Ecological Footprint Affecting the Pro-environmental Behavior of Undergraduates of Rajabhat Mahasarakham University

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Abstract

The research objectives were to study Ecological Footprint for Shelter, Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Cloth, Ecological Footprint for Medicine, and Ecological Footprint for Housing and Pro-environmental Behavior levels and to study the independent variables comprise of Ecological Footprint for Shelter, Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Cloth, Ecological Footprint for Medicine and Ecological Footprint for Housing affecting dependent variable of Pro-environmental Behavior of undergraduates. This survey used a questionnaire to gather 400 undergraduates and 10,757 undergraduates of Rajabhat Mahasarakham University in the first semester of the academic year of 2021. The Multi-Stage sampling technique was employed to collect the sample. Multiple Regression Analysis was used to determine the relationship between independent and dependent variables.

The results illustrated that in a holistic view of Ecological Footprint for Shelter, Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Cloth, Ecological Footprint for Medicine, and Ecological Footprint for Housing and Pro-environmental Behavior were most levels. Moreover, independent variables of Ecological Footprint for Shelter, Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Cloth, Ecological Footprint for Medicine, and Ecological Footprint for Housing can predict the variation of the dependent variable of Pro-environmental behavior with 65.90 percent of power prediction (Adjusted R2 = 0.659). Ecological Footprint for Food was the highest effect with 0.248.

Keywords: Ecological footprint, Public mind inspiration, Pro-environmental behavior

Introduction

Daily Human activities require consuming natural resources, whereas their activities also produce diverse forms of waste, such as solid and liquid wastes. Global consumption speedy escalate because the world populations are growth at an exponential rate. The abiotic and biotic environment are threatened due to the interaction between man and the environment. Overgrowth of the population goes beyond the carrying capacity of the ecological system. This is the origin of natural resources lacking for survival. The Ecological Footprint has been recognized as one of the principal global measures of human demand on nature. Ecological Footprint Accounting emphasizes whether the planet is large enough to maintain the demands of humanity (McGinley, 2012; Wikipedia, 2018).

The Ecological Footprint (EF) measures humans' dependence on natural resources by calculating how much of the environment is needed to sustain a particular lifestyle and the quantity of nature it takes to support people or an economy. In other words, it measures the demand vs. the supply of nature. It tracks this demand through an ecological accounting system. (Wackernagel, et al., 1996; Wackernagel, et al., 2002; Monfreda, et al., 2004) The focus on biologically productive land and water for humans reflects the anthropogenic perspective of the ecological footprint accounts. (Wackernagel, et al., 2005). In the context of LCA, the EF of a product is defined as the sum of time-integrated direct land occupation and indirect land occupation related to nuclear energy use and CO_2 emissions from fossil energy use and cement burning.

The Footprint represents two sides of a balance sheet. On the asset side, biocapacity represents the planet's biologically productive land areas, including our forests, pastures, cropland, and fisheries. Biocapacity can be compared with humanity's demand on nature as our ecological footprint. The ecological footprint is broadly used worldwide as an indicator of environmental sustainability. This is usually used to survey the sustainability of numerous facets, including shelter, food, cloth, transportation, medicine, and housing, thus, it determines terms of private lifestyles, institutes, goods and services, and industry sectors from regions and nations. These cover all dimensions of consumption even as it is determined to educate people on the natural resource in terms of environmental consumption. It can trigger people to alter their consumption patterns.

EF is a representative group of uniqueness for tracing and serving as means of classification; therefore, it can be categorized as the impact of human activities measured based on the area of biologically productive land and water required for goods produced and consumed. It is the number of natural resources required to produce the goods and services prerequisite to sustain a human living (Monfreda, et al., 2004; Wackernagel, et al., 2005; Gautami, 2010; Wackernagel, et al., 1998).

The total "footprint" for a labeled population's activities is measured in terms of 'global hectares.' A global hectare (acre) is one hectare (2.47 acres) of biologically productive space with annual productivity equivalent to the world average. Currently, the biosphere has nearly 11.2 billion hectares of biologically productive space consistent, with a coarse quarter of the planet's surface. These biologically productive hectares include 2.3 billion hectares of ocean

and inland water and 8.8 billion hectares of land. The land space comprises 1.5 billion hectares of cropland, 3.5 billion hectares of grazing land, 3.6 billion hectares of forest land, and 0.2 billion hectares of built-up land. These surfaces represent the total biologically productive hectares that depend on for our existence. They signify the earth's natural capital, and their annual yield represents our annual natural capital income (Monfreda, et al., 2004; Wackernagel, et al., 2005; Lim, 2018).

