

## Eco-Labeling Analysis of Eco-Friendly Electronic Products in Surakarta, Indonesia

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**Abstract.** The new awareness of the consumers regarding environmental issues should allow companies to gain a competitive advantage by obtaining eco-labels that certify the low impact on the environment. Consumers' understanding and knowledge about environmentally friendly products will make them care, attention, and behavior in using the products they consume. This research is descriptive-analytical, aiming to determine the variables that have a relationship with consumer awareness to buy an eco-electronic product in Surakarta. This study's conclusions are: 1) variable Eco-label Awareness and Eco-label Knowledge has a direct and significant influence on Purchase Intention of consumer electronic goods in Surakarta; 2) variable Belief in Environment-Friendly and Eco-label Availability has a direct and not significant effect on Purchase Intention of consumer electronic goods in Surakarta; 3) variable Attention Eco-label has a positive and significant influence on Purchase Intention of consumer electronics in Surakarta. Therefore, the Variable Attention towards Eco-label function as an intervening variable is effective. The government must support companies in eco-labeling that can be trusted by consumers; consumers in Indonesia need information from the government about eco-label policies so that their knowledge will increase.

**Key words:** eco-label, awareness, knowledge, environment-friendly, availability, attention towards eco-label, purchase intention.

### Introduction

Environmental preservation has become the biggest global issue since the 1900s with the end of biological competition between countries that produced scientists with the best inventions in the 1800s (Kotler et al., 2014: 165). Many problems that threaten the human environment such as global warming, ozone depletion, air, water, and soil pollution eco-Labeling come from the word Eco that means environment, and label, which means a sign on the product that distinguishes it from other products (Falkner, 2013: 7). Eco-Labeling helps consumers to choose products that are environmentally friendly while functioning as a tool for producers to inform consumers that the products they produce are environmentally friendly (Grunert and Wills, 2007: 385-399). Based on this, it is illustrated that Eco-Labeling's main use is to help consumers choose because Eco-Labeling allows a comparison between similar products. Reliable Eco-Labeling is provided through a certification process by a third party independent to assess that a product is produced by observing the principles of environmental preservation (OECD, 2016: 1). Referring to the GATT (General Agreement on tariff and trade), Eco-Labeling is based on non-discrimination and voluntary. The voluntary basis means that the certification system works based on market incentives (Respati, 2019).

Purchases of labeled products in various countries can be found in products daily. Every country has its own eco-label products and different standards eco-label on products that are certified. Countries in Europe have an eco-label product (EC 2016), which can be found in the cleaning product category (Prieto-Sandoval et al., 2020). For example, detergent for laundry soap, soap, shampoo, and hair conditioner), paper

products, products for the garden, home products stairs, electronics, shoes, textiles, heat pumps, and lubricants. Malaysia has a name (SIRIM 2016) in its eco-label. Products for eco-label Malaysia have an eco-label product, which can be found in the categories of plastic, cleaning, electronic, agricultural, and household appliances (Ecolabel Index, 2016). China has an eco-label (GC 2016) product category almost the same as European countries. The country's eco-label products are categories paper products, packaging, plastic, cleaning, office equipment, various equipment/equipment that can be consumed (printer ink, lubricant, food place, and others), computers, construction materials, and motorized vehicles.

Increasing the market that cares about the environment impacts increasing businesspersons' attention to widespread environmental issues (Laroche et al., 2001). Even today, business people are starting to implement international standards, better known as ISO-14000, regarding environmental management (Daud et al., 2019). Indonesia has now been in globalization since the signing of the ASEAN Free Trade Area (AFTA) - China agreement in January 2010. The era of globalization has meaning as an era of the creation of a unified and interdependent global society so that the borders of a country become increasingly narrow.

The increasing sensitivity of the Indonesian people to choosing healthy and environmentally friendly products does not rule out the possibility that there will be many green products from abroad that enter the Indonesian market. Green guarantees have become an issue in the world of business and global trade today. Environmental friendly guarantees, or commonly known as eco-labels, show that the product is guaranteed quality. Other Asian countries, such as China, Japan, Korea, India, Thailand, Malaysia, and Singapore, have been far more responsive in addressing environmental issues. Seeing the problems that threaten the sustainability of the environment, society is increasingly required to have a pattern of consumption of goods and services that do not harm the environment to full fill, basic human needs or commonly referred to as sustainable consumption (Khoiruman and Haryanto, 2017). Governments in these countries support the green marketing activities carried out by companies. One form of support provided by the government in the form of eco-labeling for green products. Thus, green products are easily distinguished from traditional products sold on the market.

