:: IJEBD ::
(International Journal of Entrepreneurship and Business Development)
Volume 4 Number 5 September 2021

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

Study of The Economic Value of Waste Recycling Concept in Supporting Sustainable Development Goals (SDGs) Program in TPA Kabinuang, Tolitoli Regency

Edi Yanto, Bustam, Aqfir
Management Studies Program, Mujahidin College of Economics
edi.yanto@stiemujahidin.ac.id

ABSTRACT

Purpose: This type of research is a descriptive study with a quantitative approach that aims to determine the economic value of waste through the concept of recycling to support the SDGs program for sustainable economic improvement.

Design/methodology/approach: The results showed that the total composition of waste in TPA Kabinuang Tolitoli consisted of 35% inorganic waste and 65% organic waste

Findings: The types of waste that can be recycled include kitchen waste, leaves and plants, plastic, paper, cloth, rubber, glass, wood, and iron. If accumulated, as much as 100 kg of solid waste based on its type generates an economic value of IDR 270,400. This economic value becomes the basis, reference and encouragement for the community to be able to sort waste in order to improve the community's economy in a sustainable manner.

Paper type: Research paper

Keyword: *Economic value, Recycle*
Received : September 2th 2021
Revised : September 22th 2021
Published : September 30th 2021

I. INTRODUCTION

Sustainable Development Goals (SDGs) is a global concept introduced in order to replace the previous concept of the Millennium Development Goals (MDGs). The SDGs concept was ratified by 193 Heads of State on September 25, 2015 at the United Nations (UN) Headquarters. Starting from 2016 – 2030 SDGs become a moral responsibility for all countries, both developed countries and developing countries. The theme of the SDGs concept is "Changing our world: the 2030 Agenda for Sustainable Development". The goals of the SDGs are ending poverty, reducing inequality and protecting the environment.

Based on the 2018 Environmental Quality Index (IKLH) Report, nationally Indonesia is in the Good category with a national IKLH score of 71.67. There are 9 provinces with IKLH scores with the predicate of Very Good, 10 provinces with the predicate of Good and 11 provinces with the predicate of Fairly Good. Only one province with the title Very Poor is DKI Jakarta (*Statisik KLHK 2017 – Indonesian Biodiversity Clearing Hall | CHM* |, n.d.).

The problem of waste management is mainly because the waste that is stored in the TPA does not undergo a processing process or is processed with an inappropriate system and is still focused on landfill (Mahyudin, 2014). There needs to be a real effort in waste management through the 3R concept (*Reuse, Reduce,* and Recycle). the implementation and effectiveness of the implementation of waste reduction through 3R reflects sustainability in waste/garbage management (LS Ng et al, 2017).

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

The importance of good waste management needs to be supported by government policies. Solid waste management policies through 3R represent concepts in the categories of reducing, reusing and recycling waste. The 3R concept is needed in handling waste from industry, households, and offices (LS Ng et al, 2017).

Tolitoli Regency has an area of 4,079.77 km² with a population of around 233,409 people (Tolitoli Environment Agency, 2019). Population density can cause environmental problems if there are no real efforts and programs from various parties, especially the government as the driving force. Data from the Tolitoli Environment Agency, (2019). The method of handling waste generation at the TPA uses a landfill work system. every day about 1,789.17 m3 of waste generated from various groups and community activities. The amount of waste generated is 79,005.6 M3/year. With the amount and volume of waste generated, it is appropriate to handle it, which was developed using the concept of recycling waste through 3R.

Starting from this description, the author wants to conduct a comprehensive scientific and applicable study to solve and answer problems related to the economic value of the concept of recycling waste at the Cabinuang TPA in supporting the SDGs program in Tolitoli Regency. Thus, this study is an initial study to determine the economic value of the concept of recycling waste at the Kabinuang TPA in supporting the concept of SDGs.

