

# **AN ASSESSMENT OF THE ROLE OF WOMEN AND CHILDREN IN DOMESTIC SOLID WASTE MANAGEMENT IN TUNGA- MINNA MUNICIPALITIES OF NIGER STATE**

BY:

**DR. M.B.NUHU\* AND POPOOLA, N.I (MRS.)\***

**\*Estate Management Department,  
mbnuhu@yahoo.com naomi.popoola@yahoo.com  
Federal University of Technology, Minna**

## **1.0 INTRODUCTION**

Since the 1970s, environmental issues have been discussed continuously and extensively in the print and electronic media (Opala, 1986). Further maintained, that consumption of land deforestation and displacement of natural ecology is not the only environmental damage brought by urbanization and urban development, but also construction of houses which inevitably and enormously generate domestic refuse. The organization and growth of markets has also resulted to enormous rate of refuse generation for centuries and up to present time, man's non degradable waste products which have hauled along degradable waste disposed in open gullies, valleys or abandoned pits. This method led to deterioration of local environment which attracts different insects and vermin. This dumping ground also destroys the natural beauty of our environment (Ahmed, 2000).

The gathering and disposal of solid wastes has become a major public health issue of our time which needs some urgent attention if our environment is to be protected. It is against this background the study set out to examine waste management system in Tunga-Minna with emphasis on the roles of women and children in waste generation and disposal.

This is to formulate workable waste management programme that will adequately integrate women and children in waste management to attain a sustainable environment.

## **2.0 RESEARCH PROBLEM**

Waste cannot be completely separated from women and children in African society; they are the custodian of our homes. They play active roles in generation, storage, collection and disposal of waste in the household.

The generation of waste is not the main problem rather the management. In the process of waste generation proffer supervision is not given to how and where the waste is to be dispose of by the children and the women. This indiscriminate dumping of refuse, inefficient collection and disposal of garbage may contribute to the outbreak of typhoid, cholera and malaria (Olaore, 1983). Uncollected waste encourages the breeding of insects and rodents which easily transmit diseases with a greatly affect human health and pollute underground water resources and sources which render it unfit for consumption and spread of water borne diseases (Turnea, 1979). Also, religious and social custom in Northern Nigerian has made waste collection very different. Seclusion of women and the privacy of their domestic

country and prevent collections from entering for waste collection (Ivor, 1992). Collection of waste needs to be more frequent as high temperature and humidity which cause decay and consequent danger to health and hygiene (Holmes, 1982).

In developing countries, a significant portion of waste pickers are children and pregnant women as they are residents around the disposal sites. Children are particularly vulnerable to toxin as their metabolic pathways are less developed to detoxify and excrete toxins. Any disruption during growth can easily disrupt their development (Candngan, 1998). Waste management cater for waste from the source of generation to the final disposal point, women and children play active roles in waste generation and disposal (Para and Than, 2007). Through the history, involvement of women in every societal issue has proved to be very successful. Though, there are regarded as fragile but very important role for betterment of the society. In view of this, the study seeks to examine the roles of women and children in waste generation and disposal so as to integrate them into every aspect of waste management program to ensure urban livability.

### 3.0 AIM AND OBJECTIVES

This study aimed at examining the role of women and children in domestic waste disposal within Tunga, Minna, with a view to proffer a workable waste management programme for urban sustainability.

The objectives of the study are to identify

- i. The sources of waste generated within Tunga-Minna
- ii. The mode of storage; collection and disposal of waste employed by women and children within the study area and

### 4.0 THE STUDY AREA

Minna is the capital city of Niger State. It lies at latitude  $9^{\circ} 37'$  North of the equator and longitude  $6^{\circ} 33'$  East of the Greenwich median. Prior to its present status as the state capital was a small railway inhabited many by Gwaris natives, rail workers and civil servants of the old Niger province. Before it become the state capital. Its indigenous population engaged themselves mainly farming activities. Minna further become civil service town based on the movement of country's capital to Absuja in 1991. The population is heterogeneous with considerable numbers of people from different part of Nigeria. The total population of Minna in the 2006 Census was 201, 429. It was a land area of 6,789s.q.km Tunga is one of the biggest wards in Minna which is mixed with high and medium density of residential area, generally planned with basic infrastructures. It is a neighbourhood in Minna houses the administrative center of Minna; state house of assembly, state secretariat and others legislative activities. It is a zone of civil work force. It is an area mixed with residential, commercial, industrial and other uses complimenting each other.

