
The Spatial Patterns and Development of the Sugar Industry Cities-Huwei and Sinying

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1. ABSTRACT

The sugar industry communities were developed extensively during Japanese colonial period (1895- 1945) in Taiwan. The planning of these communities was also based on the concepts of western industrial villages which connected to and interacted with the surrounding urban space. The communities significantly flourished or declined along with the rise and fall of the sugar industry. The sugar industry deeply influenced not only on the urban economy but also the urban architecture, space, and culture. During the Japanese colonial period, there were 44 modern sugar factories in Taiwan, and each was important to the development of the Taiwanese cities and townships. For this study, we chose the Huwei and Sinying sugar factories in Taiwan and their townships as samples in order to study the spatial interaction and the historical background between the sugar industry and urban space. The spatial patterns of these two samples will be analyzed and operated by urban grammars and illustrated as a tree diagram. Based on the methodology of shape grammar, the categories of urban grammars will be described in combination the urban plans in 1930s as well as in 2011. The purpose is to show the process of the urban spatial compositions of two sample towns, to provide the analyses of the patterns in the sugar industry cities and to understand the mutual relationship between the development of the sugar industry and the urban spaces.

2. Introduction

2-1. Tracing the development of Taiwan's sugar industry

The history of the cane sugar industry is closely linked to Taiwan's colonial history. The century-old sugar industry was one of the original driving forces behind Taiwan's economic development. Taiwan first learned of the sugar industry in the 17th century when the Dutch East India Company started its East Asian Seas trading in Taiwan. During the Ming Dynasty, sugar was neglected due to the need for grain rations, and sugar entered a dark period. The Qing implemented a policy of seclusion, initially only opening up to foreign markets in Japan and northern China, but political and economic market deregulation led to the development of a booming old style sugar mill. Japanese government's aid and protection of specific raw material regions and markets helped Taiwan Sugar modernize and rapidly develop into the largest and most important industry during the Japanese colonial period (Tadao, 1929). At the time, the four main sugar manufacturers in Taiwan held all of the main regions with 44 sugar factories (Yu, 1993). Therefore, Taiwan Sugar developed on a large scale, with factory environments comparable to western industry villages that influenced and interacted with the surrounding urban spaces on differing levels, thus impacting the development of the urban spaces where they were located. The sugar industry not only had an impact on Taiwan's economy, but was also very important in the development of company towns in terms of architecture and urban space. The similarities and differences that we found in the analysis of the sugar factories and urban spaces also helps us to understand the spatial composition of urban regions where the sugar industry began to boom as well as the spatial structure of sugar industry villages. After the Nationalist government arrived in Taiwan, it nationalized sugar factories, which was important in forming the foundation of economic recovery after World War II. Prices in the eighties for sugar remained low and uncompetitive on the international market, so the sugar industry began to decline, and sugar factories were forced to downsize, merge, layoff employees or close, which led to the slowing of development in the surrounding regions. In fact, some sugar factories became a hindrance to local development. Currently, there are only two sugar factories left in operation: Shanhua and Huwei. A small number of sugar factories that

were closed down began to attract attention from the cultural and creative industries, while many of the cities and towns that relied on the sugar industry were left to find other industries to develop (Hsu, 2001).

2-2 Subjects and the concept of industry villages

During the Japanese colonial period of Taiwan, the industry village concept came to Taiwan along with the industrial development of forestry, salt, liquor, tobacco, and new sugar factories. However, most factory communities were formed due to the Government Monopoly Bureau trying to settle Japanese workers and were planned and completed over several years in separate installments. This is unlike the European and American models, which were built from the beginning to service the majority of laborers (Liang and Lai, 2004).

The subjects of this study are two cities with larger scale sugar factories, Huwei and Sinying, particularly since the Huwei and Sinying sugar factories were two of the three main modern sugar factories in Taiwan during the Japanese colonial period. These two modern sugar factories were established as the other sugar factories in Taiwan which were self sufficient and promoted regional business development according to the concept of industry villages in Europe and company towns in US. The concept of industry villages was proposed as an ideal living environment for laborers by sociologists, reformers and business owners in Europe after the Industrial Revolution. In Japan this concept was used experimentally in businesses at home and in its colonies during the Meiji Restoration. In the nineteenth century, governments in Great Britain, France, the United States and other countries developed public health laws to improve living conditions that were worsening due to expanding factories. Starting in 1870, Japan visited Britain, Germany and the United States to learn from the reforms that they were making in improving their factory management efficiency and production output. Japan also learned the experience from the sugar factories in the colonies of Britain and Holland.

