



## Compost Production Potential in Ecotourism Bukit Cemeng, Bangli



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### Keywords

compost;  
ecotourism;  
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pollute the environment;  
waste characteristics;

### Abstract

Bukit Cemeng is one of the newly opened tourist attractions in Bangli Regency. Waste management is one of the concerns of Bukit Cemeng management. So far, the waste generated is only done by landfilling and burning so as not to pollute the environment. This type of research is study applied with design random group. Sampling units are waste generated in Bukit Cemeng Ecotourism. Research carried out replication as much 3 times for see stability of the manufacturing process compost from organic waste generated in Ecotourism Hill whiny. Based on results study obtained that average heavy waste generated in Bukit Cemeng ecotourism is 7.175 kg, average waste volume is 0.23 m<sup>3</sup> and density waste 33.27 kg/m<sup>3</sup>. There is no difference in the quality of Carbon, Nitrogen and Potassium in the three replications of processing waste into compost, meaning that the resulting Carbon Nitrogen, and Potassium values are stable. There is difference nitrogen quality in three replications processing rubbish it means the Nitrogen value produced no stable. Compost produced at Bukit Cemeng Ecotourism Fulfill requirements quality compost based on SNI 19-7030-2004.

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## 1 Introduction

Indonesia is a tropical country that has potency diversity diverse life \_ both flora and fauna this give many benefits and results for the State as well Public local surrounding. Lifestyle for return to nature (*back to nature*) and saturation in doing routine profession has push Public for To do journey to still areas natural, as well have a number big potency valuable resource (Hermita, 2015).

Travel pattern this push changes in the tourism sector based tourism \_ natural usually known with ecotourism or agrotourism start many developed. Package tour this is form managed tourism \_ with approach conservation with expect benefit double that is ensure sustainability nature and well- being population local. Development tourist this called as form movement conservation (Hermita, 2010).

Bali is destination tours that have variety beauty nature, marine life and life as well as uniqueness culture. Predicate as destination tour world's best given to Bali. Traveller from various the corners of the world are coming for enjoy beauty nature and culture. Bali often called as *the last paradise on earth* (Sutrisnawati & Purwahita, 2018).

Development Bali tourism that tends to bulk caused to degradation environment, such as decrease room public beach, vandalism border rivers by the construction of hotels or villas, ground water erosion in a manner excessive for golf course, and so on. Sector tourist donate enough big to degradation environment Balinese nature, from upstream until to downstream Bali 's ecosystem (Arida, 2005)

One of them is beauty the island of Bali is desecrated with existence trash. Problem rubbish no phenomenon what happened on the island of Bali. Various foreign media has highlight conditions that occur related with trash in Bali is one of them is an article written by Andrew Marshall in the April 1, 2011 issue of Time magazine mentions that Bali is the place holiday like hell (Dre@ming, 2011).

One \_ form rescue environment in the sector tourist is started with understand behavior man to environment. Behavior traveler in effort guard cleanliness environment need conducted study in a manner academic. this \_ will could reduce negative impact of tourism to environment (Darmawan & Fadjarajani, 2016)

Rina Astini 's research results at Carita Beach Pandeglang Banten about satisfaction visitors obtained results that *t ravel motivation* and quality service take effect significant to satisfaction visitors (Astini & Sulistiyowati, 2015). Research results Yofina Mulyati on Object Tour Bukittinggi that management rubbish is one \_ influencing factors \_ negative to decision traveler in choose object upcoming tour \_ visited (Mulyati & Masruri, 2019). Research results Prastika & Sunarta (2018), about influence development on-site tourism disposal rubbish that is enough negative on Balangan Beach no have the place disposal adequate trash \_ good for organic and non- organic waste. So that trash - trash made by tourists \_ or trash that comes from from sea moment install thrown at the border beach or burned (Prastika & Sunarta, 2018).

Involve Public in a manner active in handling rubbish is step first one can done. The community is involved in management rubbish with goal for society realize that problem rubbish is not quite enough answer whole layer society. The resulting impact from rubbish must realized as threat big in the future. Lack of facility form the place trash on the spot common is also one factor reason from problem trash (Sutrisnawati & Purwahita, 2018).

