出國報告（出國類別：其他國外會議）

出席 2013 國際都市規劃研討會 (International Symposium on Urban Planning 2013)

服務機關：國立聯合大學建築學系
姓名職稱：王本壯 副教授
派赴國家：日本，仙台市
出國期間：102 年 8 月 22 日 ~ 102 年 8 月 24 日
報告日期：102 年 9 月 3 日

摘要（200-300 字）

本次出席日本都市與計畫學會所舉辦之「International Symposium on Urban Planning 2013 – Resilient and Sustainable Cities」國際研討會，探勘日本經歷 311 大地震與海嘯災害後，其復建狀況與新技術、經驗之交換及學習。此次研討會之主題為 Resilient and Sustainable Cities(彈性和永續都市)，本研究者以莫拉克風災災後重建經驗，探討災後之社區關係重建為發表主題。

本研究之主題發表主題分配於「Resilient Cities and Regions」。同一場次內有以重建過程、城市結構設計及受災經驗分析都市與地方層級的防災設計。此次災後研究面向，多以「韌性城市」為發展目的，而不再是抵抗災害(此次災害中長堤完全無法抵擋海嘯之肆虐)，在各項研究面中可以發現，現在災害相關研究已朝向城市韌性與恢復力之建立，促進區域在災後可以快速重組，而不改變影響社區(人與空間)之結構改變與流失為主。

關鍵字：永續發展、災後重建、韌性城市

目次

一、目的

(包括原定計畫目標、主題、緣起、預期效益或欲達成事項)

本次出席日本都市與計畫學會所舉辦之「International Symposium on Urban Planning 2013 – Resilient and Sustainable Cities」國際研討會之目的為，親身探勘日本經歷 311 大地震與海嘯災害後，其復建狀況與新技術、經驗之交換及學習。本次研討會之主題為 Resilient and Sustainable Cities(彈性和可持續發展的城市)，本研究者以莫拉克風災災後重建經驗，探討災後之社區關係重建。

二、過程

(執行經過，包括出國期間行程、參訪單位及訪問過程，會議議程、議場主題、與會參與各項研討或聽取報告議題之內容重點摘述、見聞或新知；如發表研究或報告，個人所發表內容摘要、現場報告或討論交流情形等。)

(1) **行程:**8/22 Welcome party and opening ceremony

8/23 發表會

8/24 Technical trip（受災地區探勘）

(2) **會議議程**

Aug. 22nd(Thu)	**18:00-20:00 Welcome Party** **Place: Hotel Metropolitan SENDAI 4FL. Grand Ballroom [Sendai]**
	[Program] Reception and Registration(17:00-) Opening Address by the host institute -Haruhiko GOTO(President of CPIJ) Welcoming Address -Host City Address and a Toast Ceremony (Kanpai) -Makoto YOKOHARI(Senior Managing Director of CPIJ) Guests Address -Woo Jong Lee(President of KPA) -Kuang-Hui Peng(President of TIUP) -Chinh Tran Ngoc(President of VUPDA) Commemorative Gifts to Guests

Aug. 23rd(Fri)	**09:00-09:45 Opening Ceremony | Place: Sakura Hall**
	[Program] Reception and Registration(08:30-) Opening Address -Haruhiko GOTO(President of CPIJ) Welcoming Address -Host University Congratulatory Address -Woo Jong Lee(President of KPA) -Kuang-Hui Peng(President of TIUP) -Chinh Tran Ngoc(President of VUPDA) Keynote Speech "Sendai City : The Capital of Tohoku Region" -Makoto OKUMURA(Professor of Tohoku University)
	10:00-12:00 Oral Presentation | Place: Sakura Hall and Extended Education & Research Building
	12:00-13:00 Lunch | Place: Katahira Kitamon Commons *** Executive Meeting will be held in lunch time at Temporary Building of Dept. of Architecture.**
	13:00-14:40 Oral Presentation | Place: Sakura Hall and Extended Education & Research Building
	14:45-15:50 Poster Presentation | Place: Sakura Hall
	16:00-18:00 Special Session | Place: Sakura Hall
	18:30-20:00 Farewell Party | Place: Sakura Hall
	[Program] Reception and Registration(18:00-) Opening Address -Norihiro NAKAI(Vice-President of CPIJ) Announcement of the next symposium -Chinh Tran Ngoc(President of VUPDA) Closing Address -Makoto OKUMURA(Professor of Tohoku University) Information for Participants of the Technical Tour -Michio UBAURA(Professor of Tohoku University)
Aug. 24th(Sat)	**09:00-16:30 Technical Tour**

(3) 議場主題 ： Resilient and Sustainable Cities

(4) 內容記錄 ： 本研究者之主題發表分配於「Resilient Cities and Regions」此一場次。本場次內有三場為專一以 311 地震為主要研究對象，分別以重建過程、城市結構設計及由此次經驗分析都市與地方層級的防災設計。另三篇研究則為以城市區域聯盟、土地使用與地震初發前期記錄為切入點，由各方面了解都市防災之設計與理論。本研究者並受主辦單位(日本都市與計畫學會)邀請，擔任 Session B 場次之總主持人（請詳見附件「發表議程」），主導發表與議題討論。

圖 1. 主題演講（左圖）

圖 2. 開幕晚會致詞（右圖）

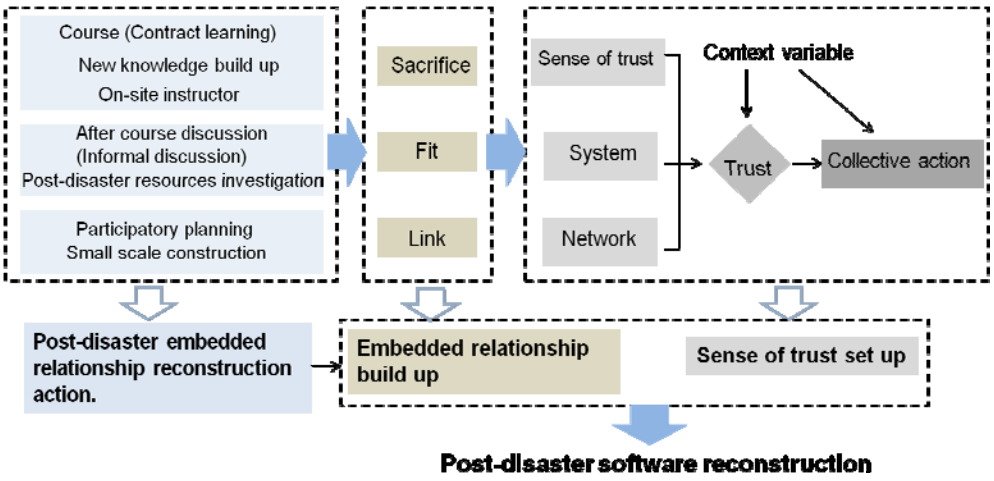
圖 3. 研究者擔任主持人

三、 心得及建議事項

(包括與出國主題相關之具體建議事項，建議參採或借鏡處)

相較於前次阪神大地震後，日本與世界各地研究者在災後提出多項以避震、隔震以及地震後火災的預防，以建築設計與結構設備之改善為主，其吸取前次經驗之成果可在此次 311 地震中看出，在此次災後中，只有鮮少(近乎沒有)人員是因為地震本身而受到傷害，多半因海嘯而受難。因此此次災後研究面向，多以「韌性城市」為發展目的，而不再是抵抗災害(此次災害中長堤完全無法抵擋海嘯之肆虐)，在各項研究面中可以發現，現在災害相關研究已朝向城市韌性與恢復力之建立，促進區域在災後可以快速重組，而不改變影響社區(人與空間)之結構改變與流失為主。

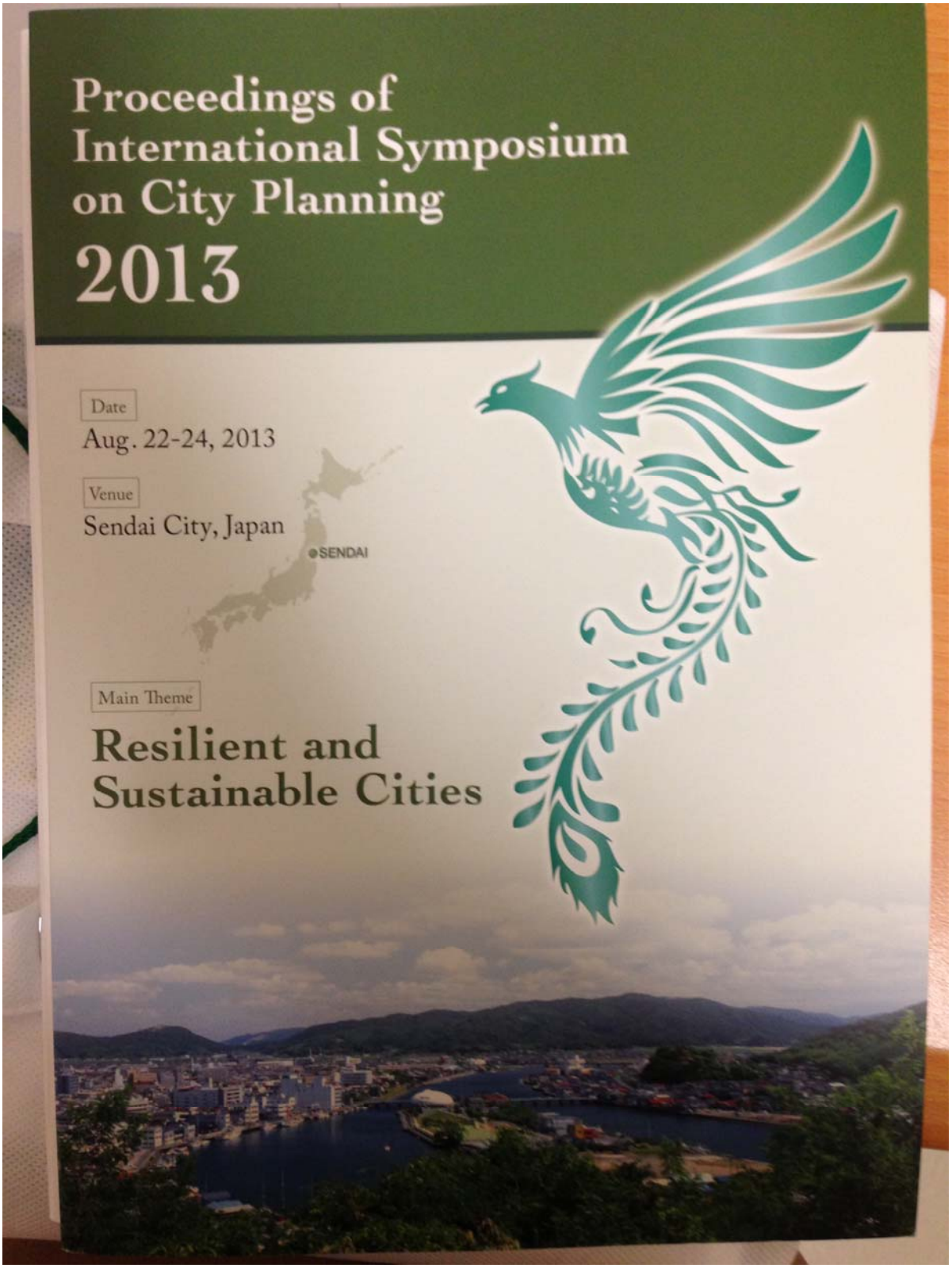
在本次研究發現，社區具有一鑲嵌之關係，當突遇災害時，人員流失、資源損害，都會造成社區鏈結之斷裂，此時即需仰賴鑲嵌關係，重建社區人與人、以及人與環境間之連結。研究更進一步發現，當災後重建時，需先注重重建軟體，而非硬體，唯有軟體之關係穩固，重建信任感，方可在硬體重建時了解社區現有資源，與真正需要的，更將居民之共識融入在硬體重建過程中。



