EDUCATION OF RURAL SOCIETY INFLUENCES GREEN BEHAVIOR IN DISPOSING FOOD PACKAGING

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Abstract. Green consumer behavior avoids using the products that have a negative impact on human health and the environment. The study aimed to analyze the consumer's attitudes, choice, and disposal behaviour of the food packaging. These analysis compared the society based on their education, both on rural and urban societies. Data were collected from Desa Sidodadi (rural) at Ngantang Subdistrict and Kelurahan Tunggulwulung (urban) at Lowokwaru Subdistrict, both places are parts of Malang Regency, East Java, Indonesia. The Mann-Whitney test was used to compare all indicators between higher and lower education. The results showed that the three indicators (attitude, packaging choice and disposal behavior) were significantly different between higher and lower education on rural society. Meanwhile, they were not significantly different on the urban society. The majority of people in rural and urban areas show a good response in protecting the environment. Such condition represented that the consumption activities have considered the environmental sustainability. Therefore, the business activities also should comprihend green consumers. Food producers have to developt green food products and the green packaging, while government should developt society to become more environmentally friendly and minimize waste.
Keywords: *green consumers, food packaging, environmental friendly, education*

Introduction

One of the global environmental issues is waste problem, also happened in Indonesia. The amount of waste production in Indonesia reaches 65.8 million tons every year, of which 7.2 million tons were plastic waste (Mufarida, 2019). These amount is the second highest in the world. The condition was worsened by the imported waste which amounted to 321,000 tons in 2018 and is always increase every year (Wahyono, 2019). Malang Regency as the second largest area in East Java Province, Indonesia, contributed 600 tons of waste or equal to 130 trucks per day (Yuswantoro, 2019). The waste came from household and industrial waste.

Wahyuni et al. (2018) said that the fertility of agricultural land in Indonesia has decreased. The soil damage caused the decreased productivity, especially on the intensification of paddy fields. One of the causes was the waste problem, mainly the plastic waste. The problem of waste became a serious threat to the agriculture sector. Such conditions will increasingly pollute the environment and can produce toxic compounds for the soil. An improper handling could reduce the soil fertility. This was because microorganisms in the soil will died so that the availability of nutrients in the soil will be lower.

Human activity was one of the causes of increasing waste problems (Prabowo, 2018). The behavior of littering and increasing consumption of packaged products made the increasing of waste. The choice of product packaging is varied, they are paper,

plastic, stereoform, aluminum foil, glass and so on. Plastic and steroform have a negative impact on the environment.

Customary and practical reasons in choosing the not-green packaging make this packaging were still very preferred. The government regulations as an effort to reduce plastic waste was not effective yet (Rianto, 2019). Human economic orientation without any effort to protect the environment would have a negative impact on environmental sustainability.

The pro-environmental economics provides a new concept in the applied economics, which developt economic without ignoring aspects of environmental sustainability. The economic activities must be environmentally friendly and have the concept of environmental awareness (Tietenberg and Lewis, 2012). The impact of environmental economic activities wa the emergence of new terms such as green products (Fegueiredo and Guillen, 2011) and green packaging (Lin et al., 2014) which triggered the emergence of green consumers' behavior (Peattie, 1992). Green consumers support the environmentally economic activities, and they become the potential new market segments to developt (Kasali, 2005).

Some previous studies had concerned the environmental awareness. For example, research on the behavior of purchasing environmentally friendly products (Wibowo, 2011; Giyanto, 2012; Cheung and To, 2019; Dagher and Itani, 2014; Widodo and Qurniawati, 2015; Laksmi and Wardana, 2015; Paramita and Yasa, 2015; Adil, 2015). Several studies also had been analyzed the pro-environment behavior in households and hotels (Miao and Wei, 2013); on campus or student life (Meyer, 2015); and organic vegetable consumers (Kusumo et al., 2017). A study on waste minimization behavior also has been done in Indonesia (Akhtar and Soetjipto, 2014). Many of these studies were only focussed on the pre-consumption behavior, meanwhile the post-consumption behavior is important to analyze. The research on behavior of green consomers has also been studied by Relawati et al., (2020), but it had not compared education in rural and urban communities. Based on the background, it is necessary to study on the behavior of purchasing packaged food in on the rural and urban societies as the implementation of the environmental awareness.