EF calculations use official statistics and peer-reviewed literature to gather data. Five assumptions underpin any EF calculation (Wackernagel, et al., 2005; Lim, 2018; Department of Environmental Conservation, 2019). including 1) Most of the wastes generated and resources consumed can be tracked, 2) Most of these resource and waste flows can be converted into the biologically productive area that is required to maintain these flows, 3) These different areas can be expressed in the same unit (acres or hectares) once they are scaled proportionally to their biomass productivity. That is, each particular acre can be translated to an equivalent area of world-average land productivity, 4) Since these areas have been standardized and stand for mutually exclusive uses, they can be added up to a total representing humanity's demand, and 5) This area for total human demand can be compared with nature's supply of ecological services, since it is also possible to assess the area on the planet that is biologically productive.

Global warming is recognized in other terms, such as Earth's Climate change and EF. However, these terms indicate that reforestation has just driven the public attention in Thailand. All legal aspects relating to land use and industrial activities, particularly public construction law, are also crucial in environmental matters (Richardson, et al., 2006).

Thailand has a wonderful and numerous range of natural resources. Thailand is rich in natural resources, comprised of the known mineral deposits of coal, gold, lead, tin, tungsten, manganese, zinc, and precious stones. The rich sedimentary soil along the Chao Phraya and other rivers constitute another important resource. Natural gas deposits were discovered offshore in the 1970s, reducing Thailand's reliance on imported petroleum (Royal Forestry Department, 2019; Department of Mineral Resources, 2019).

Plants and animals of Thailand Jungles and swamps, scattered through the coastal areas of Thailand, have extensive tracts of tropical trees, including mangrove, rattan, ironwood, sappanwood, ebony, and rosewood. The upland areas are also heavily wooded, the most valuable species being teak, agalloch, and oak. In addition, a wide variety of tropical plants and fruit trees, including orchids, gardenia, hibiscus, banana, mango, and coconut, occur in Thailand. Many species of animals inhabit the jungles and forests. Elephants, widely used as beasts of burden, are abundant. Other large animals include the rhinoceros, tiger, leopard, gaur, water buffalo, and gibbon. The Siamese cat is, as its name implies, indigenous to Thailand. Thailand has more than 50 species of snakes, including several poisonous varieties. Crocodiles are numerous, as are various species of fishes and birds (Royal Forestry Department, 2019; Department of Mineral Resources, 2019; Department of National Park, Wildlife and Plant Conservation, 2019).

Despite its low yield per hectare, Thailand is one of the world's leading rice producers. In the early 1990s. Thailand produced approximately 18.5 million metric tons of rice annually,

up from about 11.3 million metric tons per year in the 1960s. The second most important crop in value is rubber, which is raised mainly on plantations on the Malay Peninsula. In the early 1990s, approximately 1.4 million metric tons of rubber were produced yearly. Other important crops included cassava (21.1 million metric tons), sugarcane (46.8 million), maize (3.6 million), pineapples (1.9 million), coconuts (1.4 million), and kenaf (161,000), a fiber used in making canvas. Livestock totaled about 6.8 million cattle, 4.8 million buffalo, 5.1 million pigs, and 153 million poultry (Department of Agriculture, 2019; Nicely, 2018).

About 28 percent of the total land area of Thailand is forested. The most valuable forest product is hardwood. The annual timber harvest in the early 1990s totaled about 37.6 million cu m (about 1.3 billion m^3), of which all but 7 percent was burned for fuel. Thailand was a major exporter of teak until a ban on uncontrolled logging was instituted in 1989, following severe flooding due to deforestation. Fishing is rapidly growing in importance to the Thai economy. In the early 1990s, the annual catch included 3.1 million metric tons of prawns, fish, and shellfish, and exports of ocean products, particularly prawns, accounted for about 10 percent of export earnings.

