EFFECT OF A PARTICIPATORY ENVIRONMENTAL EDUCATION PROGRAMME ON TRADERS' KNOWLEDGE, ATTITUDES AND PRACTICES IN SOLID WASTE MANAGEMENT IN OYO STATE, NIGERIA

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ABSTRACT

The problem associated with solid waste management in Oyo State, Nigeria has been traced by researchers to poor environmental awareness and low level of education among the populace, especially traders, who generated much of the waste. These traders however have been excluded from various environmental awareness education programme. This study, therefore, examined the effect of a participatory environmental education programme on traders' knowledge, attitudes and practices in solid waste management in some selected markets in Oyo State, Nigeria.

The study adopted a pretest-posttest, control group, quasi-experimental design with a 2x2x2 factorial matrix. The sample consisted of 1000 traders (560 female and 440 male) from twenty markets in Oyo State using the stratified random sampling technique. Three main instruments were used to collect data, namely, Environmental Knowledge Test (r=083), Environmental Attitude Scale and (r=0.85), Environmental Practices Scale (r=075). These instruments were translated into Yoruba language because majority of the participants had little or no formal education. Participants in the experimental group were exposed to a participatory environment method, while those in the control group were exposed to the placebo method. The treatment lasted for a period of twelve weeks. Seven hypotheses were tested at 0.05 level of significance. Data were analysed using descriptive statistics and Analysis of Covariance (ANCOVA).

It was found that treatment had significant main effect on traders' knowledge ($F_{(1,480)}$ =22.55; $p < .05$), attitudes, ($F_{(1,480)}$ = 75. 18; $p < 0.05$) and practices ($F_{(1,481)}$ = 48:78; $p < 0.05$) in solid waste management. Traders exposed to participatory environmental education programme performed better in knowledge ($\overline{x}$=47.83) than their control group counterparts ($\overline{x}$=46.83). Similarly, participants in the participatory group had a better attitude score ($\overline{x}$ = 42.88) than the control group ($\overline{x}$ = 33.64), and the same pattern was observed in the practice scores with those in experimental group having higher practices score ($\overline{x}$= 40.98) than control group ($\overline{x}$= 32.97) in solid waste management. It was also found that location of traders had significant effect on their knowledge, attitudes and practices. Traders from the urban areas obtained a higher knowledge score than their rural counterparts ($\overline{x}$ = 38.29) and a higher practices mean score ($\overline{x}$ = 41.32) than their rural counterparts ($\overline{x}$ = 35.29). Gender was found to have no significant main effect on traders' knowledge, attitudes and practices in solid waste management.

Participatory environmental education programme was effective in improving traders' knowledge, attitudes and practices in solid waste management. It is therefore recommended that participatory environmental education programme be adopted by all waste management agencies for enlightening traders on solid waste management and by all the agencies of government in charge of solid waste management in Nigeria.

Key words: Participatory environmental education programme, Environmental knowledge and attitude, Environmental practices, Nigerian-traders, Waste Management

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DEDICATION

This work is specially dedicated to God Almighty who has in His infinite mercy guided and sailed me through this academic aspiration. It is also dedicated to my loving wife Adekemi Abio Oladapo and our children, Femi, Ifeoluwa and Oluwaferanmi Valentina Oladapo.

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CERTIFICATION

I certify that Samuel Olanrewaju OLADAPO carried out this work in the Department of Teacher Education, Faculty of Education, University of Ibadan, Ibadan, Nigeria.

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CHAPTER ONE

INTRODUCTION

1.0 Background to the Study

The human quest to improve the quality of life through the interactive process with nature is a prevalent phenomenon. Scientific and technological achievements are enabling humankind to control and transform the natural environment to suit their needs and demands. Indiscriminate use of this capability, however, has led to environmental pollution thereby creating a situation threatening the existence of humanity (Ogundipe, 2006). The crisis has threatened the assimilative and carrying capacity of the earth, which is human's life support system.

Environmental pollution has been known to exist for a very long time (at least since people started using fire thousands of years ago) but it has now assumed a serious dimension and constitutes a threat to human existence. This is because, as human civilisation progressed, human's interaction with the environment became progressively complex and advanced (Ogundipe, 2006).

Today, the Nigeria environment presents serious problems across the length and breadth of the country despite the fact that this environment provides all life support systems in the air, on water and on land, as well as the materials for fulfilling all developmental aspirations. The problems of environment manifest in several forms. For example, sheet erosion is a phenomenon whereby a large area of surface soil is lost by "blank sheet" flows of surface or near surface water. Sheet erosion occurs nationwide, and this produces devastating effects on agriculture. Gully erosion, in contrast to sheet erosion, is very obvious because of its disastrous nature and rapid progress. (Federal

Environmental Protection Agency, (FEPA), 2002. Drought and desertification remain very serious ecological and envPPironmental problems, affecting about 15 states in the northern part of the country. Currently, it renders the areas north of latitude either desertified or highly prone to desertification. The persistence of the problem continues to cripple the socio-economic life of the areas (FEPA, 2002).

Among the major environmental problems facing Nigeria today, solid and municipal wastes are the most visible and serious. All over the country, it is not uncommon to find heaps of refuse doting the entire landscape which is a result of improperly managed solid waste (Onibokun, 1999). These problems, if allowed to persist, could lead to epidemics and associated social problems. Therefore, there is an urgent need to address these environment-related problems in a sustainable way (Center for African Settlement Studies (CASSAD), 1996). A visit to any of the cities in Nigeria today will reveal aspects of the waste management problems as heaps of uncontrolled garbage are found everywhere and road-sides are littered with refuse, streams are blocked with junks,and disposal sites constitute hazard to residential area.

The problems of solid waste management are twofold; the attitude of the populace in embracing the culture of a clean and healthy environment on one hand and the declining efforts of the government agencies in evolving strategies to achieve same on the other. This, therefore, raises the question on the information that is available and accessible to the environmental workers, who are involved in solid waste management (Akintola, 2004).

Wastes accumulation is an endemic problem. This is mainly due to the rapid rate of urbanisation and lack of adherence to sound physical planning and development

practices (Onibokun, 2000). Recent events in the major urban centres have shown that the problem of solid waste management has become a monster which has rendered abortive most of the efforts being made by the professionals, state, local governments and federal authorities alike (Onibokun, Adedipe & Sridhar, 2000). The health or ecological risks associated with wastes are functions of (i) the quantity and rate of generation; (ii) toxicity and the associated hazard; (iii) ecological characteristics of the surrounding area;(iv) inefficiency of pollution abatement equipment; and (v) meteorological conditions. As a result of the serious adverse environmental consequences of the indiscriminately dumping of waste around Oyo State, there has been a search for solution since the last quarter of the 20th century (Oluwarore, 2006).

The problems of solid waste management in Nigeria have been catalogued in several reports such as in Sridhar and Ojediran (1983) and Federal Ministry of Housing and Environment (1982). These include lack of meaningful waste management strategy, lack of public awareness concerning waste recycling practices, economic value of wastes and the effect of improper disposal of waste both on people and the physical environment. Similarly, Ayodele (1997) categorised solid waste management problems into technical, institutional, financial and sustainable human aspects. Akintola (2004), also included in the list, the inadequacy and poor maintenance of refuse vans and equipment, role conflict between state and local governments, lack of continuity in governance with attendant shift in policies, structures and focus. Further, as part of the many problems militating against waste management practices, Babajide (1998) also identified lack of reliable data on waste generation. It was also observed by Logwood

(1997) that wastes are not really disposed of in Nigeria but are transferred from one location to another where their nuisance value is thought to be less damaging.

Solid waste collections and disposals have been an intractable problem in Oyo State, Nigeria. The state is made up of indigenous towns with a population of more than five million people located on an undulating plain with a ridge of eight quartzite hills separating the state into eastern and western components (Taiwo,1998). The state is faced with critical environmental issues and problems which include insufficient waste management services, a low solid waste collection rate which has resulted in illegal dumping, blocked drains, disruption of business in commercial areas, reduced road space and localized pollution due to neighbourhood incineration. (Okediran & Onibokun, 1997). The estimated waste generation in Oyo State was 821,000 tonnes per year. This is based on a population figure of about 5,748,000 people estimated for 1998 (IBSWMA 2008). Food related organic waste constitutes the highest proportion of wastes, followed by abattoir-related waste and paper products, metallic and wood waste, textiles and plastic wastes in the 380 recognized markets in the state with about 35000 traders (Oyo State Board of Internal Revenue, 2009).

The volume of solid waste generated sometimes over-whelmed urban administrator's capacity to plan for its collection and disposal. Attempts to solve this problem effectively have given rise to myriad of strategies involving measurable amount of capital and human resources. These strategies yielded little or no positive impact on the physical urban environment of Nigerian cities. Extant literature is explicit of the solid waste generation and disposal. Scholars such as Rushbook and Pugh (1999), Ikuporukpo (1993), Adedibu (1990), Abumere(1983) advocated that to evolve an effective solid

waste management strategy, the need to carry out research on socio-economic characteristics of the residents as well as physical characteristics of different residential districts within an urban space is of paramount importance. Despite these clarion calls at various points in time, not much study has been focused at estimating the volume, composition and per capita refuse generated in Nigerian urban centers. For instance, Adedibu (1985) opined that the nature and composition of solid waste generation is a product of the climatic and business activities of the urban centers.

Abumere (1983), in his own study of solid waste generation in Ibadan, examined the effect of socio-cultural factors on land use pattern such as housing density, eating habits. His findings show that solid waste accumulation is a product of chaotic land use pattern. Also the number of household living and eating habit in a house greatly determine the level and composition of refuse to be generated. Oyo State is occupied with diverse commercial, social and domestic activities. All of these activities produce lots of waste which are not properly managed.

The rapid development of Oyo State with impact on its spatial growth, The state like any other Nigerian state, is characterized by chaotic land use pattern which is a reflection of poor planning in the past. Despite the chaotic land use pattern which characterized the urban landscape of the state, residents occupy over 60%, while commerce account for about 40% of the total land use (Falade, 1998). Tremendous increases in population, uncoordinated growth of development and expansion of commercial activities have impact on socio-economic and environmental set up of the cities of Oyo State. The city has been plague with virtually unmanageable rate of refuse generation and its weak disposal method. It is very common to see the heaps of refuse

littering the major streets in the cities of Oyo State. This is a reflection of the poor refuse management techniques in the city (Omuta, 1987).

In Nigeria, attempt at conservation and protection of environment started in 1982 with the formation of the Nigeria Conservation Foundation (NCF) devoted to the conservation of nature. The Federal Government of Nigeria took a bold step in 1984 to introduce the monthly Environmental Sanitation Day and in 1988 the Federal Environmental Protection Agency (FEPA) was established. In 1992, FEPA's mandate was expanded by Decree 59 to cover conservation of natural resources and biological diversity. Capacity building in the area of environmental protection was pursued in a number of initiatives on public awareness, training, institutional strengthening, infrastructural development and through the establishment of non-governmental organizations (NGOs) concerned with the environment. Other activities include assistance to all states of the federation for the establishment of State Environmental Protection Agencies (SEPAs), initiation and co-ordination of the development of State Environmental Action Plans (SEPAs); training of state environmental managers on specific environmental management issues; institutional strengthening of selected universities to serve as Centres of Excellence on specific environmental management and organization of various sectorial workshops and seminars for other agencies, non-governmental organization (NGOs) and Community-based Organizations (CBOs) (FEPA, 2002; Adesanya, 2000; and Ogbuozobe, 2000).

Over the past fifteen years or so, there has been an increase in the number of local NGOs that are active in environmental and ecological conservation issues. They include the Nigeria Conservation Foundation (NCF), which is affiliated to World Wildlife

Foundation International (WWF), Friends of the Environment (FoE) and Forestry Association of Nigeria (FAN). These organizations have been able to attract considerable inflow of counterpart funds to support environmental projects in Nigeria (Adesanya, 2000, Ogbuozobe, 2000; and Petters, 1993). In recognition of the importance of co-operation with other nations of the world for the effective protection of the global environment, the government has, over the year ensured collaboration with the international community in the area of environmental protection. Such collaborative efforts have resulted in positive contributions to the development of appropriate policies, legislation, action plans and programmes at regional and international levels.

In addition to the efforts of NGOs, the government of Nigeria has several sources of funds for environmental protection activities. These include the ecological fund, through which 1% of the federation account is set aside for the amelioration of ecological problems such as soil erosion and flood control, desertification, drought and general environmental control (refuse, solid waste, water hyacinth, industrial waste). This amount was recently increased to 2% and paid into a Special Ecology Fund. In addition, the government has earmarked 3% of the revenue accruing from crude oil in the country to tackle some ecological problems through the defunct Oil Minerals Producing Areas Development Commission (OMPADEC) and which has now metamorphosed to Niger-Delta Development Commission (NDDC) (Okebukola, 2001). Financial contributions from non-governmental organizations and the private sector also provide assistance for conservation efforts. Bilateral and multilateral financial assistance from such agencies like the World Bank, UNDP, UNEP, FAO, IUCN, UNICEF and ADB equally covers such problems as desertification control, capacity building and so on (Petters, 1993).

However, all these measures have not been able to solve the environmental problems in Nigeria, and Ibadan in particular.

A consideration of practical solutions to the effective management of all waste types in a sustainable manner will be of national interest because majority of Nigerians will benefit from an improved environment (Olatundun, 2009).To this end, an environmental education programm is necessary because illegal waste dumping, if not checked, can impact natural resources, human health and ecosystems with adverse consequences for the present and future generations of Nigerians. Sridhar (1983) and Logwood (1997) listed fire, communicable diseases and contamination of underground water as part of the main environmental consequences of improper solid waste management practices. The public needs to be informed about issues that affect their well-being. Waste generation as solids, liquids, gases and air-borne particulate matter or dust has inevitable consequences on human activities.

There was no systematic/ formal approach to waste management in Nigeria until the Federal Environmental Protection Agency (FEPA) was created by decree 58 of 1988. The National Policy on Environment was officially launched on 27th November 1989, by President Ibrahim Babangida. He mentioned many glaring cases of pollution and environmental damage prevalent in Nigeria either through the preventable acts of people or as a result of natural disasters. In response to environmental problems in Nigeria, several attempts have been made by the successive regimes at finding lasting solutions. Policies have been formulated and conferences held to address issues concerning the problems locally, nationally and internationally. Notable among such international conferences and workshops were those of Stockholm in 1972, Belgrade, 1975; Tbilisi,

Georgia, in the former USSR which was held in 1977, Rio de Janeiro Conference 1992 in Brazil, popularly known as the ”Earth Summit”, Kyoto Conference, Japan, Johannesburg, South Africa, 2003 (Scoulls & Malotidi, 2004).

In the midst of this environmental problem an intervention through environmental education (EE) is urgently needed. Such intervention must be holistic and practical in manner akin to the mass literacy campaigns, universal basic education (UBE), free education at all levels, nomadic education, population education, Better Life for Rural Women, Mass Mobilization for Social and Economic Recovery (MAMSER), and HIV/AIDS campaigns, all of which were (some still are) educational programmes that made banner headlines. Environmental education, the process of inculcating the right values, attitudes, skills, and knowledge for the physical environment, seems to be the solution to the current ecological crises that have worsened rural poverty, imperiled many cities with filth and floods, and under an acute shortage of land, food and fuel, obliterated forests, thereby depopulating wildlife and stripping away soils (Petters, Ekpoh and Bisong, 1995), asked: How do we, in the midst of a teeming population, pollution, and an acute land crisis with declining agricultural productivity reconcile voracious natural resources?.

The poor environmental practices could be closely linked to the low level of awareness of the people. The level of Nigerians' environmental consciousness is abysmally low as compared with other people of the world where environmental awareness has led to informed actions. Generally, Nigerians are at best indifferent to the improvement and care of the environment. The environment is viewed widely as a source of livelihood; as discrete entities, and not as tightly knit system of inter-dependent

structures of rivers, forests, animals, microbes and flowers (Ajiboye & Ajitoni, 2007). The attitude of people and children in the indigenous areas such as Oniyanrin, Bere, Sango, and others towards waste management is generally poor. Similarly, people's awareness of the environmental impacts of the waste is generally low. Taiwo (2000) enumerated the causes of the problems to include; illiteracy, poverty, lack of basic health education, lack of or inadequate environmental education, and the inability of traditional communities to catch up with the fast urbanization (IBSWMA, 2009). The poor attitude of people towards dirty environment is not due to absence of environmental laws, it is only that these laws are not being enforced. For instance, there are laws such as those enacted by Ibadan Solid Waste Management Authority and several bye-laws by local governments in the state but these laws are not being fully applied. Ogundipe (2006) observed that ignorance on the people's part as a result of high level of illiteracy is a prominent factor militating against keeping a clean environment.

. It is clear from the foregoing that something must be done to solve these environmental problems. The questions that arise from these are: What should be done and by whom? First, it has been suggested that environmental education should be the intervention strategy for ameliorating the effects of environmental degradation (Laoye, 2006). Environmental education belongs to the domains of formal and non - formal education. Its ultimate goal is to change human values and behaviour across the entire social spectrum; from that of wanton exploitation of nature and ecological apathy, to new spirit and habit, morals, ethos, ideals, principles, customs, norms and lifestyles that will appreciate the beauty of nature and develop a culture of clean environment, as well as

protect and manage it for sustainable development that will benefit this and future generations (Petters, 1995).

Current research in environmental education has suggested participatory approaches to solving current environmental problems. The participatory action research is an established method in the social and medical sciences since the mid-20th century and has increased in importance for information system toward the end of the century. Participatory model can be applied to any type of environmental issues such as solid waste management. Consequently, the participatory model of Mansaray (1999) in which recipients took an active part in developing and packaging such information could focus on any level of research or instruction on environmental issues.

According to Laoye (2006), the location of activities of people and the relative planning of an area are crucial factors in waste generation. People living in commercial areas like Iwo road, Agodi-gate and Oluyole all in Ibadan, Rounder, Takie, Okelerin in Ogbomoso are bound to generate less solid waste than those living in unplanned market areas such as Oje, Bere, Oja'ba, Idi Arere, Bode and Orita Challenge. These areas are considered problematic when it comes to solid waste generation. The increase in volume of wastes generated is also due to spatial growth and creation of new markets.

