Causal Relationship Model of Food Security Management

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Abstract The populations were 18,463 upper secondary school students from school under Secondary Service Area Office 24 (Kalasin), Northeastern region of Thailand in academic year of 2012. The Multi-stage random sampling technique was employed to collect the sample for 371 upper secondary school students. The research instrument was the questionnaire and it was used for data collecting. LISREL wFas used for model verification. The objective of this research was to develop causal relationship model of food security management for upper secondary school student of Kalasin Province. Considering on structural model confirmatory factors of Environmental Education (EE) and Food Security Management Characteristics (FC) were able to explain the variation of endogenous factors of Inspiration of Public Consciousness with Food Security Management for Environmental Conservation (FP) to caused Food Security Behaviors (FB) with 54.00 percents. As a result, the equation 1, it can be written as following.

$$FB = 0.57*FP + 0.49*EE - 0.33*FC \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

$$R^2 = 0.54$$

Moreover, confirmatory factors of Environmental Education (EE) and Food Security Management Characteristics (FC) were able to explain the variation of confirmatory factors of Inspiration of Public Consciousness with Food Security Management for Environmental Conservation (FP) with 58.00 percents. Therefore, the equation can be written as following equation 2.

$$FP = 0.34*EE + 0.52*FC \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

$$R^2 = 0.58$$

Key Words: Causal Relationship Model / Food Security Behavior /Environmental Education

1. Introduction

The increment of greenhouse gas emissions is raising the earth's temperature and consequences include melting glaciers, more precipitation, additionally extreme weather fluctuation, and uneven seasons. The speeding velocity of climate change, combined with global population and income growth, threatens food security everywhere in the world. Populations in the developing world, which are already vulnerable and food insecure, are likely to be the most seriously affected. In 2005, nearly half of the economically active population in developing countries with 2.5 billion people relied on agriculture for its livelihood. Presently, most of them about 75 percent of the world's poor live in rural areas (Gerald, 2009, FAO, 2009 & Thiengkamol, 2009c).

According to the United Nations Food and Agriculture Organization's (FAO's) widely accepted definition, "Food security" means that food is available at all times; that all persons have means of access to it; that it is nutritionally adequate in terms of quantity, quality and variety; and that it is acceptable within the given culture. Only when all these

conditions are in place can a population be considered "food secure." In addition to, food security may be defined as access by all people at all times to the food required for a healthy life; at the household level, at issue is the household's ability to secure enough food to ensure adequate dietary intake for all of its members (Von Braun et al., 1993).

The concept of food security has been undergoing an evolutionary change during the last 50 years. In the 1950s, food security was considered essentially in terms of production. It was assumed that adequate production would assure adequate availability of food in the market as well as in the household. In the 1970s, it became clear that availability alone did not lead to food security, since those who lacked purchasing power were not able to have access to balanced diets. Purchasing power again is related to jobs or livelihood opportunities. Moreover, recently, it is becoming evidence that even if availability and access are satisfactory, the biological absorption of food in the body is related to the consumption of clean drinking water as well as to environmental hygiene, primary health care and primary education. Additionally, there are micro and macro issues cause food insecurity such as political instability, poor economic government, poverty, and lack of sustainable household income (GECAFS, 2008).

Despite remarkable success in economic growth and poverty reduction in Asia, many Asia-Pacific countries have faced with problems of food insecurity. During 2003-2005, 541.9 million people in this region were undernourished even through many countries do have policies for ensuring an adequate availability of basic food products, particularly staple food grains. Each country in the region has enhanced food accessibility with minimum food requirement at the household level (FAO, 2009, & Thiengkamol, 2009a).

Over the last 50 years, the main global food issues have been famine, chronic hunger and protein-energy malnutrition (PEM). These problems interact with other problems and, as they retreat, expose new problems. Hence, attention is paid increasingly to nutrition security. Although undernourishment still contributes to the deaths of 6 million children each year, other goals cannot be brushed aside: anemia increases the mortality risk for more than 1.5 billion people worldwide; obesity (Body Mass Index: BMI >27.5) affects about a third of adults in the United States and will help kill at least another third. Paradoxically, nutrition problems of late development, such as obesity, are genetically and behaviorally rooted in those of underdevelopment, such as PEM. Moreover, a growing majority of countries are seriously affected by both sets of problems (FAO, 2001).

Thailand has agricultural development policy based on increases in productivity and incomes is a key driver to achieve national and household food security, moreover export of surplus production for the global food security has also emphasized as well. The production of food in Thailand, particularly rice, has enormously increased far more than the domestic demand therefore the surplus production is exported. While it is a food surplus country at the macro level, food accessibility at the household level remains a problem, particularly remote rural areas (Isvilanonda, & Bunyasiri, 2009, Theingkamol, 2011c , Theingkamol, 2009c)

Food availability and accessibility have been impacted by the global economic crisis, climate change and the expansion at the production of food-fuel crops. Additionally, the rise of global food price in recent years has induced a sharp increase in the domestic food price, causing a high inflation rate, especially, for the poor, food constitutes is considerable as an important portion of expenditure of household income. The high food price and inflation rate directly affect their livelihood status (Isvilanonda, & Bunyasiri, 2009, & Theingkamol, 2009c).

