Environmental Education and Public Mind Affecting Forest Conservation Behavior
สิ่งแวดล้อมศึกษา และจิตสาธารณะที่มีผลต่อพฤติกรรมการอนุรักษ์ป่าไม้

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Abstract

This research was a quantitative research with the survey method. Data collection was conducted with the sample group of 390 local people who live in Khampom Sub-district, Wapeeprartoom District and Mahasarakham Province in the Northeastern region of Thailand. A questionnaire was used as the instrument for data collection. The objectives were to study the environmental education level, public mind for forest conservation level, and forest conservation behavior level and to study the independent variables of environmental education in terms of environmental knowledge, environmental awareness, environmental attitude, environmental participation, and public mind for forest conservation level affecting the dependent variable of local people conservation behavior. In data analysis, Multiple Regression Analysis was used for predicting the relationship between independent variables and dependent variable. The findings illustrated that environmental education, public mind for forest conservation and forest conservation behavior of local people were at high levels. Moreover, independent variables comprising of environmental knowledge, environmental awareness, environmental attitude and environmental participation, and public mind for forest conservation affected the dependent variable forest conservation behavior of local people with 78.70 percent of power prediction (Adjusted R^2 = 0.784) with statistically significant at level of 0.01.

Keywords : Environmental education, Inspiration, Public mind, Environmental conservation, Forest conservation behavior

บทคัดย่อ

การวิจัยนี้เป็นการวิจัยเชิงปริมาณซึ่งใช้การสำรวจ เก็บรวบรวมข้อมูลโดยใช้แบบสอบถามกับกลุ่มตัวอย่างคือชาวชุมชนที่อยู่ในตำบลขามป้อม อำเภอวาปีปทุม จังหวัดมหาสารคาม ในภาคตะวันออกเฉียงเหนือของประเทศไทย จำนวน 390 คน โดยมีวัตถุประสงค์ เพื่อศึกษาระดับหลักการสิ่งแวดล้อมศึกษา ซึ่งประกอบด้วย ความรู้ทางสิ่งแวดล้อมศึกษา ความตระหนักต่อปัญหาสิ่งแวดล้อม เจตคติที่ดีต่อสิ่งแวดล้อม ระดับแรงบันดาลใจในการมีจิตสาธารณะและระดับพฤติกรรมการอนุรักษ์ป่าของชาวชุมชน และศึกษาอิทธิของตัวแปรอิสระ ประกอบด้วย หลักการสิ่งแวดล้อมศึกษา และแรงบันดาลใจในการมีจิตสาธารณะ ที่ส่งผลต่อตัวแปรตามคือพฤติกรรมการอนุรักษ์ป่าของชาวชุมชน และใช้สถิติการถดถอยพหุคูณเชิงเส้นตรงเพื่อทดสอบสมมติฐานของการวิจัย

ผลการวิจัย พบว่า ระดับพฤติกรรมการอนุรักษ์ป่าของชาวชุมชน โดยภาพรวม อยู่ในระดับมากทั้งหมด อีกทั้งยังพบว่า กลุ่มตัวแปรอิสระ ซึ่งประกอบด้วย หลักการสิ่งแวดล้อมศึกษา และแรงบันดาลใจในการมีจิตสาธารณะ ส่งต่อพฤติกรรมการอนุรักษ์ป่าของชาวชุมชน โดยมีอำนาจในการพยากรณ์ ร้อยละ 78.40 (Adjusted R^2 = 0.784 อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01

คำสำคัญ: สิ่งแวดล้อมศึกษา แรงบันดาลใจ จิตสาธารณะ การอนุรักษ์สิ่งแวดล้อม พฤติกรรมการอนุรักษ์ป่า

1. INTRODUCTION

Thailand is located in the tropical rain forest area and possesses a wide range of forest habitat types that covers Deciduous Forests and Evergreen Forests. Deciduous Forests composes of Mixed Deciduous, Dry Deciduous, and Bamboo Forest. Evergreen Forests can mainly be divided into 5 groups: Moist Evergreen, Dry Evergreen, Hill Evergreen, Mangrove Forest, and Pinus Forest. About 30 percent of the forests in Thailand are regarded as Evergreen Forests. Nonetheless, it should be classified by two more definitions that are significant for describing those definitions that are very essential in explaining the forest situation. These are Primary forest and Secondary forest. Primary forest is claimed to be untouched, a perfect forest that exists in its original state. Secondary forest is a forest that has been disturbed in some ways naturally or unnaturally. Consequently, Thailand's forests range from mangroves to pine forests or from coastal to mountain top [1] [2].

