

GIZO SOLID WASTE CHARACTERISATION STUDY REPORT

J – PRISM Project 31 May – 8 2011 June

1.0 INTRODUCTION

1.1 BACKGROUND

Lack of proper data and reliable information on SWM is affecting collection and disposal of garbage in Gizo for Past years and at present time. Though Gizo Town Council as the Competent authorities responsible for collection and disposal

Have tried its best to collect garbages in every zones in Gizo, it does not have the capacity to do due to lack of Logistics,

Vehicles and proper garbage bins for disposal of waste. Therefore, it is very important to conduct this waste characterization

Study to help us plan for future improvement of Solid Waste Collection system in Gizo Town.

Aim:

The aim of this study is to gather relevant information and data that will help in the;

- a. . Development of action Plan for improvement of Waste Collection system.
- b. . Establishing a SWM policy for Gizo
- c. .improvement ,and better management of existing Land fill

2.0 Overview of SWM activities carried out 2011

Below are activities undertaken this year under the J- PRISM for 2011 fiscal year. Details of this Activities will be seen at the latter part of this reports.

2.1 Waste Minimisation

- a. . Home composting
- b. . market waste
- c. . GTC is working on to locate site for stock piling of recyclable waste (etc.. steel cans, aluminium cans)

2.2 Improvement of Gizo Dump site

- a. . site assesment at land fill completed
- b. . survey of vechicle dumping waste at land fill already done
- c. . EIA study is also conducted

3.0 Waste Characterisation study results;

Table 3.1 Waste composition for High Income household (Jah Mountain)

Category	Days							Total Weight	Percentage %
	1	2	3	4	5	6	7		
Vegetables/Putrescibles		10.0	11.0	12.0	1.0	8.0		42.0	17.9
Papers		1.4	2.2	5.0	2.4	1.8		12.8	5.4
Textiles		0.6	2.0	2.4	1.2	1.8		8.0	3.4
Plastics		4.2	4.4	18.0	5.4	3.8	5.4	41.2	17.5
Grass/leaves			2.4	4.6		1.4	2.2	10.6	4.5
Leather/Rubber			2.0		1.6	1.4		5.0	2.1

Metals				2.6		1.2		3.8	1.6
Glass/ceramic		0.8	6.4	2.4	11.8	12.8	8.6	42.8	18.3
Cardboard		1.4	2.0				1.0	4.4	1.9
Coconut husk		1.4			0.8	4.0		6.2	2.6
Steel cans		3.4	6.0	9.2	1.0	2.0	1.0	22.6	9.6
Aluminium cans		2.2		2.2	1.0	1.2		6.6	2.8
Pep bottles		0.8	6.8	13.6	3.2	3.8	1.0	29.2	12.4
Miscellaneous								0.0	
Totals		26.2	45.2	72.0	29.4	43.2	19.2	235.2	100%

Source: Survey form, SWM Counter parts, Gizo

Table 3.2 Data sheet for Volume (Density)

High Income HouseHold (Jah Mountain)

Day	1	2	3	4	5	6	7	Total
Number Of Buckets		3	4	5	4	3	5	24
Daily total volume		9.8	11.4	19.8	10.8	12.6	9.2	73.6

Source: Survey form, SWM Counter parts, Gizo

Table 4.1 Waste Composition for Middle Income HouseHolds (Gizo Hill Top)

Category	Days							Total Weight	Percentage %
	1	2	3	4	5	6	7		
Vegetables/Putrescibles		12.8	9.6	12.4		1.4	11.0	47.2	23.3
Papers			3.4		2.0	1.0		6.4	3.2
Textiles		2.2			1.0		1.6	4.8	2.4
Plastics		13.2	3.4	2.4	1.6	6.0	2.4	29.0	14.3
Grass/leaves		1.8	4.0	6.0	4.2	2.2	5.0	23.2	11.5
Leather/rubber				2.4		4.0	1.6	8.0	3.9
Metals								0.0	0.0
Glass/ceramic					19.8			19.8	9.8
Cardboard		1.2			2.8	1.8		5.8	2.9
Coconut Husk						4.0	2.0	6.0	3.0
Steel cans		1.6	3.0	2.6	1.8	2.2		11.2	5.5
Aluminium cans		9.2	6.6	2.4		6.4	1.0	25.6	12.6
Pep bottles		1.6	3.0	2.0	6.0	1.4		14.0	6.9
Miscellaneous		1.2			0.2			1.4	0.7
Totals		44.8	33.0	30.2	39.4	30.4	24.6	202.4	100%

Source: Survey form, SWM Counter parts, Gizo

Table 4.2 Data Sheet for volume (Density)