II. METHODOLOGY

The type of research in this research is descriptive research with quantitative data analysis. This research is expected to provide a specific description and explanation of the economic value through the concept of recycling 3R waste at the Kabinuang Tolitoli TPA in supporting the Sustainable Development Program (SDGs). The generalization area that is the object of this research is the type and composition of waste, waste generation and volume of waste generated at the TPA Kabinuang, Tolitoli Regency. Through the sampling method of SNI 19-3964-1994 concerning Methods of Collection and Measurement of Waste Generation and Composition, it is determined that the sample to be studied is the composition of the type of waste that can be recycled. The sample will then be processed, analyzed and studied to further determine the prospect of its economic value.

The unit of measurement of waste used is the unit of weight, namely kilograms (kg). then the results of data collection in the form of sampling of waste generation and composition will be measured through data processing with the help of a Microsoft excel computer program. The stages of data processing carried out are first calculating the generation and composition of waste through sampling SNI 19-3964-1994, then calculating the projected economic value of waste in the 3R recycling concept. The economic value of waste is obtained from the total waste generation that sells / has economic value (kg/day) multiplied by the price of the type of waste (Rp/kg) for each waste recycling business actor such as community, scavengers, small stalls, large stalls, waste banks or paper recycling industry.

The research instrument used is the management system and the concept of recycling waste through 3R (Reuse, Reduce, and Recycle) in order to obtain the type and composition of waste that has economic value and then is used to measure the economic value of the waste generated at the Kabinuang Tolitoli TPA. The data analysis technique used is quantitative data analysis with a descriptive approach, namely determining alternative waste management at the Kabinuang TPA from the existing conditions, then taking samples of waste generation and composition based on the SNI 19-3964-1994 sampling method. Next is the determination of the economic value of waste through the 3R waste recycling concept at the Kabinuang Tolitoli TPA.

III. RESEARCH AND DISCUSSION

The implementation of research to determine the economic value of waste through recycling is carried out by recording the number of people served in handling waste, both households, shops, offices/companies and so on. The number of people served is 73,893 people, the production of waste per person and per day is 0.00297 Lt/person/Hr, the total waste collected based on the number of people served is 145,350 Kg/Hr, the average solid waste density at TPA Kabinuang is as much as 25,000 people. 0.2 Kg/m3, the volume of waste in the served areas (number of souls x product of waste/day) is 219.46 m3/Hr. The composition of the waste is divided into 101,745 Kg/Hr organic waste and 43,605 Kg/Hr inorganic waste (BSTM, 2021). The following is a table of research data collection results (Aji Damanuri, 2010).

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

Table 1. Production and Composition of Waste at Kabinuang Tolitoli TPA

No.	Data Type	Unit	Stuffing	Source
(1)	(2)	(3)	(4)	(5)
1	Number of people/family served	Soul/KK	73,893 Souls	SIPSN - Department of Environment (DLH) Kab. Tolitoli.
2	Waste production per person per day	Kg/Hr or Lt/Hr	0.00297 Lt/Soul/Hr	Known when sampling waste during survey

Continuation of Table 1.

(1)	(2)	(3)	(4)	(5)
3	Total waste from the area served	Kg/Hr	145.350 Kg/Hr	Calculation Results (analysis)
4	Average waste density	Kg/m3	0.2 Kg/m3	Known at the time of the survey
5	The volume of waste in the served areas (number of souls x product of waste/day)	Lt/Hr	219.46 m3/Hr	Calculation Results (analysis)
6	Garbage composition			
	- organic trash (%)	Kg	65% = 101,745 Kg/day	Calculation Results (analysis)
	- inorganic waste (%)	Kg	35% = 43,605 Kg/day	

Source: DLH and BSTM data processed in excel in 2021

Based on the table, it is known that the number of people who are served in waste management in Tolitoli Regency is 73,893 people with the composition of organic waste at 65% (101,745 Kg/Day) and 35% inorganic (43,605 Kg/Day). This proves that the amount of organic waste dominates the composition of the waste in TPA Kabinuang, Tolitoli Regency.

In connection with data collection based on SNI 19-3964-1994 for sample measurement and analysis, several indicators or instruments were calculated including the number of people and households, residential buildings, shops, volume of waste, weight of waste, and waste generation (SNI) 19-3964-1994). The following are the results of determining the sample based on this method.