Many research works have been carried out to explain gender differences in learning outcome including environmental education. Onibokun (1997) and Kironde, (1998) explained that the differences in learning are derived from various factors such as the bicultural model. This model explains that females generally are thought of in terms of their feminine roles of how to take care of domestic chores which include cleaning of surroundings. This has caused what is referred to as "gender stereotyping", resulting in

the label syndrome of “feminine or “masculine” roles. Also other studies reported differences in environmental issues relating to gender. Vanass and Doris (2006) found that while male frequently mentioned nuclear power, the female, tended to report threats to wildlife as a major concern. Differences were also reported by an Australian study (Connell, Fien, Sykes &Yencken 1999) which found that, when asked to name the most important environmental issues in Australia, more female students identified endangered animals, while more male students mentioned soil erosion and land degradation.

On the other hand, Olagunju(2005) and Ogunleye(2003) found no significant effect of gender on students’ knowledge and attitude towards environmental education. Their findings revealed that females possessed more verbal commitment to the environment than males. Considering the important roles of women as the first teachers of the children and their closeness to the environment, bordering on their activities and use of materials in the environment, the education of women towards conserving the environment is very important. In the same vein, Gifford, Hays and Boros (1983), examined individual differences as they relate to environmental attitude. The results proved that males possess more environmental knowledge than females; while females displayed greater affection (attitudes) or concern about the environment than males, and females possess more verbal commitment than males. However, Strikland, Robertson, Jetinghoff & Carolyn (1977) in his own study, found no significant difference between male and female subjects in the amount of acquired information relating to energy before and after treatment. These conflicting evidence would require further research

1.2 Statement of the Problem

More than 50% of solid waste in Oyo State emanates from markets (IBSWM, 2006). It has also been discovered that this solid waste has not been properly handled by the traders. Hence, the need to educate traders on environmental issues especially on solid waste management has become highly imperative. This study, therefore, investigated the impact of a participatory environmental education intervention programme on the knowledge, attitudes, and practices of the traders in solid waste management in the markets. It also determined the moderating effects of gender and location of the market on the three dependent variables of knowledge, attitude and practices of the traders.

1.3 Hypotheses

The following hypotheses were tested at 0.05 level of significance

Ho_1: There is no significant main effect of treatment on participants'

(i) environmental knowledge;

(ii) environmental attitude; and

(iii) environmental practices.

Ho_2: There is no significant main effect of location of markets on participants'

(i) environmental knowledge;

(ii) environmental attitude; and

(iii) environmental practices.

Ho_3: There is no significant interaction effect of treatment and markets' location on participants'

(i) environmental knowledge;

(ii) environmental attitude; and

(iii) environmental practices.

Ho_4: There is no significant main effect of gender on participants'

(i) environmental knowledge;

(ii) environmental attitude; and

(iii) environmental practices.

Ho_5: There is no significant interaction effect of treatment and gender on participants'

(i) environmental knowledge;

(ii) environmental attitude; and

(iii) environmental practices.

Ho_6: There is no significant interaction effect of gender and location of residence on participants'

(i) environmental knowledge;

(ii) environmental attitude; and

(iii) environmental practices.

Ho_7: There is no significant interaction effect of treatment, gender and markets' location on participants'

(i) environmental knowledge;

(ii) environmental attitude; and

(iii) environmental practices.

1.4 Scope of the study

This study was designed to develop a participatory environmental education programme and to determine the impact of the programme on the environment-related knowledge, attitude and practices of 1000 selected traders in 20 markets comprising 10

urban and 10 rural markets in Ibadan, Oyo, Ogbomoso and Iseyin in Oyo State. It also investigated the impact of the intervention programme on the knowledge, attitude and practices of traders Odo Oba, Ojagbo, Arada and Akunko in Ogbomoso. Sabo,Ilora, Ajegunle and Araromi in Oyo; and Adabo, Oluwole, Ogisiyi and Koso in Iseyin. Other markets covered were, Bodija, Adelabu, Gate, Sango, Oja Oba, Bola-Ige, Ogunpa and Bode markets in Ibadan.

1.5 Significance of the Study

Findings from this study could be beneficial to traders who were exposed to new ways of solid waste management in the markets as this could reduce the spread of diseases associated with dirty market environment. It is further hoped that findings from this study would be of benefit to customers who have to buy items from a dirty market environment which could result in the outbreak of preventable diseases such as cholera. They could benefit from the studies as they would be buying items from knowledgeable traders who were expected to sell from a neater environment devoid of diseases.

Also, findings from this study could provide empirical data to all stakeholders, especially environmental educators and planners, on the need to integrate participatory environmental education in the education of traders with respect to handling of solid wastes in their locality.

Hopefully, the findings would also assist the Oyo State government in producing practical solution on how wastes could be better managed in the markets and this could reduce the amount of money being expended on waste removal in the markets. The findings should also be important to the populace who would be benefiting from a neater market environment especially those who are living close to the markets and have been

experiencing offensive odour and filth emanating from the market locations. The findings provide solution to this menace and save the populace from outbreak of epidemic as result of a dirty/filthy environment.

1.6 Operational Definition of Terms

Environmental Practices: The mental predisposition of the participants to act and develop a sense of responsibility and urgency in solving the menace of solid waste management in the markets.

Environmental Education (EE): Process of transmission of environmental information, values and skills for awareness creation attitude change towards the use of the immediate environment and its proper management of elements within that environment.

Knowledge: The acquired basic understanding by the participants on solid waste management and its associated problems.

Attitude: The feelings, opinions, likes or dislikes and interests of the traders in solid waste management as measured by their practices.

Participatory Approach: A process of developing new skills by the traders to solve problems associated with solid waste management.

Traders: Those involved in buying and selling in established markets located in Ibadan, Oyo, Ogbomoso and Iseyin in Oyo State.

Solid Waste: The bye-products of goods items and other materials used, consumed or abandoned in a market in the study area.

Waste Management: A method and approach adopted to ensure that wastes do not litter, constitute nuisance or become hazardous to the environment and also the turning of wastes to useful items

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The related literatures were reviewed under following headings:

2.1 Theoretical framework

2.2 The concept of environment

2.3 Historical perspective of environmental education

2.4 The development of environmental awareness in Nigeria

2.5 Philosophy of environmental education

2.6 Objectives and principles of environmental education

2.7 The environment and environmental problems

2.8 The rationale for educating traders on environmental problems

2.9 Global environmental problems

2.10 Environmental problems associated with solid waste

2.11 Knowledge of people about solid waste management

2.12 Attitude of people towards Waste management

2.13 Solid waste management in selected African countries

2.14 Solid waste management in Nigeria

2.15 Goal and objectives of solid waste management

2.16 Participatory action research

2.17 Qualitative research

2.18 The concept of knowledge

2.19 Studies on attitudes

2.21 Appraisal of literature

2.1 Theoretical Framework

The theoretical framework for this research was adapted from constructivist theory of learning which focuses on learner's ability to mentally construct meaning out of their environment and to create their learning through participation. According to Kirschener (2006), constructivism is a psychological theory of knowledge which argues that humans generate knowledge and meaning from their experiences. Formalisation of the theory of constructivism is generally attributed to Jean Piaget (Mayer, 2004). The constructionists argue that as far as instruction is concerned, the instructor should try and encourage learners to discover principles by themselves (Affikinson, 2000).

From the constructionists' point of view, there are some shifts in learning today. These shifts are:-

- from instruction to construction and discovery;
- from teacher to learner-centred education;
- from absorbing learning materials to learning how to navigate and learn
- from the teacher as a transmitter to the teacher as a facilitator (Falade, 2007);

According to constructionists, effective learning involves action or active participation of the learners. John Devery, one of the constructivists, stressed that the learner needs to do something. Learning should not be passive acceptance of knowledge, it involves the learners engaging in the process (Forrester & Jantzie, 2004). According to the social constructivist approach, instructors have to adapt to the role of facilitators and not teachers (Hilbert 2004). Where a teacher gives a didactic lecture which covers the subject matter, a facilitator helps the learner to get to his or her own understanding of the content. The emphasis thus turns away from the instructor and the content to the learner (Clark,

2006). Social constructivist scholars view learning as an active process where learners should learn to discover principles, concepts and facts for themselves, hence, the importance of encouraging guesswork and instructive thinking in learners (Holt 2004). In fact, for the social constructivist, reality is not something we can discover because it does not pre-exist prior to our social invention of it. Kukla (2000) argues that reality is constructed by our own activities and that people, as members of a society, invent the properties of the world. Other constructivist scholars agree with this and emphasize that individuals make meanings through interactions with each other and with the environment they live in. Knowledge is thus a product of humans and is socially and culturally constructed (Pass.1992).

A further characteristics of the role of a facilitator in the social constructivist's view point, is that the instructors and learners are equally involved in learning from each other as well (Holt & Holt 2000). This entails that learners and instructors should develop an awareness of each other's view points and then looks to their own beliefs, standards and values, thus being subjective and objective at the same time (Savery 1994). The constructivist thus belief in participatory action research which the research is based on.

Participatory model can be applied to environmental issues such as solid waste management. Consequently, the participatory model of Mansaray (1999) in which the recipients' took an active part in developing and packaging such information could focus on either level of research or instruction of environmental issues. Mansaray's findings as reported by Oyetade (2003) show that the approach had a more profound impact on the knowledge and attitudes of the participants in relation to the messages communicated which could equally be applicable at all levels (Oyetade 2003). The participatory action

research produces highly relevant results, because it is grounded in practical action aimed at solving an immediate problem situation (Westfall, 1999).

Oyetade (2003) reports that participatory action research involves undertaking research in a natural setting where the researcher is an instrument of data collection who gathers words or pictures, analyses them, focuses on the meaning and describes a process that is expressive and persuasive in language. Participatory action based method adopted in this research also takes it root from constructivist theory of learning which provide the theoretical foundation for participatory action research. It focuses on learner's ability to mentally construct meaning out of their environment and to create their own learning. Some of the theorists associated with constructivism as reported by Falade (2007) include John Dewey, Seymour Papert, Jerome Brunner, Jeen Piaget and Lev Vygotsky .

One of the proponents of this theory, pointed out that in constructivist theory, learning is interactive and collaborative (Carbonell, 2004). The constructivists believe all humans have the ability to construct knowledge in their own minds through a process of discovery and problem solving. They believe the researcher should encourage the population used in research to discover principles and solutions to problems through participatory method. The model involves working together to achieve a common purpose (Klemin, 1994).

Action research involves (i) Action to bring about change in a community, organisation or programme (ii) Research to increase understanding on the part of the researcher, client or both. Action research is a natural way of acting and researching at the same time (Rick, 2005).

Ajitoni, (2007) further emphasises the real and lasting changes that occur through action research. They argue that education programmes are usually packaged and administered by perceived "experts" without an adequate input by the beneficiaries of such programmes, which quite often, seem to work for some time and then fail without obvious reasons. Action research is action oriented and it leads to permanent outcomes.

Participatory action research is highly relevant in environmental education programmes hence one would agree with Jones (1996) as cited by Falade (2007) that participatory action research is a collaborative and 'Bottom-up' effort that starts with interpersonal attitudes to skills leading to functional and finally to broad team skills which is the ultimate intention of action research. The participatory action research is transformation; change and improvement in the lives of the participants and it enhances attitude formation (Akintunde, 2007). Environmental issues involve a complex set of multidimensional interactions between the environment and man and to find solution to such environmental problem such as solid waste management, there is a need to employ a qualitative approach, Creswell (1994). This will emphasise the researcher's role as an active learner who can tell the story from the participants' view rather than as a person that passes judgment on participants. The researcher interacts with those they study. He or she tries to minimise the "distance" or "objective separateness" between him or her and those being researched. The prolonged time on the field for the investigator minimises the distance as the investigator's observational role shifts from that of an outsider" to that of an insider during his or her stay on the field.

2.2 The concept of environment

The definition of Environment has changed drastically over the past years. We now do not only define the environment as something out there consisting of lakes, mountains, animals and plants, but:

- Everything that surrounds us;
- That humans are an integral part of the environment;
- That the interactions within or between and among the living and non-living entities constitute the environment.
- Environment is also defined as consisting of two Principal components, The Natural and the Human Environment.

It is noteworthy that these two components interact and determine the state of the environment. Hence it is often said that "human health of the natural environment"

2.3 Historical Perspective of Environmental Education

According to Inyang-Abia (1994), "the incontrovertible fact that environmental education pervades all human activities, ages, nations, races and cultures is underlined not only by its varied foundations, but more so by the fact that the environment is an absolute necessity for every existence". The modern concept of environment originated in the nineteenth century when the Industrial Revolution caused an unprecedented alienation of man from nature and the disruption of civilization's formally unified cultural milieu. Also Inyang – Abia (1992), modern efforts in the areas of environmental education can be traced to such personalities as March (1801 -1882) and Patrick Geddes (1854-1933) among a few others. The works of these great environmentalists led to formal introduction of environmental education into the school system. Patrick Geddes, a

professor of botany, is today accepted as the father of environmental education. In his work, he emphasized the strong interrelationship between the quality of the environment and the quality of education. Match was one of the earliest advocates of sustainable use of the environment. As far back as 1864 he examined how human activities threatened the earth and nature. His advocacy led to the protection of threatened biosphere and the declaration of the world's first national park, the Yellowstone National Park, which is the largest nature reserve in the United States, set up in 1872. His work led to the use of the term "conservation".

The development of responsible environmental behaviour has long been recognized as the ultimate goal of environmental education. It is interesting to observe that between 1972 and 1992 the United Nations' Environment Programme (UNEP) reports unveiled the degradation of our environment. Also, after the Stockholm (1972) and Tbilisi Conferences, environmental education attained a position of prominence at national and regional educational systems. Apart from individual efforts, non-governmental organizations (NGO) and international agencies such as UNDP, UNESCO – UNEP and IUCH have consistently encouraged the development of environmental education globally, The worldwide Fund for Nature (WWF) established in 1961 with headquarters at Glan, Switzerland, for example, has contributed in originating, installing and promoting environmental education in various parts of the world, including Nigeria (Inyang-Abia, 1995). The organization, among others is concerned with the conservation of threatened or endangered species of plants, animals and areas of biodiversity including watersheds and wet lands. To Inyang-Abia (1995), two major approaches (formal and

non-formal) are adopted by the organization for the purposes of creating environmental awareness.

2.4 The Development of Environmental Awareness in Nigeria

The genesis of environmental awareness can be traced to 1930 when the Nigerian Field Society was founded by AFB – Bridge. This society devoted its study to plants, animals, environment, peoples and cultures of West Africa with little attention paid to conservation or environmental awareness. Not until 1982 when the Nigerian Conservation Foundation was formed, nothing substantial happened in the direction of the environment. This foundation was a truly indigenous non-governmental organization (NGO) devoted to conservation of nature.

A national profile of Nigeria's environmental problems documented in "Nigeria's Threatened environment" by Nigeria Environmental Study Action Team NEST, (1991) reported that there exist land, water, atmosphere, vegetation wide life, population and cultural degradations. The propelling force that geared people's attention to tackle environmental literacy, encompassing environmental knowledge, attitude and skills are essential ingredients required for solving environmental problems.

The government, for the first time, evolved an environmental policy embedded in the fourth National Development Plan 1981 – 1985 (Federal Republic of Nigeria, 1981) which can be tagged the documented evidence expressing Nigeria's national seriousness in environmental awareness. Nigeria, however, has intensified its efforts since the past two decades in pursuing programmes of environmental education, both in the formal and informal sectors. In view of this, the 1991 National Curriculum Review Conference which appraised the curriculum of the Nation's educational system in Kaduna noted the

deficiencies of Environmental Education (EE) elements in various syllabi and those that have EE elements do not reflect the linkage between development actions and the environments (Olagunju, 2001). The conference finally recommended that the various syllabuses be updated or renovated. It is in view of this national commitment of providing an education that would enable people to apply environmental knowledge and awareness to the solution of environmental problems, The National Council on Education (Nigeria's highest educational policy body) had directed the infusion of environmental education elements in all school subjects at all levels. It is perhaps in this vein, that the Nigerian Educational Research and Development Council (NERDC) has been assigned the responsibility of integrating environmental education components into the broad spectrum of existing school subjects starting with the Secondary School (Mansaray, Ajiboye and Audu, 1998). The national prototype of environmental education curriculum has therefore been developed by NERDC based on UNESO's effort at gearing towards integrating the various components of this curriculum at the Junior and Senior Secondary levels (Adara, 1995).

Though the Nigerian Conservation Foundation (NCF) has been the moving spirit behind most environmental awareness programmes and" conservation in Nigeria as rightly observed by Inyang-Abia, (1995), other organizations which have made tremendous impact include the Endangered Species Decree No II of 1985, National Conversation Education Strategy, 1988, approval for installation of environmental education in the Nigerian School System from 1991, environmental education units at the University of Calabar and at the College of Education, Ekiadolor, near Benin in Edo State, and National Parks such as the Cross River National Park, Hadejia-Nguru

Wetlands Projects, the Kainji National Park and the Geshaka-Gumti Game reserve. Other associations that focused on environmental awareness creation and concretization include the Green Groc Foundation and the Nigerian Association for Environmental Educators (NAFEE, 1993).

2.5 Philosophy of Environmental Education

The philosophy of environmental education is the logical reflection on and of all essential values or meanings of the education process as a means of environmental conservation and sustainability. Logical reflection excludes arbitrariness or whims. It implies the essential values or meanings of the educational process as means of achieving environmental conservation and" sustainable. Educational process is the set of activities carried out intentionally to enable man acquire knowledge, skills, values and attitudes that are significantly correlated with the human efforts to conserve and sustain the environment.

The philosophy environmental education goes beyond experience into the implications of experience. Every individual operates his life, social relations, and relations, and relations with the environment on a set of assumptions. According to Marker (1975):

> *A philosophical assumption is the conceptual outcome of tentatively taking a position with regard to alternative meanings of given philosophical concept. Pg 232*

In coming experiences, ideas, or newly acquired concepts are related to these assumptions in expectation of finding their implications. If the experiences imply what we know already to be true, we conclude that it, must of necessity, be also true.

