

**INDONESIAN  
DOMESTIC SOLID WASTE STATISTICS  
YEAR 2008**



**State Ministry of Environment  
The Republic of Indonesia**

**INDONESIAN  
DOMESTIC SOLID WASTE STATISTICS  
YEAR 2008**

## **PREFACE**

We are very glad for publishing Indonesian Domestic Solid Waste Statistics in Year of 2008. We are grateful to Japan International Cooperation Agency (JICA) for supporting and publishing this book.

Arrangement and publishing the book is in right moment as the same time with stipulated Waste Management Law No 18 year 2008. A part of the law mentions that everyone has a right to get the right information, accurate and precise on waste management activity.

Waste statistics is preliminary stage which is not easy to collect the data. The information may give a sight to global waste management in Indonesia and may able to become basis for policy decision making for integrated waste management.

We hope that the book become useful, especially for waste management execution in a city.

Jakarta, August 2008

Deputy Minister for  
Environmental Pollution Control,  
State Ministry of Environment



**Mohd. Gempur Adnan**

# TABLE OF CONTENTS

<b>INTRODUCTION</b> .....	<b>1</b>
<b>A. GENERAL PROFILE</b> .....	<b>2</b>
A.1 Total Kota/Kabupaten.....	2
A.2 Total Population .....	2
<b>B. WASTE MANAGEMENT AUTHORITY</b> .....	<b>2</b>
B.1 Employee Involved in Waste Management Authority .....	2
B.2 Private Party Involvement .....	3
<b>C. WASTE GENERATION</b> .....	<b>4</b>
<b>D. WASTE COLLECTION AND WASTE HANDLING SYSTEM</b> .....	<b>6</b>
D.1 Total Population Served .....	6
D.2 Waste Collection Services.....	7
D.3 Estimation of Waste Handling System by Community (RT/RW) .....	7
<b>E. TEMPORARY DISPOSAL SITE</b> .....	<b>8</b>
E.1 Type and Amount of TPS .....	8
E.2 Transfer Depo .....	9
<b>F. WASTE TRANSPORTATION VEHICLE</b> .....	<b>10</b>
<b>G. FINAL DISPOSAL SITE (TPA)</b> .....	<b>11</b>
G.1 Number and Location of TPA .....	11
G.2 Land Ownership and Access Road to TPA .....	12
G.3 Scavenger in TPA .....	13
G.4 Served Time of TPA and Candidate for New TPA .....	13
G.5 Data Compilation for Waste Entering TPA .....	14
G.6 Facilities and Monitoring in TPA.....	15
<b>H. WASTE TREATMENT FACILITY</b> .....	<b>17</b>
<b>I. RECYCLE ACTIVITY</b> .....	<b>18</b>
<b>J. REGULATION</b> .....	<b>19</b>
<b>K. FINANCIAL ASPECT</b> .....	<b>19</b>
K.1 Source of Financial and Expenditures.....	19
K.2 Retribution .....	20
<b>L. PUBLIC PARTICIPATION</b> .....	<b>21</b>

## TABLE OF FIGURES

<b>Figure. 1</b>	Distribution of Different Employee in Answered Kota/Kabupaten Waste Management Authority .....	3
<b>Figure. 2</b>	Presence of Private Party Involvement in Waste Management .....	4
<b>Figure. 3</b>	Private Party Involvement in Waste Management .....	4
<b>Figure. 4</b>	Percentage of Total Population Served from Answered Kota/Kabupaten. ....	6
<b>Figure. 5</b>	Estimation of Waste Quantity Collected by Local Government.....	7
<b>Figure. 6</b>	Estimation of Waste Handling Systems after Waste Collected by Community from Household.....	8
<b>Figure. 7</b>	Type of TPS .....	8
<b>Figure. 8</b>	Volume Size of Containers Available in TPS .....	9
<b>Figure. 9</b>	Distribution of Total Area for Transfer Depo.....	10
<b>Figure. 10</b>	Owner Distribution of Total Truck.....	10
<b>Figure. 11</b>	Presence of TPA .....	12
<b>Figure. 12</b>	Location of TPA Based on Administration Boundary .....	12
<b>Figure. 13</b>	Usage of TPA.....	12
<b>Figure. 14</b>	Land Ownership of TPA .....	13
<b>Figure. 15</b>	Types of Access Road to TPA .....	13
<b>Figure. 16</b>	Estimation of TPA Usage .....	13
<b>Figure. 17</b>	Candidate for New TPA .....	14
<b>Figure. 18</b>	Leachate Treatment in TPA .....	15
<b>Figure. 19</b>	Leachate Monitoring in TPA.....	15
<b>Figure. 20</b>	Gas Control System at TPA .....	16
<b>Figure. 21</b>	Water Quality Monitoring.....	16
<b>Figure. 22</b>	Other Facilities at TPA .....	16
<b>Figure. 23</b>	Heavy Equipments at TPA .....	17
<b>Figure. 24</b>	Number of Treatment Facilities .....	17
<b>Figure. 25</b>	Proportion of Waste Treatment at Facility .....	18
<b>Figure. 26</b>	3R activities at Source, TPS and TPA.....	18
<b>Figure. 27</b>	Proportion of Total Recycled Waste at Source, TPS and TPA .....	19
<b>Figure. 28</b>	Base of Retribution Rate .....	20
<b>Figure. 29</b>	Retribution Billing System .....	20
<b>Figure. 30</b>	The Way of Public Participation .....	21

## TABLE OF TABLES

<b>Table. 1</b>	Amount of Answered Kota/Kabupaten .....	2
<b>Table. 2</b>	Total Population of Answered Kota/Kabupaten.....	2
<b>Table. 3</b>	Estimation of Total Employee Involved in Waste Management Authority ...	3
<b>Table. 4</b>	Total Waste Generation of Answered Kota/Kabupaten.....	4
<b>Table. 5</b>	Estimation of Total Waste Generation in Indonesia .....	5
<b>Table. 6</b>	Estimation of Waste Generation by Composition .....	5
<b>Table. 7</b>	Estimation of Population Served .....	6
<b>Table. 8</b>	Estimation of Total Amount of TPS .....	9
<b>Table. 9</b>	Total Amount of Functioning Trucks.....	10
<b>Table. 10</b>	Estimation of Total Truck Amount .....	11
<b>Table. 11</b>	Number of Still-Used TPA .....	11
<b>Table. 12</b>	Record of Waste Volume Entering TPA .....	14
<b>Table. 13</b>	Estimation of Waste Disposed into TPA.....	15
<b>Table. 14</b>	Total of Expenditures.....	19

# INDONESIAN DOMESTIC SOLID WASTE STATISTICS

## YEAR 2008

---

### INTRODUCTION

Indonesian State Ministry of Environment has conducted Domestic Solid Waste Statistics activity by questionnaire survey that distributed nationally to 465 (four hundred and sixty five) kota/kabupaten in 33 (thirty three) Provinces throughout Indonesia. The purpose of this activity is to gather information about current condition on Indonesian solid waste management.