Sugar industry communities are often very close to sugar cane production sites, so the communities often have social and cultural characteristics resembling rural communities which can meet the needs of residents for work, residence, and living. Charles Fourier of France published *Le Nouveau Monde Industriel* in 1829, where he explained that the foundation of non-repressive society is the ideal of communities, with workers living in dense phalansteres. Therefore, many communities and cities in the nineteenth century based on the socialist ideal emerged, such as: the textile company set up in New Lanark, Scotland, by Robert Owen of the United Kingdom in 1815, designed to be a cooperative and commune-style village where buildings were built along the river (Kiess, 1991); the Saltaire textile factory industry village set up in the Yorkshire suburbs by Sir Titus Salt in 1850 which had all the necessary traditional urban facilities such as residential areas, churches, hospitals, schools, public baths, almshouses and parks; the Familistere at the factory in Guise set up by industrialist JP Godin in 1859-1870 that included residences, education facilities, theaters, and public baths where each street block had a central courtyard in accordance with Fourier's theory; Bourneville set up by George Cadbury in Birmingham in 1879, configured according to local conditions and topography that initially contained the factory, a railway, residential areas, a hospice, entertainment centers, and water recycling facilities as well as a wide front yard to encourage agriculture and horticulture (Crawford, 1995; Frampton, 1980); and the Port Sunlight factory zone mainly for producing soap set up by William Lever in 1888 in Liverpool, designed by a number of well-known architects who planned an exquisite residential community that offered a variety of residential units in the form and composition and formed a city with complete public facilities and lots of open space (Crawford, 1995; Frampton, 1980). Around 1900, American chocolate tycoon Milton Hershey chose an area with many dairy farms in the Pennsylvania countryside as his chocolate factory base and gradually developed it into well-planned chocolate town, Hershey, with a large residential area, theaters, community centers, schools, and even tourist hotels (Green, 2010). Ebenezer Howard published *Garden Cities of Tomorrow* in 1898 and founded the Garden City Association in 1901 that was committed to constructing the ideal garden city. With this background, Huwei and Sinying were developed into the industry cities during Japanese colonial period in Taiwan.

The sugar industry village in Taiwan was divided into three major areas: the factory area, the worker living area, and the station area that included the railway system. The facilities could be divided into 11 categories: administrative buildings, factories, the railway station, residences, livelihood facilities, clinics, schools, recreational facilities, public baths, police department and post office (Cheng, 2000). With the support from the Taiwan Residency General, the new Japanese funded sugar companies quickly overwhelmed and replaced the old sugar factories in Taiwan. The sugar industry had an impact not only because of its scale, but also because of its wide distribution in urban and rural spaces. A sugar factory with its surrounding area is a large-scale community and the activities within the sugar industry regulate people's lifestyles and structure the space (Tomita, 1955; Wu, 1991).

3. METHODOLOGY AND ANALYSIS OF THE SUBJECTS

In this study, we analyze the spatial composition of the cities where the sugar factories are located by urban grammar, which is a part of the shape grammar field. The analyses were processed based on the drawings of urban planning in 1930s as well as 2011. We used the sugar factories as the starting point for the development of the grammars and deduced the rules for the spatial logic. Through the use of the grammars, we explored the principles behind the spatial composition of the city and, along with evidence from literature, analyzed the impact that the industry has on the city's development and growth. We compared the urban grammars of two cities from the Japanese colonial period through modern times to explore their similarities and differences in spatial development.

Many scholars have suggested various theories on spatial forms in the past hundred years, but when the concept of shape grammar were introduced in 1972 in the discussion of the forms in painting and sculpture, they were quickly applied in research on visual arts, architecture, historical site models and urban design. T.W. Knight proposed and extensively discussed many rules to the composition of various shapes, not only allowing us to understand how to deal with the different shapes, but also showing us how to establish a model to render the structure of and order of changes in space. She compiled many articles and papers on shape grammar and assembled them into a book, providing a solid foundation for analysis and design generation (Knight, 1994). Duarte (2005) conducted a rule-based descriptive analysis on the 1200-unit Alvaro Siza residential community to find the rules for the composition of the units and used a design system to combine those rules with other rules to find new combinations and new unit composition possibilities. Then, looking at Portuguese cities, they used rules to describe the changes in the composition of the street block polygons and rectangular street blocks. They analyzed the compositional rules of the existing urban communities, and then applied those rules in planning and design of new towns. Through the adjustment of different compositional rules, they produced a variety of planning and design results and provided a more flexible urban design method (Beirão and Duarte, 2005).