Middle Income HouseHold (Gizo Top Hill)

Day	1	2	3	4	5	6	7	Total
Number of bucket		4	3	6	4	3	3	23
Daily Total Volume		11.2	9.4	10.8	8.4	14.8	13.6	68.2

Source: Data sheet, SWM Counter parts, Gizo

5.1 Waste Composition for Lower Income HouseHold (Gizo Central)

Category								Total Weight	Percentage %
	1	2	3	4	5	6	7		
Vegetables/Putrescibles		22.6	20.8			1.4	11.0	55.8	23.7
Papers				3.0	2.0	1.0		6.0	2.6
Textiles			2.4	2.2	1.0		1.6	7.2	3.1
Plastics		2.4	6.6	17.4	1.6	6.0	2.4	36.4	15.5
Grass/Leaves			2.0	3.2	4.2	2.2	5.0	16.6	7.1
Leather/rubber		3.8				4.0	2.0	9.8	4.2
Metals				3.2				3.2	1.4
Glass/ceramic					19.8			19.8	8.4
Cardboard			1.2	1.2	2.8	1.8		7.0	2.9
Coconut husk			2.8	1.4		4.0	2.0	10.2	4.3
Steel cans		5.6	4.8	4.6	1.8	2.2		19.0	8.1
Aluminium cans		6.6	3.2	5.6		6.4	1.0	22.8	9.7
Pep bottles		2.4	5.0	4.6	6.0	1.4	1.8	21.2	9.0
Miscellaneous									
Total		43.4	48.8	46.4	39.2	30.4	26.8	235.0	100%

Source: Survey form, SWM Counter parts, Gizo

Table 5.2 Data sheet for volume (Density)
Lower Income HouseHolds (Gizo Central)

Day	1	2	3	4	5	6	7	Total
Number of Buckets		4	3	6	4	3	3	23
Daily Total Volume		14.0	10.6	12.0	8.8	13.2	13.6	72.2

Source: Survey form, SWM Counter parts, Gizo

Table 6.1 High Income Daily Generation Rate (Jah Mountain)

House No	Family Size				Days				Total Weight (kg)
		1	2	3	4	5	6	7	
1	7		0.4	10.0	12.0	10.8	13.0	1.0	47.2
2	6		1.0	2.0	4.0	3.0	2.0	1.4	13.4
3	4			4.4	9.6	11.8	13.0	18.0	56.8
4	8		1.6	4.6	4.0	5.0	7.0	5.0	27.2
5	6			3.2	5.0	2.2	3.0	3.0	16.4
6	10		0.6	6.2	9.6	8.0	3.4	2.0	29.8
7	7			9.0	11.2	7.8	20.2	7.0	55.2
8	5		1.4		3.8	10.6	4.0	2.8	22.6
9	6		0.6	8.2	4.2	8.2	5.0	8.0	34.2
10	7		0.8	7.0	3.0	8.2	4.4	4.2	27.6
Total	66		6.4	54.6	66.4	75.6	75.0	52.4	330.4

Source: Survey form, SWM Counter parts, Gizo

Table 6.2 Middle Income Daily Generation Rate (Gizo Top Hill)

House No	Family Size								Total Weight (kg)
		1	2	3	4	5	6	7	
11	5		8.0		5.4	9.4	7.2	8.0	38.0
12	6		3.0				15.0	17.0	35.0
13	6		12.8	4.0	5.4	6.6	5.0	8.6	42.4
14	8		7.0	9.0	2.2	7.0	3.2	7.0	35.4
15	7		1.0	1.0	4.2	2.4	3.0	1.0	12.6
16	6		3.4	3.0	2.0		1.0	0.8	10.2
17	6		18.2		3.4	2.8	3.6		28.0
18	9		17.0	14.4		16.6	4.8	5.0	57.8
19	8		6.8	4.2	2.6	2.4	4.8		20.8
20	5		4.2		13.2	16.8		23.0	57.2
Total	61		81.4	35.6	38.4	64.0	47.6	70.4	337.4

Source: Survey form, SWM Counter parts, Gizo

Table 6.3 Lower Income Daily Generation Rate (Gizo Central)

House No	Family Size								Total Weight (kg)
		1	2	3	4	5	6	7	
21	6		0.6		8.0		7.4	10.4	26.4
22	12		3.2	4.2	3.6	2.6	5.2		18.8
23	10			8.8	3.0	6.8	12.6	13.8	45.0
24	8		9.2	6.6		4.8		13.8	34.4
25	6		4.6	6.6	5.6	8.8	18.6	10.2	54.4
26	7		10.4	7.8		2.4		5.2	25.8
27	6		0.8	2.6	3.4	1.8		4.0	12.6
28	8		5.4	2.6	11.8			1.8	21.6
29	10		2.8	3.0	5.6	1.6	3.0	2.6	18.6
30	11		18.6	21.0	11.8			7.2	58.6
Total	84		55.6	63.2	52.8	28.8	46.8	69.0	316.2

