Causal Relationship Model of Flood Response Behavior

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Abstract

The populations of 2,200 peoples who faced with flood disaster in Mahasarakham Province in 2011. The 401 peoples were used as sample group. The questionnaire was used as instrument for data collection. LISREL was used for model verification. Considering on structural model confirmatory factors of Environmental Education Principle (EEP) and Community Strength (CoS) were able to explain the variation of endogenous factors of Inspiration for Flood Response (INS) to caused Flood Response Behavior (FRB) with 87.00 percents. As a result, the equation 1 can be written as following.

$$FRB = 0.99*INS + 0.069*EEP - 1.00*CoS \ldots\ldots\ldots\ldots(1)$$
$$R^2 = 0.75$$

Equation (1) factors that had the most effect to Flood Response Behavior (FRB) was Inspiration for Flood Response (INS) and subsequences were Environmental Education Principle (EEP) and Community Strength (CoS), these were able to explained the variation of Flood Response Behavior (FRB) with 75.00 percents. Moreover, confirmatory factors of Environmental Education Principle (EEP) and Community Strength (CoS) were able to explain the variation of confirmatory factors of Inspiration for Flood Response (INS) with 93.00 percents. Therefore, the equation can be written as following equation 2.

$$INS = 1.91*CoS - 0.35*EEP \ldots\ldots\ldots\ldots(2)$$
$$R^2 = 0.93$$

Key Words: Causal Relationship Model / Flood Response Behavior

1. Introduction

A disaster is a natural or man-made (or technological) hazard resulting in an event of substantial extent causing significant physical damage or destruction, loss of life, or drastic change to the environment. A disaster can be supposedly defined as any terrible event stemming from events such as earthquakes, floods, catastrophic accidents, fires, or explosions. It is a phenomenon that can cause damage to life, property and destroy the economic, social and cultural life of people. In current academic circles, disasters are seen as the consequence of inappropriately managed risk. These risks are the product of a combination of both hazards and vulnerability. Hazards that strike in areas with low vulnerability will never become disasters, as is the case in unoccupied regions (Wikipedia, 2012).

A flood is an overflow of water that submerges land. The European Union (EU) Floods Directive defines a flood as a covering by water of land not normally covered by water. In the sense of "flowing water", the word may also be applied to the inflow of the tide. Flooding may result from the volume of water within a body of water, such as a river or lake, which overflows or breaks levels, with the result that some of the water escapes its usual boundaries, or may be due to accumulation of rainwater on saturated ground in an area flood (Wikipedia, 2012, and Directive, 2007).

All through the summer and autumn of 2011, heavy monsoons and subsequent typhoons killed nearly 800 peoples and affected more than 8 million others across Thailand, Cambodia, Laos, Vietnam and the Philippines, along with the United Nations. Numerous businesses needed expert disaster restoration services after Thailand experienced the most devastating floods in a half century resulting in the most expensive natural disaster ever. Flood water damage affected more than 14,000 factories, displaced more than 600,000 workers, disrupted global supply chains, destroyed farms and drove up worldwide prices for computer hard drives and rice. In Thailand alone, where floodwaters covered an area roughly the size of the state of Florida, insured losses were estimated at more than 15 billion and total damage was expected to top 45 billion. The severe flooding across Thailand in 2011 lasted for several months and affected more than three million peoples and this flood was the most severe during five decades. Major industrial zones were hard hit, but they have built major flood walls to prevent a recurring of the deluge (Corben, 2012, MENAFN, 2012 and Figge, 2012).

Therefore, flood disaster might occur due to natural or human being activities, sometime, it is difficult to just that it is only natural situation because human have interrupted the natural system for long time ago, then the balance of natural system is also loss as well. Additionally, with rapid growth of global population of 7 billion peoples, it was celebrated on 11july 2012 (UNFPA, 2012). Nevertheless, the huge population was a major problem for natural resources consumption, especially, the encroachment of forest in every countries across the world has been occurred for long periods and it also key factors of destruction of soil surface for absorption the water from the rain, therefore this creates a flood and soil erosion. Moreover forests stabilize climate and regulate the water cycle by absorbing and redistributing rainwater quite equally to every species living within its range. Particularly in the case of tropical forests where up to 90% of the planet's species live. Tropical forests possess the highest level of biodiversity and therefore provide the biggest genes reservoir (Environment for Beginners, 2012). In conclusion for flood, it might occur from natural and/or human origins.

