

PUBLIC HOUSING, POPULATION REDISTRIBUTION,
AND URBAN DEVELOPMENT IN SINGAPORE

by

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Chapter 1

INTRODUCTION

A properous country in Southeast Asia, the city-state of Singapore had a total land area of 618 square kilometers, and a total population of 2.47 million in 1983. In March of 1983, Singapore's sole government housing agency, the Housing and Development Board (HDB), announced that seventy-five percent of the nation's population was living in public housing, also known as HDB housing or HDB flats. An additional 127,000 applications for HDB flats were on a waiting list.

For a capitalist country, the share of the population in public housing is unusually high. People residing in HDB housing are there as a matter of free choice. The popularity of HDB housing is apparent. Because of this popularity, Singapore's government is able to use its public housing program to redistribute population, develop comprehensive land-use planning, and, hence, reshape the social and economic landscape on the island.

As in many other countries, Singapore began its public housing as a social welfare program in 1960. It was designed to rehouse people living in deteriorating, overcrowded, and unsanitary squatter and slum areas. With the government's financial support and HDB's ambitious effort, a severe housing

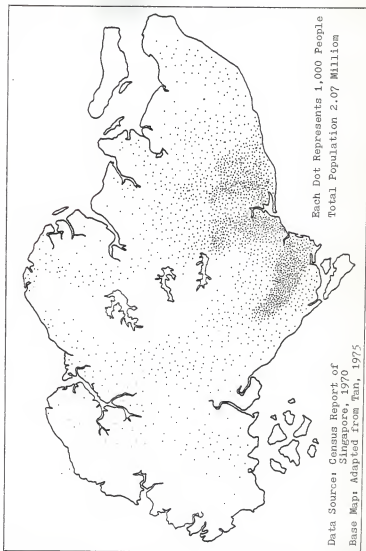
shortage was relieved within a decade. In late 1973, the government announced a plan to build middle-income housing, with the objective of accommodating those middle-income families which could not afford expensive private housing.

In 1964, the "Home Ownership for People Scheme" was introduced. As part of a multi-facet initiative, HDB encouraged and aided residents to purchase their flats. In 1968, a funding mechanism was introduced as the Central Provident Fund (CPF), the social security deposit, became a source of home purchasing payments. As a consequence, by early 1983, 65.6 percent of the residents owned their homes. (HDB 1982/83) (According to a census report, 61.9 percent of the total population owned their homes in 1980.)

Before 1960, when the HDB began its large-scale public housing project, the population in Singapore was highly concentrated on the southeastern part of the island. The housing development during the 1960s had somewhat spread the population more outward, but most of people were still on the southeastern portion of the island. (Map 1) During the 1970s, the direction of housing development shifted toward outer parts of the island, and several new towns were created outside of the city boundary. The 1980 census showed the divisions outside of the city, where the large HDB housing estates were located, all had a large population gain. Meanwhile, the city area had lost 2.3 percent of its population from 1970 to 1980, even though there was a sixteen percent increase nation-wide.

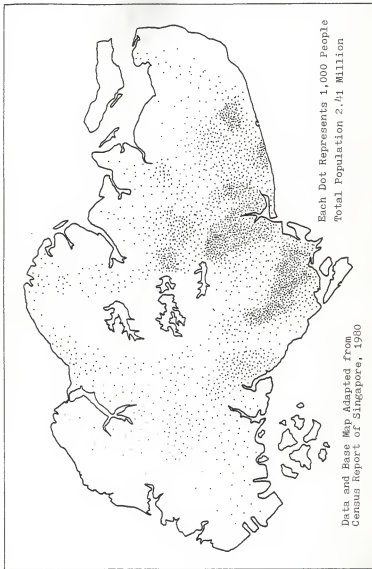
Map 1

Population Distribution in Singapore, 1970



Map 2

Population Distribution in Singapore, 1980*



*There is some variation from Map 1 in land area, particularly in the southeast and west. Some differences can be attributed to land reclamation.

It is therefore apparent, that HDB housing development not only achieved the rehousing of Singapore's people, but also redistributed the population. (Maps 1 and 2)

In 1971, with United Nations' assistance, the Concept Plan of Singapore (SCP) was introduced. It is a comprehensive development plan for the state as a whole. The plan emphasized development of the island along an east-west corridor and a ring around the water-catchment in the center of the island. The whole island is divided into seven sections. Each section includes residential areas, industrial, commercial, recreational, and other uses. Each section is also connected by expressway and public transportation. The plan would allow the island to accommodate four to six million people. HDB's housing development is guided by the plan. This study focuses mainly on the affects of HDB housing development on population redistribution and changes in people's life between 1970 and 1980.

NATURE OF THE STUDY

Public housing in Singapore began as social welfare program, namely to resolve a severe housing shortage. Over two decades of development, the program has gained such momentum that it not only has rehoused a majority of the population into government housing, but also has restructured the population distribution. This study examines how public housing development has reshaped the distribution of the population, and how such change has affected the people of Singapore. Emphasis is placed on the period of 1970 to 1980.

Guided by a comprehensive plan, housing development in Singapore has also changed the pattern of urban distribution. From the early 1970s, the Concept Plan of Singapore has been conceived as a mechanism for guiding the directions of housing and urban development. Accordingly, this study will assess the degree to which the Plan has permitted Singapore to reshape its social and economic landscape in a planned manner.

JUSTIFICATION

Of the four traditions of geography discussed by William Pattison, this study would fit into both the traditions of spatial analysis and area studies. According to Pattison, spatial analysis is, "... the act of separating from the happenings of experience such aspects as distance, form, direction, and position." (Pattison 1971) The main focus of this study is the population redistribution through a government housing program under the guidance of a comprehensive plan. In the study, where and in which direction people have moved are examined. The pattern of population growth in relation to housing development is studied.

The study also fits into the area studies tradition because it promotes a better understanding of a place, a nation. With such an understanding, one can compare and differentiate other places or nations with respect to their housing development and/or urbanization process. Also, by knowing why and how the public housing project succeeds in Singapore may lead one to have better understanding of why and how it fails or succeeds

in other places.

METHOD OF APPROACH

It would be preferable to have field observation for this study, to see how the HDB housing projects have reshaped the island's landscape. But for various reasons, it was difficult to conduct a study based on field work. The study is, therefore, based on available data and published literature.

The data used here were primarily collected from the HDB annual reports, and census reports of Singapore for 1970 and 1980. The HDB reports provide information about how housing projects have developed, and its future plans. The census reports reveal exactly how many people reside in each division and what types of housing were present in both censuses. By comparing the population growth in each division and the percentage of people living in HDB housing, the relationship between population growth, distribution, and HDB housing development can be analyzed.

Several books dealing exclusively with public housing in Singapore have been published. The books proved to be helpful in understanding more about qualitative development in HDB projects. In addition, a number of sociological surveys have been completed by HDB researchers and other scholars. These surveys provide some insights about what impacts the HDB housing development has brought for the population. Additional insight was available from a number of related articles, scattered in

journals such as The Journal of Tropical Geography, Royal Australian Planning Institute Journal, Asian Survey, and so on.

To further understand Singapore's public housing development, the Hong Kong experience is briefly touched on in Chapter 2. Hong Kong was chosen because there are many similarities between the two city-states. Both have a rather large number of people living in government housing. But when examined closely, the experiences are different, and are "successful" in different ways and degrees.

EXPECTED RESULTS

Public housing development in Singapore is successful in terms of rehousing people and redistributing the population. Through HDB housing projects, the population on the island of Singapore is no longer only concentrated along the Singapore River in the south of the island, but is spreading out to different parts of the island. The whole island is being urbanized the way the government planned. Employment opportunities are created along with HDB housing development. Employment centers are no longer confined to the Central Area. In general, the quality of life has been improved. Such extreme achievement in public housing development makes the Singapore experience interesting and unique.

TERMINOLOGY

Before getting into the main text, a few terms used in

the study should be clarified:

- (1) HDB housing: All the housing, unless specified, built and managed by the Housing and Development Board (HDB) in Singapore. The term is used interchangeably with HDB flats, government housing, and public housing throughout the text when Singapore's development is discussed. However, there were some other types of "public housing" before 1982. They were either built by the Jurong Town Corporation or the Housing and Urban Development Company. Both are also government agencies. All of their public housings were transferred to the HDB in April 1982. HDB now is the only government housing agency in Singapore.
- (2) HDB estate: An area developed and built by the HDB. The land-use pattern in an estate usually includes residential, commercial, industrial, open space, and recreational uses.
- (3) Involuntary relocated residents: The HDB residents rehoused in HDB housing because of squatter resettlement, slum clearance, or affected by other public development programs. All the families affected by these government programs have a choice of moving to HDB housing, resettlement areas, or finding their own accommodations.
- (4) Voluntary relocated residents: Contrary to involuntary relocated residents, these are HDB residents who chose to move to HDB housing without being affected by any government program.

TEXT ORGANIZATION

This study includes five chapters. Following the Introduction, Chapter Two is a short literature review of how housing shortages are generally addressed by governments. Hong Kong's public housing program is discussed to some extent. Chapter Three is a description of housing needs in Singapore before the HDB was established, the latter's establishment, organization, and its program development. The fourth chapter is an analysis of how HDB development affected population growth patterns, and how HDB residents have responded to their living environment. The last chapter is a discussion of how and why public housing succeeded in Singapore, and its implications for other places or countries.

Chapter 2

LITERATURE REVIEW

A large body of literature has revealed various urban problems in developing countries. The presence and expansion of squatter settlements and slum dwelling resulting from rapid population growth and housing shortages are often mentioned. The latter is dramatic when raw numbers are reported. According to a United Nations estimation, 995 million, or one-third of the population in the developing world could live in cities in 1980. The number will increase to 2,118 million, or forty-four percent, by the year 2000, an average 3.8 percent increase annually. United Nations studies also suggest that 13 dwelling units per 1000 urban inhabitants would have had to have built per year to meet housing needs. (Yeh and Laquian 1979) Few countries could meet this standard. Countries in Asia and the Pacific region, for example, had managed to meet only fifteen percent of their housing requirements during the 1970s. (Yeh and Laquian 1979) Despite the efforts attempted in different countries, most slum areas continue to be overcrowded and increasingly deteriorated, and the squatter settlements continue their disorderly expansion. Failure to meet housing needs is attributable to lack of funds, lack of capable administrative and planning personnel, lack of adequate housing policy, and lack of overall land-use and housing planning.

Approaches for dealing with housing shortages are many,

varying from country to country. More common methods employed include: (1) providing low-cost public housing; (2) upgrading squatter settlements; and (3) improving site conditions and public services. Providing low-cost public housing would be the most direct method to house the urban homeless. Many countries do have programs to provide low-cost housing for low-income people. However, for various reasons, most countries have found that it is difficult to achieve the primary goal of housing most of the urban homeless. Some countries lack funds to carry out their programs, or can only accomplish a fraction of their targets. Some countries with poor planning either locate the housing far away from employment places, or build higher quality housing, which is unrealistically expensive for low-income people. Other problems can be traced to fragmentation of authority, no actual survey or inaccurate estimation of housing needs, and difficulties in acquiring needed lands. (Yeh and Laquian 1979; Grimes 1976)

An example of an inappropriate public housing program is the case of the Spang Palay resettlement project in the Philippines. Forty percent of the resettled people returned to squatter areas a year and a half later. (Grimes 1976) But there are exceptions. Among all the developing countries providing public housing, Singapore and Hong Kong have proved to be successful, in that the housing need is more or less met. To a lesser extent, Malaysia and South Korea are housing a large portion of their urban homeless. (Grimes 1976) While

the experience in Singapore is the main theme of this study, programs in Hong Kong will also be discussed later in this chapter.