The results of Indonesian Domestic Solid Waste Statistics include various aspects of the management: authority, waste generation, and waste handling technique, recycle activity, regulation, finance and public participation. The survey asks to fill out the data in 2006 year basically (some question accept fill out other year result when local government doesn't have data of 2006 year). When the question asks the data of a point of time, the survey asks to use data of 31 December 2006 or the nearest existing data in 2006.

To represent Indonesian condition, some data are estimated from answered kota/kabupaten based on 6 (six) groups: (1) Metropolitan/Big City, (2) Sumatera, (3) Jawa, (4) Balinusra (Bali and Nusa Tenggara), (5) Kalimantan, and (6) Sumapapua (Sulawesi, Maluku and Papua). Group (1) until (6) include all kota/kabupaten both participating and non-participating adipura cities. The data output of all kota/kabupaten are grouped based on authority of 5 (five) regional offices of State Ministry of Enviroment: Sumatera, Jawa, Balinusra, Kalimantan, and Sumapapua.

**Note:**

- (1) The values referred to in the following figures and tables are what were rounded off; because of this, in some cases, the result of calculation does not match with the total.

**A. GENERAL PROFILE**

**A.1 Total Kota/Kabupaten**

Questionnaires were distributed to 465 kota/kabupaten throughout Indonesia with 33% participation rate of answered kota/kabupaten. The distribution of participating kota/kabupaten based on regional area is shown in Table 1.

**Table. 1** Amount of Answered Kota/Kabupaten

Group Area	Number of Kota/Kabupaten	Answered rate (%)
Sumatera	50	36%
Jawa	57	49%
Balibusra	11	29%
Kalimantan	16	29%
Sumapapua	20	17%
ALL	154	33%

**A.2 Total Population**

Based on the data given by answered kota/kabupaten, total population from participating kota/city is 93,936,261 people, about 40% of Indonesian population (232,656,251 person based on Statistics Indonesia).

**Table. 2** Total Population of Answered Kota/Kabupaten

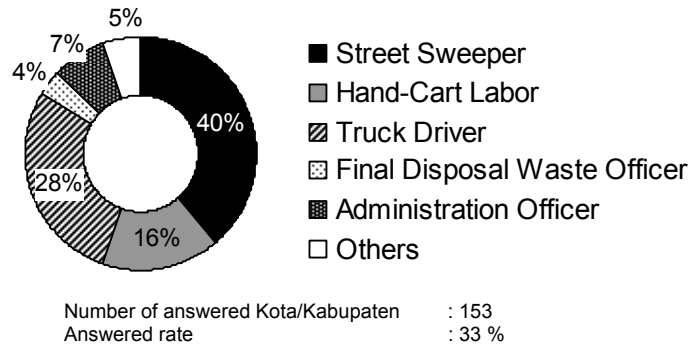
Group Area	Number of Population (person)	Answered rate (%)
Sumatera	15,382,173	31%
Jawa	64,623,161	47%
Balibusra	4,090,054	33%
Kalimantan	4,924,449	38%
Sumapapua	4,916,424	24%
ALL	93,936,261	40%

**B. WASTE MANAGEMENT AUTHORITY**

**B.1 Employee Involved in Waste Management Authority**

Percentage of total employee involved in waste management authority is shown in Figure 1.





**Figure. 1** Distribution of Different Employee in Answered Kota/Kabupaten Waste Management Authority

Estimation of total employee involved in waste management authority is 73,462 persons.

**Table. 3** Estimation of Total Employee Involved in Waste Management Authority

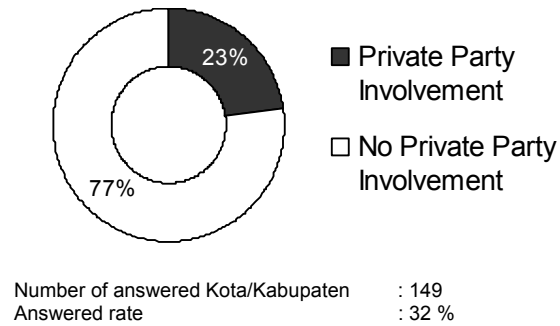
Group Area	Number of Employee (in thousand person)
Sumatera	20.5
Jawa	31.9
Balinusra	5.9
Kalimantan	4.3
Sumapapua	10.8
ALL	73.5

**Note for Estimation of total employee in kota/kabupaten:**

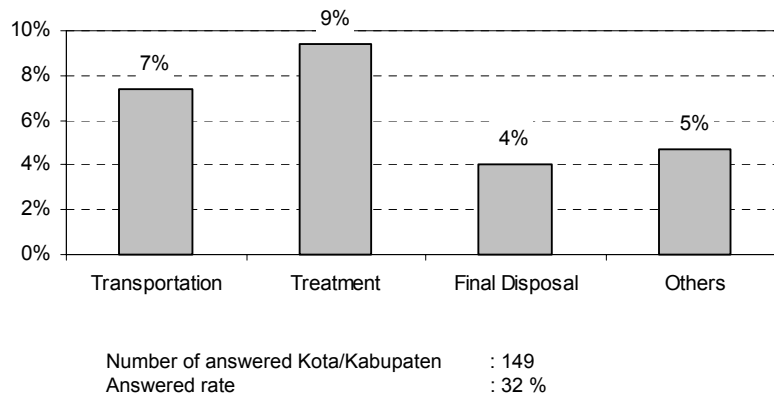
- 1) Calculating “Served population” by following formula per each answered questionnaire.  
= “Percentage Total population served” × “Total population” from answered questionnaire.
- 2) Totalizing “Total Employee” which is answered, and totalizing corresponded “Served population” per each group (group1-6)
- 3) Calculating average unit per each group (from group1–6) by following formula  
= total of “Total Employee” ÷ total of corresponded “served population”
- 4) Estimating “Total employee” of each non-answered kota/ kabupaten  
= “served population (the data is estimated also in this work)” × “the average unit”
- 5) Totalizing the every kota/ kabupaten data.

**B.2 Private Party Involvement**

Private party is involved in different stages of waste operational activity including transportation, treatment, final disposal and others.



**Figure. 2** Presence of Private Party Involvement in Waste Management



**Figure. 3** Private Party Involvement in Waste Management

### C. WASTE GENERATION

Waste generation data include waste generation at the sources both from household and non-household. The question asked fill out the data from last 5 years at least. Total of waste generation in Indonesia is shown in Table 4 and Table 5, and generation for each waste composition is shown in Table 6.

