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A Paradox of Town Spatial Development : The Growing Real Estate and Shrinking Town – a Case Study of Hsinchu County, Taiwan

Chi-Tung Hung*, Wen-Yen Lin , Mo-Hsiung Chuang

Dept. of Urban Planning and Disaster Management, Ming Chuan University

ct@mail.mcu.edu.tw http://web.updm.mcu.edu.tw/

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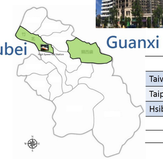
I . Abstract

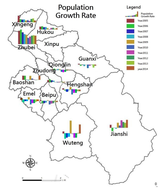
The key factors of many discussions on shrinking towns are focusing at decreasing population and declining industries. Our study, using Hsinchu County as an example, has found that part of the county (Guanxi township) is following a typical and traditional town development pattern, while somewhere else of this county (Zhubei township) shows rapid growth in real estate but with a high vacancy rate. Even though the distance between Guanxi and Zhubei is less than 20 kilometers, the spatial development phenomenon of the two townships are both "shrinking" in the same county but very different in their developing paths. This study used GIS to overlay the maps from field survey and archive data, such as real estate prices of different years, environmental hazards and disaster records, local area power consumptions, and vulnerable population data, to clarify the causes and systems behind the shrinking phenomena of the two townships and to construct a theory of "shrinking town" in Taiwan. The contribution of this study is the findings of the tangling relations of the vulnerability from land-enclosure policy, the system design of local industrial development and urban planning, and structural factors of environmental hazards.

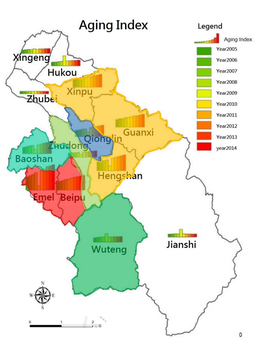
Keywords: shrinking town, environmental hazards, urban planning, spatial disasters, real estate development

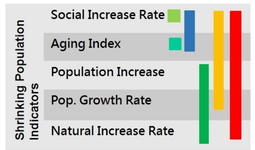
II . Introduction



	Population (Million)	Area (km²)
Taiwan	2354.5	36,197.0520
Taipei	270.5	271.8
HsibChu	43.47	104.1
Zubei	17.7	46.83
Guanxi	2.9	125.5193







III . Research Methods

1.Literature Reviews and Secondary Data Analysis
Reviewing vulnerability theory and relating indices, and collecting the development of domestic cement industry and trend analysis, Hsinchu County disaster prevention and rescue deep plowing plan, Hsinchu County local adaptation plan, Hsinchu County population and industrial statistics, environmental impact report of LCI mine, Fongshan river pollution monitoring data, Zhubei housing price changes and low-level power consumption data.

2. Field Survey and In-depth Interviews
On 2016/9/30-10/1, 2016/11/4-11/5 the research personnel of this study went to Guanxi and Zhubei to investigate the environmental issues, industrial policies, river management, to understand the urban and rural land use with the conflict of surrounding spatial development (e.g. hazardous events causing by cement mining, industrial land acquisition, housing price changes at new and old urban areas.)

3.Geographic Information System
GIS was applied on the spatial overlay analysis of historical disasters, hazard potential, industrial structure, spatial expansion, housing price on the surrounding areas.

IV. Literature Reviews

It used to consider population decreasing and industry declining as the major factors for observing shrinking phenomena. This study tends to discuss the causes of tangled relationships of the structural factors such as **political vulnerability, local industrial development, and environmental disasters.**

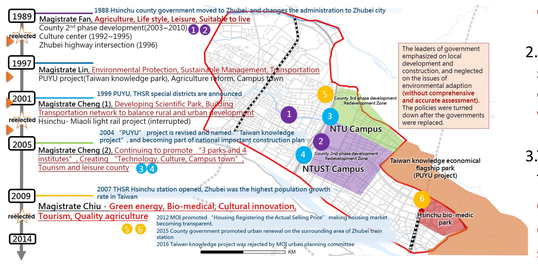
Zubei VS. Guanxi

- Chang, J.Y.(2014): Keelung City: Speeding Marginalized in the Role of Urban Area
- Chang, C.J.(2015): Analyzing Various Spatial Relationships among Urban Shrinking, Scale Politics, and Development Governance.
- Chen, M.Y.(2014): Population and Economy Analysis and Examining the Urban Shrinking Phenomena