Principally, Thiengkamol declared that the significant characteristics of environmental education volunteer or trainer should have knowledge and understanding, and awareness, responsibility and public mind based on inspiration of public mind. Furthermore, contribution in environmental activities and decision making on environmental problem solving would be emphasized in daily life practice until it turns into various environmental behaviors such as consumption behavior, recycling behavior, energy conservation behavior, traveling behavior, forest conservation behavior and knowledge transferring behavior, therefore these behaviors are able to bring about real sustainable development. Commonly, these essential characteristics should be established through all educational channels whether the formal education, informal education, non-formal education and lifelong education (Thiengkamol, 2009a, 2009b, 2011e, & 2012a). These concepts are also harmonious to findings that disclosed from the research that there are 14 essential Environmental Education Characteristics (EECs) composed of 1) ability to transfer environmental knowledge, 2) to stimulate others to realize the importance of environmental conservation, 3) to have deeply awareness about environment and natural resources, 4) to have public mind for environmental conservation, 5) to have positive attitude for environmental conservation, 6) to have value that for environmental conservation be everyone duty, 7) to have a sensitivity of environmental conservation, 8) to wish to take a responsibility for environmental conservation, 9) to participate to environmental conservation activities regularly, 10) to be consistency of self practice for environmental conservation, 11) to have ability to make correct decision for environmental conservation, 12) to practice as a role model of environmental conservation for public perception, 13) to have correct environmental knowledge and 14) to understanding to introduce and transfer environmental knowledge for others to practice correctly (Charoensilpa, et al, 2012b).

Considering on another essential factor, the inspiration of public consciousness or public mind also should not be neglected. Public mind or public consciousness was defined by different perceptions or considerations 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 with providing advantage to country with consciousness and holding the system of morality and ethics together with indignity for good action and emphasizing on being neat, economizing, and balance between human and nature.

Additionally, Thiengkamol mentioned that public consciousness or public mind based on inspiration is occurred from insight of people and inspiration is different from motivation because inspiration needs no rewards. Inspiration of public consciousness or public mind, especially, for natural resources and environment conservation, one will not receive any reward, admiration or complement for their action to protect and conserve natural resources and environment. Inspiration might occur from appreciation in a person as role model or idle, events, situations, environment, and media perceived such as movies, television, radio, book, magazine, internet or other public media (Thiengkamol, 2009b, Thiengkamol, 2009c, Thiengkamol, 2011a, Thiengkamol, 2011e, Thiengkamol, 2011i, and Thiengkamol, 2012c).

In order to develop a causal relationship model of flood response behavior, it is essential to understand the relationship among environmental education principle, community strength, inspiration for flood response and numerous flood response behaviors to prevent and alleviate damage to environment and natural resources, human lives and their properties with verification the model with different statistical index. These relationships would be guidance for national government, local administration organization, community people to realize for the importance of their leadership, community participation, community social capital, self-dependence, and support from involved work unit to decrease the loss of lives and properties with inspiration for flood response through flood response behavior including community flood surveillance, community flood warning, policy for flood response, and preparation for administration during and after flooding to conserve environment and natural resources to achieve genuine sustainable development (Thiengkamol, 2008, 2009a, 2009b, 2011e, 2011f, 2011i, 2011j, 2012a, 2012b, & 2012c).

2. Objective

The research objective was to develop a causal relationship model of flood response behavior for peoples who faced with flood disaster in Mahasarakham Province in 2011.

3. Methodology

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

The populations of 2,200 peoples who faced with flood disaster in Mahasarakham Province. The 401 peoples 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 37 peoples who faced with flood disaster in Mahasarakham Province but they were not sample group. The reliability was determined by Cronbach's Alpha. It was tried out with the group that was not sample group. The reliability in aspects of environmental education principle, community strength, inspiration of emergency response preparedness for flood disaster, emergency response preparedness behavior, and whole questionnaire were 0.884, 0.873, 0.937, 0.960 and 0.966 respectively.

1) 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 5, 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 0.90-1.00.

4. Results

4.1 General Characteristics of Sample Group

The 401 peoples who faced with flood disaster in Mahasarakham Province were used as sample group. Most of them had age with mean of 40.93 years and were female with 50.87%. Majority of their father had marriage status with 77.55 %, their father education level at bachelor or higher with 76.64%, and occupation as government officer with 47.09%. Majority of their mother had marriage status with 91.97%, their father education level at bachelor or higher with 77.014%, and occupation as government officer with 51.11%. Father age and mother age had mean of 43.008 and 40.334 years. Father income and mother income had mean of 1,000,000 and 500,000 Bahts as presented in table 1.