The philosophy of environmental education is also analytical in its orientation. There is great need for systematic analysis of the concepts of environmental science, geography, social studies, agriculture, geology, anthropology, political science and economics. Others are from education.

The philosophy of environmental education is normative in nature. Prescriptive activity should occur when Marker (1975) concludes that appropriate standards of judgment warrant viewing hypothesis as reasonable and therefore, ready for the consideration and testing of others. Education may accept to test the conclusion empirically. Until this is done, the proposition advanced by the philosopher remains a hypothesis. Environmental education therefore, seeks to change the behaviour of men, and its philosophy is concerned with finding justification for alternative responses to the environment.

In spite of its limitations in educational practices, philosophy of environmental education has great utility in articulating a paradigm for the solution of many theoretical questions and issues in environmental education (Emeh, 1995). Self examination of our values, culture, educational practices will offer moment of illumination which the injunction of Plato supports in his conclusion that, "an unexamined life is not worth living". An enlightened" environmental educator will carefully examine the significance of the environmental situations, and equally be armed with knowledge, skills and values to make others to be aware of their own environmental situations.

2.6 Objectives and Principles of Environmental Education

The objectives of environmental education vary according to the values and interest held by those advocating the necessity to teach about the environment (Martin

1975). Martin categorized advocates of Environmental Education into two – the conservationists and the educationists. Those advocates holding conservationists' ideals want a form of environmental education that sets its objectives firmly on the promulgation of the wise use of natural resources. Educationists on the other hand, are interested in implementation of Environmental Education Curricular in schools.

In 1977, Tbilisi, USSR, the World Intergovernmental Conference on Environmental Education as cited in UNESCO – UNEP International Environmental Programme (1989) adopted the goal of environmental educations as:

> *to developed a citizenry that is aware of and concerned about, the total environment and its associated problems which has knowledge, attitude, motivations, commitment and skills to work individually and collectively toward solutions of current problems and the prevention of new ones (p. 112).*

The conference further enumerated three key issues which the learners should be helped to understand in order to achieve the above stated goal.

These are:

(a) obtain an understanding that people are an inseparable part of an environmental system and that whatever they do alters their surroundings in both harmful and beneficial ways.

(b) obtain a basic knowledge of how environmental problems can be solved and recognized as the responsibility of individuals and each segment of society to co-operate in their solutions.

(c) develop analytical thinking and action skills for understanding, preventing and helping to correct environmental abuses.

In Nigeria, the Belgrade Workshop (of 1975) objectives for Environmental Education as outlined in UNEP (1995) which involve the cognitive, affective and psychomotor domains are adopted as

These objectives could be summarized in categories as:

1. **Awareness:**

   Environmental Education in Nigeria should aim at sensitizing the public by creating awareness about the total environment and its problems. Awareness will help people gain insight into certain alternatives to environmental problem identified.

2. **Knowledge:**

   Environmental Education should aim at helping individuals and social groups acquire experiences and knowledge about their environment, its associated problems and humanity's critical responsible presence and role in the environment. The knowledge objective should be concerned with producing citizens who are knowledgeable about the biophysical environment and its associated problems, aware of how to help solve these problems and are motivated to work towards their solutions.

3. **Attitude:**

   These categories of objectives deal with helping individual and social groups acquire social values, strong feelings of concern for the environment and motivation for actively participating in its protection. Desired attitude to the environment should be made second nature to every member of the society.

4. Skills:

Environmental Education should also be geared towards helping the individual and social group acquire the skills necessary for working towards the solution of environmental problems. This objective will help Nigerians to acquire skills for identifying and solving environmental problems. To identify the problems the individual need knowledge and awareness of the objective.

5. Participation:

The objective should aim at helping individual and social groups develop a sense of responsibility and urgency regarding environmental problems and to ensure appropriate action to help solve these problems. This according to Obi (1993) could lead to critical thinking and the seeing of environmental problems as challenges that need to be solved immediately.

6. Evaluation:

Environmental education should aim at measuring environmental aspect in terms of ecological, political, social, economic, aesthetic and educational factors have attempted to summarize the objectives of Nigerian environmental education as follows:-

(i) Enlightening the citizenry on the physical components of his environment.

(ii) Informing the people about our dependence on environmental resources.

(iii) Enlightening the people about the changes that have taken place in the environment over the past decades, centuries and millennia;

(iv) Alerting everyone to the consequences of human actions on the environment, including the toll on other forms of life.

(v) Creating concern for environmental quality and conservation, fostering understanding of man's relationship and interaction with the ecosphere

(vi) Developing personal, community and national sanitation, and conservation ethics that will emphasize caring for nature.

(vii) Creating a sense for responsibility that will motivate the ordinary citizen to seek and acquire more knowledge about the environment and its problem, and propagate such knowledge to other in the community.

2.7 The environment and environmental problems

The physical environment consists of land, water and air. It is from land, water, air and their resources that human needs are provided. These needs are ever changing and ever on the increase. The clearer the understanding of the environment is, the more effectively it can be managed and put at the service of human beings Ogundipe, (2006) Mannion, (2000) and Mc Commick John (2003), both report that human communities brought about environmental changes for a short time in the history of human evolution. They traced human actions since 10,000 years BC when a major change occurred. Permanent agriculture replaced hunting, gathering as the major food procurement strategy. This began in the near east and resulted in social and environmental changes that subsequently transformed the earth's surface.

The distribution of people between rural and urban areas has implications on the type of pressure put on the environment. Human activities has brought about a plethora of environmental problems ranging from desertification, pollution, waste management, deforestation, erosion menace, land degradation, and flooding.

In Nigeria, environmental pollution problems are numerous, resulting in long-term environmental degradation and increase in incidence of water borne diseases. Environmental pollution encompasses all ways by which man pollutes his environment. It could be the releasing of gases and smoke which pollutes the air, disposing of waste into water bodies, damaging of soil through application of fertiliser or pesticides, over grazing of farm lands or dumping of refuse. Problems associated with environmental pollution includes among others, the harmful effects of pesticides, insecticides and fertilisers in their application to agriculture. The use of chemicals in the control of diseases and pests in agriculture is not directly blamed on the usage of these chemicals but rather on overuse and misuse. Few people realise that DDT, for instance, has the characteristics of a well organised metallic poison such as mercury and can be concentrated as it moves in the food chain (Ogundipe, 2006). What shall we do to correct these ills?

2.8 The rationale for educating traders on environmental problems.

The environment is our way of life as such, man must continue to seek how to preserve it while making use of its resources. It is therefore our duty as the highest of all animals to ensure the continuous and healthy existence of ourselves and others. It is also our obligation to preserve the vegetation, soil, the planet earth and all that is there in.

Environmental education has become necessary because a careful reading of the signals indicates that pressures on earth's principal trend of environmental degradation consist of eroded agricultural land, depletion of soil nutrients and increasing frequency of devastating droughts. Man feels desertification is forcing him out of the limited available agricultural land. At first, he wondered why nature was so unkind to him, but later

realised he is actually the architect of his environmental misfortune. Olofin (2005) further stressed that to compound man's worries, his efforts to produce more good and enhance his survival and that of his offspring yield wastes that endanger his life more than the natural factors. His methods of disposing waste pollute rivers, lakes and air spaces, especially in the rural areas. He has also discovered that very close relationship exists between surface degradation and atmospheric pollution, little wonder those in the advanced countries dump dangerous wastes in unsuspecting developing nations, forgetting planet earth is engaged in one great uncontrolled global experiment (Burton, 1989) which may soon explode in the face of everyone.

Scholl, (2002) was of the view that other activities of man other than the generation of filth degrade the environment. A combination of these activities, atmospheric pollution and natural cyclic fluctuations would seem to be responsible for the wide variations that are now observable in the global climate conditions. In this part of the globe, droughts have become more frequent and more devastating especially in areas not cushioned by irrigation (Olofin, 1992).

Researchers are of the view that a successful policy on environmental issues hinge on exigencies of politics, this entails an effective articulation of public opinion and support. Educating traders on environmental problems and issues would go a long way in bringing the much needed awareness as they form majority of out-of-school population.

2.9 Global Environmental Problems

The physical environment consists of land, water and air. It is from land, water, air and their resources that human needs are provided for. These needs according to

NEST (1991), are ever changing and ever increasing. The clearer the understanding of the environment the more effectively it can be managed and put at the service of human beings.

The development of metal technology brought new agricultural systems in Europe which was a centre of agriculture and technological innovations. This resulted in the industrial revolution of the mid 1700's, which not only paved way for the development of modern society, but also brought with it new and potent agents of environmental change.

The distribution of people between rural and urban areas has implications for the type of stress placed on the environment. Human activities are largely concentrated in urban areas and thereby create relatively high demands for natural resources (e.g. energy, fresh water and land), basic services and infrastructures (e.g. sanitation, waste disposal services, education and health care, roads, public transport and employment, (UNEP 1993). Consequently, industrialisation and urbanisation have been accelerated in most parts of the world with a complete disregard for the well being of the physical environment. Human activities have brought about a plethora of environmental problems ranging from desertification, pollution, waste management problems, deforestation, erosion menace, land degradation, flooding and associated environmental problems.

UNEP (1993), described pollution as a deliberate or accidental contamination of the environment with wastes from human activities. These activities include the release of substances, which harm the quality of air, water and soil, which destroy biogeochemical cycles (linking people to animals and plants) and which damage the health of humans (taking decades or generation to produce terminal diseases). Growing population and increased economic growth usually aggravate pollution.

Further, Lowe, et al. (1992) associates pollution of landscape with the accumulation of unwanted waste-materials and major environmental disturbances resulting from accelerated urbanisation and industrialisation. The study estimated the annual production of domestic rubbish in the United Kingdom as exceeding 300kg per person and totals over 18 x 10^6 tonnes, plus another 20 x 10^6 tonnes from commercial and industrial sources.

Land degradation is another environmental problem caused by human activity. According to Wellens and Millington (1992), land degradation signifies a loss or reduction in land productivity. It encompasses degradation of soil and/or vegetation cover and may be caused by various anthropogenic pressures including deforestation, overgrazing, unsustainable agricultural pollution-related problems, which have had adverse impact on environmental quality. Mannion, (1992) describes acidification as causing the decay of forests and lakes while eutrophication has adversely affected aquatic ecosystems and aquifers. The causes of the two processes are well established and these reflect the society's ability to disturb the biogeochemical cycles of elements such as sulphur, phosphorus and nitrogen. Like so many pollution problems, acidification and eutrophication are inadvertent repercussions of scientific advancement and both are the products of fuel-powered urban industrial system.

On a global and regional scale, forests play a part in the modulation of climates and are the lungs of the planets, deforestation is believed to contribute as much as 25% of the increased carbon dioxide which is the principal cause of enhanced greenhouse effect. This occurs because heat-trapping gases are released by the burning of felled woodlands

and because the absorption of carbon dioxide from the atmosphere via photosynthesis is reduced (Soussan and Millington, (1992).

Transport which happens to be a means of moving people or goods from one place to another also has its environmental consequences. The major environmental consequences of transport are summarized as:

- emission of greenhouse gases, particulate, fuel and fuel additives;
- contamination of surface and ground water from surface run off and spillage of petrol, oil and transported substances;
- modification of hydrological regimes during construction of roads, ports, canals and airports;
- use and wastage of land and its associated ecosystems;
- excavation and use of minerals (e.g. gravel) for road construction; and

The United Nations Environment Programme in its environmental data report (1994) catalogued a range of environmental disasters, which are resulting from human activities. The report stated that:

- On the average, approximately 25,000 deaths are caused by natural disasters globally per year, and economic damage is estimated to be more than US $300 million a year;
- The less developed countries suffered 97% of the world's 825 major natural disasters between 1970 and 1985 and accounted for more than 97% of all natural disaster-related deaths;

- Most energy-industry related accidents between 1969 and 1986 occurred as a result of coal mining, fires, oil and natural gas explosion, hydroelectric dam failure or core damage to nuclear power plants;
- Between 1944 and 1987, there were 284 nuclear accidents world-wide, many of which were associated with mishandling of isotopes or inadvertent exposure to x-rays.

The United Nations Conference on the Human Environment, otherwise known as the Stockholm conference, which took place in June 1972, was the first to discuss or consider the political, social and economic problems of the global environment at an intergovernmental level. Mc Cormick (1995) reports that the Stockholm Conference agreed largely on both the problems and the solutions to environmental issues. The conference was a part of a process, which brought the environment to the attention of governments, encouraged subsequent international agreements and conventions on key environmental issues. It eventually resulted in the creation of the United Nations Environment Programme. The blueprint for UNEP was the Stockholm action plan, which was to be implemented in three ways, namely, environmental assessment, environmental management and Environmental supporting measures.

Mostafa (1984), while assessing the achievement of UNEP, reported that UNEP had succeeded in raising the level of environmental awareness in decision-making circles. UNEP has drawn the attention of government to their own national environmental problems. Through its principal handicaps remain in that UNEP is rarely in a position to backup its warnings and advice with either money or technical assistance. It is a

coordinating programme; hence its success and failure will continue to depend on its abilities to encourage governments and other agencies to take action.

2.10 Environmental Problems Associated with Solid Waste

One of the major environmental health problems facing Nigeria with a population of over 120m according to Sridhar, (1986), is solid waste. The problem arose from oil boom, which has changed the living conditions and attitudes of the people, together with rural-urban migration. As a result, a variety of solid wastes started appearing on the roads and residential areas. Such solid wastes according to the paper are domestic in nature, originating from food that are processed and consumed by the people. Sridhar, et al (1983) and Ologhobo (1994) reported that refuse dumps, besides being a nuisance and stinky, harbour disease vectors such as flies, mosquitoes, rats (fleas) and a grazing ground for zoonotic diseases.

Ologhobo (1994) listed a number of communicable diseases associated with solid wastes, such as fly-borne, zoonoses and mosquito-borne diseases. The common fly-boorne diseases are typhoid, dysentery, diarrhea; those of rodent-borne zoonoses are histoplasmosis, virus infections and relapsing fever, and those of mosquito-borne diseases are malaria, yellow fever, filariasis and encephalitis. Sridhar, et al (1983), also reported that refuse dumps are sources of fire hazards. This is evident from a major fire outbreak in December 1978, which was attributed to the indiscriminate refuse disposal in a market area at Dugbe, Ibadan. This resulted in loss of money and lives. Another major environmental problem reported in the work is flood disaster. Two major floods (April 20, 1978 and August 31, 1980) were caused by the blockage of Ogunpa river in Ibadan

by refuse. There were property losses and several deaths. Refuse is also known to cause traffic hold-ups in cities resulting into loss of man-hours on a daily basis.

The study by the Federal Ministry of Housing and Environment on the state of environment in Nigeria, in 1982 stated that, solid waste contributes to land pollution around urban centre are household refuse, especially, food remnants, packing materials, such as paper, cartons, boxes and plastics, tyre residuals, cans and ash resulting from burning of organic industrial residuals. Residuals such as those from cannery operations such as pulp, pits and culls, partially concentrated organic sludge, such as those from textile mills and discarded unusable materials such as junked vehicles and paints of oil drums and similar items. Pollution could also result from unsightliness and bad odours, improper disposal techniques. This can become a serious health hazard by creating suitable environments from which diseases can be transmitted.

Sridhar, (1986), reported a major environmental problem, which has to do with increasing deterioration of the natural waters, soils and air. The work stated that a variety of wastes originating from domestic and industrial sources find their way into these systems due to inadequate legislation's and basic infrastructures such as sewers and hygienic disposal facilities. The view was supported in an earlier study carried out by the Federal Ministry of Housing and Environment (1982). In the report, contamination of soil and groundwater supply by leaking and run-off during rains from accumulation of stored metals, organic matters and toxic sludge.

An environmentally disastrous trend, which was observed by Sridhar, (1983) and Oyediran (1984), is the army of human scavengers, youths and adults who make their living on refuse dumps. These are made hazardous by the present method of co-disposal

of domestic, commercial, industrial and hospital wastes. This makes the youths combing refuse dumps prone to exposure to toxic and dangerous chemicals and they could suffer from skin diseases, reproductive abnormalities etc, while female youths in particular may experience high abortion rates or give birth to deformed babies.

Oyediran (1994) described as unsafe, the establishment off housing estates and markets on abandoned hazardous waste dump sites. The practice, he stated, opens people inhabiting such markets or houses to health hazards. He likened the situation to the experience of love canal, Nigeria fall, U.S.A which demonstrated that the hazardous effects of buried wastes may manifest 25 years later in physiological disorders, birth defects, cancer and even death.

These environmental problems which are result of improper solid waste management will remain with us for a long time until specific steps are put in place to guarantee sustainable waste management which is largely a decision making function.

2.11 Attitude of people towards waste Management

Waste management is the collection, transporting, processing, recycling or disposal and monitoring of waste material of materials produced by human activity, Wikipedia (2009). The term usually refers to the activities undertaken to reduce the effect of materials produced by human activity on health, the environment or aesthetics. It is also carried out to recover resources from it. Waste management can involve solid, liquid, gaseous or radioactive substances with different methods and fields of expertise for each Wikipedia (2009). Waste Management practices differ in developed and developing nations for urban industrial producers. Management of non-hazardous residential and institutional waste in metropolitan areas is usually the responsibility of

local government authorities, while management of non-hazardous commercial and industrial waste is usually the responsibility of the generator (Shitu-Gbeko, 2008).

2.12 Solid Waste Management in selected African Countries

The problems of Solid Waste Management have been widely reported in literature. Recent events in major urban centres in Africa, according to Onibokun and Kumuyi (1999) have shown that the problem of waste management has become a monster that has aborted most efforts made by city authorities, state, Federal governments and professionals alike. A visit to any African city today will reveal aspects of the waste management problem such as heaps of uncontrolled garbage, roadsides littered with refuse, streams blocked with junk, disposal sites constituting health hazard to residential areas and inappropriately disposed toxic wastes. Onibokun et al (2002) listed a number of problems facing African countries in different magnitudes as regards as solid waste management concerns as follows:

- amorphous and ever-changing institutional arrangements;
- conflicts in legal framework in terms of definitive constitutional and legislative task allocation in tiered (multi layered) governance structure;
- inaccessible households due to haphazard physical planning and development;
- mixtures of unsorted wastes generated from households, industry, commerce and health institutions,
- Untapped prospects of creating wealth from waste

A report by Onibokun (1988) shows that the problem of waste management in Africa is largely and very much related to lack of clear conceptual and strategic framework of organisational and institutional empowerment Onibokun (2002) reports

that the French-speaking countries are relatively clean when compared to their Anglophone counterparts. The study went further to affirm that within the Anglophone countries, some cities have managed their wastes relatively efficiently while others manifest a failure of the waste management system.