The household food poverty line, on average in 2007 was at 779 baht (22.58 US$)/person/month, or approximately 54 percent of the total poverty line. Using the official food poverty line, it was found that 416,410 people in Thailand or 0.65 percent of the population were affected by food poverty. The problem of food poverty in Thailand is highly concentrated in the rural North and Northeast. Even though the poorest subsistence farmers generally consume more than half of their own production but all their food needs cannot be met by their production. For example, while purchased rice expenditures of the poorest subsistence farmer accounted for 12 percent of total rice expenditures, purchased meat and vegetable expenditures accounted for 92 percent of total meat expenditures and 86 percent of total vegetable expenditures respectively. Overall purchased food expenditures of the poorest subsistence farmers accounted for 59 percent of total food expenditures and 47 percent of the total money income. Where prices of other foods, such as meat increase dramatically relative to staple grains, some farmers cannot afford to purchase what they do not produce (Isvilanonda, & Bunyasiri, 2009).

In view of on food stability, vulnerable households have not accessed to adequate food at all times even though Thailand has action plan to greatly reduced food poverty during 1988-2007. The numbers of people were affected by food poverty increased during 1998-2000 (in the wake of the financial crisis in 1997) and during 2004-2006 because of food price inflation) (Isvilanonda, & Bunyasiri, 2009).

It's also not clear whether current research on food insecurity reflects students' experiences. Current research suggests that there are psychological, social and physical consequences of food insecurity. It is not clear whether food insecure students experience these consequences or if there are additional consequences unique to students. There was a research tried to explore the food insecurity experience of postsecondary students in Canada with the research

objectives of document the severity of food insecurity in first-time and repeat users, describe the factors that explain the clients' usage level and identify strategies that Campus Food Bank clients use for coping with food insecurity including describe the relationship between Campus Food Bank clients' well-being including health and academic performance) and food insecurity (Krista, 2007). This indicated that even though in the developed country, it also has problem of food insecurity that might be due to their consumption behavior or their knowledge and understanding of nutritional component requirement of body.

Consequently, to develop people, especially, new generations to have proper consumption behavior by minimizing ready-to-eat food such as potato chip, fried chicken, fried beef, and unwell cooking, it needs to cultivate them with environmental education process through different channels of educational system whether with Formal Education System, Non-Formal Education System, Informal Education System, and Lifelong Education System (Chotechuan, 2006, & Thiengkamol, 2011e). Particularly, the youths who are students by providing environmental education principle with a variety of activities to raise their knowledge and understanding, awareness, positive attitude, public consciousness and responsibility for natural resources and environment conservation including food security management for environmental conservation, it will lead to success mean of active learning process through brain storming of group dynamic activities. Therefore, it will assist them to aware the importance of food security and it will a good process for attitude and behavior changing to conserve natural resources and environment conservation to meet food security (Thiengkamol, 2009c,Thiengkamol, 2011e, Thiengkamol, 2011g, Thiengkamol, 2011h, Thiengkamol, 2011i, Thiengkamol, 2011j, &2012b).

During the past few decades, Thailand has agricultural development policy that has emphasized on the nation's food security and export income. It is also a food surplus country at the macro level, but at the household level remains a problem in food security. According FAO, food security refers availability, accessibility and utilization, especially, nutritional knowledge and understanding. But in the educational institute like as school, it should pay attention to quantity, quality, safety, and good taste which is the concept Ministry of Public Health of Thailand. Therefore, the secondary school students in Northeastern Region, lack of nutritional knowledge, attitude, awareness, value and behavior.

Concerning to another essential factor that was neglected is inspiration to have public consciousness or public mind. Public mind or public consciousness was defined according to different perception or consideration of people, however in Thai society gave various meaning such as National Research Council of Thailand giving definition of public mind that take notice and participate in the public issues that are advantage to country with consciousness and holding the system of morality and ethics including indignity for wrong action and emphasizing on being neat, economizing, and balance between human and nature.

Along with concept of inspiration of public consciousness, Thiengkamol mentioned on public consciousness or public mind based on inspiration from insight and inspiration different from motivation because inspiration needs no rewards. Inspiration of public consciousness or public mind, especially, for natural resources and environment conservation, one doesn't receive any reward, admiration or complement for ones act for natural resources and environment conservation. Inspiration on might occur due to appreciation in a person as role model or idle, events, situations, environment, media perceived such movies, book, magazine, and internet. (Thiengkamol, 2009a , Thiengkamol, 2009b , Thiengkamol, 2011a; and Thiengkamol, 2011e, Thiengkamol, 2011f, Thiengkamol, 2011i, Thiengkamol, 2011j, Thiengkamol, 2012c, &Thiengkamol, 2012d).