Table 1 Demographic Characteristics of Sample Group

Demographic Characteristics	People faced with Flood Disaster	
	Number	Percent
Sex		
Male	197	49.13
Female	204	50.87
Age = 40.93 years, Min 18 years Max 80 years		
Religion		
Buddhist	399	99.50
Christ	2	0.50
Status		
Single	68	16.96
Marriage	311	77.55
Widow/Widower	16	3.99
Divorce	4	1.00
Separated	2	0.50
Total	401	100

Table 1 (Continue)

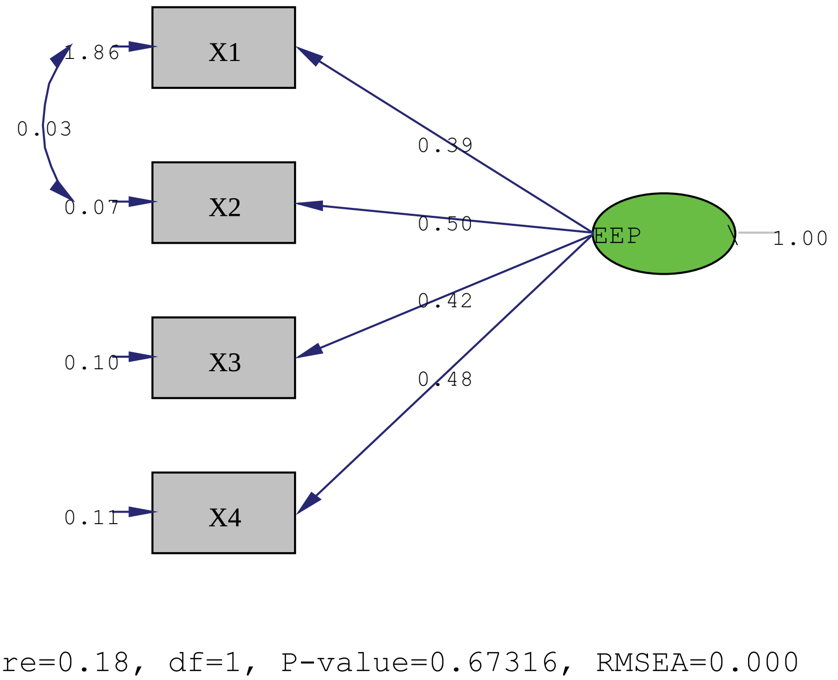
Demographic Characteristics	People faced with Flood Disaster	
	Number	Percent
Educational Level		
Primary Level	211	52.62
Lower Secondary Level	68	16.96
Upper Secondary Level	81	19.96
Vocational Level	14	3.49
High Vocational/ Diploma	10	2.49
Bachelor Degree	16	3.99
Master Degree	1	0.25
Occupation		
Agriculturist	267	66.58
Merchant / Business Owner	62	15.47
Employee / Hire	36	8.98
Government Officer	11	2.74
Househusband/ Housewife	25	6.23
Income		
0-10,000 Baht	191	47.63
10,001-20,000 Baht	116	28.93
20,001-30,000 Baht	71	17.71
30,000-40,000 Baht	12	2.99
40,000-50,000 Baht	2	0.50
More than 50,000 Baht	7	1.74
Member of Household		
1-3 Peoples	127	31.67
4-6 Peoples	235	58.60
More than 6 Peoples	39	9.73
Residence in Community		
1-3 years	10	2.50
4-6 years	13	3.24
7-9 years	16	3.99
More than 10 years	362	90.27

Social Position in Community		
Health Volunteer	8	2.00
Head	6	1.50
Head of Village	5	1.25
Member of TOA /Municipality	5	1.25
General People	377	94.00
Total	401	100

4.2. Confirmatory factors Analysis of Exogenous Variables

4.2.1 Confirmatory factors Analysis of Exogenous Variables of Environmental Education Principle (EEP)

Confirmatory factors of EEP had Bartlett's test of Sphericity of 640.759 statistically significant level (p< .01) and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA) of 0.755. This indicated that components of EEP 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.