Table.1: Modalities for Governance of Waste in selected African Countries

WASTE HANDLING & MANAGEMENT	ABIDJAN	IBADAN	DAR-ES-SALAAM	JOHANNESBURG
Waste storage methods	Not Standardised: mostly drums, plastic bags (introduction of refuse bags in 1995, but not popular)	Not Standardised: Buckets, plastic pails, bags, drums & buckets	Many types; paper, plastic pails and bags bamboo baskets, etc	Standardised in white areas: refuse bags (2 per refuse bin) not standardised in black areas
Transfer from homes to refuse dumps/and fill sites	By contractor employed by city councils; also small contractors employed by residents	By residents also by firms employed by residents	By the residents	Collected from refuse bins and transferred to refuse collection points by the city council or private firms.
Refuse dump management	Skips located in different parts of the city. At some point closed by the contractors. ASH International moved refuse directly from homes to landfills	50 skips located at major road junctions (provided by the IWMA)	Use of skips in a few places; few and far between, giving rise to unauthorised dumping grounds	- 500,000 refuse collection points mostly in the white areas - use of 240 litre wheeled bins - Managed by city council In the informal settlements, 5.5 cu.m bulk refuse container for every 200 shacks provided by city council
Transfer of waste	Crusher Trucks; fork lifts with loading bins	Mechanically into refuse compactor vehicles (skip eaters) Litter and spillage cleared manually.	Manual loading of vehicles mostly (A lot of litter and spillage). Us of skip eaters in a few places	Mechanical loading Bins emptied to the back of compactors by means of lifting mechanism. (little litter and spillage).
Frequency of Removal	Supposed to be weekly but sometimes two to three weeks	Supposed to be weekly but sometimes once in 4 weeks	Very irregular only small proportion of wastes cleared	
Dispersal of Wastes	one Landfill site (more or less a refuse dump because no sanitary treatment or burying of bio-medical waste takes places	one Landfill area; three others being planned	one Landfill site. In real sense, not a sanitary landfill but a dumping ground	seven sanitary land fill sites
Recycling	Negligible: Neither organized nor recognized	Negligible	Negligible	Negligible
Overall Waste governance setting Governance	Mostly privatized	Primarily state-run; some privatization	Privatisation of a few areas since 1994; some state-run	Mostly state-run; some privatisation in black townships; also community based approach.

Source: Onibokun, 1998

The study also gave a comparative analysis of modalities for governance of wastes in four African cities. This is presented in Table 2.1. It is very clear from the Table as presented by Onibokun (1998) that the system varies from the highly privatised system in Abidjan to the highly public system in Johannesburg with Ibadan and Dar-es-Salaam systems lying between the two extremes. On the whole, according to the study, the participation of the private sector is still very low. The system of house-to-house collection of refuse is effective only in Johannesburg where, there are seven sanitary landfills, 1 in Ibadan (two additional are being planned for Ibadan) and one each in the other cities. It is also noted that with the exception of Johannesburg, in the case of Abidjan, Cote d'Ivoire, Attahi (1999) states that a master plan for the retrieval and removal of the solid waste of Abidjan exists but has not been adopted. Nevertheless, this document and the study on the management of household refuse in the city of Abidjan have provided basic information for the preparation of a management strategy, according to Attahi (1999), it was not implemented because of political interference, incompetence and the contract operator's lack of resources.

In Johannesburg, South Africa, community participation is encouraged in the management of solid waste Swilling and Hutt (1999). It was discovered that for any meaningful solid waste management practice, the citizens need to be aware of their daily responsibilities, which means not simply the abstract idea of citizen commitment to the system but knowledge of daily routines, collection time-tables, standard procedures and location, although this has been the practice in the white area, it is gradually being introduced to the black suburbs. Experience of solid waste management in Dar es Salaam, Tanzania, according to Kironde (1999) shows that the non governmental

agencies and the community based organisations are involved in waste management. The above poses a lot of challenges to other African counties especially Nigeria where little is being done at the moment to address this problem arising from poor solid waste management practices.

2.13 Knowledge of people about Solid Waste Management in Nigeria

The collection and disposal of refuse and other solid wastes in Nigeria has been a serious problem. This view was expressed by Sridhar, (1985). The paper quoting earlier studies by Awoyinka (1979) and Sridhar (1983) which focus attention on the gross composition of refuse and the socio-cultural and economic factors that contributed to ineffective implementation of hygienic disposal methods. Omoeyin (1997) report that available statistics for waste generation stands between 0.39kg/head/day and 0.53 kg/head/day for Nigerian. In their separate presentations, NEST (2005) and Oyediran (1994) listed problems of waste management as resting on haphazard urbanisation, population explosion, rapid urbanisation, policy inadequacies, weak institutional and legislative framework, weak enforcement of existing legislation, low capacity and capability as well as poor funding. These factors, according to them, have exacerbated the problems of waste management in Nigeria.

The fragmentation of responsibilities between different institutions raises the questions of deficiencies in the organisational structures for solid waste management in Nigeria. This issue was raised in the Federal Ministry of Housing and Environment (1982) and by Okpala (1994),further reports that breakdown in organisational and management structures has hampered garbage disposal. She cited the case of Lagos and

Imo states of Nigeria, where disagreements between the authorities responsible for waste disposal was the cause of breakdown in garbage management in Owerri and Lagos.

The changing composition of wastes, according to the Federal Ministry of Housing and Environment (1982), Oyediran (1994), determines the type of management strategy that will be employed. The composition of wastes also depends on the source, consumption pattern, cultural practices and seasonal regimes of different localities. Municipal waste according to various studies consist of leaves, plastic containers, carcasses of dead animals, metal scraps, polythene bags, used tyres, etc.

However, Onibokun and Kumuyi (1999) stated that waste recycling is a neglected aspect of waste management; yet, wastes are known to contain a high proportion of recyclable materials, such as paper, glass, rags, plastics and metals. The proportion of these materials varies from 35.6% in Mokola, to 41.3% in the GRA'S, 46.4% in Bodija, according to the study, significant proportion of these materials should be salvaged at the household level, but because wastes are not sorted out at source, a large proportion is lost because they are so contaminated by the time they reach the dumps that scavengers have difficulty retrieving them. To promote recycling, therefore, it is necessary to

- Promote the segregation of waste materials at source, that is, the household levels;
- Streamline the operations of the scavengers, through proper training, upgrading of techniques and the requisite health-protection mechanisms.
- Promote formalised recycling of waste materials by such modern devices as composting and generation of methane gas through anaerobic decomposition. This would require the cooperation of researchers, the private sector, and the various tiers of government.

In the Agenda 21 of the earth summit, four typical areas were highlighted for waste management to be effective and sustainable. The four areas recommended are to be given integrated and comprehensive approach. The areas are: waste minimisation, maximizing environmentally sound waste, re-use and recycling. Others are, promoting environmentally sound waste disposal and treatment and extending waste service coverage to all the cities.

In her work, Okpala, (1994) states that for a meaningful solid waste management, there should be in place a comprehensive, well-planned programme backed up with appropriate legislations, environmental awareness, consumer education and re-organisation of waste management authorities. There should be creation of awareness of waste types and consequences on health and environment resulting from environmentally unfriendly, which would lead to reduction of non-degradable wastes.

Producers should have a sense of responsibility disposing the wastes generated from their production processes. These measures are most appropriate for any meaningful waste management in Nigerian cities. The involvement of the people, the non-governmental organisations and the community-based organisations (CBOs) will go a long way to provide an integrated approach to solid waste management in Nigeria.

2.14 Solid Waste Management and Sustainable Development

In most African countries, worthwhile policies are formulated to guide development activities. It is however surprising, that, those policies are not sustained at the stage of implementation, which has made most development efforts to either fail or not properly sustained.

The Brudtiand Commission Report of 1987 defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their needs.

Udogwu, (1996), states that there has been a growing recognition that many of the actions taken in order to generate development in the immediate future failed to sustain the momentum of growth in the longer term. The same report quoting Pezzey (1989) suggests that most sustainable development definitions consist of two common elements.

a) concern for a lasting improvement in the well being of people and

b) concern for protecting and maintaining the capacity of the natural resource systems that provides the basis for such improvements.

Oyediran (1994) draws attention to the full participation of Nigeria in the earth's summit in Rio de Janeiro, Brazil, 1992 and the eventual endorsement of sustainable development which also formed the cornerstone of the Nigerian policy on environment. The sustainable management of waste suggests waste minimisation, pollution, prevention or avoidance through sustainable management. The report listed ways by which waste minimisation or avoidance can be achieved, these are: source segregation and separation; raw material substitutions and process modification e.g. by use of raw materials with low potential environmental impact, more efficient manufacturing by the use of clean production technologies.

In recent years, the term cleaner production has come to embody the principles of integrated preventative waste management strategies, UNEP (1995). Cleaner Production according to UNEP Industry and Environment (1994) has been clearly defined for production process and for individual products. For production process, efforts are

geared towards conserving raw materials and energy, eliminating toxic raw materials, and reducing the quantity and toxicity of all wastes and pollution discharges. For individual products on the other hand, cleaner production strategy should involve reduction of impacts along the entire life cycle of a product, from raw material extraction to the ultimate disposal of the products.

It has been observed in the literature that there are differences in the distribution and magnitude of waste management problems in different sections of Nigerian cities. The implication of this is that the strategies and action plans that would be needed or adopted in these areas should be different. Taiwo (1998) suggests a number of generalised options towards sustainable waste management in Nigerian cities. These include: institutionalisation of sustainable city programme; provision of technical support for the institutions responsible for waste management in the area of capacity building, training and evolvement of action plans and strategies, community participation should be explored in the area of waste management decisions and operations in different parts of the cities; there should be active intersectoral collaboration since issues relating to waste management across several disciplines, professional and sectoral interests, financing waste management should be appreciated from three analyses, one from the view of adequately funding the agency responsible for the city's waste management functions two, from the view point that consumers of waste management services be encouraged to pay for the services consumed; and the establishment and third maintenance of an information system that will facilitate the process of planning and management, monitoring and evaluation of waste management systems.

In the words of Soussan, (1992) sustainable development is not supposed to be in a fixed state, but rather a process of change in which each nation achieves its full development potential, while at the same time building upon and enhancing the quality of the environmental resources on which development is based.

Nigeria's National Policy on Environment, which was launched in 1989, provided detailed framework of the Federal Government's position on the state of the environment in the country. More succinctly, the document states "Nigeria is committed to a national policy that ensures sustainable development based on proper management of the environment in order to meet the needs of the present and future generations". According to the document, in order to attain this height, it demands positive and realistic planning that balances human needs against the potential that the environment has for meeting them.

Specifically, the following were identified as the major goals of the policy:

- to secure for all Nigerians a good environment that promotes sound health and well-being;
- to conserve and use the environment and natural resources for the benefit of present and future generations;
- to restore, maintain and enhance the ecosystems and ecological processes essential for the functioning of the biosphere to preserve biological diversity and the principle of optimum sustainable yield in the use of natural resources and ecosystems;

- to raise public awareness and promote understanding of essential linkages between the environment and development and its to encourage individual and community participation in environmental improvement efforts; and
- to cooperate in good faith with other countries, international organisations/agencies to achieve optimal use of transboundary natural resources and effective prevention or abatement of transboundary environmental pollution. National Policy on the Environment,(1989)

Perhaps one of the most significant objectives enunciated for the implementation of the policy is on sanitation and waste management. This strategy is based on the premise that environmentally sound management of wastes requires an understanding of the range treatment, disposal and re-use options available for sanitary and industrial effluents, raw domestic wastes and storm water. Further, the objective laid more emphasis on the environmental studies of industrial effluents as well as the variety of solid and liquid wastes generated in the various ecological zones of Nigeria in order to ensure a disease free procedure.

2.15 Goal and Objectives of Solid Waste Management

The overall goal of solid waste management is to improve and safeguard public health and welfare through an efficient, sustainable and cost-effective waste disposal system in consonance with the requirement for guaranteed environmental quality.

To achieve this ultimate goal, the objectives, as policy tools, must be comprehensive enough to cater for the multi-purpose requirements of a healthy environment. This, in essence, entails a crafty application of the systems approach. In this context, therefore, the main objectives of effective waste management shall be:

(a) developing a healthy environment for human habitation and reducing the incidence of communicable and other infectious diseases associated with poor/lax waste management practices;

(b) making waste management sustainable through the application of user charges and other resource recovery measures;

(c) promoting private sector participation in waste management through partnership with recognized public agencies;

(d) sensitizing the public about the need for taking personal responsibilities in community health and socio-economic welfare as they relate to waste generation, disposal and management;

(e) promoting appreciation, by the public at large, of the socio-economic, health and aesthetic implications of waste management.

2.16 Participatory Action Research

Participatory action research (AR) represents a growing field of educational research whose major identifying characteristic is the recognition of the pragmatic requirements of educational practitioners for organised reflective to inquiry into instruction (Gabel, 1995). Action research has also been described as an informal, qualitative, formative, subjective, interpretive, reflective and experiential model of inquiry in which all individuals involved in the study are knowledgeable and contributing participants (Falade,2009). The participatory action research framework is most appropriate for participants who recognise the existence of shortcomings in their activities and who would like to adopt some initial stance with regards to the problem, formulate a plan carry out an intervention, evaluate the outcomes and develop further

strategies in an interactive fashion (Clark, 2006). He argue that action research is an interactive inquiry process that balances problem solving actions implemented in a collaborative context with data-driven collaborative analysis or research to understand underlying causes enabling future predictions about personal and organisational change. Participatory research is a bottom-up approach where the researcher and the participants are involved in collaborative activities. Collaborative participation according to Oyetade (2003), requires intensive interaction between researchers and the clients/participants. Collaborative participation is characterised by the

(i) researcher and the participants working together as equal partners

(ii) researcher and the participants jointly identify a problem and proffering solution to the problem

(iii) participants intensively participate in problem identification and evaluation of possible solutions.

The essentials of action research design are considered by Ediott as reported by Oyetade, (2003), as per the following characteristics cycle:

- Initially ,an exploratory stance is adopted where an understanding of a problem is developed and plans are made for some form of intervention strategy (The Reconnaissance and General plan).
- Then the intervention is carried out (The Action in Action Research)
- During and around the time of the intervention, pertinent observations are collected in various forms. (Monitoring the Implementation by observation)

- The new interventional strategies are carried out, and the cyclic process repeated, continuing until a sufficient understanding of (or implement able solution for) the problem is achieved (Reflection and Devision).

Another distinguishing characteristic of action research cited in Hopkins, 1985 by Ebbutt is the degree of empowerment given to all participants. Involvement is of a knowing nature, with no hidden controls or pre emption of direction by the researcher. All participants negotiate meaning from the data and contribute to the selection of inteventionary strategies.

2.17 The Concept of Knowledge

Knowledge falls within the cognitive domain of learning; it is acquired through exposure and experience. It is learnt. Knowledge is all that is known or that can be known or being familiar as a result of learning. Bloom (1979) opines that the most common educational objective is the acquisition of knowledge, having been exposed to some learning experiences. According to him, knowledge is the main educational objective in the curriculum. By knowledge, according to Bloom (1979), learners can give evidence that they remember, either by recalling or recognising, some ideas or phenomena with which they has had experience in the learning process. Knowledge may range from simple to complex behaviours and from concrete to abstract. Bloom (1979) distinguished between "knowledge of universals and obstructions at the upper end of the knowledge category. Some knowledge may be learnt through meaningful reception processes. Knowledge is distinct from and more important than bits of information alone.

Knowledge in any field of study can be placed in three main categories: knowledge of specifies, knowledge of ways and means of dealing with specifics and knowledge of universal and abstractions Klemn, (1994) classifies intellectual abilities into knowledge, comprehension, application, analysis, and evaluation. According to him, knowledge about something precedes comprehension of it, and comprehension, in turn, precedes application and other higher intellectual abilities.

There are two schools of thought on the origin of knowledge; some scholars opine that man is born with knowledge. To them knowledge is in-born. The second school of thought stress that knowledge is acquired and not in-born. However for the purpose of this study, knowledge is regarded as being acquired. Knowledge therefore means the awareness of the existence of a phenomenon, object or situation. It is imparted by the knowledgeable to a less knowledgeable, by the more experienced to a less experienced person. It is important to realize that without having the knowledge of, or being able to obtain it when needed, the individual may have nothing to apply or evaluate.

The cognitive taxonomy categories as knowledge, statements that are ascertained as true and correct as facts, a body of facts as information, it becomes knowledge, and when knowledge is applied to solving present or future problems, it is called intelligence. Bloom (1979) concludes that knowledge involves the recall of specifies and universals, the recall of methods and processes, or the recall of a pattern, structure or setting.

2.18 Studies on Attitudes

Attitudes have been described in so many ways. For instance, Clark (2006) refers to attitude as how we think, feel about and act towards our fellow human beings and how they think, feel about and act towards us. Crow and Crow (1963) regard attitudes as the

affective by-products of an individual's experience, having his/her bases in his/her inner urges, acquired habits and the environmental influences by which he/she is surrounded. Taiwo(1998) states that an enduring system includes a negative component, a feeling component and an action tendency, hence when an attitude is formed, it becomes resistant to change. Attitude involves beliefs as well as evaluations and gives some consistency to our thinking about social objects as well as our feelings towards them.

Attitude has many attributes, it implies an established state of readiness and action tendencies. Attitude can be learned or acquired, It can exert a potent influence on an individual, serving as motives, incentives and drives in attaining a goal. Attitude grows and develops just as other mental and emotional behaviour patterns in terms of an individual's reaction to his/her environment. Attitude may be positive or negative towards certain objects (Onibikun,1998).

Primarily, formation of attitude begins as a learning process and once the attitudes are formed, the influence of the principle of cognitive consistency becomes increasingly important. Thus, well established attitudes tend to be extremely resistant to change, but others may be more amenable to change. Formation of attitudes can be influenced by family, peer group, socio-economic status, heredity, bodily states and direct experience like shock of being attacked physically by an opponent.

