Sustainable Learning Factors of Community Disaster Prevention Education

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Abstract-**This study mainly consisted of two parts. First, the objective and content of community disaster prevention learning were constructed based on literature review and in-depth surveys. The development, influential factors and subject of community disaster prevention learning were analyzed and explored as well. Second, the concrete names and the content of the indicators were preliminarily drafted. Delphi method and AHP were used to evaluate the importance degree, sifted the indicators, revised the content and adjusted the frame. The result showed that the elements of maintaining the basic operation of the community were also the fundamental condition of constructing the disaster resistant community.**

Keywords-Community Disaster Prevention Education; Learning Indicators; Delphi method; AHP

I. INTRODUCTION

When it comes to conceptualizing the idea of disaster prevention and rescue, people often emphasize on the rescuing and rebuilding after the disaster. However, what truly can decrease damages and casualties in such events is learning, training and practicing the correct procedures to react properly to a sudden disaster. The idea of "disaster resistant communities" has been carrying out for several years in Japan and the United States, as have their techniques and practices; through mutual helping and united support, some residents of Taiwan communities have also shown strength in emergent disaster rescue after several incidents. Community Disaster Education emphasizes on residents reaching a common consensus and building mutual relationships in order to organize them into a disaster resistant group. What has lacked in the aforementioned institution is freedom for the independent communities to make adjustments given their individual needs. In order to increase residents' knowledge on disasters, experts and communities should work as a group in planning and practicing evacuation drills–the participation of every person should be stressed. As for the technical perception, residents should be able to integrate the resources in the community. Additional to improving the environment, residents should be able to run disaster-preventing campaigns and drills for refuge seeking and evacuation. Pitifully, not only has professional training regarding disaster-prevention proven to be insufficient in our nation, the drills are not carried out thoroughly either, thus fomenting serious inefficiency in the Community Disaster Education. Other than the above, many more uncertainties prevent the promotion of domestic Community Disaster Education. Chief among them are variant political environment, the fact that governmental departments may neither know nor understand the existence

and relevance of such project, the unstable acquisition of academic resources and budget for equipment, the dissensions between local communities, failure to coalesce the massive and diverse of every individual community etc.

II. EVALUATION BASE

Via reviewing literature on related topics about community learning as well as disaster prevention education, and through in-depth interviewing with community leaders and experts on implementing plans for community disaster prevention, this study will construct a content of community disaster prevention learning. The content includes: a. to shape the proper values of disaster prevention in order to establish a positive interaction between people and the environment; b. considering community features and citizens' characteristics to construct a content of teaching material which is centered on the community, and based on the demand made by the community itself to realize citizen participation; c. to train the skills of problem-solving and communication with others, and via the ways of community development to subsume community disaster prevention learning within the scope of "lifelong learning" and work toward community empowerment; d. to shape multiple incentives to learn community disaster prevention, the main cause of which is to make the community possessed of a sense of honor and participation. Domestic issues on community disaster prevention learning include: most planning of curriculum and teaching material does not act on circumstances; teacher training is not yet institutionalized, and the learning process is also lacking in instructional objectives and learning proposals; the top-down selection mechanism is deficient in spontaneous learning motivation. In addition, factors affecting community disaster prevention learning include: passive attitudes toward disasters resulting from living problems lead to low willingness to learn disaster prevention; the relatively long period that the citizens have been through without any disaster gradually lower their awareness of disaster prevention; the citizens' employment of environmental awareness and past disaster experience as the basis of disaster prevention action lowers their sensitivity to disasters; the experts' and citizens' different cognition of disaster itself as well as ways of disaster prevention impedes disaster prevention learning; other factors such as personal attitudes, social values, legal and political barriers, financial condition and "bounded rationality" restrain motivation and awareness, impacting the efficiency of disaster prevention learning.

III. METHODS

This part explores the content of community education/learning, clarify its meaning and combine in-depth surveys with interviews and then preliminarily construct the hierarchy frame of the community disaster prevention indicators. Delphi method is used to evaluate and modify the importance degree of the indicators, AHP is applied by means of expert questionnaires. The results of the phase are three system aspects of the indicators, twelve concrete names of the indicators, and contents of the fifty-six indicators: community fundamental system, includes community consciousness solidarity, community organization construction, and community affair involvement; community disaster prevention learning system, includes disaster prevention learning system opening, integration of disaster prevention learning resources, innovation of disaster prevention method, disaster prevention learning in daily situations, and construction of learning disaster prevention community; community sustainable system, includes mastery of community disaster issue, education of disaster prevention knowledge and ability, pursuit of social and environmental righteousness, and construction of sustainable development. As for the importance comments of the concrete names and the contents of the indicators, they were evaluated as the "main indicator"(very important, important) by the majority, especially the part of "disaster prevention learning in daily situations" and "mastery of community disaster issue" were approved by the experts. Fifty percent of the contents of the indicators was evaluated "very important"; however, seventy-five percent of the content of "construction of learning disaster prevention community" was evaluated as "average", which shows that the relation discussion between the "community disaster prevention learning" and "learning community" needs to be strengthened in order to be approved by the experts.