The study aimed to analyze the consumer's attitudes, choice, and disposal behaviour of the food packaging. Thee research hypotheses were: (1) consumer attitudes towards food packaging on the higher education society differed from those of the lower education society; (2) food packaging choices on the higher education society differed from those of the lower education society; and (3) disposal behavior of food packaging on the higher education society differed from those of the lower education society. All three hypotheses were tested in rural and urban societies.

Theoritical concept

Consumer behavior

Consumer behavior is defined as consumers' action in finding, purchasing, using and evaluating the usage of goods or services as an effort to meet the needs (Sumarwan, 2011). There are at least 5 stages of the consumer decision model, that is begining from introduction of consumer needs, information search, alternative evaluations, purchasing actions and the fulfillment of needs. The consumer decisions are certainly influenced by several factors such as individual differences, consumer's environmental factors and marketing strategies (Kotler and Keller, 2009). Individual differences includes

motivation, personality, self-concept, information processing and perception, learning processes, knowledge, attitudes and religion. Consumer's environmental factors includes culture, demographic, social and economic characteristics, family, reference groups, environment and consumer and technological situations. The success of marketing strategy is identified by the transaction process in which consumers get goods or services while producers get rewards from the goods or services consumed by the consumers.

The focus of consumer behavior is not only on how to obtain and consume a product or service but also focus on how they dispose the trash, part of foods that are not consumed, including the packaging. The disposal process of food packaging after consumption depends on its characteristics. There are several alternatives of packaging disposal. The food pachaging made from cans, glass, and paper are can be reused or recycled. The alternatives of disposal are selling, storage, donated to other people who need it, processing into the new products or thrown away as the trash (Sumarwan, 2011). Product development is expected to not only concern the economic aspect, but also must concern to the ecological and environmental awareness. The application of this concept will make the product life cycle longer, because gradually the society aware of protecting the environment.

Environmental economics

Environmental economics is defined as a science that studies how humans meet needs with something available in nature that can be utilized by humans. The purpose of utilizing natural resources is to achieve community welfare. Utilization activities need to pay attention to existing natural resource reserves, exploration activities, production activities, consumption activities, costs incurred and prices obtained. The goal is to meet human needs, preserve the environment and equitable development in various sectors. At least the use of natural resources must have two benefits, economically and ecologically (Tietenberg and Lewis, 2012). Economically the use of natural resources must be able to improve the standard of living of the community, and the use of natural resources must be environmentally friendly and have the concept of environmental carrying capacity and sustainable.

Green packaging

Green product is defined as a product made from safe, non-toxic, non-hazardous, recyclable components, packaged with environmentally friendly materials in the hope of reducing the negative impact of product consumption on the environment. Green products are designed and processed in certain ways to be able to reduce the negative impacts caused both in the stages of production, distribution and consumption. The concept of a green product is achieving a balance of benefits economically and ecologically (Fegueiredo and Guillen, 2011). Economically, the product is expected to be able to improve the standard of consumers living, ecologically the product is expected to be environmentally friendly.

The most widely used packaging materials are plastic and styrofoam which are not environmentally friendly. The green packaging is product packaging that is not harmful to the environment and human health (Lin et al., 2014). The emergence of green packaging indicates that packaging also develops towards sustainable development as a form of concern for environmental sustainability. The application of green products

generally has four kinds of benefits, namely saving resources and energy, easy to recycle packaging, waste produces new energy by burning and decomposing the material itself so that there is no environmental pollution. The internationally recognized green packaging principle is known as 3R1D. The 3R principle is reduce, reuse and recycle, while 1D is degradation. Economic principles in the application of green packaging must save material, reduce costs, increase efficiency and improve competitiveness.

Green consumers

Individuals or groups of people who implement environmentally conscious behavior in their daily consumption activities are known as green consumers. Green consumers always avoid using products that have potential negative impacts on health and the environment (Peattie, 1992). Green consumers' behavior arises because consumers are aware of the impacts arising from conventional consumption activities, namely the problem of environmental sustainability so that new breakthroughs are known as green consumers and develop from time to time (Kasali, 2005). The green consumers movement is also able to give birth to new market segments that are very potential to be developed.