A recent synthesis of studies on the impact of several environmental education programmes that focused on learners' attitudes revealed both positive and negative influences. Miller (1980) uses multi-items indices of concern about pollution, and overpopulation on 17,000 students in approximately 130 high schools each year between 1976 and 1979. In his report, the environmental attitudes of the U.S. high school senior

classes showed little change over the four year period, with low support for pollution control and environmental education.

Several other attempts made to change attitudes of people to the environment through different conservation programmes/instructions have yielded positive impacts Mayer, (2004) investigated the effects of participation in environmental programme on environmental attitudes and knowledge. The study was designed to assess the impact of the caretaker instruction on participants and the influence on their parents. Using 16 participating experimental groups, the pre-test and post-test scores showed a significant positive effect on attitude towards the environment. Learners rated by their teachers as most interested in the activities showed greater increase in pro-environmental attitudes than those rated least interested.

The studies on positive attitudinal disposition are strong indications of positive relationship between environmental knowledge and attitude. Since behaviour modification is a result of attitudinal and valuation change in a person, it is assumed from the theory of operant conditioning (Skinner, 1976), that change in attitude must first occur in an individual before, it results to change in behaviour.

2.19 Appraisal of Literature

From the relevant literature reviewed it is observed that the participatory model adopted to carry out this study was not new in the field of research. Many researchers have used it as it allows the participants to think and try out the solution to multi facet problems. However, it has not been practicalised among the traders as emphasis was on the in-school setting. Hence, there is the need for the development of participatory

programme for the training of out-schools environment especially traders' on how to improve their knowledge, attitude and practices toward solid waste management.

The Governments of Nigeria at various levels have attempted to handle the issue of solid waste which has resulted in having different programmes including the establishment of different ministries and parastatals such as Environmental Protection Agency (EPA) Decree 58 of 1988 and Ministry of Environment. Environmental sanitation programme in Nigeria started in 1984 and it takes place every last Saturday of the month. The literature reviewed also shows that researchers always focus on in- school programme in dealing with solid waste management and only collect information from traders to analyse. Perhaps this will be one of the few attempts made by researchers to try solution together with the traders who are the major sources of generation of solid waste in society.

Based on the above, it is essential that a participatory environmental education programme serve as an intervention to save the country from the epidemic of poor solid waste management in the society. Against this background, the present study was carried out to bridge the gap between the use of a participatory environmental education programme between in-school and out-school populations.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the methods and procedure adopted in the study. It describes the research design, variables of the study, selection of participants, research instruments, procedure for instruments validation and the study as well as methods of data analysis.

3.1 Research Design

A participatory action research paradigm was adopted to develop a participatory environmental education programme, developed through the active collaboration of the participants. The study also adopted a pre-test, post-test, control group quasi-experimental design to determine the participants' environmental knowledge, attitude and practice of solid waste management in Oyo State, Nigeria.

The design is illustrated thus

Focus Group - 0_1 X_1 0_2

Control Group - 0_3 X_2 0_4

Where:

0_1 0_3 = pre-test for both focus and control groups

O_2 O_4 = post- test for both focus and control groups

X_1 (Treatment) – A participatory environmental education programme

X_2 (Treatment) – Placebo

The research design shows one experimental group to one control group. The experimental groups were exposed to a participatory environmental education programme while the control groups were exposed to placebo treatment.

A 2x2x2 factorial matrix was used and this is shown in Table 3.1.1

Table 3.1. 2x2x2 factorial matrix used in the study

Treatment	Gender	Market location	
		Urban	Rural
Experimental	Male		
	Female		
Control	Male		
	Female		

3.2. Variables in the study

The following variables were used in the study**:**

A. Independent Variable. This is the mode of instruction, manipulated at two levels;

(i) Participatory approach

(ii) Placebo method

B Moderator Variables

The moderator variables involved in this study were

Market Location: - At two levels; (i) Urban and (ii) Rural

Gender: at two levels, (i) Male (ii) Female

C Dependent Variables

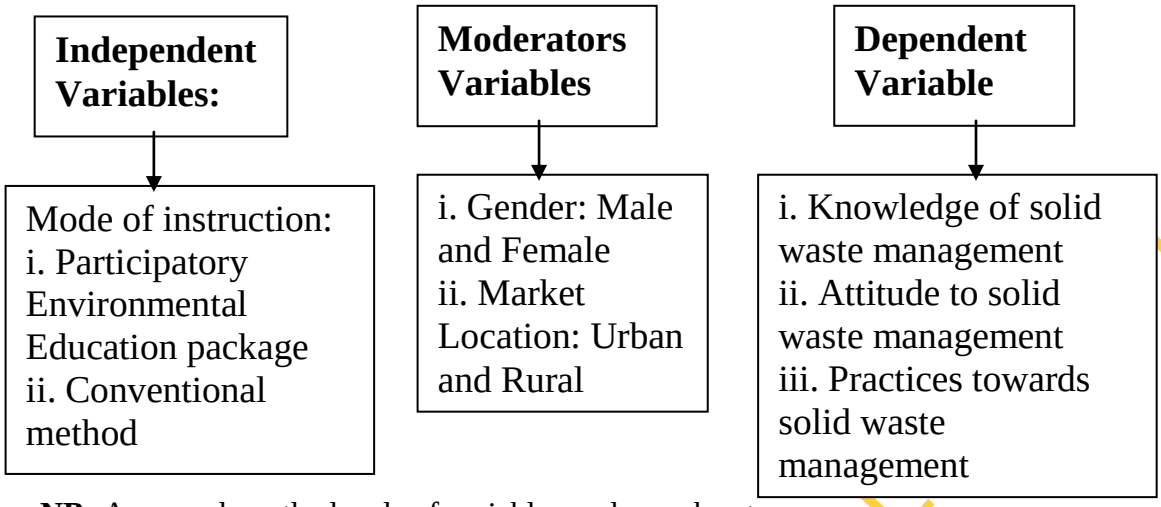
There were three dependent variables

(I) Participants' knowledge of solid waste management

(ii) Participants' attitude towards solid waste management

(iii) Participants' practice in solid waste management

Figure 2: below shows the framework in which the variables were studied



NB: Arrows show the levels of variables under each category.

The following steps were undertaken to plan the participatory environmental education package.

i Experimental group discussion moderators who were mostly environmental health officers were selected and trained. The experimental group discussion moderators moderated group activities and led discussions towards making decisions in each group. A training format was used to train the experimental group discussion moderators. They were trained to achieve participatory means of making decision among the group members and engage in collaborative efforts to solve problems.

3.3 Selection of Participants

Twenty markets were randomly and stratified selected in Oyo State for this study, ten were for experimental group and ten were for control group. Five markets in each group were from urban area and rural areas respectively. The criteria for the selection for urban markets were:

i The population of the market

ii The social amenities available such as toilet, dump sites and shops. In each market, 50 traders were selected through simple random and stratified sampling. One thousand traders participated in the study; about 900 traders were regular throughout the study.

3.4 Experimental Group Discussion (EGD)

The experimental group discussion (EGD) formed the strategy used to determine the objectives and contents of the environmental education package. The EGD took place in each selected market. The participants were divided into groups for effective participation. All experimental groups in each market had their discussion session simultaneously. The procedures for the discussion were introduction, overview of topic, group rules, opening questions and answer.

Introduction: The EGD sessions started with self-introduction of the moderator and the participants.

Overview of the topic: The EGD was described. The moderators read out the issues to be discussed and the questions to be answered. They stressed that the participants should feel free to express their views as no answer will be rejected or tagged wrong.

Group rules: The experimental group moderator told the participants the need to be well behaved as the proceedings will be recorded. They were advised to be punctual as attendance was to be taken to know the actual number of those that participated fully in the study. The selected concepts were presented to each group. The concepts were discussed and the problems associated with the discussion were identified. A total of ten sessions were held over a period of 10weeks with one issues discussed on a particular day of the week by all the focus groups. Immediately after each discussion, the recording

was transcribed to give the researcher a trend of discussion and to enable him know those areas in which more information or views were required from participants.

The main instrument used for collecting the qualitative data was the EGD guide.

3.5 Research Instruments

The following instruments were use:

1. Environmental Knowledge Test (EKT)
2 Environmental Attitudes Scale (EAS)
3. Environmental Practices scale (EPS)

3.5.1 Environmental Knowledge Test (EKT)

This is a15 – item multiple choice tests. The test was adapted from Mansaray and Ajiboye (1997). The instrument was developed to measure the acquisition of knowledge. It was adapted to suit the acquisition of knowledge on solid waste management by market men and women. It was divided into two parts. These consisted of the personal data of the participants. It was used to ascertain market men and women's acquisition of knowledge on the solid waste management. EKT was designed to measure the following:

(a) Acquisition of knowledge and experience in environmental concepts, in order to assist the subjects individually and collectively in solving issues and problems associated with the environment – its use and conservation – now and in future.

(b) The extent of traders' involvement in applying the knowledge gained in environmental education (EE) in solving immediate and future problems that might arise from time to time in the course of man's bid for protection, satisfaction, survival and improvement of his environment.

(c) To determine traders' ability to express, in practical forms, their understanding of certain environmental concepts as far as such concepts are related to their needs in particular and the needs of the society in general. (Mansaray and Ajiboye, 1997).

3.5.2 Validation of EKT

EKT was validated through experts' review of the items. The draft was given to lecturers in Social Sciences/Environmental Education Department. Their comments, criticisms and suggestions were used to re-work some items, expunged some and added some. The final draft was then administered to 30 traders who were not part of the target group. This was used to compute the reliability of the instrument using Kuder-Richardson formula 21 (KR – 21). This was also used to determine the average item difficulty level of the test. The reliability co-efficient obtained was 0.8562 which indicates that the instrument was reliable

3.5.3 Environmental Attitude Scale (EAS)

It is a-15 item scale adapted from Mansaray and Ajiboye (2000). The researcher modified the scale from 10 to 15 items to enable the instrument to adequately measure the attitudes of traders to solid waste management.

The scale was made up of two sections, section A was on personal data of the participants which covers name, sex and location of the market, while section B contains 15 questions. This scale was designed and modified to measure the following:

(i) Development of a sense of responsibility in solving problems on solid waste management

(ii) Improvement of market men and women awareness on waste management in the markets

(iii) Inculcation of the right values and skills in traders in solid waste management in the markets.

3.5.4 Validation of EAS

EAS was validated through experts' review of the items. The suggestions, criticisms and comments of my colleagues and experts in related disciplines who were given the instrument were taken into consideration in expunging or adding some items. The final draft was then administered to 30 traders who were not part of the targeted group. This was used to compute the reliability of the instrument using Cronbach's alpha method to determine the item consistency and reliability. The reliability co-efficient obtained was 0.7364 and this shows that the instrument was reliable.

3.5.5 Environmental Practice Scale (EPS)

The instrument is a property of George Street Research Limited, Edinburgh (2006). It was modified to suit the measurement practices of traders to solid waste management in the market. The instrument was divided into two parts.

Part A: This is made up of the data of the participants such as name of participants and market, the location of the market, and so on.

Part B: This section has 15 items with statements that assess the participants' practices toward solid waste management in the market.

3.5.6 Validation of EPS

The instrument was given to colleagues, that is, PhD students in related disciplines as well as lecturers in Social Sciences/Environmental Education. Their comments, criticisms and suggestions were used to re-work some items, expunged and added some. The final drafts were then administered to thirty traders who were not part

of the targeted group. This was used to compute the reliability of the instrument using Cronbach Alpha method to determine the items' consistency and reliability. The result of the reliability co-efficient obtained was 0.74 and this shows that the instrument is reliable.

3.5.7 Research Procedure

The researcher obtained authority letter from the Head of Department (HOD), Teacher Education and got the permission of Oyo State Environmental Protection Agency to use markets in the State for the research. The traders' association in the State was also contacted and the association's Public Relations Officer was the researcher's gate keeper. This step was taken to facilitate the cooperation needed from the traders that participated in the research activities.

The researcher also visited authorities of the selected markets in company of the gate keeper, the Public Relations Officers of the traders' association where participatory activities were carried out. Leaders of the markets were briefed on the reason for the research. Twenty research assistants were employed in the course of this research. They were chosen from among the environmental health officers who were based in the markets and were trained on what was expected of them. Ten each were for experimental and control groups.

After the assurance and cooperation of the leaders of the selected markets had been secured, the twenty research assistants were given requisite training on the use of focused group discussion model and outdoor environmental education module. The training of the research assistants was done in the first week.

The objectives of the research were explained to the research assistants. They held brief discussion with the participants in the different markets where pertinent issues expected to come up were discussed and agreement were entered into on how to facilitate smooth research activities.

For the preparatory exercise, the researcher and the research assistants visited some areas to be visited in order to familiarise with the places. All the participants for the study were pre-tested using the following instruments in the following order, environmental knowledge test (EKT) environmental attitudes scale (EAS) and environmental practices scale (EPS). The step by step by step presentation of activities in the groups is presented as follows.

3.6 Outline of the field activities

This study covered twelve weeks. The breakdown of the activities is shown in the Table below:

Table 3.2 Outline of the field activities

S/N	***Week***	***Research Activities***	***Topic***
1.	*1st Week*	*Selection and training of research assistants.*	*Research assistants were trained at Bodija office of the environmental health officers.*
2.	2nd Week	Pre-test for participants.	Pre-test was conducted at the selected markets.
3.	3rd Week	Lecture	Waste Disposal/Management Method
4.	4th Week	Visitation	Visitation to Dumpsites at Apete, Koso, Isale Oyo and Adunin.
5.	5th Week	Lecture.	Effect of pollution.
6.	6th Week	Video show	Waste generation, evacuation and disposal.
7.	7th	Visitation	Visitation were made toInorganic Fertiliser factory at Bodija, steel pot production at Iseyin. Plastic factory in Ibadan, Idowu paper conversionary

			company, Ogbomoso.
8.	8th	Visitation	Visitation to illegal dump sites at Iyana Ajibode, Isale Ora, sabo, Oyo, Iseyin road Oyo.
9.	9th	Participating activities	Sorting of waste into different basket.
10.	10th	Lecture	Flood and its effect
11.	11th	Participatory activities	General cleaning/method of disposing the waste
12.	12th	Post tests for experiment and control group	Post tests for experimental and control groups.

3.6.2 Control Group

The control groups were not given any treatment.

3.6.3 Training Sessions

In the third week, the research assistants at each of the selected markets trained the participants on waste disposal methods. As contained in the package, the participants were trained on method of waste disposal and the advantages and disadvantages of these selected methods. In the fifth week, there was lecture on pollution and its effect while there were participatory activities on practical ways of waste disposal and how to control pollution.

3.6.4 Video Show

In the sixth week there was video show. There were four edited film shown to the participants. The films were as collected from the Ministry of Environment and Water Resources and films taken from production sites of some recycling factory. The films were on the following:

(i) Evacuation of solid waste at illegal dump sites in the state

(ii) The collection of waste by tipper and skip heater by the officers from the ministry.

(iii) Sanction of markets that contravened environmental laws. This is to sensitise the participants with sanction that can be imposed if their markets were not clean

(d) The turning of waste to inorganic fertiliser at Bodija.

3.6.5 Lectures

As stated before, series of lectures were organised as suggested by the participants. Some selected specialists gave the lectures through the research assistants

The lectures were adjudged to be interesting, questions were asked and reactions were highly impressive. Throughout the programme of activities, pictures were taken, tape recorded and video coverage made. These were done to document the activities that took place and information collected which are useful to the researcher.

3.7 Method of Data Analysis

Data collected were analysed using ANCOVA (Analysis of Covariance). The MCA aspect of ANCOVA was used to determine the magnitude of the performance of each group. Also, graphs were used to interpret relevant interaction effects which were significant.

CHAPTER FOUR

RESULTS

4.0 Introduction

This chapter presents the results of this Study. The results and the analyses of the data obtained in the study are presented below according to the order in which the data were collected and in accordance with the order in which the hypotheses were tested.

4.1 Effect of treatment on participants' knowledge, attitude and practices in solid waste management.

4.1.1 HO_1a

There is no significant main effect of treatment on participants' knowledge in solid waste management

Table 4.1: Summary of ANCOVA of Post-Test Knowledge Score by Treatment, Location and Gender

Source of Variance		Hierarchical Method				
		Sum of Squares	df	Mean Square	F	Sig.
Covariates	PRESCORE	86.049	1	86.049	11.055	.001
Main Effects	(Combined)	292.554	3	97.518	12.528	.000
	TREATMENT	175.575	1	175.575	22.556	.000
	LOCATION	116.936	1	116.936	15.023	.000
	GENDER	4.293E-02	1	4.293E-02	.006	.941
2-Way Interactions	(Combined)	383.320	3	127.773	16.415	.000
	TREATMENT LOCATION	.375.561	1	375.561	48.248	.000
	TREATMENT GENDER	1.847	1	1.847	.237	.626
	LOCATION GENDER	14.847	1	14.820	1.904	.168
3-Way Interactions	TREATMENT LOCATION GENDER	47.083	1	47.083	6.049	.014
Model		809.007	8	101.126	12.992	.000
Residual		3744.104	481	7.784		
Total		4553.110	489	9.311		

Significant at p<.05

Table 4.1, shows that there is a significant effect of treatment on participants knowledge of waste management ($F_{(1,481)} = 22.556$; P<.05). This means that those exposed to the experimental and control groups differed significantly from one another in their knowledge. Hypothesis 1a is, therefore, rejected

Table4.2: MCA of Post-Test Knowledge Score by Treatment, Location and Gender Grand Mean = 7.33

Variable + Category		N	Predicted Mean Unadjusted	Predicted Mean Adjusted for Factors and Covariates	Unadjusted	Eta	Adjusted for Factors and Covariates	Beta
TREATMENT		246	7.91	7.83	.57		.49	
participatory		244	6.76	6.83	-.57	.188	-.50	.164
	Control							
LOCATION	urban	247	7.96	7.83	.62		.49	
	rural	243	6.70	6.83	-.63	.205	-.50	.164
GENDER	male	217	7.26	7.32	-7.2021E-02		-1.05E-02	
	female	273	7.39	7.34	5.725E-02	.021	8.370E-03	.003
R =				.288				
R squared =				.083				

From Table 4.2, participants exposed to the participatory environmental education instruction obtained higher adjusted post-test knowledge score **($\bar{x}$ =7.83)** than the control group **($\bar{x}$ =6.83).**

HO_1b: There is no significant main effect of treatment on participants' Environmental attitude toward solid waste management.