Ecological Footprint for Transportation includes environmental degradation, adversely affecting ecological eminence and, ecosystem balance. UN Climate Change News, 15, March 2019 -The UN has published a comprehensive and rigorous assessment of the situation of the environment this week, warning that Ecological Footprint for Transportation to the planet is becoming so terrible that millions of lives will soon be at risk; therefore, it requires the urgent action taken (United Nations, 2019). The report, produced by 250 scientists and experts from more than 70 countries, indicates that either humanity drastically scales up environmental protection, including climate protection, or cities and regions, particularly in Asia, the Middle East, and Africa, could see millions of premature deaths by mid-century. The report also highlights that the world has the science, technology, and finance to move towards a more sustainable development pathway, though adequate support is still absent from the business and political leaders who are holding on to obsolete production and development models (United Nations, 2019). Therefore, the Ecological Footprint of Transportation must be taken into account the public attention to protect it for their own save (Thiengkamol, 2011e).

Objective

1. To study Ecological Footprint for Shelter, Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Cloth, Ecological Footprint for Medicine, and Ecological Footprint for Housing and Pro-environmental Behavior levels.

2. To study the independent variables Ecological Footprint for Shelter, Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Cloth, Ecological Footprint for Medicine, and Ecological Footprint for Housing affecting dependent variable of Pro-environmental Behavior of undergraduates.

Methodology

The research design was implemented step by step as the followings.

1. Population and sample

The populations were 10,757 undergraduates of Rajabhat Mahasarakham University in the first semester of the academic year of 2021. The Multi-Stage sampling technique was employed to collect the sample for 400 undergraduates (Schonlau, et al., 2002). The sample was collected by multi-stage sampling technique (Thiengkamol, 2016)

2. Research tool

The questionnaire was used as a research instrument for data gathering. The questionnaire contains 6 items of demographic characteristics and 44 questions with 5 rating scales Ecological Footprint for Shelter, Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Cloth, Ecological Footprint for Medicine and Ecological Footprint for Housing and Pro-environmental Behaviors. The content and structural validity were determined with Item Objective Congruent (IOC) by 5 experts in environmental management, social science, and social research methodology (Rovinelli, et al., 1977). The reliability was done by collecting the sample group from 50 undergraduates of Mahasarakham University, Maha Sarakham Province, which is the same characteristic of the sample group. The reliability was examined by Cronbach's Alpha (Cronbach, 1951). The IOC value is between 0.8-1.0. The reliability of Ecological Footprint for Shelter, Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Cloth, Ecological Footprint for Medicine, and Ecological Footprint for Housing and Pro-environmental Behaviors, and the whole questionnaire were 0.84, 0.87, 90, -0.91, 0.89, 0.92, 0.88 and 0.93 respectively. Answer here 8 values because it is included in the whole questionnaire.

Regression analysis is a form of predictive modelling technique that predicts the relationship between a dependent (Pro-environmental Behavior) and independent variables (Ecological Footprint for Shelter, Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Cloth, Ecological Footprint for Medicine and Ecological Footprint for Housing). The model in this study is $y = a+b1x1+b2x2+b3x3+b4x4+b5x5+b6x6\ldots$ (1).

3. Data collection

The questionnaire was used for data collecting from undergraduates of Rajabhat Mahasarakham University in the first semester of the academic year of 2021.

4. Statistical analysis

4.1 The descriptive statistics included frequency, percentage, mean and standard deviation. The rating for the explanation of the level of knowledge, public mind inspiration, and behavior was starting 1.0 as very low level, 2.0 as a low level, 3.0 as a moderate level,4.0 as more level, 5.0 as most level using the Likert scale (Thiengkamol, 2016).

4.2 The inferential statistics used was Multiple Regression Analysis (Hair, et al., 2010) considering confident intervals at 0.05 and 0.01.

Results

1. General characteristics of sample group

The 400 undergraduates who study at Rajabhat Mahasarakham University in the first semester of the academic year of 2021. They were collected by Multistage random sampling technique. Most of them studied in Humanities and Social Science Faculty with the female with 92 (23.00%), and they were female with 245 (61.25%) with an age average of 19.22 years old. They were the first order child with 199 (49.75%). Their father's occupation was agriculturist with 295 (73.75%) and had a family income per month with an average of 9,024.62 baht.

