

CITY REDEVELOPMENT IN TAIWAN - PROBLEMS AND PROGRAMS

by

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Taiwan, Republic of China, 1977

A MASTER'S REPORT

Submitted in Partial Fulfillment
of the Requirements for the Degree

MASTER OF REGIONAL AND COMMUNITY PLANNING
Department of Regional and Community Planning

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1981

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ACKNOWLEDGEMENT

I like to thank my parents and my wife for their support and encouragement of my studies.

Sincere thanks and appreciation are extended to the members of my advisory committee John Selfridge, Ray Weisenberger and Dr. Amos Chang, for their direction, encouragement and assistance in the preparation of this report.

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INTRODUCTION

This introductory chapter includes four parts: (A) environmental information about Taiwan, (B) the problems to be addressed, (C) the purpose and objective, and (D) the methodology to be employed.

A. Environmental Information about Taiwan

The Physiographic Setting (see figure 1).

Off the eastern coast of Asia lie the mountainous island arcs of the western Pacific. The island chain closest to the continent marks the edge of the Asiatic continental shelf. Taiwan, one of the islands of this chain, is the largest between Japan and the Philippines.

Taiwan is 394 kilometers long and 144 kilometers broad at the widest point. With an area of 35,981 square kilometers, Taiwan is the smallest province in China. It is separated from Fukien province on the Chinese mainland by the Taiwan Straits, about 200 kilometers at the widest point and 130 kilometers at the narrowest. The island is almost equidistant from Shanghai and Hongkong.

The surface geology of the island varies in age from very recent alluvial deposits to early sedimentary and crystalline rocks. The structure, relatively simple for the most part, is formed by a tilted fault block running roughly northeast to southwest along the entire length. The steep slope of this tilted block faces east and the rock mass slopes more gently to the west. The tilted block is composed primarily of

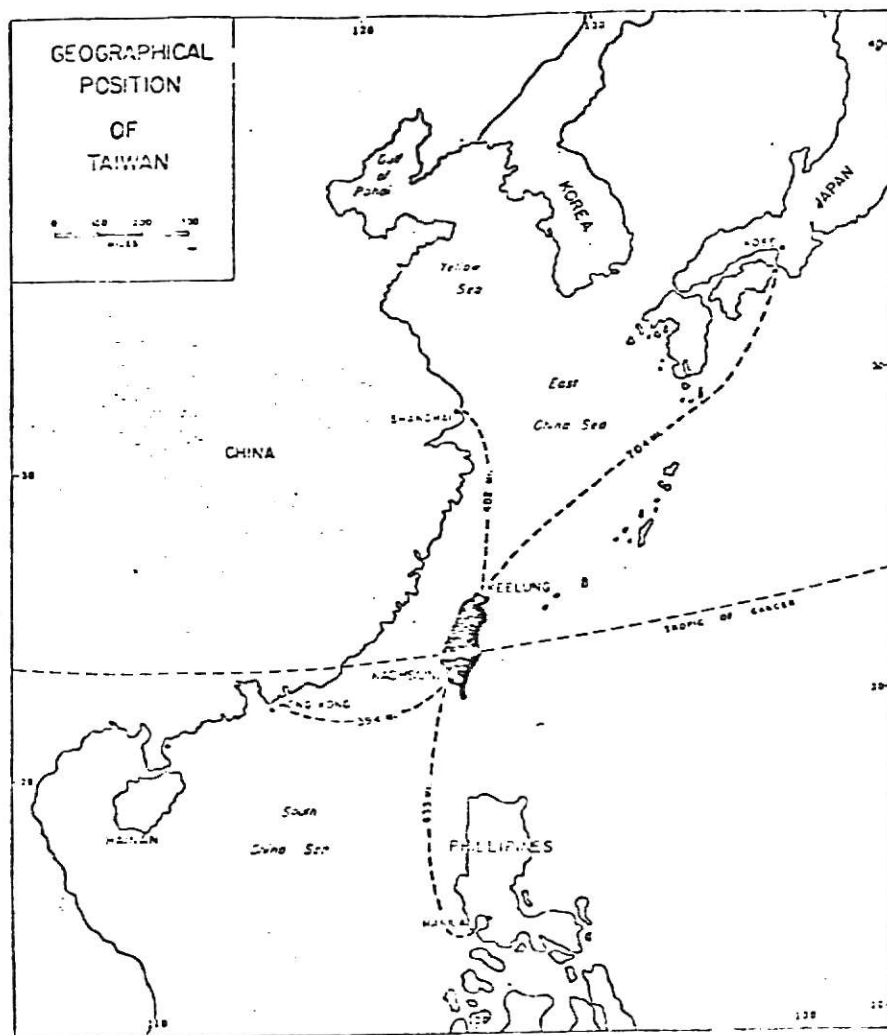


Figure 1. Geographical Position of Taiwan

Source: Chiao-min Hsieh, Taiwan-Ilha Formosa, A Geography in Perspective (Washington: Butterworths, Inc., 1964), p. 4.

old rocks, some of which have been subjected to heat and pressure.

Because of the terrain, scarcely more than one- third of the land is arable. The mountains are mostly forested, with some minerals, chiefly coal, in the northern end.

On the east coast, slopes fall away to the Pacific. To the west, the level sediments lie just below the surface of the sea. As a result, the deposits of rivers have filled the shallow waters and extended the land 15 to 30 kilometers west-ward from the foothills, giving Taiwan a larger proportion of useful and level land than either Japan or the Philippines. In terms of human requirements of food and raw materials, this coastal plain is of the greatest importance.

The shore line of Taiwan is simple and fairly straight. The total length is 1,593 kilometers. Off the southern end of the island lie a number of coral reefs built up along the island's shores during the pleistocene period. However, the area covered by these reefs is small. Near the port of Kaohsiung, some coral limestone is exposed.

The fundamental topographical feature of Taiwan is the central range of high mountains running from the northeast corner to the southern tip of the island. Based on differences in elevation, relative relief character of rock formation and structural pattern, the island can be divided physiographically into five major divisions: Central Range, Volcanic Mountains, Foothills, Terrace Tablelands and Coastal Plains and Basins.¹ See Table 1.

¹Chen Kao- tang, China Year Book (Taiwan: China Publishing Co., 1979), pp. 137-140.

TABLE 1. AREA OF MAJOR LAND FORMS

Land Form	Square Kilometers	Percentage
Total	35,981	100.0
Mountains	22,835	63.5
Basalt and Mesa	108	0.3
Foothills	2,265	6.3
Terrace and Tablelands	1,798	5.0
Alluvial Plains	8,759	24.3
Sandhills and Dunes	216	0.6

Source: Chu-Yui Soong, China Year Book (Taiwan: China Publishing Co., 1979), p. 160.

Climate

As Taiwan lies off the east coast of Asia and athwart the Tropic of Cancer, it is surrounded by warm currents and enjoys an oceanic and subtropical monsoon climate which is conspicuously influenced by its topography. The climate is subtropical in the north and tropical in the south. The island receives more rainfall than any part of the Chinese mainland. Except for the mountainous region, the mean monthly remperature in the winter is above 15⁰C. This is favorable for the cultivation of rice and other crops, including sugar care, pineapples and bananas.²

Rainfall

Rainfall is abundant. The mean annual rainfall is 2,580 mm with a maximum of more than 5,280 mm. There are two areas where the amount of precipitation is large. Hohaoliao in the north has a mean annual rainfall of 6,572 mm. Chinshuiying in the south has a mean annual rainfall of 5,281.mm.

The central west coast has comparatively little rain. Because of the different directions of the winter and summer monsoons, seasonal distribution of rainfall in northern Taiwan is different from that in the south. In winter, the northeast monsoon, picking up abundant moisture when it crosses the East China Sea, brings heavy rains to the eastern and northern sides of the island. In summer, in the face of the prevailing southwest monsoon, the central and southern parts get more rain than the northern part. The moisture carried by the southwest monsoon and local terrestrial winds fall largely in convectional forms.

²Chen Kao- tan, China Year Book (Taiwan: China Publishing Co., 1979), p. 142.

Thundershowers and typhoons often bring Taiwan heavy rainfall in the summer months. Thundershowers sometimes occur several afternoons in succession, especially in June, July and August. During the typhoon season, especially in June, August and September, some windward mountain slopes may have rainfall of as much as 100 mm in 24 hours.³

Temperature

Warm currents give Taiwan a climate that makes vegetation abundant and permits two to three rice harvests a year. Cultivation of sugar cane is profitable, and such tropical fruits as bananas, pineapples, oranges, papayas and watermelons flourish. The summer is long and accompanied by high humidity, while the winter is short and usually mild. In the coldest months, a thin layer of snow is visible on the peaks of the high mountains.

Mean monthly temperature rises to 20°C in April, and remains high until November. June to September brings the hottest weather, with mean monthly temperature ranging from 25°C to 28°C. Between the northernmost and the southernmost parts of the island, there is remarkable temperature variation in the summer and a differentiation of only 5.5°C in the winter.⁴

B. Problems

Urban developments in Taiwan is often accompanied by other problems such as traffic congestion, high crime-rates, etc. If attention is focused

³Chen Kao-tang, China Year Book (Taiwan: China Publishing Co., 1979), p. 143.