Forests are fundamental to all living creatures including human life containing approximately 90 percent of the world's terrestrial biodiversity [3]. Additionally, they are necessary producers of human basic needs including food, medicine, clothing, and shelter since prehistoric time. Subsequently, humans are gradually involved in food cultivation by clearing a small patch forest to grow food. However, humans persistently depend on forests to serve numerous needs such as the need for paper, timber, fire wood, medicine, and food. Currently, in developing countries, forests are functioning as fences going against the wind and stopping soil erosion. Since the roots bind the soil, they prevent erosion caused by wind or water then. Plant communities cover approximately 9.4 percent of the Earth's surface in various regions, and they functions as habitats for organisms, hydrologic flow modulators, and soil conservers. Forest components are the most essential aspects of the biosphere. Moreover, they are classified mainly by trees. The concept of a forest ecosystem includes additional species such as smaller plants, fungi, bacteria, and animals as well as physical and chemical processes such as energy flow and nutrient cycling [1] [2] [5] [6]. Also, forests offer products like fruits, herbs, fibers, bamboos, grasses, canes, rattans, timers, flosses, oils, and medicine, and diverse types of trees in forests support human life in the form of various products.

Forest conservation results from understanding the local people's way of life and gaining precise information from their daily life and behavior including their environmental knowledge, environmental awareness, environmental attitude, and environmental participation. Therefore, the environmental education principles are necessary for local people to gain forest conservation behavior, and it aims to give knowledge, make understanding, raise awareness and change attitude and value, so they take responsibility, make correct decision for environmental problem solving, participate in environmental activities with consciousness, and change behavior in their daily life to conserve environment and natural resources [5] [7] [8] [9].

Accordingly, Thiengkamol (2009-2012) revealed that public consciousness or public mind are based on inspiration found in people who wish to conserve forests. However, inspiration is dissimilar to motivation because inspiration needs no rewards, admirations, and complements. Inspiration from public consciousness or public mind means when one particularly wishes to conserve the natural resources and environment, he or she doesn't want any rewards, admirations or complements to do it, but he or she is willing to do it. For that reason, inspiration might occur due to admiration in a person as a role model or an idol, or due to impression of events, situations, environment, and the media such as movies, books, magazines, and information on the Internet. [1] [5] [8] [10] [11] [12] [13] [14] [15].

Moreover, it was found that environmental education composing of environmental knowledge,

environmental awareness, environmental attitude, and environmental participation could adjust conservation behavior. Therefore, numerous studies indicated that the environmental education and public inspiration are mediators altering environmental behavior and the studies by Thiengkamol and her colleagues, using the structural equation model, can prove this relationship. Numerous factors revealed that environmental knowledge, environmental awareness, environmental attitude, and environmental participation are observed variables of environmental education, and latent variable affected inspiration of public awareness for environmental conservation to environmental behavior related global warming alleviation. Other various studies of her colleagues also found the similar results [15] [16] [17] [18] [19].

Therefore, this research introduced environmental education and public mind for forest conservation that affect forest conservation behavior by implementing a survey research to investigate forest conservation behavior based on environmental education and public mind for forest conservation to establish the better behavior of forest conservation of local people in order to gain more knowledge , awareness, attitude and participation of local people in the Northeastern region of Thailand [15] [16] [17] [18].

2. OBJECTIVE

2.1 To study the environmental education, public mind for forest conservation and forest conservation behavior levels of local people.

2.2 To study the independent variables comprising of environmental education and public mind for forest conservation affecting dependent variable of forest conservation behavior of local people.

3. METHODOLOGY

3.1 The populations of 1,818 local people living in 4 villages in Khampom Sub-district, Wapeepratoom District, Mahasarakham Province in Northeastern region of Thailand. The simple random sampling technique was used to collect the sample of 390 local people.