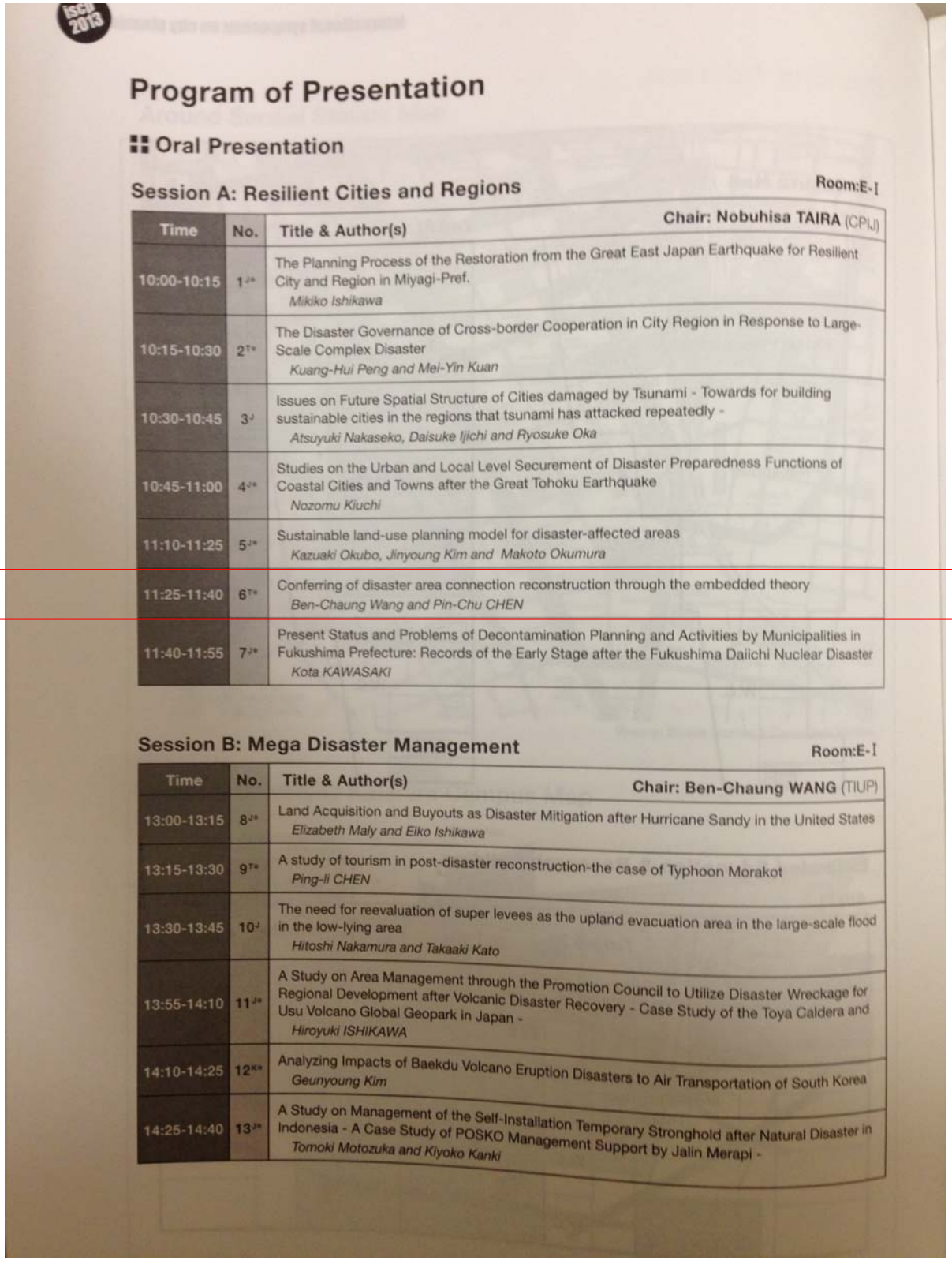
四、 攜回資料名稱

大會出版論文集

1. 論文集封面



2. 發表順序、名單



Program of Presentation

Oral Presentation

Session A: Resilient Cities and Regions

Room:E-1

Chair: Nobuhisa TAIRA (CPIJ)

Time	No.	Title & Author(s)
10:00-10:15	1J*	The Planning Process of the Restoration from the Great East Japan Earthquake for Resilient City and Region in Miyagi-Pref. *Mikiko Ishikawa*
10:15-10:30	2T*	The Disaster Governance of Cross-border Cooperation in City Region in Response to Large-Scale Complex Disaster *Kuang-Hui Peng and Mei-Yin Kuan*
10:30-10:45	3J	Issues on Future Spatial Structure of Cities damaged by Tsunami - Towards for building sustainable cities in the regions that tsunami has attacked repeatedly - *Atsuyuki Nakaseko, Daisuke Ijichi and Ryosuke Oka*
10:45-11:00	4J*	Studies on the Urban and Local Level Securement of Disaster Preparedness Functions of Coastal Cities and Towns after the Great Tohoku Earthquake *Nozomu Kiuchi*
11:10-11:25	5J*	Sustainable land-use planning model for disaster-affected areas *Kazuaki Okubo, Jinyoung Kim and Makoto Okumura*
11:25-11:40	6T*	Conferring of disaster area connection reconstruction through the embedded theory *Ben-Chaung Wang and Pin-Chu CHEN*
11:40-11:55	7J*	Present Status and Problems of Decontamination Planning and Activities by Municipalities in Fukushima Prefecture: Records of the Early Stage after the Fukushima Daiichi Nuclear Disaster *Kota KAWASAKI*

Session B: Mega Disaster Management

Room:E-1

Chair: Ben-Chaung WANG (TIUP)

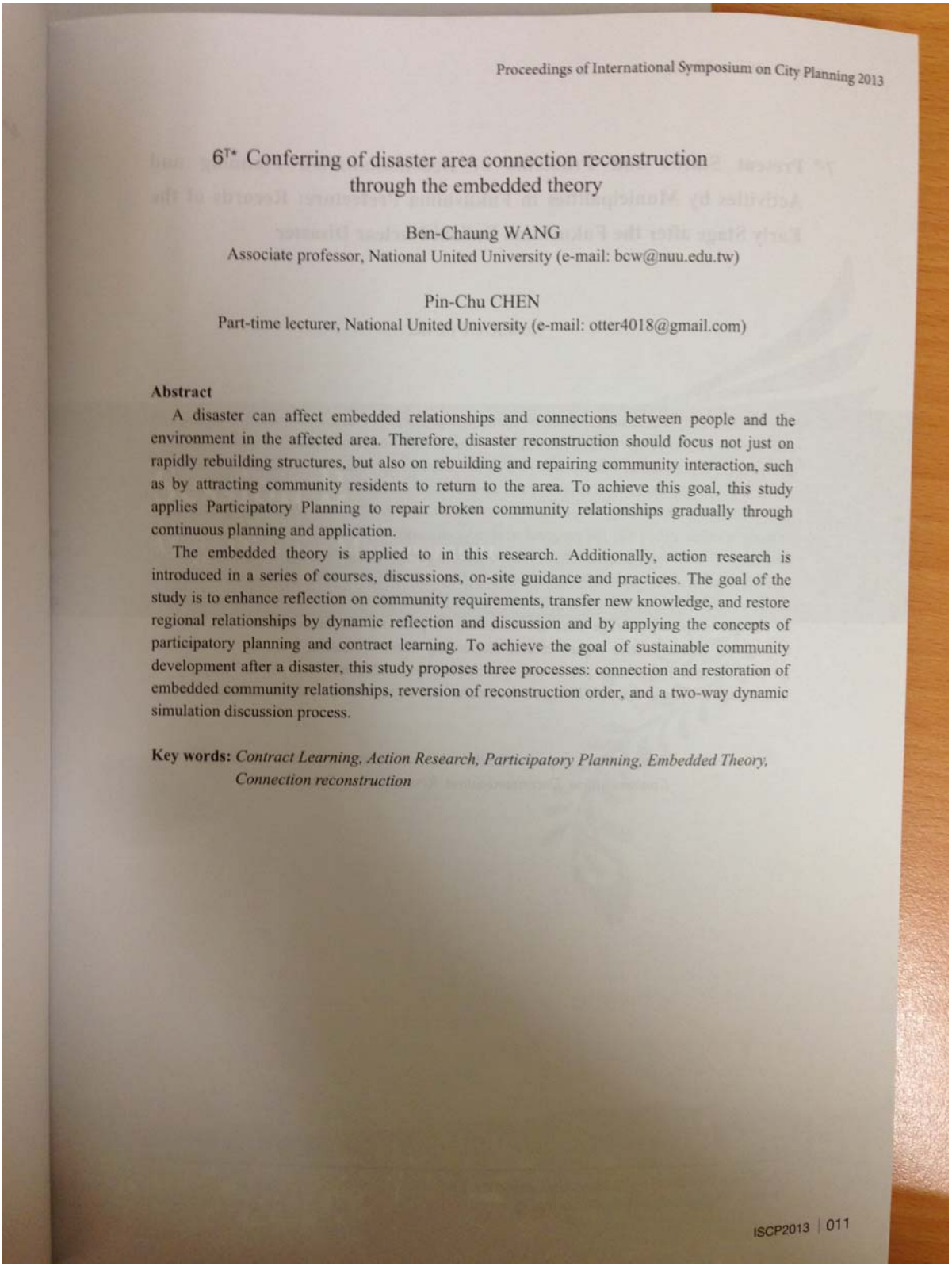
Time	No.	Title & Author(s)
13:00-13:15	8J*	Land Acquisition and Buyouts as Disaster Mitigation after Hurricane Sandy in the United States *Elizabeth Maly and Eiko Ishikawa*
13:15-13:30	9T*	A study of tourism in post-disaster reconstruction-the case of Typhoon Morakot *Ping-li CHEN*
13:30-13:45	10J	The need for reevaluation of super levees as the upland evacuation area in the large-scale flood in the low-lying area *Hitoshi Nakamura and Takaaki Kato*
13:55-14:10	11J*	A Study on Area Management through the Promotion Council to Utilize Disaster Wreckage for Regional Development after Volcanic Disaster Recovery - Case Study of the Toya Caldera and Usu Volcano Global Geopark in Japan - *Hiroyuki ISHIKAWA*
14:10-14:25	12K*	Analyzing Impacts of Baekdu Volcano Eruption Disasters to Air Transportation of South Korea *Geunyoung Kim*
14:25-14:40	13J*	A Study on Management of the Self-Installation Temporary Stronghold after Natural Disaster in Indonesia - A Case Study of POSKO Management Support by Jalin Merapi - *Tomoki Motozuka and Kiyoko Kanki*

3. 論文目錄

Contents

Session A : Resilient Cities and Regions

4. 論文集內研究者發表之內容刊載



6T* Conferring of disaster area connection reconstruction through the embedded theory

Ben-Chaung WANG
Associate professor, National United University (e-mail: bcw@nuu.edu.tw)