⁴Ibid., P. 143.

on the physical development problems themselves, one can see that they stem from three conditions: (1) rapid urbanization, (2) sub- standard housing, and (3) the lack of comprehensive planning.

Rapid Urbanization

Because of immigration and rapid economic growth in Taiwan, the population is becoming concentrated in the urban areas, causing rapid development of the cities. Public decision-makers as well as the general public have become more concerned with these problems in the last twenty years. Specifically, current population forecasts indicate that the total population of Taiwan will approach 22,356,000 people in 1996, of which 18,555,000 or 83% will be in urban settings.⁵ It is obvious that in the near future the population will be even more concentrated in the cities than it is today. The most immediate result of this process of population growth and concentration in the urban areas, unfortunately, is the rapid deterioration of human environments, caused by the increasing gap between economic and population growth on one hand and a lack of appropriate planning on the other.

Sub-Standard Housing

The old, poorly constructed buildings, which in most cases were erected without building permits or any respect of building codes, spread throughout the cities. This caused the appearance of slums, which make urban growth difficult. All cities were neglected during the time of Japanese occupation of 1895 to 1945. After World War II, when Taiwan's

⁵Ministry of Interior, The Research of Institution Process of City Planning in Taiwan. (Taiwan: Ministry of Interior, 1979), p. 28.

sovereignty was returned from Japan, according to the Cairo Declaration, the cities were badly in need of restoration. With the return of Chinese control, many people were designated to settle in the cities. Housing shortages became a serious problem, causing individuals to construct shanties for shelter. Four years later, in 1949, when the Communist Party took over mainland China, hundreds of thousands of Chinese people migrated from the mainland to the island. Again, thousands of additional crude shelters were hurriedly constructed for housing the newcomers. These were the unexpected factors which caused city development problems to emerge.

The Need of Comprehensive Planning

To make up for a chaotic situation, shrewd planning is needed. Planning for city development is a continuous process which begins with the survey and analysis of data, through the drafting of plans of action, to the programming of schemes and projects. There are two reasons why planning in Taiwan can not catch up with city development. First is the lack of coordination of planning for city development at various administrative levels and between different jurisdictions. The fact that city problems transcend the proper city limits and take on regional if not national dimensions, has rarely been given sufficient recognition. The second problem is the need for a comprehensive type of planning which coordinates planning undertaken in various sectors: economic, social and physical planning for the cities.⁶

⁶International Union of Local Authorities, Urbanization in Developing Countries (The Hague: Martinus Nijhoff, 1968), p. 24.

C. The Purpose and Objective

In light of the above, this report attempts to, (1) analyze the existing conditions and programs for city development in Taiwan, including population growth, the pressures of immigration, the effect of partial emmigration, public housing programs, urban renewal programs and planning programs, and (2) investigate urban renewal and design experiences of the more developed countries and evaluate the feasibility of using similar methods in Taiwan. The objective is to set up a program or programs which would best serve the needs of city redevelopment for the island.

D. Methodology

The study is based on secondary data obtained from library research, reports, documents and newspapers. The process will be:

1. Find out from urban renewal programs and techniques used in the U.S. and Japan, their advantages and disadvantages.
2. Review the development programs used in Taiwan to find out the advantages and disadvantages of the existing programs.
3. Find out what is the future need for the development and redevelopment of the cities, and what is their particular insufficiency.
4. Generate recommendations for the policies and directions for a Taiwan redevelopment program which will fulfill future needs.

CHAPTER ONE: FACTORS EFFECTING CITY DEVELOPMENT IN TAIWAN

A. Land Reform and Land Consolidation

Land Reform:

The land reform program carried out in Taiwan included three phases: (1) reduction of farm rent; (2) sale of public farm land; and (3) implementation of the land-to-the-tiller program.

(1) Reduction of Farm Rent

The Farm Rent Reduction Act, first enforced in April, 1949, provided that the farm rental rate must be limited to 37.5 per cent of the annual main-crop yield. If the rent originally agreed upon exceeded that limit, it had to be reduced accordingly. On the other hand, if the original rate was less than 37.5 per cent, it could not be increased. The reduction from the average rent of 50 per cent of the main-crop yield gave tenants a wider financial margin and enabled them to buy their own land and plan for the future.

The reduction of rent also provided the tenants with the necessary incentive to make improvements on the land. Written contracts replaced verbal leases and the landlords could no longer terminate the tenancies at will. The period of lease could not be shorter than six years and had to be continued if the tiller was not at fault, in cases of failure to make payments. A total of

370,000 farm lease contracts were signed and enforced in 1949, benefiting 300,000 tenant families.⁷

(2) Sale of Public Farm Lands

The government owned about 181,000 hectares of Land at the end of 1948, of which 100,000 hectares were tilled by tenant farmers. To abolish farm tenancy on public lands and to set an example for implementation of the land-to-the-tiller policy on privately tenanted land, the government sold public lands to tenant farmers experimentally, starting in 1948. In 1951, the government promulgated the "regulations governing the sale of public farmlands to establish owner-farmers in Taiwan" and began to sell public lands to incumbent tenants. The sale price was fixed at 2.5 times the annual main-crop yield, to be amortized by tenant purchasers in 20 installments spread over 10 years. From 1951 to 1964, six sales were conducted and 110,000 hectares of such lands were transferred to the private ownership of 210,000 tenant families.⁸

(3) Implementation of Land-to-the-Tiller Program

The land-to-the-tiller program, promulgated in 1953, was the most important stage of the land reform. Privately tenanted holdings in excess of three hectares or seven acres of medium grade paddy field or equivalent were compulsorily purchased by the government and resold to incumbent tenants. All immovable fixtures, such as farm buildings, drying grounds and trees attached to the land, were also purchased and sold together with the farm land. Privately tenanted land under

⁷Kao-tang Chen, China Year Book (Taiwan: China Publishing Co., 1979), p. 176.

⁸Ibid., pp. 176-7.

joint ownership was purchased by the government regardless of the size of the holding. Both purchase and resale prices were fixed at 2.3 times the annual main-crop yield. The government paid a lump sum to landlords, 70 per cent in commodity bonds and 30 per cent in the stocks of four government enterprises.⁹

In reselling the land, the government collected 4 per cent interest per annum. Both principal and interest were paid by purchasers in 20 installments over 10 years. The yearly payment for the purchase price, plus land taxes, water fees and other expenses a purchaser had to bear were about equal in amount to the annual 37.5 per cent land rent the farmer would have had to pay, and continued to be a tenant.

In 1953, the government purchased 140,000 hectares, or 55 per cent of all privately tenanted land, and resold it to 195,000 farm families making up 64 per cent of the tenant population on private land. Farm ownership in Taiwan accordingly increased from 61 to 86 per cent and farm tenancy was reduced from 39 to 14 per cent.¹⁰

The land reform program enabled the tenants to have their own land to cultivate and never be deprived of it by the landlord. The landlord sold the land and invested money in industry or commercial activity in urban areas, thus encouraging city growth, economic progress and social stability in Taiwan.

⁹Ibid., p. 177.

¹⁰Ibid., p. 177.

Land Consolidation

The government has taken a number of follow-up measures in land reform, including extension of loans, protection of owner-tillers and land consolidation. Taiwan farm plots are small, irregular and difficult to manage. The consolidation program amalgamates small, irregular plots. With a consolidated holding, the farmer gets access to roads and irrigation.

Land consolidation is of two types. One is to remodel fragmentary paddy fields into rectangular plots of .2 to .3 hectares, each surrounded by new roads and irrigation and drainage ditches. The other type is to make large dry farming areas into 3 hectare plots of rectangular shape.¹¹

Land consolidation has produced the following results:

- Uniform plots have clear boundaries.
- Farmland is concentrated so that use and management can be easier.
- Because every plot can be directly irrigated, water savings amount to 20 per cent.
- Drainage is improved.
- Roads provide access to fertilizer and to markets with economy of labor.
- Mechanized farming is promoted.
- Pest control is made easier and can be effectively applied.
- Average unit production of rice is increased by 30 per cent and production of intercrops raised.
- When large areas are consolidated, it is easier to carry out community development.

¹¹Ibid., p. 177-8.

B. Economic Development

Taiwan is a showcase success story in the postwar economic history of the less-developed world. It was transformed within a short span of time from an unstable agriculture economy exporting sugar, rice, and other primary goods to a rapidly expanding exporter of light manufactures and other highly processed goods.

For the period 1953 - 73 (see Table 2), the annual overall growth rate of the economy was 8.6 per cent. During this period, population grew at an average rate of 2.8 per cent per annum. Thus, real per capita GNP increased at an impressive rate of 5.7 per cent per year, an enviable performance by any reasonable standard.

The strong growth in GNP is confirmed by the performances of another less aggregated time series. From 1953 to 1973, agricultural production, as measured by the official agriculture production index, increased at an annual rate of 4.6 per cent. In the same period, industrial production increased at an impressive rate of over 15 per cent a year, and the rate of increase accelerated in the second half of the period. Industrial output grew at an average annual rate of 11.5 per cent from 1953 to 1973 and an astonishing 19.7 per cent from 1964 to 1973.