**Table. 4** Total Waste Generation of Answered Kota/Kabupaten

Group Area	Waste Generation (m <sup>3</sup> /year)	Answered Rate (%)
Sumatera	8,623,106	31%
Jawa	29,413,366	44%
Balinusra	1,027,149	26%
Kalimantan	916,163	18%
Sumapapua	3,233,774	11%
ALL	43,213,557	27%

Number of answered Kota/Kabupaten : 126  
Answered rate : 27 %  
Number of population from answered questionnaire : 82,870,801  
Answered rate (population base) : 36%

**Table. 5** Estimation of Total Waste Generation in Indonesia

Group Area	Waste Generation (million ton/year)
Sumatera	8.7
Jawa	21.2
Balinusra	1.3
Kalimantan	2.3
Sumapapua	5.0
<b>TOTAL</b>	<b>38.5</b>

**Note for Estimation of Total Waste Generation**

- 1) Converting each answered questionnaire to “Ton/year” for each data (Household Waste, Non-Household Waste, Total waste generation estimation). Average density for household waste is 0.34 ton/m<sup>3</sup> and average density for non-household waste is 0.33 ton/m<sup>3</sup>.
- 2) Totalizing “Household Waste”, “Non-Household Waste”, “Total waste generation estimation”.
- 3) Totalizing the above waste generation volume and totalizing corresponded “Total Population” per each group (group1-6)
- 4) Calculating average unit waste weight per each group by following formula.  
= total of “waste generation (by weight)”÷total of “corresponded population”
- 5) Calculating estimation waste generation (by weight) of each kota/ kabupaten by following formula.  
=”population of each kota/ kabupaten (from other data source (BPS statistics etc.))” × ”average unit waste weight”
- 6) Totalizing the every kota/ kabupaten data.

And then, Metropolitan/Big City (26 cities) generate 14.1 million ton (total population is 40.1 million) in the estimation.

**Table. 6** Estimation of Waste Generation by Composition

Type of Waste	Amount (million ton/year)	Percentage (%)
Garbage	22.4	58%
Plastics	5.4	14%
Papers	3.6	9%
Others	2.3	6%
Woods	1.4	4%
Glasses	0.7	2%
Rubbers / Leathers	0.7	2%
Fabrics	0.7	2%
Metals	0.7	2%
Sands / Inert Material	0.5	1%
<b>ALL</b>	<b>38.5</b>	<b>100%</b>

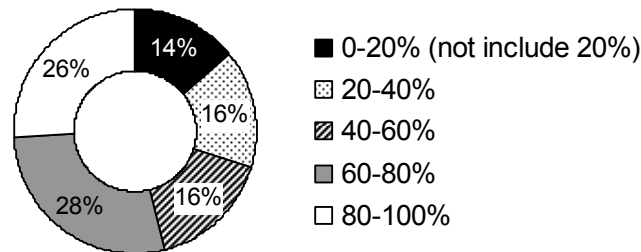
**Note for Estimation of Solid Waste Composition Generation**

- 1) Calculating “Garbage Generation (by Weight)” per each answered questionnaire  
=” Waste generation (by Weight (Ton/ year))” × ”Garbage waste composition(%)”
- 2) Totalizing “Garbage Generation (by Weight)” which is calculated
- 3) Calculating other kind of waste generation data by same method.
- 4) Calculating percentage of each kind waste composition.

**D. WASTE COLLECTION AND WASTE HANDLING SYSTEM**

**D.1 Total Population Served**

Percentage of population served from answered kota/kabupaten is different among the cities. Distribution of the percentage could be seen in Figure 4 below.



Number of answered Kota/Kabupaten : 128  
 Answered rate : 28 %

**Figure. 4** Percentage of Total Population Served from Answered Kota/Kabupaten

Estimation of total population served by waste management authority throughout Indonesia is about 130 million people (56% from total population of Indonesia).

**Table. 7** Estimation of Population Served

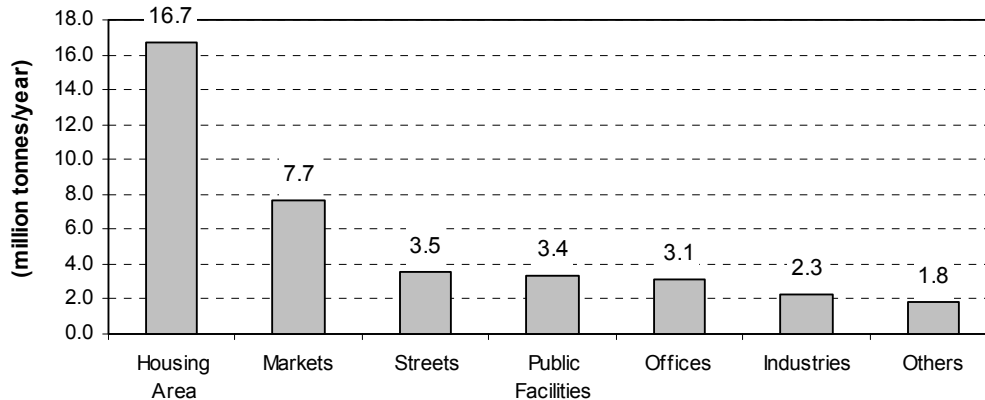
Group Area	Total Population (in million)	Served Population (in million)	% Population Served
Sumatera	49.3	23.5	48%
Jawa	137.2	80.8	59%
Balinsura	12.6	6.0	47%
Kalimantan	12.9	6.0	46%
Sumapapua	20.8	14.2	68%
All	232.7	130.3	56%

**Note for Estimation of total population served**

- 1) Calculate all the population served from answered city by following formula:  
 $A = (\% \text{ of total population served}) \times (\text{Total population})$
- 2) Find the average percentage of population served for each group by following formula:  
 $B = (A) : \text{Total population served from answered city} \div \text{Total population of answered city}$

## D.2 Waste Collection Services

Waste quantity collected from household is greater than other non-household sources. Waste quantity collected from each sources is estimated (Figure 5). The question asked to fill out the data from last 5 years at least.



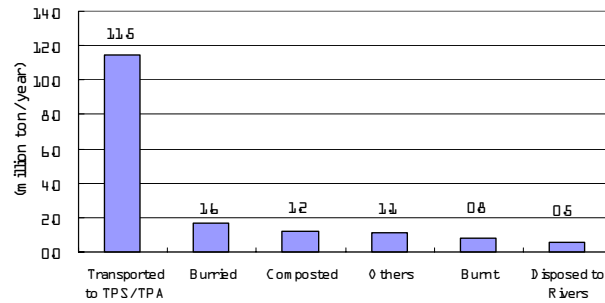
**Figure. 5** Estimation of Waste Quantity Collected by Local Government

### Note for Government Service Rate in Solid Waste Collection

- 1) Served total solid waste generation (ton/year) is calculated using following formula:  
= Service rate percentage (e.g. Housing Area) x total solid waste generation
- 2) Totalizing the generation volume
- 3) Calculating waste volume for other each kind of collection area by same method.
- 4) Calculating percentage of waste volume for each kind of collection area.
- 5) Estimating waste volume of each collection area in Indonesia by following formula.  
Waste generation in Indonesia x the percentage of waste volume for each kind of collection area

## D.3 Waste Handling System by Community (RT/RW)

Total waste generation could not be transported by local government to final disposal site and as a result several waste handling systems are done by community (Figure 6). The question asked to fill out the data from last 5 years at least.