Environmentally friendly products (eco-product products or green products) are defined as products with all physical and operational aspects at each stage of their life cycle - not harmful to the environment. The main varieties of modern technologies and principles of work used in agriculture are considered a moment. The modern market of agricultural technologies in East Europe, such as Ukraine and the agro-industrial complex as a whole, is also analyzed (Dubovskiy, 2018: 1-9). Other assessments of agricultural land are also often carried out for loan credit guarantees. This assessment also still uses a market data comparison approach. As a result of this assessment, there is often a value below or above the market value (Khristiana et al., 2020). Environmentally friendly products are designed, created, and evaluated by applying all innovation and technology-focused forms on reducing green product evaluation mechanisms. Furthermore, this shape shows that the community's perception of the information remains optimistic about conducting transactions despite an economic recession (Husain et al., 2020: 53-57). Electronic products issued by various electronic companies have claimed that their products are environmentally friendly, as indicated by eco-labels as part of their product attributes (UNEP, 2015).

### Literature Review and Hypothesis Development

The main purpose of eco-friendly labels is to encourage purchases. Hence, it is important to know what factors can influence consumers to buy advertised, environmentally friendly products. A consumer who cares about the environment, after deciding to buy environmentally friendly products, will evaluate the attributes of the product in terms of environmental care starting from the product raw material (using certified materials), product packaging, distribution, to product disposal (easily biodegradable) (Grillo et al., 2008: 40-46). The attitude of consumers who care about the environment affects the purchase of environmentally friendly products, and they believe that environmentally friendly products will be effectively used as expected (Pickett-Baker and Ozaki, 2008: 281-293).

Labeling is one of the elements that must be considered by the company in running its business because the labeling will help consumers in choosing the desired product. Applying the green marketing strategy cannot be separated from environmentally friendly labeling. Eco-labeling is a tool provided by companies to guide consumers in purchasing the desired product. For example, this product is environmentally friendly and can be recycled. Marketers are increasingly using Eco-labels in identifying green products (D'Souza et al., 2006: 162-173). Rex and Baumann (2007: 567-576) define eco-label as a tool that can help consumers choose a green product and inform them how the product is made. Eco-labels can also provide opportunities for companies to enter the market and gain market share.

Nguyen and Du (2010: 72-82) researched eco-label use on environmentally friendly products such as Euro flower, Nordic Swan, Blue Angle, and Krav; this study focuses on the choice of students in Sweden in buying ecological food products, the results of the study prove Eco-label effectiveness as a guiding instrument for students in choosing ecological food products. D'Souza et al., (2006: 162-173) in a research journal entitled "An empirical study on the influence of environmental labels on consumers. Corporate Communications ". The study found that consumers will look for information about products that care about the environment through the labels on the product. Consumers get enough information about product labels to make informed purchasing decisions.

Rashid (2009: 132-141), in the research journal "Awareness of Eco-label in Malaysia's Green Marketing Initiative," a study conducted in Malaysia showed that awareness of eco-labels has a positive relationship between knowledge of eco-labels and consumer buying interest. Teisla et al. (2002: 339-359), in a research journal entitled "Can Eco-labels Tune a Market? Evidence from Dolphin Safe Labeling, "concluded that consumers who respond positively to eco-labels would cause an increase in the market share of the product concerned. Information provided by eco-labels is proven to affect consumer preferences for a product, especially if the consumer has a great concern for the environment.

The alternative hypothesis is stated as follows:

H<sub>1</sub>, "Attitude towards the Environment" influences "Belief in Environment-Friendly Buying" consumers of electronic goods in Surakarta.

H<sub>2</sub>, "Eco-label Awareness" influences "Attention towards Eco-label" consumers of electronic goods in Surakarta.