Table4.3: Summary of ANCOVA of Post-Test Attitude Score by Treatment, Location and Gender

Source of Variance		Hierarchical Method				
		Sum of Squares	df	Mean Square	F	Sig.
Covariates		2222.765	1	2222.765	25.600	.000
PREATTITUDE		10807.173	3	3602.391	41.490	.000
Main Effects	(Combined)	6527.154	1	6527.154	75.175	.000
	TREATMENT	4154.164	1	4154.164	47.845	.000
	LOCATION	125.855	1	125.855	1.450	.229
	GENDER	2997.112	3	999.037	11.506	.000
2-Way Interactions	(Combined)					
	TREATMENT LOCATION	2795.383	1	2795.383	32.195	.000
	TREATMENT GENDER	1.613	1	1.613	.019	.892
	LOCATION GENDER	311.936	1	311.936	3.593	.059
3-Way Interactions	TREATMENT LOCATION GENDER	2.425	1	2.425	.028	.867
Model		16029.476	8	2003.684	23.077	.000
Residual		41763.220	481	86.826		
Total		57792.696	489	118.185		

Significant at p<.05

From table 4.3, there is significant effect of treatment on participants attitude towards solid waste management ($F_{(1,481)} = 75.175$, P<.05). Therefore, hypothesis 1b is rejected. This implies that the experimental group differs significantly from the control group in their attitude towards solid waste management.

Table 4.4: MCA of Post-Test Attitude Score by Treatment, Location and Gender.
Grand Mean = 38.28

Variable + Category		N	Predicted Mean Unadjusted	Predicted Mean Adjusted for Factors and Covariates	unadjusted	Eta	Adjusted for Factors and Covariates	Beta
TREATMENT		246	42.42	42.88	4.14		4.59	
participatory		244	34.10	33.64	-4.18	.383	-4.64	.425
	control							
LOCATION	urban	247	36.17	35.29	-2.11		-2.98	
	rural	243	40.42	41.32	2.14	.195	3.0	.277
GENDER	male	217	37.40	37.71	-88		-.57	
	female	273	38.98	38.73	.69	.072	.45	.047
R = .475								
R Squared = .225								

Table 4.4 shows that the participating groups had higher attitude score **(F = 42.42)** than their control group counterparts **($\bar{x}$ =34.10)**

HO_1c: There is no significant main effect of treatment on participants' practices, in solid waste management.

Table 4.5: Summary of ANCOVA of Post-Test Practices Score by Treatment, Location and Gender.

Source of Variance		Hierarchical Method				
		Sum of Squares	df	Mean Square	F	Sig.
Covariates	PRESCORE	2946.579	1	2946.579	32.895	.000
Main Effects	(Combined)	9605.427	3	9605.427	35.744	.000
	TREATMENT	4369.286	1	4369.286	48.778	.000
	LOCATION	5205.730	1	5205.730	58.116	.000
	GENDER	30.410	1	30.410	.339	.560
2-Way Interactions	(Combined)	1286.689	3	1286.689	4.788	.003
	TREATMENT LOCATION	1241.388	1	1241.388	13.859	.000
	TREATMENT GENDER	21.245	1	21.245	.237	.626
	LOCATION GENDER	2.982	1	2.982	.033	.855
3-Way Interactions	TREATMENT LOCATION GENDER	14.697	1	14.697	.164	.686
Model		13853.392	8	1731.674	19.332	.000
Residual		43085.557	48114.6	89.575		
Total		56938.949	97	116.440		

Significant at p<.05

From Table 4.5, it is observed that the effect of treatment on participants practices towards solid waste management is significant ($F_{(1,481)} = 48.778$; $P<.05$).

Hence, hypothesis 1c is rejected.

Table 4.6: MCA of Post-Test Practices Score by Treatment, Location and Gender.

Variable + Category		N	Predicted Mean Unadjusted	Predicted Mean Adjusted for Factors and Covariates	Unadjusted	Eta	Adjusted for Factors and Covariates	Beta
TREATMENT		246	40.69	40.98	3.70		3.99	
participatory		244	33.26	32.97	-3.73	.345	-4.02	.371
	Control							
LOCATION	urban	247	34.49	33.69	-2.50		-3.30	
	rural	243	39.54	40.34	2.55	.234	3.35	.309
GENDER	male	217	36.89	37.27	-9.1178E-02		.28	
	female	273	37.06	36.77	7.248E-02	.008	-.22	.023
R =				.470				
R squared =				.220				

Table 4.6 shows that the participants in the experimental group had higher practices in solid waste management **($\bar{x}$ =40-98)** than the control group **($\bar{x}$ =32.97).**

4.1.2 Effect of location of markets on participants' knowledge in solid waste management.

HO_2a: There is no significant main effect of location of markets on participants' knowledge in solid waste management.

Table 4.1 Shows that there is Significant effect of market location on participants knowledge in solid waste management ($F_{(1,481)}$ = 15,023; P<.05). **HO_2a** is therefore rejected.

Furthermore, the table 4.2 shows that participants from the urban markets obtained higher knowledge score **($\bar{x}$ = 7.83)** than those in the control group **($\bar{x}$ = 6.83).**

HO_2b: There is no significant main effect of location of markets on participants' attitude toward solid waste management.

It is observed from Table 4.3 that market location has significant effect on participants attitude in solid waste management ($F_{(1,481)} = 47.845$; P<.05).On the basis of this, hypothesis 2b is rejected. From Table 4.4, participants from the rural markets obtained higher environmental attitude score **($\bar{x}$ = 41.32)** than their control group counterparts **($\bar{x}$ = 35.29)**

HO_2c: There is no significant main effect of location of markets on participants' practices in solid waste management. Table 4.5 shows that the effect of market location on attitude of the participants towards solid waste management is significant ($F_{(1,481)}$ = 58.116; P<.05). Hence, hypothesis 2c is rejected. To this end, Table 4.6 shows that the rural market men and women obtained higher practices Score **($\bar{x}$ = 40.34)** than their counterparts in urban markets **($\bar{x}$ = 33.69).**

4.1.3 Effect of gender on participants' knowledge, attitude and practices in solid waste management.

HO_3a: There is no significant main effect of gender on participants' knowledge in solid waste management ($F_{(1,481)}$ = .006; P>.05). Hence, hypothesis 3a is not rejected. From Table 4.2, females obtained higher knowledge score **($\bar{x}$ = 7.34)** than their male counterparts **($\bar{x}$ = 7.32).**

HO_3b: There is no significant main effect of gender on participants' attitude towards solid waste management. From Table 4.3, gender has no significant effect on participants environmental attitude ($F_{(1,481)}$ = 75.175; P>.05). Hypothesis 3b is hereby not rejected. Table 4.4 further reveals that the higher score was obtained by the female participants **($\bar{x}$ = 37.71).**

HO_3c: There is no significant main effect of gender on participants' environmental practices on solid waste management.

Table 4.5 shows that there is no significant effect of gender on the environmental practices of participants ($F_{(1,481)} = 48.778$; P>.05) on this premise, hypothesis 3c is not rejected.

From Table 4 – 6, males were found to obtain higher environmental practices score **($\bar{x} = 37.27$)** than the females **($\bar{x} = 36.77$).**

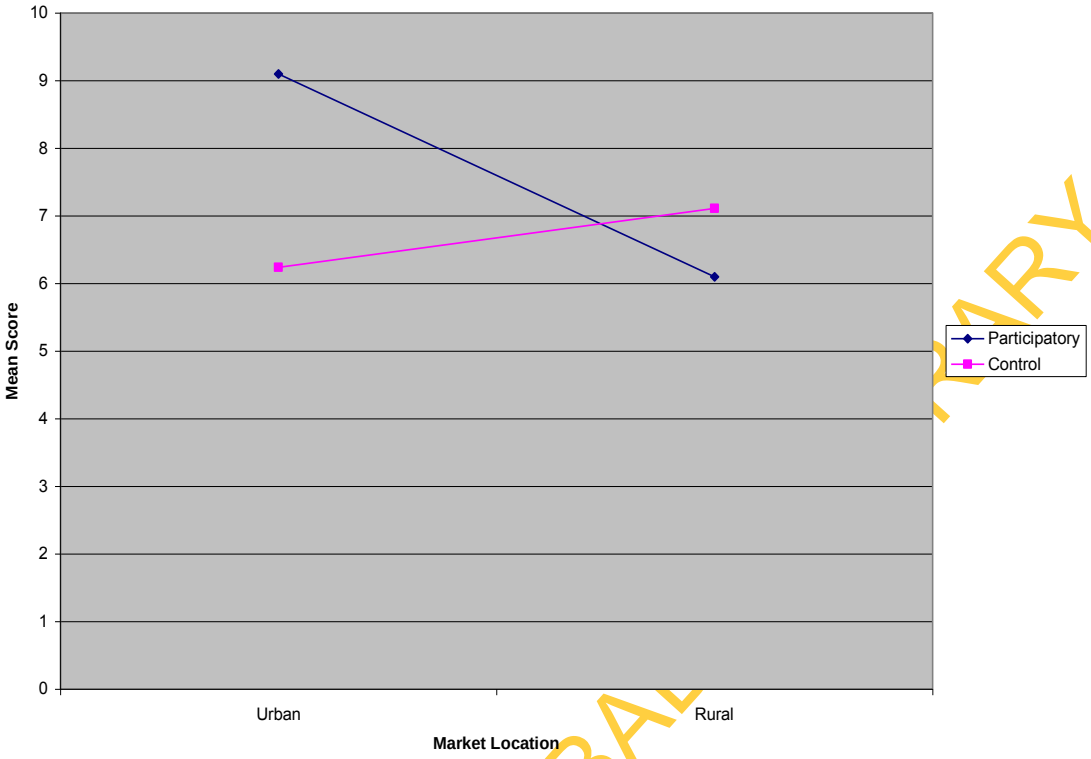
4.1.4 Effect of treatment and location of markets on participants' knowledge, attitude and practices in solid waste management.

HO_4a: There is no significant interaction effect of treatment and location of markets on participants' knowledge in solid waste management.

Table 4.1 shows that the interaction effect of treatment and market location on participants knowledge is significant ($F_{(1,481)} = 48.248$; P<.05). Hence, hypothesis 4a is rejected.

This significant interaction effect is represented in figure 4.1

Figure 4.1: Interaction Effect of Treatment and Market Location on knowledge.

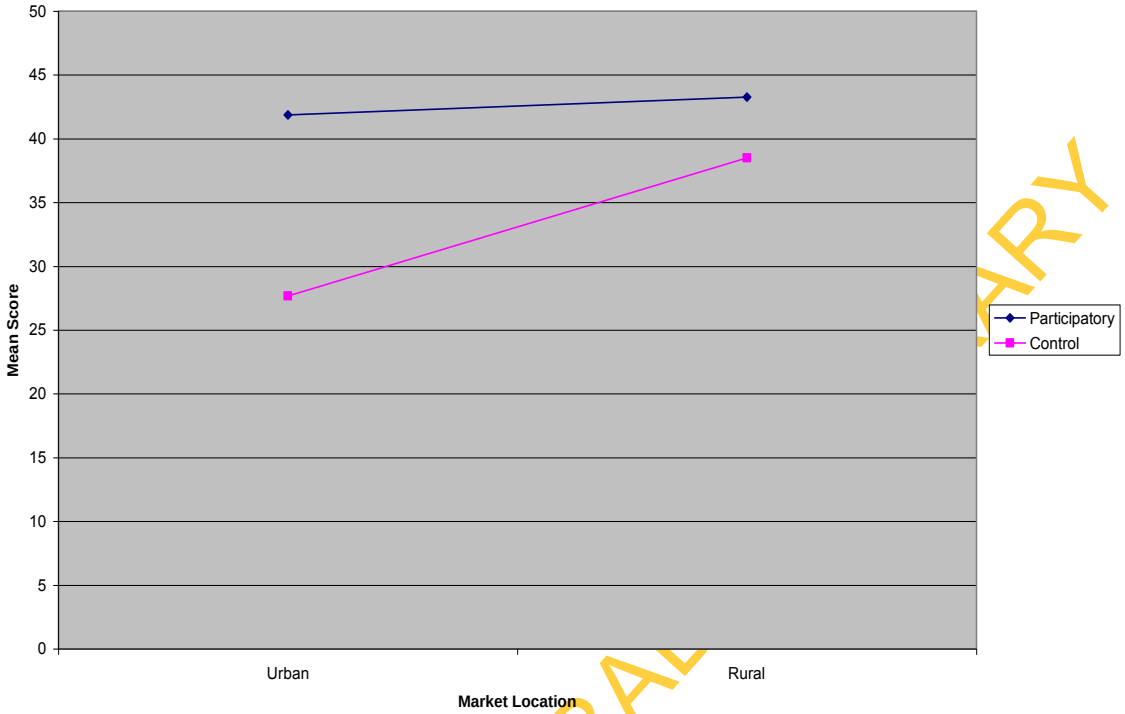


From figure 4.1, the participants' instruction was more effective only for the urban market participants. In the rural markets, the control group obtained higher knowledge score than the participating group. This is disordinal interaction.

HO_4b: There is no significant interaction effect of treatment and location of markets on participants' attitude toward solid waste management.

From the Table 4.3, the interaction effect of treatment and market location on participants' attitude toward solid waste management is significant ($F_{(1,481)}$ = 32.195 P>.05) Hypothesis 4b is therefore rejected.

Figure 4.2: Interaction Effect of Treatment and Market Location on Attitude.



From the figure, the participatory instruction was more effective both for the urban and rural market participants towards improving their environmental attitude. This is an ordinal interaction.

HO_4c: There is no significant interaction effect of treatment and location of markets on participants' practices in solid waste management.

Table 4.5 Shows that there is a significant 2-way interaction of treatment and market location on environmental practices of the participants ($F_{(1,481)} = 13.859$; $P<.05$). Hence, hypothesis 4c is rejected. Figure 4.3 explains the interaction.

Figure 4.3: Interaction Effect of Treatment and Market Location on Practices.

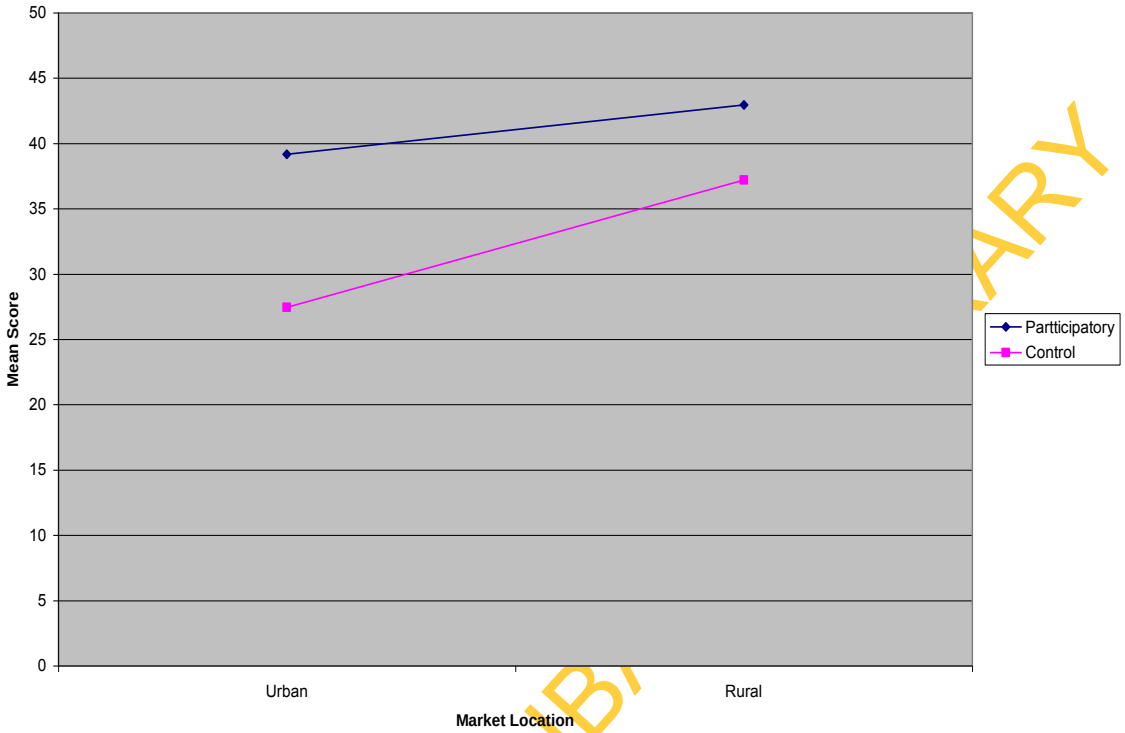


Figure 4.3 shows that the interaction is ordinal. The participating instruction was more effective for both urban and rural markets participants.

4.1.5 Effect of treatment and Gender on participants' knowledge, attitude and practices in solid waste management.

HO_5a: There is no significant interaction effect of treatment and gender on participants' knowledge in solid waste management.

Table 4.1 reveals that the interaction effect of treatment and gender on participants' knowledge on solid waste management was not significant ($F_{(1,481)} = .237$; $P>.05$). Therefore, hypothesis 5a is not rejected.

HO_5b: There is no significant interaction effect of treatment and gender on participants' attitude toward solid waste management.

From Table 4.3, there is no significant effect of treatment and gender on participants' environmental attitude towards solid waste management ($F_{(1,481)} = .019$; P>.05). Hence, hypothesis 5b is not rejected.

HO_{5C}: There is no significant effect of treatment and gender on participants' practices in solid waste management.

Table 4.5 shows that the interaction effect of treatment and gender on practices of participants on solid waste management is not significant. ($F_{(1,481)} = .237$; P>.05). Hypothesis 5c is, therefore, not rejected.