3-1 Urban grammar

The cities related to the sugar industry during the Japanese colonial period developed the sugar industry, which created new opportunities in the development of the surrounding urban and rural regions. With the expansion of the sugar factories and the communities, the surrounding urban space took shape, and many new problems arose. As the sugar industry rose and declined and other industries moved in, there was an even greater need for clear and flexible planning to combat the ever changing urban space. However, plans are often old methods used to deal with new problems while finding and proposing new approaches to old problems (Hudson, 1978). The keys to planning are how to define the proposal, how to convert the proposal into a flexible design, and how the design deals with the possible problems that may arise. Therefore, Christopher Alexander's pattern language was used to define the proposal, and then the rules of shape grammar were used to convert the proposal into the design. Preliminary research shows that this method is conducive to combining the specific development goals and urban planning design (Beirão and Duarte,

2007). In this study, we used rules to describe the pattern language of the urban space and used this to analyze the composition of urban space. In the study of Zaouiat Lakhdar quarter in Morocco, Duarte inferred parametric urban grammars. Initial historical analysis and field surveys, and the confirmation of the three sub-grammars proved that coding rules for urban pre-existences was a necessary process in parametric designs. The three sub-grammars were urban grammars, housing grammars, negotiation grammars. The analysis and comparison of grammars were completed top-down and bottom-up. The systematically developed urban grammars were described, and the real-world urban fabric was derived from the grammars (Duarte, Rocha and Soares, 2007). The goals were the same as ours in establishing a basic system that could capture the features of the urban fabric and can be applied in contemporary urban planning and architectural design.

As this study is based on the urban planning maps of Huwei and Sinying in 1930s and in 2011, we can learn from the research done on sixteenth to eighteenth century Portuguese maps and related literature that used Shape Grammar to define the patterns in Portuguese colonial cities and analyzed the logic, interpretation, classification, and evaluation of the forms. This research had a complete set of rules for designing the urban grammar, and their results showed that geometry was a key in the Portuguese urban planning and design (Paio and Turkienicz, 2009). It also discussed how traditional urban planning usually had a more fixed and clear design system but lacked the ability to process complex, ever changing, and special contemporary cities. Therefore, shape grammar is chosen as a tool in our research because it provided more flexibility with the custom rules. In the development and application of urban grammar, researchers proposed a three-step participatory design cycle for urban planning and combined it with digital design chains. In the first stage, visual, interactive cards were used as interview tools that integrate urban design requirements and specifications. In the second stage, integrated requirements were transformed into variables in the geographic information system and applied to the shape grammar system to generate the corresponding design conditions. In the third stage, a city model that can grow and be repeated was formed which included the buildings, street blocks, transport network and open space in a visual model to integrate the various spaces within a proposal and their impact (Jacobi, Halatsch and Kunze, 2009). Later, the urban grammar of Praia, Cape Verde in the Atlantic showed how shape grammar can be applied to the urban design of city growth to formulate and model urban conditions and used shape grammar to complete a permanently functional system for urban design. Urban induction patterns (UIPs) were then used for in depth research (Beirão, Duarte and Stouffs, 2011). UIPs can be used to create formulas for urban spaces, estimate the possible development methods according to the system, and establish an assessment model for cities according to their unique characteristics. The sugar city urban grammars used in this study were urban models that use visual communication to integrate the unique characteristics of spatial systems in the city.

3-2 The development of Huwei

"First there was a sugar factory, then Huwei." Huwei is a city that was formed because of the new style sugar factory. In 1906, Great Japan Sugar Company established a large scale sugar plant next to Huwei Creek that became known as the Huwei Sugar Factory nowadays. This factory was the largest in Taiwan's sugar industry and once had the highest sugar yield in Taiwan. For hundreds of years, the Huwei Sugar Company has been closely linked with local development, for good or for worse, and with the sugar industry leading the urban development; Huwei became a "sugar capital." The Huwei Sugar factory is located in south Huwei, with a total area of 41.99 hectares. Following the paradigms of industry villages, the Japanese sugar company constructed the highest quality community in Huwei, providing modern residence, education, health, recreation services, and Japanese shrine, so Huwei became one of Taiwanese modern cities under Japan's rule in 1930s (Chen, 2004). The post-war Huwei Sugar Factory continued to be vital for the sugar industry, the sugar company was renamed as Taiwan Sugar Corporation, Huwei Branch later (Taiwan Sugar Corporation, 1996; Gao, 2006; Shen, 2005).

Both the sugar factory and Huwei developed north of the Huwei Creek. As seen in Figure 1, on the left is the Huwei urban planning map in 1938; on the right is the map in 2011, showing the spatial relationship between the sugar factory and the surrounding city. The items of the legend in Figure 2 are according to the description of the urban development here. Early during the Japanese colonial period, there were only 2 villages, Wu Jian Cuo and Ching Pu Zi. After the sugar factory opened in Wu Jian Cuo, the village was renamed as "Huwei Village" under Huwei County. Downtown Huwei was formed mainly in two periods: the "old town" that was built in 1910 in sync with the establishment of the sugar factory, and the "new town"

formed with the government agencies after the urban restructuring in 1935. The modern greenery and parks were also planned in this new city. Japanese geographer Tomita mentioned that since the sugar factory was set up in 1908, Huwei had already become a small scale industry city and was no longer a rural city that relied on the countryside (Tomita, 1955).