Taiwan's economic performance can perhaps be better appreciated if it is compared with that of other countries. Table 3 brings together the average growth rates of real Gross Domestic Product (GDP) and per capita real GDP for a group of selected developing and developed countries. For the period 1950-1971, Taiwan's real GDP grew at rates substantially higher than that attained either by the average less developed country or the average developed country. In Asia, during the 1950s and the 1960s, only

TABLE 2. ECONOMIC INDICATORS, 1951 - 1973

	Midyear Population (1,000)	GNP (million NT\$)		Real per Capita GNP 1971 NT\$/ person	Index of agricultural production 1971 = 100	Index of industrial production 1971 = 100
		Current prices	1971 prices			
1951	8,263	12,315	52,121	6,308	38.0	5.8
1952	8,600	17,247	57,795	6,720	41.3	7.3
1953	8,885	22,988	62,582	7,043	45.3	9.1
1954	9,195	25,225	68,022	7,398	46.3	9.7
1955	9,523	30,088	73,270	7,694	46.5	10.9
1956	9,847	34,543	77,149	7,835	50.2	11.3
1957	10,153	40,291	82,461	8,122	53.6	12.7
1958	10,476	44,752	87,184	8,322	57.7	13.8
1959	10,840	51,727	93,278	8,605	58.3	15.5
1960	11,211	62,561	98,523	8,788	59.1	17.7
1961	11,571	69,792	104,974	9,072	64.2	20.4
1962	11,935	76,882	112,622	9,436	65.5	22.1
1963	12,253	87,134	122,262	9,978	65.2	24.0
1964	12,601	102,209	136,197	10,808	73.5	29.1
1965	12,992	112,867	150,342	11,572	79.0	33.9
1966	13,360	125,554	162,058	12,130	83.1	39.2
1967	13,694	145,878	178,790	13,056	87.9	45.7
1968	14,023	170,834	194,648	13,881	93.3	55.9
1969	14,267	195,572	211,341	14,813	92.3	67.0
1970	14,505	226,368	234,161	16,143	97.9	80.6
1971	14,836	261,436	261,436	17,621	100.0	100.0
1972	15,142	307,361	292,693	19,330	101.9	121.0
1973	15,427	388,583	327,588	21,235	105.6	144.2
(Average annual rate of growth)						
1953-73	2.82	—	8.63	5.65	4.63	15.42
1953-63	3.27	—	7.05	3.65	4.32	11.55
1964-73	2.32	—	10.37	7.84	4.99	19.67

Source:

Notes and Sources: Except for population, all figures are official estimates. The official population estimates have been adjusted to include military personnel. The midyear population figures are simple interpolations of year-end figures. Agricultural production includes, besides crop and livestock production, forestry and fishery production, and is from PDAF, *Taiwan Agricultural Yearbook*, 1974. The industrial production index is from MOEA, *The Republic of China Taiwan Industrial Production Statistics Monthly*, June 1975, p. 9. The other figures are from DGBAS, *Statistical Abstract of the Republic of China*, Dec. 1974, pp. 72-73, 256-59, and 280-83.

Japan, which grew at an average annual rate of 8.4 per cent from 1952 to 1960 and 10.7 per cent from 1960 to 1971, outperformed Taiwan. Of the non-Asian countries, a search of United Nations sources revealed only Trinidad, Tabago, and Israel to have experienced growth exceeding that of Taiwan, and since the mid-1960s Israel's growth rate has fallen below that of Taiwan. Taiwan's postwar economic performance was therefore unique.

The growth of per capita real GDP increased faster in Taiwan than in any other Asian country except Japan. Rising at 3.8 per cent a year from 1951 to 1960, the growth of Taiwan's per capita real GDP exceeded by a substantial margin the average rates achieved by either the developing or the developed countries. In the 1960s the growth of Taiwan's per capita real GDP increased to 7.3 per cent per year, further widening the gap between it and the per capita income growth of the average less developed country.

What makes the experience of Taiwan distinctive is that the initial stage of import substituting industrialization and the subsequent saturation of domestic markets by "easy" manufactures were followed by a thorough reorientation of policy incentives to encourage the export of manufactures and the promotion of industrial efficiency. Partly because of this, import substitution and the export of manufactures ceased to be a dichotomy and became a continuing sequence of economic development in Taiwan.

C. Industrial Development

Industrial development on the island can be divided into four stages.

TABLE 3. AVERAGE RATE OF GROWTH OF GDP FOR TAIWAN, OTHER DEVELOPING COUNTRIES AND DEVELOPED COUNTRIES (PERCENT).

	Taiwan	East and Southeast Asia (exc. Japan) ^a	Developing countries ^b	Developed countries ^c
<i>1950-60</i>				
Real GDP at factor cost	7.4 ^d	4.0	4.6	3.7
Per capita GDP at factor cost	3.8 ^d	1.8	2.4	2.4
<i>1960-71</i>				
Real GDP	10.1	4.7	5.3	5.0
Per capita GDP	7.3	2.3	2.7	3.9

Sources: Except for Taiwan, all other figures are from United Nations, Department of Economic and Social Affairs. *Yearbook of National Accounts Statistics*, 1968, vol. 2, table 5B, and 1972, vol. 3, table 4B. Taiwan's GDP figures are from DGBAS, *National Income of the Republic of China*, various issues. Taiwan's population figures are those in table 8.1 and include military personnel.

^a All countries and territories in East and Southeast Asia except the Chinese mainland, Mongolia, and North Korea.

^b The figures are for 1950-60 and include all countries in Africa (except South Africa), Caribbean and Latin America, East and Southeast Asia (except Japan), and the Middle East (except Cyprus, Israel, and Turkey). For 1960-71, they include the same countries as in 1950-60 plus Cyprus and Turkey.

^c Countries in Western Europe, North America, and Oceania, together with Israel, Japan, and South Africa.

^d 1951-60.

In the first stage, 1945 to 1950, emphasis was placed on rehabilitation and reconstruction of the war damaged industries, mainly power, fertilizer and textiles.

In the second stage, 1951 to 1960, while development of the power supply and light industry continued, new industries were actively established and all industrial enterprises were encouraged to expand operations, increase production and promote exports.

The third stage of 1961 to 1970 saw an acceleration in industrial development with the emphasis placed on expansion of the power supply, enlargement of operations, and acquirement of modern technical know-how. Initial measures were taken to develop heavy and chemical industries as well as technology intensive industries. Enterprises were encouraged to produce basic raw materials for local consumption and sophisticated manufactures for export.

The fourth stage, beginning in 1971, has seen the development of capital and technology intensive industries, including heavy and chemical industries, precision and high grade industries.

Starting in 1971, industry grew rapidly with an average rate of more than 10 per cent for 1972 and 1973. The rate in 1974 was negative, at 1.5 per cent, mainly owing to worldwide recession and the energy crisis, which caused slackening demands for industrial production. Beginning in 1975, recovery was seen. The growth rate in 1976 was registered at 21.9 per cent. It rose to 25 per cent in 1978.

The accelerated progress of industrialization has led to a steady increase in the variety and quantity of industrial products. In addition, it has enhanced the quality and the value of production. An important role

has been played by industry in the supply of employment opportunities and increase of national income. The quantity of industry has increased quickly.

D. Population

Population growth and its concentration in the urban areas of Taiwan cause many city development problems. The problems include the need for housing, public facilities, employment, etc. This section will discuss the population growth and urbanization phenomenon. It will show why the population causes city development problems in Taiwan.

(1) Population Growth

The growth of Taiwan's population has been rapid. The total population of the island in 1946 was six million; in 1956, 9 million; in 1966, 12 million; in 1976, sixteen million. From 1946 to 1966 the total population of the island almost doubled, (see Table 4).

The highest annual increase rate (%) in 1949 was due to the migration of the Nationalist Government. It brought more than 1.3 million mainlanders to this island. Despite the immigration factor, the other reason for population growth is natural increase. The birth rate began to decline in 1955. The rate of decline was slow. The death rate began to decline in 1947. So the key factor for the natural growth was the decline of the death rate.

(2) Urbanization

Taiwan's population rose from some 3 million in 1920 to over 14 million in 1970. During the same half-century, the land under cultivation increased by only one-fifth. (The 749,000 chia of 1920 had increased to only 896,000

TABLE 4. TOTAL POPULATION, ANNUAL INCREASE, AND NUMBERS AND RATES OF NATURAL INCREASE BIRTHS AND BIRTHS FOR TAIWAN AREA, 1946-1976.

