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代表著作

Strengthening the resilience of urban retailers towards flood risk study in the riverbank region of Kaohsiung City

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ABSTRACT

The urban environment is a complex system composed of the human-environment interactions within the physical-environmental system. It is constantly at the risk of the recurrent and prevalent flooding events in densely populated low land neighborhoods. Resilience is crucial to mitigating climate risks; this study ascertained the retail sector as the basic industry in Meinung with the Location Quotient (LQ) analysis; the interactive visualization tools supported and affirmed the retailers' concentration in the area most prone to flood risk. By conducting the semi-structured interviews for 15 key retailers, the study focused on the driver, pressure, state, impact, and response (DPSIR) framework to assess the knowledge, skills, and network capacity attained from climate change scenarios and flooding. The measurement of the level of resilience showed that retailers' focus on strategic identification of potential weather-related risks and implementation of adaptation plans for each business's provision of services conformed to place-specificity criteria.

The results indicated that (1) mal-adaptation of mitigation measures focus only on short-term objectives and overlook long-term and the overall resilience potential; (2) the appropriate tools for resilience strengthening assessment ascertained the perceived vulnerability; the mitigation relies on knowledge, skill and network capacity attained from previous experiences; (3) interactive visual tools provided an accurate mean, evaluation, and implementation of an integrative interface to guide and enhance the process of resilience strengthening; (4) resilience adaptability from local retailers built an effective way to mitigate flood risks. Finally, further research issues are identified with an effective resilience strengthening method against climate change.

1. Introduction

Recent studies on global disaster incidents indicated that more people are being affected by flood than any other type of disaster [58]; further assessment has estimated between 1996 and 2015, more than 528,000 people died worldwide and losses of US\$ 3.08 trillion (in PPP) were incurred as a direct result of almost 11,000 extreme weather events [8,32,49,54,98,105,106]. These risks have urged communities to strive to adapt to the impacts of floods and reduce their vulnerability through mitigation measures such as physical barriers, retention basins, and early warning systems [1,3,108]. Other measures such as ways to enhance the flood mapping techniques and improve understanding of the global flood hazard [33,87], exposure [43], and vulnerability [50,92] to achieve process-based modeling of river flood risk at a global scale under present and future are used to strengthen the flood resilience in urban system.

Multiple concepts are attached to resilience. As a component of the process of mitigation in climate change, resilience is more inclined

towards the realm of sustainability [74]. The emphasis is placed on the scope and the performance of the subjects, objects, and systems under changing boundary conditions [89] restricted to the urban constraints. Previous research primarily focused on changes in epistemic beliefs as people accepted climate change as a physical reality [77] in the context of resilience strengthening. Resilience is built on the perception that incorporates a vast range of contemporary risks [25]. Consequently, the concept has a long and multidisciplinary history [111]; it assumes that the ability of a system, community, or society is present to pursue its social, ecological, and economic development. On the contrary, its growth objectives are met while its disaster risk of time is met in a mutually reinforcing way [57,59].

No consensus exists now on how to measure resilience [11,26,42,45,75]. Experiences of an extreme weather event might make climate risk more cognitively available or salient in peoples' minds. A number of indicators were developed for assessing the regional disaster resilience [28,109]. The impacts of climate change are experienced locally [18,48]. The United Nations Framework Convention on Climate

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代表著作暨參考著作

代表著作

Strengthening the Resilience of Urban Retailers towards Flood Risks - A Case Study in the Riverbank Region of Kaohsiung City-Journal of Disaster Risk Reduction

都市零售業之抗洪調適培力-以高雄市河岸區為例

This study ascertained the retail sector as the basic industry in Meinung with the Location Quotient (LQ) analysis; the interactive visualization tools supported and affirmed the retailers' concentration in the area most prone to flood risk. By conducting the semi-structured interviews for 15 key retailers, the study focused on the driver, pressure, state, impact, and response (DPSIR) framework to assess the knowledge, skills, and network capacity attained from climate change scenarios and flooding. The measurement of the level of resilience showed that retailers' focus on strategic identification of potential weather-related risks and implementation of adaptation plans for each business's provision of services conformed to place-specificity criteria.

城市環境是一個由物理環境系統內的人與環境相互作用組成的複雜系統。在人口稠密的低地社區，經常發生洪水氾濫事件，故都市抵禦能力對於居民對緩解氣候風險至關重要；本研究通過區位商數（LQ）分析確認零售業為美濃的基礎產業；互動式視覺化工具支持並肯定了零售業均集中於最易發生洪水風險的地區。研究對 15 家主要零售商進行半結構化訪談，必且歸納驅動居民防洪模式驅動力-壓力-狀態-衝擊-反應（DPSIR）框架，以評估氣候變化情景和洪水所獲得的知識，技能和社區網絡能力。半結構式訪談顯示，零售商把重點放在識別潛在的氣候相關風險，並為每個商店對應計畫。此模式顯示其對應策略符合地方特異性標準。

研究結果表明：（1）目前防洪風險措施只應對短期目標，忽略了長期的整體抗禦能力；（2）加強調適力評估的適當工具可加強感知並對於從以往經驗中獲得的知識，技能和網路能力獲得調適力；（3）互動式視覺化工具提供了準確的平均值，評估和實施綜合介面，以指導和加強增強韌性的過程；（4）當地零售商的適應能力是緩解洪水風險的有效途徑。最後，針對氣候變遷之有效調適力之加強方法本研究確定進一步的研究問題。