3.2 The research instrument was the questionnaire, used for data collection. The questionnaire is composed of 40 questions with 5 rating scales on environmental knowledge, environmental awareness, environmental attitude, environmental participation, public mind for forest conservation, and forest conservation. The contents and structural validity were determined with Item Objective Congruent (IOC) by 5 experts in the aspects of forest, social science and social research methodology. The reliability was done by collecting the sample group from 50 local people of Khampom Sub-district, Wapee Prartoom District, Maha Sarakham Province, having the similar characteristics of the sample, but they were not part of sample group. The reliability was determined with Cronbach's Alpha [19].

3.3 The descriptive statistics used included frequency, percentage, mean and standard deviation. The rating for explanation of levels of environmental knowledge, environmental awareness, environmental attitude, environmental participation, public mind for forest conservation and forest conservation were starting at 0-1.50 as very low level, 1.51-2.50 as low level, 2.51-3.50 as moderate level, 3.51-4.50 as higher level, and 4.51-5.00 as the highest level. The inferential statistics used was Multiple Regression Analysis [36] by considering confident interval at 0.05 and 0.01.

4. RESULTS

The reliability of environmental knowledge, environmental awareness, environmental attitude, environmental participation, public mind for forest conservation, and total questionnaire were 0.901, 0.903, 0.901, 0.902, 0.938 and 0.987 respectively.

4.1 Results of Environmental Education Level

The results of environmental education level of 390 local people had total mean score at higher level with 4.47. By considering on each aspect, it was revealed that the environmental education level comprising environmental knowledge level, environmental awareness level, and environmental attitude level were at high level with 4.45, 4.39 and 4.45 but environmental participation level was at the highest level with 4.54. Moreover, by considering on the aspect of environmental knowledge, the mean score of "Forest destruction is the main factor of climate change" was at the highest level with 4.62. The mean scores of "Forest is important for ecosystem because it is a primary producer" and "If we introduced others to use other materials instead of timber, it is accounted as forest conservation" were 4.49 and 4.47 respectively. In the aspect of environmental awareness, the mean score of "Forest is a renewable resource, but everyone should avoid using it" was at the highest level with 4.62. The mean scores of "Human action destroys the environment and the environment destroys human", "Everyone gains benefit from environmental protection", and "Avoid cutting timber is a means of forest conservation" were 4.49, 4.49, and 4.47 respectively. In the aspect of environmental attitude, the mean score of "Forest area is in crisis; therefore it needs to be solved" was at the highest level with 4.62. The mean scores of "All living creatures in forest are valuable to conserve", and "One protects environment because one wants better quality of life" were 4.50 and 4.49 respectively. In the aspect of environmental participation, the mean score of "One distributes the forest conservation information on implementation and regulation" was at the highest level with 4.63, and "One participates in the campaign of forest conservation", "One regularly participates in tree cultivation activities", and "One cultivates tree around the house and surrounding rice farm" were 4.62, 4.62, and 4.49.

4.2 Results of Public Mind for Forest Conservation Level

The findings revealed that 390 local peoples favoring forest conservation level in holistic view was at high level with 4.48. By considering on each issue, it was revealed that one getting inspiration of the public mind from the His Majesty the King who gave trees to nature was at the highest level with 4.63. One got impression from social people who devoted to forest conservation, and one got inspiration from public exegete from the role model and the movie stars at 4.62 and 4.61 respectively.

4.3 Results of Forest Conservation Behavior Level

The findings revealed that forest conservation behavior level of 390 local people in holistic view was at high level with 4.45. By considering on each issue, it was found that "Local people participated in decreasing timber cutting and deforesting", "Local people persuaded other local community to protect the forest for global warming alleviation", and "Local people participated in every environmental activity without benefit demand" were at the highest levels with 4.63, 4.62, and 4.62 respectively.

4.4 Results of Environmental Education and Public Mind Affecting to Local Peoples Forest Conservation Behavior

The relationship between the independent variables of environmental education and public mind for forest conservation affected forest conservation behavior as presented in table 1 and 2.