### 5.0 RESEARCH METHODOLOGY

In the study the data used were collected from primary and secondary sources. An extensive field survey was carried out were observation, interview were conducted and responses from questionnaire were also adopted as it form the major data used in the study. Stratified sampling and simple random sampling techniques were employed. The study area was divided into four (4) strata and from

each stratum simple random sampling was adopted. 50 questionnaires were administered to each stratum making the total number of 200 for the study. The data of the study were presented in tables,

charts and percentages. While the data were illustrated in descriptive form. Below table 1 and 2 shows the breakdown of the administered questionnaire.

**Table 1: Survey Response Rate**

S/N	Neighbourhood	Number Administered
1.	Sabon Layi area	50
2.	MTP 7 and 10 area	50
3.	Tunga lowcost area	50
4.	Sauka Kahuta area	50
	<b>Total 200</b>	

Source: Field survey 2010

**Table 2: Categories of Respondents**

S/N	Categories of respondents	Frequency	Percentage (%)
1.	Women	120	60
2.	Children	40	20
3.	<i>Almajiries</i>	40	20
	<b>Total</b>	<b>200</b>	<b>100</b>

Source: Field survey 2010

## 6.0 CLASSIFICATION OF WASTE

According to (Adedibu, 1982) waste is the non-gaseous and non-liquid waste resulting from domestic activities of the inhabitants of a particular residential area (waste constitutes the most visible and obviously harmful affront to the environment and human. It further maintained that waste is an act of omission which alters the nature of land waste is solid i.e garbage, paper, plaster e.t.c or liquid - i.e oil spillage toxin from textiles etc which can be voluntary or permissive waste

The Federal Environmental protection Agency (FEPA, 1991) has

categorized waste into three (3).

1. Municipal waste arising from residential, institutional, commercial and street-left over such as cans, food waste, pieces of papers etc. all those waste found on the street and sidewalks.

2. Industrial wastes these are notorious and dangerous, the less harmful could be the solid form such processing plants metal scraps, chemical wastes-oil, celluloid materials, all this waste arises from factories and electric power plants.

3. Toxic wastes: This category is the most harmful to health as it pose substantial danger immediately or over a

period of time living organisms such as carbon monoxide from fumes of cars, machinery, chimney, generating plants and other combustible items.

According to Mmakwe (Ibid) hazardous waste were previously grouped into the following categories.

- i. Radioactive substance
- ii. Biological waste
- iii. Explosives
- iv. Chemicals
- v. Flammable waste

The principal sources of hazardous waste are hospitals, biological research facilities and pharmaceutical comprise.

### 6.1 SOLID WASTE GENERATION AND COMPOSITION

Municipal solid waste is produced as a result of economic productivity and consumption. Countries with higher incomes produce more waste per capital and employee and their wastes have higher portions of packaging materials

and recyclable wastes (Bernard, et al, 1999). In low-income countries, there is less commercial industrial activity and an institutional activity generates less waste. Countries where personal incomes are low, there is, of necessity, extensive recycling at the sources (Benry, Bore, 1997).

Cointreau, 2006 observed that, waste composition (table 3) is largely affected by too factors (i) income level (ii) Extent of industrialization. The composition of waste affects the amount soil and ash within the waste and the moisture content. There is less food material, yard wastes and other putrescible organic in the waste of high-income countries which the calorific value is high relatively high. While wetter waste of developing countries does not have calorific value to self sustain incineration, that is, it will not burn without the addition of fuel.

Table 3: Composition Of Raw Waste According To Country

COMPOSITION OF RAW WASTE (by wet weight):	LOW INCOME COUNTRY	MIDDLE INCOME COUNTRY	HIGH INCOME COUNTRY
VEGETABLE/PUTRESCIBLE %	40 to 85	20 to 65	7 to 55
PAPER AND CARTON %	1 to 10	15 to 40	15 to 50
PLASTIC %	1 to 11	2 to 13	2 to 20
METAL %	1 to 5	1 to 5	3 to 13
GLASS %	1 to 10	1 to 10	4 to 10
RUBBER, MISC. %	1 to 3	1 to 5	2 to 12
FINES % (sand, ash, broken glass)	15 to 50	15 to 40	5 to 20
<b>OTHER CHARACTERISTICS:</b>			
MOISTURE %	40 to 80	40 to 60	20 to 35
DENSITY IN TRUCKS kg/m <sup>3</sup>	250 to 500	170 to 330	120 to 200
LOWER HEATING kcal/kg	800 to 1100	1000 to 1500	1500 to 2700

Source: Cointreau. (2006)