Table 2. Research Supporting Data (SNI 19-3964-1994)

No.	Data type	Unit	Stuffing

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

(1)	(2)	(3)	(4)
1	Number of Individuals	Soul	241 souls
2	Number of Family Heads	KK	48 KK
3	Building		
	- Permanent House	Unit	12 Units
	- Semi Permanent House		14 Units
	- Non-Permanent House		22 Units
4	shops	Unit	3 Units
5	Volume of trash per soul	ltr/soul	2 liters/person
6	The weight of trash per soul	kg/person	0.5 kg/person
7	Average Waste Volume		
	- Permanent House	ltr/org/hr	2.50 ltr/or/hr
	- Semi Permanent House		2.30 ltr/person/hr
	- Non-Permanent House		2.10 liters/person/hr
8	City waste generation	ltr/org/hr	3,539 ltrorg/hr

Source: Excel processed data in 2021

The data describes a sample of research data to determine the economic value of waste based on the SNI 19-3964-1994 sample determination method. The number of individuals who can be sampled is 241 people with the number of heads of families (KK) as many as 48 families.

Based on the characteristics of the building, it is divided into several specifications, namely permanent houses with high income categories, semi-permanent houses with medium income categories and non-permanent houses with low income. Here is the division.

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

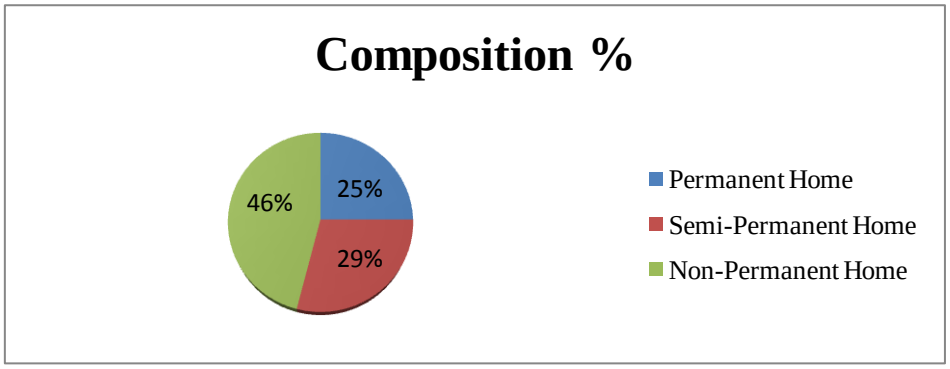

Figure 1. Composition of Residential Buildings

The graph illustrates the data on the composition of residential buildings that will be sampled in this study. It can be seen that 46% (22 units) of the sample data were taken from non-permanent houses with low income categories, while the lowest was 25% (12 units) from high-income permanent houses, and the last 29% (14 units) from semi-permanent houses. permanent medium income.

The average volume of waste also provides a different picture based on housing specifications. The following is an illustration of the composition based on Figure 2:

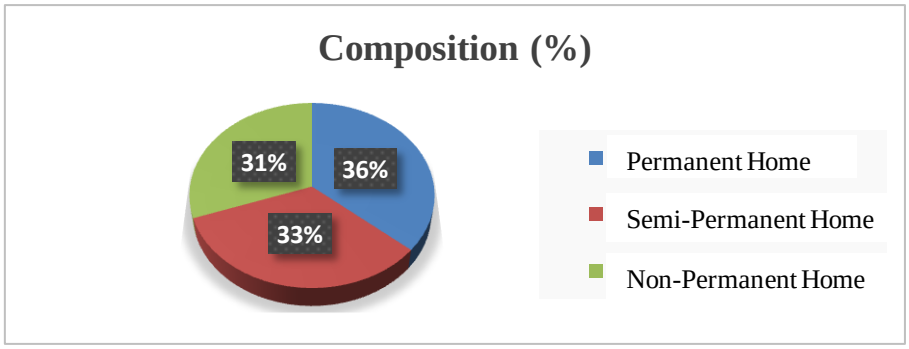

Figure 2. Composition of Average Waste Volume

According to the data shown on the graph, 36% (2.50 ltr/person/day) the average volume of waste for high-income permanent houses, 33% (2.30 ltr/person/day) for medium-income semi-permanent houses and 31% (2.10 ltr/person/day) houses non permanent low income.