Table 1. Result Analysis Prediction Power of Environmental Education and Public Mind Affecting to Local Peoples Forest Conservation Behavior

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.887[a]	0.787	0.784	0.19854

a. Predictors: Constant, Environmental Education and Public Mind

b. Dependent Variable: Forest Conservation Behavior

Table 2. Multiple Linear Regression Analysis between Environmental Education and Public Mind Affecting to Local Peoples Forest Conservation Behavior

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	55.895	5	11.179	283.596	0.000[a]
	Residual	15.137	384	0.039		
	Total	71.032	389			

a. Predictors: Constant, Environmental Education and Public Mind

b. Dependent Variable: Forest Conservation Behavior

From table 1 and 2, as Multiple Linear Regression was analyzed between independent variable of environmental education and public mind for forest conservation affecting the dependent variable of air to forest conservation behavior, it was found that regression coefficient equaled to 0.887 (88.70%) and coefficient of Adjusted R Square was 0.784 (78.40 %) at statistically significant with level of 0.01. After it was adjusted, the coefficient of Adjusted R Square with power of prediction was 0.784 (78.40%).

4.5 Results of Environmental Education and Public Mind Affecting to Local Peoples Forest Conservation Behavior

The relationship between environmental education and public mind affecting local people forest conservation behavior was illustrated in table 3.

Table 3. Relationship between Environmental Education and Public Mind Affecting to Local Peoples Forest Conservation Behavior

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	Constant	-0.112	0.132	-	-.790	0.359
1	Environmental Knowledge	0.196	0.062	0.174	3.142	0.00**
	Environmental Awareness	0.083	0.061	0.085	1.363	0.174
	Environmental Attitude	-0.034	0.057	-0.033	-0.599	0.549
	Environmental Participation	0.255	0.060	0.210	4.257	0.00**
	Public Mind	0.527	0.050	0.515	10.566	0.00**

a. Dependent Variable: Forest Conservation Behavior

From table 3, linear regression equation, it was revealed that independent variables of environmental education in terms of environmental knowledge and environmental participation, and public mind affected dependent variable of local people's forest conservation behavior with statistically significant at level of 0.01, 0.01, and 0.01 respectively, but environmental awareness and environmental attitude affected dependent variable of local people's forest conservation behavior with no statistically significant at level of 0.05 and 0.05 respectively.

The equation 1 can be written as the following

$y = a+b1\ X1+b2\ X2+b3\ X3+b4\ X4+b5\ X5$.... (1)

When

y = Local Peoples Forest Conservation Behavior as Dependent Variable

a = constant value

b1 = Coefficient relation of Environmental Knowledge

X1 = Environmental Knowledge as Independent Variable

b2 = Coefficient relation of Environmental Awareness

X2 = Environmental Awareness as Independent Variable

b3 = Coefficient relation of Environmental Attitude

X3 = Environmental Participation as Independent Variable

b4 = Coefficient relation of Environmental Participation

X4 = Environmental Attitude as Independent Variable

b5 = Coefficient relation of Public Mind for Forest Conservation

X5 = Public Mind for Forest Conservation as Independent Variable

The prediction equation of the relationship among environmental knowledge, environmental awareness, environmental attitude, environmental participation and public mind affected dependent variable of local people's forest conservation behavior. It can be explained that public mind for forest conservation had the greatest effect on local people's forest conservation behavior with 52.70 percent with statistically significant at level of 0.01. Environmental participation and environmental knowledge were 25.05 and 19.60 percent with statistically significant at level of 0.01 and 0.01 respectively as presented in the following equation 2.

$Y=-0.122+0.196X1+0.083X2-0.034X3+0.255X4+0.527X5$..... (2)

5. DISCUSSIONS

The results indicated that environmental participation was at the highest level and environmental knowledge, environmental awareness, environmental attitude, and public mind for forest conservation and forest conservation behavior were at high levels. However, the prediction equation of the relationship between environmental education and public mind for forest conservation affecting dependent variable of people's forest conservation behavior was revealed that the public mind for forest conservation was the most effective prediction. This implies that public mind for forest conservation was the most effective variable that can be used for changing local people's forest conservation behavior with 52.70 percent and subsequence was environmental participation. Therefore, people who have high public mind awareness for forest conservation tend to perform and participate in forest conservation. Nevertheless, environmental knowledge also affected forest conservation behavior. Therefore, to alter local people's forest conservation behavior, we need to raise their public mind awareness, enhance their environmental participation and give more environmental knowledge to them. Finally, they would perform better behavior of forest conservation. The results were congruent to the studies of Donkonchum et al., 2012a; Tumpracha et al., 2012b; Udonboon et al., 2012b; Waewthaisong et al., 2012a;Saisunantharom et al., 2013a; Suebsing et al., 2013a; Kotchachote et al., 2013a.

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