## 6.2 WASTE DISPOSAL SYSTEMS

In high-income countries, essentially all collected wastes go to safe sanitary landfill, composting, and materials recovery or incineration facilities that are designed and operated to meet high environmental protection standards. In these countries, hazardous wastes are handled separately from municipal solid waste, and subject to stringent rules. Landfill is still the primary method of disposal used by most high-income countries, because it is a relatively low cost compared to other disposal options. (Bhide, Sundaresan, 1984) Because of a shortage of land licensed for land disposal in Europe, some European countries maximize the amount of waste recycling and composting possible, prior to land filling of those materials that are unsuitable for resource recovery. In 1998, land filling in the USA accounted for 55.4% of the nation's municipal solid waste disposal (down from 83.2% in 1986). Incineration and materials recovery, and to a lesser extent composting, shared the remaining 44.6%.(U.S. Environmental Protection Agency, 1998) In middle-income countries, probably less than 25% of collected wastes are deposited in controlled landfills, and probably less than 15% are deposited in modern sanitary landfills. The rest is discharged to open dumps, most of which burn openly and have hazardously steep side slopes. In low-income countries, nearly all of collected wastes are deposited within open dumps. The cost and resources required to implement waste technologies are often regarded as too prohibitively high to be sustained. In most developing countries, hazardous waste facilities have not yet been implemented and hazardous wastes are co-mingled for disposal with

municipal solid wastes, despite laws to the contrary. (de Coura Cuentro S, Dji Malla Gadji, 1990)

## 6.3 METHODS OF WASTE COLLECTION AND DISPOSAL

According to Omman (2000) waste management and disposal comes in two main stages (i) collection (ii) disposal

### Collection

Collection of waste is the first stage in all other stages of waste disposal. The adequacy and efficiency by which waste is collected by the municipal services depends on three main methods of collection.

1. Manual collection; waste are collected through the use of bins and transferred manually to garbage trucks and dumps (plate 1) stands for subsequent disposal largely done by children.

2. Site incineration. This is done through combustion process by reducing waste to carbon dioxide.

3. Air suction pipe. It uses air suction pipe that have vacuum stalked in building to convey solid waste in a stream of air to a central collection point.

Also refuse collection can be done through the use of refuse collection vehicles.

## 6.4 Disposal of Waste and Management

Waste disposal is defined by Mmakwe (2000) as the collection, storage and processing of waste material. According to Othman, 2000 recognized that waste disposing comprises four main processes these include sanitary land fill: It is a method of disposing of refuse on land without creating nuisance, health

regards or safety unlike the old age practice of dumping refuse on land which is characterized with unsightliness, odour and unavoidable presence of insects and rodents. This method is used to confine the refuse to the smallest volume and cover with layer of earth on a regular basis. It requires operational planning and designs. The disadvantage of this method is that as the needs for waste disposal grow. The number of suitable sites diminishes'.

Incineration, this method of waste disposal controlled combustion process for reducing solids, gases or liquid combustible waste primarily to carbon dioxide (CO<sub>2</sub>) other gases relatively non combustible residue (Robert 1978). This method can either be central or on site incinerators. Compositing, this involves the biochemical degradation of the organic fraction of solid waste material