As mentioned above, particularly, for Northeastern region, most of people prefer to eat unwell cooking beef and fish. Particularly, the problems of food insecurity, the new generations of secondary school students are still of lacking knowledge and understanding, awareness, positive attitude, public consciousness and responsibility for consumption behavior changing to practice in accordance with awareness of better nutritional composition. Moreover, these youth are in trap of over consumption without economization by following capitalism concept and materialism, they should turn back to traditional Thai food that contains various herbs and vegetables to meet healthier. This research was interesting to study on development of causal relationship model food security management with integration of environmental education and food security management characteristics affecting through inspiration of public consciousness with food security management for environmental conservation to food security behaviors for upper secondary school student under the Office of Kalasin Educational Area Zone 24.

2. Objective

The objective of this study was to develop causal relationship model of food security management for upper secondary school student of Kalasin Province.

3. Methodology

The research design was implemented in steps by step as follows:

1) The populations were 18,463 upper secondary school students from school under Secondary Service Area Office 24 (Kalasin), Northeastern region of Thailand in academic year of 2012. The 371 upper secondary school students were used as sample group. The research instrument was the questionnaire and it was used for data collection. LISREL was used for model verification. The content and structural validity were determined by Item Objective Congruent (IOC) with 5 experts in the aspects of environmental education, psychology, social science and social research methodology. The reliability was done by collecting the sample group from 50 upper secondary school students from other area of education that locates nearby. The reliability was determined by Cronbach's Alpha. The reliability of environmental education, food security management characteristics, inspiration of public consciousness with food security management for environmental conservation, and food security behaviors, and the whole questionnaire were 0.872, 0.917, 0.935, 0.875 and 0.957 respectively.

2) The descriptive statistics used were frequency, percentage, mean and standard deviation. The inferential statistics used was LISREL by considering on Chi-Square value differs from zero with no statistical significant at 0.05 level or Chi-Square/df value with lesser or equal to 2, P-value with no statistical significant at 0.05 level and RMSEA (Root Mean Square Error Approximation) value with lesser than 0.05 including index level of model congruent value, GFI (Goodness of Fit Index) and index level of model congruent value, AGFI (Adjust Goodness of Fit Index) between 0.9-1.00.

4. Results

4.1 General Characteristics of Sample Group

The sample group was 371 upper secondary school students under the Office of Kalasin Educational Area Zone 24 in academic year of 2012. Most of them were female with 58.22%, studying at level 6 with 33.97%. Their father status and father status were living together with 82.48% and 77.36%. Majority of their father, and mother education levels were at the same level at lower than lower secondary school and upper secondary school/vocational school with the same 36.12%. Their father, and mother had occupation as agriculturist and employee / hire with 21.56%, and 22.64% respectively. Their father and mother had average income with 8,000 Bahts and 7,600 Bahts, and their father and mother had average age with 41.50 and 37.50 years old as presented in table1.

Table 1 General Characteristics of Sample Group of Upper Secondary School Students

Sex	Number	Percent
1.Male	155	41.78
2.Female	216	58.22
Total	371	100
Studying in Level	Number	Percent
1. Level 4	122	32.88
2. Level 5	123	33.15
3. Level 6	126	33.97
Total	371	100

Table 1 (Cont')

Student from School Size	Number	Percent
1. Special Large	100	26.95
Total	371	100
Father Status	Number	Percent
1. living together	306	82.48
Total	371	100

Mother Status	Number	Percent
1. living together	287	77.36
Total	371	100
Father Education Level	Number	Percent
1. Lower Secondary School or Lower	134	36.12
Total	371	100
Mother Education Level	Number	Percent
1. Lower Secondary School or Lower	133	35.85
Total	371	100

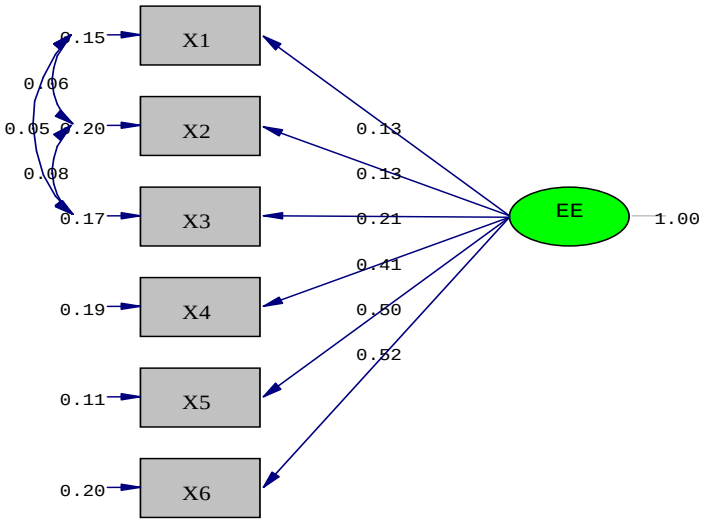
Table 1 (Cont')