Source: Survey form, SWM Counter parts, Gizo

Table 7.1 Data sheet for Daily Generation Rate (Commercial)

House Hold No	Premises	Floor Area	No.of Employees/Rooms	Days							Total Weight (kg)
				1	2	3	4	5	6	7	
31	Gizo Hotel		104		6.2	2.2	3.6	6.0	8.4	9.0	35.4
32	Chan Store		8		4.0	3.8	5.4	6.8	4.2	4.4	28.6
33	Lamasa Restaurant		6		2.2	1.6	3.4	4.8	1.6	5.0	18.6
34	Provincial Office		16		0.8	1.2	1.4	1.6	1.0	1.0	7.0
35	Education Office		10		2.0	2.6	1.8	1.0	2.4	3.0	12.8
Total			144		15.2	11.4	15.6	20.2	17.6	22.4	102.4

Source: Survey form, SWM Counter parts, Gizo

Summary of Waste Composition for Household in Gizo

Table 7.2 HouseHolds Summary Data for Gizo

Waste Category	Total Waste in %
Vegetables/Putrescibles	64.9
Papers	11.2
Textiles	8.9
Plastics	47.3
Grass/Leaves	23.3
Leather/Rubber	10.2
Metals	3.0
Glass/Ceramic	36.5
Cardboard	7.7
Coconut Husk	9.9
Steel Cans	23.2
Aluminium cans	25.1
Pep Bottles	28.3
Miscellaneous	0.7

Source: Survey form, SWM Counter parts, Gizo

Base on this study it is obvious that **organic waste**, and plastics were the most generated waste in residential

Houses in Gizo,, which can be reduce by using Home composting and reducing purchasing of plastics From shops. Already we are introducing home composting in some residence in Gizo for purpose of demonstration

And we are planning to organize awareness programmes in each five (6) zones in Gizo to encourage each households

To introduce home composting as a means to reduce waste.

8.0 Photo shoots on activities undertaken this year in Gizo.

8.1 WASTE CHARACTERISATION STUDY.



Photo 1. Waste collection from Households



Photo 2. Weighing of household waste



Photo 3. Waste Segregation



Photo 4. Waste Photo ready for disposed to dump site

Table 7.3:Gizo Existing Dump Site Vehicle Hauled Survey Data

<u>Date</u>	<u>Vehicle no.plate</u>	<u>Measurement/Volume</u>	<u>Owner</u>	<u>Total no. of loads /7days</u>
11 th – 17 th July, 2011	G3406	4 m x 1.52m x 0.4m = 2.4	Prison Service	2 = 1 ton/wk
11 th - 17 th July, 2011	X 1274	4 m x 1.54m = 6.16	EHD/RWSS	4 = 6 tons/wk
11 th – 17 th July, 2011	X 1364	4 m x 1.52m = 6.08	Gizo Hospital	6 = 6 tons/wk
11 th – 17 th July, 2011	AB2379	5m x 1.83m = 9.15	RTC	3 = 9 tons/wk
“ “ “	AB772	4m x 1.60m = 6.4	Wong Store	1 = 1.5 tons/wk
“ “ “	AB786	4m x 1.60m = 6.4	Rekona Lodge	1 = 1.5 tons/wk
“ “ “	AB6039	4m x 1.60m = 6.4	Naqua Lodge	3 = 3.5 tons/wk
“ “ “	AB 4389	4.27m x 1.55m = 6.6	Gizo Hotel	3 = 3.5 tons/wk
11 th – 17 th July, 2011	AB4389	4.88m x 1.55m = 7.5	Francis	1 = 1.5 ton/wk
“ “ “	AB6282	3.10m x 1.40m = 4.4	Corner shop (Elvis)	1 = 1 ton/wk
“ “ “	AB4265	4.95m x 1.78m = 8.8	GF Store	3 = 6 tons/wk
“ “ “	AB13561	3.79m x 1.91m = 7.0	Wing Sung	1 = 2 tons/wk
11 th -17 th July, 2011	AB1498	4m x 1.52 x 0.4 = 2.4	RAMSI	1 = 1 ton/wk
“ “ “	A1448	4.73m x 1.53m = 7.1	RC. Chang	3 = 3 ton/wk
“ “ “	AB 1082	4.58m x 1.53m = 7.0	Gizo Dive (D.Kennedy)	1 = 1 ton/wk
“ “ “	A7690	4.83m x 1.68m = 7.0	Telekom	3 = 3 ton/wk
11 th -17 th July, 2011	AB4892	5m x 1.81m = 9.0	Bowmans	1 = 1 ton/wk
Total Load		Total Volume = 109.74 sqm	Total load/wk →	38 = 51.5 tons/wk
		Total Av.Vol/day/wk = 15.7 sqm	Total	Average ton/day/wk = 7.3 tons