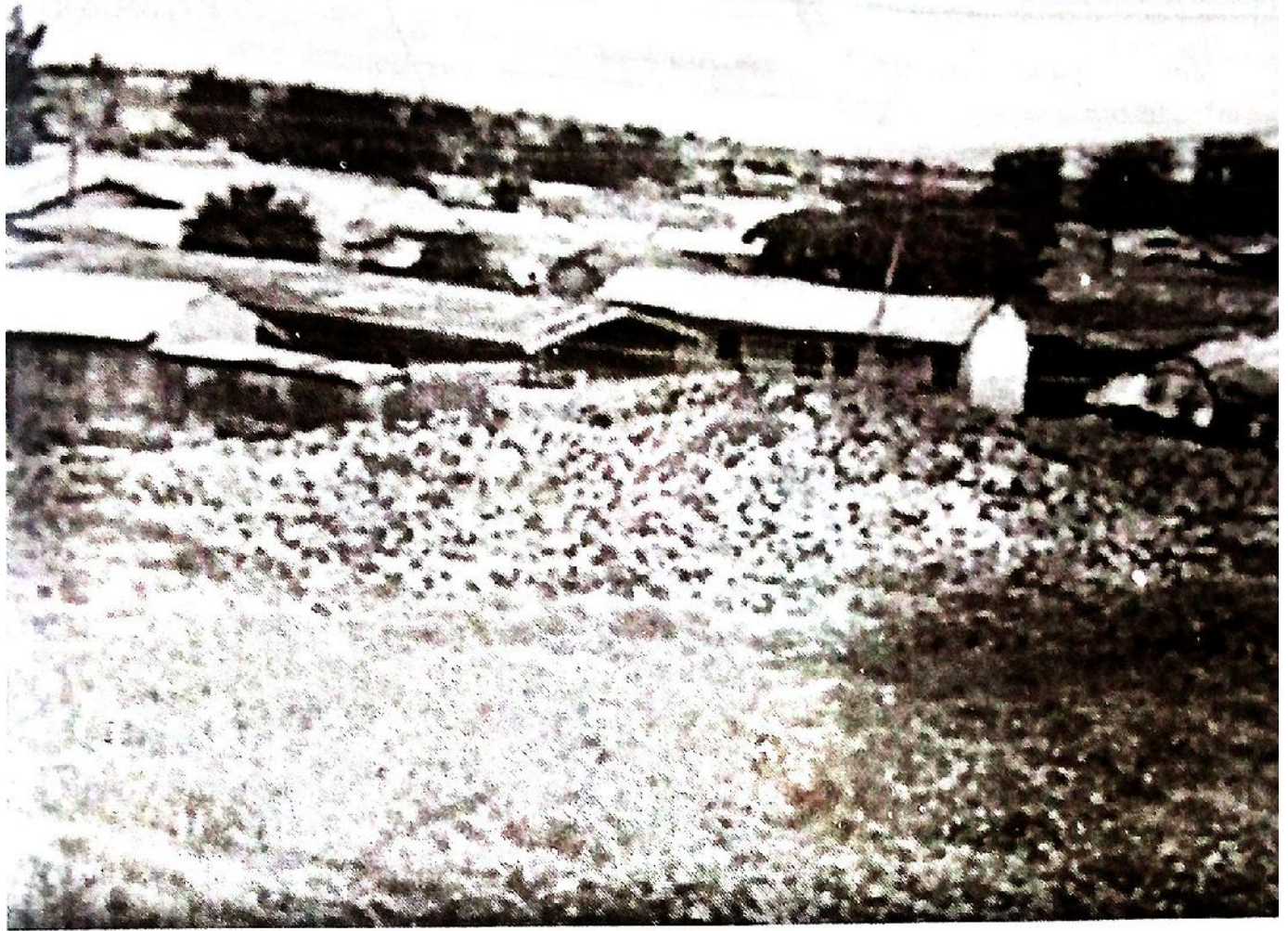
into humus like materials.

In developing countries, the health related underpinning of solid waste management cannot be over emphasis. The mineral regulatory framework on environmental protection and occupational health and safety are often not enforced waste are left on uncollected, workers not protected from direct contact and injury, lift heavier loads and in traffic condition significantly more dust and diesel exhausted pollution.

Waste pitters who are mostly women and children less than 16 years of age lived adjacent to the dump site in poor housing condition (plate 2) and minimal basic infrastructures. Wastes sorting and recycling typically conducted micro-and small scale enterprises with minimal workers protection (Cointreau, 2001).



Plate 1: Showing a child at a disposal site bare footed located in Tunga



**Plate 2: Showing poor housing condition adjacent to dump site in Tunga**

### **6.5 Statutes of Solid Waste Management in Nigeria**

Poor environmental sanitation through inadequate refuse collection and disposal system has been a common feature of cities. Wastes are seen all over our major cities blocking roads, railroads and pavement serving as a sign post for travelers' attention.

According to Mmakwe (2003), it is estimated between 30-50% of solid waste generated is often uncollected and disposed off properly. These uncontrolled wastes serve as breeding grounds for diseases vectors. Due to this, it has been reported that Nigerian cities is one of the dirtiest, most unsanitary and east a esthetically pleasing cities in the world. This is pointing an accusing finger at our failure to deliver functional, aesthetical

sound and livable settlement. To react to this, the Federal, Environmental protection-Agency (FEPA) was set up with the mandate to protect the environment for sustainable development and management which is still operational.

However with all the policies regulations and agencies, our cities are still in poor sanitary condition. To achieve a sustainable environment for development and management there is need to map out the vicious stages of waste generation and disposal and how to reduce waste see fig 1. Waste management hierarchy, established legislation and the environment project Act wastes should be managed in accordance with the following order of preference.