2. Results of ecological footprint for shelter level

The results of Ecological Footprint for Shelter Level of 400 undergraduates had the total mean score at more level with 4.34 while considering on each aspect, it illustrated that Using the wooden material for shelter can be accounted as EF for shelter, at most level with 4.54, and subsequences were The ruin material can be reused to decrease the greenhouse gases, and Using cement for construction can cause the greenhouse effect were with 4.40 and 4.30 respectively as presented in Table 1.

Table 1 Ecological footprint for shelter level

	Ecological footprint for shelter level	$\overline{X}$	S.D.	Level
1.	Using the wooden material for shelter can be accounted as EF for shelter.	4.54	0.68	Most
2.	Using cement for construction can cause the greenhouse effect.	4.30	0.67	More
3.	Transportation of raw materials for building construction is an origin of greenhouse gases.	4.26	0.67	More
4.	The accumulation of greenhouse gases from shelter construction is a cause of global warming.	4.26	0.67	More
5.	The ruined material can be reused to decrease greenhouse gases.	4.40	0.69	More
6.	The iron production process is the origin of greenhouse gas accumulation.	4.21	0.70	More
Mean of ecological footprint for shelter level		4.34	0.68	More

3. Results of ecological footprint for food

The results of Ecological Footprint for Food Level of 400 undergraduates had the total mean score at more level with 4.33; while considering each aspect, it was revealed that Using food carriers instead of plastic bags or foam will decrease greenhouse gases at most levels with 4.57. Subsequences were Energy required for cooking, and this activity increases the greenhouse gases, and Energy is needed for food transportation, and greenhouse gases will occur at 4.41 and 4.38, respectively, as presented in Table 2.

Table 2 Ecological footprint for food level

	Ecological footprint for food level	$\overline{X}$	S.D.	Level
1.	Energy is needed for food transportation, and greenhouse gases will occur.	4.38	0.68	More
2.	Energy is required for cooking, and this activity increase greenhouse gases.	4.41	0.69	More
3.	A delicatessen or instant food increases many greenhouse gases.	4.27	0.67	More
4.	To decrease global warming, we should consume food.	4.16	0.70	More
5.	Avoid delicatessen consumption, will decrease greenhouse gas accumulation.	4.09	0.68	More
6.	Using food carriers instead of plastic bags or foam, will decreases greenhouse gases.	4.57	0.69	Most
Mean of ecological footprint for food level		**4.33**	**0.73**	**More**

4. Results of ecological footprint for transportation level

The results of Ecological Footprint for Transportation Level of 400 undergraduates had the total mean score at more level with 4.45 while considering each aspect, it was revealed that Travel with mass communication assists to decrease greenhouse gases at most levels with 4.54, and subsequences were Traveling with a bicycle will assist in decreasing greenhouse gases accumulation, and Driving with the limitation of 50 Km/hr will assist in decreasing greenhouse gases accumulation were with 4.53 and 4.40 respectively as presented in Table 3.

Table 3 Ecological footprint for transportation level

	Ecological footprint for transportation level	$\overline{X}$	S.D.	Level
1.	Traveling by bicycle will assist in decreasing greenhouse gas accumulation.	4.53	0.64	Most
2.	Walking will assist in greenhouse gas decrease.	4.39	0.69	More

	Ecological footprint for transportation level	$\overline{X}$	S.D.	Level
3.	Traveling by carpool style help to decrease greenhouse gases.	4.38	0.71	More
4.	Travel with mass communication assists in decreasing greenhouse gases.	4.54	0.67	Most
5.	Driving with a of 50 Km/hr limit will decrease greenhouse gases accumulation.	4.40	0.671	More
6.	When parking the car, the engine must be stopped because it helps decrease greenhouse gas accumulation.	4.37	0.65	More
Mean of ecological footprint for transportation level		4.45	0.78	More

5. Results of ecological footprint for cloth level

The results of Ecological Footprint for Cloth Level of 400 undergraduates had the total mean score at more level with 4.42 while considering on each aspect, Drying cloth under the sunlight will save the energy and alleviate the global warming at most level with 4.56 and subsequences were Wearing non-iron fabric, this helps to decrease greenhouse gases accumulation. Cloth is washed by hand; It will decrease greenhouse gas accumulation by 4.53 and 4.46, respectively, as presented in Table 4.