It has been argued that a squatter-upgrading program is easier for those countries with a shortage of funds to adopt to resolve housing shortages. (Grimes 1976) In such a program, squatter and slum areas are provided with necessary urban amenities like water, electricity, sewage treatment, and new roads. While avoiding the high cost of opening up new lands, and the risk of dislocating low-income people, this approach allows the poor to have a more desirable set of living conditions. The Kampong Improvement Program in Jakarta is a successful case of this kind. The residents were mobilized to improve infrastructure and existing housing stock. By the late 1970s one million people had been affected. The program is now being extended to 1,400 villages in rural areas. (Yeh and Laquian 1979)

A program complimentary to squatter-upgrading involves improvement of sites-and-services like roads, drainage, sewage, electricity, schools, and health clinics. Individuals can build their own houses at the sites. The objective of such programs is to aid families affected by squatter-upgrading programs. Those uprooted by installation of new facilities and roads have an opportunity to resettle at a comparable cost. (Grimes 1976) Earlier versions of such programs were not effective because the sites were either too far from jobs, or deficient in services. With help from the World Bank, more

sites in or near cities have been opened. Small industries are encouraged to locate near the new sites. (Laquian 1979)

Both squatter-upgrading and a new sites-and-services approach provide alternatives to absorb the excess of low-skilled labor among the squatters and the urban poor. In both programs, cooperative housing is usually promoted. Community resources and labor are pooled together to get public loans to construct houses and to improve community facilities. A new community is, therefore, often created. (Grimes 1976; Laquian 1979) In some countries, for example, the Philippines, Malaysia, and Thailand, such an entity is eventually guided to form a pressure group, and demonstrate to increase the power of the poor in local politics. (Laquian 1979)

PUBLIC HOUSING: THE HONG KONG CASE

Before getting into the topic of Singapore's public housing experience, public housing development at other places would further prove Singapore's success in both quality and quantity of its public housing programs. To make a comparison, the Hong Kong case is chosen. There are many similarities between the two states, and yet a few differences in some aspects like their public housing experiences. Both are city-states in a tropical area. Both have experience with British dominance, and Hong Kong is still ruled by the British. Both are overwhelmingly Chinese. Both have a similar rate of population growth. Both adopted a capitalist philosophy. They are the more prosperous and advanced states in Asia after

Japan. Both economies are heavily dependent upon industrial development and trading.

In terms of public housing, both are regarded as successful, with a large percentage of their population living in government housing. However, the programs in Singapore are guided by a comprehensive plan, which is intergrated into its national development policy. But in Hong Kong, development of programs is more piece-meal. There, the degree of success is largely dependent on sufficient funds.

Severe Housing Shortage in Hong Kong:

The total area of Hong Kong, which includes Hong Kong Island, Kowloon, and the New Territories, covers 1,032 square kilometers (400 square miles). Given the estimated population of 5.4 million in 1984, the overall density is 5,240 persons per square kilometer, or 135,000 per square miles. (PRB 1984) Constrained by the rugged physical conditions and accessibility to the harbor areas, most people concentrate in the city of Victoria, the narrow coastal plain on the north of Hong Kong Island, and Kowloon which is across a strait from Victoria. In the 1970s, a density level of 75,000 persons per square kilometer was reported for the urbanized area. There is a small portion of the population living in sampans and junks. (Dwyer 1979)

Before the Pacific war, a housing shortage in Hong Kong was already apparent. In the city areas, typical open-front

shophouses prevailed. The front portion of the ground floor was for business. A kitchen occupies the rear. The second and third floors were for residential use. To cope with housing shortages, the residential spaces were divided into cubicles, one to each family. The intensity of occupance was related to high population growth, further exacerbated by historical events. During World War II, ten percent of the entire housing stock was damaged. Another ten percent was destroyed. (Dwyer 1979, 159)

Immediately after the War, only 600,000 people remained in Hong Kong. About one million left during the War, either voluntarily or involuntarily. Most returned after the War. The population reached 1.8 million by 1948. In 1949, with the communist seizure of China, refugees rushed into Hong Kong. For a period, as many as 10,000 arrived in Hong Kong each week. By May 1950, the total population rose to 2.4 million. (Dwyer 1979, 153-5) Since then, the legal and illegal refugee waves, fast or slow, have not stopped. It is estimated between 30,000 to 80,000 illegal refugees come annually. (Yeung and Drakakis-Smith 1982) The influx of refugees in Hong Kong may be regarded as somewhat like rural-urban migration in other developing countries.

Many refugees have found places in squatter areas. In 1964, there were 550,000 settled in squatter areas. Some found places at old shophouses. The already divided shophouses were further subdivided into sleeping spaces. In extreme

cases, sleeping spaces were taken in a shift system by three families. (Dwyer 1979) The overcrowding was almost unimaginable. Some districts in urbanized areas reached 238,000 persons per square kilometer in 1961. (Yeung and Drakakis-Smith 1982)

Inception and Development of Public Housing in Hong Kong:

Despite the overcrowding, not much was done by the Colonial Government. There was a government Housing Society to provide housing for low-income people in 1951, but it was ineffective. On Christmas day of 1953, a fire at Shek Kip Mei in Kowloon left 53,000 people homeless. An ad hoc Resettlement Department was formed within a few days to take care of the victims of the fire. Two principles were followed in its program: high-density building with a standard that ensured low rent, and less land should be used than for the same number of people in squatter areas. (Dwyer 1979, 165)

The quality of the resulting resettlement buildings was very low. H-type blocks with six to eight stories in height were built. There were only communal washing, cooking, and toilet facilities at the center of the building on each floor. On average, a family of five was squeezed in a room of 11 square meters. The rent was kept at 3 dollars (U. S.) a month for many years. An important consideration behind the government's unwillingness to improve or provide better housing was a belief that when the political turmoil was over, many would return to China. Only after 1963 were some improvements

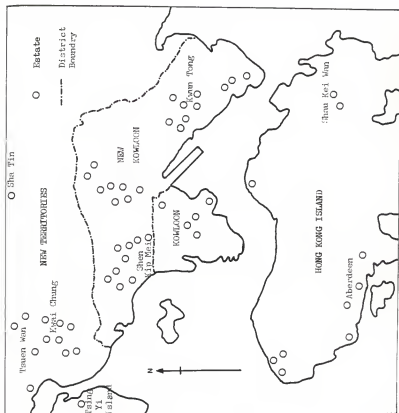
brought to the program. Household living space was expanded to an average of 3.3 square meters per adult. Children were counted as half an adult. Kitchens and bathrooms were gradually installed in some flats, and balconies were built. By the end of the 1960s, one million squatters were rehoused in land areas covering two-fifths of the size they previously occupied. (Dwyer 1979; Yeung and Drakakis-Smith 1982) People in slum areas were not included in the resettlement program until 1964. (Yeung and Drakakis-Smith 1982, 228)

In addition to the Resettlement Department, there were three other public housing agencies up to 1973; the Housing Society, the Housing Authority, and the Government Low-Cost Housing Program. Both the Housing Society and Housing Authority were to provide housing for low-income, white collar people with a monthly family income between H. K. 500 to 1,000 dollars. The Low-Cost Housing Program was responsible for families with monthly incomes below H. K. 500 dollars. The Low-Cost Housing was less of an independent agency. Its projects were built by the Public Works Department, and estate management was in the hands of the Housing Authority. By 1973, all four agencies, including the Resettlement Department, were integrated into one body, the Housing Authority, which subsequently has been the sole agency in charge of public housing programs in Hong Kong. (Dwyer 1979; Yeh and Laquian 1979; Yeung and Drakakis-Smith 1982)

A comprehensive assessment of housing needs in Hong Kong

Map 3

LOCATION OF PUBLIC HOUSING ESTATES IN HONG KONG



was not attempted until the early 1970s. A ten-year housing program (1973-83) was then outlined. The program's objective was to provide improved housing for 1.8 million people during the period. It was estimated that about 240,000 dwelling units needed to be built. For the years of 1974-75, and 1975-76, the government placed 17.3 and 20.8 percent, respectively, of its total expenditure on public housing. (Yeh and Laquian 1979, 18) About 1.8 million people, or forty-one percent of the total population, were living in government housing by 1975. This was lower than the 2.1 million projected at the beginning of the decade. Most of these people lived in the resettlement flats. (Yeung and Drakakis-Smith 1982, 226)

The government housing estates are scattered on the fringe of cities, except for the older ones built in the 1950s (Map 3), when lands were made available by squatter fires, or squatter clearances. (Yeung 1979; Yeung and Drakakis-Smith 1982) As the public housing program gradually expanded, new town development was incorporated into the program. The earliest new towns were Tsuen Wan in the southeast of the New Territories, and Kwun Tong in south Kowloon. The development of Tsuen Wan was not planned until its piece-meal urban growth had created an urgent problem. Originally it was an industrial area. Housing was not adequately provided. People usually found shelter in squatter huts. The first long-term development plan of the town was published in 1961, when Tsuen Wan already had over a decade of industrial development. According to the government plan, about a half million people would be

accommodated in subsidized housing. (Dwyer 1979, 179-81)

Compared with Tsuen Wan, Kwun Tong was better planned and developed. Before the city of Kowloon expanded, Kwun Tong was relatively remote. Because of its closeness to Kowloon, in 1954 the government decided to develop it into an industrial area. Now it has the biggest industrial concentration in Hong Kong. Commercial and residential zones are also better developed than those in Tsuen Wan. (Dwyer 1979) Recently, planned new town development has been emphasized. New towns planned and in the process of development are Castle Peak, Sha Tin, Tuen Mun, and Yuen Long. Each is planned to accommodate one-half million people in low-cost housing projects. (Dwyer 1979; Yeung and Drakakis-Smith 1982)

Unlike many other developing countries, land acquisition for the implementation of its public housing projects is not a problem. The government of Hong Kong owns the entire land area. Private interests can only lease lands from the government. When leased land is needed for public development, the government may exchange another piece of land or offer cash compensation. (Casanova, Tan, Leong, and Soepangkat 1979) Meanwhile, reclamation projects are carried out to expand the insufficient land area. By the end of the 1970s, about nineteen percent of the total land area was reclaimed. The new towns of Tsuen Wan and Kwun Tong have large reclaimed areas, especially in Kwun Tong, where the entire industrial zone is reclaimed. (Yeung and Drakakis-Smith 1982)

The relatively successful public housing program in Hong Kong was not initiated as a welfare program. As noted by Dwyer in an official statement in 1955:

"What was required was not primarily to improve the living conditions of that section of the community which happened to be breaking the law relating to the occupation of Crown land: the task was to devise a rapid and practical method, at a cost less than prohibitive, of removing, in the interests of the whole community, the fire risk and the threat to public health and public order presented by the worst squatter areas." (1979, 177)

Because of this attitude, only the families in the programmed areas can be rehoused. The result is that some very poor squatters cannot move to more decent housing, and some relatively well-off squatters have been benefited. Recently, squatter-upgrading has been applied to improve the remaining squatter settlements. Many of them are located on steep hillsides. (Yeung and Drakakis-Smith 1982)

Because of the priority given to the control of land use and improving the environment, individual well-being is not of much government concern. Housing quality has been kept at a minimum. The oldest resettlement blocks, as pointed out earlier, are only provided with communal cooking and washing facilities. A family of five adults is accommodated in a simple concrete cell of 10.8 square meters. (Dwyer 1979, 165) Children under ten years old are counted as half adult. Standards were not improved until the mid-1960s. As families continue to expand, the old estates have become so crowded, Yeung and Drakakis-Smith point out, that in 1975, 400,000 people lived in less than the 2.2 square meters allowance. They describe

it as "the creation of new slums." (1982) Action to improve the older estates has been taken, which includes converting and renovating units, and providing individual facilities as well. All the new units now are self-contained. Meanwhile shopping complexes have also been introduced into newer estates.