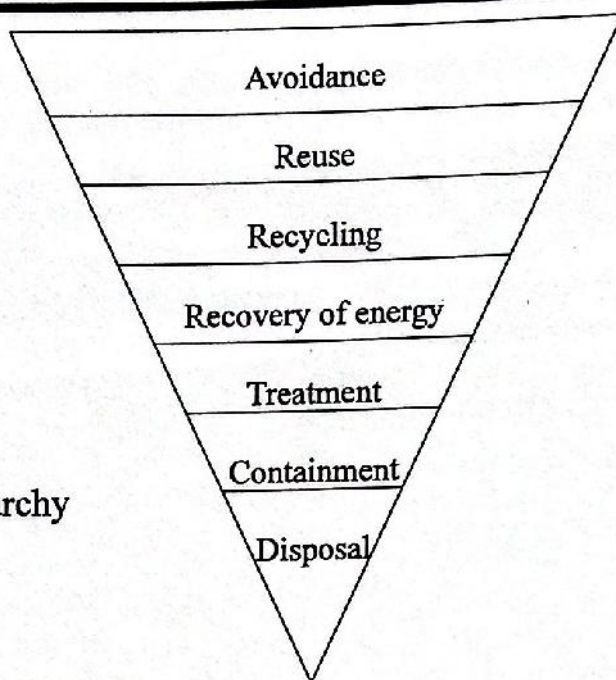


Fig 1. The waste Hierarchy  
Source: FEPA, (1991)

### 6.6 SOLID WASTE MANAGEMENT PLANNING

In our contemporary urban center, many people dispose their waste in cities gutters, drains, stream, rivers and all sort of bad refuse/waste disposal. The waste material deposited become clogged, causes flow in rainy season.

Waste management involved waste handling controlling and monitoring of the technique adopted in managing the available waste (Mabogunge, 1974). Khan et al, (1990) described solid waste management planning as the development, comparism and monitoring

of various alternatives approaches to the solving of municipal solid waste problem ( fig. II). He maintained that it also includes environmental, economic, social and political factors. He further said the dynamic nature of these factors and there relationships make collection and analysis of data on waste very difficult which imposes numbers of constraints. Solid waste management consists of a number of individual activities which can be grouped into six functional elements namely; waste generation, on-site storage, collection, thrasher and transport, recovery and disposal. (Khan et al. 1990).

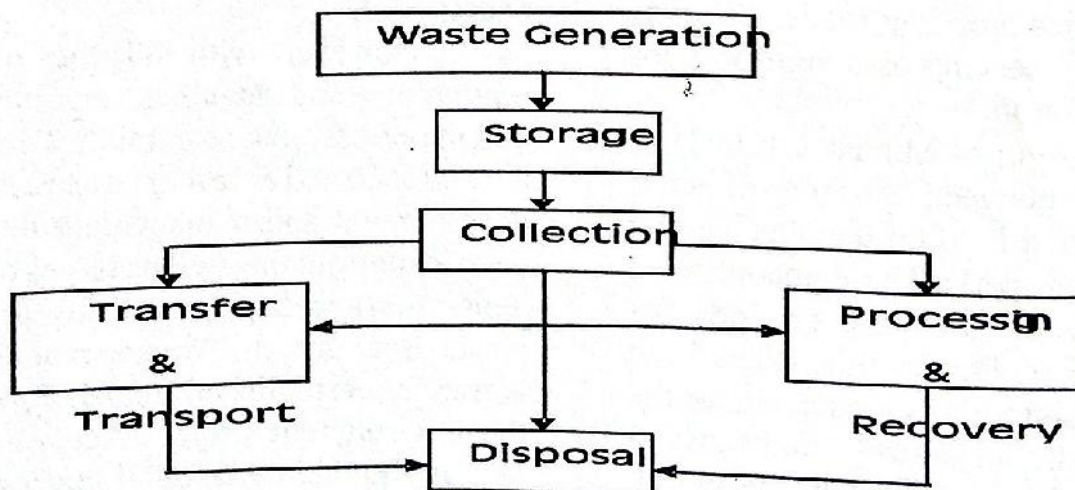


Fig.II: Interrelationship of functional element of solid waste management.  
Source: Khan etal (1990)



## 7.0 RESULTS

The research was carried out in four neighborhoods of Tunga-Minna to test the role of women and children in waste disposal. From the study, it revealed that

women and children have a major role to play in waste generation to disposal point. The analysis of the research shows that;

### SOURCE OF WASTE

Source		
Kitchen	44	36.97%
Provisions	28	23.53%
Neighbourhood	44	36.97%
Others	03	2.53%
	<b>199</b>	<b>100%</b>