Table 4 Ecological footprint for cloth level

	Ecological footprint for cloth level	$\overline{X}$	S.D.	Level
1.	The Washing machine must be used by following its power. This helps to decrease greenhouse gas accumulation.	4.33	0.67	More
2.	Drying cloth under the sunlight will save energy and alleviate global warming.	4.56	0.65	More
3.	Cloth is washed by hand, Which will decrease greenhouse gases accumulation	4.46	0.68	More
4.	Wearing non-iron fabric helps to decrease greenhouse gas accumulation.	4.53	0.60	Most
5.	Iron cloth with large amounts at the same time alleviates global warming.	4.27	0.65	More
6.	A Washing machine with a hot water system increases greenhouse gases.	4.22	0.68	More
Mean of ecological footprint for cloth level		4.42	0.69	More

6. Results of ecological footprint for medicine level

The results of Ecological Footprint for Medicine Level of 400 undergraduates had the total mean score at more level with 4.44 while considering each aspect. It was revealed that Herb drug could increase greenhouse gas at most with 4.52 and subsequences where Traditional Treatment assists in alleviating global warming and All medical instrument

production process increase the increases greenhouse gases were with 4.43 and 4.40 respectively as presented in Table 5.

Table 5 Ecological footprint for medicine level

Ecological footprint for medicine level	$\overline{X}$	S.D.	Level
1. All types of medicine production processes cause global warming.	4.35	0.65	More
2. All medical instrument production processes increase the increasing greenhouse gases.	4.40	0.67	More
3. Herb drugs can decrease increases greenhouse gases.	4.52	0.63	Most
4. Massage treatment helps to decrease drug consumption and helps to alleviate global warming.	4.27	0.66	More
5. All medicine factories consume energy and increase greenhouse gases.	4.39	0.69	More
6. Traditional Treatment assists in alleviating global warming.	4.43	0.68	More
Mean of ecological footprint for medicine level	4.44	0.67	More

7. Results of ecological footprint for housing level

The results of Ecological Footprint for Housing Level of 400 undergraduates had the total mean score at more level with 4.36 while considering each aspect. Ceramic wear increases the greenhouse gases at most levels with 4.51 and subsequences were Using Charcoal stove can cause global warming and Soap, toothpaste, and shampoo cause the greenhouse gases accumulation were with 4.42 and 4.38 respectively as presented in Table 6.

Table 6 Ecological footprint for housing level

Ecological footprint for housing level	$\overline{X}$	S.D.	Level
1. Dishwashing liquid causes global warming.	4.34	0.67	Most
2. Soap, toothpaste, and shampoo cause greenhouse gas accumulation.	4.38	0.68	More
3. All electrical appliances increase-greenhouse gases.	4.17	0.70	More
4. Ceramic wear increases greenhouse gases.	4.51	0.69	More
5. PVC pipe or Iron pipe can cause global warming.	4.33	0.66	More
6. Using a Charcoal stove can cause global warming.	4.42	0.67	More
Ecological footprint for housing level	4.36	0.69	More

8. Results of pro-environmental behavior level

The findings revealed that the Pro-environmental Behavior level of 400 undergraduates in holistic view was at more level with 4.45 while considering on each aspect, Everyone should consume local food to decrease greenhouse gases was at most levels with 4.52 and subsequences were Everyone should consume according to body requirement decrease greenhouse gases and Travel with Mass Transportation is a pro-environmental behavior with 4.49 and 4.47 respectively as presented in Table 7.

Table 7 Result of pro-environmental behavior level

	Pro-environmental behavior	$\overline{X}$	S.D.	Level
1.	Everyone should consume according to body requirement decrease greenhouse gases.	4.49	0.69	More
2.	Everyone should use green and clean electrical appliances to alleviate global warming.	4.36	0.66	More
3.	Everyone should use refill products to decrease greenhouse gases.	4.42	0.67	More
4.	Everyone should consume local food to decrease greenhouse gases.	4.52	0.65	Most
5.	Everyone should consume all food and drink all water to decrease global warming.	4.46	0.67	More
6.	Everyone should reuse the plastic bottles to alleviate global warming	4.45	0.65	More
7.	Travel with Mass Transportation is a pro-environmental behavior	4.47	0.78	
8.	If it is not far, I travel by bicycle to decrease greenhouse gases.	4.45	0.69	
Mean of pro-environmental behavior level		**4.45**	**0.72**	

9. Results of the independent variables comprising Ecological Footprint for Shelter, Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Cloth, Ecological Footprint for Medicine and Ecological Footprint for Housing affecting dependent variable of Pro-environmental Behavior of undergraduates

The Association between independent variables comprising Ecological Footprint for Shelter, Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Cloth, Ecological Footprint for Medicine, and Ecological Footprint for Housing affecting dependent variable of Pro-environmental Behavior of undergraduates as presented in Table 8 and 9.