TABLE 1 AHP LEVEL ANALYSIS EVALUATION

content		Sort
indicator system	The second specific indicator	
(A) community base system	(A1) sense of community cohesion (0.237) **	1
	(A2) constructive community organization (0.165) *	3
	(A3) community participation (0.193) *	2
(B) community disaster prevention systems	(B1) open learning system of disaster prevention (0.043)	8
	(B2) learning resource integration of disaster prevention (0.045)	7
	(B3) disaster-prevention method of learning innovation (0.039)	9
	(B4) disaster-prevention of learning (0.068)	4
	(B5) learning community construction of disaster prevention (0.038)	10
(C) sustainable community system	(C1) community disaster issues to master (0.056)	5
	(C2) disaster prevention knowledge conservation (0.047)	6
	(C3) society and pursue environmental justice (0.031)	12
	(C4) construction of sustainable development (0.037)	11

Note:1.( ) The value in the to weight ratio.2.*Indicates the relative ratio class is above the average (average: 0.083); ** Indicates the highest the relative ratio

IV. RESULTS

When it comes to conceptualizing the idea of disaster prevention and rescue, people often emphasize on the rescuing and rebuilding after the disaster. However, what truly can decrease damages and casualties in such events is learning, training and practicing the correct procedures to react properly to a sudden disaster. The idea of "disaster resistant communities" has been carrying out for several years in Japan and the United States, as have their techniques and practices; through mutual helping and united support, some residents of our [Taiwan] communities have also shown strength in emergent disaster rescue after several incidents. Community Disaster Education emphasizes on residents reaching a common consensus and building mutual relationships in order to organize them into a disaster resistant group. What has lacked in the aforementioned institution is freedom for the independent communities to make adjustments given their individual needs. In order to increase residents' knowledge on disasters, experts and communities should work as a group in planning and practicing evacuation drills --- the participation of every person should be stressed. As for the technical perception, residents should be able to integrate the resources in the community. Additional to improving the environment, residents should be able to run disaster-preventing campaigns and drills for refuge seeking and evacuation. Pitifully, not only has professional training regarding disaster-prevention proven to be insufficient in our nation, the drills are not carried out thoroughly either, thus fomenting serious inefficiency in the Community Disaster Education. Other than the above, many more uncertainties prevent the promotion of domestic Community Disaster Education. Chief among them are variant political environment, the fact that governmental departments may neither know nor understand the existence

and relevance of such project, the unstable acquisition of academic resources and budget for equipment, the dissensions between local communities, failure to coalesce the massive and diverse of every individual community, etc.

This part mainly consisted of two parts. First, the objective and content of community disaster prevention learning were constructed based on literature review and in-depth surveys (28 persons). The development, influential factors and subject of community disaster prevention learning were analyzed and explored as well. Second, the concrete names and the content of the indicators were preliminarily drafted. Delphi method was used to evaluate the importance degree (24 persons), sifted the indicators, revised the content and adjusted the frame. Besides, Analytic Hierarchy Process and Super Decisions software were operated in order to know experts' opinion toward the inter-importance among the indicators of community disaster prevention, analyze the relevance and weigh values factors and obtained the sequence of advantages (21 persons). Based on the established indicators, a questionnaire survey of the degree of satisfaction was conducted among a group of experts and community leaders to know the result of current community disaster prevention education

Delphi method and AHP are used to evaluate the importance degree of the indicators. The results (Tabl ,2,3)are three system aspects of the indicators, twelve concrete names of the indicators, and contents of the fifty-six indicators. Community fundamental system, includes community consciousness solidarity, community organization construction, and community affair involvement; community disaster prevention learning system, includes disaster prevention learning system opening, integration of disaster prevention learning resources, innovation of disaster prevention method, disaster prevention learning in daily situations, and construction of learning disaster prevention community; community sustainable system, includes mastery of community disaster issue, education of disaster prevention knowledge and ability, pursuit of social and environmental righteousness, and construction of sustainable development. As for the importance comments of the concrete names and the contents of the indicators, they were evaluated as the "main indicator" (very important, important) by the majority, especially the part of "disaster prevention learning in daily situations" and "mastery of community disaster issue" were approved by the experts. Fifty percent of the contents of the indicators was evaluated "very important"; however, seventy-five percent of the content of "construction of learning disaster prevention community" was evaluated as "average", which shows that the relation discussion between the "community disaster prevention learning" and "learning community" needs to be strengthened in order to be approved by the experts. Since the indicators were not evaluated as unimportant and very unimportant, apparently the experts highly approve the indicators of this study, which can be viewed as an important reference of the community disaster prevention learning in Taiwan.