### TYPES OF WASTE

Types		
Paper	48	25.39%
Vegetables	47	24.87%
Rubber	15	7.94%
Plastics	16	8.47%
Polythene	35	18.52%
Wood & Ashes	16	8.47%
Others	12	6.34%
	<b>189</b>	<b>100%</b>

### VOLUME OF WASTE

Volume (kg)		
1-2	04	6.35%
3-4	25	39.68%
5-6	17	26.98%
6 Above	17	26.98%
	<b>63</b>	<b>99.99%</b>

### METHOD OF STORAGE

Methods		
Open space	07	11.11%
Sacks	27	42.86%
Waste bin	16	25.39%
Uncovered bin drum	12	19.05%
Polythene bag	01	1.59%
	<b>63</b>	<b>100%</b>

### METHODS OF WASTE COLLECTIONS

Collection Method		
Private	6	8.70%
Child	21	30.43%
Govt	09	13.04%
Almajiris	23	33.33%
Self	10	14.50%
	<b>69</b>	<b>100%</b>

### PROBLEMS OF WASTE COLLECTION

Problems		
In effective private operatives	10	14.92%
In Effective Govt. Agencies	11	16.42%
Littering of waste	28	41.79%
Lazy ward	05	7.46%
None	06	8.96%
Others (waste sorting, lack of storage facilities)	07	10.45%
	<b>67</b>	<b>100%</b>

### DISPOSAL METHOD

Methods		
Recent plots	10	15.38%
Road side	10	15.38%
H <sub>2</sub> Channels	28	43.08%
Burning	10	15.38%
Pits	06	9.23%
Others	01	1.55%
	<b>65</b>	<b>100%</b>

### WHO DISPOSES

Persons		
Child	21	31.82%
Almajiris	25	37.88%
Private	05	7.56%
Govt	06	9.09%
Self	09	13.65%
Other	00	0.0% <sub>s</sub>
	<b>66</b>	<b>100%</b>

### FREQUENCY OF DISPOSAL

Freq. of Disposal		
Daily	10	15.87%
Every other day	29	46.03%
Weekly	21	33.33%
Forth nightly	03	4.77%
	<b>63</b>	<b>100%</b>

### TIME OF DISPOSAL

Time		
Dawn	09	14.29%
Morning	23	36.51%
Afternoon	12	19.04%
Evening	15	23.81%
Twilight	04	6.35%
	<b>63</b>	<b>100%</b>

**PROBLEMS ENCOUNTERED DURING DISPOSAL**

Problems		
Threat	13	
Injury	12	17.80%
Kick of disposal site	32	16.44%
Population	16	43.84%
	73	21.92%
		100%

**DO YOU PAY FOR WASTE COLLECTIONS**

Response		
Yes	23	36.51%
No	40	63.49%
	63	100%

**DO YOU AGREE TO COMMERCIALIZE**

Response		
Yes	38	60.32%
No	25	39.68%
	63	100%

**AFFORDABILITY TO LEVY**

Affordability		
10 - 20	10	11.11%
30 - 50	17	26.99%
60 - 100	14	22.22%
NILL	25	39.68%
	63	100%

**REASON FOR VOTING AGAINST WASTE COMMERCIALIZATION**

Reasons		
Not employed	11	17.46%
Govt responsibility	12	19.05%
Childs collect	14	22.22%
Family affairs	11	17.46%
Others	15	23.81%
	63	100%

**IMPLICATION OF IMPROPER WASTE DISPOSALS**

Implications		
Dirty environment	32	34.04%
Risk of infection	19	20.21%
Breeds pests	11	11.70%
Pollution	20	21.28%
Injury	12	12.77%
	94	100%

**STEPS TO PROPER WASTE DISPOSALS**

Steps		
Paying for waste collection	14	19.44%
Public enlightenment	12	16.68%
Law abiding	24	33.33%
Regular sanitation	08	11.11%
Encourage community participation	14	19.44%
	72	100%

### OBSTACLE TO ACHIEVING WASTE FREE ENVIRONS

OBSTACLES		
Lack of neighbourhood	24	30%
Financial constraint	06	7.50%
Lack of defined waste disposal site	33	41.25%
Lack of support from Govt	17	21.25%
	80	100%

### WAY FORWARD

Way forward		
Community cooperation	21	26.92%
Public enlightenment	24	30.77%
Law enforcement	25	32.05%
Formulation of law	05	6.41%
Implementation of waste disposal programme	03	3.85%
	78	100%