H<sub>3</sub>, "Belief in Environment-Friendly Buying" influences "Attention towards Eco-label" consumers of electronic goods in Surakarta

H<sub>4</sub>, "Eco-label Knowledge " influences "Attention towards Eco-label" consumers of electronic goods in Surakarta

H<sub>5</sub>, “Eco-label Availability” influences “Attention towards Eco-label” consumers of electronic goods in Surakarta

H<sub>6</sub>, “Eco-label Awareness” influences “Purchase Intention” consumers of electronic goods in Surakarta

H<sub>7</sub>, “Belief in Environment-Friendly Buying” influences “Purchase Intention” consumers of electronic goods in Surakarta

H<sub>8</sub>, “Eco-label Knowledge” influences “Purchase Intention” consumers of electronic goods in Surakarta

H<sub>9</sub>, “Eco-label Availability” influences “Purchase Intention” consumers of electronic goods in Surakarta

H<sub>10</sub>, “Attention towards Eco-label” influences “Purchase Intention” consumers of electronic goods in Surakarta

### Methodology

This research is descriptive-analytical, aiming to determine the variables that have a relationship with consumer awareness to buy a green product. This research is a development of research conducted by Nguyen and Du by adding other latent constructs based on other related literature (Rashid, 2009: 132-141; Lefébure and Muñoz, 2011). Development of research models with IPO logic (input-process-output) and a combination of causal models to formulate alternative hypotheses (Sani et al., 2020). Based on the research framework in Figure 1, the research model was rebuilt by adopting the existing variables and simplifying them into a research model that would be tested concerning this study.

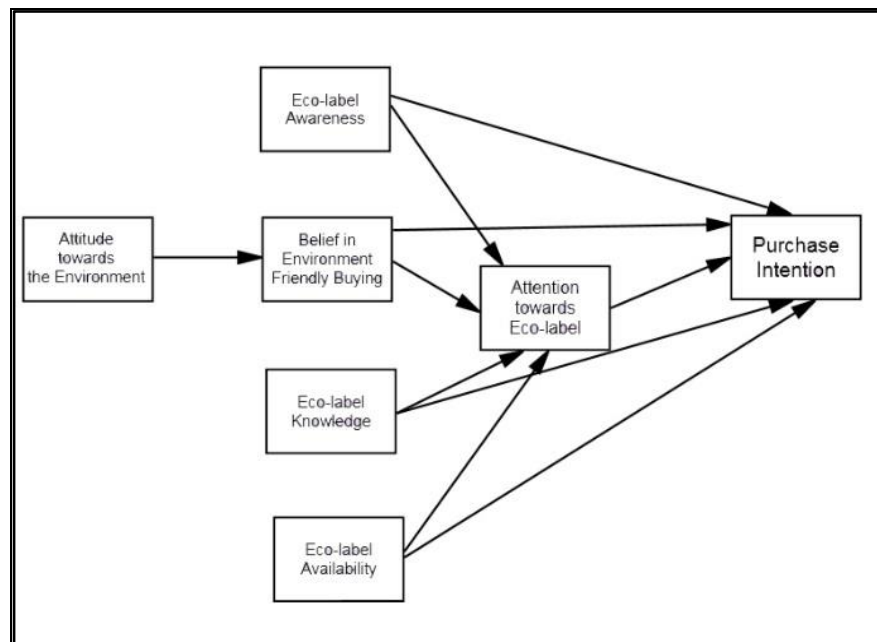


Fig. 1. Research Model. *Source:* (Nguyen and Du, 2010; Lefébure and Muñoz, 2011; Suminto, 2011: 201-206; Muslim and Indriani, 2014: 66-80)

This study has ten hypotheses that are tested using the technique of path analysis. Path analysis is an extension of regression analysis to estimate causal relationships between variables (causal models) that have been predetermined based on the theory (Ghozali, 2017: 237). Respondents in this study were consumers of electronic goods in Surakarta. 185 questionnaires were distributed to respondents, and

all of them were complete and could be used for analysis.