Huwei had urban restructuring since 1935 but first announced its urban plan in 1941. The second plan came out in 1972, which covered a greater area. The urban plan in 1980 shows that the downtown region was developed eastward, expanding out from the center circle to form a dense commercial center. The colonial government provided public land to the sugar company during the Japanese colonial period, and now the state-owned Taiwan Sugar is responsible for releasing that land for local schools and public constructions. In terms of transportation, the railroad has tracks of 239km long with 7 railroad lines. Passenger services were discontinued in 1978, but the rail transportation of raw materials continues even today as it has become Taiwan's only remaining sugar raw material transport line (Chen, 2006; Huwei Township, 1933). The population of Huwei was 3,914 in 1909, 30,504 in 1946, and 70,080 in 2011 (Huwei Township Household Registration Office, 2012).

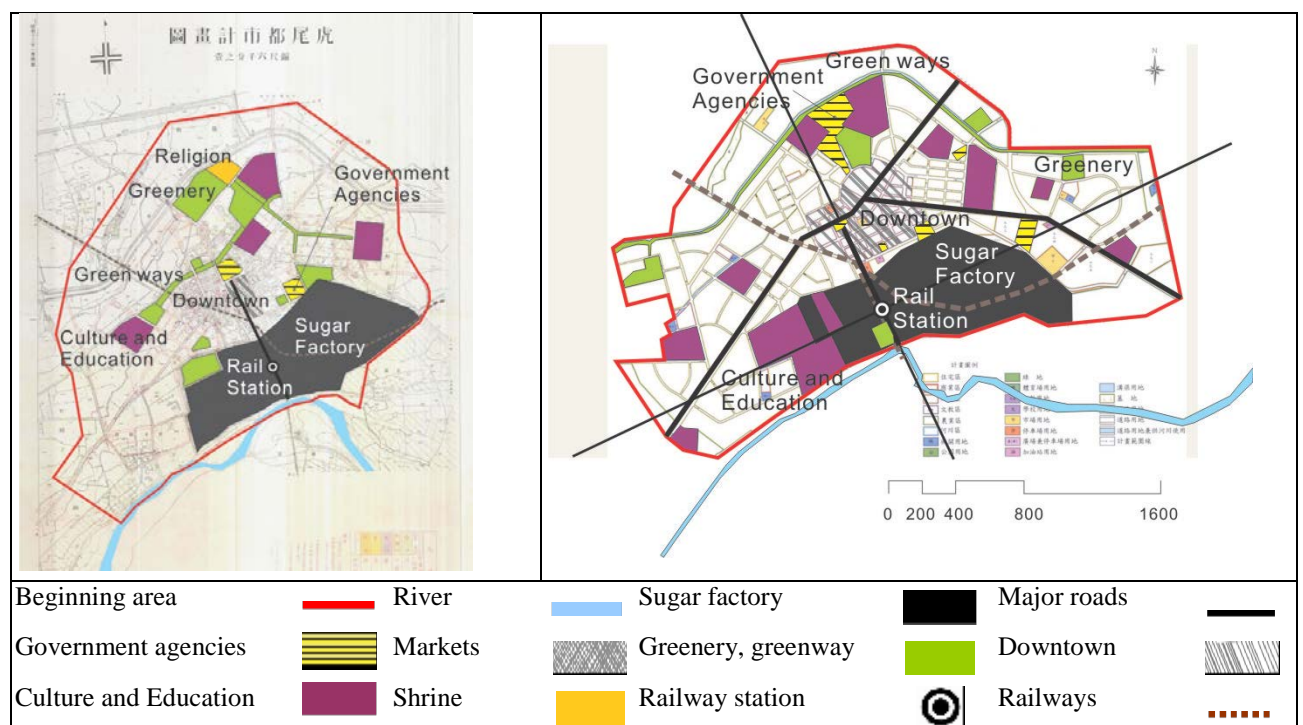


Figure 1. Location of Huwei Sugar Factory in Huwei: On the left is the Huwei urban planning map in 1938 (Huang, 2006), and on the right the map in 2011 (Yunlin County Government, 2011).

3 -3 The development of Sinying

The Yanshui Harbor Sugar Company set up headquarters in Sinying in 1907, the sugar factory was completed in the following year, and a commercial city built on the sugar industry began to blossom. The workers at this sugar factory became the main consumers in downtown Sinying, and many new shops, cinemas, eateries, and public baths received more business (Yang, 2008). Later a railway system was constructed in 1908 for the sugar factory and throughout the sugar cane plantations to transport raw materials. In 1909, the 8.4km long railway from Sinying to Yanshui began sugar train services, and the first passenger line in the history of the sugar industry was born. A new 21km long Sinying-Budai line was added in 1911 and an 18km long Sinying-Xuejia line was added in 1945. These lines formed a convenient and important railway network that helped Sinying rapidly prosper (Hsieh, 2002). The Sinying Sugar Factory officially closed in 2000.