Bukit **Cemeng Ecotourism** is object tour which was inaugurated on December 26 2019 by the Deputy Regent Bangli. Cemeng Hill Ecotourism managed by the group aware tourism (pokdarwis) Bukit Cemeng Sidembunut Ward Cempaga which has 26 members of the community local government, chaired by Wiwin kayoan. Pokdarwis this truly pure formed on initiative Public local (*community-based tourism*). Vision you want built by Pokdarwis are: 1) Empowerment local community; 2) Conservation nature/ environment; 3) Preservation local culture and wisdom; 4) Education about cultivation plant medicine and ceremonies, as well management plastic waste (Bangli, 2019). Bukit Cemeng Ecotourism this offer view beautiful mountains, rice fields, and oceans. Besides it, in object tour this has built means form the place selfie, with view very nature beautiful (Atmadja, 2019)

Management rubbish ie one \_ part to be attention for manager of Bukit Cemeng. During this generated waste \_ only conducted hoarding and burning so as not to dirty environment. This is the basis study with title

"Identification Characteristics Garbage, Mole Activator and Potency Production Compost in Bukit Cemeng Ecotourism Bangli".

## 2 Materials and Methods

This type of research is study applied with design random group. Sampling units are waste generated in Bukit Cemeng Ecotourism. Research carried out replication as much 3 times \_ for see stability of the manufacturing process compost from organic waste generated in Ecotourism Hill whiny. Research instruments are scales, tools measure the volume of waste, composting equipment and observation sheets for the composting process. Next carried out laboratory tests quality compost covers levels of Carbon, Nitrogen, Phosphorus and Potassium. Analysis univariate used for describe characteristics waste, volume and density garbage, and C/N ratio. Analysis bivariate in study this use anova

## 3 Results and Discussions

### 1. Characteristics Trash in Bukit Cemeng Ecotourism Bangli

Arise rubbish calculation emergence and composition rubbish refer to SNI 19-3964-1994. Generation and composition data collection conducted for 8 days successively. Every collected garbage be measured weight (kg) and volume (m3). Measurement heavy use scales with scale 0-50 kg. Volume measurement using tub with capacity 500 L. Rate arising trash average each source is the average yield rubbish for 8 days measurement. Density rubbish Density data collection rubbish for waste on land and waste on the coast conducted based on SNI 19-3964-1995. Measurement density rubbish conducted with measure especially formerly waste weight and volume (Han et al., 2018; Aleluia & Ferrão, 2016). Here are the results arising waste in Bukit Cemeng Ecotourism:

Table 1  
Weight, volume and density rubbish in Bukit Cemeng Ecotourism

Day	Heavy average per day (kg)	Volume rubbish per day (m3)	Density (kg/m3)
1	7.02	0.25	28.08
2	6.75	0.15	45
3	8.14	0.35	23.26
4	6.55	0.18	36.39
5	5.76	0.13	44.31
6	8.71	0.28	31.11
7	7.05	0.29	24.31
8	7.42	0.22	33.73
Average	7.175	0.23125	33.27375

Ecotourism waste is included as organic waste and a little also consists of inorganic waste. Organic waste is waste that can be decomposed and decomposes easily including leftovers vegetable dry leaves flower etc. In essence, what is needed to get an added value from a waste is to carry out the previous separation between organic waste and inorganic waste. Waste weight and volume data based on composition like following (Cobbinah, 2015; Blangy & Mehta, 2006; Scheyvens, 1999).

Table 2  
Garbage Weight and Volume Based on Composition in Bukit Cemeng Ecotourism

Day	Composition								
	Remainder food / leaf leaves organic	Paper	Wood	Cloth	Rubber	plastic	Metal	Glass	etc
<b>Heavy</b>									
1	6.89	-	0.13	-	-	-	-	-	-
2	6.5	-	0.25	-	-	-	-	-	-
3	7.78	-	0.36	-	-	-	-	-	-
4	5.9	-	0.65	-	-	-	-	-	-
5	5.65	-	0.11	-	-	-	-	-	-
6	8.71	-	0	-	-	-	-	-	-
7	6.8	-	0.25	-	-	-	-	-	-
8	7.1	-	0.32	-	-	-	-	-	-
<b>Volume</b>									
1	0.2	-	0.05	-	-	-	-	-	-
2	0.14	-	0.01	-	-	-	-	-	-
3	0.32	-	0.03	-	-	-	-	-	-
4	0.15	-	0.03	-	-	-	-	-	-
5	0.1	-	0.03	-	-	-	-	-	-
6	0.28	-	0	-	-	-	-	-	-
7	0.25	-	0.04	-	-	-	-	-	-
8	0.2	-	0.02	-	-	-	-	-	-

## 2. C/N Ratio of Waste in Bukit Cemeng Ecotourism Bangli

Based on analysis test results next C and N values will calculated C/N Ratio value As for the result of C/N Ratio is as give.