In more recent years, the Housing Authority has begun to build flats for sale. Priority is given to the existing tenants of the Housing Authority, so that their current flats can be available for poorer families. Currently, about 5,000 to 6,000 units are built each year. More of them are still rented rather than owned. Despite the massive public housing program, the housing shortage continues to be a problem in Hong Kong. The problem comes mainly from middle-income families. Their income is too high to be eligible for government housing, and yet private housing is too expensive for them. The income ceiling for the government housing is \$ 325 (U.S.) per month for a family up to six, and \$ 475 for a family of seven or more. (Yeung and Drakakis-Smith 1982)

In general, the success of public housing in Hong Kong is more quantitative than qualitative. After the emergency housing need was more or less dealt with in the 1950s, poor quality units were constructed through the 1960s. Employment opportunities and shopping convenience for the public housing residents were not considered until the late 1970s. This indicates that the Colonial Government did not have an overall plan for its housing development until fairly recently, when

the problems of the older estates were becoming apparent. The government's ad hoc response to the situation is also demonstrated. With the same attitude, chances for success may be low in other developing countries. What the Hong Kong Colonial Government enjoys more than other countries is its economic prosperity. Large revenues are generated from its economic boom, allowing the government to place a good share of its expenditures on public housing. From the beginning of the project until March 1977, about U.S. \$ 1,000 million was allocated to public housing. Another \$ 870 million is planned for the period of 1978-88. (Yeung and Drakakis-Smith 1982)

The future of public housing in Hong Kong is difficult to predict at present. In May of this year (1984), the Governor of Hong Kong officially announced that Hong Kong would come under communist Chinese control in 1997. Moreover, the Chinese government refused to commit itself not to send troops after it takes over. Several large firms have already transferred their investments to other places. Whether the future government can continue to generate as large revenues as before would be the first question. The second question would be whether the Chinese government would be willing to continue the construction of public housing for the already much better off Hong Kong people.

Chapter 3

SINGAPORE'S EXPERIENCE

The tiny city-state of Singapore is located at one degree north of the Equator, and across the narrow strait of Johore from the Malay Penninsula. At the throat of the Strait of Malacca, the strategic location provides the state with a most precious and only important "natural resource". Through the first half of the century, it had been an important entreport in the region for over 150 years. Now it has become a commercial, financial, and industrial center. Its people enjoy the most prosperous living conditions among its neighbor countries. Its per capita GNP was U.S. \$ 6,515 in 1980, while some of its neighboring countries like Indonesia were struggling to survive with per capita GNP below U.S. \$ 400 in 1978. (The Statesmans's Year-Book 1981-82)

The state is not only unique in its economic success, but also in its high level of social and political stability. National policy usually aims at integrated social and economic development. The construction of public housing is a strong case demonstrating such a commitment. As of March of 1983, seventy-five percent of its people (2.47 million) were living in government housing. (HDB 1982/83) Not only did the construction stimulate the economy, it also became a popular program. Government policy is well supported. As Yeh stated in 1973, "Public housing is probably the most visible and

demonstrative project in the Republic. Its success had ensured support for many other government policies." (Hassan 1977, 1)

On the day Singapore gained its independence from the British in 1959, the new government faced various, severe problems such as a double-digit unemployment rate, an extreme housing shortage, and rapid population growth. In its first campaign for Parliament in 1959, the People's Action Party (PAP) promised to reduce the unemployment rate and provide adequate housing for those in need. When the PAP government came into office, creating jobs and providing housing became its top priorities. (Gamer 1972; Quah 1983)

Lacking natural resource, the new government decided that rapid industrialization was the quickest way to begin reducing unemployment. The government began to create a favorable environment for labor-intensive industries like textiles and electronics. In 1961, the Economic Development Board (EDB) was established. The swamp in the west of the island, Jurong, was designated for industrial use. A Jurong Town Corporation (JTC) was formed to develop the area. Together with the large-scale public housing projects, the unemployment problem was eased. Full employment was reached in the early 1970s. In more recent years, the economy has continued to grow at a rapid pace, but the rate of population growth dropped drastically. The state has faced a labor shortage. Eleven percent of its current labor force, or about 100,000 people, are drawn from Indonesia, Malaysia, and other countries. To

reduce the reliance on foreign labor, the direction of its economic development has begun switching to capital-intensive, high-tech industry in recent years. (L. Lim 1983, 753; T. C. Ling 1983)

THE HOUSING SITUATION BEFORE 1960

The housing shortage in Singapore has a long history. Beginning with the nature of its population, which was entirely composed of migrants, housing need had been largely neglected during its colonial period. Most of the migrants were transients from China, Malaysia (then Malayan), and India. They came to the island for economic reasons only. Once they made enough money, they went back to their home country. Most of them either could not afford to construct homes, or did not bother with it. Since the majority of the migrants were single males, having a space to sleep was all they needed.

When Sir Thomas Stamford Raffles arrived in 1819, he established a trading station at the mouth of Singapore River. The area surrounding his station became the major locus of settlement. Later it grew to be the Central Area, also known as Chinatown. The buildings in Chinatown were,

"... single-storyed with the front portion of each building serving as a shop while the back portion was utilized for storage and as a dormitory for the workers without families. At that time they were suitable ..."
(T. C. Wang 1975, 2)

With the expansion of trading activity in the second half of the nineteenth century, more migrants came. Instead of

constructing more houses,

"Partitions were put up in these shophouses to accommodate new arrivals. As the population continued to increase, more partitions were put in to subdivide the living space into small cubles and eventually the entire Central Area became one of the most crowded slums in the world." (T. C. Wan 1975, 2-3)

The original one-family buildings soon sheltered an average of five families or more. Basic amenities like running water and lighting were lacking, and the crowded condition made it difficult to maintain a sanitary environment. By 1947, 680,000 out of 938,000 people, or seventy-two percent of the total population, lived in the Central Area. In the heart of the Area density reached as high as 1,000 persons per acre. (L. H. Wang and T. H. Tan 1981; Neville 1969)

With some fluctuations during recession and war periods, the migration streams to Singapore did not slow until 1953. In that year, the Colonial Government posed an "Immigration Ordinance". Under the Ordinance, migration from China, Malaysia, and India was restricted. In fact, as early as 1930, an "Immigration Restriction Ordinance" put a quota on the largest migration stream, Chinese male migrants. To balance the uneven sex ratio of three to one, Chinese females migrants were not restricted. A total of 190,000 Chinese females were introduced to the island between 1934 and 1938. (Singapore 1975, 63)

With arrivals of these female migrants, more families were established, and more migrants were settled on the island.

Population growth had been high up to the early 1960s.

At the beginning of the century, population stood at 228,000. By 1950, it had grown over one million. Growth before the World War II was mainly from migration. After the War, natural increase became more important. The average annual growth rate was 4.4 percent between 1947 and 1957. Migration counted for twenty-two percent of the increase. Today, in-migrants contribute little to the nation's population growth. In fact, between 1970 and 1977, there were over 2,500 net out-migrants. The rate of natural increase before 1960 was above three percent annually. The success of the national family planning campaign beginning in the middle of the 1960s, has brought down the rate of natural increase to 1.8 percent in 1969, and further down to 1.2 percent in 1980. (Saw 1980; Census Report 1980) According to the 1980 census, the total population was 2.41 million. Of this total, 76.9 percent was Chinese. Malay and Indian groups composed 14.6 and 6.4 percent, respectively. (Census Report 1980)

THE SINGAPORE IMPROVEMENT TRUST, 1924-59

The first sixty years of rapid population growth during the century resulted in worsening slum areas and the appearance of squatter settlements. Slum areas were overcrowded. Squatter areas were filled with wood, zinc, attap, and other temporary and semi-temporary housing. Fire, diseases, and other hazards constantly threatened the areas. Even though a report was prepared in 1918 by the Housing Commission urging the government to take action to deal with the overcrowding and unsanitary

conditions in the Central Area, the problems were not immediately dealt with. (L. H. Wang and T. H. Tan 1981; Quah 1983)

In 1924, the Singapore Improvement Trust (SIT) was established, and began functioning in 1927. Improving housing conditions was one of its responsibilities. Other responsibilities included constructing new roads, condemning unsanitary buildings, providing homes for those affected by new road construction, and opening up back lanes in the slum property. (T. C. Wan 1975) Even though the housing shortage was severe, more of SIT's energy was directed to road improvements, opening up the back lanes, and demolishing unsanitary housing. Very little effort was invested in large-scale housing construction. By 1942, only 2,049 houses and 53 shops had been completed. (T. C. Wan 1975)

In 1948, the Housing Committee submitted another report observing that a total of 4,336 dwelling units would be needed by 1950. The SIT was granted more power for its housing projects. But it only built 2,359 units in the two-year period (1948-1950). Similarly, a goal of 19,365 units was set for the period 1955-1959. The SIT only finished 10,978 units. Before the new government came into office in 1959, the SIT completed a total of 20,907 housing units, accommodating 8.8 percent of the population (then 1.6 million); (Table I). (Quah 1983; T. C. Wan 1975; L. H. Wang and T. H. Tan 1981)

Though there was a more vigorous effort in the later period

Table I

THE HDB TARGET, COMPLETION, AND PERCENTAGE OF
POPULATION ACCOMMODATED, 1960-85

Year	Target ¹ (unit)	Completion (unit)	% of Population Accommodated
SIT 1927-59	—	20,907	8.8
HDB 1960-65	51,030 (50,000)	54,430	25
1966-70	62,120 (60,000)	64,114	34.6
1971-75	113,000 (100,000)	113,819	46.8
1976-80	130,000 (105,000)	134,000	67
1981-85	155,000 (100,000)		75 ² (1983)

1. Figures in parentheses are the original targets.

2. Since May 1982, the HDB has taken over the management of flats formerly managed by the Jurong Town Corporation and Housing and Urban Development Company.