4.1.6 Effect of gender and location of markets on the knowledge attitude and practices of traders in solid waste management.

HO_6a: There is no significant interaction effect of gender and location of markets on participants' environmental knowledge.

Table 4.1 shows that the interaction effect of market location and gender was not significant on environmental knowledge of participants on solid waste management ($F_{(1,481)} = 1.904$; P>.05). Hypothesis 6a is, therefore, not rejected.

HO_6b: There is no significant interaction effect of gender and location of residence on participants' attitude towards solid waste management.

From Table 4.4, it is obtained that market location and gender had no significant interaction effect on environmental attitude of participants' toward solid waste management ($F_{(1,481)} = 3.573$; P>.05). Hypothesis 6b is, therefore, not rejected.

HO_6c: There is no significant interaction effect of gender and location on participants' practices in solid waste management.

Table 4.5 reveals that the interaction effect of market location and gender is not significant on participants' practices in solid waste management, ($F_{(1,481)}$ = .0033; P>.05). Hence, hypothesis 6c is not rejected

4.1.7 Effect of treatment, gender and location of the markets on participants' knowledge, attitude and practices in solid waste management.

HO_7a: There is no significant interaction effect on treatment, gender and location of the Markets on participants' knowledge in solid waste management.

From Table 4.1, there is significant 3 – way interaction effect of treatment, market location and gender on participants knowledge in solid waste management ($F_{(1,481)}$ = 6.049; P<.05). Hypothesis 7a is therefore rejected.

HO_7b: There is no significant interaction effect of treatment, gender and location of the markets on participants' attitude toward solid waste management.

Table 4.3 shows that there is no significant interaction effect of treatment, market location and gender on environmental attitudes of the participants ($F_{(1,481)}$ = 0.28; P>.05). Hypothesis 7b is, therefore, not rejected.

HO_7c: There is no significant interaction effect of treatment, gender and location of the markets on participants' practices in solid waste management.

From Table 4.5, there is no significant interaction effect of treatment; market location and gender on participants' practices in solid waste management ($F_{(1,481)}$ = .164; P>.05). Therefore, hypothesis 7c is not rejected

CHAPTER FIVE

SUMMARY, DISCUSSION OF RESULTS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The main issue addressed in this study was to design, implement and evaluate the impact of a participatory environmental education programme on traders' knowledge, attitudes and practices in waste management in Oyo State, Nigeria. The study also investigated the moderating influence of gender and market location on their knowledge, attitudes and practices towards waste management in the markets.

5.2 Summary

The results of this study are presented as follows:

(i) The participatory approaches had a significant effect on the participants' knowledge, attitude and practices on solid waste management MCA on table 4.2 shows that participant obtained higher adjusted posttest scores than the control group.

(ii) There was a significant main effect of market location on participants' knowledge, and attitude while the rural market men and women obtained higher practices scores than their counterparts in urban markets.

(iii) There was no significant effect of gender on the participants' knowledge, attitude and practices on waste management of the participants in both urban and rural areas though female participants had better practices toward solid waste management than their male counterpart.

(iv) There was the interaction effect of treatment and market locations on the participants' knowledge, attitude and practices

(v) There was no significant interaction effect of treatment and gender on the participants' knowledge, attitude and practices in solid waste management.

(vi) There was no significant interaction effect of market location and gender on participants' knowledge, attitude and practices towards solid waste management.

(vii) There was a significant 3 – way interaction effect of treatment, market location and gender on participants' knowledge and practices, while there was significant 3 – way interaction on the participants' attitudes towards solid waste management.

5.2.1 Discussion

From the previous research studies, Participatory Environmental Education Programme has played a great role as part of active environmental education, especially in helping people in many environmental problems, in offering people new techniques and exciting challenges and in helping people to gain skills in taken care of their environment. This present study extended this work in another way. It investigated the effect of a participatory environmental Education programme on traders' knowledge, attitude and practices in solid waste management. It also examined the moderating effect of location of the markets and gender of the traders on their learning outcomes. The study offered the traders opportunity to participate actively in all the activities.

5.2.2 Participatory environmental Education Programme, Placebo method and Traders Environmental Knowledge, Attitude and Practices in Solid waste management

The result of the analysis of the data collected from this study revealed that participatory method had positive effects on traders knowledge, attitude and practices in Solid Waste Management. The first finding was that there was significant main effect of treatment in traders knowledge in solid waste management. Traders exposed to a participatory environmental Education programme performed significantly better than those that undergone placebo treatment in post – knowledge test. The main effect of treatment on traders' attitude to solid waste management was also significant. These findings lend credence to the findings of Brookes (2004), Smith (2002), Stine (1997) and Knapp (1996) on the significance of the participatory method above the conventional method.

These findings ought to be as a result of the fact that Participatory programme provide the Opportunities to learn on their own, having been exposed to various problems associated with waste management. They developed better physical skill, have more physical and mental energy, more self confidence and more importantly the learning is real and seen as being related to other lives.

The Participatory Environmental Education Programme offered the traders opportunity for self esteem, concentration and persistence in given tasks (Martin, 2002) and this improved the learning process. Based on the report from the fields the method provides opportunity for the traders to learn how to manage solid waste, acquire knowledge about the solid waste management.

The effect of treatment is expected to extend to the environmental practices of the traders. These traders were able to manage solid waste effectively. This claim is based on effectiveness of participatory Environmental Education Programme as a method for facilitating traders knowledge, attitude and practices in solid waste management many research findings have shown significant relationship between attitude and knowledge in one hand and between attitude and practice in other hands.

Scroll (2002) opines that attitude can be learned or acquire. Attitude can exert a powerful influence on an individual, serving as motives, incentives and drives in attaining a goal. Attitude grows and develops just as other mental and emotional behavior patterns in term of an individual's reaction to his/her environment.

5.2.3 Attitude to Solid Waste Management

When the programme started, there was initial uncertainty about some issues relating to solid wastes, environmental degradation, and so one. However as progress was made in the activities, this uncertainty seemed to have disappeared. The participants at post- activities changed some of their initial belief on the way to handle solid waste especially that it is not only the government that should take care of our waste.

As the programme moved on, the participants came up with questions they could not openly ask or discuss before. An example was how to keep animals' dung and human excreta on which it was agreed that it could be used as fertilizer. This goes, therefore, to demonstrate the particular advantages of the participatory model used in the study. If this active participation is sustained, it could be assumed that more profound changes in practices could eventually be attained.

5.2.4 Traders' Knowledge about Solid Waste Management

The results from the study of a participatory Environmental Education package held certain impression about some environmental issues. The environmental issues in questions are some of the ones that affect every individual in one way or the other, such as pollution, flooding and solid waste. The understanding, however, is very fundamental to environmental related practices and unless formal understanding of such issues, it is unlikely that people will be in position to make informed choices.

It should be noted that, as the participatory activities progressed, changes in the traders' knowledge, attitudes and practices occurred. This is in connection with the free participatory atmosphere in which the activities were conducted which also contributed to fostering a deeper understanding among the traders of all issues involved in the programme. They interacted well, asked questions and exchanged view freely with others.

It should be noted that participants in the experimental group performed significantly better than the participants in the control group in their knowledge scores. Based on the result, the null hypothesis which stated that there is no significant main effect of treatment on participants' environmental knowledge was rejected. It can, therefore, be said that, the traders exposed to the participatory environmental programmes had positive impact on their knowledge of the messages on environmental issues. Also based on the result, it is established that traders at the urban markets performed better than those in the rural area in Oyo State. This can be due to the fact that

those in the urban settings were enlightened and this could contribute to their knowledge, on environmental issues which include solid waste management.

The result agrees with the findings of Mansaray (1999) who based his theoretical consideration on a participatory model in which the participants took an active part in developing and packaging such information and found that the study had a more profound impact on the knowledge of the participants. It also agrees with the findings of Olagunju (1998). The result also agrees with Mansaray and Ajiboye (2000) that made use of participatory model in informal civics education for secondary school pupils in rural and semi-urban areas of Nigeria. The participants also performed better than those in the control group.

5.2.5 Location of market and Traders' Environmental knowledge, Attitude and practices in Solid Waste Management.

The second hypothesis of the study stated that there is no significant main effect of location of markets on participants' environmental knowledge, attitude and practices. This study found that location of the market had significant effect on the participants' knowledge, attitude and practices on waste management. However those traders in rural areas have better attitude and practices are than those in the urban area. The finding therefore rejected HO_2.

5.2.6 Effects of Gender and Environmental Knowledge, Attitude and Practices of Solid Waste Management.

One of the intervening variables in this study was the effect of gender on solid waste management. Hypothesis 3 of the study aimed at determining the main effect of gender on the traders' knowledge, attitude and practices towards waste management. The

result on the hypothesis as shown in tables **4.1** and practices scores of male and female traders. The data in table **4.2** indicated that female traders had the highest mean score on environmental knowledge, attitude and practices than their male counterparts. This finding lends credence to earlier findings on gender differences by Ogunleye (2002), Aremu and Anuoluwa, (2005): Okeke, (2001). Ogunleye (2002) revealed in his findings that female possessed more verbal commitment to the environmental issues and this was supported by this research.

5.2.7 Treatment and location of markets on traders' knowledge of solid waste management

The aim of this study was to investigate the effect of market location on traders' knowledge of solid waste management. The findings reveal that the participatory instructional package has effects on urban and rural areas. There was a significant main effect of the treatment on the traders. Their performance after the treatment was better than those in the control group. However, treatment does not have effect on the knowledge of the traders in the rural area as the control group obtained higher knowledge score-than the treatment group. This is disordinal interaction.

5.2.8 Treatment and location of markets on participants' attitude to solid waste management.

This study investigated the effect of market location on traders' attitude to waste management. The result shows that the interaction of treatment on location is significant. This result is in line with the findings of Ogunleye (2002) that location produced significant differences in learning outcome. The result, however, negates the findings of Akintunde and Olanipekun (2002) and Akintunde (2004) that location had no significant effect on learners. Though the difference between urban and rural traders was

significant, the rural traders had better attitude to solid waste management than their counterparts in urban areas. This also negates Akintunde's (2004) findings which state that urban learners are better in attitude than rural learners when confronted with environmental test.

Figure 4.2 shows ordinal interaction between treatment and location with respect to traders' attitude to solid waste management. Analysis revealed that urban and rural traders perform better after the treatment. This might be due to the fact that the participants were involved in the packaging of the participatory instruction and this corroborated the qualitative report that showed that the learners interest and participation in environmental activities often impact the extent to which they would benefit in terms of concept attainment. This is also in consonance with Wong (2005) who reported that the greater the level of learners' participation in the intervention activities, the higher the effect on their attitude.

5.2.9 Effect of treatment and location of markets on participants' practices of solid waste management.

The study was also concerned about the effect of market location on traders' practices of solid waste management. Table 4.5 shows that there was a significant 2-way interaction of treatment and market location on environmental practices of the participants. Figure 4.3 also reveals that the treatment was more effective for urban and rural participants as the participatory activities had significant improvement on their solid waste management practices. This corroborates Ogundipe's (2006) finding that participation in environmental training improved knowledge and practices of the participants. Mansaray (1999) stated that it always takes time for attitude to be formed, once formed, it leads to practices that will be difficult to change.

5.3 Implications of Findings

The findings on the need for an empirical solution to the problems of solid waste management in Oyo State would seem to have profound implications for participatory environmental education programme for market men and women. This is because knowledge, attitude and practices of solid waste management were essential for having a clean environment that devoid of pollution-borne diseases in markets.

The results of the programme have shown clearly that those traders in the experimental group gained a lot of experience after being exposed to participatory environment education programme when compared with the participants in the control group who were not exposed to the programme. The findings show that the programme had significant effect on the traders' knowledge, attitude and practice in solid waste management irrespective of where they came from. Therefore, the programme can work in any area, be it urban or rural.

It is also pertinent to note that the gender of the traders was found to have no significant effect on the outcome. For instance, the programme had significant effect on men and women traders. The implication is that the programme can be done without gender discrimination.

5.4 Recommendations

Based on the findings of the study, the following recommendations are made.

Curriculum planners

The result of this study could be useful to curriculum planners as the people in charge of markets can liaise with curriculum planners to include the participatory method in the curriculum, as many of the traders had elementary education and occasionally

attend workshop organised by local government authorities. Participatory activities have been found to be very effective at improving effective solid waste management of traders because they are fully involved in the act of packaging of the instructional programme.

The participatory environmental education programme should be targeted more at urban than rural markets as the environmental degradation is more intense in the urban than rural areas, this may be as a result of the population of the traders and buyers in the urban markets. While the rural traders sell in bulk to retailers, the retailers sell in units to several people this make sthe patronage in urban markets more than that of rural markets.

In improving market sanitation the local, state and federal governments should take the issue of participatory environmental education programme serious. It should be popularized and ensure effective implementation in all the markets

In addition, government should pay attention to each market at different locations in order to address their peculiar problems as the study reveals that every market in different location has their peculiar problems.

5.6 Limitations of the Study

Some constraints were encountered which may limit the generalisability of the result. The study took place in ten out of about 1000 markets in the state, there is the need to replicate this research using more markets in the state and in other states of Nigeria.

Another limitation encountered during the study was uncooperative attitude of some traders. As study progressed some of the traders left to attend to their sales and returned later.

Another limitation is the number of moderator variables considered in the study, gender and location were considered among other moderator variables that could likely affect the results of the programme, however other variables such as the beliefs, practices, customs, age and background of the traders could have combined limitation to the study.

Despite all the limitations stated above, the findings of this study would serve as a basic foundation for future studies in the field of participatory environmental education programme for traders in Oyo State in particular and Nigeria in general.

5.7: Suggestions for Further Studies

The study could also be replicated in all other states of Nigeria so as to have enough evidence to verify the findings of the study in order to be able to generalise the result in all parts of the country.

5.8: Conclusion

This study developed a participatory environmental education programme for traders in markets. It also sought to determine the effects of location of the market and gender on traders' environmental knowledge, attitude and practices. Major findings included that the participatory programme was more effective in improving the traders' knowledge, attitude and practices of solid waste management in their different markets. This research found that though women performed lightly better than men in their knowledge on environmental issues yet gender did not have significant effect on traders' knowledge, attitude and practices of solid waste management. Also, location did not have any strong impact on traders' knowledge, attitude and practices on solid waste management. In view of this, it is recommended that participatory environmental

education programme combined with discussion be used as a way of improving knowledge, attitude and practices of traders in this respect.

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APPENDIX 1

Focus Group Model

Lesson 1

WASTE DISPOSAL AND MANAGEMENT METHODS

Proper disposal of refuse is required if we must protect our environment and ourselves from the harmful effect of waste in our environment. The main solutions or techniques to waste problems include:

- **Source reduction-** that is, we should reduce the amount of waste we produce in our environment. This is the primary solution to world's increasing garbage.
- **Re-use method-** we must begin to re-use every used item, for example boxes, bags, shoes, belts, etc, that can still be put into some "new use. These may still have a life other than in the dump.
- **Recycling-** This is the collection, separation and processing of waste materials to produce a marketable material. For example in shoe manufacturing, damaged rubber slippers and sandals, plastic buckets, etc are recycled back into another quality rubber shoes, plastic buckets and quality polythene bags. Also, in paper manufacturing and printing, surplus pulp fibred, used newspapers magazines and damaged paper rolls are recycled back into the pulping purpose. However, it must be noted that, not all waste materials can be recycled.

  Composting: This involves the act of depositing solid and liquid wastes in a land disposal site. The wastes are left uncovered and without regard for control of scavengers, air, land and water pollution problems and diseases.
- **Secured land fillings-** this involves the use of a land site for the

storage of dangerous solid and liquid waste, stored in containers and buried. This method has bad effect on neighboring inhabitants.

- **Incineration-** incinerator is a house-like facility where solid, liquid and gaseous burning waste materials are burnt with oil; coal or gas serving as fuel. The ashes are removed at the base and dispose quickly.
- **High Technology Approach-** this requires the collection trunks to transport mixture of various urban wastes to the plant site where the wastes are cut and separated to recover the different types of wastes like glass, iron, and so on separately. These items are then recycled to provide new items.

Collection methods of solid wastes include the use of dust and waste bins, collection points or refuse depot, detachable motor vehicle refuse containers placed in a particular place. In cities like Ibadan, commercial refuse collectors help in solid wastes disposal off houses and street only to turn round and dump them in places where they still cause environmental problems.

Exercises for the Participants

(1) What is waste?

(2) Name three types of wastes

(3) What are harmful effects of waste in your environment?

(4) List methods of waste disposal in your environment.

APPENDIX II

Lesson II

OUTDOOR EDUCATIONAL, ACTIVITIES (OEA) PERFORMED BY THE PARTICIPANTS

1. Visitation to waste dumpsites at food section and abattoir of Bodija market oja oba at iseyin, Owode market in oyo, Odo Obato market in Ogbomoso to observe the environmental problems and ask questions from the Traders on the causes and problems of waste disposal in the market.
2. Make a possible suggestion on how to dispose wastes in the market. Provide wastebaskets for the market women.
3. The Participants also asked questions from the sanitary officers in the market on problems of waste and how to tackle it.
4. Provision of wastebasket to the market men and women in markets to serve as practical ways of managing the waste generated.

APPENDIX III

Lesson III

POLLUTION: Air, Land and Water Pollution.

Pollution makes air and land unsafe for our use. Polluted air is dangerous to breathe in while polluted land can affect the lives of plants, especially our crops.

Air pollution: This is very common in our country and other parts world. When air is polluted, it often has a bad odor. Air can be polluted in many ways. Some motor vehicles whose engines have not been serviced give out a lot of smoke and pollute the air Diesel engines used as generators also pollute the air with their smoke. Infarct, almost all motor vehicles and engines give out a gas called carbon monoxide which pollutes the air. During harmattan, much dust pollutes the air. Many industries pollute the air with their engines and some waste product. Soak away and pit latrines that are left uncovered pollute the air.

Other pollutants of the air include: insecticides to kill insects and mosquito coils, Faces and chicken droppings which are found in many places around some houses often pollute the air. When people breathe in polluted air, they may become ill.

Land Pollution: It can be polluted by the dumping of refuse or by dirty oil poured out of engines. Such land does not always support good vegetation. The use of chemicals as fertilizer, pesticides to kill harmful insects and weeds also pollutes the soil and makes it bad, poor, or useless for planting.