Type	Attribute	Cause	Example	Policy
Forced Shrinking	1.Conflict/War 2.Political/Economic Reform 3.Resource Depletion	1.Political and Military Conflicts 2.National and Governmental Spatial / Political Reforms 3. Uneconomical Natural Resource Exploitation	1. Beirut 2. Lebanon 3.Chinese Urban and Rural Areas 4. Nauru and Other Mining Cities (Resource Towns)	1.Conflict Resolution 2.Administrative Reform 3.Innovative Technology 4.Effective Resource Exploitation
Shrink Caused by Global / Social Changes	1.Population Decrease 2.Aging Population 3.Climate Changes	1.Low Birth Rate 2.Low Population Replacement Rate 3.Population Structure (Dependency Ratio) 4.Global Climate Changes	1.Dresden(Germany) 2. Kyoto(Japan) 3. Australian Inland Townships	1.Population Policy 2.Investments on Urban Facilities/Infrastructures 3.Global Climate Policies/Alternatives
Relative Disadvantage Shrinking	1. Lacking Economic Opportunity/diversity 2. Attraction of Life Styles 3. Climate Conditions 4. Supply of Infrastructures	1.Core/Peripheral Area Becoming Globalization 2. Deindustrialization 3. Reindustrialization (Balancing Regional Inequality: Strengthening Knowledge) 4.Climate Difference 5.Metropolitan Life Style	1.Poland 2.Korea(Out of the Soul MRT Range) 3.France(Outside Paris MRT) 4.Scotland 5.Old Industrial Centers of Northeast of China 6."Rust Belt"(e.g. U.S.)	1.Enhancing Regional Response Capacity 2.Ensuring the Merge of Economical Activities 3.Decentralization Policies Wiechmann(2011)

V - 1. Research Contents – Zhubei

A . Policy Practice and Spatial Changes

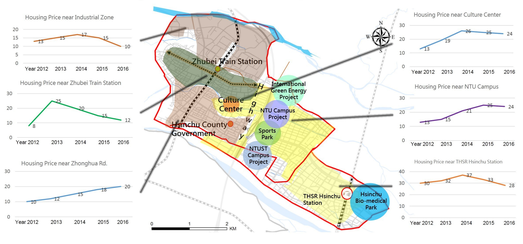


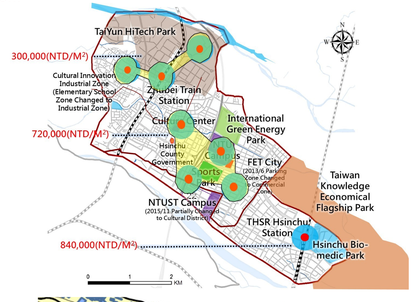
1.The electricity user housing units surrounding THSR is more than the ones near to Zhubei train station, which means **prosperous development in real estate**.

2.Zhubei developing rapidly, the real estate commodity was over supplied and resulting in the raising of housing price. Later, owing to **government policy failure and supporting facilities without comprehensive evaluation and planning.**

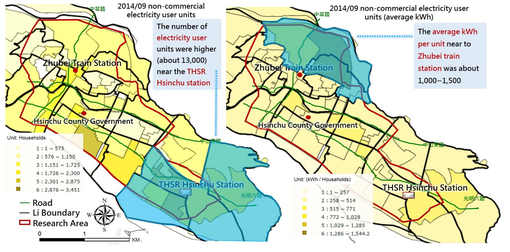
3.The average electricity consumption at the surrounding area of THSR station is lower than train station. **The low average electricity consumption may be resulted by the large number of vacant housing units at the surrounding area of THSR station.**