TABLE 2 QUESTIONNAIRE NUMBER OF INTENSION DEGREE OF IMPORTANCE THE POINTER ALLOCATION

Pointer system dimensions Name/specific pointers	Extremely important	Important	General	Meter
(A) community base system	1	2	0	3
(A1) Sense of community cohesion	1	2	0	3
(A2) Construction of community organizations	0	4	0	4
(A3) Community participation	0	3	0	3
(B) community disaster prevention systems	0	4	1	5
(B1) Open learning system of disaster prevention	0	4	0	4
(B2) Learning resources integration of disaster prevention	0	5	2	7
(B3) Innovative learning methods of disaster prevention	0	6	0	6
(B4) Disaster-prevention of learning	2	2	0	4
(B5) Learning community construction of disaster prevention	0	1	3	4
(C) sustainable community system	1	3	0	4
(C1) Community disaster issues to master	2	2	0	4
(C2) Disaster prevention knowledge conservation	1	5	0	6
(C3) Pursuit of social and environmental justice	0	3	1	4
(C4) Construction of sustainable development	0	6	1	7
Meter (specific name pointer)	2	9	1	12
Meter (Pointer content)	6	43	7	56

TABLE3   EVALUATION OF LEARNING INDICATOR (PROFESSIONAL BACKGROUND)

indicator	Relative Weight Ratio(A)	Total(all)		Archi. & Plann.		Civil eng.		others	
		mean (B)	Index (A*B)	mean (C)	Index (A*C)	mean (D)	Index (A*D)	mean (E)	Index (A*E)
(A1) Sense of community cohesion	0.237	4.19	0.99	4.20	1.00	4.29	1.02	4.00	0.95
(A2) Construction of community organizations	0.165	3.83	0.63	3.70	0.61	4.00	0.66	4.00	0.66
(A3) Community participation	0.193	3.85	0.74	4.00	0.77	3.57	0.69	4.00	0.77
(B1) Open learning system of disaster prevention	0.043	3.55	0.15	3.67	0.16	3.43	0.15	3.50	0.15
(B2) Learning resources integration of disaster prevention	0.045	3.65	0.16	3.80	0.17	3.57	0.16	3.33	0.15
(B3) Innovative learning methods of disaster prevention	0.039	3.62	0.14	3.90	0.15	3.43	0.13	3.25	0.13
(B4) Disaster-prevention of learning	0.068	4.00	0.27	4.40	0.30	3.67	0.25	3.33	0.23
(B5) Learning community construction of disaster prevention	0.038	3.24	0.12	3.30	0.13	3.14	0.12	3.25	0.12
(C1) Community disaster issues to master	0.056	4.25	0.24	4.40	0.25	4.14	0.23	4.00	0.22
(C2) Disaster prevention knowledge conservation	0.047	3.84	0.18	4.22	0.20	3.67	0.17	3.25	0.15
(C3) Pursuit of social and environmental justice	0.031	3.52	0.11	3.70	0.11	3.29	0.10	3.50	0.11
(C4) Construction of sustainable development	0.037	3.57	0.13	3.70	0.14	3.43	0.13	3.50	0.13
total		3.88		3.98		3.81		3.77	

Among the three system aspects of the indicators, Community Fundamental System, is the most important of all. The relative weight ratio of the three concrete indicators (community consciousness solidarity, community affair involvement, and community organization construction), subordinated to the Community Fundamental System, took the first three places among the twelve indicators. They were markedly different from the relative weigh ratio of other indicators. The result showed that the elements of maintaining the basic operation of the community were also the fundamental condition of constructing the disaster resistant community.

V. CONCLUSION

Based on the empirical study of the degree of satisfaction toward the indicators, community leaders' assessment of the degree of satisfaction, and evaluating the effectiveness was higher than that of the experts'. Experts with Architecture &

Urban Planning background, comparing with whom from Civil Engineering and any other fields, made higher appraisal in the assessment. The degree of satisfaction of the community leaders in the model of potential debris-flow community is higher than that of in the non potential debris-flow community. The degree of satisfaction of the community leaders in the model of prevention community is higher than that of in the community-based hazard mitigation plan. The degree of satisfaction of community

core members, comparing with that of the village head is higher, as well. Since the indicators were not evaluated as unimportant and very unimportant, apparently the experts highly approve the indicators of this study, which can be viewed as an important reference of the community disaster prevention learning in Taiwan.

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