Both the sugar factory and Sinying city developed north of the Jishui River. As shown in Figure 2, on the left is the Sinying urban planning map in 1935; on the right is the map in 2011, showing the spatial relationship

between the sugar factory and the surrounding city. The items of the legend in Figure 2 are according to the description of the urban development here. In the early stages, development of Sinying began at Taizi temple and Tiexian Bridge, with farmland outside of the city center. In the 1904 map of Taiwan, downtown Sinying was divided into six main sections; with the main road being what is now the Zongguan highway that stretches southwest from the railroad station through the southern region of Sinying. In order to connect to neighboring towns, several roads were developed first. In 1916 the Zongguan highway passed through central Sinying. In 1920 city reforms were implemented with the establishment of the county hall and the round park. The establishment of a county hall made Sinying the local administrative and economic center (Yang, 2008).

Sinying began as an agricultural city, but it all depended on the weather for harvests. In order to increase agricultural production, a Sinying branch of the Chianan Canal was planned. When water began flowing into the new canal in 1930, rice and sugarcane production greatly increased, making the area into an important agricultural center. The sugar industry also helped stimulate the pulp and alcohol industries and made Sinying into a boomtown (Yang, 2008; Tomita, 1940). In 1933 Sinying was upgraded in the state structure. It had an area of approximately 2.62 square kilometers and housed the local government hall, becoming an important city in Tainan County. Various businesses and financial services moved in, and several types of companies started building factories there. With Sinying's industrial development, various infrastructures were also completed, such as connecting road paving and sewage system creation. The urban plan was officially published in 1937 (Yang, 2008). In 1981, the Sinying Industrial Park was established on the left of National Highway 1 and the Dongshan Industrial Park was established to the right of the Sinying railroad station. The Liuying Technological Industrial Park was established in 2004. The land for all of these industrial parks was granted as part of a farmland release program by the sugar factory. The population of Sinying was 11,794 in 1910, 26,815 in 1946, and 78,473 in 2011 (Sinying District Office, 2012)..

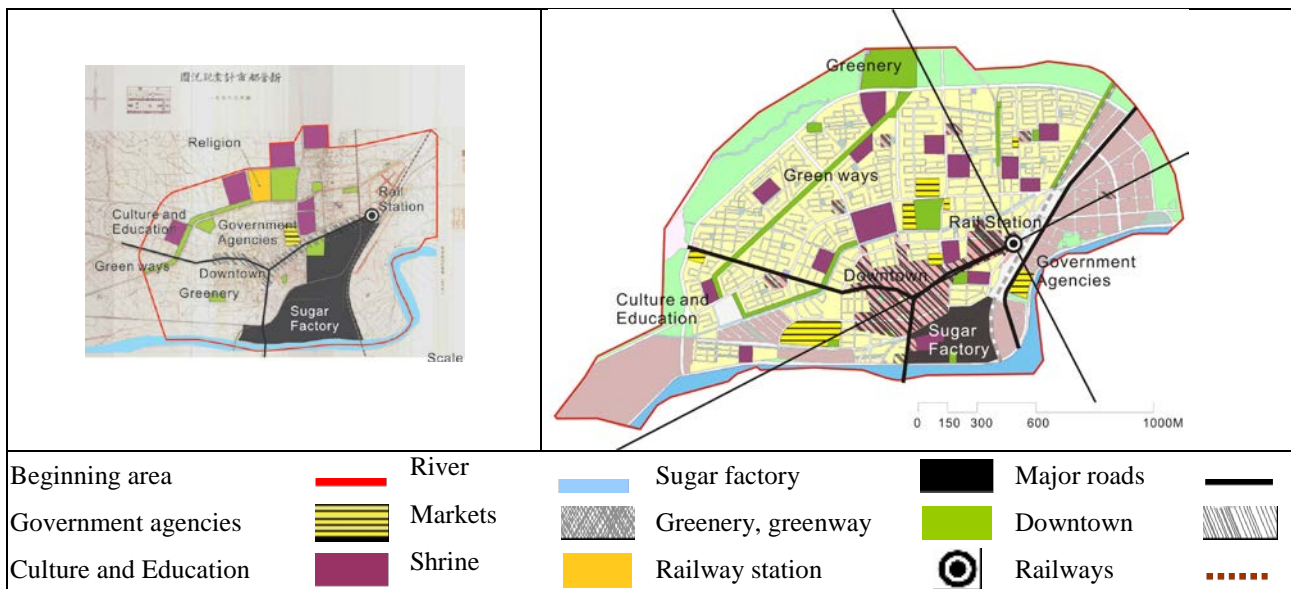


Figure 2. The location of the Sinying Sugar Factory in Sinying: On the left is the Sinying urban planning map in 1935 (Huang, 2006), and on the right the map in 2011 (Tainan County Government, 2011).