Pin-Chu CHEN
Part-time lecturer, National United University (e-mail: otter4018@gmail.com)

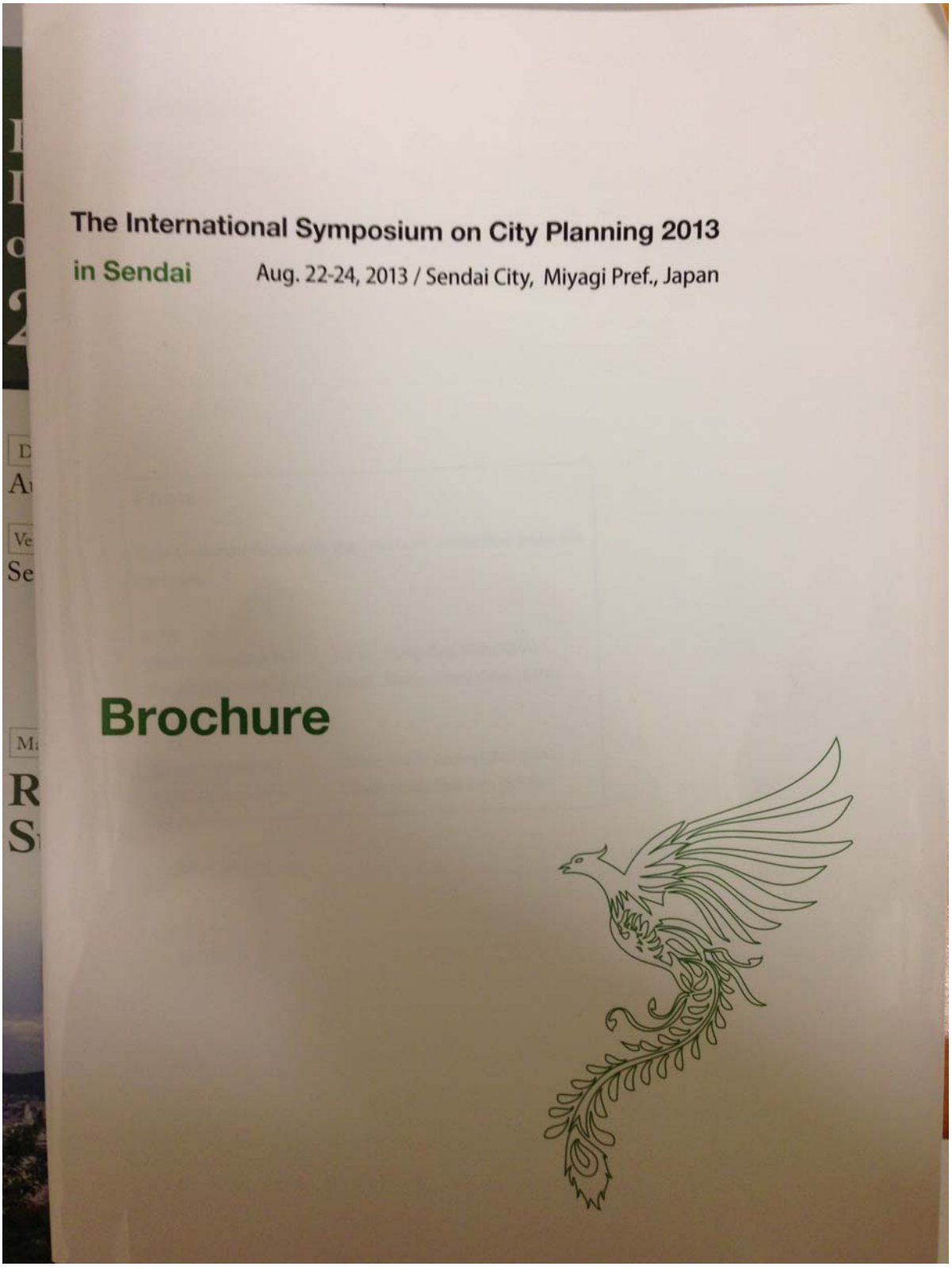
Abstract

A disaster can affect embedded relationships and connections between people and the environment in the affected area. Therefore, disaster reconstruction should focus not just on rapidly rebuilding structures, but also on rebuilding and repairing community interaction, such as by attracting community residents to return to the area. To achieve this goal, this study applies Participatory Planning to repair broken community relationships gradually through continuous planning and application.

The embedded theory is applied to in this research. Additionally, action research is introduced in a series of courses, discussions, on-site guidance and practices. The goal of the study is to enhance reflection on community requirements, transfer new knowledge, and restore regional relationships by dynamic reflection and discussion and by applying the concepts of participatory planning and contract learning. To achieve the goal of sustainable community development after a disaster, this study proposes three processes: connection and restoration of embedded community relationships, reversion of reconstruction order, and a two-way dynamic simulation discussion process.

Key words: *Contract Learning, Action Research, Participatory Planning, Embedded Theory, Connection reconstruction*

5.論文集封底


The International Symposium on City Planning 2013
in Sendai
Aug. 22-24, 2013 / Sendai City, Miyagi Pref., Japan
Brochure

Conferring of disaster area connection reconstruction through the embedded theory

Ben-Chaung WANG
Associate professor, National United University (e-mail: bcw@nuu.edu.tw)

Pin-Chu CHEN
Part-time lecturer, National United University (e-mail: otter4018@gmail.com)

Abstract

A disaster can affect embedded relationships and connections between people and the environment in the affected area. Therefore, disaster reconstruction should focus not just on rapidly rebuilding structures, but also on rebuilding and repairing community interaction, such as by attracting community residents to return to the area. To achieve this goal, this study applies Participatory Planning to repair broken community relationships gradually through continuous planning and application.

The embedded theory is applied to in this research. Additionally, action research is introduced in a series of courses, discussions, on-site guidance and practices. The goal of the study is to enhance reflection on community requirements, transfer new knowledge, and restore regional relationships by dynamic reflection and discussion and by applying the concepts of participatory planning and contract learning. To achieve the goal of sustainable community development after a disaster, this study proposes three processes: connection and restoration of embedded community relationships, reversion of reconstruction order, and a two-way dynamic simulation discussion process.

Key words: *Contract Learning, Action Research, Participatory Planning, Embedded Theory, Connection reconstruction*

Natural disasters associated with climate change have occurred regularly in recent years. Studies have examined post-disaster reconstruction and hazard mitigation, as well as sustainable development. Particularly, rural regeneration has become an important focus for many countries. Rural regeneration in Taiwan involves reinstatement of the dignity of rural residents, industrial rebirth and conservation of the natural environment. The government has established regulations governing rural regeneration, land use renovation and flexible land use. Agriculture has always been important to the Taiwanese economy, and rural vision is important for country. Natural disasters have recently caused rural destruction and crop damage in Taiwan. Typhoon Morakot caused serious damage on August 8, 2009, damaging mountain slopes, fields, life and property. Disasters have also affected western Taiwan, where many villages depend on agriculture and fishery. To rebuild destroyed villages, the Soil and Water Conservation Bureau, Council of Agriculture, Executive Yuan has promoted the "Central district rural reconstruction empowerment program", which cultivates the abilities of communities to engage in community reconstruction, long-term planning, hazard mitigation and preservation. This program is being implemented in rural communities those were hit by Typhoon Morakot and are located in Nantou County, Changhua County, Yunlin County and Chiayi County.

Exordium

This research discusses regional reconstruction through the embedded theory and builds new reconstruction processes and concepts. Furthermore, it adopts voluntary-registration, interview and election for advance preparation reconstruction courses, improves reflection of residents of current community common value, and learns applies current resources to realize three new reconstruction concepts.

(1) Connection and embedded reorientation

(2) Reverse reconstruction order

(3) Two-way dynamic simulation

The most important thing for residents of post-disaster communities is to rebuild connections, whether those among people, those between people and the environment, and those among different environments. This study applies an action research approach to discuss new reconstruction order, and it helps solve problems of a lack of reflection and accelerate the reconstruction process.

1. Research motive

Hazard is strongly related to society, economic and political system, and internal community connections. C.S Wang (2005) noted that sustainability researches in Taiwan enhance people's empowerment, which demonstrates that non-governmental social empowerment and community connections are important in post-disaster reconstruction. Society comprises interaction between peoples and the environment. The relationships among people, and between people and the environment, comprise various activities, as well as space and time. Therefore, changes in network relationships and members lead to connections changing or being lost. Disasters break connections and operations of society. After typhoon Morakot, rural villages suffered mudflows and landslides, and relationships were destroyed as people fled the disaster. Moreover, damage to lives, the environment and crops are all issues disaster areas will face after the changes to embedded networks.

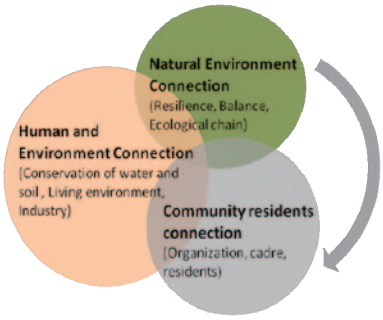


Figure1. Before disaster: society work well.

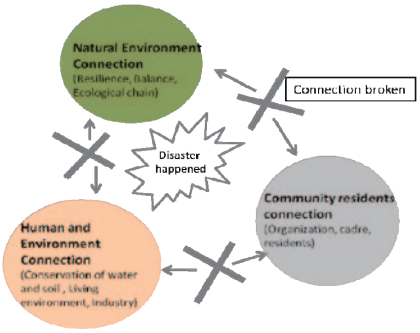


Figure2. Disaster causes connection broken.

The current focus of reconstruction is on the rapid reconstruction of dwellings. However, residents have inadequate time to re-identify community future vision, and also have difficulties adjusting their participation in the community and rebuild community common conscious. (P.C Shao, 2003) However, reconstruction order now values the construction of hardware (buildings, environment) over that of software (peoples' linking, regional value), and is decided by the central government rather than regional communities. The current reconstruction process does not rebuild the connections of residents, common values are not renewed, and the process does not include resident visions, all of which destabilize the reconstruction process. Based on this situation, there are three issues and requirements exist in relation to reconstruction.

(1). Connection and embedded reorientation. Changes in common community values result in loss of network connections. Therefore, reconstruction should focus first on rebuilding software. Moreover, such changes should involve joint efforts by professionals, administrators and the community itself to help residents identify the most suitable position for new networks and s establish a community consensus. Planning new community values which are setting on providence development prospects substitutes for pursuing short term benefits. Furthermore, such planning reconnects networks through reflection and new knowledge.

(2). Reverse reconstruction order. Rebuild networks among people, and between people and the environment. Current reconstruction emphasizes hardware construction, and the connections among people (residents) have not been rebuilt and do not interact with new concepts. Reconstruction does not build on the vision of residents, which causes network instability.

(3). Two-way dynamic simulation. Communities combine the concepts of "co- management" and "adult education - contract learning concept", and apply informal discussion to the courses, and ultimately learn "new knowledge". Finally, residents establish a "common benefit future" image, and should accept the concept of "sacrifice". This concept re-molds the vision of residents, and finally identifies values related to new networks and suitable network positions.