Father Occupation	Number	Percent
1. Agriculturist	80	21.56
Total	371	100
Mother Occupation	Number	Percent
1. Agriculturist	75	20.22
Total	371	100

4.2 Confirmatory factors Analysis of Exogenous Variables

1) Confirmatory factors Analysis of Exogenous Variables of Environmental Education (EE).

Confirmatory factors of EE had Bartlett's test of Sphericity of 639.323 statistically significant level ($p < .01$) and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA) of 0.764. This indicated that components of EE aspect had proper relationship at good level and it can be used for analysis of confirmatory factors as shown in picture 1 and table 2.



Chi-Square=6.94, df=6, P-value=0.32607, RMSEA=0.021

Picture 1: Model of Confirmatory factors of Environmental Education

Table 2 Results of Analysis of Confirmatory factors of Environmental Education

Components of Environmental Education	Weight	SE	t	R^2
X1 Knowledge and Understanding	0.13	0.032	5.65**	0.10
X2 Environmental Attitude	0.13	0.026	4.74**	0.071
X3 Environmental Awareness	0.21	0.025	834**	0.20
X4 Environmental Skill	0.41	0.030	13.79**	0.48
X5 Environmental Participation	0.50	0.012	17.21**	0.70
X6 Environmental Evaluation	0.52	0.034	15.32**	0.57
Chi-square = 6.94 df = 6 P = 0.32607				
GFI = 0.99 AGFI = 0.98 RMSEA = 0.021 RMR =0.0055				

** Statistically significant level of .01

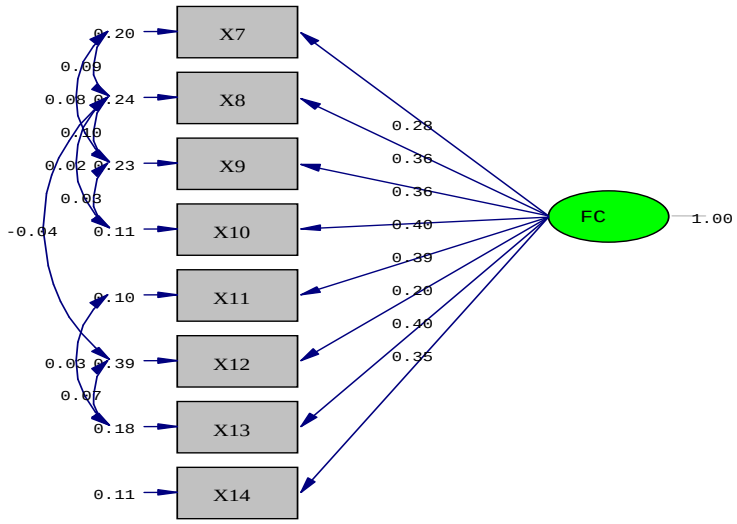
From picture 1 and table 2, results of analysis of confirmatory factors of EE from 6 observed variables was revealed that the model was congruent to empirical data by considering from 1) Goodness of Fit Index (GFI) equaled to 0.99 and Adjust Goodness of Fit Index (AGFI) equaled to 0.98 2) Root Mean Square Error of Approximation (RMSEA) equaled to 0.000 (RMSEA < 0.05) and 3) Chi- Square value had no statistically significant at level of .01 and degree of freedom was lesser than or equaled to .05 ($\chi^2 / df \leq 5.00$).

Considering on loading weight of observed variables in model, it was revealed that observed variables had loading weight with 0.13 to 0.52 and had covariate to model of Environmental Education with 7.10 to 70.00 percents.

2) Confirmatory factors Analysis of Exogenous Variables of Food Security Management Characteristics (FC)

Confirmatory factors of Food Security Management Characteristics (FC) had Bartlett's test of Sphericity of 1203.451 statistically significant level (p< .01) and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA) of 0.871. This indicated that components of Food Security Management Characteristics (FC) aspects had proper relationship at good level and it can be used for analysis of confirmatory factors as shown in picture 2 and table 3.