Table 1. Variable and Indicator Variables

Variable	Indicator Variables	Code
<i>Eco-label Awareness</i>	1. Know that eco-labels are in environmentally friendly products (Juwaheer, Pudaruth, and Noyaux, 2012)	ELA-1
	2. Be aware of the existence of eco-labels when shopping (Nguyen and Du, 2010)	ELA-2
	3. Recognizing that the Indonesian government supports eco-labels (Nguyen and Du, 2010)	ELA-3
	4. Know that eco-labels are a set of policies that aim to guide consumers to sustainable consumption (Nguyen and Du, 2010)	ELA-4
<i>Attitude towards the Environment</i>	1. Recognizing in environmental activities will benefit the next generation (Lefébure and Muñoz, 2011)	ATT-1
	2. Recognizing contributions to environmental protection (Nguyen and Du, 2010)	ATT-2
	3. Having concern for the environmental impacts caused by the products that I have bought (Lefébure and Muñoz, 2011)	ATT-3
	4. Consider conservation of the environment when I buy a product (Nguyen and Du, 2010)	ATT-4
<i>Belief in Environment Friendly Buying</i>	1. Believing that buying eco-label products is an environmental protection effort (Nguyen and Du, 2010)	BEB-1
	2. Believing that products that have eco-labels are safe for the environment (Nguyen and Du, 2010)	BEB-2
	3. Consider eco-labels in choosing a product (Nguyen and Du, 2010)	BEB-3
<i>Eco-label Knowledge</i>	1. Knowing eco-label regulations in Indonesia (Nguyen and Du, 2010)	ELK-1
	2. Knowing that "Eco-labels are labels that identify environmental preferences for a product based on their life cycle (Nguyen and Du, 2010)	ELK-2
<i>Eco-label Availability</i>	1. Can find desired environmentally friendly products in a shopping place (Nguyen and Du, 2010)	EVA-1
	2. Can find products that have eco-labels in shopping (Lefébure and Muñoz, 2011)	EVA-2
<i>Attention towards Eco-label</i>	1. Eco-labels attract attention when shopping (Nguyen and Du, 2010)	ATT-1
	2. Eco-labels provide relevant information (Lefébure and Muñoz, 2011)	ATT-2
	3. Information contained in eco-labels is easy to understand (Nguyen and Du, 2010)	ATT-3
	4. Eco-labels provide accurate information	ATT-4

Variable	Indicator Variables	Code
	(Lefébure and Muñoz, 2011) 5. Eco-labels provide reliable information / claims (Lefébure and Muñoz, 2011) 6. Up-to-date eco-label certification (Lefébure and Muñoz, 2011) 7. Can find information about eco-labels from other media (TV, newspapers, and the internet) easily (Nguyen and Du, 2010) 8. Eco-labels can improve the image of environmentally friendly products (Suminto, 2011) 9. Eco-labels are in line with current environmental needs (Lefébure and Muñoz, 2011)	ATT-5 ATT-6 ATT-7 ATT-8 ATT-9
<i>Purchase Intention</i>	1. Concerned about the use of eco-labels on environmentally friendly products (Lefébure and Muñoz, 2011) 2. Eco-labels can be convincing to buy environmentally friendly products (Nguyen and Du, 2010) 3. Will buy eco-labeled products, even though they are more expensive (Lefébure and Muñoz, 2011)	PIT-1 PIT-2 PIT-3

**Results and Discussion**

Running the SPSS analyses for the three regression models is the first step in the path analysis procedure. Three regression analyses were performed to obtain the beta coefficients needed to populate the path diagram and check the statistical significance of direct and indirect effects. The details of the regression analyses are presented here, reporting beta coefficients (Table 2-4):

Table 2. Coefficient Results (Model 1)

Variables	The Regression Coefficient's Beta	Std. Error	Significant Probability Score	Conclusions
<i>Constant</i>	0.528			
ATT	0.511	0.043	0.000	Positive Significant

Source: Output Calculation by Authors (2020)

Table 3. Coefficient Results (Model 2)

Variables	The Regression Coefficient's Beta	Std. Error	Significant Probability Score	Conclusions
<i>Constant</i>	6.329			
ELA	1.454	0.103	0.000	Positive Significant
BEB	0.263	0.136	0.055	Insignificant