Source: Survey form, SWM Counter parts, Gizo

Type of Vehicles dumping waste at the dump site



Table 7.4: Gizo Town Council Tractor Loads/day/7 days at the dump site(SWM)

DATE	DAY	BIG TRAILOR/1.5 ton	SMALL TRAILOR/1.5 ton
11/7/11	Monday	5 loads = 7.5 ton/day	2 loads = 3 ton/day
12/7/11	Tuesday	4 loads = 6 ton/day	2 loads = 3 ton/day
13/7/11	Wednesday	6 loads = 9 ton/day	3 loads = 4 ton/day
14/7/11	Thursday	2 loads = 3 ton/day	1 loads = 1.5 ton/day
15/7/11	Friday	4 loads = 6 ton/day	2 loads = 3 ton/day
16/7/11	Saturday	2 loads = 3 ton/day	1 loads = 1.5 ton/day
18/7/11	Monday	6 loads = 9 tons/day	3 loads = 4.5 ton/day
		Total loads/wk	14 loads = 21 ton/wk
		30 loads = 45 tons/wk	Average ton/day = 3 tons
		Total ton/day	Av.ton/day = 6.4 tons

Source: Survey form, SWM Counter parts, Gizo

A week survey was done to determine how much in terms of tones of waste is disposed in the dumpsite in a week. The result shows that an average of 6.4 tons of waste is disposed at the dumpsite everyday and 45 tons every week by a 1.5 ton truck with a big tailer. When the topographic survey is done will can find the capacity of the land fill we are currently using.

The current result will reduce when hoe composting and recycling strategies are fully implemented in Gizo.

Table 7.5: Number and basic data of business Establishment

Business Establishment	Total no.	Current Status	Waste Disposal System
Shops	34	Operating	Burning, disposed at dumpsite, illegal dumping.
Hotel	1	Fully operational	Disposed at refuse dump
Hospital	1	Operating	Burning, incineration, disposed at dumpsite or sea
Guest houses	13	Fully operational	Burning, burying, unmanaged dumping, disposed at dumpsite
Restaurant	3	Fully operational	Disposed at sea, disposed at dumpsite
Timber dressing	4	Fully operational	Composting, Sawdust stove cooking, landfilling, disposed at dumpsite
Banks	3	Fully operational	Burning
Offices	14	operation	Burning, Disposed at dumpsite by GTC

Churches	11	active	Burning, burying, dispose at refuse site
Household	660(3630 pop)	Fully operational	Burning, burying, dispose at refuse site, careless disposal in bush and sea

Source: SWM Counter parts, Gizo

- The number of potential waste producers in Gizo Town alone taken from the 2009 Population & Housing Census is 660 households and approximately 3630 people at an average of 5.5 people in one household. The number of potential waste producers will be more up to 8,000 people when rural Gizo is also taken into account.
-

Challenges

- a. Lack of appropriate logistics
- b. Poor refuse data collection system
- c. inadequate manpower capacity
- d. poor swm collection system
- e. inadequate financing
- f. insufficient awareness program

Conclusion

The completion of this report will take us further in our planned programmes for SWM in Gizo, especially in **Solid Waste Management Awareness programmes. We are targeting 5 zones, 4 schools all market vendors and business houses which have already been done.**

From this short survey report Gizo SWM counterparts will create strategies to tackle solid waste problem arising in the town.

Recommendation

1. Massive awareness on SWM
2. Demonstration on Composting for all Zones to reduce the dumping of 64.9% organic waste
3. Negotiate with business houses through Gizo town Council to provide location for recyclable items
4. Provide a better waste collection system so that all residents will aware when to collect, how to collect, which place to collect etc.

There are challenges which we confronted that needs to be improved in order to develop a sound SWM approach in Gizo. We believe that the JPRISM project will support our initiative to maintain a friendly Environment in Gizo town within the cope of the SWM programme within the next 5 years. It is anticipated that the program will be extended to the other substation upon successive under taking of the current program in Gizo in the future.

We are looking forward for your continuous guidance towards this program.