Water Pollution: Water can also be polluted. For example, some people throw refuse into the water. Others use the river, lake or stream as toilet. Some people also wash their clothes and bathe in stream or pond water. Similarly, engine oil from boats also get into

the water. These various ways of polluting water make it unsafe for drinking or for other uses.

APPENDIX III

Lesson IV

WHAT TO DO TO STOP POLLUTION

- Government has made laws to stop dumping of refuse especially by industries. They have also set up inspectors who visit places and see that rubbish is not dumped just anywhere and everywhere. But this does not seem to solve the problem
- We should pick up litter and put them in the dustbin and have this properly covered.
- Waste products and unwanted materials should be thrown into the incinerator.
- We should help to form a strong public opinion against pollution and use effective environmental education campaign on the danger of pollution in our environment.

Exercises for the Participants

1) What is land Pollution?
2) In what ways can land be polluted?
3) What can we do to stop land pollution?
4) What is air pollution?
5) Suggest ways by which we can stop air pollution.
6) How do people pollute our water?

APPENDIX 1V

Lesson V

Outdoor educational activities (OEA) to be performed by the participants.

1) Participants visited environmental pollution sites at Iyana Ajibode area Kudeti-Ogunpa channelization Isale Ora in Ogbomoso, sabo Oyo, Okeho road, Iseyin.

APPENDIX V

Lesson VI

FLOOD/EFFECT OF FLOODING

Floods like the Ogunpa river flood and the Ojerami flood disasters are caused by usually heavy rainfall and by poor drainage systems. Heavy down pour of rain causes rivers to overflow their banks and rush into surrounding areas where they destroy everything in their path. They also wash and carry away people and their belongings, including animals.

Flood is an example of natural disaster. A disaster is a sudden and very unfortunate event that affects many people. Some disasters like fire burn down houses and kill people, or like an air crash in which many people are killed, are caused by man. Others like floods, drought and earthquakes are natural disaster. They are not caused by man. Such disasters are known as natural disasters. Natural disasters often cause great damage to property and lead to loss of many lives and property.

Floods are not man-made. They cannot, therefore be controlled by man. We can, however, reduce the effect on our lives. We can avoid building houses and living near river banks. We can also stop dropping refuse into rivers which may block their flow and leads to floods.

Exercises for the participants

1) What is flood?

2) What is the difference between flood and other disaster?

3) What can we do to prevent floods in our environment?

4) In what ways can we help victims of floo

APPENDIX VII

Table: Waste Generation and number of markets by Local Governments in Oyo State

S/no	Local Govt.	Headquarters	No of markets	projected Waste generation (tons/day)
1.	Afijio	Jobele	07	30.24
2.	Akinyele	Moniya	28	60.022
3.	Atiba	Offa-Meta	07	
4.	Atisbo	Tede	10	
5.	Egbeda	Egbeda	12	55.46
6.	Ibadan North	Bodija	13	129.40
7.	Ibadan North East	Iwo Road	07	117.38
8.	Ibadan North West	Onireke	10	63.11
9.	Ibadan South East	Mapo	10	97.98
10.	Ibadan South West	Oluyole Estate	07	117.83
11.	Ibarapa Central	Igbo-ora	07	45.22
12	Ibarapa East	Eruwa	14	
13.	Ibarapa North	Ayete	19	24.52
14.	Iddo	Iddo	06	24.03
15.	Irepo	Kisi	09	56.97
16.	Iseyin	Iseyin	19	73.35
17.	Itesiwaju	Otu	04	24.01
18.	Iwajowa	Iwere-ile	22	30.04
19.	Kajola	Okeho	10	74.08
20.	Lagelu	Iyana-offa	10	29.55
21.	Ogbomoso North	Kinnira2	19	71.39
22.	Ogbomoso South	Arowomole2	10	60.40
23.	Ogo-Oluwa	Ajaawa	11	15.58
24.	Oluyole	Idi-ayunre	23	39.14
25.	Ona-ara	Akanran	19	52.62

26.	Oorelope	Igboho	11	35.49
27.	Oorire	Ikoyi-ile	11	40.17
28.	Olorunsogo	Igbeti	02	22.04
29.	Oyo-East	Kosobo3	08	118.26
30.	Oyo-West	Ojongbodu3	05	
31.	Saki –East	Ago Amodu4	07	99.20
32.	Saki-West	Saki4	13	
33.	Surulere	Iresaadu	05	
	Total		**381**	

APPENDIX V111

Environmental Knowledge Test (EKT)

SECTION A

1. Name of Market -
2. Name of the Trader -
3. Gender: (Male ( ) Female ( ) -
4. Age

SECTION B

Below are some questions of the problems and issues concerning the conditions of our environment? Choose the Tick ( ) boldly in the box relating to your choice. Please tick only one answer for each question.

(1.) What do you understand by environment?

(a) Sweeping of our environment

(b) Environment is our Surroundings

(c) Building of houses on the environment

(d) Removing of trees in our environment

(2.) Soil Erosion is:

(a) The wasting away and removal of soil nutrient

(b) The same as deforestation

(c) Burning of refuse

(d) Cutting down the trees in our environment

(3.) How do you believe that the environment should be taken care of?

(a) By throwing paper around.

(b) By sweeping the ground

(c) Environment will take care of itself

(d) People should care less the environment.

(4.) Cutting down off trees and land clearing can cause the following excises.

(a) Soil erosion

(b) Deforestation

(c) Flooding

(d) Growth and development

(5.) To control soil erosion, people should be encouraged to

(a) Throw garbage on drains

(b) Plant trees and flowers in their surroundings

(c) Digging land in their surroundings

(d) Don't throw garbage on drains.

(6.) To protect our environment.

(a) We should always keep it clean

(b) Allow only government to take care

(c) Allow the environment to take care of itself

(d) Partially involve in sanitation exercise

(7.) Which of the following emissions (discharge) could cause environmental pollution?

(a) Sewage

(b) Toxic waste

(c) Both A & B

(d) None of the above

(8.) Which of the following pollutions is degradable?

(a) Sewage

(b) Pesticides

(c) Radio – active waste

(d) Organic chemical from Industries

(9.) Which of the following solid waste disposal methods produces air pollution?

(a) Composition

(b) Sanitary land fills

(c) Dumping in rivers 1 streams

(d) Burning (Incineration)

(10.) Which of these statements about water pollution is not correct?

(a) The polluted Streams are more likely to occur where there are large numbers of people

(b) Water purifies itself when allowed to run down on an open Stream

(c) The organic waste from domestic sewage and Industrial wastes are oxygen demanding waltzes.

(11.) Garbage thrown into bodies of water kills fish because the decaying garbage:

(a) Gives of a bad smell

(b) Removes the food eaten by fish

(c) Uses up oxygen by fish in respiration

(d) Add carbon chloride to water

(12.) Water pollution resulting from impurities or contamination can cause disease such as

(a) Typhoid

(b) Malaria fever

(c) Sneezing

(d) All of the above.

(13) Possible effects of air pollution on human body include

(a) Headaches

(b) Nausea and vomiting

(c) Lung cancer

(d) All of the above

(14.) How do we conserve our natural environment?

(a) Not using natural resources

(b) Use natural resources only

(c) Replace used natural resources

(d) Non of the above

(15) All these except one are ways of taken care of our solid waste

(a) Throwing garbage in the stream

(b) By sweeping our environment

(c) Recycling of used items

(d) Parking waste into dustbin.

APPENDIX IX

Environmental Attitudes Scale (EAS)

SECTION A

1. Name of Market

2. Name of the Trader

3. Gender: (Male ( ) Female ( )

4. Age

Below are some statements about our environment. Please mark in the box that matches the extent of your agreement or disagreement with each statement. The letters stand for the following:

SA - Strongly agree

A - Agree

D - Disagree

SD - Strongly disagree

S/NO		Strongly agree	Agree	Disagree	Strongly disagree
1.	For healthy life humans should be concerned with the quality of air, water and food.				
2.	Solid waste disposal is the biggest environmental problems in Nigeria				
3.	Insecticides (mosquitoes spray), pesticides have no harmful effect on the environment				
4.	Burning of rubbish is a harmless way of disposing our garbage.				

5.	Whether we take care of our environment not, God will always look after it				
6.	We are all guilty of polluting our environment.				
7.	Government is not doing enough at the moment to sensitize people about our environmental problems				
8.	All food items should be packaged in plastic container				
9.	Our waste should be treated and used into making fertilizers.				
10.	Government should provide lorries and trucks to transport waste to dump site				
11.	Dumping of wastes in the quitter makes me feel bad				
12.	Floods should be channel into the Stream				
13.	Those who make environment dirty should be punished				
14.	It is nobody business where to dump refuse				
15.	Environmental problems cannot be solved; we just have to live with them.				

APPENDIX X

Environment Practices Scale (EPS)

SECTION A

1. Name of Market -
2. Name of the Trader -
3. Gender: (Male ( ) Female ( ) -
4. Age

These are some statements' about practices of market men and women towards solid waste management in markets, in Oyo State, Nigeria.

Please mark (X) in the box provided that matches the extent of your agreement or disagreement with each statement.

The letters stands for the following:-

VO - Very Often

O - Often

S - Seldom

N - Never

How often do you do the following?

S/No.		VO	O	S	N
1.	Throwing garbage in the drainage.				
2.	Throwing garbage in the bush.				
3.	Burning my refuse.				
4.	Dropping refuse in the dust bin for pick up or truck to pick.				

5.	Cleaning our market.				
6.	Cleaning our toilet.				
7.	Observing environmental sanitation exercise.				
8.	Participating in sanitation exercise in market.				
9.	Holding meetings on how to tackle environmental issues.				
10.	Contributing financially to the tidiness of the market.				
11.	Providing dust bin.				
12.	Keep our environment tidy				
13.	Leave waste on ground till you have chance				
14.	I agree with Environmental Sanitation Committee on environmental issues				
15.	I pollute Environment unconsciously/consciously				

APPENDIX XI

Agbeyewo imo lori Ayika

Ipin kinni

(1) Oruko Oja

(2) Oruko Onisowo/Iya/Baba loja

(3) Obinrin/Okunrin

(4) Ojo Ori

Ipin Keji

Ni isale ni awon I beere lo kan-ojokan lori isoro to nkoju ayika wa? Mu eyi to ba wu o lati fi owo si ninu awon ti a ko jo sinus akamo yii

1. **Kini o mo nipa agbegbe**?

(a) Pipale egbin mo ni agbegbe

Agbegbe wa tumo si ayika wa

(b) Kiko awon ilegbee si agbegbe wa

Gige awon igi ni agbegbe wa

2. **Agbara je:**

a. Sisan awon nnkan alumoni ile danu

b. O je nnkankan naa pelu gige igi lai gbin agbin paro

d. Ile sisun

e. Gige awon igi lule ni agbegbe wa.

3. **Ba wo ni o se ro pe ale se amojuto agbegbe wa?**

(a) Nipa jiju idoti sile kaakiri

(b) Nipa ile gbigba

(d) Nipa fifi agbegbe sile fun itoju ara re

(e) Ki awon eniyan ma bikita fun agbegbe wa

4. Gige awon Igi pelu pipa ile:-

(a) Agbara

(b) Ai gbin agbin paaro igi

(d) Omiyale

(e) Idagba soke ati Imu gbooro

5. Lati dawo agbara duro, a gbodo gbiyanju :

(a) Dida ile si oju agbara

(b) Gbigbin Igi ati ododo si ayika

(d) Gbigbe ile ni ayika wa

(e) ma se dale si oju agbara

6. Lati daaboboo agbegbe wa:

(a) A gbodo ri pe o wa ni mimo ni oorekore

(b) Ki a fun Ijoba nikan laaye lati maa toju re

(d) Ki a fi agbegbe sile fun itoju ara re

(e) Fifi owo yepere mu eto kole kodoti.

7. E wo ninu awon nnkan dida si ayika wonyi lo le fa ayika didoti

(a) Igbe

(b) Awon idoti ti o le ko aisan ba ago ara

(d) Mejeeji to keyii

(e) Ko si ikan kan ninu mejeeji to wa loke yii.

8. E wo ni o buru ju ninu awon oorun wonyi

(a) Igbe

(b) Ogun pakopako

(d) Kemika

(e) Oogun ti awon ile-ise se pelu igbe eranko tabi oku eranko.

9. Ewo ninu awon ona ipale egbin mo wonyi lo le fa oorun ni agbegbe wa?

(a) Kiko ile soju kan

(b) Dida egbin si ile ti a gbe

(d) Didale si oju odo

(e) Sisun ile.

10. Ewo ninu awon oro wonyi ni ki se otito nipa dida nnkan oloro sinus omi?

(a) O seese ki a maa ri awon odo ti o doti ni agbegbe ti awon eniyan po si

(b) Omi maa n mo funrare re ni gba ti a ba fun laaye ki o san lo

(d) Nkan oloro lati awon ile- ise nla- nla dara fun fin fin simu

11. A won nkan egbin ti ada soju omi maa n pa eja nitori pe won:

(a) Mu oorun buruku jade

(b) O maa n mu Ounje eja kuro

(d) O maa n di eemi eja lawo

(e) Gbogbo nkan ti owa loke yi

12 Idoti inu omi to mo lee sokunfa awon arun wonyi

(a) Iba jedojedo

(b) Iba

(d) Sisin lera lera

(e) Gbogbo ohun ti o wa loke yii

13. Awon nukan ti oorun buruku lefa si ago ara ni wonyii:

(a) Ori fifo

(b) Eebi

(d) Jejere Ona-ofun

(e) Gbogbo ohun to wa loke yii.

14. Ona wo la lee gba daabobo ayika wa?

(a) Ki a ma lo awon ohun ti Olorun fun wa

(b) Ohun ti Olorun fun wa nikan ni ki a maa lo

(d) Fifi nnkan miran dipo eyi ti a ba lo

(e) Ko si nnkan ninu awon ohun to wa loke.

15. Gbo ona ti ala sile yi ayafi okan ni ona ti angba mojuto idoti wa.

(a) Dida idoti sinu odo

(b) Gbigba ile ayika wa

(d) Titun oun ti ati lo lo pada

(e) Kiko idoti sinu igba ile

APPENDIX XII

Ayewo lori imo eto ayika

Awon wonyi ni oro nipa ihuwa si awon babaloja ati iyaloja si ajo to mojuto oro ayika ni awon oja wa ni Ipinle Oyo, ni orile ede Naigiiria.

Jowo fi aami(x) si inu apoti ti a pese to ba ero tire mu ti o fara mo tabi eyi ti o ko fara mo ninu awon oro wonyi;

- Nigba Gbogbo
- Nigba die
- Nigba miran
- Rara

Nigba wo ni o maa nse awon nkan wonyi

S/No		Nigba gbogbo	Nigba die	Nigba Miiran	Rara
1.	Didale soju agbara				
2.	Didale sinus igbo				
3.	Sisun ile				
4.	Didale sinus Igba ile fun awon oluko lati gbe				
5.	Titun oja se				
6.	Titun ile iyagbe se				
7.	Kikopa ninu itoju ayika				
8.	Kikopa ninu titun				
9.	Sise ipade lori oro ayika				
10.	Didawo ni ona ati tun ayika oja se				
11.	Pipese Igba idale si				
12.	Pipa ayika mo tonitoni				

13.	Fifi idoti sile di igba ti oba raye lati ko				
14.	Lo ma nfara mo ase awon igbimo pipale egbin mo lori oro egbin Oja				
15.	Lo nse nkan ti o fa egbin si ayika oja laimo tabi mimo				

APPENDIX XIII

Igbelewon iwa wa si eto imototo ayika

Ni isale yii awon oro kan wa lori ayika wa. Jowa mu eyi ti o ba fara mo tabi eyi ti o lodi si ninu won.

Awon leta wonyi duro fun:

(a) Mo faramo pupo

(b) Mo faramo

(c) Mi o faramo

(d) Mi o faramo rara

S/No		Mo faramo pupo	Mo faramo	Mi o faramo	Mi o faramo rara
1.	Fun igbe aye idera, omo eniyan gbodo ni agboye lori afefe, omi ati ounje ti a nilo				
2.	Ipale egbin mo je isoro gboogi to nkoju orile ede wa.				
3.	Ogun eefon ati oogun pakopako ko ni akoba kankan fun ayika wa				
4.	Sisun idoti je ona ati dale nu ti komu ipalara lowo				
5.	Bi amujuto ayika wa,bi a o mojuto, Olorun yoo ba wa moju to.				
6.	Gbogbo wa ni a jebi didoti ayika wa.				

7.	Akitiyan Ijoba lori Ipolongo lori imototo ayika wa ku die ko to.				
8.	Gbogbo ounje loye ki a ko sinu ike				
9.	Oye ki a ma fi idoti wa se ajile				
10.	Oye ki Ijoba pese Oko akole lati ma ko egbin wa danu				
11.	Dida idoti sinu gota ma nbami ninu je				
12.	Oye ki a ma se gbasoro omi sinu agbara				
13.	Oye ki ijiya wa fun awon ti o ndoti ayika				
14.	Kosi nkan ti okan enikeni lori ibiti a ndale si				
15.	Ko si bi ase le bori isoro ayika, a yafi ki a ma gbe pelu isoro yi.				

Appendix IX
SOME SCENES FROM THE PROGRAMME ACTIVITIES

One of the research assistants leading traders out on outdoor activities.

Research assistant explaining the film watched by traders.

Trained research assistant explaining a method of waste disposal to participants.

One of the research assistants explaining some things to some participants

Research assistants with participants during one of the outdoor activities.

Participatory activity by traders.

Participatory activity by the traders.

A trader dumping waste at an official dump site while others watching.

Research assistants distributing waste baskets to the participants.

Some research assistants with the researcher.

Some waste already sorted out for sale.

A research assistant explaining recycling procedure to traders at a recycling site.

Participatory activity by some traders.

Participatory activity by traders while one of the research assistants watching.

Traders listening to lecture giving by one of them.

Participants at a session.

A research assistant distributing questionnaires to participants.

Group discussion by participants.

Post-test exercise with traders.

Participants watching film at one of the centres.

Some of the research assistants in group photograph.