Picture 1: Model of Confirmatory factors of Environmental Education Principle (EEP)

Table 2 Results of Analysis of Confirmatory factors of EEP

Components of EEP	Weight	SE	t	R^2
X1 Knowledge and Understanding	0.39	0.078	4.99**	0.076
X2 Environmental Awareness	0.50	0.024	20.89**	0.79
X3 Environmental Attitude	0.42	0.023	17.92**	0.63
X4 Environmental Participation	0.48	0.025	18.78**	0.67
Chi-square = 0.18 df = 1 P = 0.67316				
GFI = 1.00 AGFI =1.00 RMSEA = 0.000 RMR =0.0030				

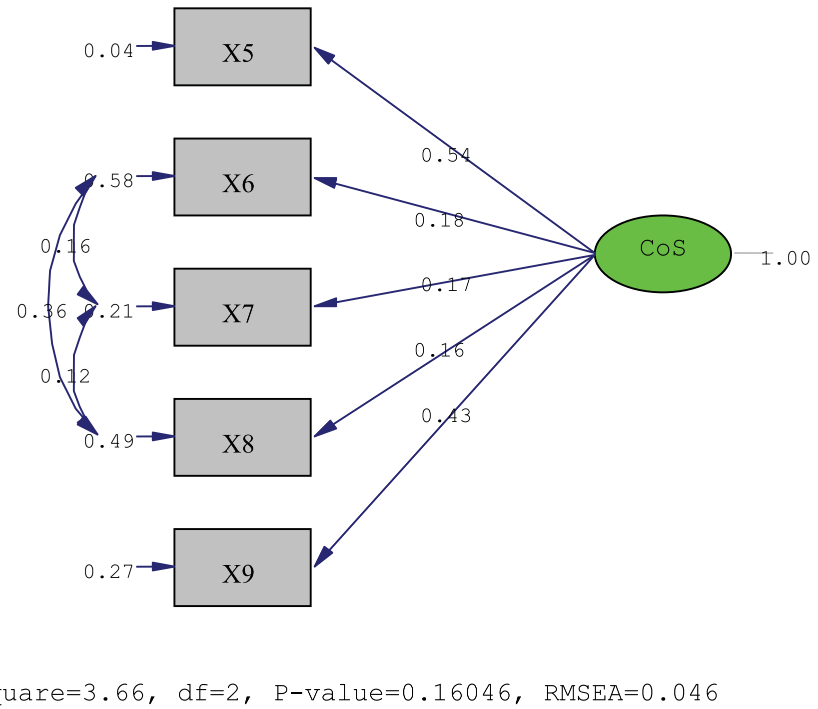
** Statistically significant level of .01

From picture 1 and table 2, results of analysis of confirmatory factors of EE from 4 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 ($\chi^2 / df \leq 5.00$).

Considering on loading weight of observed variables in model, it was revealed that observed variables had loading weight with 0.39 to 0.50 and had covariate to model of Environmental Education Principle with 7.60 to 79.00 percents.

4.2.2 Confirmatory factors Analysis of Exogenous Variables of Community Strength (CoS)

Confirmatory factors of Community Strength (CoS) had Bartlett's test of Sphericity of 581.369 statistically significant level (p< .01) and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA) of 0.591. This indicated that components of Community Strength (CoS) 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 Community Strength (CoS)

Table 3 Results of Analysis of Confirmatory factors of Community Strength

Components of Community Strength	Weight	SE	t	R^2
X6 Community Leadership	0.54	0.036	15.03**	0.87
X7 Community Participation	0.18	0.030	4.31**	0.53
X8 Community Social Capital	0.17	0.026	6.54**	0.12
X9 Self-Dependence	0.16	0.039	4.18**	0.50
X10 Support from Involved Work Unit	0.43	0.038	11.43**	0.41
Chi-square = 3.66 df = 2 P = 0.16046				
GFI =1.00 AGFI =0.97 RMSEA = 0.046 RMR =0.011				

** Statistically significant level of .01

From picture 2 and table 3, results of analysis of confirmatory factors of Community Strength (CoS) from 5 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 0.97, 2) Root Mean Square Error of Approximation (RMSEA) equaled to 0.046 (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 ($\chi^2 / df \leq 5.00$).