Source: Field survey 2010

### 8.0 SUMMARY OF FINDINGS

Above analysis is self explanatory with respect to respective percentages obtained from the field survey as per each table captioned. Similarly, waste disposals as indicated above are mainly done by the *Almajiris* and Children which constitute the highest percentages with 37.88% and 31.82% respectively and mostly generated from the kitchen (women constituency). Below are other salient findings;

1. The socio-Economic status of the residents are characterized by low income earners and they are predominantly civil servants and petty traders
2. The high population density is the predominant factors that influence the magnitude of solid waste generation in Tunga-Minna.
3. Household refuse or domestic waste dominates the types of solid waste generated in Tunga-Minna
4. It was discovered that because there was no adequate care toward good waste management, even of waste water, lack of drainages and where there are drainages, they are broken and often result in the spillage of its contents. This leads to littering of the streets and thereby making the environment filthy.
5. It was also discovered that due to the carefree nature of the inhabitants to proper waste ethics, there has also been the tendency of waste to be thrown about by agents such as wind.
6. It was discovered that though a number of

people used one form of refuse disposal system or the other, they are not properly maintained as they are either torn in the case of bags or sacks and bins without covers or have lost their bases to rust. This causes them to spill their contents.

NOTE: *Almajiris* herein refers to children who mostly are from far north in search of Qu'aranic (Islamic) knowledge end-up wandering in search of food and are informally employed by women as domestic servants in exchange for food or stipend.

### 9.0 RECOMMENDATIONS

The following recommendations are made based on the results of the research work;

1. Government should embark on public enlightenment and awareness on the importance and implications of improper waste generation, collection and disposal.

2. Women should be encouraged to maintain proper waste collection and disposal system. This will play an important role in sustaining good environmental hygiene in the community.

3. Public Private Partnership in Solid Waste Disposal should be promoted by government and encouraged by the community. The public private partnership in solid waste disposal concept would go a long way to give stakeholders (NGO, private organizations, Government establishment, e.t.c) opportunities to sensitize the people, educate them on the importance of effective solid waste disposal

system.

4. The unofficial solid waste disposal site should be abolished and the waste should be evacuated and be replaced with a bunker to ensure a clean Environment.
5. The law should be re-visited and enforced against the indiscriminate dumping of solid waste and who ever is guilty of such offence be punishable according to the law this can be done in connection with the government and the district village head.
6. A final solid waste disposal site should be provided and located at the outskirts of Tunga-Minna to protect against any disease contact during treatment.
7. Composting of waste should be encouraged to add value to the waste.
8. The provision of waste collection bins should be encouraged and placed at strategic positions for easy monitoring and Supervision.

## 10.0 CONCLUSION

Nigeria's aim of achieving the vision 20: 2020 can only be attainable when we have effective and workable procedure of healthy environment as well as adequate system of waste generation, collection and disposal. The current procedure is dangerous and capable of jeopardizing the well being of the children in the study area. The nation need to wake up to the 21<sup>st</sup> century callings of effectiveness in achieving health for all. Until the communities take ownership and responsiveness by paying for the waste they generate in their environment for sustainable growth in effective manner before we can achieve the vision 20:2020

## REFERENCES

- Adedibu, A.A. (1982). 'Spatial Pattern of Solid Waste Generation in Ilorin'. Paper presented at the Annual Conference of Nigerian Geographical Association, Ibadan.
- Adeyemo, A. J. (2000). City Planning and Management Techniques: In *Contemporary Issues in Environmental Studies*. Haytee Press and Publishing co. Ltd. Ilorin.
- Pp. 210-216.*
- Ahmed, Y. A. (2000). Waste Generation and Management Technique. In *Contemporary Issues in Environmental Studies*. Haytee Press and Publishing co. Ltd. pp. 110-116.
- Bernard BP, et. al. (1999): Musculoskeletal Disorders (MSDs) and Workplace Factors: A Critical Review of Epidemiologic Evidence for Work-Related Musculoskeletal Disorders of the Neck, Upper Extremity, and Low Back. U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, Cincinnati, Ohio, U.S.A. July
- Berry, M., Bove, F., (1997): New Jersey Department of Health, USA, *Birth weight reduction associated with residence near a hazardous waste landfill*, Environmental Health Perspective, 105(8):856-61, August.
- Bhide AD, Sundaresan BB. (1984) *Street Cleansing and Waste Storage and Collection in India*. In: Holmes JR, editor. *Managing Solid Wastes in Developing Countries*. John Wiley & Sons, Ltd, Chichester, UK.: 139-149.
- De Coura Cuentro S, Dji Malla Gadji, (1990): The Collection and Management of Household Garbage. The Poor Die Young: Housing and Health in Third World Cities, edited by Hardoy JE, Caincross S, Satterhwaite D. Earthscan, London, UK.
- FEPA, (1991). *Guidelines and Standards for Environmental Pollution Control in Nigeria*.
- Holmes, J.R. (1982): Waste Management Decisions In Developing Countries. *Chart. Municipal Engineering*, 109. pgs.11-16. In: *Public Works Engineering* by Ivor, H. S. (1992). The Macmillan Press Ltd. Hong Kong. Pg.215.
- Ivor, H. S. (1992): *Public Works Engineering*. The Macmillan Press Ltd. Hong Kong. Pg.215-245.
- Kanitz S, Poli A, et.al. (1995): *Occupational and*