Green purchasing

Consumer's willingness to buy green products is a real action in an effort to reduce environmental damage due to consumption activities (Peattie, 1992). The price of green products on the market is relatively more expensive, so there is a possibility that the company will get a bigger profit. An organization that chooses to buy environmentally friendly, will contribute in reducing the burden on the environment thereby improving health conditions and can also reduce energy consumption. Green purchases can also improve an organization's image. The application of green purchases can improve the economic position of a company. The steps that can be taken are by reducing company costs and conservation or prevention of environmental damage that will indirectly improve the image of a company.

Materials and Methods

Data type and collection

Primary data were obtained through questionnaires or interviews and direct observation. The data needed were consumer attitudes towards environmental, consideration of food packaging choices, and the behavior on post-consumption trash disposal. The variables and indicators used in this study were presented in *Table 1*.

Table 1. *Research variables and indicators.*

No	Variables	Indicators
1	Consumer attitude	a. Environmental awareness
		b. Attitude on keeping environment
		c. Self control
2	Packaging choise	a. Paper packaging
		b. Styrofoam packaging
		c. Plastic packaging

3	Post consumption behavior (disposal behavior of food packaging)	a. Disposing trash based on category b. Separating trash

Determination of location

The selection of research places used the multistage random sampling method. The study was conducted in Sidodadi Village, Ngantang District, Malang Regency and Tunggulwulung Village, Lowokwaru District, Malang City. Data collection was carried out from September to December 2019.

Sampling technique

The sampling technique in the study used a purposive sampling method. Below are the sampling criteria of the study (*Table 2*).

Table 2. *Sampling Criteria.*

Rural area	Urban area
The respondents do not live in a housing complex	Respondents live in a housing complex
The society manages their waste disposal independently	There is a trash can in front of the house
There is no garbage collection services available	The garbage collection services are available
Respondents are willing to be interviewed	Respondents are willing to answer the questionnaire

The number of samples used in this study used the formula of Hair (2006) by adjusting the number of questions in the questionnaire. The formula used was n x 5 to 10, where n is the number of question indicators. Since the number questions is 20, so the number of sample is 80. These number was separated to two criteria, namely rural and urban societies. Each of them has 40 respondents.

Data analysis

The data analysis method was descriptive and non parametric statistical test, Mann-Whitney. Descriptive analysis was used to identify attitudes on the environmental in purchasing behavior of packaged foods. The Mann-Whitney statistical test was used to examine differences in consumer attitudes, packaging choices and environmentally friendly behavior between the higher and lower education.

The Mann-Whitney test (U test) was used to test the similarity of the distribution of two unrelated populations, by assuming that the distribution of the two populations is continuous. The variables used to test Mann-Whitney are consumer attitudes, packaging choices and post-consumption disposal behavior. The Mann-Whitney testing procedure begins with compiling hypotheses and the real level α, ranking data without regard to sample categories, summing rankings according to each sample category and calculating U statistics and drawing statistical conclusions on hypotheses (Sriwidadi, 2011). The formula to calculate U statistics is as follows.

$$U_1 = n_1 n_2 + \frac{n_1(n_1 + 1)}{2} - R_1 \quad \text{(Eq. 1)}$$

$$U_2 = n_1 n_2 + \frac{n_2(n_2+1)}{2} - R_2 \quad \text{(Eq. 2)}$$

Information:

n_1 = The sample number of higher education society

n_2 = The sample number of lower education society

R_1 = The number of levels in the higher education society sample

R_2 = The number of levels in the lower education society sample

Measurement of variables

Research indicators were measured by using a Likert scale. The sum of variable scores was the sum of all studied indicator scores. The maximum score for each indicator was 5 and the minimum score obtained was 1 (*Table 3*).

Table 3. *The Likert scale score.*

No	Symbol	Information	Score
1	SS	Strongly agree	5
2	S	Agree	4
3	TT	Do not know	3
4	TS	Disagree	2
5	STS	Strongly disagree	1

Results and Discussion

The characteristics of respondents

A total of 80 respondents consisted of 40 respondents of rural societies and 40 those from urban societies.

