論 文 の 内 容 の 要 旨

論文題目 　　　From Vulnerable to Valuable City : A Comprehensive Analysis of
　　　　　　　　Landscape Adaptive Capacity and Characteristics Through
　　　　　　　　Analytical Studies of Urban Agriculture Changes and Tendency
　　　　　　　　（脆弱な都市から価値ある都市へ：都市農業の変化と傾向
　　　　　　　　に対するランドスケープの適応可能性およびその特性
　　　　　　　　の包括的分析）

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　　This study examines the unexpected consequence of the richness of the ecosystem, land use re-planning and new typology of vegetation caused by the civil engineering implementation works. It aims to examine whether the outcome of conducting civil engineering works would only carry one single effect or it could result in a chain of causation. Accordingly, the Green Infrastructure Strategy describes GI as a strategically built network of natural and semi-natural areas with additional environmental features designed and managed to provide a wide variety of ecosystem services' in both rural and urban settings (EC, 2013a). Prior to figuring out the historical processes of UA's contingency, the necessitated step is theorizing its numerous geographies. The objective of this study exemplifies two-fold. In the first step, this study defines and categorizes the types of environmental hazards in several dimensions and to respond to the situated disasters to their physical and sociological contexts. The aspects reflect the landscape radioactivity in an urban pattern, especially on the side of Urban Agriculture. On the second fold, it discusses the prototype of restoring in an urban environment to elevate the landscape evolution caused by civil engineering works and natural disasters. The landscape pattern has been altered by natural disasters and the "Novel ecosystem." It demonstrates how the non-native species adapt to the evolved landscape environment radically.

　　In order to adapt to variable environmental influences such as flooding, landslides, drought, the cities of landscapes are inevitably approaching landscape resilience. Through social metabolism, we find out that the "socio-natures" is a contingent immediately after revealing how social and natural processes are

co-produced—argued by Marxian geographers and political ecologists (Harvey, 2006; Swyngedouw, 2006; Smith, 2008). The pessimistic physical and mental illness can be tackled by the following. Agriculture serves a multi-purpose usage. Agriculture land can utilize as a tool to reduce unforeseen disastrous risks and bring substantial, ecological, and agricultural trade-offs and opportunities. As the urban environment is in constant flux, affected by the changes in climate, economies, and infrastructure, this study aims to analyze the causation of natural hazards and civilization. Farmland can be adapted to serve multiple functions such as floodplains, stormwater runoff management areas, a discretion area for peak flows, and a stream with high capacity.

1. Introduction

In past studies, Urban Agriculture (UA) mainly aids the underdeveloped countries. Due to the change in economic role structure, domestic agriculture has diminished in those cities. The needs of agriculture are based on the unique conditions for the region. Embraced by citizens and governor, urban agriculture (UA) has scattered in both vacant and marginal land for the function of the source of food, citizen's entertainment, ecosystem services, and agriculture industry occupation, especially during the financial crisis. This study identifies UA's multi-functional applications and an undifferentiated point of view. In a city, it can respond to as a panacea for the urban ill. The consequence and identification of urban farming, natural hazard mitigation, and ecological evolution.

Three interrelated measurements of UA are evaluated, including production, social, and environmental aspects. The rift appeared after natural hazards destroyed our environment. To conquer these rifts, UA performs to rescale production, reclaim abandoned land and delineate urban dwellers for their food allocation. Stable food supply, close social networking, enhanced environment, improved health condition, and quantified economic contribution regarded as the essential functions of UA.

2. Data collection and Methodology

From the 46 rivers in Hong Kong, this study identified rivers to study through a stratified random selection process. Firstly, it eliminated the location with the commercial districts because of their local agricultural productivity. Secondly, it reduced the construction period of the river channel and its complexity. Thirdly, it eliminated the low ecological value evaluation where merely coexist with nature. This resulted in a set of 3 rivers remaining, including Kam Tin Valley River, Long Valley, and Lam Tsuen Valley River, Hong Kong.