Picture 2: Model of Confirmatory factors of Food Security Management Characteristics



Chi-Square=10.05, df=12, P-value=0.61120, RMSEA=0.000

Table 3 Results of Analysis of Confirmatory factors of Food Security Management Characteristics

Components of Environmental Food Security Management Characteristics	Weight	SE	t	R^2
X7 Nutritional Knowledge	0.28	0.028	10.09**	0.28
X8 Safe and Clean Foods	0.36	0.032	11.21**	0.35
X9 Environmental Quality for Food Preparation	0.36	0.032	11.22**	0.35
X10Food Production for House and Community	0.40	0.025	15.84**	0.59
X11 Environmental Quality for Food Production	0.39	0.024	15.78**	0.59
X12 Sustainable Agriculture	0.20	0.037	5.50**	0.25
X13 Social and Economic Security	0.40	0.030	12.30**	0.46
X14 Public Health	0.35	0.024	14.73**	0.52
Chi-square = 5.31 df = 7 P = 0.62251				
GFI = 0.99 AGFI = 0.98 RMSEA = 0.000 RMR = 0.0047				

** Statistically significant level of .01

From picture 2 and table 3, results of analysis of confirmatory factors of Security Management Characteristics (FC) from 8 observed variables was revealed that the model was congruent to empirical data by considering from 1) Goodness of Fit Index (GFI) equaled to 0.99 and Adjust Goodness of Fit Index (AGFI) equaled to 0.98 2) Root Mean Square Error of Approximation (RMSEA) equaled to 0.000 (RMSEA < 0.05) and 3) Chi- Square value had no statistically significant at level of .01 and degree of freedom was lesser than or equaled to .05 ($\chi^2 / df \leq 5.00$).

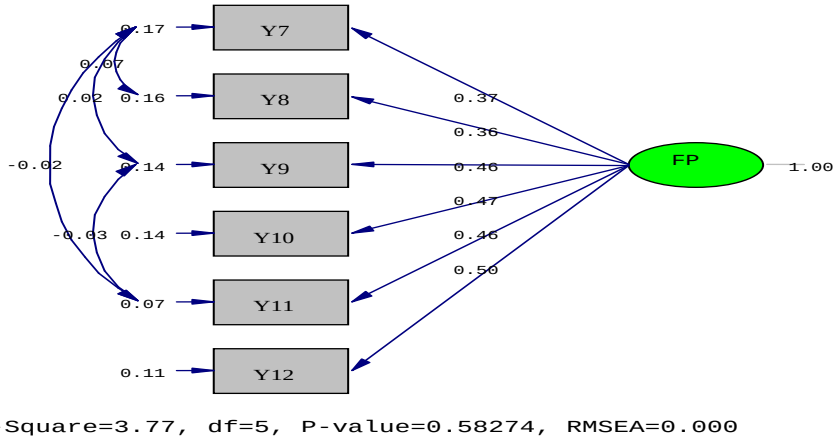
Considering on loading weight of observed variables in model, it was revealed that observed variables had loading weight with 0.20 to 0.00 and had covariate to model of Security Management Characteristics (FC) with 25.00 to 59.00 percents.

4.3 Confirmatory Factors Analysis of Endogenous Variables

Results of Confirmatory Factors Analysis of Endogenous Variables of Inspiration of Public Consciousness influencing to Environmental Behaviors for Sustainable Development, was revealed as followings.

1) Confirmatory Factors Analysis of Endogenous Variables of Inspiration of Public Consciousness (PM)

Confirmatory Factors of Inspiration of Public Consciousness with Food Security Management for Environmental Conservation (FP) had Bartlett's test of Sphericity of 1227.1847 statistically significant level (p< .01) and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA) of 0.878. This indicated that components of Inspiration of Public Consciousness with FP aspect had proper relationship at good level and it can be sed for analysis of confirmatory factors as shown in picture 3 and table 4.



Picture 3: Model of Confirmatory factor of Public Consciousness with Food Security Management for Environmental Conservation

Table 4. Results of Analysis of Confirmatory factors of Public Consciousness with Food Security Management for Environmental Conservation

Confirmatory factors of Public Consciousness with Food Security	Weight	SE	t	R^2
Y7 Person as Role Model	0.37	0.028	13.37**	0.44
Y8 Impressive Event	0.36	0.026	13.99**	0.44
Y9 Impressive Tourism Environment	0.46	0.028	16.28**	0.60
Y10 Book Reading	0.47	0.027	18.97**	0.61
Y11 Television Watching	0.46	0.023	20.09**	0.78
Y12 Internet Using	0.50	0.028	17.84**	0.68
Chi-square = 377 df = 5 P = 0.58274				
GFI = 1.00 AGFI = 0.99 RMSEA = 0.000 RMR = .0033				