Table 3  
Material C/N Ratio Value Compost organic in Bukit Cemeng Ecotourism Bangli

No	Code	Organic Carbon (%)		Nitrogen (%)		C/N Ratio	
		Repeat 1	Repeat 2	Repeat 1	Repeat 2	Repeat 1	Repeat 2
1	Acacia	50.3247	48.7013	1.0253	1.0696	49.0810	45.5321
2	Mixture	59.5668	60.4693	0.8085	0.8286	73.6722	72.9783
3	Cempaka	60.3865	61.5942	0.7645	0.7740	78.9855	79.5740
4	Mango	61.2245	60.3741	0.6392	0.7049	95.7810	85.6526
5	Merbau pantai	58.4862	59,6330	1.1693	1998	50.0177	49.7018
6	Jackfruit	53.0822	53.9384	0.7154	0.7143	74.2015	75.5139

## 3. Analysis Quality Compost

Table 4  
Examination Results Total Carbon (%), Nitrogen, Phosphorus and Potassium Compost Cemeng Hill Ecotourism

Sample	Repeat 1				Repeat 2				Repeat 3			
	C	N	P	K	C	N	P	K	C	N	P	K
1	12.76	0.52	0.47	0.42	7.26	0.52	0.36	0.48	10.93	0.57	0.39	0.54
2	10.47	0.56	0.39	0.47	7.06	0.53	0.38	0.48	9.11	0.50	0.44	0.39

3	9.03	0.50	0.37	0.46	12.27	0.52	0.33	0.47	10.54	0.50	0.40	0.49
4	8.63	0.53	0.38	0.67	11.14	0.48	0.35	0.40	6.21	0.54	0.30	0.58
5	9.63	0.53	0.36	0.66	11.99	0.42	0.30	0.55	13.12	0.55	0.36	0.65
6	11.43	0.53	0.35	0.62	12.36	0.48	0.35	0.48	10.95	0.57	0.43	0.59
7	13.67	0.47	0.36	0.63	9.58	0.47	0.33	0.64	14.45	0.55	0.52	0.77
8	12.46	0.54	0.35	0.52	12.46	0.49	0.28	0.69	13.07	0.54	0.42	0.61
9	13.40	0.54	0.37	0.49	9.91	0.69	0.40	0.54	14.99	0.53	0.37	0.58
10	11.60	0.54	0.32	0.59	9.46	0.52	0.30	0.66	12.78	0.54	0.46	0.72
11	13.05	0.54	0.47	0.43	7.12	0.51	0.36	0.52	10.77	0.52	0.39	0.52
12	10.33	0.55	0.39	0.40	6.80	0.54	0.38	0.45	8.83	0.52	0.44	0.34
13	9.33	0.50	0.37	0.43	12.53	0.53	0.33	0.55	10.66	0.55	0.40	0.47
14	8.21	0.53	0.38	0.40	11.43	0.48	0.35	0.40	5.85	0.56	0.30	0.43
15	9.80	0.55	0.36	0.58	11.89	0.45	0.30	0.59	12.94	0.55	0.36	0.51
16	11.57	0.52	0.35	0.74	12.07	0.53	0.36	0.50	11.09	0.53	0.43	0.56
17	13.81	0.47	0.36	0.67	9.31	0.50	0.33	0.55	14.59	0.60	0.52	0.65
18	12.16	0.48	0.35	0.49	12.62	0.50	0.28	0.55	13.33	0.51	0.43	0.77
19	13.53	0.55	0.37	0.57	10.24	0.75	0.40	0.59	15.12	0.55	0.38	0.58
20	11.86	0.52	0.32	1.46	9.73	0.51	0.30	0.58	12.21	0.54	0.46	0.71
Average	11.34	0.52	0.37	0.59	10.36	0.52	0.34	0.53	11.58	0.54	0.41	0.57

#### 4. Quality C/N Ratio

Table 5  
Compost C/N Ratio Calculation Results in Bukit Cemeng Ecotourism

Sample	Repeat 1	Repeat 2	Repeat 3
1	24.54	13.96	19.18
2	18.70	13.32	18.22
3	18.06	23.60	21.08
4	16.28	23.21	11.50
5	18.17	28.55	23.85
6	21.57	25.75	19.21
7	29.09	20.38	26.27
8	23.07	25.43	24.20
9	24.81	14.36	28.28
10	21.48	18.19	23.67
11	24.17	13.96	20.71
12	18.78	12.59	16.98
13	18.66	23.64	19.38
14	15.49	23.81	10.45
15	17.82	26.42	23.53
16	22.25	22.77	20.92
17	29.38	18.62	24.32
18	25.33	25.24	26.14
19	24.60	13.65	27.49
20	22.81	19.08	22.61
Average	21.75	20.33	21.40

Leaf waste will decompose faster than leaf waste, but it takes almost the same time to decompose both of these wastes. This is because the decomposition process is a very complex process which is influenced by several factors including environmental factors such as climate (temperature, humidity and weather), chemical composition of the samples and soil organisms. Weather conditions at the time of sampling supported decomposition. This is indicated by air humidity data ranging from above 80% which allows the leaching of the additive substance in the material and air temperature below 28°C which is a driving force for the activities of soil organisms. The chemical content in the sample is composed of high lignin which causes the decomposition carried out by the decomposer to take a long time. According to [Chabot & Hicks \(1982\)](#), states that low quality litter has low N and Ca content and high lignin and tannin. This causes low decomposed biomass.