Source: Compiled from HDB Reports

of the SIT, its work did not keep up with the 4.4 percent annual population growth. Before it was dissolved by the new government, the situation on the island was described as,

"... one quarter of a million people living in badly degenerated slums and another one-third of a million people in squatter areas who urgently needed rehousing."
(T. C. Wan 1975)

THE HOUSING AND DEVELOPMENT BOARD

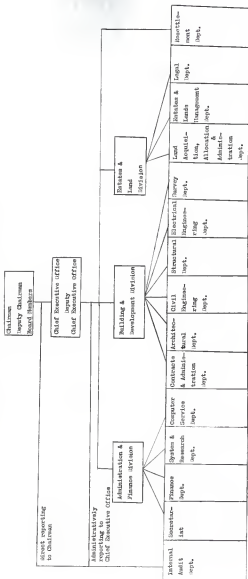
Organization and Functions:

Within a few weeks after the new government came into office in 1959, the SIT was replaced by a Statutory Board, the Housing and Development Board (HDB), which was placed under the Minister for Law and National Development. Originally, the Board consisted of seven departments: Secretary, Financial, Statistics and Research, Building, Estates, Urban Renewal, and Resettlement. It was reorganized in 1973/74 into three divisions and one department. Since then, it has expanded through time. As of March 1983, its organization was as shown in Figure 1. The Urban Renewal Department was singled out in 1974. It has become another Statutory Body under the same Ministry.

The functions and duties of the HDB are:

- "(1) To prepare and execute proposals, plans, and projects for:
 - (a) The erection, conversion, improvement, and extension of any building for sale, lease, rental, or other purposes;
 - (b) The clearance and redevelopment of slum and urban areas;
 - (c) The development or redevelopment of areas designated by the Minister;
 - (d) The development of rural or agricultural areas

Figure 1



Source: HDB Annual Report, 1982/83

- for the resettlement of persons displaced by operations of the Board or other resettlement projects approved by the Minister.
- (2) To manage all lands, houses, and buildings or other property vested in or belonging to the Board.
 - (3) To carry out all investigations and surveys necessary for the performance of the functions and duties of the Board.
 - (4) To provide loans, with approval of the Minister, to enable persons to purchase and develop land or part thereof upon a mortgage of such developed land or part thereof at such interest as may be prescribed.
 - (5) To do all such other matters and things as are necessary for the exercise and performance of all or any of the functions and duties of the Board."
- (T. C. Wan 1975, 6-7)

In addition, the minister may assign any other functions to the Board. It also undertakes activities like land reclamation and buildings for the government and other Statutory bodies.

Programs and Achievements:

Soon after the HDB was formed and the functions were assigned, a study of housing needs was conducted. It was estimated that a total of 150,000 dwelling units were needed for the decade of 1960 to 1970. The number included consideration of new families and people who would be affected by public development, urban renewal, and slum clearance. It was expected that private developers could construct about 40,000 units during the period. The HDB would, therefore, have to build 110,000 units. Two five-year plans were set up for the decade. The target for the first five-year plan, 1960-65, was 50,000 units; an additional 60,000 were projected for the second five-year plan, 1966-70. Both targets were exceeded (Table 1). By 1970, 34.6 percent of the total population, 2.07 million, was

housed in HDB flats.

Within a decade, the urgent housing need was met. But the HDB had made its projects so popular that the demand for the flats increased, and is still increasing (Table II). To meet the demand, the HDB has had to push up the targets for later years. The targets for the third, fourth, and fifth five-year plans have been higher than previous periods (Table I). The speed of construction also increased sharply. For the year of April 1982 to March 1983 alone, a total of 22,180 units of houses, shops, and industrial premises were completed. (HDB 1982/83) The number exceeded three decades of accomplishment by the SIT (Table I).

Since the main task of the HDB during the first decade was to rehouse low-income groups with urgent needs, emphasis was placed on the construction of one to three-room flats. Rent was fixed at ten to fifteen percent of family income, from S \$ 20, S \$ 40, to S \$ 60 for one-, two- and three-room flats, respectively, per month. For those who could not afford the rent, a government subsidy has been provided. The rent did not increase until 1979, a ten percent increase. (HDB 1979/80)

As the housing shortage was gradually relieved, the demand from middle-income groups provoked the government to begin to construct middle-income housing as well in 1974. Four- and five-room flats were added to the construction program. In fact, with the improvement of the living standard, demand

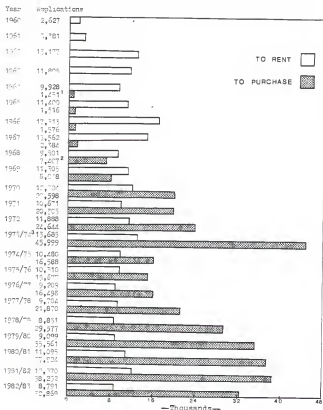
for larger flats has been much higher since the early 1970s (Table II). The interest in small flats has gone down so much that in the year of 1982/83, only 20 units each of one- and two-room flats were built. (HDB 1982/83) All HDB housing is in the form of high-rises, seven to eighteen storeys high. (T. C. Ling 1983)

☆ An important factor that makes public housing a popular project is the government's encouragement of home ownership. In 1964, a "Home Ownership for the People Scheme" was introduced. The objective of the Scheme was, and is, to enable lower-income people to own their homes. It is hoped that by owning their homes people would take better care of them, and it also makes management easier. In order to allow more people to own their homes, the selling price has been purposely kept low, an average of two to two and a half years of family income. The HDB provides loans to those who cannot pay out-right. The loans are repayable over five to twenty years at 6.25 percent interest per annum. In 1968, the government further announced it would allow people to apply their Central Provident Fund (CPF, the social security contribution) as a down payment and for monthly payments. The number of applicants waiting to buy flats increased dramatically following the announcement (Figure 2). Since the late 1970s, well above three-quarters of applicants have wanted to buy flats.

The sharply rising price of private housing also plays a role in pushing up the demand for public housing. Even though the price has increased over the years, the selling

Figure 2

NEW APPLICATIONS TO RENT AND TO PURCHASE HDB FLATS, 1960-1982/83



1. Home Ownership For The People Scheme introduced.
2. Allowed to apply Central Provident Fund for home payments.
3. HDB changed calendar year, from January-December to April-March.
The figures represent a 15 months period of application.
The same year, the HDB began to construct middle-income housing.

SOURCE: HDB Report, 1982/83

price of a HDB flat is, on average, sixty to seventy percent cheaper than private housing. The prices of HDB flats are usually below construction cost, and the land cost is not charged to home buyers. (T. C. Ling 1983, 172-3) In December 1976, the Prime Minister stressed the goal of home ownership as, "Each of you can own your home and have your family brought up in healthy and gracious surroundings." (T. C. Ling 1983, 172) By 1983, 65.6 percent of the HDB residents owned their homes, mostly being three- to five-room flats. (HDB 1982/83) After June 1981, however, the government decreed that the sale price of flats would raise an average of thirty-three percent, (seventy-two to 100 percent in the Central Area). And it is to continue to increase each year. "The cheap public housing era is over," as the Minister of Law and National Development declared. (T. C. Ling 1983, 173; Chan 1982) Since prices for private housing are still higher, and going up much faster, 100-600 percent increase from 1980 to 1981, the HDB housing will continue to be in demand. (L. Lim 1983) The evidence for such a judgement is that the number of applicants in 1981 and 1982 were still going up (Table II).

Another factor that has stimulated demand for HDB flats is the relaxation of the qualifications over periods of time. The monthly income ceiling in the early 1960s was S \$ 500 for one- and two-room flats, S \$ 800 for a three-room flat. To qualify for a flat, a family size of five was also required. After 1968, the family size requirement was reduced to two.

Table II

WAITING LIST FOR DIFFERENT TYPES OF FLATS, SELECTED YEARS

Year	Total	1-room	2-room	3-room	4-room	5-room	Executive & HUDC
1972	78,096	12,510	8,398	38,305	13,487	5,396	--
1973/74 ¹	103,767	9,173	8,729	50,400	23,624	9,851	--
1974/75	91,901	5,275	7,738	46,783	23,316	8,834	--
1979/80	68,681	2,134	3,519	24,727	25,485	10,734	2,088
1981/82	115,388	4,405	3,941	44,544	40,358	16,822	5,308
1982/83	126,730 ²	6,229 ³	7,007 ³	39,945	44,052	19,029	10,468

1 The HDB calendar year changed from January-December to April-March.

2 Figure includes 3,818 applications for HUDC housing.

3 The HDB no longer builds one- and two-room flats. Applicants will have to wait for the release of flats from existing lessees.

Source: Compiled from HDB Annual Reports

In 1970, the income ceiling was raised to S \$ 1,200, and S \$ 1,500 for buying a five-room flat. (S. H. K. Yeh 1979) By 1980, the ceiling was further raised to S \$ 2,500 for other types of flats, and S \$ 3,500 for a five-room and other middle-income housing. (HDB 1980/81)

Since the early 1970s, although the targets of HDB construction have been set high, the demand has been higher than expected. The HDB therefore, has had to adjust its targets. For the third five-year plan (1971-75), for example, the original target was set at 10,000 units. It was advanced to 113,000 later. For the fourth five-year plan (1976-80), the target was moved up from 125,000 to 130,000. There is also a dramatic adjustment for the current fifth five-year plan (1981-85), from 10,000 to 155,000 (Table I). Each year since the late 1970s, the government has been placing one-third, or near one-third, of its annual expenditure on public housing construction. (HDB 1982/83) As early as 1973, the HDB projects had already accounted for a ninety-three percent share of the total construction on the island. (Yeh 1979)

Beginning in 1978, the HDB began demolition/redevelopment of old estates. A total of eighty-eight blocks comprising 19,400 one-room emergency flats built in the early 1960s are to be demolished. (HDB 1979/80) Also, many other earlier built neighborhoods have been adjoined by newer ones, and have grown to a size of a new town, but without new town features like town center, sport complex, and other institutional

facilities. The redevelopment plan is to provide new town amenities in these "estate conglomerates". (HDB 1979/80) Employment opportunities were generally absent in these older estates too. Part of the redevelopment plan is to introduce commercial and light industrial activities into these older estates.

PLANNING GUIDE AND DEVELOPMENT

Master Plan of 1955, (SMP):

As early as 1947, a housing report from the Housing Committee had suggested the need for a development plan to deal with housing, traffic, and other land use problems. A Master Plan was formulated in 1955, extending to 1972. Official sanction was given to the Plan in 1958.

The plan strongly adopted some major features of the new town idea. The major proposals included a green belt around the Central Area to prevent further expansion, decongestion of the population in the Central Area by one sixth, and construction of three self-contained new towns. (Y. M. Yeung 1973; L. H. Wang and T. H. Tan 1981) But only Queenstown, in the west of the Central Area, was developed by the SIT. It contained public housing, schools, factories, and recreational facilities.

The plan was viewed, however, as too conservative and inflexible by the new government. It did not foresee the political, social, and economic changes which were to occur in the future. Instead of coping with economic expansion

and population growth, its strategies were to limit and control possible changes. As the urban environment continued to deteriorate and the economy remained stagnant, the new government established statutory bodies like the HDB and the EDB to deal with problems. Urban and economic development on the island since then has gradually shifted away from that outlined in the original Master Plan.

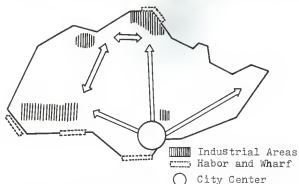
The Concept Plan Of Singapore (SCP):

Dissatisfaction with the earlier "Master Plan" and changing conditions led to the development of the Concept Plan of Singapore(SCP). The SCP, also known as the Comprehensive Plan or the Ring Plan, has become a guide for Singapore's development. In the early 1960s, when the government decided the old plan was inadequate for the state's development, with the assistance from United Nations' experts, a series of studies of its urban problems were conducted. A long-range development strategy, the Concept Plan, was introduced in October 1971. The Plan is designed to accommodate four million people at a reasonable density, six million at a maximum density. (T. C. Ling 1983) The projected conditions for 1992 were utilized as guiding points for the Plan. It is constantly under review and modified as situations change through time. This makes the Plan flexible and applicable beyond 1992 (Map 4).