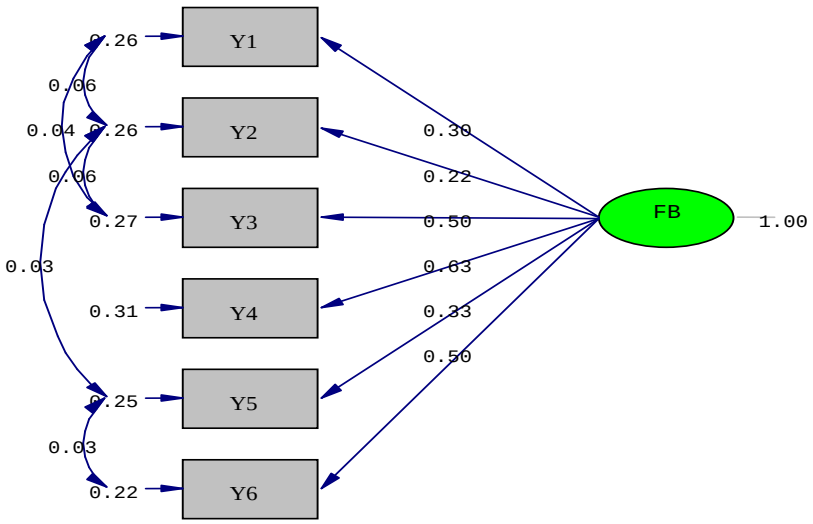
** Statistically significant level of .01

From picture 3 and table 4, results of analysis of confirmatory factors of FP from 6 observed variables was revealed that the model was congruent to empirical data by considering from 1) Goodness of Fit Index (GFI) equaled to 1.00 and Adjust Goodness of Fit Index (AGFI) equaled to 0.99 2) Root Mean Square Error of Approximation (RMSEA) equaled to 0.000 (RMSEA < 0.05) and 3) Chi- Square value had no statistically significant at level of .01 and degree of freedom was lesser than or equaled to .05 and $\chi^2 / df \leq 5.00$.

Considering on loading weight of observed variables in model, it was revealed that observed variables had loading weight with 0.36 to 0.50 and had covariate to model of Inspiration of Public Consciousness with Food Security Management for Environmental Conservation (FP) with 44.00 to 78.00 percents.

2) Confirmatory Factors Analysis of Endogenous Variables of to Food Security Behaviors (FB)

Confirmatory Factors of Food Security Behaviors (FB) had Bartlett's test of Sphericity of 616.087 statistically significant level (p< .01) and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA) of 0.836. This indicated that components of BE aspect had proper relationship at good level and it can be used for analysis of confirmatory factors as shown in picture 4 and table 5.



Picture 4: Model of Confirmatory factors of Food Security Behaviors

Table 5 Results of Analysis of Confirmatory factors of Food Security Behaviors

Confirmatory factors of Food Security Behaviors	Weight	SE	t	R^2
Y1 Consumption Behavior	0.30	0.033	8.98**	0.26
Y2 Production Behavior for Consumption	0.22	0.033	6.82**	0.16
Y3 Acquisition and Preparation Behavior	0.50	0.038	13.37**	0.49
Y4 Food Waste Management Behavior	0.63	0.043	14.60**	0.56
Y5 Social and Cultural Behavior	0.33	0.034	9.65**	0.30
Y6 Environmental Conservation Behavior	0.50	0.036	14.05**	0.54
Chi-square = 168 df = 4 P = 0.80318				
GFI = 1.00 AGFI = 0.99 RMSEA = 0.000 RMR = 0.0037				

** Statistically significant level of .01

From picture 4 and table 5, results of analysis of confirmatory factors of factors of Food Security Behaviors (FB) from 6 observed variables was revealed that the model was congruent to empirical data by considering from 1) Goodness of Fit Index (GFI) equaled to 1.00 and Adjust Goodness of Fit Index (AGFI) equaled to 1.00, 2) Root Mean Square Error of Approximation (RMSEA) equaled to 0.000 (RMSEA < 0.05) and 3) Chi- Square value had no statistically significant at level of .01 and degree of freedom was lesser than or equaled to .05 and $\chi^2 / df \leq 5.00$.

Considering on loading weight of observed variables in model, it was revealed that observed variables had loading weight with 0.22 to 0.63 and had covariate to model of Environmental Behaviors for Sustainable Development with 16.00 to 56.00 percents.

4. Results of Effect among Variables in Model in Terms of Direct and Indirect Effect

4.1 Confirmatory factors of Environmental Education (EE) and Food Security Management Characteristics (FC) had direct effect to Inspiration of Public Consciousness with Food Security Management for Environmental Conservation (FP) with statistically significant at level of .01 with effect of 0.34 and 0.52. Moreover, Environmental Education (EE) and Food Security Management Characteristics (FC) had direct effect to Food Security Behaviors (FB) with statistically significant at level of .01 with effect of 0.49 and -0.33. In addition, confirmatory factors in aspect of Environmental Education (EE) and Food Security Management Characteristics (FC) had indirect effect to Food Security Behaviors (FB) with statistically significant at level of .01 with effect of 0.24 and 0.30.