Next is to determine the research sample data based on the type and composition of the waste. The data can be seen in the following table:

Table 3. Types and Composition of Waste at Kabinuang Tolitoli TPA (Sample 100 kg)

Component	*Type*	*Weight (kg)*	*Composition*	
			Per Type	*Per Component*
1	*2*	*3*	*4*	*5*
Inorganic Garbage	*Plastic*	*3.6 kg*	*3.6%*	*35%*
	Paper	*2 kg*	*2%*	

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

	Fabric/Textile	*6.5 kg*	*6.5%*	
	Rubber/Leather	*4.0 kg*	*4.0%*	
	Glass	*4.4 kg*	*4.4%*	
	Metal	*6.5 kg*	*6.5%*	
	Others (Iron)	*5.5 kg*	*5.5%*	
	Wood	*2.5 kg*	*2.5%*	
Organic trash	*Kitchen trash*	*60 kg*	*60.0%*	
				65%
	Leaf and Plant Garbage	*5 kg*	*5%*	

Source: Data processed in 2021

Based on Table 5, several types of waste were determined to be the research sample with a weight determined by this method of 100 kg. Organic waste consists of kitchen waste, leaves and plants, while inorganic waste consists of plastic, paper, cloth/textile, rubber/leather, glass, metal, others (iron) and wood. The following is a graph of the distribution by type and weight of waste:

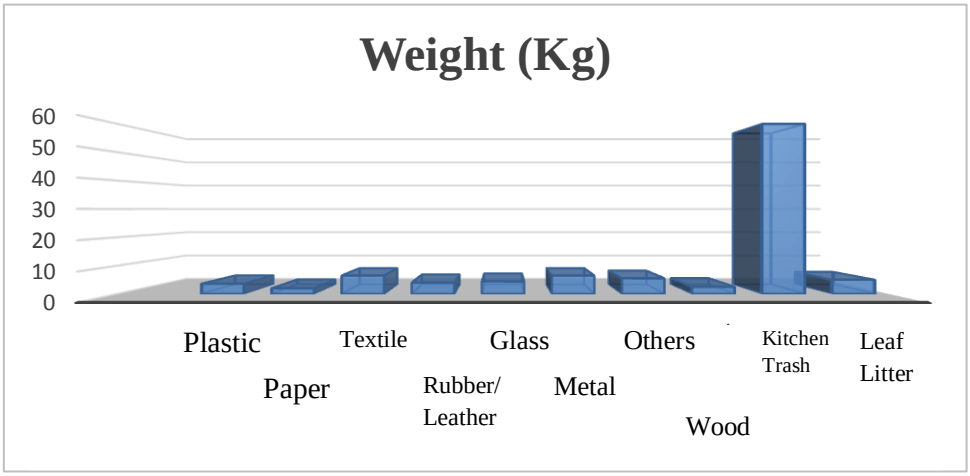

Figure 3. Garbage Weight

It can be observed based on the graph, that kitchen waste weighs higher than the others, which is 60 kg, and the lowest is paper with a weight of 2 kg. The composition can be seen in the following image :