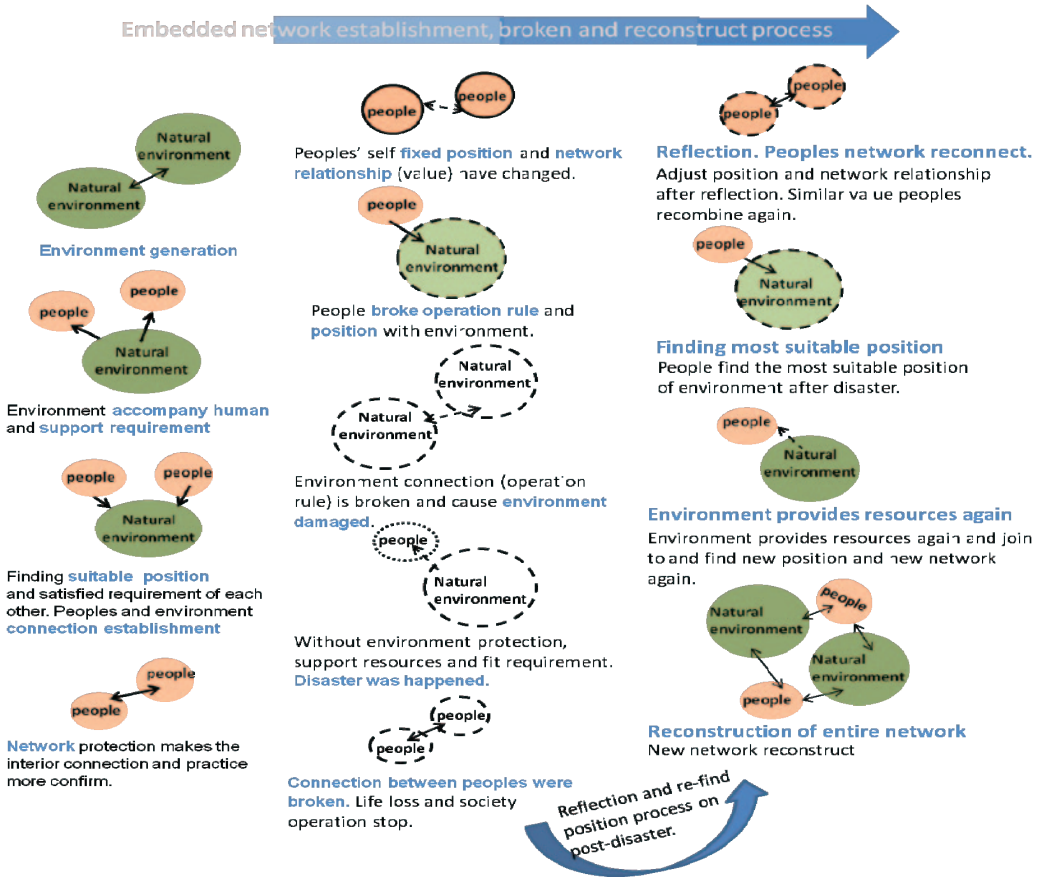


Figure3. Connection rebuild in the reconstruction buffer period

Disaster community interior reflection and informal discussion can help residents identify new positions of value within networks, and networks among people, and between people and the environment. Damage to human resources and environmental and network damage cause imbalance communities affected by disaster. This study uses participatory planning, contract learning, on site guidance (instructors), and small scale construction in the reconstruction process. Those elements can connect people with the environment, and identifies new community values such as common sense and suitable position of resident in the community through discussion and exercise. The findings of this study can assist communities afflicted by disasters to fix broken connections and finish re-cultivation of human resources, re-composition of community organizations, and finally rebuilding of the embedded network.

2. Research scope

This study focuses on disaster communities that were affected by Typhoon Morakot, which include Nantou County, Changhua County, Yunlin County and 16 other disaster communities. Action research as research method and residents process discussion, reflection and decide courses they wanted through the contract learning. The use of action research as the research method, and the analysis of resident discussions, reflections, and decisions enables this study to realize what the residents requirements through the contract learning. Moreover, this study investigates community post-disaster resources, and uses onsite professionals to perform team evaluation and supply long-term guidance, which can improve the ability of residents to self-reflect.

3. Documentary

(1) Cultural life circle – Community connection

Kevin Meethan (1997) mentioned distinctive attributes of places as the key element of regional development, and noted that features of regional culture have long existed in daily life. The concept of cultural life circle has two meanings, a "geographically homogenous cultural space" and a "psychologically homogenous cultural space", as represented in the daily life of regional groups and the residents behavior. (B.C Wang, 2006, 2007). The ideal community are not only united by geography and psychological methods but also by actions. Most important is that residents must participate jointly in cultural life circle. Furthermore, combination with each systems (culture, knowledge, daily life and administration) in the region can promote successful regional work.

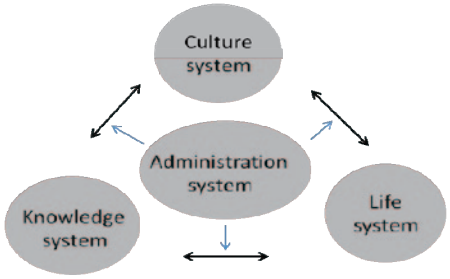


Figure4. Community systems working relationship

The culture life circle not only combines with people but also the way they interact with the environment, and their daily life, and the interaction among these elements, which shows that the culture life circle is important in promoting members of society to work. (Wang, Chou, & Lee, 2010). Interaction between the environment and humans is indispensable, and is also important in post-disaster reconstruction. When people lose environmental support and connections with others , they lose balance in their lives. Regarding disaster communities, loss of life, broken community structures and environmental damage will paralyze the culture life circle. Therefore, disaster community reconstruction needs to find new network connections and the most suitable position of the community for survival. Peoples suffer various traumas and feel surreally detached from the environment when they face dramatic change. Humans have three responses so such situations: resilience, stress-resistance and invulnerability. Resilience is important in post-disaster reconstruction whether mentally, physiologically or environmentally.

Holling (1973) defined resilience as the ability of a system to renovate in response to damage and sudden changes. According to this definition, resilience means the ability to suffer change. The Weber dictionary notes that resilience describes the ability of interior systems to renovate, and to restore themselves to their original state when individuals face the change (e.g. pressure or adversity). Benard (1995) mentioned that individual resilience is affected by three elements, namely "attentive environment", "positive expectation" and "opportunity for social participation". Moreover, resilience involves an interactive relationship between peoples and the environment (system). (Hsiao Wen, 2001) Resilience is related to the daily life and values of regional residents. Therefore, connections among people and between people and the environment, and readjustment of entire network cultures and values are the key point of post-disaster reconstruction.

Reconstruction elements show that if people want to maximize the effectiveness of resilience, they must provide a caring environment. Furthermore, the process of reconstruction should make residents feel positive and should allow residents to participate in the entire reconstruction process, which means no matter whether in psychology or behavior, residents should establish new identities and feel they are part of their organizations (environments), to restore broken connections. (Wang, Liu & Chou, 2010)

(2) Disaster community organization relationship re-embedded.

Embedded theory notes the existence of an interactive relationship between people and their living environments, and that systems can be embedded in existing structures and relationships. Social relationship can help individuals steadily develop their behavior, and can maximize the efficiency of organization resource use. Meanwhile, embedded theory can protect people from disasters. Embedded theory represents that economic behavior (attempted behavior) is based on significant and lasting embedded relationships among persons, organizations and the environment.

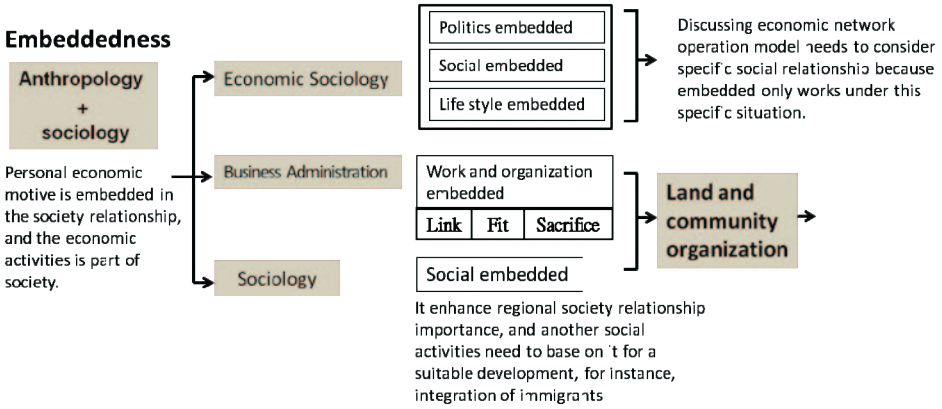


Figure5. Documentaries relationship

Embedded theory demonstrates that interpersonal relationships associated with peoples and living environment. Moreover, organization networks influence personal behavior. This theory describes the embedded relationships of people and the environment, and describes peoples' internal interactions through three elements, namely link, fit and sacrifice. (T.R Mitchell,. et al, 2001) Link means organizational peoples have both psychological and economic connections, and individuals can play a role in the group – for example by supplying and using network resources. Fit represents that personal knowledge, attitude, character and harmony are suited to the organization. Only when personal targets and values match common organizational values can people completely work with organizational culture (value) and development sustainability. Sacrifice means that if individuals leave the organization, they must sacrifice the experience, resources and other things that they have accumulated. Moreover, they lose relationships; both people and organizations seek to avoid this situation, and so they confirm embedded relationships as firmly as possible.

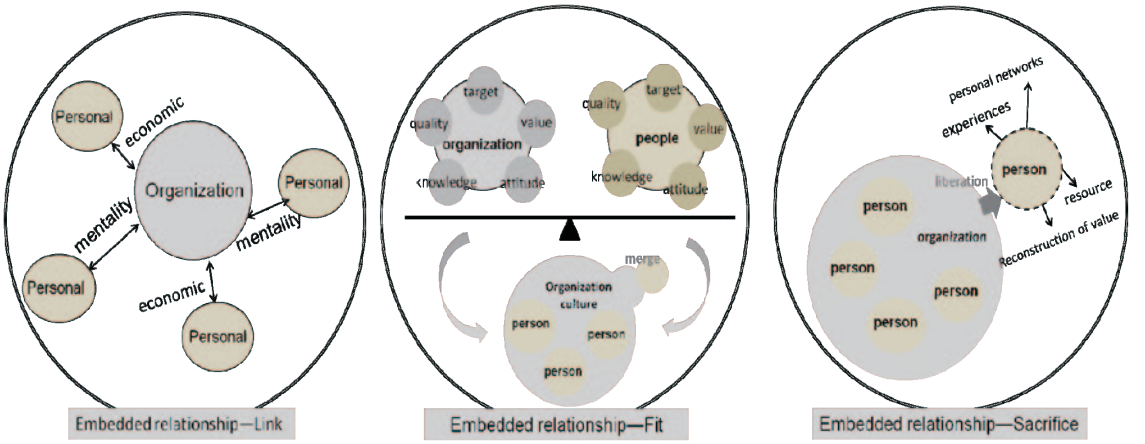


Figure6. Embedded theory

Embedded theory holds that disaster damages resources and so on, which results in the disappearance of persons and organizational connections, and involves a form of sacrifice of humans and the environment. This study attempts to remold network culture, establish editing of dynamic values, and cultivate the ability to deal with disasters through the reflection, knowledge rebuild and fit relationship between individuals and organizations.

	Business Administration -Human and organization	Organism(human)and environment - Land and community organization
Fit	* People position in organization - Functional and achievement * Accept **organization value**	Finding the most suitable position . Harmony with **environment operation rule.**
Link	**Network relationship of organization interior. It can makes organization operate confirm and efficiency.**	**Food chain of environment. Dynamic reflection and adjust the way of co-benefit living.**
Sacrifice	Leaving organization because of society network relationship and other benefit of value.	Sacrifice small benefit to get the entire balance with the environment. (Don't take too much.)