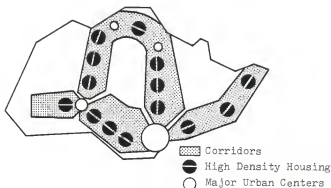
The main features of the Plan are described by Olszewski and Skeates as:

- A. Central Area: More intensive development in the Area.

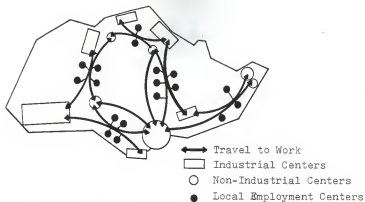
MAP SERIES OF THE IMPLEMENTATION OF THE CONCEPT PLAN



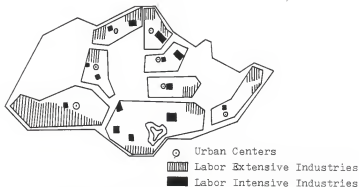
- A. Future urban expansion will be outward from the Central Area linking the major industrial centers.



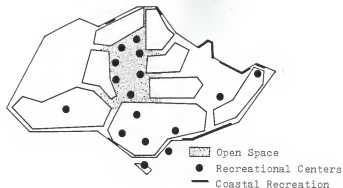
- B. Development is along the designed corridors. High density residential areas will be on one side of corridors, and the other side is for lower density residential uses.



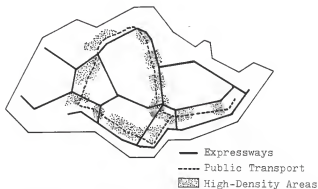
- C. While a certain portion of people will travel a longer distance to work at major employment centers, local employment centers are available at choice. Mostly will be manufacturing jobs of light and clean industries.



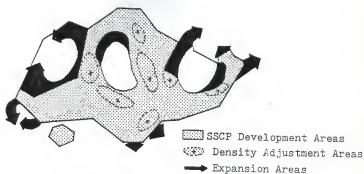
- D. Seven large districts composed of new towns are proposed. While the Central Area will remain as a dominant economic center, new towns will be self-contained for daily needs.



E. Open space and recreational areas are reserved in and between major urban centers and large housing estates.



F. Pan-island expressway and public transportation will be constructed.

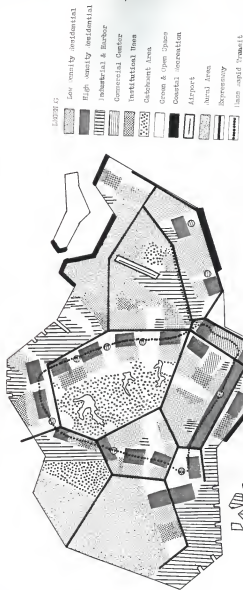


G. The development and expansion beyond 1992.

Source: Compiled from Olszewski and Skeates, 1971;
Wang and Tan, 1982

Map 5

Future Land-Use Pattern of the Concept Plan of Singapore



Source: Compiled from Olsewski and Skeates, 1971
and Wang and Tan, 1982

The population is to be increased to 300,000. (The Area was losing population rapidly when the Plan was prepared.) Employment is to be increased from 155,000 in the early 1970s, to 360,000 jobs by the year 1992.

- B. Southern Belt: A link of east and west with the existing Central Area. East to Changi, the emphasis is on lower density residential development. West through Queenstown to Jurong, the emphasis is on industrial and higher density residential development. The total population, not including the Central Area, is to be 2.25 million; about one million increase from the time the Plan was prepared. The development of this belt was to be emphasized before 1982.
- C. External Ring: A development around three sides of the water catchment areas at the center of the island. The development after 1982 will be more concentrated along the ring area. There will be five districts, each contains 120,000 to 250,000 people. Commercial, employment, schools, and other activities are to be provided in each district. Industrial land will be reserved. Both high and low residential densities will be developed along the ring area, and will be served by public transportation and expressway. The lower residential area will accommodate future population increase.
- D. Island-wide recreational and open space will be provided. This includes: 1. the construction of a central water-catchment area with reservoirs, golf courses, parks, zoo

gardens, and so on; 2. reservation of the coastline along Johore Strait in the north, and a reclaimed area along the east coast; 3. protection of some off-shore islands for future recreational needs. (Olszewski and Skeates 1971)

While the Concept Plan is mainly for public development, private development is controlled and guided by a short-term Statutory Plan. It will ensure that private development is in agreement with the Concept Plan. The Statutory Plan is prepared for about five years of development, and is reviewed every two to three years. (Wardlaw 1971, 47) Unlike the Master plan, the Concept Plan does not have official sanction. Legally, there is only the Master Plan. The implementation of the Concept Plan is in the name of the Master Plan.

Neighborhood Principle and New Town Concept:

The new town idea, evolved from Ebenezer Howard's Garden City, was adopted in the Master Plan, as well as the Concept Plan. Three new town were proposed in the Master Plan: Queenstown, Toa Payoh, and Jurong. Queenstown was the only one constructed during the SIT period. Under the development of the HDB, as of March of 1983, fourteen new towns have been constructed, or are being constructed. (HDB 1982/83) Each new town is comprised of several neighborhoods.

The original new town idea has been modified to fit situations in Singapore. With limited land area and relatively large population size, the density in new towns suggested by

Howard is unrealistic for Singapore. The optimal neighborhood size designed by the HDB is 4,000 to 6,000 dwelling units, with an average of five to six persons per unit (20,000 to 36,000 people per neighborhood), on a land area of 100 acres. These figures contrast with Howard's 5,000 people per neighborhood on 1,000 acres. The density in Singapore is forty to seventy-two times the level proposed in Howard's Garden City. To accommodate such high density, all the HDB flats are in the form of high-rises, from seven to eighteen stories.

In Singapore, a neighborhood is planned to be self-contained for simple daily needs. Each neighborhood is provided with a neighborhood center which includes a market, shops, schools, sports and recreational facilities. Ideally, the center should be within walking distance (360 meters radius) for all residents. But two centers should be far apart enough so that the residents in each neighborhood would have no choice between centers. The desirable interval is about 900 to 1,200 meters. For people living beyond 230 meters, a sub-neighborhood center would be constructed for minor convenience shopping and quick-eating places. (Liu 1975)

Lands are reserved for future expansion in each neighborhood. To break socio-economic segregation, sites for middle-income and private (or upper-income) housing are provided. Accordingly, since 1978, the precinct concept has been incorporated into the HDB town planning. Variation in individual characteristics of different precincts and new towns is emphasized

through differences in design, choice of materials, and local landscapes. (HDB 1979/80)

For each three or more adjoining neighborhoods, a town center is established at the center of the area. The center serves as commercial, communal, and transportation focus; shops, a fresh food market, a hawker center, an emporium, cinemas, a post office, a library and social function hall are included as well. Not only are the residents in public housing served by the center, but also residents in the surrounding areas.

The minimum size-range for a new town is set at 150,000 to 200,000 people (Howard recommended 30,000). Each new town is connected by the overall transportation network. In more recently planned new towns, about thirty to forty percent of the land area is for residential uses. The proportion for industrial use varies from ten to twenty-five percent. The rest is for open space, playgrounds, sports complexes, schools, institutes, and so on. (Liu 1975)

New towns are to be self-contained in services. In terms of employment, especially in older estates, a large portion of the residents still need to travel to larger employment centers like the Central Area to work. However, as the Central Area is becoming more intensively developed with office buildings, as cost for land or office floors is getting higher, more firms will be looking for available spaces in new towns. Gradually, it is hoped that new towns can be self-contained in employment,

Table III

NEW TOWN DEVELOPMENT AS OF 31 MARCH, 1983

Name	Estimated Population	Total Land Area (hectares)	Residential Area Allocated (hectares)	Projected Total Dwelling Units	Dwelling Units Completed	Dwelling Units Under Construction	Distance & Direction From Central Areas (km)
Ang Mo Kio	237,500	705	254	49,500	49,480	—	10-14 N
Bedok	219,400	770	270	48,800	45,710	660	10-14 E
Bukit Batok	1,700	750	165	24,800	360	12,010	14-17 W
Clementi	106,400	434	158	24,500	22,160	1,590	11-13 W
Hougang	24,600	522	204	25,500	5,130	8,460	9-13 NE
Jurong East	40,400	236	82	12,800	8,410	3,650	14-19 W
Jurong West	9,200	176	92	14,500	1,920	10,720	19-21 W
Queetown	134,400	285	140	28,000	28,000	—	5-8 W
Serangoon	—	600	83	18,000	—	6,060	8-11 N
Tampine	11,900	957	322	45,700	2,470	16,540	14-18 E
Telok Blangah	63,300	365	85	13,700	13,190	—	5-7 W
Tua Payoh	175,700	339	141	36,600	36,600	—	6-8 N
Floodlands	34,500	1,000	330	55,000	7,190	6,470	22-25 N
<u>Yishun</u>	<u>8,100</u>	<u>907</u>	<u>282</u>	<u>40,000</u>	<u>1,690</u>	<u>10,680</u>	<u>19-21 N</u>

Source: HDB Report, 1982/83

and thus reduce the traffic congestion in the Central Area.

As of March 1983, fourteen new towns have been created (Table III). The development by that time had been heavily concentrated in the eastern part of the island, which originally was more densely populated than the west. According to the Concept Plan, future development will be more concentrated in the north and the west. More units have been under construction in these areas since early 1983 (Table III).

LAND ACQUISITION AND RECLAMATION

In the early days, rehousing squatters was the top priority of the HDB. To minimize dislocating of squatters, buildings were mainly constructed within ten kilometers from the Central Area. By the early 1970s, available space on the urban fringe was virtually all consumed. Further development would have to take place in the inner Central Area, the slum areas, or further away from the Central Area. The HDB reported more than 121 hectares of slums and areas occupied by squatters in the Central Area had been cleared and developed by the early 1970s. (HDB 1973/74) However, as the HDB projects progressed rapidly, a search for land for development shifted to outer sections of the island.

Since land availability is critical to the HDB's vast development program, the Land Acquisition Act of 1965 was passed

to empower the HDB to purchase land for "any residential, commercial, or industrial purposes." (Y. M. Yeung 1973) Since then, the HDB has systematically acquired lands fifteen to twenty years in advance of planned future development. In the early 1970s, including the British military bases transferred to the Singapore government in 1971, the state owned fifty percent of the land. (Thomson and Wardlaw 1971, 51) This increased to three-quarters by 1983. (L. Lim 1983) According to an HDB report, as of March of 1983, 4,000 hectares of land were available for future development. (HDB 1982/83)

According to the Land Acquisition Act, when a piece of land is needed for any public development, the government may compulsorily purchase it at market price. People who have bought HDB property do not pay for the land cost. Private enterprise, when participating in the development of the island, are on a leasehold basis for the lands they occupy. (Thomson and Wardlaw 1971) Thus, the Act ensures that the government can develop the island as it wishes.