- Environmental Health Problems at MSW Landfills: A Case Study.* Proceedings of Sardinia 95, Fifth International Landfill Symposium, Cagliari, Italy. October.
- Khan, R, Husain, T, Khan, H.U, Khan, S.M, & Hoda, A. (1990): *Municipal Solid Waste Management- A Case Study of Municipal Engr.* April. Pgs 109-116: *Public Works Engineering* by Ivor, H. Seleey (1992). The Macmillan Press Ltd. Hong Kong. Pg.215.
- Landrigan, P.J., et.al. (1998): *Vulnerable Populations*, International Occupational and Environmental Medicine, Jessica A. Herzstein (editor) et.al., Mosby, Missouri.
- Mabogunje, A.L. (1974) 'Cities and Social Order' An Inaugural Lecture, University of Ibadan, Nigeria.
- Mar Para, Ali Khan, (2007): *Women Role In Community Development. A Journal Of Human Development Foundation: May 25-29. Retrieved: www:goggle.com. 12:11pm.*
- Najwa Karout (2009): *Role of Women /Women Associations in Hygiene Education and Behavior Change for Successful Community Based Solid Waste Management Activities.* Retrieved May, 27, 2009. www:goggle.com
- Okpala, D.C, (1986): *The Nature of Environmental Problems In Nigeria: Institutional Problems in The Management Of Nigerian Urban Environment.* NISER, Monograph Series. No 15. Ibadan. Pgs.23-35.
- Olanrewaju, R.M, Ogunleye-Adetona, (2000): *Women In Environmental Degradation.* In; *Contemporary Issues in Environmental Studies. Eds. Jimoh, H.I, Ifabiyi, I.P. Haytee Press and Publishing co. Ltd. pp. 110-116.*
- Olaore. G.O. (1983): *Population Growth And Environmental Pollution. Population And Development In Nigeria.* Eds. Orubuloye.I.O, Oyeneye, O.T. NISER, Ibadan. Pg.89, B 104.
- Olokesusi .F, Soji .A, Joe .O, Demola .A & Felix, O. (2005): *Public-Private for National Development: The Case of Water Supply and Solid Waste Governance in Nigeria: In Public-Private Partnership in Nigerian Development; A Multi-Disciplinary Approach (NISER).* Ibadan. Pgs. 162-163.
- Sandra Cointreau-Levine, Adrian Coad, (2000): *Guidance Pack: Private Sector Participation In Municipal Solid Waste Management.* SKAT Swiss Centre for Development Cooperation in Technology and Management. Vadianstrasse 42, CH - 9000 St.Gallen, Switzerland. Vol. 1. First Ed. url: [www.skat.ch](http://www.skat.ch)
- Cointreau, S (2001): *Declaration of Principles For Sustainable and Integrated Solid Waste Management (SISWM).* 12 Church Street Roxbury, CT 06783, USA. March 7, Page 1
- Cointreau, S (2006): *Occupational and Environmental Health Issues of Solid Waste Management Special Emphasis on Middle- and Lower-Income Countries.* The International Bank for Reconstruction and Development/The World Bank 1818 H Street NW Washington, DC 20433. [www/worldbank.org](http://www/worldbank.org).
- Turner, (1979): *Turner's Personal and Community Health.* The CV Mosby Company, London 15<sup>th</sup> Ed. In: *Waste Generation and Management Technique* by Ahmed, Y. A. (2000). *Contemporary Issues in Environmental Studies Eds. Jimoh, H.I, Ifabiyi, I.P. Haytee Press and Publishing co. Ltd. pp. 110-116.*
- U.S. Environmental Protection Agency, (1998): *Characterization of Municipal Solid Waste in the United States.* By Franklin Associate, Ltd., Kansas, USA. Sponsored by the U.S. Environmental Protection Agency, Office of Solid Waste, Washington DC, USA. Report No. 1997 Edition EPA530-R-98-007. May.