Table 8 Result analysis prediction power of ecological footprint for shelter, ecological footprint for food, ecological footprint for transportation, ecological footprint for cloth, ecological footprint for medicine, and ecological footprint for housing affecting pro-environmental behavior

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.786[a]	0.661	0.659	0.410

a. Predictors: Constant, ecological footprint for shelter, ecological footprint for food, ecological footprint for transportation, ecological footprint for cloth, ecological footprint for medicine and ecological footprint for housing affects pro-environmental behavior

b. Dependent Variable: Pro-environmental behavior

Table 9 Multiple linear regression analysis between result analysis prediction power of ecological footprint for shelter, ecological footprint for food, ecological footprint for transportation, ecological footprint for cloth, ecological footprint for medicine and ecological footprint for housing affecting pro-environmental behavior.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.436	6	8.406	8.414	0.000[a]
	Residual	352.557	393	0.911		
	Total	402.993	399			

a. Predictors: Constant, ecological footprint for shelter, ecological footprint for food, ecological footprint for transportation, ecological footprint for cloth, ecological footprint for medicine and ecological footprint for housing affects pro-environmental behavior

b. Dependent Variable: Pro-environmental Behavior

From Table 8 and 9 when Multiple Linear Regression was analyzed between the independent variable of Ecological Footprint for Shelter, Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Cloth, Ecological Footprint for Medicine, and Ecological Footprint for Housing affecting the dependent variable of Pro-environmental Behavior, it was found that regression coefficient equaled to 0.786 (78.60%) and coefficient of R Square was 0.661 (66.10 %) at statistically significant with the level of 0.01. After it was adjusted, the coefficient of R Square with the prediction power was 0.659 (65.90%).

10. Results of result analysis prediction power of ecological footprint for shelter, ecological footprint for food, ecological footprint for transportation, ecological footprint for cloth, ecological footprint for medicine and ecological footprint for housing affecting pro-environmental behavior

Association between result analysis prediction power of ecological footprint for shelter, ecological footprint for food, ecological footprint for transportation, ecological footprint for cloth, ecological footprint for medicine and ecological footprint for housing affects pro-environmental behavior: the result is illustrated in Table 10.

Table 10 Association between result analysis prediction power of ecological footprint for shelter, ecological footprint for food, ecological footprint for transportation, ecological footprint for cloth, ecological footprint for medicine, and ecological footprint for housing affecting pro-environmental behavior

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. error	Beta		
1	Constant	0.125	0.152	-	1.486	0.069
	Ecological footprint for shelter	0.182	0.052	0.165	2.479	0.00*
	Ecological footprint for food	0.248	0.064	0.109	4.230	0.00*
	Ecological footprint for transportation	0.191	0.056	0.081	2.612	0.00*
	Ecological footprint for cloth	0.152	0.046	0.072	1.502	0.061
	Ecological footprint for medicine	0.166	0.034	0.098	1.945	0.047*
	Ecological footprint for housing	0.173	0.046	0.0632	2.202	0.045*

a. Predictors: Constant, ecological footprint for shelter, ecological footprint for food, ecological footprint for transportation, ecological footprint for cloth, ecological footprint for medicine and ecological footprint for housing affecting pro-environmental behavior

b. Dependent Variable: Pro-environmental behavior

From Table 10, linear regression equation, it was revealed that independent variable of Result Analysis Prediction Power of Ecological Footprint for Food, Ecological Footprint for Transportation, Ecological Footprint for Shelter affecting dependent variable of Pro-

environmental Behavior with statistically significant at the level of 0.01. The Ecological Footprint for Housing and Ecological Footprint for Housing is not statistically significant at 0.05.