In addition to land acquisition, large reclamation projects also are carried out by the HDB. So far, most reclaimed and to-be-reclaimed areas are along the southeast coast. The task began in 1966. By 1983, 1,450 hectares were reclaimed. (HDB 1982/83) An expressway, East Coast Parkway, has been built on reclaimed land. The HDB's middle-income estates, Marine Parade, is also being built on the same piece of the reclaimed land. A large portion of the reclaimed area is planned for

low-density residential, commercial, industrial, and recreational uses.

Smaller reclamation projects are being carried out in other part of the island as well. Forty percent of the four hundred hectares of land area in the Kallang Basin are reclaimed. Twenty thousand dwelling units have been built on 100 hectares of the land in the Basin. The rest of the Basin is largely reserved for industrial use. In the new town of Clementi, west of the Central Area, 42 hectares have been reclaimed for the town's development. (HDB 1975/76) Another 300 hectares is planned for reclamation on the northeast coast. (HDB 1982/83).

URBAN RENEWAL

In 1962, after his study of urban problems in Singapore, the United Nations planning consultant, E. Lorange, recommended that an urban renewal program should be initiated. Later a team of experts supported by the United Nations arrived to do a further study on the subject. In their report, they described areas that urgently needed renewal:

"Most of the buildings in the urban renewal areas date from the late nineteenth century. They have been and are still used with an intensity never dreamt of at the time of their construction. The tax structure of Singapore and the protection of sitting tenants have made rebuilding unprofitable; rent control has acted as a disincentive for maintenance and repairs. The street network has remained unchanged since the early nineteenth century and is unsuited for present needs. There is no rapid transit system, and peak hour traffic has become a nightmare, ..." (Abrams, Kobe and Koenigsberger 1963, 17)

Because of the smallness of the area, they recommended, " ...

urban renewal in the center can succeed only if it forms part of a comprehensive development plan for the whole island." (Abrams, Kobe and Koenigsberger 1963, 11) The report later became the basis for formulation of the Concept Plan.

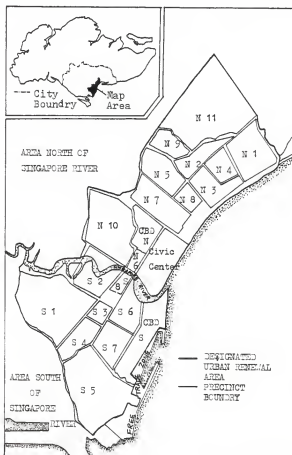
Their report was reviewed by the government. A comprehensive urban renewal program was initiated in 1964. The Urban Renewal Department was placed within the HDB organization in 1966. In order to speed up the implementation of the program, the department was singled out to become an independent statutory body, the Urban Redevelopment Authority (URA), in April 1974.

The designated renewal area covers 1,700 acres, or 1.2 percent of the total land area. To systematically develop the area, the URA divided it into 19 precincts, two CBDs, and one civic center. Both precincts on the north and south ends of the area are to be developed first, then effort would shift toward the center. (Map 6) A mixed land-use approach is applied. In each precinct, land is zoned for a shopping center, offices, apartments, recreation, and other uses. About 207 hectares of land are to be reclaimed on the water-front of the city. At least two-thirds of the reclaimed land will be for open space, landscaping, and recreational uses. (A. Choe 1975)

The immediate problem faced in implementing an urban renewal program is slum clearance. It was estimated that for each slum building demolished, seven households would need to be rehoused. For this reason, urban renewal was not initiated until the late 1960s, when the backbone of housing shortage

Map 6

Urban Renewal Area in the Central Area in Singapore



was broken by the HDB's projects. All families affected by slum clearance, as in other public projects, are offered housing in HDB flats. Compensation for moving and a rent rebate for three years are granted. The families also can choose to move to resettlement areas, or find their own accommodation. Affected shopkeepers have priority in renting the HDB shops. (A. Choe 1975).

In addition to rehousing of the slum poor, the HDB and the URA together formed a Housing and Urban Development Company (HUDC) to provide middle-income housing for the higher-income people in slums and other areas. The income ceiling for this type was S \$ 4,000 in 1982. In May 1982, the management of the HUDC housing was handed over to the HDB. About 2,700 units had been built. Housing constructed by the Jurong Town Corporation for industrial workers, 24,000 units, was handed to the HDB too. The HDB population, therefore, increased from sixty-nine percent of the total population in 1982 to seventy-five percent in 1983. Since then, the HDB has become the sole national housing authority. (HDB 1982/83)

Other than rehousing families and shopkeepers, backyard industry in slums is provided sites to continue operation after relocation. For larger ones, sites are found in designated industrial estates for operators to build their own factories. Smaller firms are offered a place in the HDB multi-storyed, flat factories. (A. Choe 1975) Over 189,000 cases of families, shops, and industrial firms were resettled by early 1983. Of them, sixty percent chose HDB accommodations. (HDB 1982/83)

Another problem encountered in the implementation of the urban renewal program was the fragmentation of land ownership. More than half of the land in the deteriorated area was privately owned. (Choe 1975) In some areas the number involved in ownership reached as high as 100 persons per hectare. (L. H. Wang and T. H. Tan 1981) To address this problem, the URA was granted power to purchase and assemble fragmented properties. For some larger pieces of land, owners are given three years to develop parcels according to government guidelines. If owners fail to do so, the URA may compulsorily acquire them. (L. H. Wang and T. H. Tan 1981)

The Singapore government takes urban renewal as a social and economic development program. To generate maximum economic turnover, private participation is encouraged. In designated areas, after the sites are cleared, they are tendered to private developers for planned purposes. For these sites, planning, infrastructure, and professional expertise are provided by the government. In response to the program, fifty sites covering 26.3 hectares were sold to private developers for hotels, offices, and car parks by the end of the 1960s. Together they generated an investment of S \$ 500 million, and created 50,000 jobs. (Yeh 1979; HDB 1960-69) The URA began as a government subsidized agency, gradually became self-contained, and is now one of the most profitable government agencies. (L. H. Wang and T. H. Tan 1981; L. Lim 1983)

In general, the urban renewal program has brought about

positive consequences such as better utilization of the valuable land, improvement of public sanitation, reduced social tension, removal of slums, increased investment, and increased employment opportunities. However, some unexpected results have begun to show. First of all, the success of public housing has caused rapid depopulation in the Central Area. The total dropped from 360,000 in 1957 to 200,000 in 1977. (T. C. Ling 1983) Ironically, the government now has policies to attract people back to the area. In its fourth five-year plan (1976-80), the HDB had built 10,000 flats in the area. That compared with 12,500 during the ten-year period from 1965 to 1975. (T. C. Ling 1983) Another policy is to encourage the building of commercial and residential floors in the same building at smaller sites. At larger sites, commercial and residential buildings are separated. Traffic-free pedestrian walkways and open spaces are provided. (L. H. Wang and T. H. Tan 1981) As a result, population in the Area went up to 228,400 in 1980. (T. C. Ling 1983)

Because of depopulation and an increase in jobs in the Central Area, more people have to travel to work, which has intensified the traffic congestion. Enlarged road capacity also induced more incoming motor trips. An increase in car ownership further worsened the problem. In 1975, an Area Licensing Scheme (ALS) was introduced to relieve the traffic problem. According to the Scheme, from 7:30 to 10:15 AM, only specially licensed cars can enter the restricted zone. Exception is given to cars with at least four passengers which

can enter the zone freely. The restriction does not apply in evening peak hours because of a policy to revitalize the area's night life. (L. H. Wang and T. H. Tan 1981; Holland and Watson 1982)

Besides ALS, other means are also taken to deal with the area's traffic congestion. The bus system has been reorganized for better service. Planning for mass rapid transit (MRT) began in late 1982. An expressway network system is also under construction which will offer quick accessibility to the main activity centers. (HDB 1982/83)

SUMMARY

The housing shortage in Singapore can be traced back as early as the late nineteenth century. The economic expansion attracted streams of migration from China, Malaysia, and India. Instead of building new shelters to accommodate newcomers, old ones were divided, and subdivided. The overcrowding conditions made the major city area the worst slum in the world.

In the 1920s, the SIT was established to deal with the housing situation and other urban problems. But because of the limited power given to the SIT, construction of public housing could not meet the current housing demand, not to mention keeping up with the rapid population growth. In 1959, when the PAP government came into power, the SIT was replaced by the HDB.

The new government granted the required power and funds to the HDB to tackle a housing shortage. Intensive and ambitious

housing programs were formed. The housing shortage was relieved within a decade. The HDB's program became so successful that even middle-income group began to demand it. The HDB started building middle-income housing in 1974. By early 1983, seventy-five percent of the total population was living in the HDB housing.

Also because of the success and the popularity of the HDB projects, the government has an overall plan to develop the state through the projects. Currently, the SCP is the guide for the country's urban and housing development. The neighborhood principle and new town idea are incorporated in the SCP. The SCP extends to 1992 and beyond.

Urban renewal was the initial theme of the SCP. The proposed renewal area, mainly the Central Area, was only a small portion of the island, but the population was disproportionately high. The construction of large-scale public housing facilitated movement of people to other parts of the island. Thus, the URA could redevelop vacant sites. In fact, the population loss was so great that by the late 1970s, the government had to have a policy to encourage people to move back to the Central Area. The government undertook the urban renewal program, but private participation in redeveloping the renewal area was encouraged. The active participation of private developers has generated a large investment and created many jobs. The program has, therefore, become an integrated part of the nation's social and economic development program.

Chapter 4

HDB HOUSING DEVELOPMENT, IMPACTS, AND POPULATION REDISTRIBUTION

The main theme of this chapter is a comparisons of population growth in relation to the HDB housing development from 1970 to 1980. Basically, the unit of the comparison is the census division. The data have been drawn from census reports of 1970 and 1980, and HDB annual reports.

PROBLEMS ENCOUNTERED IN THE STUDY

Before getting into the subject, some problems encountered in this study and the ways they are dealt with should be discussed. Changes in division boundaries and creation of new divisions, make comparison of individual areas difficult, and often impossible or inaccurate. In such case, it often has been necessary to aggregate 1980 units to agree with 1970 units. Thus, multi-division units (including several to many 1980 divisions) are treated as one unit and compared with the same or about the same area of 1970.

It is clear that most of the census division boundaries had been changed to some degree from 1970 to 1980. But nowhere in materials or data gathered for this study were changes clearly stated. A researcher must overlay census maps of 1970 and 1980 to determine changes. In some cases, the shapes of some divisions may look the same, but when overlaid, they

do not exactly match. Paya Lebar and Upper Serangoon are examples of this kind. When changes were slight, a division boundary is treated as unchanged. Of course, some of the very slight changes may be attributed to cartographic practices, rather than to actual boundary change.

Another difficulty is presented in the units used in HDB reports. HDB units differ from those used in census reports. In its reports, the HDB does not provide a definite boundary for each estate or new town it builds. Apparently it does not always follow a census boundary. For instance, the division of Queenstown is a rather small division in both censuses, but on the HDB map the New Town of Queenstown covers a rather large area (Map 7, 8, and 10). The population in the New Town of Queenstown is over 4.6 times of that of Queenstown Division (134,400 vs. 28,981). A similar situation obtains for Bedok and Ang Mo Kio new towns. To deal with this problem, the HDB map is overlaid with the census map to get a rough estimation of how the two correspond. When a population figure is applied, unless stated otherwise, it will be a number from a census report.