The age of respondents

The age of respondent is presented at *Table 4*. The age distribution shown in *Table 4* used the distribution issued by Departemen Kesehatan RI (2009). The majority of rural respondents were in the age range of 26 to 45 years. Meanwhile, the majority of respondents at urban areas were in the age range of 12 to 45 years. This is due to their age range was at the productive ages in doing various activities including choosing food consumtion.

Table 4. *The age of respondents.*

Age (years)	Frequency			
	Rural societies		Urban societies	
	Men	Women	Men	Women
12 to 25	2	6	7	12
26 to 45	14	14	5	12
46 to 65	2	1	2	2
> 66	1	0	0	0

Total	19	21	14	26

Data collection at rural areas used interview techniques, while at urban areas used questionnaire techniques. The samples were taken based on predetermined sampling criteria (*Table 2*). Anyone who meets these criteria can be a respondent of this study. Respondents in this study were family representatives, so that one household was only represented by one respondent. Table 4 shows that the distribution of respondents by gender was more dominated by female with a percentage of 58% compared to 42% of male respondents. This was due to female respondents had more role in determining the family food consumption.

Another factor was that women are considered to be more understand about food than men. This condition was clearly seen in rural societies when conducting interviews. The husband asked his wife to answer the questions raised because they are considered more understand. A different approach is used in urban societies where the questionnaire is distributed and it was taken the day after or according to the agreed time. This was intended so that respondents was not feel pressured in filling the questionnaire.

The education of respondents

The distribution of respondents based on education is presented at *Table 5*. It shows that the majority of rural societies were lower educated, while the majority of urban societies were higher educated. This was due to the fact that the majority of rural societies work as farmers, so they do not prioritize education.

Table 5. *Characteristics of respondents based on education.*

Education	Sidodadi Village (rural)		Tunggulwulung Village (urban)	
	Men	Woman	Men	Woman
Not school	0	0	0	1
Elementary school	6	11	1	1
Junior high school	5	4	0	0
Senior high school	6	5	4	4
Diploma	1	1	1	8
Undergraduate	1	0	8	12
Total	19	21	14	26

Many urban societies work as public and private employees so that they require higher education. Another factor was the access and availability of education levels at urban areas much more complete than in rural areas. This condition was one of the factors caused rural societies had lower interest in continuing higher education comparing with the urban societies.

Validity and Reliability Test

The validity test used α of 5% level and df = N - 2 (0.05 ; 38), so the r-table was obtained for 0.312. The all r-counted values were greater than r-table values, so the data were valid (*Table 6*). It means that the study instrument was valid and appropriate to the study.

Table 6. *Validity test.*

No	Variable	Indicator	r-counted		r-table	Criteria
			Village	City		
1	Consumer attitude	Environmental awareness	0,449	0,523	0,312	Valid
		Attitude on keeping environment	0,616	0,639	0,312	
		Self control	0,386	0,663	0,312	
2	Packaging choise	Paper	0,351	0,361	0,312	
		Styrofoam	0,392	0,401	0,312	
		Plastic	0,333	0,459	0,312	
3	Post consumption behavior	Separating trash	0,347	0,329	0,312	
		Disposing trash based on category	0,347	0,329	0,312	

The Cronbach's Alpha value on all variables was greater than the r-table value, so the all data were reliable (*Table 7*). It means that the questions in the questionnaire were reliable.

Table 7. *Reliability test.*

No	Variable	r count		r table	Criteria
		Rural	Urban		
1	Consumer attitude	0,662	0,722	0,312	Reliable
2	Packaging choise	0,484	0,424	0,312	
3	Post-consumption behavior	0,447	0,459	0,312	

Consumer's attitude on the environmental awareness

Environmental awareness is indicated from the attention to the consumer behavior in purchasing the environmentally friendly products. One of the environmental awareness was performed through consumer behavior in buying food. There were three indicators of consumer attitudes were used in the study. The test was carried out using the Mann-Whitney test separately in rural and urban societies. Education levels in each area were categorized as higher and lower education. The following Mann-Whitney test results are presented in *Table 8*.