3-4 Establishment of Urban Grammar Rules for Sugar Cities

Wittgenstein said: "If you play a game, keep to its rules. And it is an interesting fact that people set up rules for the fun of it, and then keep to them" (Wittgenstein, 1956). Using the previously described categories of sub-grammars in combination with items of the urban features in Figure 1 and Figure 2, we set up the following applications to the sugar factory urban grammars: (1) linear space: rivers, the sugar rail or public railroads, and major roads; (2) dot space: train stations and shrines; and (3) planar space: sugar factories, government agencies, greenery, parks, park roads, downtown, markets, and cultural and educational areas.

We compiled these urban spaces into urban sub-grammars for the sugar cities, as seen in Table 1, to show a legend of the rule category and urban spaces.

Before writing the urban grammars, we first created rules for generating the urban plan in accordance with the item and the legend in Table 1. We described the rules of spatial generation in order to write the grammar rules. A rule is marked R, and the number after R is the rule category, and if there is more than one grammar rule in a category, then X is added after the category number representing the rule group. The order in the rule writing phase is based on the spatial categories, as marked in the legend.



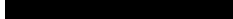









Rule: Item	Representation	Rule: Item	Representation
R0: Beginning area		R1: Rivers	
R2: Sugar factory		R3X: Major roads	
R4X: Government agencies		R5X ~ R7X: Greenery, greenway	
R8X: Markets		R8X: Downtown	
R9X: Culture and Education		R10: Religion	
R11X: Railway station		R12X: Railways	

Table 1. Grammar Writing Rules for the Cities with Sugar Factories

R0: beginning of a coordinate axis and marking off the urban limits according to the urban planning map.

R1: marking the major river or stream as Huwei's creek and Sinying's River which were also the main sources of water for the sugar factories.

R2X: the location and area of the sugar factory.

R3X: the main roads in the center of town.

R4X: government agencies, including county, city or town halls.

R5X ~ R6X: greenery, including city parks and farmland.

R7X: the greenway, since it can be identified by its shape; it is the same color as greenery.

R8X: downtown including the business district and markets, distinguished by their different shading.

R9X: culture and education areas.

R10X: shrine which is important for Japanese government

R11X: main railway station.

R12X: main railway, including public railways and the sugar rail.

After setting up the rules, they were applied to urban planning maps of Huwei and Sinying in Figure 1 and Figure 2 as the reference to write the operation process. The grammar rules are listed at Figure 3. We then compiled the grammar development trees of spatial composition for these two cities (see Figure 4). Our shape grammar development tree diagram is somewhat different from the typical tree diagram due to the difference of city limits of the cities. The tree diagrams here are similar to flow charts to map out each step in writing the urban grammars.