Based on the results of the research above, it takes a long period of time to decompose ecotourism waste, especially Merbau beaches with a hard structure which can be caused by the tissues that make up the leaves. The number of transport bundles and sclerenchyma in the leaves determines the hardness and toughness of the leaves because the sclerenchyma cell walls are thickened by lignin. The high percentage of lignin and cellulose makes the leaf fibers strong and stiff. Lignin is a polymer compound that fills the cavities between cells in plants. Thus causing plant tissue to become hard and difficult to be overhauled by soil microorganisms ([Stevenson, 1982](#)). That matter causes the decomposition process to take a long time as in the decomposition of leaves.

Handling waste into organic fertilizer provides many advantages. One of them can empower the community's economy as an alternative for job creation because the material is abundant and easy to obtain and the market opportunity is very good ([Asman et al., 2021](#)). With the new method, namely the provision of MOL because the processing of making organic fertilizers can accelerate and improve the quality of organic fertilizers. With these advantages, it can be used as an alternative to solving environmental problems. It can also be used as a soil fertilizer. Organic fertilizer itself is not the main fertilizer but when applied to the soil it can improve soil texture because organic fertilizers can increase biological activity in the soil which causes earthworms to thrive and causes the soil to be more loose so that plants can grow well. Soil structure can be improved by increasing the porosity of the soil so that the soil becomes loose. The difference in technique is related to the existence of factors that affect the process of decomposition (decomposition) of waste materials namely setting aeration, temperature, humidity type of decomposer body, type of waste, condition of waste (whole or first cut and size of pieces) as well as the presence of additional materials such as MOL. Organic waste and organic waste can provide benefits to humans after first being converted into organic fertilizer by the role of beneficial bacteria for humans. Saprophytic bacteria play a role in breaking down dead plants or animals the remains or excrement of organisms. Human friendly bacteria (probiotics) break down proteins carbohydrates and other organic compounds ([Sharholly et al., 2007](#); [Yang et al., 2012](#)).

Factors causing differences in nitrogen (N) values are due to the influence of processes that occur in the nitrogen cycle. The fermentation process is carried out anaerobically which causes the nitrification process not to run optimally, on the contrary the denitrification process is more dominant. Factors that affect the results of protein decomposition are the nature of the material, the type of microbes that grow during the fermentation process, the conditions of the fermentation, and the duration of the fermentation. Other factors that influenced the results of this study were due to the different speed of microbes in decomposing the fermented material and the number of bacteria contained in liquid organic fertilizers which resulted in these bacteria consuming a lot of minerals in liquid organic fertilizers which were also less and the fermentation process affected the nutrient content in the fertilizers. From the test results for nitrogen (N) content based on SNI 19-7030-2004, Carbon 9.8% - 32 %, Nitrogen minimum 0.4%, Phosphorus ( P2O5) minimum 0.1 %, C/N Ratio 10 - 20, Potassium (K<sub>2</sub>O) minimum 0.2%. Based on results study is known that Carbon, Nitrogen, Phosphorus and potassium Fulfill requirements quality good compost ([Bernal et al., 2009](#); [Tognetti et al., 2007](#); [Postma et al., 2003](#)). The C/N Ratio value exceeds limit on though no too tall

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## 4 Conclusion

Based on the results study obtained the conclusion as follows:

- 1) Average \_ heavy waste generated in Bukit Cemeng ecotourism is 7.175 kg, the average volume of waste is 0.23 m<sup>3</sup> and the density waste 33.27 kg/m<sup>3</sup>
- 2) There is no difference in the quality of Carbon, Nitrogen and Potassium in three replications of processing waste into compost, meaning that the values of Carbon Nitrogen and Potassium produced are stable.
- 3) There is difference nitrogen quality in three replications processing rubbish it means Nitrogen value produced no stable
- 4) Compost produced at Bukit Cemeng Ecotourism Fulfill requirements quality compost based on SNI 19-7030-2004

### *Suggestion*

Planning management waste in Bukit Cemeng Ecotourism and analysis cost operational activity management must conduct for application management sustainable waste.

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