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

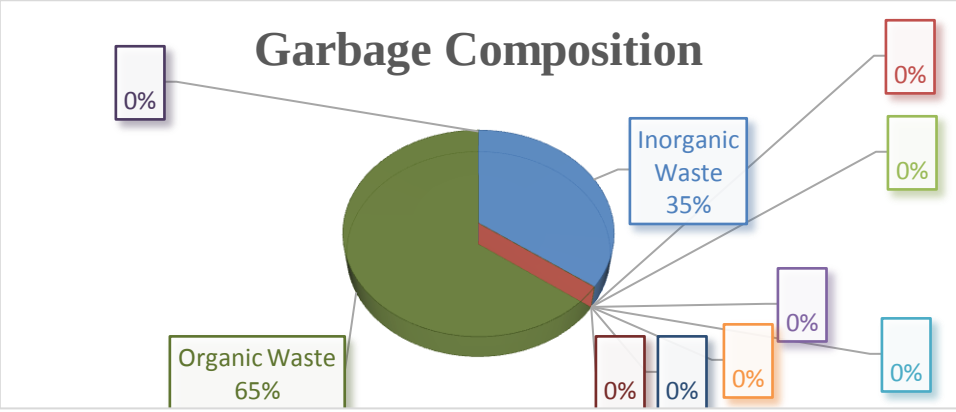

Figure 4. Garbage Composition

It is known that the composition of the components of organic waste is greater than that of inorganic waste, which is 65%. This proves that the potential added value or economic value of recycling organic waste is greater than that of inorganic waste. For organic waste, it is usually made into compost which of course becomes plant fertilizer.

Table 4. Economic Value by Type and Composition of Waste

Component	*Type*	*Weight (Kg)*	*Price (Rp)*	*Potential economic value (Rp)*
(1)	*(2)*	*(3)*	*(4)*	*(5)*
Inorganic Garbage	*Plastic*	*3.6*	*1,100*	*3,960*
	Paper	*2*	*1,300*	*2,600*
	Textile	*6.5*	*0*	*0*

Continued Table 4

(1)	*(2)*	*(3)*	*(4)*	*(5)*
	Rubber/Leather	*4*	*0*	*0*
	Glass	*4.4*	*100*	*440*
	Metal	*6.5*	*9,000*	*58,500*
	etc	*5.5*	*1,800*	*9,900*
	Wood	*2.5*	*0*	*0*
Organic trash	*Kitchen trash*	*60*	*3,000*	*180,000*

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

Leaf and Plant Garbage	*5*	*3,000*	*15,000*
Total	*100*		*270,400*

Source: Data processed in excel in 2021

Table 4 shows that there are several types of waste based on their components whose fixed prices are not known so that their potential value cannot be known. This table also shows that the composition of waste that has the highest price is inorganic waste with a metal type costing Rp. 9,000,- which if totaled according to its weight is Rp. 58.500,-. The highest potential economic value is in the type of organic kitchen waste, with a total of IDR 180,000 for 60 kg and priced at 3,000/kg. The total potential economic value obtained is IDR 270,400,-. The economic value generated from several types of recycled waste can be seen in the graph below:

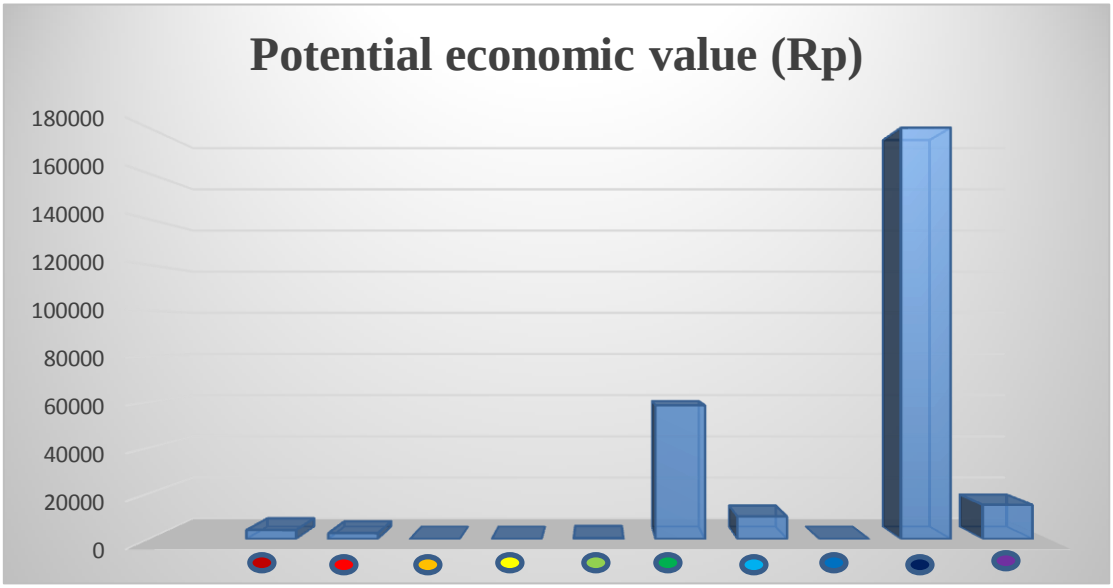

Figure 5. Economic Value of Recycled Waste

Figure 5 shows the level of potential economic value of recycled waste. The highest value is in the type of kitchen waste (organic waste) with a value of Rp. 180,000, -. Then the second is the type of metal waste with a potential value of IDR 58,500 (< IDR 60,000). this can of course be maximized through the concept of recycling waste through the 3R, especially the type of kitchen waste that provides a higher potential value.

This is in accordance with the results of previous studies that waste in TPA Cipayung is dominated by organic waste by 63.59% and the rest is inorganic waste by 36.41% Zahra, Fatima. Damanhuri, (2011). Then the results of other studies that the composition of the most waste is food waste (organic) by 26.43% so that it has the potential to improve the community's economy through waste recycling treatment Wardiha, Made W., Pradwi SA Putri, Lya M. Setyawati, (2013)

The economic value obtained is the main attraction for some people, especially for the recycling waste collectors at the Kabinuang Tolitoli TPA. if the public in general realizes the potential that will be obtained from waste recycling (3R), of course it can be an impetus for sorting and collecting waste. Thus, it can be one of the bases for improving the community's economy in a sustainable manner in accordance with one of the objectives of the Sustainable Development Goals (SDGs) program.

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

IV. CONCLUSIONS AND SUGGESTIONS

The results of the economic value obtained from the calculation of the type and composition of organic and inorganic waste is 100 kg of recycled waste generating Rp 270,400,-. The economic value is the potential for sustainable community economic improvement which is the embodiment of the objectives of the global Sustainable Development Goals (SDGs) concept.

The Environmental Service and BSTM as an extension of the local government can be a driving force for the community to be able to play an active role in waste processing through waste sorting based on its composition and use so that it is expected to provide added value or sustainable economic value for the community

THANK-YOU NOTE

WL, praise and thanks be to Allah subhanahu wata 'ala. Thanks to him, the writer was able to complete this research article. We thank the Ministry of Education and Culture, Research and Technology of Higher Education, for the research funding assistance. Likewise, the Mujahideen College of Economics for its support and trust in us as researchers. All research partners, including the Environment Agency, the Tolitoli Regency Research and Development Agency, the Tolitoli Mandiri Waste Bank (BSTM) and the community

REFERENCESS

Aji Damanuri. (2010). *Metodologi Penelitian Mu'amalah*. STAIN Po PRESS,.

LS Ng et al. (2017). Current practices of construction waste reduction through 3R practice among contractors in malaysia: Case study in penang. IOP Conf. Series: Materials Science and Engineering 271 (2017). *Papper Open Acces.*

Mahyudin. (2014). Strategi Pengelolaan Sampah Berkelanjuta. *EnviroScienteae*, *10*, 33–40.

Statisik KLHK 2017 – Indonesian Biodiversity Clearing Hall | CHM |. (n.d.).

Tolitoli Environment Agency. (2019). *Strategic Plan for 2016-2021*.

Wardiha, Made W., Pradwi SA Putri, Lya M. Setyawati, and M. (2013). Generation and composition of waste in office and homestead areas (case study: Werdhapura Village Centre, Denpasar City, Bali Province). *Precipitation Journal*.

Zahra, Fatima. Damanhuri, P. (2011). Study of Composition, Characteristics, and Potential of Waste Recycling at TPA Cipayung, Depok. Study Of Composition, Characteristic, And Recycling Potential Of Waste At Cipayung Final Disposal Site, Depok. *Journal of Environmental Engineering*, *17*(1), 59–69.