年 別 Year	年終人口總數 Year-end Population	人 口 總 數 Total Population		自 然 增 加 Natural Increase		出 生 Birth		死 亡 Death	
		年增加率 Annual Increase Rate %	增加指數 Increase Index	人 口 數 Number	自然增加率 Rate %	人 口 數 Number	出生率 Rate %	人 口 數 Number	死亡率 Rate %
民國 35 年 1946	6,090,860		100.00	—	—	—	—	—	—
民國 36 年 1947	6,495,099	66.37	106.64	126,879	20.16	241,071	38.31	14,192	18.15
民國 37 年 1948	6,806,136	47.89	111.74	168,463	25.33	263,803	39.67	95,340	14.34
民國 38 年 1949	7,396,931	86.80	121.44	207,494	29.22	300,843	42.36	93,349	13.14
民國 39 年 1950	7,554,399	21.29	124.03	237,906	31.82	323,643	43.29	85,737	11.47
民國 40 年 1951	7,869,247	41.68	129.20	296,124	38.40	385,383	49.97	89,259	11.57
民國 41 年 1952	8,128,374	32.93	133.45	293,871	36.74	372,905	46.62	79,034	9.88
民國 42 年 1953	8,438,016	38.09	138.54	296,458	35.79	374,536	45.22	78,078	9.43
民國 43 年 1954	8,749,151	36.87	143.64	313,393	36.47	383,574	44.63	70,181	8.17
民國 44 年 1955	9,077,643	37.55	149.04	327,098	36.70	403,683	45.29	76,585	8.59
民國 45 年 1956	9,390,381	34.45	154.17	339,961	36.82	414,036	44.84	74,075	8.02
民國 46 年 1957	9,690,250	31.93	159.09	314,156	32.93	394,870	41.39	80,714	8.46
民國 47 年 1958	10,039,435	36.03	164.83	336,143	34.07	410,885	41.65	74,742	7.58
民國 48 年 1959	10,431,341	39.04	171.26	347,406	33.94	421,458	41.18	74,052	7.23
民國 49 年 1960	10,792,202	34.59	177.19	345,727	32.58	419,442	39.53	73,715	6.95
民國 50 年 1961	11,149,139	33.07	183.05	346,431	31.58	420,254	38.31	73,823	6.73
民國 51 年 1962	11,511,728	32.52	189.00	350,548	30.94	423,469	37.37	72,921	6.44
民國 52 年 1963	11,883,523	32.30	195.10	352,516	30.14	424,250	36.27	71,734	6.13
民國 53 年 1964	12,256,682	31.40	201.23	347,665	28.80	416,926	34.54	69,261	5.74
民國 54 年 1965	12,628,348	30.32	207.33	338,718	27.22	406,604	32.68	67,886	5.46
民國 55 年 1966	12,992,763	28.86	213.32	345,328	26.96	415,108	32.40	69,780	5.45
民國 56 年 1967	13,296,571	23.38	218.30	302,421	22.63	374,282	28.01	71,861	5.38
民國 57 年 1968	13,650,370	26.60	224.11	320,610	23.43	394,260	28.81	73,650	5.38
民國 58 年 1969	14,334,862	50.14	235.35	320,179	22.72	390,728	27.72	70,549	5.00
民國 59 年 1970	14,675,964	23.80	240.95	322,880	22.26	394,015	27.16	71,135	4.90
民國 60 年 1971	14,994,823	21.72	246.10	309,470	20.86	380,424	25.64	70,954	4.78
民國 61 年 1972	15,289,048	19.62	251.02	294,263	19.43	365,749	24.15	71,486	4.72
民國 62 年 1973	15,564,830	18.04	255.54	293,466	19.02	366,942	23.78	73,476	4.76
民國 63 年 1974	15,852,224	18.46	260.26	293,063	18.66	367,823	23.42	74,760	4.76
民國 64 年 1975	16,149,702	18.76	265.15	292,586	18.28	367,647	22.98	75,061	4.69
民國 65 年 1976	16,508,190	22.20	271.03	346,760	21.24	423,356	25.93	76,596	4.69

Sources: In the table, the data for the years of 1946-65 are obtained from the reports of household registration statistics submitted by Civil Affairs Department of Taiwan Provincial Government, the data for 1966-68 are obtained from the reports of household registration statistics submitted by Civil Affairs Department of Taiwan Provincial Government and Civil Affairs Bureau of Taipei Municipal Government and the data for 1969-76 are obtained from the reports of household registration statistics submitted from Police Department of Taiwan Provincial Government and Police Bureau of Taipei Municipal Government.

chia in 1966, chia being equal to 9699 square meters). Food production kept pace with population growth only through technological advances. In any case, the pressure of growing numbers of people on the relatively stable land base became increasingly severe and, despite the Land Reform of 1949-53, rural Taiwan suffers from underemployment, landlessness, and family farms far too small to support all family members.

For many of the people faced with these problems, or those whose standard of living has not kept pace with their rising expectations, the solution has been to move to the larger cities of the island to seek employment.

From 1951 to 1972, the population of Taiwan's five largest cities expanded from 1.5 to 4.1 million.¹² In 1951, these five cities contained 18 per cent of Taiwan's population; in 1972 they contained 27 per cent. Not only did the largest municipalities grow, but so did the smaller cities and towns. The census counted 40 communities with populations of over 30,000 in 1940 and 179 in 1966.

One of the many factors that contributed to Taiwan's urbanization was the great influx of mainlanders in the late 1940s. Since most of the mainlanders were originally urban dwellers, a large proportion of them resettled in cities, where they could more easily eke out an existence.¹³ As a consequence, urban growth was most rapid in the late 1940s and early 1950s. However, thereafter, urbanization was primarily the result of a high rate of natural increase in the cities and migration from rural areas.

¹²The five cities are Taipei, Taichung, Keelung, Tainan and Kao hsiung.

¹³At the end of 1951, of the registered mainland civilians in Taiwan, 60 per cent lived in the five largest cities. (See PDCS, Household Registration Statistics of Taiwan Province, 1959).

Although urban Taiwan had a rate of natural increase that was appreciably lower than that of rural Taiwan, it was still high, averaging over 30 per 1,000 in the 1950s and about 23 per 1,000 in the 1960s. Thus, even without migration to the cities, the urban population would have increased rapidly. Nevertheless, throughout the postwar period, large numbers of Taiwanese moved each year, and the net flow was toward the cities, especially those with a population greater than 250,000.

The continual movement of people from rural to urban Taiwan was, of course, a reflection of the shift in labor from agriculture to non-agriculture activities. Theory tells us that such movements are closely related to the difference between the workers' expected real income in agriculture and that in the non-agricultural sector.¹⁴ In the early 1950s the per capita real income originating in Taiwan's non-agricultural sector was twice that in agriculture. Despite a steady rise in agricultural productivity, rapid industrialization after the mid- 1950s widened this differential considerably, so that between 1966 and 1970, the average per capita real income in the non-agricultural sector, at NT\$ 11.791 in 1966 prices, was more than three times that in agriculture.¹⁵ In this same period, with the average rate of natural increase in rural Taiwan in excess of 30 per 1,000, the pressure of population on land intensified. Thus, there were powerful economic incentives for people to move off their farms and into the cities.

¹⁴For example, see Michael P. Todaro, "A Model of Labor Migration and Urban Unemployment in Less Development Countries."

¹⁵Paul K. C. Liu, Economic Development and Population in Taiwan Since 1895: An Over-View in Essays on the Population of Taiwan. (Taipei: Institute of Economic, Academia Sinica, 1973).

CHAPTER TWO: PROGRAM AND PROBLEM ANALYSIS FOR CITY DEVELOPMENT

The programs and problems hindering city development in Taiwan can be placed in three categories: (1) lack of comprehensive plans, (2) incomplete urban renewal programs, and (3) undesirable, sub-standard housing.

A. Lack of Comprehensive Planning

Planning History in Taiwan

(1) Before Recovery to China

Building control and city planning occurred earlier in Taiwan than in mainland China. A Taiwan Residential Building Code was issued in order to control construction in the city in 1899. During the same year, the Taipei city plan was issued and implemented. In 1908, the Taichung and Kaohsiung city plans were issued. In 1909, the City Planning Committee was organized. The responsibility of this committee was to review and implement the city plans for those cities that had them. Owing to the development of the city, Taichung and Kaohsiung began the expansion of their city plans in 1932. After that, 17 cities and township plans were finished and implemented. Because of a severe earthquake in 1935, 18 townships were partially destroyed. To reconstruct these townships, a plan was issued for each of them. In 1936, an official declaration: the Taiwan City

Plan Implementation and Regulation, instituted the source of planning budgets and limited the use of land and buildings. By this time, the city plan had its legal foundation.

There were 74 cities or township plans finished by 1945 (see Table 5). In these 74 places, only the Taipei, Taichung and Kaohsiung plans included transportation, public facilities, and zoning for land use. The rest of the plans were simple. For example, the Nanchuang plan encompassed seven acres, the Sanyi plan was for ten acres. Most of the "plans" were plans for street layout only.

(2) After Recovery to China

After Taiwan was returned to China from Japan in 1945, the Chinese government announced that all the laws and regulations made by Japan were invalid, but most of the plans and planning regulations were still held valid, unless they were determined to be in opposition to the constitutional law. In 1973, the Ministry of the Interior instituted the Building Technical Regulation. All plans needed to conform to this new regulation.