Table 8. *Mann-Whitney analysis result of consumer attitudes.*

No	Indicators	Education							
		Rural				Urban			
		H	L	M	S	H	L	M	S
1	Environmental awareness	4.71	4.38	4.50	0.05	4.65	5.00	4.68	0.22
2	Attitude on keeping environment	4.57	4.42	4.48	0.38	4.41	4.33	4.40	0.81
3	Self control	4.57	4.23	4.35	0.09	4.41	4.67	4.43	0.39

H = High; L = Low; M = Mean; Sig = Significant

The probability value of environmental awareness indicators in rural areas is 0.050 and significant at α level of 5%, so that the decision H_1 was accepted. This means that there are differences in environmental concern for the purchase of food in packaging between higher and lower education. The higher educated people were more concern to

the environment than them with lower education. These results are in line with Yulida et al. (2016) who mentioned that the knowledge of someone who is more likely to have better behavior than those who have low knowledge. Village communities make highly educated people role models in various activities. Not a few highly educated people occupy important positions.

The self-control indicator in rural areas were significant at α level of 9.4%, so that the H_1 was accepted. It means that there were differences in self-control in purchasing packaged food between higher and lower education. The self-control of society with higher education was higher than them with lower education. Self-control society with higher education is higher than those with low education. These results were in line with Yulida et al. (2016) who mentioned that someone with higher education had better behavior than him/her who have lower knowledge. This is an example of how education can be a differentiator of a better behavior. Self-control was indicated as the strict attitude towards consumption activities which was not damage the environment.

One of non-significant indicator is protecting the environment with a probability value of 0.376. These means that there is no difference in attitude in protecting the environment between higher and lower education in rural communities. The majority of rural people are strongly agree to protect the environment as a form of environmental concern in consumption activities. This result is in-line with the theory that economic activity is also concern with ecological aspects (Tietenberg and Lewis, 2012) to sustainable environmental.

All indicators of consumer attitudes in Table 8 in urban areas show insignificant probability values, so the decision of all H_1 was rejected. This means that there are no differences in consumer attitudes towards purchasing food in packets between higher and lower education in urban societies. The majority of the society strongly agreed to concern on environment. These results were in line with Kusumo et al. (2017) as well as Cheung and To (2019) who states that consumers' attitudes of the consumption activities were able to influence the environmental awareness.

Food packaging choise

There are some stages of consumer decisions of food purchasing activities. Many aspects were considered before consumers decide to buy food, the food itself and the packaging. The pro-environmental consumers would avoid consuming foods with not environmentally friendly packaging. There were three indicators of packaging choice used in this study. The test used the Mann-Whitney separately in rural and urban societies. The education levels at each region were categorized as higher and lower education. The Mann-Whitney test results were presented at *Table 9*.

Table 9. *The Mann-Whitney analysis result of packaging choise.*

No	Indicators	Education							
		Rural				Urban			
		H	L	M	S	H	L	M	S
1	Paper packaging	3.43	3.12	3.23	0.36	3.59	2.67	3.53	0.10
2	Styrofoam packaging	2.71	2.92	2.85	0.47	2.76	3.00	2.78	0.64
3	Plastic packaging	3.00	2.96	2.98	0.88	3.22	3.67	3.25	0.38

H = High; L = Low; M = Mean; Sig = Significant

Paper packaging was claimed as having a more environmentally friendly comparing to plastic and styrofoam packaging. Higher educated people in both places showed an agreement towards paper packaging. Meanwhile, people with lower education showed a doubtful attitude in agreing the plastic packaging. This is because the lower educated people may not understand the impact caused by plastic and styrofoam packaging. Another reason was that usage of packaging was considered practical and the society activities were increasingly bussy, so the plastic and styrofoam packaging become preferred choice.

All indicators at Table 9 in both places had insignificant values, so all H_1 were rejected. This means that there were no differences food packaging choices between higher and lower education. Such conditions indicated that respondents in the two places had similarities in considering choise of food packaging, both environmentally friendly and unfriendly packaging. These results were in line with Wibowo (2011) as well as Giyanto (2012) who stated that there were many considerations in deciding to buy a product, one of which is the existence of ecolabelling in packaging as a form of support and care for the environment. Although the majority of education in rural areas is much lower than in urban areas, it did not make a difference in packaging choices between education in rural and urban societies.