**Figure. 6** Estimation of Waste Handling Systems After Waste Collected by Community from Housing Area

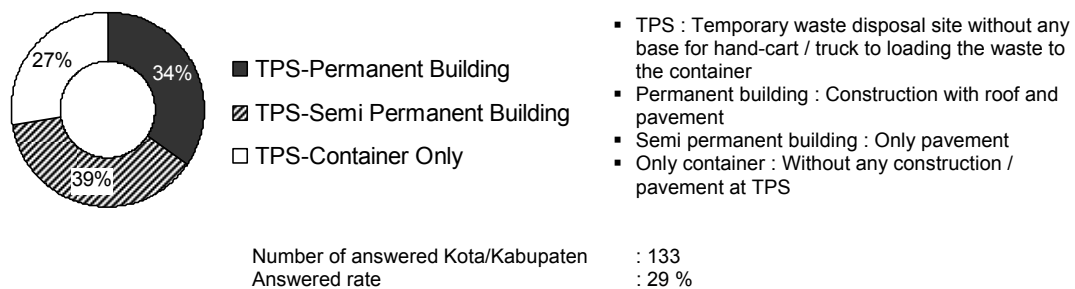
**Note for Waste Handling Systems after waste collected by community**

- 1) Total solid waste generation (ton/year) from Housing Area for each different handling system is calculated using following formula:  
= Waste handling percentage (e.g. Transported to TPS/TPA) x total solid waste generation from Housing Area
- 2) Totalizing the generation volume.
- 3) Calculating waste volume for other each kind of waste handling by same method.
- 4) Calculating percentage of waste volume for each kind of waste handling.
- 5) Estimating waste weight of each waste handling in Indonesia by following formula.  
= Percentage of waste generation for each different waste handling system x Waste density at household x Estimation of household waste generation in Indonesia

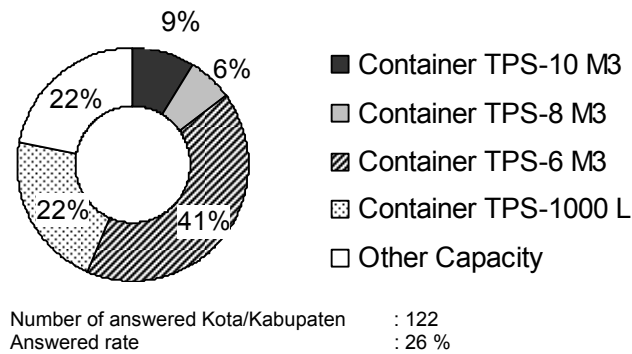
**E. TEMPORARY DISPOSAL SITE**

**E.1 Type and Amount of TPS**

TPS is temporary waste storage that based on its type, it can be divided into permanent building, semi permanent building and only container. From answered kota/kabupaten data, it is found that 39% of total TPS are in the form of semi permanent building (Figure 7). In other hand, 41% of total amount of containers available in TPS are having volume of 6 m<sup>3</sup> (Figure 8).



**Figure. 7** Type of TPS



**Figure. 8** Volume Size of Containers Available in TPS

From the estimation, there are 50.800 TPS distributed in Indonesia, 40% of TPS located in Sumatera (Table 8).

**Table. 8** Estimation of Total Amount of TPS

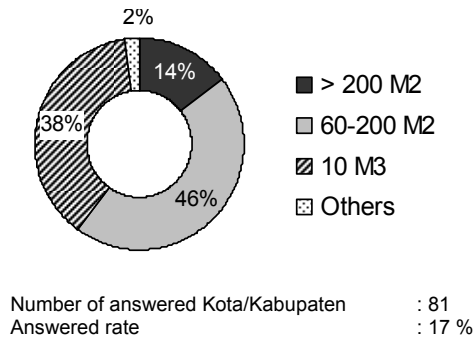
Group Area	Total TPS (in thousand units)
Sumatera	23.3
Jawa	11.8
Balinsura	1.8
Kalimantan	4.0
Sumapapua	18.0
TOTAL	59.0

**Note for Estimation of Total TPS Amount**

- 1) Calculate ton/year/TPS unit (A) from answered city per each group =  
(B): total solid waste generation transported to TPS/TPA (ton/year) (from result of previous estimation method) ÷ total of corresponded (TPS amount)
- 2) We could estimate amount of TPS by using following formula =  
(B): total solid waste generation transported to TPS/TPA (ton/year) ÷ (A): Ton/year/TPS unit

**E.2 Transfer Depo**

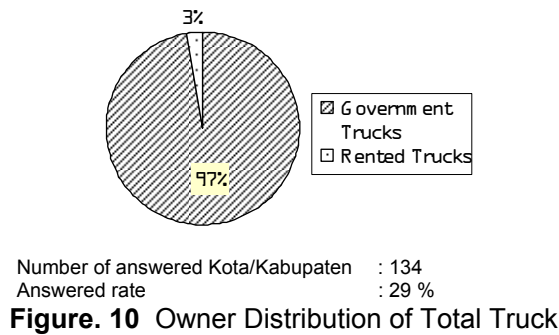
Transfer Depo is temporary waste storage site equipped by area for hand cart / truck to load the waste to the container. Distribution of total area for transfer depo is presented.



**Figure. 9** Distribution of Total Area for Transfer Depo

#### F. WASTE TRANSPORTATION VEHICLE

The vehicle is limited only for transferring waste from TPS and/or household (in some cases) to waste treatment facility and/or TPA. Almost available trucks are owned by local government (Figure 10). Type of most large number is the form of dump truck with volume size of 6 m<sup>3</sup> (Table 9). Estimation number of total truck available is 7,700 trucks (Table 10).



**Figure. 10** Owner Distribution of Total Truck





**Table. 9** Total Amount of Functioning Trucks

Type of Transportation	Number of Unit	Proportion (%)
Amroll Truck-6 M <sup>3</sup> Functioning	598	19%
Amroll Truck-8 M <sup>3</sup> Functioning	123	4%
Amroll Truck-10 M <sup>3</sup> Functioning	184	6%
Dump Truck-6 M <sup>3</sup> Functioning	969	31%
Dump Truck-8 M <sup>3</sup> Functioning	449	15%
Dump Truck-10 M <sup>3</sup> Functioning	156	5%
Compactor Truck-6 M <sup>3</sup> Functioning	40	1%
Compactor Truck- 8 M <sup>3</sup> Functioning	12	0.4%
Compactor Truck- 10 M <sup>3</sup> Functioning	23	1%
Truk Biasa- 2 M <sup>3</sup> Functioning	193	6%
Truk Biasa- 6 M <sup>3</sup> Functioning	47	2%
Truk Biasa- 8 M <sup>3</sup> Functioning	17	1%
Others	275	9%
<b>TOTAL</b>	<b>3,086</b>	<b>100%</b>

Number of answered Kota/Kabupaten : 142  
Answered rate : 31 %



**Additional Information :**

	<b>Armroll Truck :</b> Truck which is able to transport container directly
	<b>Dump Truck :</b> Truck which is provided hydraulic system
	<b>Truck Biasa / Pick Up :</b> Truck which is only provided a basin for waste without hydraulic system
	<b>Compactor Truck :</b> Truck which is provided with waste compaction system