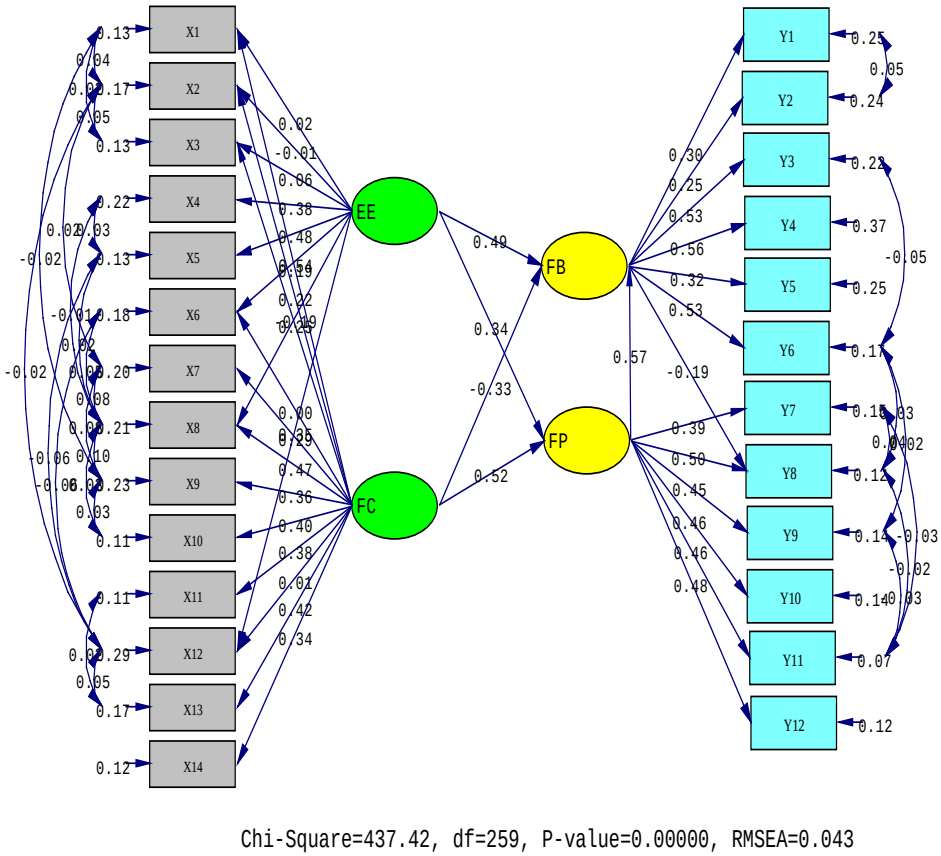
4.2 Confirmatory factors of Inspiration of Public Consciousness with Food Security Management for Environmental Conservation (FP) had direct effect to Food Security Behaviors (FB) with statistically significant at level of .01 with effect of .57.

Considering on structural model confirmatory factors of Environmental Education (EE) and Food Security Management Characteristics (FC) were able to explain the variation of endogenous factors of Inspiration of Public Consciousness with Food Security Management for Environmental Conservation (FP) to caused Food Security Behaviors (FB) with 54.00 percents. As a result, the equation 1, it can be written as following.

$$FB = 0.57*FP + 0.49*EE - 0.33*FC \quad \text{.....(1)}$$
$$R^2 = 0.54$$

Moreover, confirmatory factors of Environmental Education (EE) and Food Security Management Characteristics (FC) were able to explain the variation of confirmatory factors of Inspiration of Public Consciousness with Food Security Management for Environmental Conservation (FP) with 58.00 percents. Therefore, the equation can be written as following equation 2.

$$FP = 0.34*EE + 0.52*FC \quad \text{.....(2)}$$
$$R^2 = 0.58$$



Picture 5: Model of Direct and Indirect Effect of EE and FC through FP Influencing to FB

5. Discussion

The findings indicated that EE had direct effect to Inspiration of Public Consciousness with Food Security Management for Environmental Conservation (FP) and Food Security Behaviors (FB) with statistically significant at level of .01 with effect of 0.49 and 0.34. Moreover, when considering on prediction of correlation of observed variables of Environmental Evaluation (X6), Environmental Participation (X5), Environmental Skill (X4), Environmental Awareness (X3), Environmental Attitude (X2), and Knowledge and Understanding (X1) can predict the EE rather high with 0.52, 0.50, 0.41, 0.21, 0.13 and 0.13 respectively. These were congruent to different studies of Thiengkamol and her colleagues (Thiengkamol, 2005a, Thiengkamol, 2011a, Thiengkamol, 2011g, Thiengkamol, 2011i, Thiengkamol, 2012b, Thiengkamol, 2012c, Dornkornchum, et al, 2012a, Gonggool, et al, 2012b, Ngarmsang, et al, 2012b, Pimdee, et al, 2012a, Ruboon, et al, 2012a, and Waewthaisong, et al, 2012a) that the results illustrated that Inspiration of Public Consciousness with Food Security Management for Environmental Conservation would inspire upper secondary school student to perform better food security behaviors whether consumption behavior, production behavior for consumption, acquisition and preparation behavior, food waste management behavior , social and cultural behavior, and environmental conservation behavior when they had real practice through food security behaviors with inspiration of public consciousness with food security management for environmental conservation.