Environmentally friendly consumer behavior

Human activities at pre and post food consumption done by consumers without damaging the environmental sustainability reflects the environmentally friendly behavior. One form of environmentally friendly behavior at post-consumption activities was to sort and dispose of food waste based on the waste category. This action was carried out as an effort and support in reducing the burden of waste in the landfill (Kementerian PUPR, 2010). The two indicators of post-consumption were used in this study. The test was carried out using the Mann-Whitney test separately in rural and urban societies. The education levels in each region were categorized as higher and lower education. The following Mann-Whitney test results were presented in *Table 10*.

Table 10. *The Mann-Whitney analysis result of the disposal behavior.*

No	Indicators	Education							
		Rural				Urban			
		H	L	M	S	H	L	M	S
1	Seperating trash	4.36	3.65	3.90	0.02	4.16	4.33	4.18	0.75
2	Disposing trash based on category	3.79	3.73	3.75	0.77	3.54	4.00	3.58	0.43

H = High; L = Low; M = Mean; Sig = Significant

The probability value of separating trash in rural areas was significant at 5% α level, it was 0.021, so that the decision of H_1 was accepted. It means that the behavior on separating trash on the higher education society was different with these behavior on the lower education society at rural place. Rural societies take benefit from separating trash. One example of utilizing separated trash was to make food waste as animal feed, so it reduced the feeding cost. These results were in line with Miao and Wei (2013), Akhtar and Soetjipto (2014) as well as Meyer (2015) who stated that the remaining consumption of a product needs to be minimized so it did not cause negative impacts on the environment. One of the application was the 3R1D principle. The higher educated

people was more response in separating trash than them with lower education. It was because highly educated people aware of protecting environment begining from theirself. One way to do that was separating trash and use it.

Disposing trash based on category in urban areas showed that the probability value was not significant, that is 0.768, so that the decision H_1 was rejected. This means that there was no difference in the behavior of disposing trash between higher and lower education in urban communities. The majority of urban communities stated their strong agreement to separate trash. This activity was carried out as a form of environmental concern. These results were in line with Yudistirani et al. (2015) who stated that the trash problem solving should be approached from its source. One example was by separating trash at household level, considering that they were one of the trash contributor. The behavior of separating trash at household level was expectedly followed by good handling of trash by the janitor. The trash management in the urban housing had been coordinated by the cleaning workers. In addition, separating trash seems no benefit if the trash transportation was still mixed.

The indicator of disposing trash based on category in Table 10 in both regions showed the value of probability was not significant, so the decision H_1 was rejected. This means that there was no difference in behavior of disposing trash based on category between higher and lower education. No difference means that the majority of people in both regions agreed to dispose trash based on the place. These results were in line with Yulida et al. (2016) and Rashid et al. (2017) who stated that the availability of trash disposal facilities in public places indirectly tell the society to dispose trash on the right place. Societies with higher and lower education in both regions were equally aware that in public areas trash bins have been provided based to the category. The response shown to dispose trash based on category was a support to the environment.

Conclusion

The higher educated societies at rural had more awareness and self-control towards the environment and they also acted better in separating trash, comparing with them who had the lower education. These means that education is important on rural societies to influence their awareness on the environment and finally act better in disposing trash of food packaging.

The environmental attitude and behavior on urban societies were not influenced by education anymore, since their education level almost equal. Most of them already aware on the environment and act to keep it by disposing food packaging at the right place separatedly. The important aspect they needed are a better collecting and transporting of trash.

Recommendation are given to some parties, as the follow up of the study results. For all societies, purchasing food products shoulds consider the environmental friendly food packaging, also separating and disposing the food packaging trash at the right place to keep the environment. For the Government, it is necessary to developt management and technology to solve the waste problem, and applying the 3R1D (reduce, reuse, recycle, and disposal). For business, developing the green packaging is really important to match the business and the environmental urgency. For researchers, future studies are expected to add several social variables that influence the attitude and behavior on the environment.

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