Equation 1 can be written as the following.

$$y = a+b1x1+b2x2+b3x3+b4x4+b5x5+b6x6……. (1)$$

When

y = Pro-environmental Behavior as Dependent Variable
a = constant value
b1 = Coefficient relation of Ecological Footprint for Shelter
x1 = Ecological Footprint for Shelter as Independent Variable
b2 = Coefficient relation of Ecological Footprint for Food
x2 = Ecological Footprint for Food
b3 = Coefficient relation of Ecological Footprint for Transportation
x3 = Ecological Footprint for Transportation as Independent Variable
b4 = Coefficient relation of Ecological Footprint for Food
x4 = Ecological Footprint for Cloth
b5 = Coefficient relation of Ecological Footprint for Medicine
x5 = Ecological Footprint for Medicine as Independent Variable
b6 = Coefficient relation of Ecological Footprint for Housing
x6 = Ecological Footprint for Housing

The prediction equation of association ecological footprint for shelter, ecological footprint for food, ecological footprint for transportation, ecological footprint for cloth, ecological footprint for medicine, and ecological footprint for housing affecting dependent variable of pro-environmental behavior of undergraduate.

It can be explained that ecological footprint for food was the most effective for people practicing pro-environmental behavior quality maintenance behavior with 24.80 percent with a statistically significant level of 0.01. subsequences were ecological footprint for transportation and ecological footprint for shelter with 19.10 and 18.20 percent with a statistically significant level of 0.01 as shown in the following equation 2.

$$y = 0.125+0.182x1+0.248x2+0.191x3+0.152x4+0.166x5+0.173x6..... (2)$$

Discussions

The findings illustrated that the 6 items measured the independent variable of ecological footprint for shelter, and it was revealed that items using the wooden material for shelter could be accounted as EF for shelter at most levels with 4.54. This might indicate that people are aware and understand that using the wooden material for shelter can be accounted as EF is one of an origin of deforestation causing global warming. It is pertinent to the study of (Chaysri, et

al., 2016) who researched "Carbon Footprint and Environmental Education Affecting Conservation Behavior" in Roi Ed Province" that carbon footprint or ecological footprint affects the conservation behavior. Moreover, the ecological footprint for food results showed that using food carriers instead of plastic bags or foam will decrease greenhouse gases at most levels with 4.57. This is also relevant to the research of (Mukpradab, et al., 2016) who studied the "Model of Factors Affecting Environmental Conservation Behavior of High School Students". People agree to use food carriers instead of plastic bags or foam because they want to protect the accumulation of greenhouse gases. However, the results of ecological footprint for transportation showed that traveling with mass communication assists in decreasing greenhouse gases at most levels with 4.54. This is in line with the study of (Chaysri, et al., 2016) which on "Carbon Footprint and Environmental Education Affecting Conservation Behavior", revealed that mass transportation assists in decreasing greenhouse gases accumulation and help practice pro-environmental behavior. Subsequently, the results of ecological footprint for medicine showed that herb drug could decrease greenhouse gases at most levels with 4.52. It is higher than other aspects. People recognized ecological footprint for medicine that they realized the importance of using herb drugs instead of modern medicine.

Finally, the aspect of ecological footprint for housing showed that Ceramic wear increases the greenhouse gases at most levels with 4.51. This is congruent to the study (Sangkaew, et al., 2016) that researched the "Model of Factors Affecting Environmental Conservation Behavior of Junior High School Student," which revealed that ecological knowledge affected environmental conservation behavior. Furthermore, Ecological Footprint for Housing results indicated that Using Charcoal stoves can cause global warming at is more level of 4.42. It is congruent to the study of (Mukpradab, et al., 2015) who studied the "Model of Ecological Footprint and Environmental Education," which revealed that all aspects of Ecological Footprint could predict environmental conservation behavior with 48.00 percent, Ecological Footprint, directly and indirectly affected environmental conservation behavior with 0.54 and 0.06. Finally, this research result indicated that the Ecological Footprint for Food affecting or predicting the Pro-environmental Behavior with 24.80 % has the highest effect compared to others, such as Ecological Footprint for Shelter, Ecological Footprint for Transportation and Ecological Footprint for Cloth and Ecological Footprint for Medicine. It might explain the undergraduates or people aware of changing their behavior after they gain more knowledge and understanding of all aspects of ecological footprint.

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