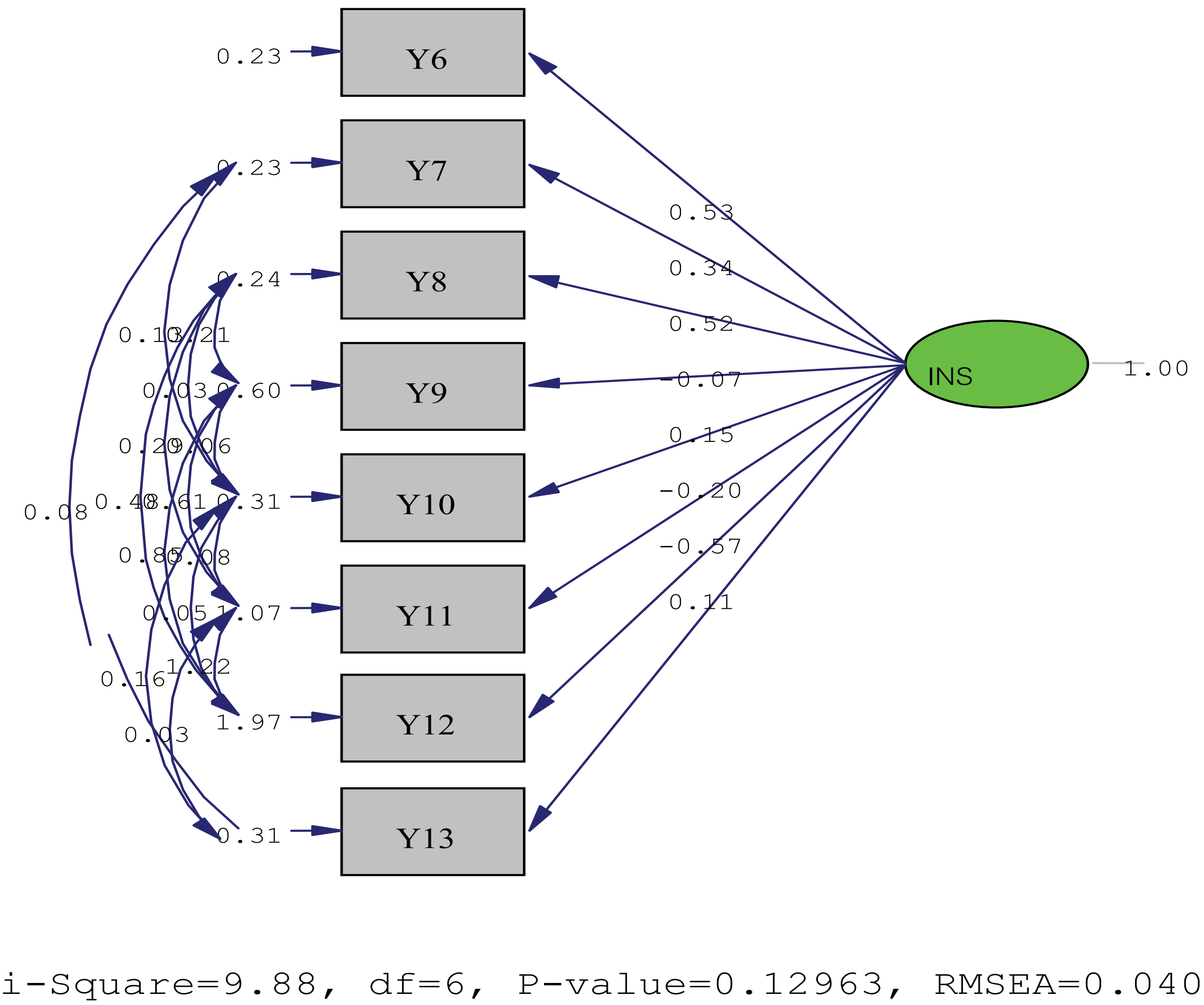
Considering on loading weight of observed variables in model, it was revealed that observed variables had loading weight with 0.16 to 0.54 and had covariate to model of Community Strength (CoS) with 12.00 to 87.00 percents.

4.3. Confirmatory Factors Analysis of Endogenous Variables

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

4.3.1 Confirmatory Factors Analysis of Endogenous Variables of Inspiration for Flood Response (INS)

Confirmatory Factors of Inspiration of Inspiration for Flood Response (INS) had Bartlett's test of Sphericity of 1613.922 statistically significant level (p< .01) and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA) of 0.771. This indicated that components of Inspiration for Flood Response (INS) 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 Inspiration for Flood Response

Table 4 Results of Analysis of Confirmatory factors of Inspiration for Flood Response