Food Security Management Characteristics (FC) had direct effect to Inspiration of Public Consciousness with Food Security Management for Environmental Conservation (FP) and Food Security Behaviors (FB) with statistically significant

at level of .01 with effect of -0.33 and 0.52. Additionally, considering on prediction of correlation of observed variables of Food Production for House and Community (X10), Social and Economic Security (X13), Environmental Quality for Food Production (X11), Safe and Clean Foods (X8), Environmental Quality for Food Preparation (X9), Public Health (X14), Nutritional Knowledge (X7) Sustainable Agriculture (X12) can predict the EE rather high with 0.40, 0.40, 0.39, 0.36, 0.36, 0.35 0.28 and 0.20 respectively. These were congruent to concept and studies of Thiengkamol and Thiengkamol and her colleagues (Thiengkamol, 2009c, Thiengkamol, 2011a, & Thiengkamol, 2011g) that food security management in youth such as upper school students would succeed, it needs to change their consumption behavior through the daily practice by selecting knowledge and understanding of nutritional knowledge, raising awareness of avoiding high carbohydrate fat of fast food consumption such as pizza, hamburger, potato chip, potato chip, fried chicken, fried beef, and unwell cooking. Additionally, they should adjust their life style from sitting in front of computer or television to play for exercise regularly to prevent obesity, mellitus, hypertension and cardiovascular which is the top ten diseases that threaten Thai people currently.

Furthermore, Inspiration of Public Consciousness with Food Security Management for Environmental Conservation (FP) had direct effect to Food Security Behaviors (FB) with statistically significant at level of .01 with effect 0.57. Particularly, considering on prediction of correlation of observed variables of Person as Role Model (Y7), Impressive Event (Y8), impressive Environment (Y9), Book Reading (Y10), Television Watching (Y11), and Internet Using (Y12), can predict the FP rather high with 0.37, 0.36, 0.46, 0.47, 0.46, and 0.50 respectively, these results are pertinent to numerous studies of Thiengkamol, and her colleagues (Thiengkamol, 2011i, Thiengkamol, 2011j, Thiengkamol, 2012c, Thiengkamol, 2012d, Dornkornchum, and Thiengkamol, 2012, Dornkornchum, et al, 2012a, Gonggool, et al, 2012b, Ngarmsang, et al, 2012b, Ruboon, et al, 2012a, Pimdee, et al, 2012, and Waewthaisong, et al, 2012a).

However, it might be concluded that EE observed from observed variables of Environmental Attitude (X1), Knowledge and Understanding (X2), Environmental Awareness (X3), Environmental Skill (X4), Environmental Participation (X5) and Environmental Evaluation (X6), and FC observed from observed variables of Nutritional Knowledge (X7), Safe and Clean Foods (X8), Environmental Quality for Food Preparation (X9), Food Production for House and Community (X10), Environmental Quality for Food and Public Health (X14), can influence through Inspiration of Public Consciousness with Food Security Management for Environmental Conservation (FP) composing of Person as Role Model (Y7), Impressive Event (Y8), impressive Environment (Y9), Book Reading (Y10), Television Watching (Y11), and Internet Using (Y12), to Food Security Behaviors (FB) that included Consumption Behavior (Y1), Production Behavior for Consumption (Y2), Acquisition and Preparation Behavior (Y3), Food Waste Management Behavior (Y4) Social and Cultural Behavior (Y5), and Environmental Conservation Behavior (Y6).

Therefore, the model of EE and FC influencing through FP to FB was verified the proposed model was fitted with all observed variables according to criteria of Chi-Square value differs from zero with no statistical significant at .01 level or Chi-Square/df value with lesser or equal to 2, P-value with no statistical significant at .01 level and RMSEA (Root Mean Square Error Approximation) value with lesser than 0.05 including index level of model congruent value, GFI (Goodness of Fit Index) and index level of model congruent value, AGFI (Adjust Goodness of Fit Index) between 0.90-1.00.

Finally, food security behavior comprised 6 observed variables Consumption Behavior (Y1), Production Behavior for Consumption (Y2), Acquisition and Preparation Behavior (Y3), Food Waste Management Behavior (Y4), Social and Cultural Behavior (Y5), and Environmental Conservation Behavior (Y6) in this study were modified from food security management concepts of FAO and environmental education principles to investigate the factors that will affect through inspiration of public consciousness of Thiengkamol. Therefore, to understand these factors are able to use for food insecurity solving in Northeastern Region and other region of Thailand.

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