From 1945 to 1958 only thirteen plans were made, because there was a lack of man-power in the planning organization of the provincial government. Since 1958, population growth and economic development made people aware of the importance of city development; hence, a Bureau of the Public Engineer was established under the Department of Construction, in charge of making plans for the cities of Taiwan. It is the organization responsible for planning affairs.

TABLE 5. NUMBER OF PLACES WITH PLAN

Name of County	Number of Places With Plan
Taipei	4
Taoyuan	4
Hsinchu	4
Miaoli	13
Taichung	10
Changhua	4
Nanton	5
Yunlin	5
Chiayi	2
Tainan	8
Kaohsiung	4
Pingtung	3
Taitung	2
Hualien	3
Ilan	3
Total	74

Source: R.O.C., Department of the Ministry of the Interior.
A Research of City Planning Instituted Process. 1979, p. 22.

By 1977, there were 268 places planned and the total areas were 2053.69 square kilometers, (see Table 6).

Under the jurisdiction of the province are counties (or hsien) and municipalities. In 1950, the Taiwan provincial government re-organized the province of Taiwan into 16 counties, five municipalities and one administrative area (Yangmingshan). In July, 1967, Taipei city became a Special Municipality, and in July, 1968, the only administrative area was combined with Taipei city. This changed the number of provincial districts to 16 counties and four municipalities. Under the jurisdiction of the 16 counties are townships, villages and districts, (details in Table 7).

As listed in Table 6, there were a total of 345 townships, villages or districts. Table 5 shows that just 268 of these places had been planned, hence, 77 places were not planned.

The Need

A comprehensive plan is an official public document adopted by a local government as a policy guide to decisions about the physical development of the community.¹⁶ The content of comprehensive plans commonly include the private uses of land, community facilities, and circulation. Comprehensive plans may cover other subjects, such as utilities, civic design and special uses of land unique to the locality.

For the description above, it is recognized that the comprehensive plan is a policy guide to decisions about the physical development, and is to be adopted by a local government. So for the local physical development,

¹⁶William I. Goodman and Eric C. Freund, Principles and Practice of Urban Planning (Washington, D.C.: International City Managers' Association, 1968), p. 349.

TABLE 6. NUMBER OF PLACES WITH PLAN AND AMOUNT OF AREA PLANNED

Name of County or City	Number of Places With Plan	Area, sq. kilometer
Taipei county	32	365.39
Ilan county	13	46.71
Taoyan county	13	131.66
Hsinchu county	12	52.59
Miaoli county	15	39.50
Taichung county	19	260.77
Changhua county	14	58.30
Nanton county	14	71.03
Yunlin county	18	61.07
Chiayi county	13	103.58
Tainan county	28	127.45
Kaohsiung county	24	145.58
Pingtung county	24	99.91
Taitung county	10	30.15
Hualien county	13	59.21
Penghu county	2	5.24
Keelung city	1	72.50
Taichung city	1	163.40
Tainan city	1	58.17
Kaohsiung city	1	101.65
Total	268	2053.69

Source: R.O.C., Department of Ministry of the Interior, A Research of City Planning Instituted Process. 1979, p. 25-26.

TABLE 7. LIST OF COUNTIES AND MUNICIPALITIES AND THE NUMBER OF TOWNSHIPS AND VILLAGES UNDER THEIR JURISDICTION

Counties/Municipalities	No. of Townships, Villages or Districts
Taipei County	29
Ilan "	12
Taoyuan "	13
Hsinchy "	15
Miaoli "	18
Taichung "	21
Changhua "	26
Nanton "	13
Yunlin "	20
Chiayi "	19
Tainan "	31
Kaohsiung "	28
Pingtung "	33
Taitung "	16
Hualien "	13
Penghu "	6
Keelung City	7
Taichung "	8
Tainan "	7
Kaohsiung "	10
Total	345

Source: China Year Book, 1979. p. 156.

a comprehensive plan is needed. In Taiwan, there are 345 jurisdictions, just 268 of them having plans and the other 77 townships, villages or districts need plans.

From the planning history in Taiwan, in 1945, 74 cities or townships had plans, and just 3 of these places included circulation, public facilities, and land use plans. The plan for the remaining places were simple.

So, for the physical development of the future of the city, the comprehensive plans for each of the jurisdictions are needed.

Reasons for Lack of Planning

The reasons for a lack of comprehensive planning will be discussed below:

- (1) The government policy in Taiwan had a great regard for economic development and neglected planning for city growth.
- (2) The general public does not have the knowledge or common understanding of the comprehensive plan for the city.
- (3) Politicians often think of urban issues in simple or segmented terms - they do not link transport issues with questions about housing or sewerage.
- (4) Lack of a legal basis to give a plan to every city.
- (5) Insufficient financial resources for the local government to make a plan.
- (6) Shortage of man power in provincial government to make a plan for the local governments.

B. An Incomplete Urban Renewal Program

The Need for Urban Renewal

The need for urban renewal is because of the decay of the cities in Taiwan. The reasons behind the decay phenomenon are summarized as follows:

(1) High Population Density

Table 8 compares the planning residential density with the actual residential density in the selected cities. The actual population density is two or three times the planning population density. This unreasonable situation helps cause the decay phenomenon of the city.

(2) Deteriorated Buildings

From the survey, Taiwan was divided into 5 areas, (see Figure 2). The five areas are the Taipei Municipality, North region, Central region, Eastern region, and the Southern region. Declining communities¹⁷ and illegal building areas¹⁸ are scattered throughout the five areas, (see Table 9). There is a higher percentage in the northern part of the island. The age of structures (see Table 10) in declining communities and illegal building areas can be summarized as 80 years and over, 30 - 40 years, 21 - 30 years, 11 -20 years, 10 years and below. The highest percentage of structures in declining communities are 30 - 40 years. The highest percentag in illegal building areas are 11 -20 years. In declining communities, the highest percentage of housing units are made of brick and wooden structures are the next most frequently used. In illegal building

¹⁷Communities with declining growth rates and predominantly older structures.

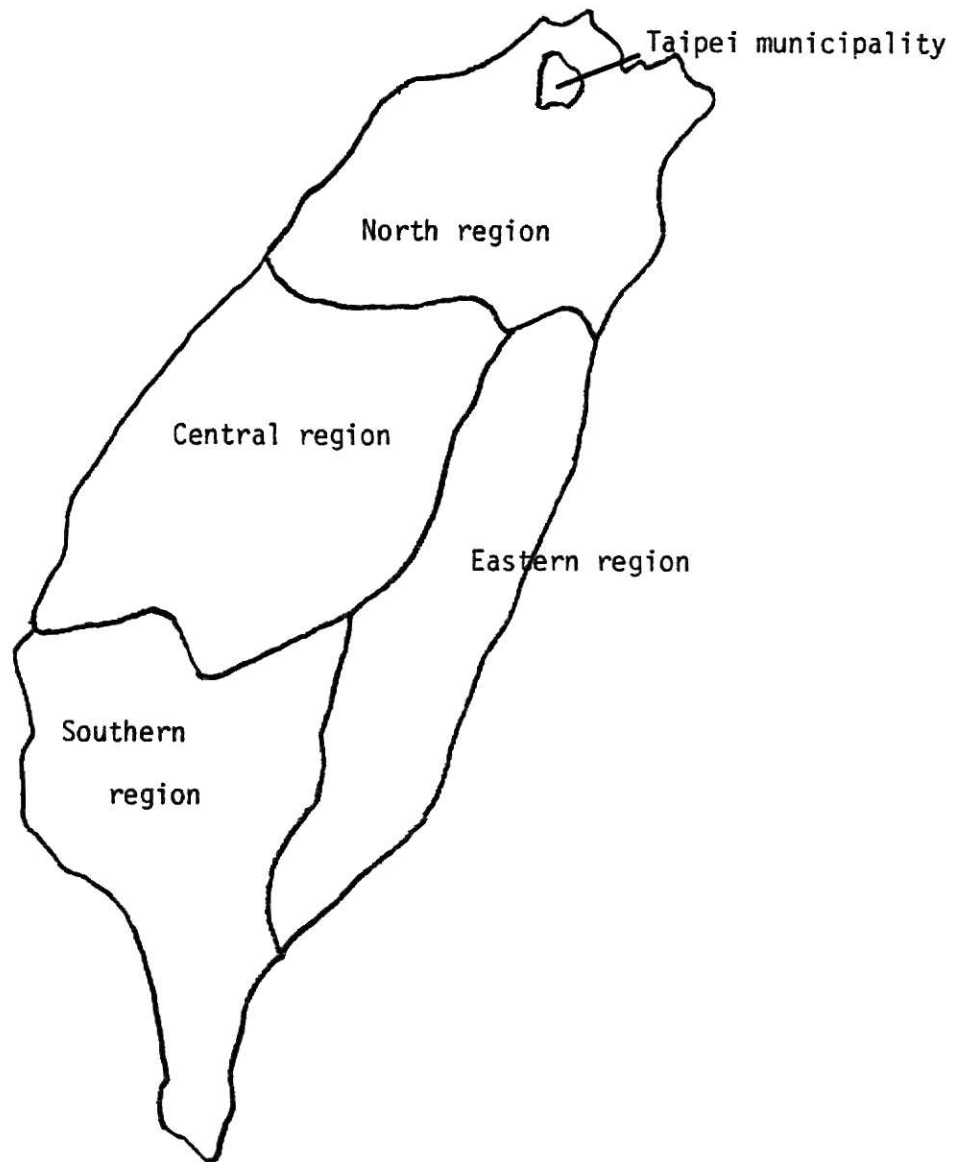
¹⁸Public or private land where groups of houses are built without the permission of the land owner.