**Table. 10** Estimation of Total Truck Amount

Group Area	Total Truck (in thousand units)
Sumatera	2.0
Jawa	3.6
Balinusra	0.2
Kalimantan	0.4
Sumapapua	1.4
All	7.7

**Note for Estimation of Total Truck Amount**

- 1) Totalize total waste transported to TPS/TPA per each group:  
(A) = (% Waste transported to TPS/TPA) x Total waste generation
- 2) Totalize truck per volume of waste transported to TPA :  
(B) = (Truck owned by government + Rental truck) ÷ (A)
- 3) We can estimate Kota/Kab using this following formula :  
(A) from each kota/kab x (B)

**G. FINAL DISPOSAL SITE (TPA)**

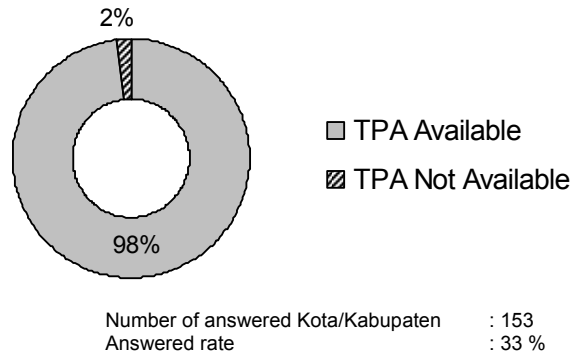
**G.1 Number and Location of TPA**

From answered questionnaire, almost Kota/Kabupaten have 1 (one) TPA (Table 11).

**Table. 11** Number of Still-Used TPA

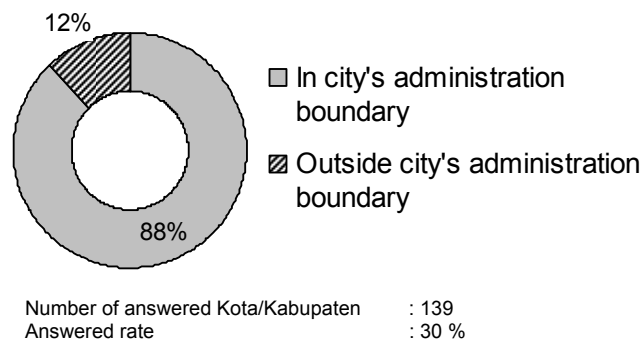
Group Area	Number of TPA	Number of answered kota/kab
Sumatera	57	50
Jawa	75	56
Balinusra	11	11
Kalimantan	19	16
Sumapapua	17	20
ALL	179	153

Number of answered Kota/Kabupaten : 153  
Answered rate : 33 %

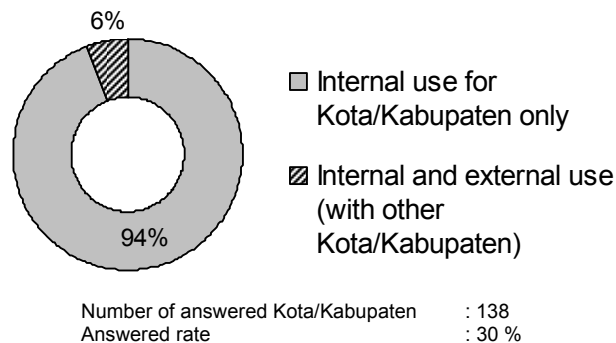


**Figure. 11** Presence of TPA

Most of TPA in kota/kabupaten is in the city's administration boundary (Figure 12). From the answered questionnaire, about 6% of TPA is used for internal and external (together with other kota/kabupaten) (Figure 13).



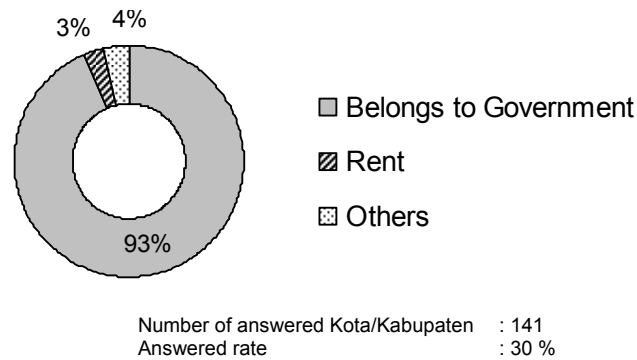
**Figure. 12** Location of TPA Based on Administration Boundary



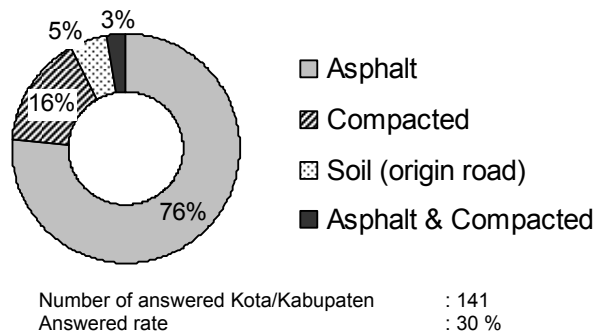
**Figure. 13** Usage of TPA

## G.2 Land Ownership and Access Road to TPA

Related information about land ownership and access road to TPA entry is shown in following figures.



**Figure. 14** Land Ownership of TPA



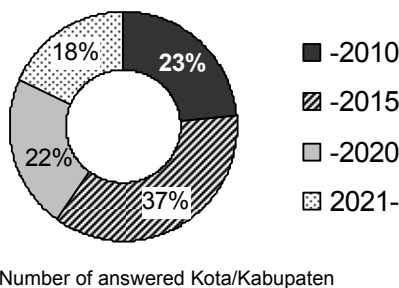
**Figure. 15** Types of Access Road to TPA

### G.3 Scavenger in TPA

Total number of scavengers at TPA in 116 answered kota/kabupaten (with number of population of answered kota/kabupaten is 85 million persons) is 14,538 persons.

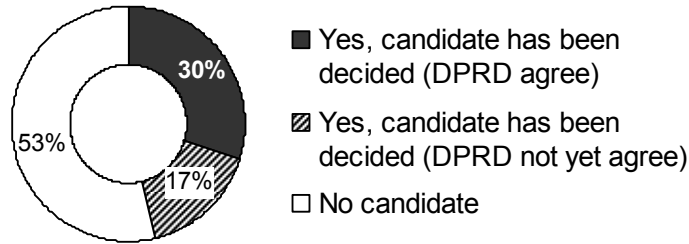
### G.4 Served Time of TPA and Candidate for New TPA

Kota/kabupaten are requested to estimate the usage period for still-used TPA. From answered kota/kabupaten, 21% of TPA will be closed in next 2 years (Figure 16). And 53% kota/kabupaten did not yet have candidate for new TPA (Figure 17).



Answered rate : 25 %

**Figure. 16** Estimation of TPA Usage



Number of answered Kota/Kabupaten : 129  
Answered rate : 28 %

**Figure. 17** Candidate for New TPA

**G.5 Data Compilation for Waste Entering TPA**

Not all TPA administrator recorded volume of waste entering TPA (Table 12). From the estimation, 13.6 million ton of waste has been disposed to all TPA in Indonesia (Table 13).