Figure 7. Relationship between community reconstruction and business administration of embedded theory.
Resource: Granovettwe, M (1985) and constructed by the authors

Granovetter (1985) presents opinions regarding social embeddedness, and believes that human activities are based on formal networks that are based on specific societies. Therefore, such activities are related to original social relationships. This shows that the embeddedness theory which is practiced in economic activities discusses social operations (those between people and the environment) and network forming concepts. Embeddedness theory includes "relational embeddedness" and "structural embeddedness". Relational embeddedness is the quality of dyadic exchanges and further forms the informal individual network, which enhances the "trust relationship" between members. However, building up the network and trust relationships among network members is important.

Descriptions show that network relationships are the key focus for post-disaster reconstruction and establishing attitudes for dealing with disaster in future. Embedded theory developed from anthropology and sociology, and discusses human and organizational relationships. Peoples determine the most suitable position and obtain environmental support, pay homogenous expenses, and form interaction networks. Therefore, this study practices embedded theory in the post-disaster environment and human (community organization) rebuilding, and so improves post-disaster reflection and connection rebuilding.

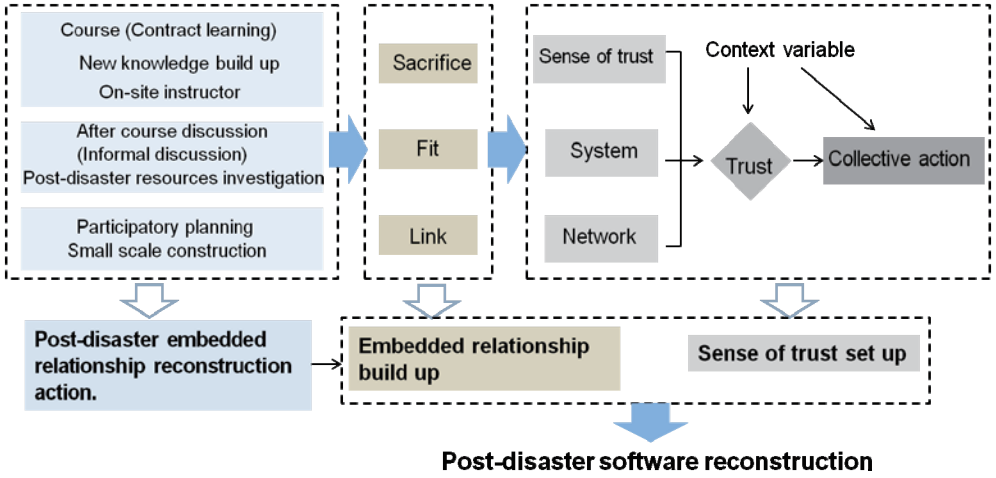


Figure8. Embedded theory and Second-generation collection action

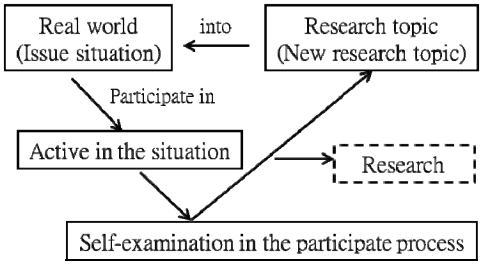
Second-generation Collection Action mentions the importance of establishing a common sense of trust of regional residents in public events and behavior. In order to build up the common sense of trust of regional residents, it needs to build up a " sense that trust is worthwhile", "system" and "network", and can provide residents with Cognitive trust, Affective trust and Systemic trustto improve collection action, and can improve collective action. (Ostrom and Ahn, 2003). Compared second-generation collection theory like in the embedded theory, individuals "sacrifice" to earn bigger mutual benefit. This sincerity comes from everyone involved "stepping back" to produce basic trust. Furthermore, in the embedded theory, "fit" is individual to find out the most suitable operation position of entire environment and content with this position. Fit can achieve to the finest share of the resources with others, and increase community common efficiency. Furthermore, the community takes the form of a "system" of second-generation collection. Finally, it finishes the individual "link" relationship of embedded theory, and establishes new environmental "network" systems. (Fig. 8)

Focusing on embedded relationship and sense of trust to achieve post-disaster software reconstruction can maintain tight regional network relationships. This study applies different post-disaster actions, for instance contract-learning, informal discussion, on-site instructors, and etc, in establishing embedded theory goals (sacrifice, link and fit). Moreover, this study improves post-disaster community network sense of trust set up, and finally establishes new relationships that are firmly embedded in the community.

(3) Action research

In 1930, American sociology psychologist, Lewin introduced the concept of action research, which combines the insights and ability of researchers and participants to increase

understanding of a specific area. Characteristics of action research include “research in action”, “research for action” and “research by actors” (M.Q Wu,1991) Action research focuses on clarifying the cooperation between researchers and participants, and makes participants into action researchers. The researcher serves as a catalyst and guides participants to identify issues and express different opinions. The researcher can adjust the research direction and method depending on participant condition and needs.



Recourses: Checkland & Holwell , 1998

Figure9. Action research

This study applies action research to disaster community reconstruction, and performs evaluation, planning and reaction from the learners. Moreover, this study discusses and reflects on the action research circle, and tries to clarify the issues of reconstruction and help meet the needs of disaster community reconstruction. The research process involves professional team, residents, and on site instructors. Moreover, the study identifies the optimal post-disaster reconstruction process though repeated resident discussions of new environment values, course reviews and so on. (Fig. 10)

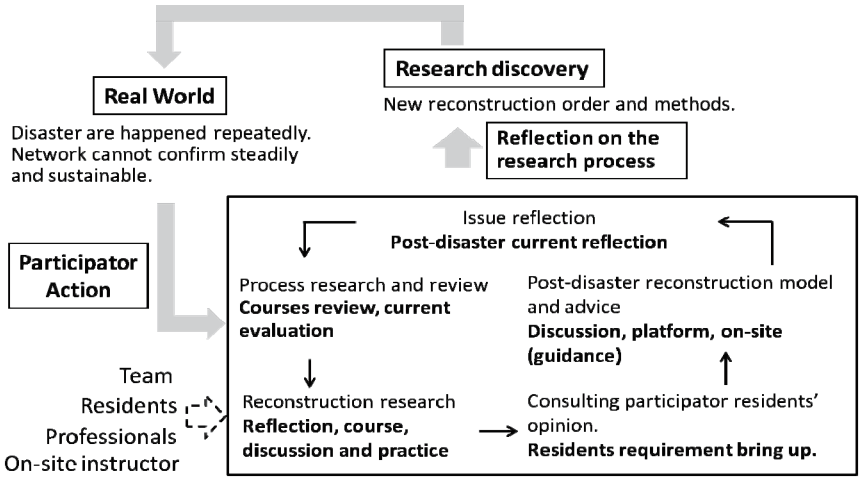
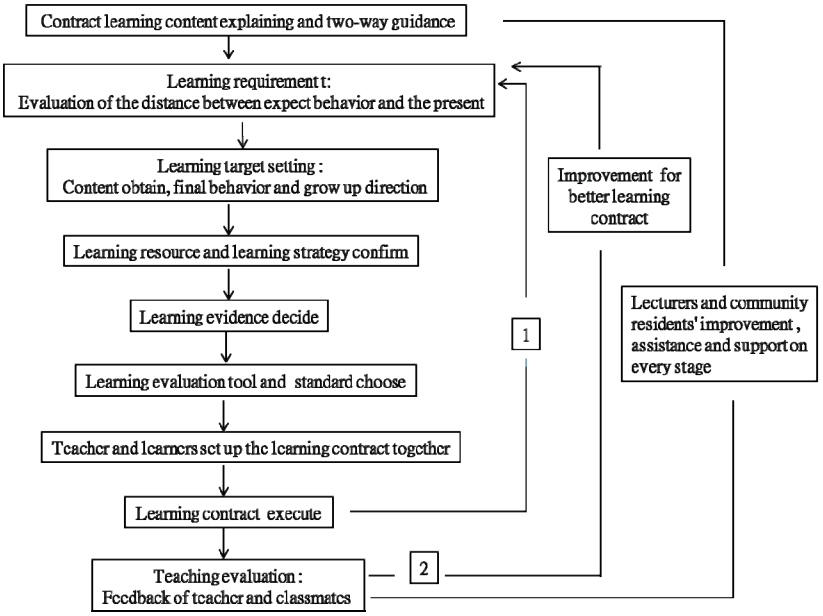


Figure10. Action research methods practices in the research process

(4) Contract Learning

Contract learning broke the traditional model of “vertical one-way educational power” (B.C Wang, 2006). Contract learning is based on “learning target”, “learning resources and strategy”, “learning outcome demonstration”, “evaluation standards” and “learning schedule”, and involves five elements, 11 processes and two circles.



Resource: B.C Wang, F.J.Chou, 2006

Figure11. Contract learning practices in teaching. (Editing model)

The learning process requires teachers to provide teaching ideas for learners, and to guide, encourage and direct them. Learners organize resources and execute learning designs. Contract learning builds mutually beneficial and independent learning attitudes.

Vygotsky (1978) represents "Metacognitive Scaffolding", and means that human metacognitive experiences are constructed step by step and have their own hierarchy. The process resembles constructing a building, and the accumulation of knowledge can provide the foundation of new knowledge. Disaster community empowerment not only involves remolding original networks, but also reflection and reconstruction of regulations. Based on existing resources, people reflect and establish] new common values and knowledge. Residents survey the post-disaster situation and recourses and then determine a course of learning through contract learning and interior discussion. Furthermore, on-site professionals assist with course planning. Residents can reflect on their wants and needs through contract establishment.

(5) Participatory planning

Participatory planning brings together professional planners and users, and to share their ideas about planning and participate in the planning process. The participation of residents in environment planning builds consensus and helps them identify with their communities (environment). Participatory planning considers both planner and user ideals and concepts, and can increase the enthusiasm of residents through participatory planning, and introduces new ideas to the process. Residents contributing their ideas is better than leaving idea generation entirely to planners who might not know the region well, and can also help ensure future reconstruction closely matches resident ideas, making reconstruction more practical and more likely to reflect the consensus views of residents.

The study established new values and reflections of current situation and resources through the reconstruction courses and guidance, and introduces informal discussion to the reconstruction courses which not only encourages interaction of ideas but also establishes new

common values through dynamic reflection. Discussion can identify suitable locations, common sense establishment, and bring up current resources. Moreover, participation of professional teams and on-site instructors in the discussion can give timely advice and provide direction. Changes in and losses of current knowledge and networks cause disaster to recur. Therefore, the research team established series of courses based on current situation and enhanced its abilities in "knowledge strengthening". Based on contract learning, the reconstruction process not only provides rapid reconstruction but is also necessary for processing "self identification", "contract setting" ,"course planning" and "knowledge strengthening". Residents must reflect the knowledge they are scanty of, and rebuild environmental value and position by themselves.

The aim of disaster community reconstruction is to combine with three way connection among people and between people and the environment, promote remolding of community centripetal forces, and rebuild the values of residents. This study uses the action research method, and combines these methods with participatory planning and contract learning to enhance the establishment of self-consciousness in residents. Furthermore, this study increases the opportunities of residents for discussion and interaction, and uses rolling learning to improve the rebuilding of network connections.