TABLE 8. COMPARISON OF PLANNING RESIDENTIAL DENSITY WITH ACTUAL DENSITY
(SELECTED SURVEY AREA)

Planning Area	Planning Residential Density (Person/Acre)	Actual Residential Density (Person/Acre)
Yungho	431	1,110
Panchiao	403	1,175
Sanchung	706	2,575
Hsintien	481	1,180
Fengshan	269	560
Pintung	258	949
Tachia	516	754
Chunghsiung Hsintsun	184	341
Kuejen	155	288
Hsinshih	200	460

Source: R.O.C., Executive Yan, Economic Design Committee,
A Study of Urban Residential Density, 1977.

Figure 2. Regions of Taiwan



Source: Ming-Lung Tu, The Study of Social Factor to Urban Renewal (Chung Hsin University, 1978), p. 35.

TABLE 9. THE PERCENTAGE OF DECLINING COMMUNITIES AND ILLEGAL BUILDING AREAS IN TAIWAN

Region	Declining Communities (%)	Illegal Building Areas (%)
Taipei municipality	59.26	13.68
Northern region	21.41	34.21
Central region	11.12	28.42
Southern region	6.73	16.67
Eastern region	1.48	7.02

Source: Ghi-Hsun Chu, Urban Renewal Theory and Examples (Taipei: Tai Lung Book Co., 1975). p. 8.

TABLE 10. THE AGE OF STRUCTURES IN THE DECLINING COMMUNITIES AND ILLEGAL BUILDING AREAS

Year	Declining Communities (%)	Illegal Building Areas (%)
40 and over	13.70	1.75
30 - 40	38.15	3.51
21 - 30	29.26	16.67
11 - 20	11.48	50.86

Source: Ghi-Hsun Chu, Urban Renewal Theory and Examples (Taipei: Tai Lung Book Co., 1975), p. 8.

areas, 51.49 per cent of the houses are made of wood (see Table 11).

In Taiwan, because of the high humidity and the work of termites, a wooden house fails very fast. The life of the building depends upon the construction materials. Usually, the life of a wood building is 20 years, brick buildings last 40 years and concrete 100 years.¹⁹

From the data above, it can be concluded that most of the wooden housing is in deteriorating condition.

(3) Improper Location or Lack of Public Structures, Parks and Recreation Facilities

Public structures like schools, kindergardens, health centers, city halls, district offices, community centers, fire departments, police departments, public libraries, hospitals and post offices should have enough capacity and a proper location to serve the people. In Taiwan, public structures, parks and recreation facilities can not meet the needs of the people in the city, because of increasing population. It reinforces the decay phenomenon.

(4) Misuse of Public Installation

Certain public installations, like sewage treatment plants, abattoirs, crematoriums and penitentiaries, should be in rural areas. But in Taiwan, some of these public installations, many with very extensive holdings, are mixed into urban areas, thus hindering urban land development.

(5) Chaotic Transportation

The increasing number of vehicles and the development of transportation business within the city increases the load on the streets. The insufficient capacity of the street, and a shortage

¹⁹Ghi-Hsun Chu, Urban Renewal Theory and Examples (Taipei: Tai Lung Book Co., 1975), p. 8.

TABLE 11. HOUSING STRUCTURE IN DECLINING COMMUNITIES AND ILLEGAL BUILDING AREAS

	Declining Communities (%)	Illegal Building Areas (%)
Concrete	12.34	2.24
Strengthened Brick	14.38	8.21
Brick	33.16	17.61
Stone	.68	.00
Dust	8.48	.00
Wood	28.22	51.49
Bamboo	2.74	20.45

Source: Ghi-Hsun Chu, Urban Renewal Theory and Examples (Taipei: Tai Lung Book Co., 1975), p. 8.

of parking spaces causes transportation chaos in the city.

(6) Fire, Infection and an Increase in the Crime Rate

Decay of an urban setting (for example: facilities and housing) easily causes social problems like fire, infection and crime. Wooden houses with old facilities easily catch fire. The shortage of sewage treatment in old communities easily causes infection and social disease. The lack of street lights in slum areas increases the opportunity for night crimes.

(7) Improper Use of Public Land

The limitation of the land in Taiwan is size. High efficiency use of urban land is needed. Low density use of public land like military bases or the university in the urban area, (which occupies a large area of urban land) is not necessary.

All of these phenomena appearing in the city will need physical improvement. One technique to bring about improvement through urban renewal.

Implementation

It is strongly believed that an urban renewal program can accomplish the growth objectives of the city plan. Urban renewal was designed to clear city slums and build new residential complexes on them in accordance with a comprehensive plan.

Urban renewal serves an important housing function by making sites available for housing, by undertaking rehabilitation activities and, most important, by providing the total community development framework in which

sound housing relationships can be developed within the neighborhood and the community.²⁰

Urban land consolidation and the public housing program implemented urban renewal in Taiwan.

(1) Urban Land Consolidation

Urban land consolidation is usually practiced in the city slums or decayed areas. The places are usually in declining communities or illegal building areas.

There are two conditions that must be met before a project of urban land consolidation can be implemented. The first is approval of over one half of the residents in the decay area. The second is a requirement that residents approving land consolidation own over one half of the land.

The urban land consolidation is sponsored by the Land Bureau under the Provincial Government. The project remodels fragmentary paddy lots into square blocks. The size of the blocks are determined by the need of the residents. The project will reserve the land for public facilities and build the street and drainage system. Under this project, all the lots will face the street, and be available for construction.

(2) Public Housing

The public housing program is the major program for urban renewal in Taiwan. Analysis of this program is the next topic.

²⁰Mary K. Neuns, Housing in Metropolitan Areas, Roles and Responsibilities of Five Key Factors (National Association of Housing and Redevelopment Official, 1973), p. 50.

Evaluation

In the Western countries, there are three tools used in urban renewal: conservation, rehabilitation and redevelopment. The degree of blight usually determines the tool to use to correct unwanted conditions. Early signs of growing blight in fairly acceptable neighborhoods may indicate only the light treatment of conservation, while more advanced deterioration may also require rehabilitation, and predominant substandard conditions may be corrected only by clearance and redevelopment.

In Taiwan, urban renewal is a policy of city development.²¹ The idea of urban renewal in Taiwan has been learned from the West. Comparing the program to the West, the urban renewal program in Taiwan just practices the rehabilitation element and ignores conservation and redevelopment. Urban land consolidation is in the experimental stage. It needs to use the whole planning system for its implementation.

C. Undesirable Sub-standard Housing

The Need

Inadequate housing remains critical throughout Taiwan, although substantial progress has been made by the National Government toward alleviating the situation. The difficult problem posed by the evacuation of more than two million persons from the mainland to an already densely populated island is compounded by one of the world's highest birth rates. Population increases by some 3.5 per cent annually.²²

²¹Yung-Mei Tsai and Wen H. Kuo, The Study of Urban Social Development (Taipei, Taiwan: Chu Liu Book Inc. Ltd., 1978), p. 266.

²²International Cooperation Administration Mutual Security Mission to China, Economic Progress of Free China 1951 - 1958 (Westport, Connecticut: Greenwood Press), p. 54.

With the first influx of evacuees in 1949, improvised shelters and squatter's shacks sprang up almost overnight in many urban areas, blocking out streets and parking spaces. The absence of sanitary and fire - prevention facilities in these mushrooming communities created a serious menace to public health and safety.²³

The need for housing programs is urgent to replace undesirable sub-standard housing.

The Public Housing Program

A program is necessary to improve the sub-standard housing and to meet increases in population. This is the Public Housing Program. The Public Housing Program began in 1954, and has been engaged in improving the housing problems for a long time, but it was not working very well. One can divide this program into three stages, according to the different sponsors. The first stage, 1954 to 1958, was sponsored by the National Government. In 1954, the disaster of Curti Typhoon and the housing problem itself made the government notice the importance of a housing policy. The organization of the Public Housing Construction Committee (PHCC) was established under the Executive Yuan. This is the first housing authority in Taiwan. PHCC used a U.S. grant as a basic fund, lending to workers for long terms and at low interest rates. Because of the limitations of the U.S. grant and a lack of enforcement procedures (standards) the benefits of the program could not stretch to most low income families. So PHCC closed in 1958 and transferred the Public Housing Program to the provincial government. The second stage was sponsored by the Taiwan Provincial Government. The Taiwan Provincial took over the public housing affairs in 1959.

²³Ibid.