**Table. 12** Record of Waste Volume Entering TPA

Group Area	Waste volume (in million m <sup>3</sup> /year)	Answered Rate (%)
Sumatera	1.5	17%
Jawa	8.8	42%
Balinsura	0.5	11%
Kalimantan	1.4	13%
Sumapapua	1.6	9%
<b>TOTAL</b>	<b>13.8</b>	<b>20%</b>

Number of answered Kota/Kabupaten : 94  
Answered rate : 20 %  
Number of population from answered questionnaire : 73,314,214  
Answered rate (population base) : 32%

**Table. 13** Estimation of Waste Disposed into TPA

Group Area	Waste disposed into TPA (million ton/year)
Sumatera	2.5
Jawa	7.0
Balinsura	1.7
Kalimantan	0.7
Sumapapua	1.6
<b>TOTAL</b>	<b>13.6</b>

**Note for Estimation of Solid Waste Record Procedure**

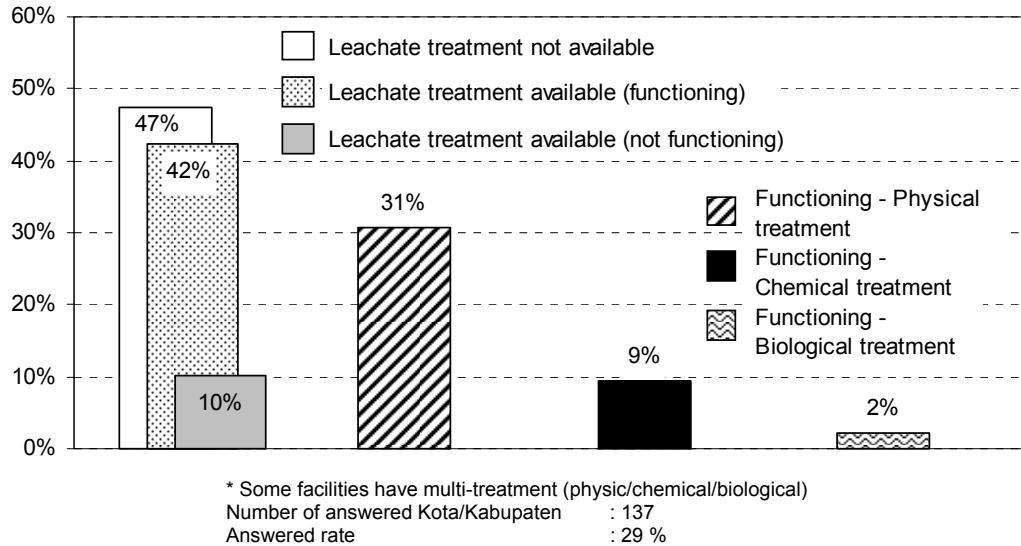
- 1) Use waste density average : 0.31 ton/m<sup>3</sup>
- 2) Convert total solid waste end up in TPA landfill (m<sup>3</sup>/year) to ton/year  
(A)= (Solid waste volume end up in TPA landfill) x (Solid waste density)
- 3) Compare total solid waste end up in TPA landfill to served population per each group

$(B) = (A) \div \text{served population}$

- 4) Estimate the total solid waste end up in TPA for non-answered Kota/Kab  
=  $(B) \times \text{served population}$

**G.6 Facilities and Monitoring in TPA**

Table and Figure below show availability of functioning facility such as leachate and gas treatment. Other facilities like drainage system, liner and heavy equipment as well as monitoring activities are also identified from kota/kabupaten.



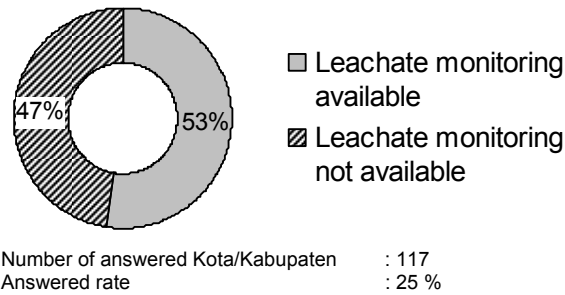
**Additional Information :**

Physical treatment : Filtration, Sedimentation, Reverse Osmosis (membrane), etc.

Chemical treatment : Chemical precipitation, etc.

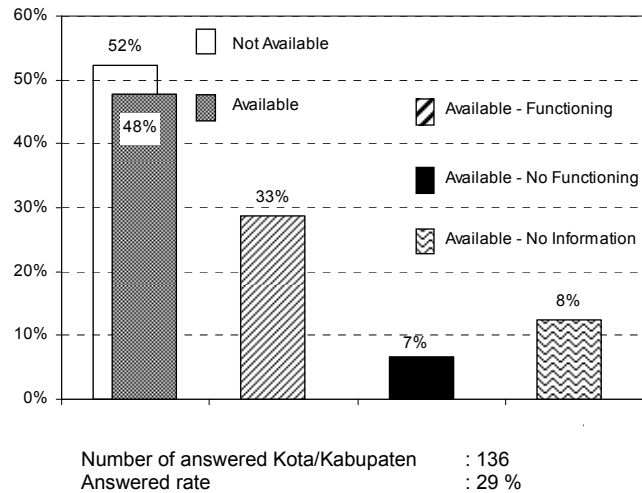
Biological treatment : Facultative pond, Aerated pond, Activated sludge, Rotating Biological Contactor, Packaged Filter Bed, Trickleing Filter Bed, etc.

**Figure. 18** Leachate Treatment in TPA

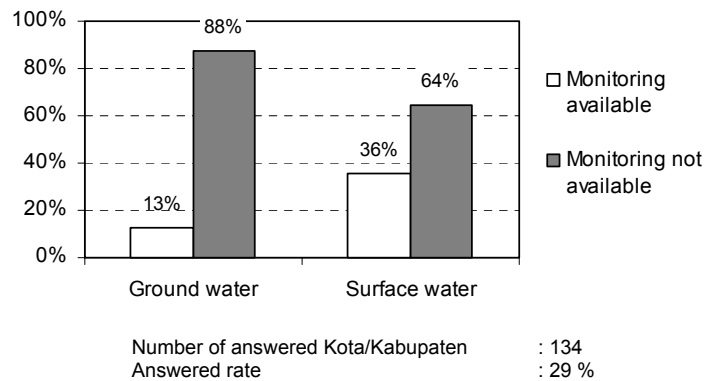


**Figure. 19** Leachate Monitoring in TPA

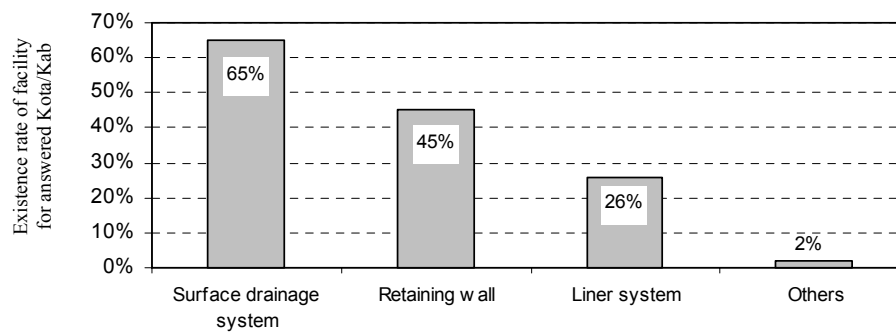
**INDONESIAN DOMESTIC SOLID WASTE STATISTICS  
IN YEAR OF 2008**



**Figure. 20** Gas Control System at TPA



**Figure. 21** Water Quality Monitoring



Number of answered Kota/Kabupaten : 137 (Supposition on the same number with the question of Figure 18)  
Answered rate : 29 %