Locations of the HDB estates also cause confusion. The HDB does not indicate all the names of estates or new towns on its maps. Luckily, many of the names it uses are the same or similar to the names of census divisions. It is assumed that the location of a particular estate is in the division with the same name. Also, the census report of the number of people

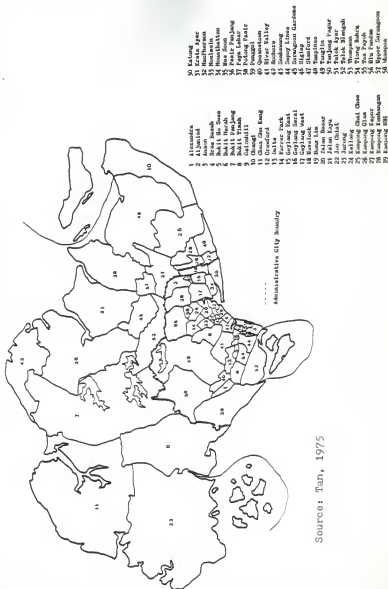
living in HDB housing in each division is helpful in determining locations of estates.

Another point of confusion is related to whether the administrative city boundary has been changed since the 1960s. With the construction of HDB housing, the urban areas and the pattern of population concentration are quite different now from the situation obtaining when the current government took office. Most of the references seem to give different definitions of urban, suburban, and city area. (Neville 1979, 142; Ooi 1969, 1; Yeung 1973, 49) Both census reports of 1970 and 1980 also gave different boundaries for urban, suburban, and rural areas. (K. C. Kim 1981; Department of Statistics 1973) Of all the maps collected for this study, only the one provided by Ooi Jin-Bee, a professor of geography at University of Singapore, in Modern Singapore clearly indicated the city boundary on the map was the administrative city boundary. Therefore, the city boundary on his map is applied to define the administrative city area (Map 7 and 8).

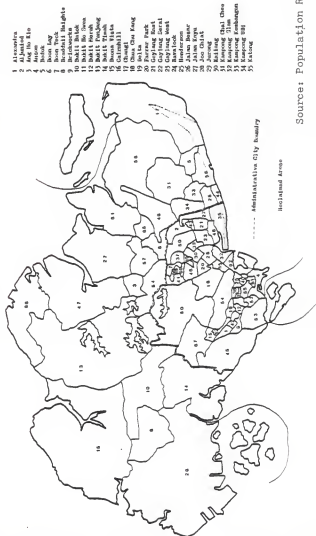
A similar problem occurs in the Central Area. The 1980 census report did give the divisions that were classified as the Central Area. But all the given divisions had new boundaries. The entire area also appeared to be smaller than that shown on the maps provided by some authors of articles published in various journals and books. (Choe 1975, 114; Teo 1979, 154; Yeung and Yeh 1971, 76) All these maps had a somewhat identical boundary for the Central Area, which is quite different from the boundary

Map 7

Census Divisions of Singapore, 1970



Census Divisions of Singapore, 1980



- 1 Alexandra
- 2 Aljunied
- 3 Ang Mo Kio
- 4 Anson
- 5 Bishok
- 6 Bona Bay
- 7 Bona Bay
- 8 Braddell Heights
- 9 Brickswork
- 10 Bukit Merah
- 11 Bukit Merah
- 12 Bukit Merah
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- 68 Bukit Merah
- 69 Bukit Merah

Source: Population Report, 1980

given in the 1980 census report. In this study, the census boundary of the Central Area is ignored. Furthermore, instead of Central Area, some scholars/researchers use the term "Central City" to refer the same area. To avoid the possible confusion with the administrative city area, "Central Area" is applied throughout the text. Finally, it should also be pointed out that since this study heavily depends on government data and reports, the conclusion is subject to further verification.

CHANGES OF CENSUS DIVISION BOUNDARIES, 1970-80

For the 1970 census the island was divided into 58 divisions. The city area had 39 divisions, with 19 divisions for the rest of the country. For the 1980 census the number was increased to 69 divisions; 45 in the city, 24 outside of the city (Maps 7 and 8). For 1980 census not only had new divisions been added, but the old boundaries were redrawn. . Also, some divisions were removed. The boundaries of the 1980 census, "... coincided respectively with the corresponding electoral divisions ... for the 1976 Parliamentary elections." (Kim 1981, 1)

Most changes in boundaries and creation of new divisions occurred near the Central Area. Some old divisions were merged with others or redrawn to be new divisions. The 1970 divisions of Crawford, Sepoy Lines, Bras Basah, Stamford, Kampong Kapur, Hong Lim were redrawn and renamed in 1980. Buona Vista, Brickworks, Leng Kee, Radin Mas, Henderson, Kim Seng, and Kolam Ayer were newly created divisions in the 1980 census. No

single division in or near the Central Area retained its old boundary. Therefore, the measure of the population growth in this section, including the Central Area, is based on a region composed of units in and adjacent to the Central Area. For instance, the division of Telok Ayer and Anson, westward all the way to Alexandra and Queenstown, a total of 18 divisions, are treated as one unit in 1980 to compare with a corresponding area of 17 divisions in 1970. In the middle section of the city, 12 divisions, from Potong Pasir to Cairnhill in 1980, are compared with the 13 divisions of 1970 in the same part of the city. The New Town of Toa Payoh, built in the middle of the 1960s, was a single division in 1970. For the 1980 census it became five divisions: Kuo Chuan, Khe Bong, Boon Teck, Kim Keat, and Toa Payoh. The divisions in the eastern section of the city, generally speaking, maintained original boundaries (Map 7 and 8).

Outside of the city, changes in division boundaries were largely related to HDB development. The creation of the New Town of Bedok in the east changed the boundaries of Kampong Chai Chee and Siglap. Similarly, Ang Mo Kio New Town in the north of the city partly reshaped boundaries of Nee Soon and Thomson. The new division of Braddell Heights was mostly taken from Serangoon Gardens; and a small part from Thomson. Jurong, the industrial estate in the west, was split into Jurong and Boon Lay. Bukit Timah, between Jurong and the city, became Bukit Timah and Bukit Batok. The southeastern part of Bukit

Batok was taken from Bukit Panjang. In the northern part of the island where HDB housing was not emphasized until the 1980s, the division boundaries remained much the same, such as Chua Chu Kang and Sembanwang.

IMPACTS OF THE PUBLIC HOUSING DEVELOPMENT

After more than two decades of development, the HDB housing projects have reshaped the spatial pattern of urban centers and population distribution in Singapore. Before independence (1959) and also during the 1960s, the major urbanized area and the area with highly concentrated population, were within the administrative city area. The city area covered 37.5 square miles, or a sixteen percent of the total land area. Sixty-three percent of the total population lived in the city in 1957, and sixty-two percent in 1970. (Neville 1969, 56) Within the administrative city area, the so called Central Area, the major urban center, was the most crowded. Its 1,700 acres area (1.2 percent of the total) accommodated 360,000 people (twenty-five percent of the total) in 1957. (Neville 1969; T. C. Ling 1983) This area was later designated for urban renewal.

As a consequence of the HDB housing projects, not only has the city population been decentralized but also the Central Area. By 1980, the city population declined to fifty-two percent of the total (2.41 million). In the Central Area, the population declined to a low of 200,000 in 1977, which

was 8.7 percent of the total (2.31 million). A more recent policy of bringing back lost population resulted in an increase to 228,400 in 1980 (9.5 percent of the total). (T. C. Ling 1983) Meanwhile, several urban centers have been created, also through the HDB housing development, in different parts of the island. Such a massive public housing construction not only changed the overall urban population distribution, but also affected the pattern of economic growth.

Population Growth and HDB Housing Development, 1957-70:

Since the inception of HDB housing programs in 1960, a series of initiatives have guided residents in their choice of where to live. A trend is evident from the 1970 census. Wherever the large HDB estates located, there would be a substantial population increase. The census divisions of Queenstown and MacPherson, for example, had population increase of 1.806 and 1.144 percent, respectively, from 1957 to 1970. The average national population increase for the same period was 43.5 percent. In Queenstown, 99.2 percent of the population was living in HDB housing, while a similar level of ninety-seven percent was recorded for MacPherson. The ten divisions with greater increases during the intercensal period all had a large portion of their people living in HDB housing (Table IV).

HDB housing construction during the 1960s was mainly within ten kilometers of the Central Area, an area that did not extend

Table IV

PERCENT OF POPULATION INCREASE, 1957-70 AND 1970-80; PERCENT OF POPULATION LIVING IN HDB HOUSING, 1970 AND 1980, BY CENSUS DIVISION

Division	Population Growth, (%) 1970-80	% in HDB Housing, 1980 (1)	Population Growth, (%) 1957-70	% in HDB Housing, 1970	Growth of HDB Population, (%) 1970-80
Alexandra	-36.6	99.6	429	94.3	+5.3
Aljunied	-5 (2)	75	282	65.8	+9.2
Ang Mo Kio	*	93	—	— (4)	—
Anson	+25	61.7	-24	..	+61.7
Bedok	*	99.6	—	—	—
Boon Lay	*	83.6	—	—	—
Boon Teck	*	100	—	—	—
Braddell Heights	*(3)	..	—	—	—
Bras Basah	**	—	-30	..	—
Brickworks	*	96.4	—	—	—
Bukit Batok	*	18	—	—	—
Bukit Ho Swee	-53.9	99.2	137	97.4	+1.8
Bukit Merah	-49.6	99.7	194	86.2	+13.5
Bukit Panjang	-13.4	35.3	59	..	+35.3
Bukit Timah	+104	80.8	87	3.1	+77.7
Buona Vista	*	92.4	—	—	—
Cairnhill	-8.5	13.5	-9	3.5	+8
Changi	-23.9	5	56	..	+5
Chua Chu Kang	-3	17.3	108	3.2	+14.1
Crawford	**	—	-23	54.4	—
Delta	-42	95.5	24	88.4	+7.1
Farrer Park	-4.1	48.3	-12	37.2	+11.1
Geylang East	-45	52	5	..	+52
Geylang Serai	-44	66.9	38	..	+66.9
Geylang West	+47	77.9	-26	5	72.9
Havelock	+3.6	78.2	-37	47.4	+30.8
Henderson	*	99.9	—	—	—
Hong Lim	**	—	-43	10.6	—
Jalan Besar	+21.8	46.6	-30	10.4	+36.2
Jalan Kayu	+15	37.9	58	..	+37.9
Joo Chiat	-12	..	-3	..	—
Jurong	-3.6	82.3	116	30.6	+51.7
Kallang	+0.3	81.2	18	73.3	+7.9
Kampung Chai Chee	+67.7	87.5	81	9.4	+78.1
Kampung Glam	+101	58.9	-39	..	+58.9
Kampung Kapor	**	—	-22	.4	—
Kampung Kembangan	-53.7	..	83	..	—
Kampung UBI	-28	59.1	65	8.1	+51
Katong	-43	43.8	146	54	-10.2
Khe Bong	*	99.9	—	—	—
Kim Keat	*	99.7	—	—	—
Kim Seng	*	99.7	—	—	—
Kolan Ayer	*	99	—	—	—
Kreta Ayer	+40	63.9	-39	16.3	+47.6
Kuo Chuan	*	99.1	—	—	—