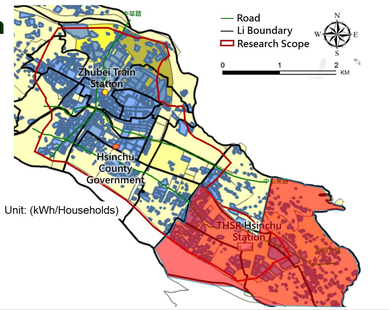
B . Housing Prices Analysis





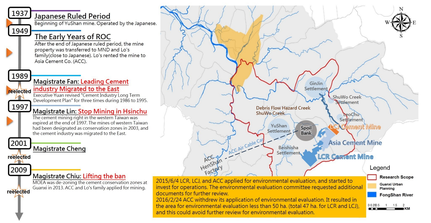
C . Vacancy Rate and Electricity Consumption

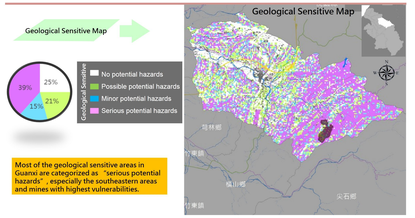




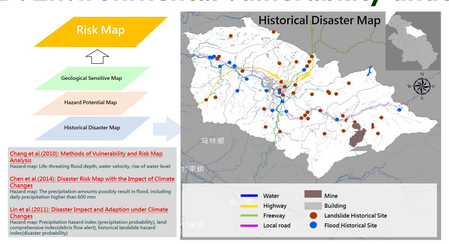
V - 2. Research Contents - Guanxi

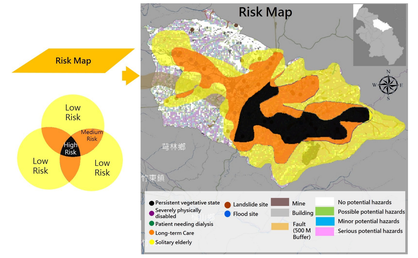
A . Vulnerability Causing by the Return of Cement Industry



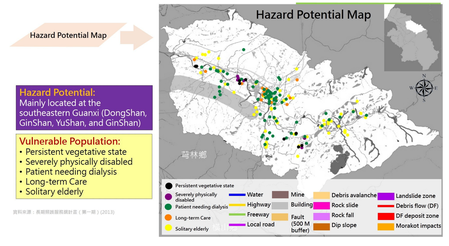


B . Environmental Vulnerability under Industrial Transition





C . Land and Population Vulnerabilities



Risk	Location	Description
High	Upper reaches of Fongshan river and east of ChunFung road	Areas with strong geological sensitivity, vulnerable population, hazard potential, or overlap of disaster sites
Medium	Midstream of Fongshan river, west of ChunFung road, and the surrounding areas of major roads	Areas with vulnerable population or overlap of disaster sites
Low	Areas near to major roads and not to the watershed of Fongshan river	Areas with strong or medium geological sensitivity, or hazard potential

VI . Research Findings

1.Rapid Developing of Town Land Use Phenomena

(1)Zhubei population grows rapidly, and the urban space continues to expand.

(2)Guanxi industrial space has transformed, and the industrial zones (cement industry) is decreasing.

2.The Improperly Managed Township Land Use and Hazard Potential

(1)Government enclosed land to support Zhubei's urbanization policy. It has altered the existing spatial texture, plus the insufficient supporting public facilities, which affected the land infiltration rate and increasing the surface runoff.

(2)Guanxi has high hazard potential conditions, thus the "Return of Cement Industry" policy should be examined for its necessity and rationality.

3.Land Development and the Risk of Vacancy Housing

"Slogan-policy" has promoted the real estate benefits, while results in town governance failure.

The Aspects of Taiwan's Shrinking Town Analysis

Vulnerable Aspect \ Town	Zhubei	Guanxi
Industry	The Myth of Hi-Tech Industry	Cement Industry
Population	Rapid Growth	Decreasing and Aging
Environment (hazard)	Pollution caused by Hi-Tech Industry, Incomplete Urban Infrastructures	High Hazard Potential
Policy	Industrial Enclosure, Land Speculation	"Return of Cement Industry" policy