Confirmatory factors of INS	Weight	SE	t	R^2
Y6 Person as Role Model	0.53	0.036	14.67**	0.56
Y7 Impressive Event from Flooding	0.34	0.029	11.46**	0.34
Y8 Impressive Environment	0.52	0.039	13.22**	0.53
Y9 Impressive from Radio Receiving	-0.07	0.048	-1.46	0.08
Y10 Impressive from Television Receiving	0.15	0.035	4.22**	0.67
Y11 Impressive from Newspapers	-0.20	0.092	-3.14**	0.38
Y12 Impressive from Internet	-0.57	0.033	-6.19**	0.14
Y13 Impressive from Tower News Distribution	0.11	0.031	3.75**	0.41
Chi-square = 9.88 df = 6 P = 0.12963				
GFI = 0.99 AGFI = 0.96 RMSEA = 0.040 RMR = .015				

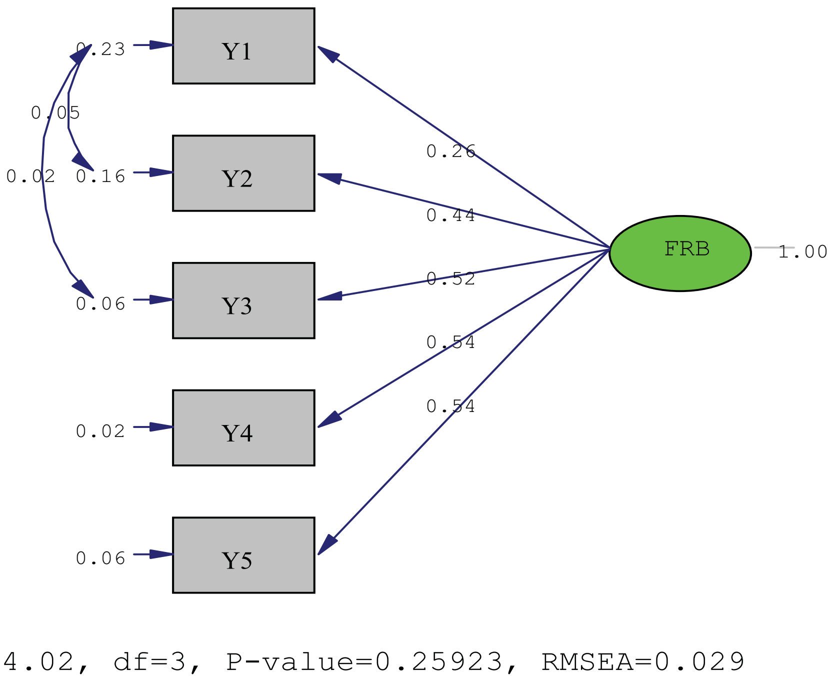
** Statistically significant level of .01

From picture 3 and table 4, results of analysis of confirmatory factors of INS 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 0.96 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 - 0.57 to 0.53 and had covariate to model of Inspiration for Flood Response (INS) with 8.00 to 67.00 percents.

4.3.2 Confirmatory Factors Analysis of Endogenous Variables of Flood Response Behavior (FRB)

Confirmatory Factors of Flood Response Behavior (FRB) had Bartlett's test of Sphericity of 1648.204 statistically significant level (p< .01) and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA) of 0.857. This indicated that components of FRB 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 Flood Response Behavior (FRB)

Table 5 Results of Analysis of Confirmatory factors of Flood Response Behavior

Confirmatory factors of Flood Response Behavior	Weight	SE	t	R^2
Y1 Community Flood Surveillance	0.26	0.026	9.95**	0.23
Y2 Community Flood Warning	0.44	0.025	17.33**	0.56
Y3 Planning for Flood Response	0.52	0.022	23.12**	0.81
Y4 Administration during Flooding	0.54	0.020	26.38**	0.94
Y4 Administration After Flooding	0.54	0.023	23.48**	0.83
Chi-square = 4.02 df = 3 P = 0.25923 GFI = 1.00 AGFI = 0.98 RMSEA = 0.029 RMR = 0.026				

** Statistically significant level of .01

From picture 4 and table 5, results of analysis of confirmatory factors of Flood Response Behavior (FRB) from 5 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 0.98, 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 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 0.26 to 0.54 and had covariate to model of Flood Response Behavior (FRB) with 23.00 to 94.00 percents.

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

Confirmatory factors of Environmental Education Principle (EEP) and Community Strength (CoS) had direct effect to Inspiration for Flood Response (INS) with no statistically significant at level of .05 with effect of - 0.35 and 1.91. Moreover, Environmental Education Principle (EEP) and Community Strength (CoS) had direct effect to Flood Response Behavior (FRB) with statistically significant at level of .05 with effect of 0.07 and -1.00. In addition, confirmatory factors in aspect of Environmental Education Principle (EEP) and Community Strength (CoS) had indirect effect to Flood Response Behavior (FRB) with statistically significant at level of .01 with effect of -0.3465 and -0.99.