The Public Housing fund at this period gained from the land increment tax. The policy in this period was to provide new housing in three ways: government construction of housing on government owned land, subsidizing private individuals who already owned land, and, subsidizing investors for larger scale projects. Encouraging the individuals who own the land to get the loans from the government to construct housing for themselves is the dominant principle. In this stage, Taiwan suffered a natural disaster (typhoon) and the government spent a large amount of funding money to recover the loss from the disaster. The shortage of funding blocked development of the housing program. The third stage, after 1968, was sponsored by both the provincial and local government. Taiwan's housing construction fell into recession in early 1968. Because of the rapid economic growth, industrial growth and rapid urbanization changed the economic and social structure from a rural to an urban emphasis. The past housing policy and housing construction method could not suit modern social demands and city development. The lack of capital resources, difficulty in getting the land, incomplete organization systems, lack of a legal base and absence of a long term construction plan hindered the growth of housing construction. In this stage, the government reviewed the whole housing program and sought public cooperation with the government to improve housing.

Evaluation of the Public Housing Program

In nearly two decades, the population grew by about seven million in Taiwan. 110,000 dwelling units had been built through the government program. This number is far from demand. From 1960 to 1976, there were only 18,209 units built in this seven years, about 2,200 units annually. The failure of the Public Housing Program can be summarized by the following reasons:

(1) National Housing Limitations

The government knows the importance of the human environment, but the priority for housing in the national budget is low, particularly in comparison with industrial development.

(2) Lack of Public Housing Development Policy

There is no long term or short term planning for public housing programs.

(3) Lack of Legal Base

There is no complete law, regulation and enforcement of the implementation of the program.

(4) High Land Cost

Urban land speculation has greatly increased land prices, thus making land acquisition difficult.

(5) Lack of Financial Resources

For financing the program, the government borrows the money from the Central Bank or other commercial banks and pays the interest. This represents an inadequate financing technique because the source is not large enough and the government chooses not to spend revenue on housing.

(6) Lack of Staff

The Authority sponsors changes. The sponsor organization itself is not strong. The lack of staff members and trained specialists are serious problems.

(7) Lack of Public Facilities

There is no installation of parks, markets, schools, etc., in most of the mass construction public housing areas.

(8) Poor Design

The design of public housing is just for immediate physical needs.

Broader concerns for comfort, health, safety and public amenities are not considered.

(9) Lack of Social Plan

The Public Housing Program did not consider the low income families' job problem. The location of the housing far from the working place makes the people unwilling to move in and adds to transportation problems.

(10) Lack of Management

Lack of proper maintenance in the large public housing areas creates opportunities for a new slum.

CHAPTER THREE: U.S. FINANCE PROGRAM AND SKYSCRAPERS IN JAPAN

The planning history in Taiwan is short. The planning knowledge comes from abroad. The programs may be or may not be good for Taiwan. Careful selection of programs and methods is necessary. Owing to the different background of the country, some changes can not be avoided. The preceeding analysis of the existing city development programs and problems shows that the main difficulties are financing and how to efficiently use limited land. This chapter will introduce U.S. methods of financing capital improvements and the benefits of the skyscraper used in urban renewal in Japan.

A. U.S. Financing of Capital Improvements Programs

There are ten methods to finance capital improvements programs:
 (1) pay-as-you-go, (PAYG), (2) bond issue, (3) short-term notes, (4) joint financing, (5) reserve funds, (6) lease-purchase, (7) authorities and special districts, (8) special assessments, (9) tax increment financing, and (10) state and federal aid.

(1) Pay-As-You-Go (PAYG)

PAYG is a method of financing capital projects with current revenues, paying cash instead of borrowing against future revenues. The amount available to spend is the difference between what is collected currently and what is required for operating expenses and a prudent reserve.

PAYG has several advantages. First, it saves interest costs. Interest on long-term bonds can more or less equal the original capital cost, depending on interest rates and repayment schedules. Thus, one can pay "twice" for a capital improvement, even though the annual bill over an extended period is disarmingly low. Second, PAYG protects borrowing capacity for unforeseen major outlays that are beyond any current year's capability. Third, when coupled with regular, steady completion of capital improvements, and good documentation and publicity, PAYG fosters favorable bond rating when long-term financing is undertaken. Finally, the technique avoids the inconvenience and considerable cost associated with marketing of bond issues: advisors, counsel, printing, etc.

(2) Bond Issues

The use of bond issues is the major alternative to PAYG. A brief discussion of the different types of bonds follows:

- a. General Obligation Bonds - are backed by the full faith and credit of the municipality. Payment on these bonds may come from the general fund. The advantage is that, because the municipality's credit is pledged and because of tax laws, a lower interest rate may be obtained. Generally, this kind of bond issue must be approved by a majority of voters in a special referendum.
- b. Special Assessment Bonds - are sometimes used to finance the construction of streets, sewer lines, storm drains, or other improvements which actually improve the value of the adjacent property. Special assessments are levied against the owners of the property being improved and this income is pledged to the repayment of the bonds. The advantage is that debt service costs are not charged against the municipal debt limit.

c. Revenue Bonds - are those to which the income from some specific enterprise is pledged. Such bonds might be used, for example, to finance the extension of municipal water works lines to newly annexed areas of a town or city. Charges made to the recipients of the service are then committed to repayment of the borrowed money.

(3) Short-Term Notes

Short-term notes are issued by local banks or state-wide banking establishments. The advantages include:

- A substantial lump-sum can be borrowed at the moment of need and repaid in installments over the next few year.
- A prospective bond issue can be shortened in years and reduced in amount with consequent interest savings.
- Interest on notes is generally less than interest on bonds.

(4) Joint Financing

An ever-increasing number of cities and counties are finding that there is a benefit to both jurisdictions for joint development and financing of a project. The services of the city can extend to the rural areas.

(5) Reserve Funds

This is a variation of the PAYG method. Funds are accumulated in advance for the construction of capital projects. The accumulation may result from surplus or earmarked operational revenues that are set aside, depreciating accounts, or from the sale of capital assets.

(6) Lease Purchase

Local governments utilizing the lease-purchase method prepare specifications for a needed public works project and take steps to have it constructed by a private company or outhority. The facility is then leased by the municipality at an annual or monthly rental.

At the end of the lease period, the title of the facility can be conveyed to the municipality without any future payments.

(7) Authorities and Special Districts

These are created in most cases to manage facilities that are supported by user charges. Special districts with power to tax are also created for the purpose of issuing bonds and constructing facilities that may not be self-supporting. Authorities may offer a convenient method of financing inter-jurisdictional facilities.

(8) Special Assessments

Public works that benefit certain properties more than others may be financed more equitably by special assessment. Local improvements are often financed by this method.

(9) Tax Increment Financing

This method is designated for redevelopment purposes. In this form of financing, all "additional" taxes generated by new developments are used to retire tax incremental bonds issued by the municipality for acquisition, relocation, administration and site improvements.

(10) State and Federal Aid

State and Federal aid represents a major source of funding. Most state and Federal aid programs require a local match of funds. When contemplating this aid, it is important that local priorities still be maintained.

B. Skyscrapers in Japan

An atom-bomb destroyed Hiroshima and Nagasaki. Many other cities in Japan were in chaos after World War II. Because houses in the cities were destroyed, temporary shelters were erected. To solve housing problems, and

provide a high efficiency use of land, skyscraper groupings were designed.

The skyscraper in Japan will be evaluated from the following perspectives: (1) design, (2) benefits to the residents, (3) benefits to the surrounding residents, (4) benefits to the city environment. Because Japan and Taiwan are similar, (both are island countries with high density populations) the solutions used in Japan may be appropriate in Taiwan.

The Design

Japanese skyscraper groupings have included the following design characteristics.

- One skyscraper was built in each super-block.
- In each of the super-block, half of the land was left vacant.
- Public facilities, such as street furniture, public phones and recreation facilities are installed on vacant land.
- Linkages, such as pedestrian walkways are made between skyscrapers.
- The height of the buildings is different, with each building properly located for sufficient sunshine and air.
- Separate routes are created for pedestrians and cars.
- Centralized air conditioning, heating and parking is included.
- Double-deck roads, with both the upper and lower levels having terminals, save ground area.
- Each construction is a community.

Benefits to the Residents

The skyscraper design provides the following benefits to their residents.

- Allows them to have a good view.
- Specially designed doors and windows for central air conditioning isolate noise.
- Elevators are convenient to the handicapped and senior citizens.
- Special structural designs can provide safety in case of typhoons or earthquakes.
- The architectural material is fire proof.
- Because the skyscrapers are built close to work, shopping, etc., the residents won't suffer traffic problems.
- Adequate recreation and rest open space.

Benefits to the Surrounding Residents

- Shared open space of the skyscraper.
- The open space of the skyscraper can preserve the sunshine and fresh air.
- Skyscrapers can use fireproof walls.
- Shared utilities: sewage systems, electric power and water.

Benefits to the City Environment

- Benefits to urban renewal.
- Allows development of service and other productive business.
- Raising the economic value of the surrounding area.
- Solving traffic difficulties in the city.
- Providing high quality housing in the city.
- Increasing the amount of green land or parks in the urban area.