4. Research structure

Post-disaster reconstruction should adopt four strategies, namely "cooperative planning", "co-management", "integral evaluation" and "practical planning". (H.K Wang, H.C Lin, 2004) The decision process should subsume different opinions and management coordination. The various departments and professionals involved in the participatory circle must engage in mutual evaluations. Post-disaster reconstruction should achieve "connection and embedded reorientation" and "two-way dynamic interaction simulation process", and finally should establish a new "reverse reconstruction order".

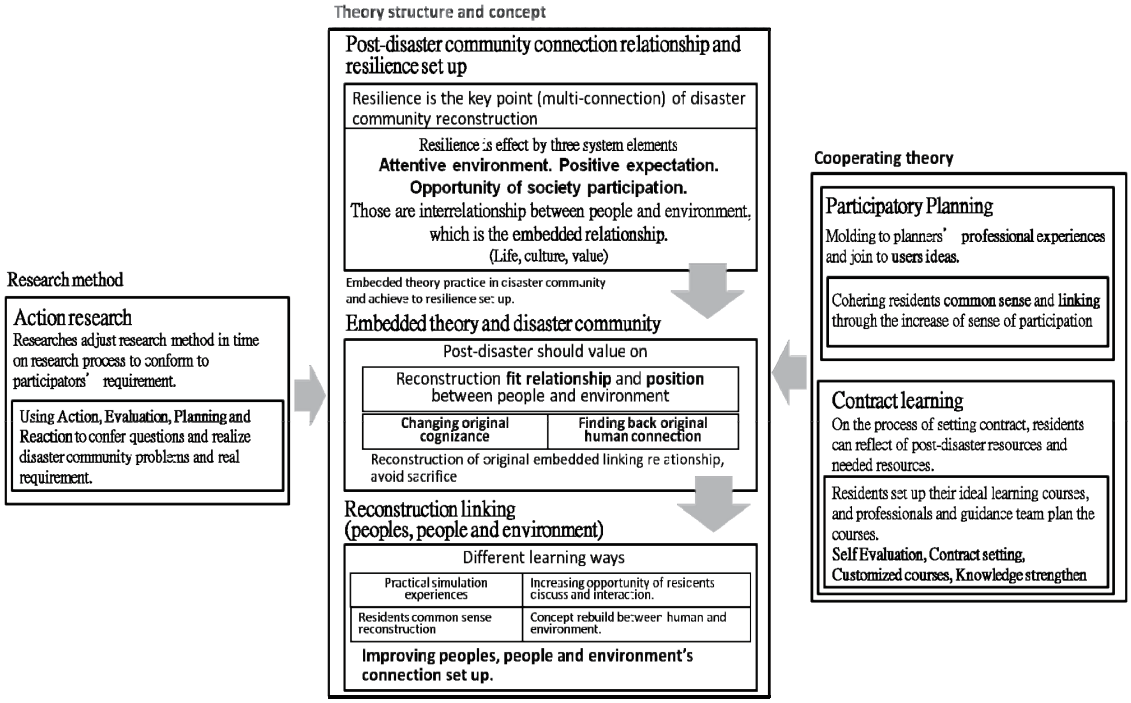


Figure12. Research structure

Embedded theory represents an interaction relationship between persons and the living environment. Networks can confirm a steadily interaction relationship, and can maximize the use of resources and protect humans against the damage associated with disasters. Embedded theory discusses the relationship between humans and organizations. People find their most suitable position of the new environment and obtain support from the environment and give equal pay back to the environment; moreover, embedded theory forms the most common value in interaction networks. This study practices embedded theory in the post-disaster environment and reconstruction process, and combines participatory planning and contract learning for post-disaster reflection and rebuilding of connections.

5. Research process

The study issues are "current value and relationship reflection", "researching for suitable position of interior network" and "connection among peoples, between people and environment, and between environments" through embedded theory. Action research serves as the study method and is coordinated with participatory planning and contract learning. Informal discussion, on-site guidance, and reflection are necessary to rebuild common living value for residents, and to identify the most suitable positions of the environment and rebuild connections.

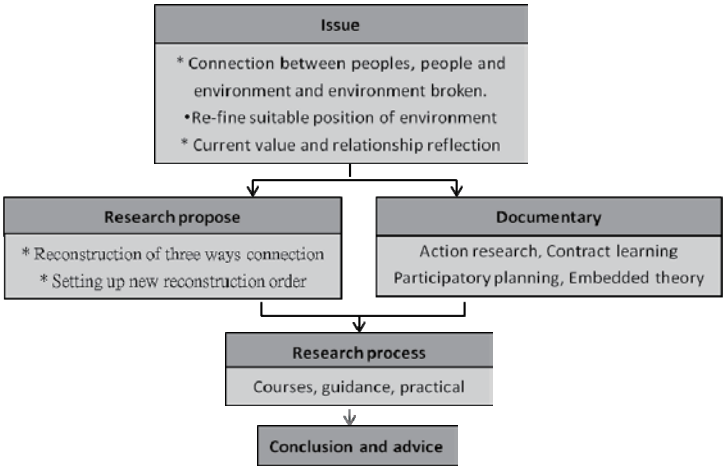


Figure13. Research process

Three elements of embedded theory, namely "sacrifice", "fit" and "connection", represent that following a disaster, the community faced a need to "sacrifice" and its relation between residents, value and environmental resources changed. Moreover, peoples damaged, and vamoosed from the organization cause sacrifice people face life and property damage in the wake of a disaster, and in response organizations must make sacrifices. Therefore, the aims are establishing network value, identifying suitable position and reconnecting embedded relationships. Such activities can decrease the damage associated with sacrifice and reconnect the network. Moreover, such activities can decrease the possibility of future damage and the future sacrifices.

The concept of "fit" is the re-posited of residents in the network which can be set up through self-review by residents, evaluation by professionals, and on-site instructors. The course provides residents with new values and knowledge, and they sacrifice their own interests to

achieve higher public benefit, and rebuild connections through repeated discussion. In response to disaster, participatory planning, on-site guidance, after class discussion and learning of new knowledge from the courses are used to reconvene community residents back to the community and network. Long-term observation and accompany way of on-site instructors in the community to build up a new network, confirm and complete the reconstruction embedded relationship. Finally, the reconstruction process applies small scale construction to rebuild spaces damaged by communities, and reconnects network between community residents through the building process. (Fig.14.) Meanwhile, interviews are conducted and questionnaires administered to identify the current community situation and requirements, as well as community volition and autonomy.

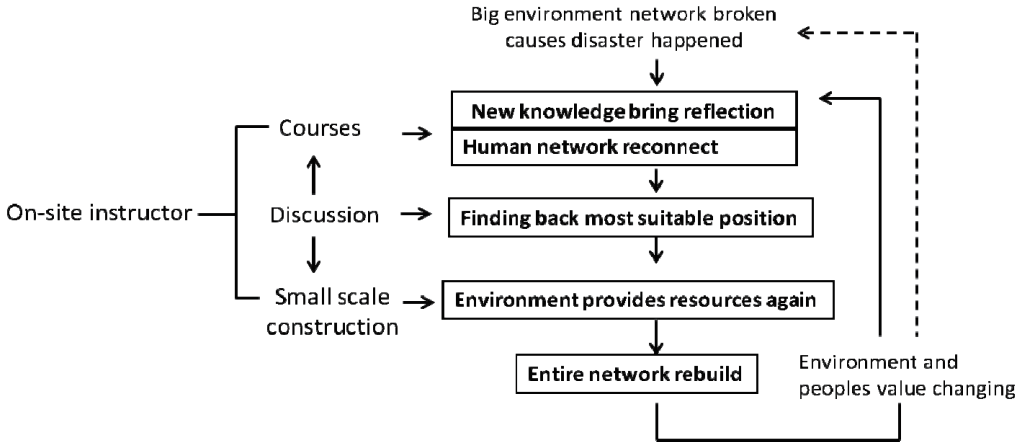


Figure14. Research process and reconstruction relationship

(1) Network relationship

The study combines different kinds of professionals and multiple theoretical approaches (embedded theory, contract learning and participatory planning) to increase community interior reflection and establishment of new knowledge in response to disaster. Moreover, the study guides the community to identify the optimal positions of new networks and rebuild network and human resources structure. Finally, the community reconstructs new embedded relationship and value.

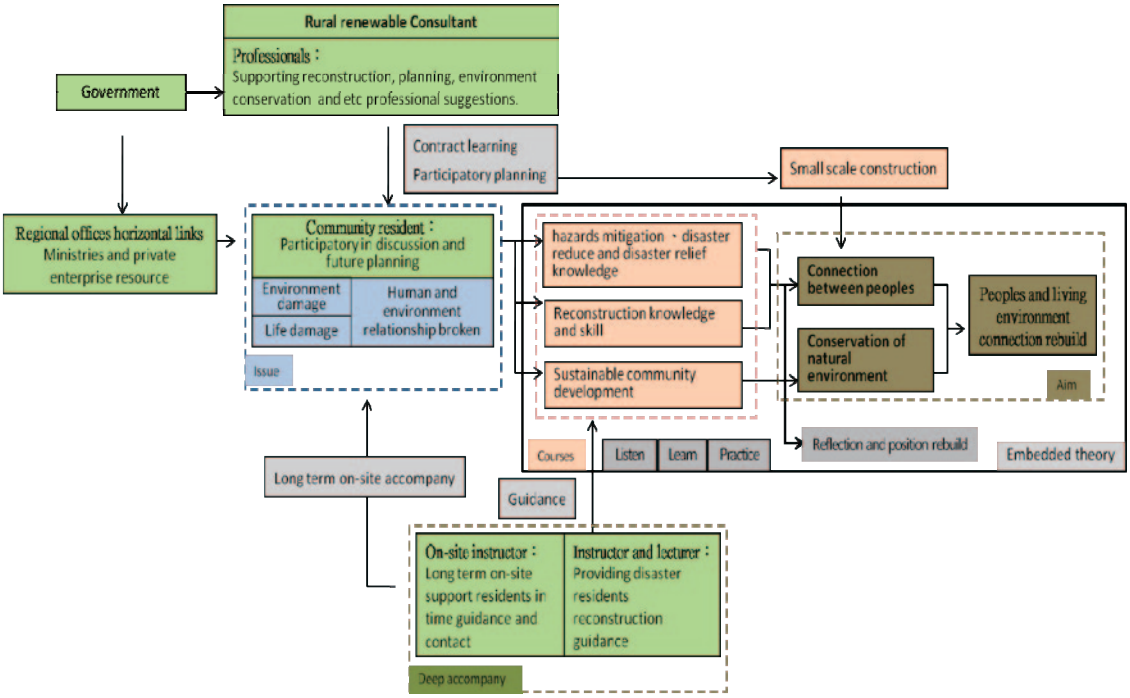


Figure15. Diversification and multilevel participators and process

(2) Research process

In the reconstruction process, government and the public require an emergency model to accelerate reconstruction. However, based on long term observation, the researchers found that quick reconstruction cannot create a flexible network structure to deal with every disaster and also cannot stabilize existing network relationships. Lack of refection, the reconstruction process should combine the efforts of residents and on-site instructors to identify the current situation, respond to the changes in the network relationship, and bring up dynamic corresponding adjustment between residents. This study creates a new post-disaster reconstruction order, and focuses on post-disaster reflection and new embedded network relationship and value setting to achieve sustainable development. The research process involves three stages.

a. Connection and embedding repositioning.