4.4.1 Confirmatory factors of Inspiration for Flood Response (INS) had direct effect to Flood Response Behavior (FRB) with statistically significant at level of .01 with effect of 0.99. Considering on structural model confirmatory factors of Environmental Education Principle (EEP) and Community Strength (CoS) were able to explain the variation of endogenous factors of Inspiration for Flood Response (INS) to caused Flood Response Behavior (FRB) with 87.00 percents. As a result, the equation 1 can be written as following.

FRB = 0.99*INS + 0.069*EEP - 1.00*CoS ....(1)

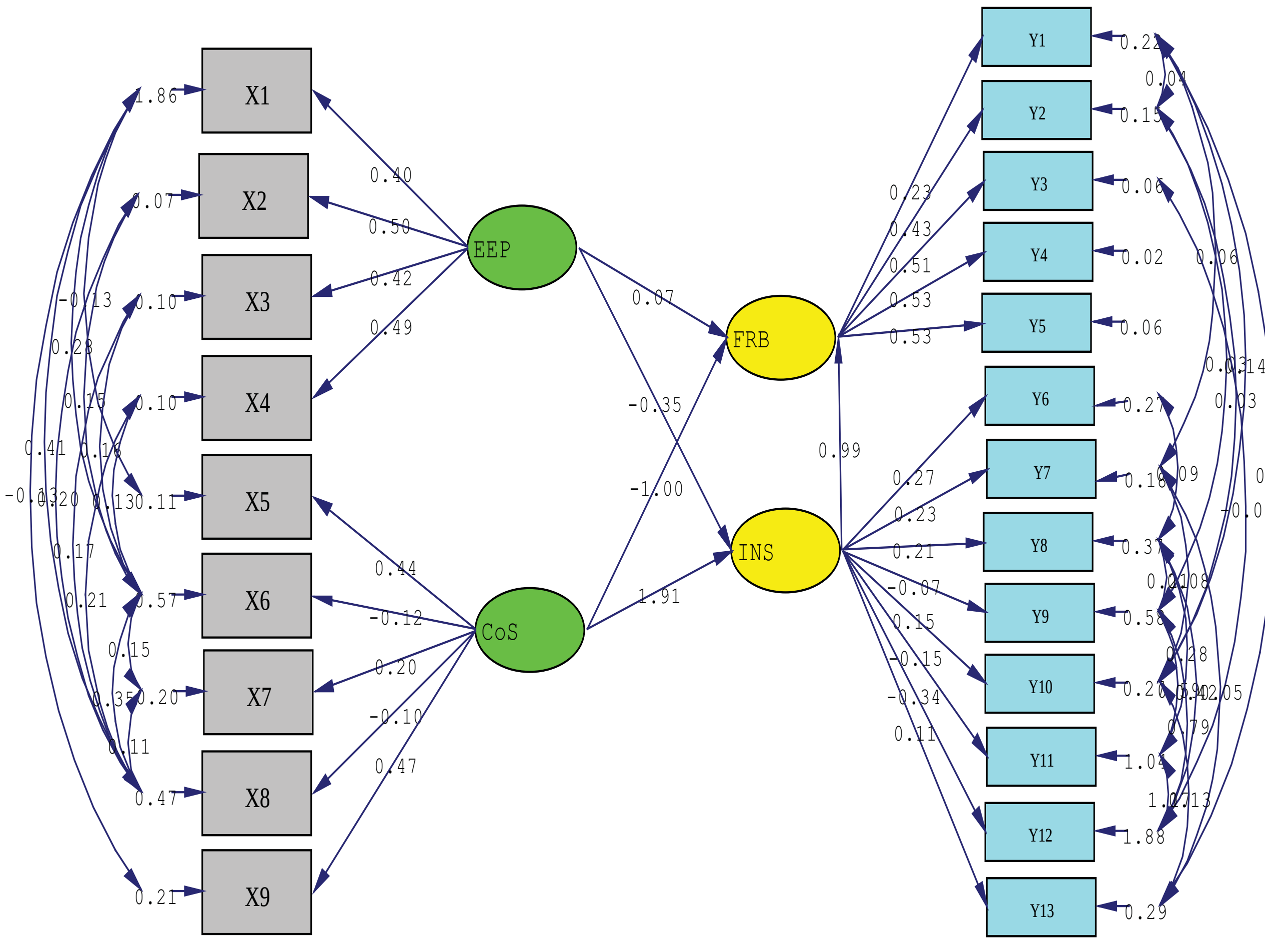
R^2 = 0.75

Equation (1) factors that had the most effect to Flood Response Behavior (FRB) was Inspiration for Flood Response (INS) and subsequences were Environmental Education Principle (EEP) and Community Strength (CoS), these were able to explained the variation of Flood Response Behavior (FRB) with 75.00 percents.