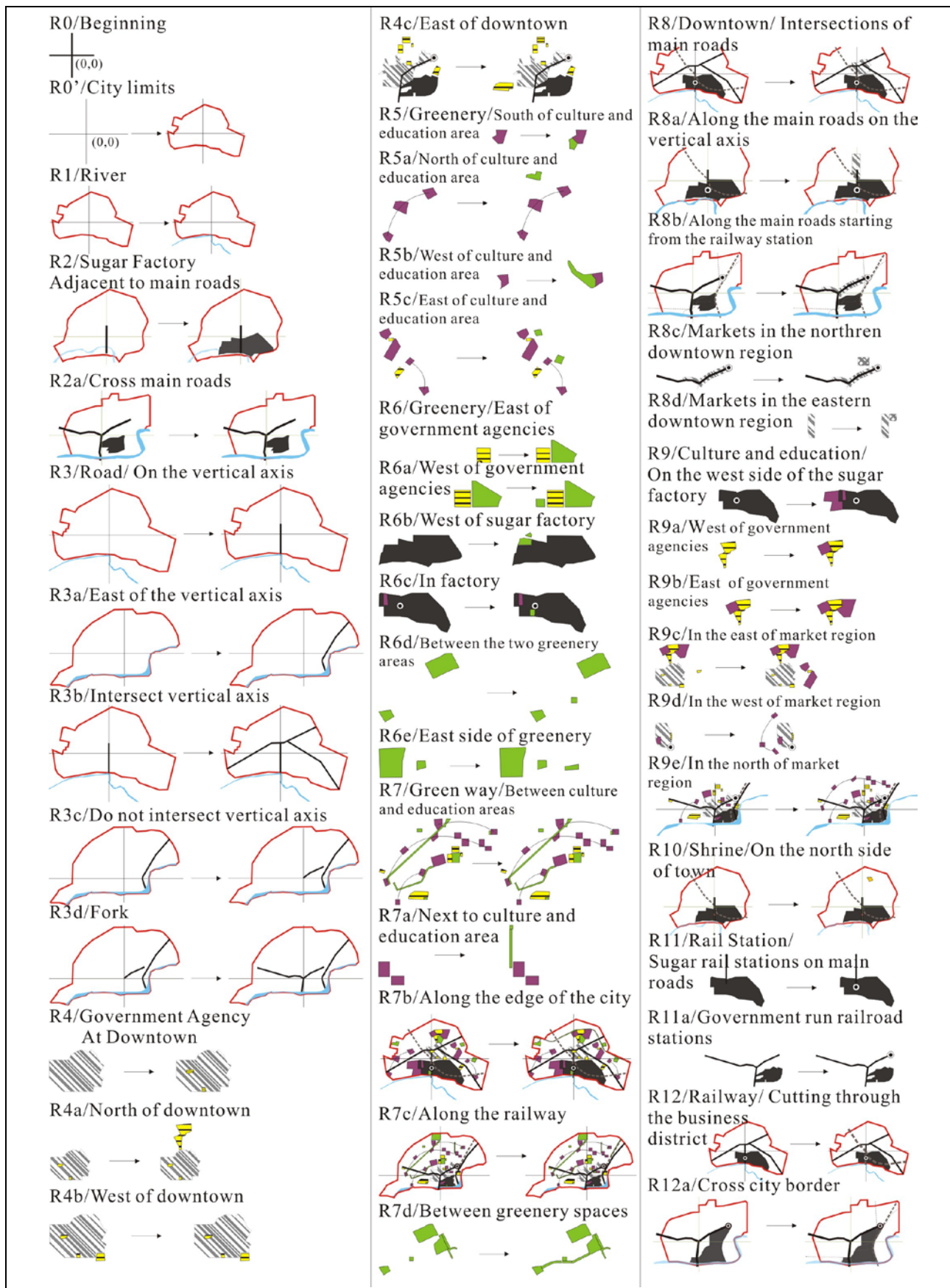


Figure 3. Urban grammar rules for the urban development of Huwei and Sinying

3-5 Shape Grammar Operation for Huwei and Sinying

1. Shape Grammar for Huwei and Sinying during 1930s

Based on the urban planning maps of Huwei in 1938 and Sinying in 1935, we developed the urban grammars with the process described in the left column of Figure 4. Other than the common starting rule of R0, the two cities have 10 rules in common: R1, R2, R3, R4a, R5c, R6, R6b, R7, R9b, and R10. This shows that both rivers are located to the south of the cities, the sugar factories take up a quite great proportion of the total urban space, and are closely linked to the main roads. After the downtown region was built and the area began to prosper, government agencies were set up close by. Shrines were located near to the north, close to the center of town. Shrines were supposed to be located in the north, northwest, west, and southeast according to the traditional Japanese concept of Feng Shui (Chen, 2000). In addition to the main roads being on the vertical axis, the main similarities are in the placement of the cultural and educational areas and greenery as well as how the railroads run through the downtown regions.

2. Shape Grammar for Huwei and Sinying in 2011

Based on the urban planning maps of Huwei and Sinying in 2011, we developed the urban grammars with the process described in the right column of Figure 4. Other than the common starting rule of R0, the two towns have 14 rules in common: R1, R3, R4a, R4b, R5, R5a, R6c, R8, R9a, R9b, R9c, R9d, R9f, and R12. This shows that the two cities have main roads that extend vertically out from the sugar factories. There are similarities in the configuration of greenery and government agencies, and the train stations are located within or close to the sugar factories. The downtown regions mainly developed from the intersections of the main roads, as did cultural and educational areas. The locations of greenery are also similar. R10 was not used because the shrines that were in Huwei and Sinying during the Japanese colonial period no longer existed.