Original value changing results in the network relationship loosen connections and cause their disappearance. Therefore, it should first reconstruct software and independently connect internally with the community. Such an approach involves reversing the roles of the daily life model. Moreover, the study connects to on-site instructors and professionals to assist residents to identify the most suitable of the network, condense common sense, and reconstruct the community conscious through interaction of residents, following discussion and practice of reconstruction courses. The community should change community common value of environment and develop further vision to replace short term benefits. Therefore, in the post-disaster reconstruction time should reflect the current situation, learn new knowledge, reestablish connection and confirm the network.

b. Reverse reconstruction order.

Network and relationship reconstruction now focuses on reconstruction of hardware (buildings), investigation of data related to community resources, interaction among residents

and final planning of community future. (P.C Shao, 2002) However, such reconstruction does not reestablish resident connections and set up new values. Consequently, the construction is not based on the common vision of residents.

c. Two-way dynamic simulation process.

Combining "co-administration" and the concept of "adult education – contract learning" this study processes "informal discussion after reconstruction courses", "knowledge empowerment" (new connection establishment), and finally determines the community "co-benefit future vision" based on the sacrifice of individual residents. Furthermore, this study identifies the new network value and the optimal positions of every participant.

Apparently, during the post-disaster reconstruction buffer time, to achieve the reconstruction target, the simulation process base on courses, practical activity (small scale construction), discussion and on-site guidance to rebuild broken connections (between peoples, people and the environment, and the environment), and establish new values (related to community culture and knowledge). These measures improve dynamic reflection, stabilize network relationships and ensure development is sustainable. The action research process continues taking the advice and ideas of each participant. These measures begin at the community level and determine the investigation of resources for post-disaster reflection and determination of courses. Regarding the reconstruction process, different participants perform different missions. The following are records of each stage and the interactions of the participators. The various stages and the interactions of participants in those stages are given below.

a. Course planning.

To achieve the first stage of reconstruction, and to improve the reflection of residents, field interviews and questionnaires are used, which can encourage residents to discuss and realize the current situation of the community. Furthermore, residents identify their requirements and cooperate with professional estimates of each community as a reference for course planning. The aim during the early stage of courses is to improve the ability of residents to discuss the post-disaster network relationship and identify the network value and residents most suitable position of community network. Course settings are based on the contract learning concept and combined with observation by professionals, guidance from on-site instructor, and discussion among residents to adjust course targets and content. These measures can make learning more independent and efficient.

"…we hope to prioritize courses on water and soil conservation, for instance, what is disaster danger zone…moreover, how to build a hazard mitigation house." *Community A*

"Various things are missing following a disaster, and we do not know what recourses the community currently has, and so tend to focus on courses of community recourses investigation." *Community B*

"Packaging design and marketing…new community network mobilization." *Community C*

Residents reflect on the current situation of their communities, summarize community requirements, and estimates from professionals on the reconstruction community needs, and finally give related suggestions. This approach allows communities to learn more about their current requirements. Co-operating with the observations of on-site instructors of current

community situation can create a platform between professionals and communities. This process allows residents to clearly understand their wants, needs and current community situation through their own reflections and the estimates of professionals.

"This community has progressed to the mature stage…but in terms of community development major structures have not yet been practiced… Image marketing is focused on the leisure industry…and we suggest integration of different regions as the best immediate course…" *Professional A*

"The community has high expectations of the tourism industry… and to ensure the construction and sustainable development of the tourism sector the suggested short term course is based on concepts of water and soil conservation, and improvement of the living environment. Furthermore, the long term expectations are the pursuit of organic agricultural production technology and industry marketing." *Professional B*

"We need to first understand our wants and then complete the reconstruction. Based on advice from lectures, we realize that we still require more related knowledge to support reconstruction require knowledge." *Community A*

"On-site instructors and professionals teach us about what kind of courses are suitable for the community, and is really useful…especially the industry and ecological construction part." *Community B*

The community requirements show that the focus of residents in relation to post-disaster courses is community resource investigation, knowledge of hazard mitigation, and establishment of new network values. Priority courses are "community resource investigation", "industry renewal" and "ecological restoration". Notably, in the final small scale construction, community representation fits the original contract setting.

b. Learning process

Regarding courses dealing with post-disaster reconstruction, a complete learning process comprises the three stages of listening, learning and practicing (contract learning, followed by participatory planning and final small scale construction). Residents interaction way translate from one way impartation of information to two-way discussion, the director becomes the instructor no longer leads the course and the learners process the reconstruction by themselves. During the first stage, to avoid supply and demand affecting learning differently, contract learning is adopted, and learners first set up learning targets following reflection and discussion. During the second stage, "learning by doing", participatory planning, discussion among learners, inspiration and imagination, and director participation are used to obtain recommendations. This stage focuses on resident discussion and the rebuilding of network value. The final stage comprises small scale construction, in which learners undertake construction based on courses they have learned, investigation and discussion with residents.

Regarding the three stages, not only are the roles of participants changed, but so too are resident attitudes towards the environment. The first stage, "listening" involves listening to the environment, discussing with others, and realizing each other' ideas. This process also involves learning new knowledge, making individual sacrifices, and identifying changes in the network relationship. In the second stage, "learning" involves identifying suitable positions for the new network and culture. The final stage is "practicing", following and begins after new network

relationships are established; this stage constructs new spaces and rebuilds the relationship between peoples through the practical process; simultaneously, it establishes new network relationships and positions.

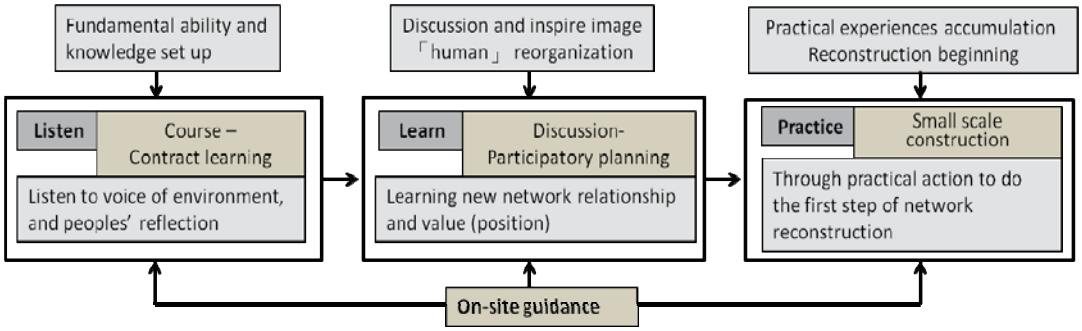


Figure16. Learning three stages

c. Small scale construction

Based on participatory planning, following completing contracted learning courses, communities begin small scale construction. Community reconstruction stage transforms from the "learning stage" to the "practical stage". Following discussion, new values and knowledge are based on courses, and residents identify issues relevant to reconstruction and suitable locations for such reconstruction. Practical workshops are conducted to record community resources, including, community maps, data on building foundations, identifying potential disaster happened region, evacuation routes and space. This database is used for the planning resources, and as a basis for small scale construction. Following the completion of these activities initial courses of reconstruction and discussion, residents better understand community requirements, existing damage space, and current resources. These measures reconnect residents through discussions and construction.

"…to rebuild the damaged space together is the first step in reconstruction for all residents." *Community B*

"…residents have not gathered for a long time since the disaster…" *Community C*

On site instructors also identify that the broken connections that can be rebuilt through dynamic reflection (early stage), discussion and construction.

"Regarding the participatory process (course, guidance), we discover that the community is most cohesive and displays the most common sense during the small scale construction period." *On-site instructor*

"Residents escape from the shadow of disaster through real practice - specifically, small scale construction" *On-site instructor*

Small scale construction increases residents' sense of participation and reconstruction experiences and also represents that the reconstruction process is transformed from establishing foundations to practical reconstruction work. Residents mention that all residents participate in and discuss the rebuilding of lost connections among residents. Moreover, practical reconstruction promotes the relationship between people and the environment and normalizes

life through environmental reconstruction and optimal position of community network refunding.

d. Guidance

Post-disaster reconstruction enhances "accompany" with residents. The process of post-disaster reconstruction involves arranging long term on-site instructors and a professional guidance team to accompany the discussion and provide suggestions. On-site instructors observe communities, solve their problems, and timely assistance. (Fig.16)

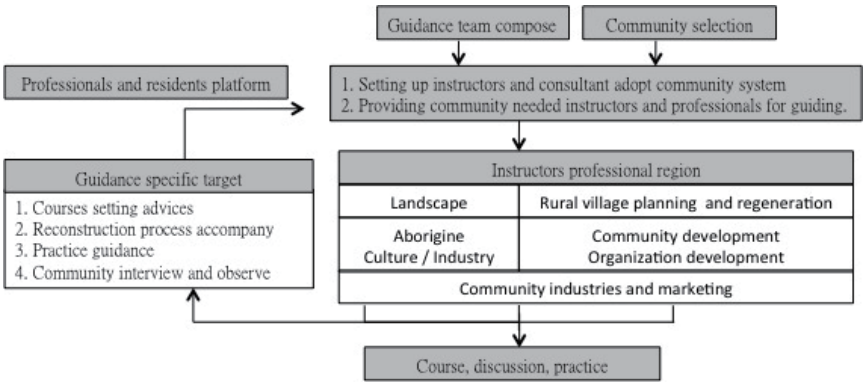


Figure17. Guide and assist relationship.

The guidance team is primarily gives advices, and arranges lecturers in different regions. These instructors offer communities advise on reconstruction. On-site instructors are positioned close to the community they advise to observe and participate in all activities, and to identify resident requirements and become a platform between the community and the professionals tasked with providing assistance.

> *"…conduct community interviews…observe communities from different perspectives, identify community characteristics and requirement and offer timely feedback and reactions…"* *On-site instructor*

> *"…interact with residents and record the community, including its inhabitants, geography, industry and landscape, through the eyes of residents…and also identify alternative perspectives on the community"* *On-site instructor*

> *"We can talk to the on-site instructor directly and they will respond promptly to lecturers who perform the reconstruction knowledge impartation. Such interaction is useful for post-disaster communities that require consideration and timely help"* *Community A*

After instructors completing the grading accompany with resident, residents all agree that on-site instructors can provide timely help when they meet difficulties in reconstructing and become the platform between the community and the professionals tasked with assisting it.

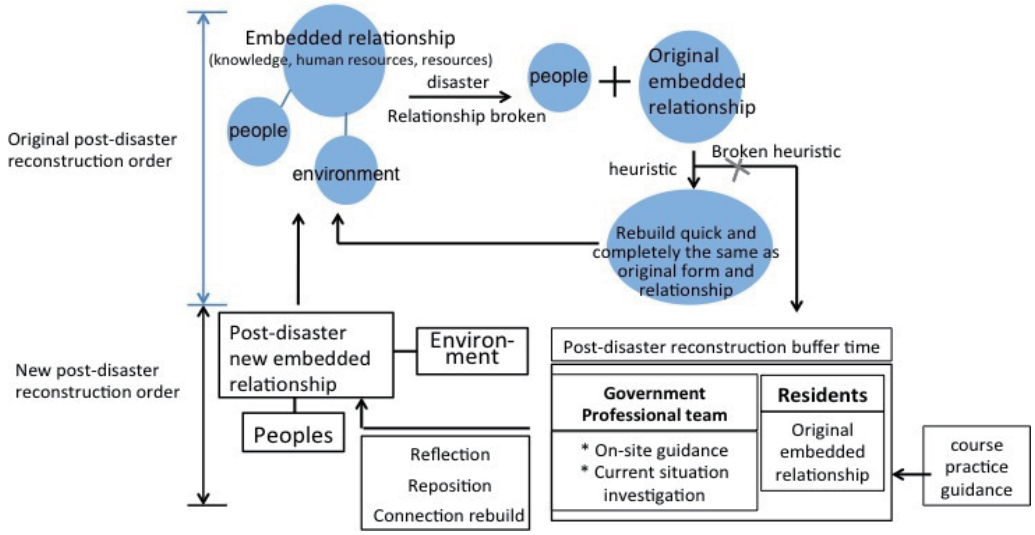


Figure18. New and old reconstruction order

6. Conclusions and Recommendations

This study uses contract learning, participatory planning and on-site guidance to achieve the reconstruction target "Connection among residents and embedded reorientation"," Reverse reconstruction order" and "Two-way dynamic simulation process."