Literature review on resilience and urban sustainability together with observation and secondary data analysis on the living environment and civil infrastructure will be carried out to study the impacts of UA on social network and unfavorable conditions which were caused by human activities and natural

disasters. The urban landscape measurements in terms of UA include functionality, urban fabric, and culture to micro-politics of place-making will identify through the analysis of the pivotal functions of UA by survey and mapping. In this study, an aerial photograph comparison lists out the place's development from the 1960s to 1990s. The drastic environmental land-use change, reduction of farmland and enhancement of ecological land use is discussed. The illustration of this spatial and transformation of the land in the result as today's resilience landscape. Geographic Information System (GIS) was conducted and the interview was proceeded to contribute to the landscape analysis. To understand more about the public awareness to the river construction in HK, a questionnaire methodology of simple sample taking is conducted.

2-1. Causes of Flooding and site context

Rainfall is the cause of flooding in most of the circumstances. Flooding has been caused by several aspects, which include precipitation, surface runoff, river aggradation, backwater effects, surrounding surface impoundment, sewage systems, river blockages by sediments, storm surge and insufficient flood plain. For instance, composed of steep topography and brief river water catchments, rapid surface water runoff has resulted. Water surface runoff is the main principle that causes flooding in the first generation of agricultural lands, such as Kam Tin Valley River, Long Valley and Lam Tsuen Valley River, Hong Kong. The significance of these places is embodied in terms of setting, naturalistic form features, landscape resources, customs, indigenous clans and tenant farmers.

2-2. Flood Prone, Infrastructure and Remote

Even though flooding had not killed numerous people in history, there are still several other consequential effects of Kam Tin Valley River, Long Valley River and Lam Tsuen River. Because of agricultural development, direct inundation was more devastating owing to the central development of agriculture, ecology, residential usage, and assets. The previous flooding in these three case studies, culminating in 1962 with Typhoon Wanda, resulted in damaging numerous properties and agricultural lands. Before applying the river widening civil engineering works, the transport and communication connections were often buried due to the links occasionally blocked out by streambed aggradation. Houses and farmland have initially been situated adjacent to the main flood river. The ecologies, farmers and the villagers lost their living environment when flooding occurred in Long Valley. The heavy rain to this place was well-known for continually damaging the living area.

2-3. Multicriteria Layering analysis

First, I summarized the three river numbers and types of events encountered in this study rivers with a farm. Mainly, it characterizes overall patterns across Hong Kong. I then sought to explain patterns of project type and frequency based on various factors. Setting up the river project characteristics (e.g.,

measurements, category) as dependent variables, and analyzed by seven independent variable factors. The dependent variables include the types of analysis, including waterfront environment, traffic atmosphere, slope analysis, and topography analysis, ecological analysis, and air quality index analysis.

3. Findings and Discussion

The primary purpose of this study is to investigate the critical resilience criterion that eventually can be used for developing the assessment blueprint. The preliminary stage research result is far from being exhaustive. A comprehensive review of adaptation and disaster risk reduction criteria would be clarified. In order to defend the vulnerable urban spaces against natural disasters, the best way is to review past case studies. Hong Kong and other international cities shared similarities with divergences, where significantly represent the importance of UA in developed cities in the world. A disaster brings a particular impact to the landscape, which consists of a diversity of manifestations of the interaction between contemporary civil engineering infrastructure and the natural environment.

Over the centuries, Kam Tin Valley River, Long Valley and Lam Tsuen Valley River, Hong Kong, Hong Kong – where the farmland alongside the water, constituting a community, faced problems such as flooding and natural hazards. These valleys' topography is significant to villagers. From year of 1985 to 2020, Hong Kong underwent the change of landscape functions from the productive landscape, food miles, social solidarity, food security and business tradeoff to environmental degradation. An urban population is shrinking owing to the change of the population lives in urban areas. These farmlands that are at risk to maintain their cultural landscape and UA. The signature of the forms of these agricultural lands has been identified. It exemplifies the degree of these independently variable factors are driving the current result.

4. Conclusions

Notwithstanding, the functions of agriculture may vary for a couple of configurations, cultural integration of custom, history and ecological conditions are based upon a set of processes resulting in a community. After the civil engineering landscape works have been applied, it made the major deviations and the cause of natural disasters have been going through. To defend the ever-changing and complex natural climate changes, a more holistic and multi-disciplinary landscape orientated approach is an indispensable factor. It has evolved from the traditional farming practice landscape into a multi-diverse and ecological agricultural landscape. By using the value of using an empirical study, this research revealed that the site-based and infrastructure with river specific flooding risks under linked with social-ecological could be found on a local scale.