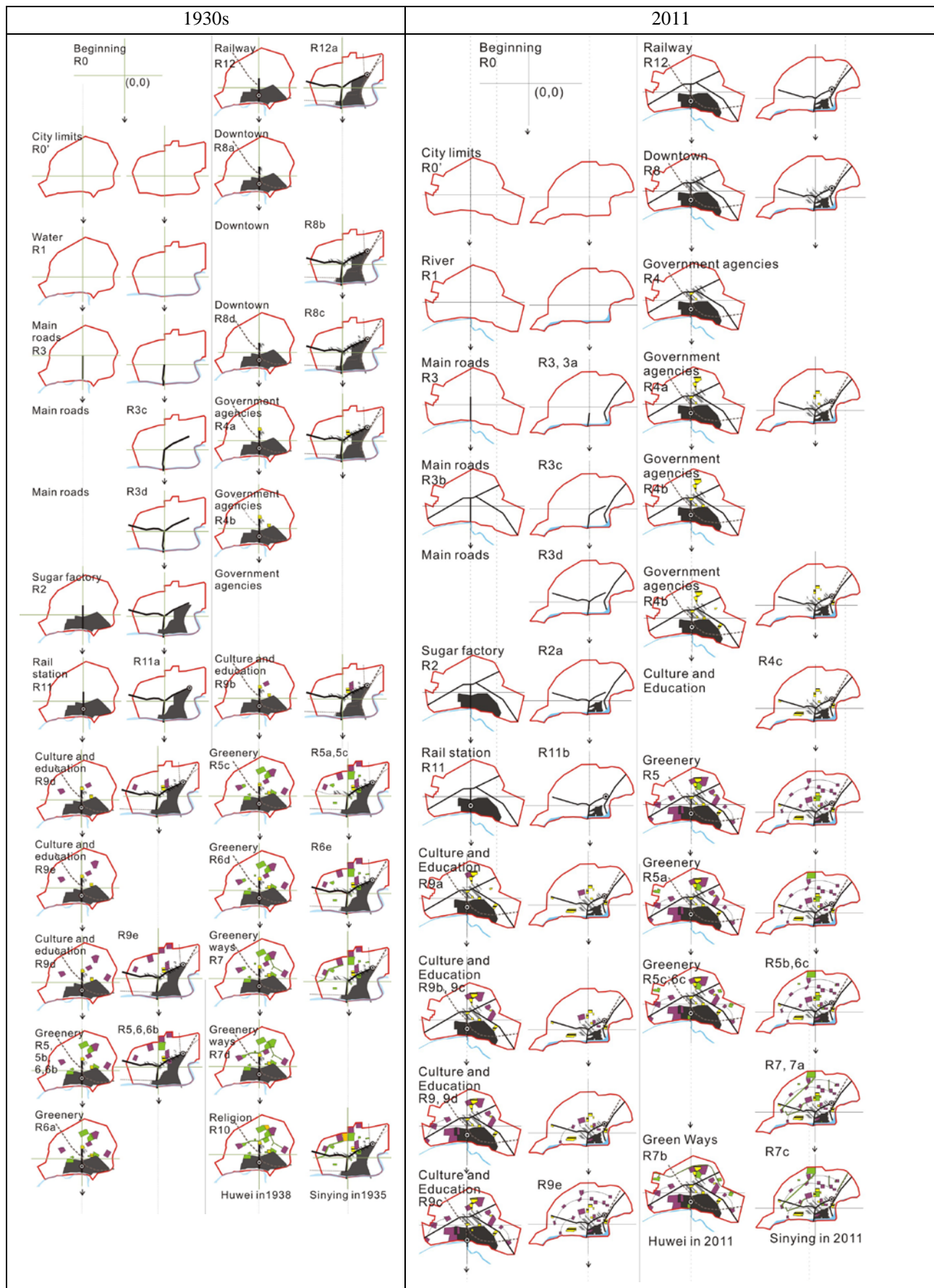


Figure 4. Grammar development tree diagram of spatial composition for Huwei and Sinying

4. Conclusion and Discussion

This study uses grammar rules to analyze the composition of urban space in cities where sugar factories were located and the impact of the rise and fall of these sugar factories in hopes of providing a non-quantitative yet rational explanation of events. The process of setting up reasonable rules was interesting because the rules direct the discussion on spatial development. In establishing our tree development diagram, we applied our own custom rules to observe similarities and differences in the process of the composition. Therefore, we design rules that are linked to the items that we want to discuss or a series of sub-grammar systems for the main topics in order to present a clear and comprehensive comparison. When comparing the tree development diagrams, there are interesting urban development characteristics:

1. The rivers at the beginning of the sugar factories and cities (R1): The rivers are the water sources for the sugar cane fields and in the sugar manufacturing processes. They are also vital to the development of both cities, including transportation.
2. The sugar factories (R2X): The sugar factories were important industrial drivers and impacted the urban fabric during 1930s. The establishment of sugar factories in small-scale rural communities brought in people, consumption power, and the establishment of public facilities, including government agencies. Currently, the decline or closing of the sugar factories have led them to becoming the source of public facilities.
3. Main roads (R3X): During 1930s all of the main roads in the cities passed through the sugar factories, showing that the development of the sugar factories and the downtown region is interactive and intertwined. The main roads of the Huwei and Sinying sugar factories are connected to the main roads of the cities, which further supports the above observation.
4. Greenery (R5X, R6X, and R7X): Although not directly related to the sugar factories, it was interesting to find that most of the greenery and green ways were part of the original urban plans in 1930s.
5. Market and downtown (R8X): Downtown Huwei was mainly developed for the sugar factory, as the workers were the main customers, so it was at the intersections of main roads in 2011 while during 1930s it was mainly along the roads. Downtown Sinying was mainly developed on the main roads and next to the train station for Sinying had both booming agriculture and industry.
6. Culture and education areas (R9X): This item is to discuss that the sugar factories was often used for culture and education purposes after their decline.
7. Railway system (R11X and R12X): The railway in western Taiwan was added to the laying of the sugar rails due to the establishment of modern sugar factories. Although the sugar rails owned by different companies often radiated out from the sugar factories before connecting to the public railroads, they still helped promote public transportation and commercial activities.

This study focuses on the development of the sugar industry cities of Huwei and Sinying. It is also a bid to observe the development of these two cities and the factors for which they expanded and dwindled along with the fate of the sugar industry. This will be good reference in the restructure of the declined sugar industry cities while some of them are planning to redevelop with the other industries. It might also contain clues for what role should or will those cities that were closely linked to the sugar factories play in the future?

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