The government policy in Taiwan prohibits change in the use of good agriculture land (as classifying higher than grade 12) to another use. This is done in order to maintain the policy of self-sufficiency in food for the island.

The idea of high-rise apartment buildings may not be accepted by everyone. For example, the United States will no longer build high rise public housing for families with children, only for the elderly.

Because the limit of land, the countries like Hong Kong, Singapore and Japan must build high rise buildings. So the idea of a skyscraper is adapted for the physical limits and functional needs, not for aesthetic values.

CHAPTER FOUR. PROPOSAL AND SUGGESTIONS FOR A CITY REDEVELOPMENT PROGRAM

According to the previous discussion, the economic development, the industrial development and the population migration of cities will continue, however, existing urban renewal and public housing programs for the development of cities are not working very well. All of the problem findings are in a beginning stage, yet, it is not too late to evaluate the existing problems and give proper adjustments in order to meet the future needs of the city. In this chapter, suggestions regarding the development program problems will be given, as a proposition for city redevelopment in Taiwan.

A. Proposal

For the city redevelopment, a comprehensive plan for every jurisdiction is necessary. Improving the existing urban renewal and public housing programs must be a complete and workable effort. The public housing program should be used as a back bone of urban renewal. The comprehensive plan will guide urban renewal, give direction of development and coordinate with the public housing program. If this is done, public housing, urban renewal and comprehensive plans will be a systematic project. Suggestions for each program will be discussed separately.

B. The Comprehensive Plan

Land reform and land consolidation programs are the factors driving economic growth in Taiwan. Strategies for industrial development will

also contribute to growth. Because of this continuous growth, the comprehensive plan is urgently needed to match for urban conditions the economic and industrial plans.

The reasons behind the lack of comprehensive planning were: (1) discrimination by the government, (2) general lack of public knowledge of planning, (3) neglect by the politicians, (4) lack of a legal base, (5) financial problems, and (6) scarcity of man power.

Suggestions will be made addressing each of these reasons.

Suggestions

(1) The comprehensive plan should have the same weight as economic and industrial programs. If there is no plan, the growth of the city will be in chaos, and will decrease economic or industrial development. On the other hand, a well planned city will provide an incentive for economic and industrial growth. So, the development of a plan for cities should have a higher priority, if the economic and industrial sectors are to flourish.

(2) The general public does not have knowledge and understanding of the plan. The government may put an advertisement in the newspaper, explain the importance of the plan and the benefit for the people. Another method is to give more chances for citizen participation as an incentive to increase the interest of the people

(3) The comprehensive plan is a long term plan. Street construction easily can be seen by the people, but it is an instant merit for the politicians. A few years later, it may not be adequate for usage levels. At that time, it will be necessary to invest another sum

of money to widen the street or construct a new one instead. The politicians should realize real needs for a long-term period of the city.

(4) It is necessary for a law to support the comprehensive plan for every jurisdiction. This provision is needed to provide a legal basis for the comprehensive plan. It also improves planning implementation.

(5) Both the central and provincial governments should have funds or grants to support comprehensive planning for the city.

(6) To strengthen organization, adding sufficient numbers of staff personnel is necessary. The number of staff should be enough to handle the work load in the organization.

C. Urban Renewal

Clearing slums and deterioration in order to reshape the urban scene into a more desirable livable environment is the purpose of urban renewal. Urban renewal is used to solve the problems of, (1) high population density, (2) deteriorating buildings, (3) improper location or lack of public structures, parks and recreation facilities, (4) misuse of public installations, (5) chaotic transportation, (6) fire, infection and increasing crime rates, and (7) improper uses of public land.

The following suggestions for urban renewal address the preceeding problems.

Suggestions

(1) For a high efficiency use of land, to build group skyscrapers like Japan in renewal areas and to maintain high density residential

areas. Although there is still a high density residential use, it would improve housing conditions and the environment of the vicinity.

- (2) Rebuild deteriorating buildings.
- (3) Preserve land for parks and recreation facilities and construct public structures at proper locations.
- (4) Relocate extensive public installations to rural areas.
- (5) Rearrange buildings, widen roads, and preserve parking spaces.
- (6) Enforce zoning ordinances to decrease fire, infection and the crime rate.
- (7) Relocate the urban military base and university and use this public land efficiently.

In Chapter Two, urban renewal in Taiwan was found to be using the public housing program as a component of the renewal program. The strategy of the public housing program in urban renewal is rehabilitation, which is the middle course in renewal. The suggestion here is to include the other two urban renewal tools: conservation and redevelopment. Depending upon the degree of deteriorating conditions, a combination of two or all three of the urban renewal tools is necessary. A complete urban renewal strategy can shorten the time necessary for the renewal process.

D. Public Housing

Since redevelopment was associated with housing, the requirement of the project must be predominantly housing.

The discussion of Chapter Two indicated that the failure of the public housing program for these reasons: (1) national financing limitations, (2) lack of public housing development policies, (3) lack of a legal base, (4) high land cost, (5) lack of financial resources, (6) lack of staff,

(7) lack of public facilities, (8) poor design, (9) lack of a social plan, and (10) lack of management. The following suggestions respond to each of these failures.

Suggestions

- (1) The budget is the most important device for program implementation. The government should give higher priority to the housing program.
- (2) Institute a long-term and short-term policy and implement a program derived from it for the fiscal year.
- (3) Institute the law and related ordinances to protect implementation of the program.
- (4) The law and ordinances will limit land speculation. For public welfare uses, the power of eminent domain can be used to acquire land and pay compensation according to the announced land price.
- (5) Both the national and provincial government should have funds or grants for financing the program. Bond issues, short-term notes, and tax increment financing are additional ways to finance renewal programs.
- (6) Increasing the planning staff size in the provincial government will make plan production faster. Increasing the staff of local government will help make implementation of the plan more efficient.
- (7) A community without public facilities will be seen as an unattractive place to live. The installation of public facilities should be considered in the project.
- (8) The design of public housing should not only provide basic needs but also regard the comfort, health and safety of future residents.

(9) The location of public housing should be near places of employment for the residents.

(10) To preserve existing achievements, management regulation and authority are needed. This includes maintenance of public housing and public facilities.

CHAPTER FIVE. RECOMMENDATIONS

There are several recommendations that can help city redevelopment in Taiwan.

- A. An official issue of The Taiwan Comprehensive plan is needed. This plan will give the direction to the city, and guide the related programs (for example: Urban renewal program or public housing program) for the future city redevelopment. It will also help preserve the resources of the island
- B. City redevelopment should have a redevelopment authority in charge of project implementation. The redevelopment authority should be in the national government because a redevelopment authority in the national government would make it easier to get funds and grants and provide better coordination with neighboring authorities and plans.
- C. For the future city redevelopment, the existing law may hinder program implementation. Update and review of the planning law, construction codes and zoning ordinances is necessary. This is done in order that the law will protect the implementation of the program.
- D. For financing the program, money may be available from foreign countries. For example: City Redevelopment in Korea gets long-term and low interest rate loans from the U.S. and Saudi Arabia. Taiwan imports a large amount of crude oil from Saudi Arabia and industrial products from Japan, so it

may be possible to get loans from private or governmental sources in these two countries.

E. Training the Professional Staff

The staff may not be equipped for the job, so proper training is necessary. Instituting a period of practical training, holding a meeting to exchange experiences and issuing books of professional knowledge to the staff may help.

F. For the long-term program, the population is the key factor to the future. One failure of existing projects is due to the (population) demand that can not meet the need. Taiwan is faced with population growth by the end of the century which will see her cities almost triple in number of inhabitants. Another component of city redevelopment, therefore, is a proper program of birth control to provide for lower population growth.

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CITY REDEVELOPMENT IN TAIWAN - PROBLEMS AND PROGRAMS

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AN ABSTRACT OF A MASTER'S REPORT

Submitted in Partial Fulfillment
of the Requirement for the Degree

MASTER OF REGIONAL AND COMMUNITY PLANNING

Department of Regional and Community Planning

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1981

ABSTRACT

Urban development in Taiwan has been accompanied by physical and social problems. The reasons, at least for physical problems, stem from three conditions: (1) rapid urbanization, (2) undesirable, sub-standard housing, and (3) the lack of comprehensive planning.

In Taiwan, rapid population growth and concentration in urban areas has caused rapid deterioration of the human environment. Old, poorly constructed buildings, which in most cases were erected without building permits or any respect of building codes, spread throughout the cities. Lack of coordination of planning for city development at various levels of administration, and the need for a comprehensive type of planning which coordinates planning undertaken in various sectors, such as economic, social, population, and physical planning is apparent. All of these are development problems.

The purpose of this report is to review 20th Century urban development in Taiwan, to investigate some urban renewal and design experiences outside of Taiwan, and to evaluate the feasibility of using similar methods to combat development problems in Taiwan.

The broad program of urban renewal in the United States and the Japanese urban skyscrapers were two urban development programs found to be appropriate to Taiwan and are included in recommendations of this report. Other recommendations include a call for increasing national government participation in local redevelopment and the strengthening of regional planning.