(1) Connection and embedded reorientation: Through understanding the empowerment courses and current post-disaster situation and identifying the new position, the guidance systems of professionals and on-site instructors drive reconstruction work and help communities to conduct re-working with organizations.

On-site instructors remain with residents throughout courses and provide community residents with timely guidance and be the platform between residents and professionals. Communities lead small scale construction. Furthermore, disaster communities identify construction targets through model construction, community resources map, investigations etc. Regarding the process of reconstruction courses and construction, it identifies the new network connections and culture and new suitable positions of community network through lecturer knowledge transmission, on-site instructor guidance, and resident discussions and reflections.

Changes of current value loosen network relationships and connection nodes. Therefore, such changes should rebuild the connection between government and the community (daily life model and role reconstruction). Professionals, administration and community connections help residents identify the most suitable positions and restore post-disaster common sense. Additionally, these factors can help change values and substitute future vision for short term benefits.

(2) Reverse reconstruction order: Research shows that operations of disaster communities are broken because of broken connections those among people, between people and the environment, and among environments are the primary cause of the operations of disaster communities. The broken order and time has certain characteristics. Simply following the order to reconstruct connections is the best method of achieving development. Therefore, future disasters will not break the system.

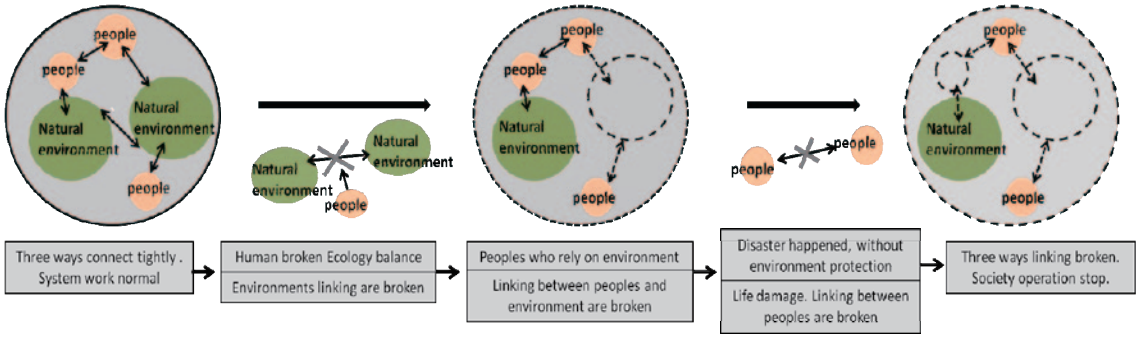


Figure19. Broken order of connection

Past reconstructions focus on rapid reconstruction of community future development vision. (P.C Shao, 2003) However, resident connections have not been rebuilt, common values have not been renewed and reconstruction cannot be established based on the common vision of residents. Research that not only establishes a dynamic review system, but also conducts reflection and renewal, and engages in discussions with residents, can establish corresponding attitudes and knowledge of new environments. Based on guidance from on-site knowledge instructors and discussions with residents, residents can optimize the optimal position of their new environment. Such approaches offer the steadiest and most efficient approach to reconstruction. In conclusion, such approaches are the only way to effectively establish and identify environments and peoples, and to reconstruct networks. Moreover, determining the most suitable position and value of the network and cultivating the common sense of community residents, and it can reconstruct the embedded community network.

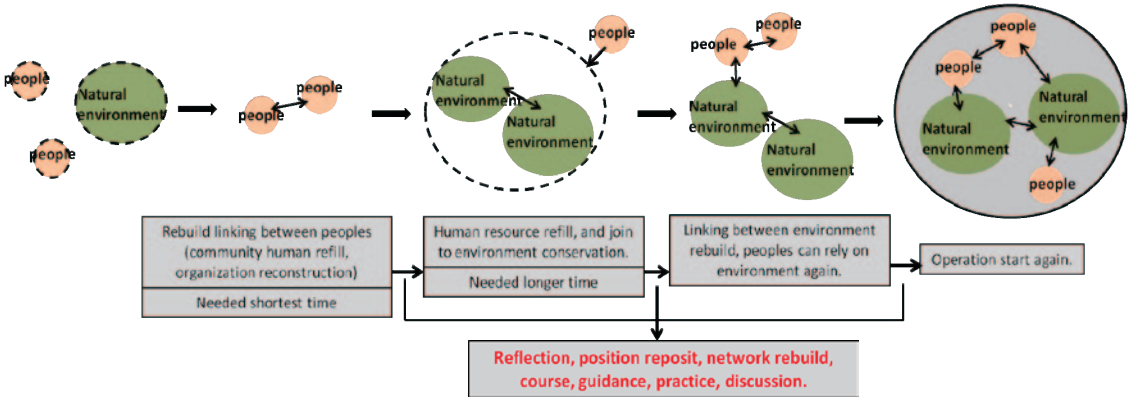


Figure20. Connection rebuilds order

(3) Two-way dynamic simulation process: Initially this research aims to encourage reflection among residents and examine post-disaster community resources. Based on the concept of contract learning, residents autonomously nominate desired courses, and complete resource investigation, potential disaster point map marking and planning of evacuation and rescue routes. Professionals and on-site instructors participate in the courses, and help residents reconstruct and organize resources, including community industries and human resources. The related knowledge can help community residents identify new network relationships and positions.

The research process combines the concepts of “co-administration” and “adult education contract learning”, together with informal discussion and “knowledge empowerment” (establishment of new connections), and finally residents’ engage in “self-sacrifice” and identify the “common future image” (future vision of residents). Moreover, it encourages community residents to lead the direction of reconstruction and establish flexible environments through informal discussion and construct a common vision. Finally, they established a new network value, common sense, and suitable network position for resource sharing.

Research focuses on receiving knowledge and on-site instructors accompany with residents, and trains communities in reconstruction. Cooperating with related courses and guidance can connect broken linkages of embedded networks through repeated discussion and practice. After finishing human resources re-cultivation, organization reconstruction, environmental conservation and industry renewal, connections can be established between peoples, between people and the environment and with the environment.

Disaster communities practice contract learning and participatory planning, as well as practical small scale construction and on-site guidance to help residents understand the current situation and the new network position and relationships between peoples. These measures achieve) “dynamic reflection and new value and knowledge set up”, “finding the optimal network position” and “reconnect peoples, people and environment and environments” in a step-by-step manner. Furthermore, it establishes a new post-disaster reconstruction order to enhance embedded network, knowledge and practical experiences, and creates opportunities for discussion and participation, and improves dynamic reflection, condensation of common sense, and reconstruction of final finish.

Reference

1) Benard, B. (1995). Fostering Resilience in Children Bonnie Benard. Fostering resilience in children. Urbana, IL: ERIC Clearinghouse on Elementary and Early Childhood Education. [ED386327]。 http://chiron.valdosta.edu/whuitt/files/resilience.html (2012.03.18)
2) B. C. Wang., F. Y Chou. & Y. J Lee. (2010). Awareness of Residents Regarding the Construction of a Sustainable Urban Community. Systemic Practice and Action Research 23: 157-172.
3) B. C. Wang , S. C. Liu, & F. Y Chou. (2010). National Policy and Promotion Model of Cultural and Creative Industry in Taiwan. International Journal of Business Research 10 (1)：121-132.
4) B.C. Wang , F.Y Chou. (2007). Action Research of Youth Public Participation in Community Overall Planning-A Case Study of Maioli City. Journal of National United University 4(2)：125-149.
5) B.C. Wang , F.Y Chou. (2006). Establish Community Lifelong Learning System – The Role and Action Strategies of the Non-Profit Organization. Social and education bimonthly 132 : P 6-14.
6) Checkland, P., Holwell, S. (1998). Action Research: Its Nature and Validity. Systemic Practice and Action Research 11(1), 9-21.
7) C.L Lee . (2009). Global Climate Change Impacts on the Spatial Pattern of Socio-economic Metabolism and Land Use Change: SEMLUC Model Applications. City and Planning 36(4) : 445-472.
8) C.S Wang. (2005). Social Discourse on Sustainable Taiwan Indicator System (STIS): Theory and Practice. City and Planning 32 (2) :179-202.
9) Granovetter, M. (1985) Economic Action and Social Structure: the Problem of Embeddedness. American Journal of Sociology 91: 481-93 (first half)
10) Holling, C.S. (1973) ,Resilience and Stability of Ecological Systems , Annual Review of Ecology and Systematics 4: 1-23.

11) Hsiao Wen (2001). Resilience Concept and Practical in Counseling. Singapore Chinese counseling knowledge Symposium, Singapore.
12) H.K Wang, H.C. Lin (2004). A Policy-oriented Study on Sustainability of the Post-921-Disaster Tourism Reconstruction. City and Planning 31(2) : 143-166.
13) Kevin Meethan (1997). York managing the tourist city , Cities 14(6) : 333-342.
14) Mitchell, T.R., Holtom, B.C., Lee, T.W., & Erez, M. (2001) Why People Stay: Using Job Embeddedness to Predict Voluntary Turnover, Academy of Management Journal 44 :1102-1121
15) M.Q Wu (1991). Education Research - An analysis of the basic concepts and methods. Press: Wu-Nan Book, Taipei
16) Ostrom, E., Ahn, T.K. (2003). Foundations of Social Capital, NorthamptonL Edward Elgar Publishing, Inc.
17) Peter Checkland, Sue Holwell, (1998), Action research: Its nature and validity. Systemic Practice and Action Research , Pages: 109-127
18) P.C. Shao. (2004). Mechanism of Post-Earthquake Community Reconstruction for the Taiwan Chi-Chi Earthquake: In the Cases of Chun-Kong Li Community and Liu Traditional Quadrangle House. City and Planning 30 (4): 371-389.
19) S.C.Yeh,Y.H. Yu & Y.H. Kuo (2002). Where Are We in the Earth Village? – Calculation and Analysis of the Environmental Sustainability index Scores of Taiwan. City and Planning. 29 (3) : 445-470.
20) Vygotsky, L.S. (1978) Mind in society :The development of higher psychological processes, M. Cole, V. John - Steiner, Scribner, E, Souberman. Eds, Cambridge, MA: Harvard University Press
21) W.Y Lin. (2011). Constructing Social and Economical Vulnerability Assessment Indicators for an Disadvantaged Elderly Population and Application of Spatial Clustering Analysis. City and Planning 38 (3) : 219-243.

Acknowledgment

The authors would like to thank the Soil and Water Conservation Bureau, Council of Agriculture, Executive Yuan, Taiwan, for financially supporting this research under “Central district rural reconstruction empowerment program”.