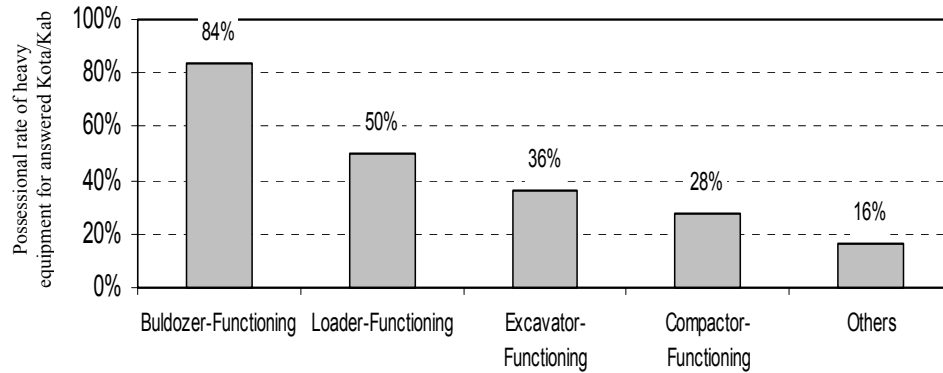
**Additional information :**

Surface drainage system : Designed for collecting precipitation and run off (include gutter, waste slope, etc).

Liner system : A barrier layer to intercept leachate and to direct it to leachate collection system and also as part of gas control system





**Figure. 22** Other Facilities at TPA

**INDONESIAN DOMESTIC SOLID WASTE STATISTICS  
IN YEAR OF 2008**



Number of answered Kota/Kabupaten : 137 (Supposition on the same number with the question of Figure 18)  
 Answered rate : 29 %

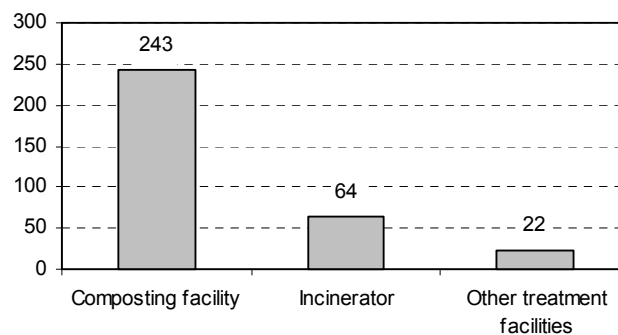
**Additional information :**

	<b>Buldozer :</b> For flatter and compacting waste or soil		<b>Excavator :</b> For digging, flatter and filling waste or soil
	<b>Wheel Loader :</b> For digging and filling waste or soil		<b>Landfill Compactor :</b> For compacting waste or soil

**Figure. 23** Heavy Equipments at TPA

**H. WASTE TREATMENT FACILITY**

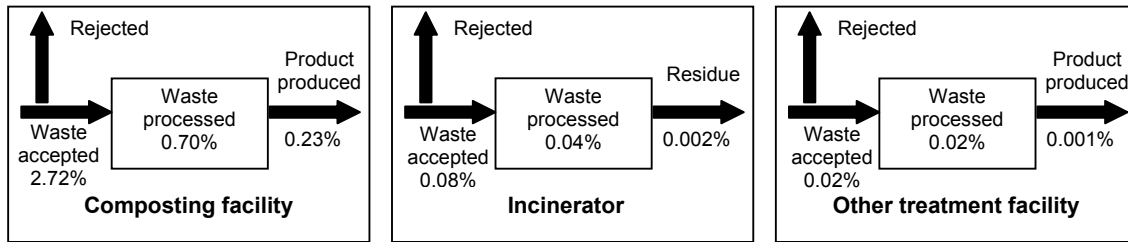
Waste treatment facility is limited for municipality facility, including cooperated and permitted private parties. Waste treatment facility including composting facility, incinerator and others waste treatment facility.



Number of answered Kota/Kabupaten : 154  
 Answered rate : 33 %

**Figure. 24** Number of Treatment Facilities

**INDONESIAN DOMESTIC SOLID WASTE STATISTICS  
IN YEAR OF 2008**



**Figure. 25** Proportion of Waste Treatment at Facility

**Note for Calculation of Solid Waste Treatment :**

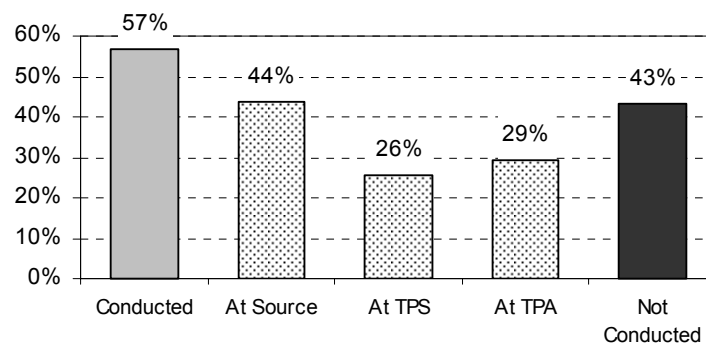
For Waste Accepted :

- 1) Totalizing Total of (Estimated) ‘Waste Generation’ (ton/year).
- 2) Convert Total of ‘Waste Generation’ into m<sup>3</sup>/year (using waste density : 0.35 ton/year).
- 3) Totalizing ‘Waste accepted’ from answered kota/kabupaten (m<sup>3</sup>/year).
- 4) Calculating percentage of ‘Waste accepted’ using this following formula  

$$= \text{Total of ‘Waste accepted’ (m}^3\text{/year)} \div \text{Total of ‘Waste Generation’ (m}^3\text{/year)} \text{ from answered 154 kota/kabupaten.}$$
- 5) We can find the percentage of ‘Waste processed’ and ‘Product produced’ using the same method.

**I. RECYCLE ACTIVITY**

Recycle activities are conducted at source, TPS and TPA. Reduce, Reuse and Recycle activities in these questions are limited for Municipalities 3R program (including cooperated and permitted private parties). The statistics asked the respondent to not include scavengers / waste pickers activity, except if the activity is part of government program).