Variables	The Regression Coefficient's Beta	Std. Error	Significant Probability Score	Conclusions
ELK	0.314	0.058	0.000	Positive Significant
EVA	0.349	0.061	0.000	Positive Significant

*Source: Output Calculation by Authors (2020)*

Table 4. Coefficient Results (Model 3)

Variables	The Regression Coefficient's Beta	Std. Error	Significant Probability Score	Conclusions
<i>Constant</i>	0.081			
ELA	0.171	0.045	0.000	Positive Significant
BEB	0.048	0.041	0.241	Insignificant
ELK	0.047	0.019	0.012	Positive Significant
EVA	0.018	0.020	0.357	Insignificant
ATE	0.241	0.022	0.000	Positive Significant

*Source: Output Calculation by Authors (2020)*

Summary of Regression Models and Hypothesis test:

a.  $BEB = 0,664 ATT + e$

Attitude towards the Environment (ATT) has a positive and significant effect on Belief in Environment-Friendly Buying (BEB)

b.  $ATE = 0,942 ELA + 0,125 BEB + 0,175 ELK + 0,201 EVA + e$

- Eco-label awareness (ELA) has a positive and significant effect on Attention towards Eco-label (ATE)

- Belief in Environment-Friendly Buying has a positive but not significant effect on Attention towards Eco-label (ATE)

- Eco-label Knowledge (ELK) has a positive and significant effect on Attention towards Eco-label (ATE)

- Eco-label Availability (EVA) has a significant and significant effect on Attention towards Eco-label

c.  $PIT = 0,316 ELA + 0,065 BEB + 0,075 ELK + 0,030 EVA + 0,687 ATE + e$

- Eco-label Awareness (ELA) has a positive and significant effect on Purchase Intention (PIT)

- Belief in Environment-Friendly Buying (BEB) has a positive but not significant effect on Purchase Intention (PIT)

- Eco-label Knowledge (ELK) has a positive and significant effect on Purchase Intention (PIT)

- Eco-label Availability (EVA) has a positive but not significant effect on Purchase Intention (PIT)

- Attitude 1 towards the Environment has a positive and significant effect towards Purchase Intention (PIT)

The total R square value is 0.87, which means that Purchase Intention is explained, by the variable Eco-label Awareness, Belief in Environment-Friendly, Eco-label Knowledge, Eco-label Availability with Attention towards Eco-label as an intervening variable of 87 percent and the remaining 13 percent explained other

variables outside the research model.

The purpose of path analysis takes into account the direct and indirect effects, based on the results of the above analysis, conclusions can be drawn on the overall analysis in the following table:

Table 5. Direct and Indirect Effects

Variables	Direct Effects	Indirect Effects with Attention towards Eco-label (ATE) as a Intervening Variable	Total effect
Eco-label Awareness (ELA) on Purchase Intention (PIT)	0,316	0,647	0,963
Belief in Environment-Friendly ( <i>BEB</i> ) on Purchase Intention (PIT)	0,065	0,086	0,151
Eco-label Knowledge(ELK) on Purchase Intention (PIT)	0,075	0,120	0,195
Eco-label Availability (ELA) on Purchase Intention (PIT)	0,030	0,138	0,168
<i>Source:</i> Output Calculation by Authors (2020)			

Belief in Environment-Friendly Buying is influenced by the Attitude towards the Environment variable significantly (Table 1). This shows that consumers' positive attitude towards their environment will increase the trust in the environmental impact caused by environmentally friendly products. Awareness of the importance of protecting the environment and considering the conservation of the environment when buying a product so that consumers will place a green product as their main consideration in every selection of products to be purchased. Consumers believe the importance of energy-saving lighting products, the importance of energy-saving televisions, refrigerators that do not use ozone-depleting substances with environmentally conscious refrigerants, and built trust will shape consumers' attitudes to consider and buy environmentally friendly electronic products. The variables that have the biggest influence on Attention towards Ecolabel variables are (Table 3) Eco-label Awareness (0.942), Eco-label Availability (0.201), Eco-label Knowledge (0.175), and Belief in Environment-Friendly Buying (0.065). Awareness of eco-labels, the availability of eco-label products, and the awareness that the government supports environmentally friendly products by making policies on environmentally friendly products have a positive influence in making consumers pay more attention to eco-labels.