參考著作

Exploring the Flood Resilience Thinking in the Retail Sector under Climate Change: A Case of an Estuarine Region of Taipei City-Sustainability Journal

The aim of this case study was to contemplate sustainability from the perspective of flood resilience that focuses on environmental problems and solutions. The study provided insights into retailers' resilience thinking regarding the flood-prone Shetzu Peninsula in Taipei City. The study discussed that, in the face of climate change,

maladaptation, interactive visualization models for communicating flood risks, and place attachment are key issues to increase flood resilience under climate change. The introduction of adaptation interventions in terms of urban resilience as a part of a comprehensive strategy helps to manage the impacts of climate change towards urban sustainability.

Well-being, Health and Urban Coherence- Advancing Vertical Greening Approach toward Resilience: A Design Practice Consideration-Journal of Cleaner Production

The approach for urban coherence requires a rigorous and comprehensive understanding of available adaptive practice toward resilience and sustainability in the urban centers. We ascertain that this calls for swift restorative actions to amend the ecology damages with the incorporation of 'greening' elements as available methods of environmentally sensitive, innovative practices in bridging the fields of ecology, horticulture, architecture and environmental tools to the natural restoration of the urban damages, hence the purpose of this study.

The theoretical frameworks, including sustainability, resilience, adaptive practice, may be helpful when considering urban resilience. We suggest that all of the considerations should cooperate through the practical implementation. Given this, design consideration to vertical greening for urban sustainability may be categorized as those: (1) the enhancement with vertical greening in urban setting, whether in the interior or exterior environment, can aid in the regenerative role toward the restoration of the urban ecological landscape; (2) the recent progress on smart building technology further enhanced the management for comfort, biodiversity and well-being benefits of vertical greening; (3) ideas and practices permutations of the systemic design possibilities for vertical greening contribute to the resilience of the urban core; (4) the outcome focuses on the design thinking process into the practice of vertical greening aimed for sustainable conscious architecture, advantageous on their potential for human's well-being and health, at the same time, being feasible for amelioration of our urban microclimate condition, opportunity and threats; together, they contribute toward the sustainability for the future of urbanity.



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教育部專科以上學校教師資格審查代表作合著人證明

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合著人(或共同研究人)親自簽名	1	江益璋	2	3
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註：

- 一、本證明係依據專科以上學校教師資格審定辦法第 23 條規定辦理。
- 二、依專科以上學校教師資格審定辦法第 43 條第 1 款規定，合著人證明登載不實、代表作未確實填載為合著及繳交合著人證明、未適當引註、未經註明授權而重複發表、未註明其部分內容為已發表之成果或著作，經本部審議確定者，應不通過其資格審定，並處 1 至 5 年不受理其教師資格審定之申請；另依同法同條第 3 款規定，合著人證明偽造、變造，經本部審議確定者，除不通過其資格審定，並處 7 至 10 年不受理其教師資格審定之申請。
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- 四、合著之著作，僅可一人用作代表著作送審，他人須放棄以該著作作為代表著作送審之權利。
- 五、如各欄不敷填寫者，可另以附件呈現。

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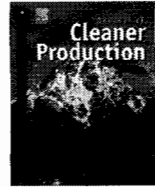
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Well-being, health and urban coherence-advancing vertical greening approach toward resilience: A design practice consideration



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ABSTRACT

The approach for urban coherence requires a rigorous and comprehensive understanding of available adaptive practice toward resilience and sustainability in the urban centers. We ascertain that this calls for swift restorative actions to amend the ecology damages with the incorporation of 'greening' elements as available methods of environmentally sensitive, innovative practices in bridging the fields of ecology, horticulture, architecture and environmental tools to the natural restoration of the urban damages, hence the purpose of this study.

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1. Introduction

Sustainability is a process, not an outcome (Childers et al., 2014), and includes a normative, socially firm set of implemented targets. On the advent of a new 'urban millennium', it is estimated that by 2050, two-thirds of the world population will be living in the urban area (UN, 2015), mostly in isolation from Nature. The global urbanization process had blazed thru the urban systems expanding the boundary of densely packed population settlements and urban infrastructures. Moreover, the fourth assessment report on the Intergovernmental Panel reported that climate change has caused the global average temperature during 1995–2006 to increase, and

heavy rainfall events have become much frequent. Further, the 2015 UN Global Report on Human Settlements, by the United Nations Centre for Human Settlements (UN Habitat) called for the focus on the planning of socially inclusive, resilient, economically prosperous and energy-efficient cities (UN, 2015). Thus, the stature of Architecture needs to incorporate innovative ideas and experimentation that explore purposeful design through the incorporation and redefinition on traditional paradigm into sustainable urbanism and consider the urban-rural gradients, urban mass and energy budgets supporting the "ecology of cities" to integrate the social and natural practices (Revell and Anda, 2014; Pickett et al., 2016) toward the resilient sustainable urbanity.

Due to the high cost of imported energy cost and heavy dependence on mechanical cooling practice in Taiwan, the heat island condition in the urban centers has deteriorated the urban microclimate environ, causing discomfort to the urban lifestyle (Hsu et al., 2011; Liao et al., 2015; Peng, 2013; Sun, 2015); the recent

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