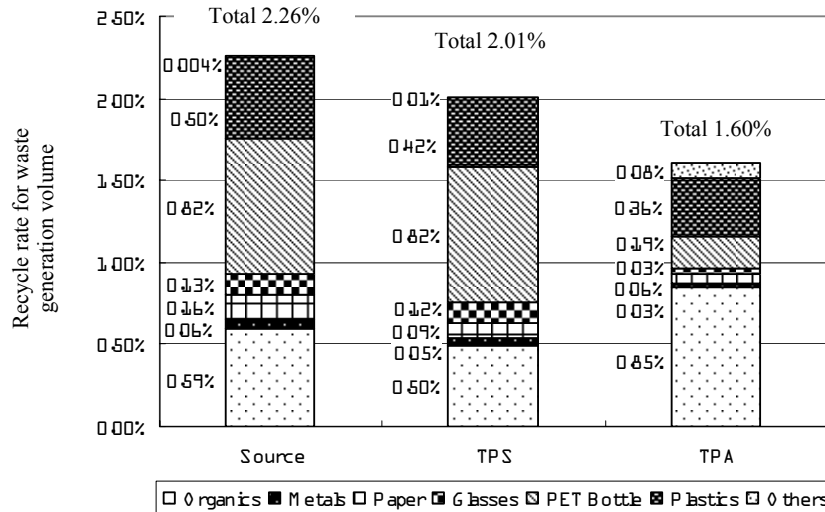


Some city select multi answers  
 Number of answered Kota/Kabupaten : 137  
 Answered rate : 29 %

**Figure. 26** 3R activities at Source, TPS and TPA



**INDONESIAN DOMESTIC SOLID WASTE STATISTICS  
IN YEAR OF 2008**



**Figure. 27** Proportion of Total Recycled Waste at Source, TPS and TPA

**Note for Calculation of Recycling waste generated from Source**

Ex. For (Organic)

- 1) Summarize (Organic)

Totalizing waste generation estimation from answered (154) kota/ kabupaten

- 2) Calculate the percentage of garbage that recycled (B)

$$= (\text{Organic}) \div (\text{A})$$

- 3) This calculation can be applied to estimate other type of waste

**J. REGULATION**

**K. FINANCIAL ASPECT**

**K.1 Source of Financial and Expenditures**

Source of expenditures from answered kota/kabupaten is shown in Table 14.

**Table. 14** Total of Expenditures

Group Area	Rp/year (in billion)	Answered Rate (%)
Sumatera	152.8	22%
Jawa	370.1	35%
Balinsura	50.2	13%
Kalimantan	16.1	16%
Sumapapua	41.1	8%
<b>TOTAL</b>	<b>630.3</b>	<b>20%</b>

Number of answered Kota/Kabupaten : 95  
Answered rate : 20 %

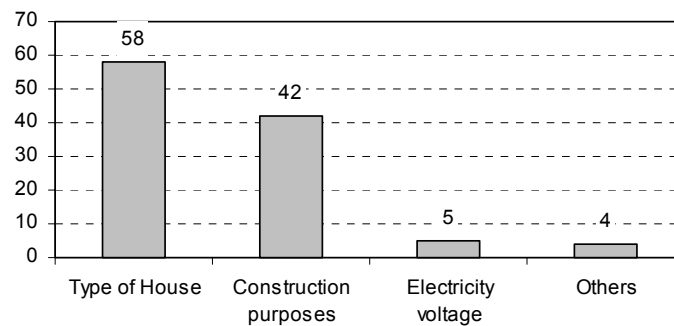
Estimation of total expenditure of waste management in Indonesia is 2,342 billion IDR per the year and the unit cost is 10,070 IDR per capita per the year.

**Note for Estimation of Total Expenditures :**

- 1) Summarize all the total cost (Total) and totalizing corresponded "served population" per each group (group 1-6)
- 2) Calculating average unit cost per each group by following formula.  
= total of "cost" ÷ total of "corresponded served population"
- 3) Calculating estimation total of each non-answered kota/ kabupaten by following formula.  
= "served population of each kota/ kabupaten" × "average unit cost"
- 4) Totalizing the every kota/ kabupaten cost data.

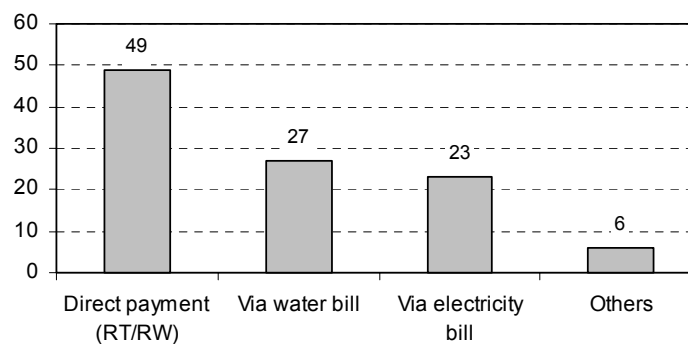
**K.2 Retribution**

Unit for waste retribution charged to community mainly determined by type of house or construction purposes and half of the retribution conducted directly by RT/RW.



Some city select multi answers  
Number of answered Kota/Kabupaten : 108  
Answered rate : 23 %

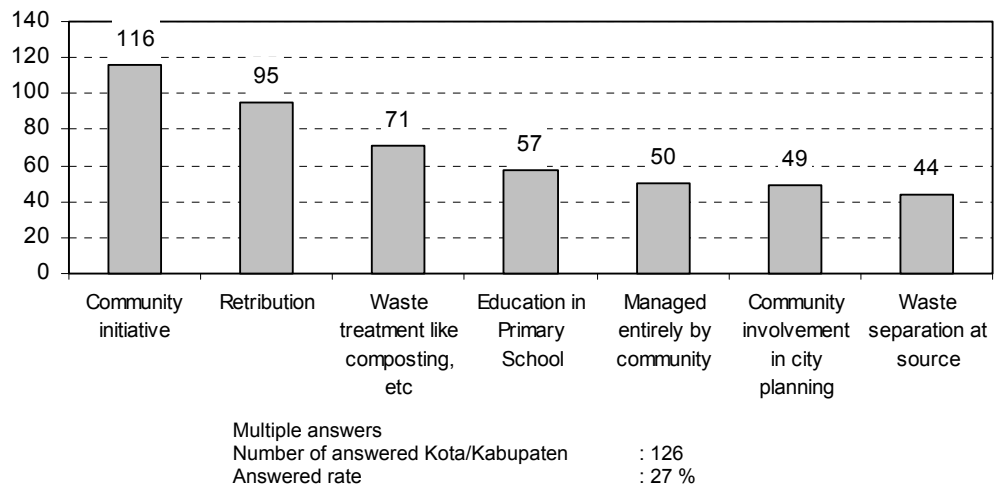
**Figure. 28** Base of Retribution Rate



Multiple answers  
Number of answered Kota/Kabupaten : 104  
Answered rate : 22 %

**Figure. 29** Retribution Billing System

L. PUBLIC PARTICIPATION



**Figure. 30** The Way of Public Participation

*This book is prepared and printed out in cooperation with  
Japan International Cooperation Agency (JICA)*