Consumers who have good knowledge of eco-labels will pay attention and be sensitive to accuracy, relevance, credibility, ease of understanding, and up to date information provided by eco-labels. Knowledge of consumers of energy-efficient electronic products, electronic products that can be recycled, and electronic products that do not damage the ozone, or electronic products with environmentally sensitive materials will increase their awareness of the importance of the next generation and concern for the environmental impacts of products electronic.

The existence of eco-label electronic products at electronic stores in Surakarta making consumers pay more attention to eco-labels, awareness of the importance of the environment for the next generation, concern for the environmental impact of electronic products, and awareness of the importance of their contribution to



environmental protection, the easier consumers get eco-label electronic goods, the more electronic products are produced to build a good environment in the future.

Consumers who have a high level of trust in purchasing green products will also pay great attention to eco-labels on electronic products. Still, in this study, Belief in Environment-Friendly Buying has no significant effect on Attention towards Ecolabel; in other words, even if consumers have a level of trust big on the purchase of green products, but does not make consumers pay attention to eco-labels more carefully. The variables that have the biggest influence on Purchase Intention variable are (Table 4) Attention towards Ecolabel (0,687), Eco-label Awareness (0.316), Eco-label Knowledge (0.075). Belief in Environment-Friendly Buying (0.065) and Eco-label Availability (0.201).

Consumers who pay attention to eco-label functionality tend to show great interest in buying environmentally friendly electronic products. Eco-labels attract attention when shopping at electronic stores, eco-labels provide relevant information, the information contained in eco-labels is easy to understand, eco-labels provide reliable information/claims, eco-labels can enhance the image of environmentally friendly products, and eco-labels are following current environmental needs. When consumers pay close attention to eco-labels, consumers will feel confident to pay attention and choose environmentally friendly electronic products. Awareness of eco-labels, the availability of eco-label products, and the awareness that the government supports environmentally friendly products by making environmentally friendly products' policies positively influence making consumers pay more attention to eco-labels.

Consumer knowledge about eco-labels affects the purchase intention of electronic products in Surakarta. Knowledge about the environment and ecolabel products has many benefits from making consumers' buying intentions increase and a positive attitude to their environment. This study supports the research conducted by Dinu et al. (2012: 8-24), which say that Roma consumers can distinguish segments characterized by a good knowledge of reality, education, and high knowledge, which can make Roman consumers have a fair and decisive attitude to individual goals as well as broad social care then consumers will have an increasingly positive attitude towards their environment. Afandie Adil (2015: 122-128) revealing that knowledge about the environment has a significant effect on the intention to purchase green products in Surakarta, Central Java, Indonesia. This research also contradicts the research results in Indonesia (Sumarsono and Giyatno, 2012: 70-85), which concluded that knowledge of ecolabel in Indonesia still lacks, as evidenced by the low level of consumer knowledge on environmental information contained in detergent product packaging.

This study yields an important conclusion that the government must support companies in ecolabelling that consumers can trust. Consumers in Indonesia need information from the government about eco-label policies so that their knowledge will increase. Ralph E. Horne (2009: 175-182) reveals that consumers generally prefer eco-labels that are regulated or sponsored by the government. However, in public, the community needs environmental information, especially information about ecolabel, which can open up people's views on society and behavior. Many people consume ecolabel products but do not know more information about the sustainability of ecolabel products that have been consumed. With a lack of in-depth information, the community has the view that not purchasing products is the most environmentally friendly attitude.

## **Conclusion**

This study's conclusions are:

- 1) Variable Eco-label Awareness and Eco-label Knowledge has a direct and significant influence on Purchase Intention of consumer electronic goods in Surakarta;
- 2) Variable Belief in Environment-Friendly and Eco-label Availability has a direct and not significant effect on Purchase Intention of consumer electronic goods in Surakarta;
- 3) Variable Attention Eco-label has a positive and significant influence on Purchase Intention of consumer electronics in Surakarta. Therefore, the Variable Attention towards Eco-label function as an intervening variable is effective.

The government must support companies in eco-labeling that can be trusted by consumers. Consumers in Indonesia need information from the government about eco-label policies so that their knowledge will increase.

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