Moreover, confirmatory factors of Environmental Education Principle (EEP) and Community Strength (CoS) were able to explain the variation of confirmatory factors of Inspiration for Flood Response (INS) with 93.00 percents. Therefore, the equation can be written as following equation 2.

INS = 1.91*CoS - 0.35*EEP ....(2)

R^2 = 0.93



Chi-Square=279.76, df=173, P-value=0.00000, RMSEA=0.046

Picture 5: Model of Direct and Indirect Effect of EEP and CoS through INS Influencing to FRB

Discussion

The findings indicated that EEP had direct influencing to Inspiration for Flood Response (INS) and Flood Response Behavior (FRB) with no statistically significant at level of .05 with effect of -0.35 and 0.07. However, when considering on prediction of correlation of observed variables of Environmental Awareness (X2), Environmental Participation (X4), Environmental Attitude (X3), and Knowledge and Understanding (X1) can predict the EE rather high with 0.50, 0.48, 0.42, and 0.39 respectively. These were congruent to different studies of Thiengkamol and her colleagues (Thiengkamol, 2004, Thiengkamol, 2005a, Thiengkamol, 2011a, Thiengkamol, 2011g, Thiengkamol, 2011i, Thiengkamol, 2012a, 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). Even though, EEP did not highly direct effect to flood response behavior but it had indirect and total effect to flood response behavior with highly statistically significant at level of .01 with 0.35 and 0.28. Nevertheless the results illustrated that inspiration for flood response would inspire people to perform better flood response behavior whether community flood surveillance, community flood warning planning for flood response, administration during flooding, and administration after flooding when they had real practice through flood response with inspiration of public mind. Moreover, community strength such as community leadership, community participation, community social capital, self-dependence, and support from involved work unit based on community flood surveillance, community flood warning planning for flood response, administration during flooding, and administration after flooding also lead to good practice of flood response behavior for alleviation the flood disaster and decrement of damage to human life and their properties.

Consequently, Community Strength (CoS) such as community leadership, community participation, community social capital, self-dependence, and support from involved work unit had direct influencing to Inspiration for Flood Response (INS) and had indirect influencing to Flood Response Behavior (FRB) with highly statistically significant at level of .01 with effect of 1.91 and 1.89. Additionally, when considering on prediction of correlation of observed variables of Community Leadership (X6), Support from Involved Work Unit (X10), Community Participation (X7), Community Social Capital (X8), and Self-Dependence (X9) can predict the CoS rather high with 0.54, 0.69, 0.18, 0.17 and 0.16 respectively.

Moreover, Inspiration for Flood Response (INS) had direct effect to Flood Response Behavior (FRB) with statistically significant at level of .01 with effect of .99. Particularly, when considering on prediction of correlation of observed variables of Person as Role Model (Y5), Impressive Event from Flooding (Y6), impressive Environment (Y7), and Impressive from Television Receiving (Y10), can predict the INS with 0.53, 0.34, 0.52, and 0.15 respectively (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 EEP observed from observed variables of Knowledge and Understanding (X1), Environmental Awareness (X2), Environmental Attitude (X3), and Environmental Participation (X4), and CoS observed from observed variables of Community Leadership (X6), Community Participation (X7), Community Social Capital (X8), Self-Dependence (X9), and Support from Involved Work Unit (X10), can influence through Inspiration for Flood Response (INS) composing of Person as Role Model (Y6), impressive Event from Flooding (Y7), Impressive Environment (Y8), Impressive from Radio Receiving (Y9), Impressive from Television Receiving (Y10), Impressive from Newspapers (Y11), Impressive from Internet (Y12), and Impressive from Tower News Distribution (Y13) to Flood Response Behavior (FRB) that included Community Flood Surveillance (Y1), Community Flood Warning (Y2), Planning for Flood Response (Y3),

Administration during Flooding (Y4), and Administration after Flooding (Y5). Therefore, the model of EEP and CoS influencing through INS to FRB 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.

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