Table IV (continued)

Division	Population Growth, (%) 1970-80	% in HDB Housing, 1980	Population Growth, (%) 1957-70	% in HDB Housing, 1970	Growth of HDB Population, (%), 1970-80
Leng Kee	*	98.5	—	—	—
MacPherson	-7	99.8	1,144	97	+2.8
Marine Parade	*	100	—	—	—
Moulmein	-21	47.6	-1	16.9	+30.7
Mountbatten	-31	97.8	597	98.2	-4
Nee Soon	-8	22.4	63	..	+22.4
Pasir Panjang	+8	56.4	12	18.4	+38
Paya Lebar	-50	25.7	42	..	+25.7
Potong Pasir	-31	48.7	9	..	+48.7
Punggol	+17	38.5	43	..	+38.5
Queestown	-31	99.6	1,806	99.2	+4
Radin Mas	*	95.4	—	—	—
River Valley	+15	31.8	0	..	+31.8
Rochore	+3	43.7	-12	33	+10.7
Sembawang	+16.5	35	23	..	+35
Sepoy Lines	**	—	37	63.8	—
Serangoon					
Gardens	+216	80.1	27	..	+80.1
Siglap	+6	33.5	34	2.4	+31.1
Stamford	**	—	-41	..	—
Tampines	-4	30.2	62	..	+30.2
Tanglin	-8	5.9	25	..	+5.9
Tanjong Pagar	+5	55	-14	19.3	+35.7
Telok Ayer	-14	23.9	-31	.1	+23.8
Telok Blangah	-4	97.4	13	..	97.4
Thomson	-33	24.4	72	..	+24.4
Tiong Bahru	-47	92.7	31	81.2	+11.5
Toa Payoh	-78	100	232	87.7	12.3
Ulu Pandan	+6	57.7	42	..	+57.7
Upper Serangoon	-47	..	20	..	—
Whampoa	+12	95.8	316	84.5	+11.3

- (1) Since the HDB has taken over the management of all other public housing built by the JCT and HUDC, the percentages are calculated with population living in all types of public housing.
- (2) * The new divisions of 1980.
- (3) ** The old divisions of 1970 which had been redrawn and renamed.
- (4) .. No people was living in public housing in the divisions.

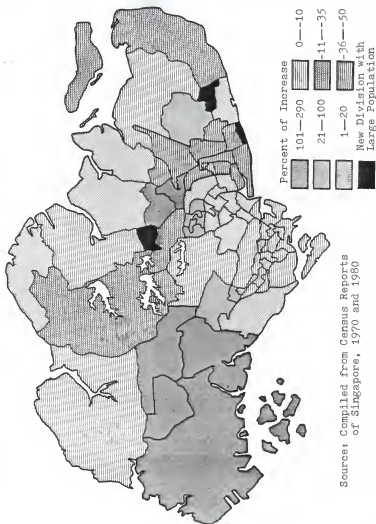
Source: Compiled from Census Reports of 1970 and 1980

beyond the administrative city boundary. Therefore, while the population in the Central Area declined significantly, the city population remained as large as sixty-two percent of the total population in 1970. Most of the divisions in the Central Area had a population decrease, from a forty-three percent decrease in Hong Lim to twelve percent in Rochore. The divisions around the Central Area, nevertheless, had a large gain. Many divisions more than doubled or tripled their population. Mountbatten gained nearly 600 percent, Alexandra 429 percent, and Toa Payoh 232 percent. Each of these divisions had nearly ninety percent or more of their population residing in HDB flats (Table IV).

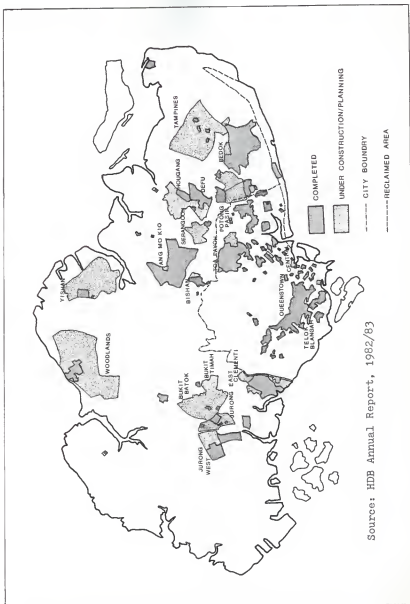
Almost every division outside of the city, even those with less extensive HDB housing construction, gained population between 1957 and 1970 as well. Jurong, for example, which has been designated for industrial development, had a 116 percent increase in its population. Some housing was provided for workers by the Jurong Town Corporation, also a government agency. Some other divisions gained a much higher percentage of population than the national average. Much of the change could be attributed to suburbanization. Bukit Timah and Thomson for instance, gained eighty-seven and seventy-two percent, respectively, during the same period, but Bukit Timah had only three percent of its people living in HDB housing. The gain in these divisions came mainly through private housing development. The population increase in these divisions, however,

Map 9

Population Growth in Singapore by Census Division, 1970-80

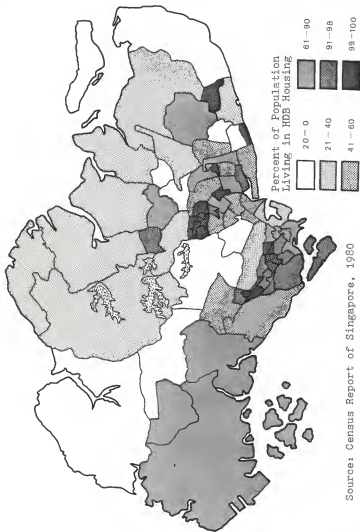


Map 10
Location of HDB Development



Source: HDB Annual Report, 1982/83

Population Living in HDB Housing in Singapore by Census Division, 1980



is not as dramatic as those divisions with a high percentage of HDB population.

Since the 1970s, construction of public housing has spread to different parts of the island. The HDB has put more effort into the development outside of the city. A large number of people moved out to new estates or newly created urban centers (new towns). As a result, the city population dropped to fifty-two percent of the total in 1980. The divisions with greater increase are those outside of the city, either those with large HDB estates, or the planned new towns.

Population Growth and HDB Housing Development, 1970-80:

Over the decade, 1970 to 1980, Singapore recorded a population increase of sixteen percent. But the increase was not evenly distributed. In the city area, a decline of 2.3 percent actually occurred. All the population gain during the period was, therefore, in areas outside of the city; a 46.5 percent increase. In general, especially outside of the city, the pattern of population growth followed HDB's housing development closely (Maps 9, 10, and 11).

Despite the overall loss in the city, two sections had a higher percentage increase than the national average, Ulu Pandan and Toa Payoh. For the 1980 census, the original division of Ulu Pandan was divided into Ulu Pandan and Buona Vista, with a large portion in the north being transferred to Tanglin. Even with the loss of some area to Tanglin (the density of the lost segment was low), Ulu Pandan and Buona Vista together

had an eighty-three percent increase over the original Ulu Pandan Division. Without the population in Buona Vista, the growth was only six percent for Ulu Pandan. Therefore, most of the growth occurred in Buona Vista. Over ninety-two percent of the population in Buona Vista was living in HDB housing in 1980, and 57.7 percent in Ulu Pandan (Table IV). In 1970, no housing was built in Ulu Pandan Division. The HDB construction certainly played a most important role in the population growth in this region (Map 9 and 11).

Toa Payoh, which was divided into five divisions for the 1980 census, had a forty-one percent increase. It was the site for the second new town constructed in Singapore. There was already 87.7 percent of the population living in HDB housing in 1970. The total increased to 99.7 percent in 1980 when all five divisions are aggregated. The HDB development, again, caused the rapid population increase in the New Town of Toa Payoh.

Two other areas also had population gains, but far below the national average: the middle section of the city and Pasir Panjang; seven and eight percent, respectively. Both areas had a substantial increase in the HDB population, but the overall population increase was only one half or less than one half of the national average. For the eleven divisions in the middle section of the city (12 divisions in the 1970 census), the slow rate of growth may have been due to urban renewal programs and clearance of squatters. People in the

slum and squatter areas were rehoused to other divisions such as Toa Payoh or Ang Mo Kio. For Pasir Panjang, the population living in public housing increased over the decade, from eighteen to fifty-six percent, but the population did not increase proportionately. The most likely explanation is that some non-HDB residents had moved to the HDB housing in neighboring divisions like Buona Vista and Bukit Timah, since both had a large population as well as HDB population increases.

Overall, the population in the Central Area continued to decline up to the late 1970s. The census reported a thirty-four percent decrease from 1970 to 1980. But all the divisions included in the Central Area had changed boundaries. The area identified as the Central Area in the 1980 census report appeared to be smaller than that appearing in most articles and maps published in the 1970s. According to T. C. Ling, quoted in the URA report, the population in the Central Area went up from the lowest point of 200,000 (8.7 percent of the total) in 1977 to 228,400 in 1980 (9.5 percent of the total). (1983, 175) The 1980 census reported there were only 149,892 people in the Area, 6.2 percent of the total population. (K. C. Kim 1981, 3) (Due to boundary changes, the Central Area is not singled out on the population growth map, Map 9.) There has been a government policy to bring some people back to the Central Area. A total of 22,500 units were built by the end of the 1970s. For this reason, it is likely that the Central Area has been gaining population in recent years.

Except for the Ulu Pandan, Toa Payoh, the middle section of the city, and Pasir Panjang, the rest of the city area had a population decline during the intercensal period. The heaviest loss was in the eastern section. Except for MacPherson, which lost only seven percent, other divisions had declines ranging from thirty-one percent in Mountbatten to forty-five percent in Geylang East. Even though every division in this section had a rather high percentage of HDB population, from 43.8 percent in Kantong to 99.8 percent in MacPherson, the population declined. It could very well be because of the redevelopment program for older estates beginning in 1978. The program's goal is to demolish emergency one-room flats built in the 1960s. This program has necessitated out-migration for some people. In the Division of MacPherson, for example, the number of dwelling units under HDB management in 1979/80 was 12,200. It was down to 5,875 units in 1982/83. (HDB 1979/80; 1982/83) Construction of the Marine Parade estate (a middle-income estate) and Bedok New Town may have drawn people away from these divisions in the eastern section of the city, producing a large population loss in this section (Map 9).

The eighteen divisions in the middle-west section of the city, from River Valley, Queenstown, and Alexandra eastward to Telok Ayer, had lost a total of nine percent of their population of 1970. A substantial majority of the people in this section were living in HDB housing in both 1970 and 1980. Except for River Valley and Telok Ayer, all other divisions

had more than half of their population living in HDB housing. A few reached nearly 100 percent, such as Queenstown, Alexandra, and Bukit Ho Swee (Table IV). HDB housing in this section is among the oldest in the country. The New Town of Queenstown, which covers parts of several divisions in this section, was the first new town constructed. There was an extreme population gain in this area from 1957 to 1970. By 1980, despite the large percentage of people living in HDB housing, the overall population declined. Two possible reasons for this decline: one is the effect of the redevelopment program for the older estates; second, some squatters have been resettled and rehoused in HDB housing elsewhere. This section, however, is still among the more densely populated areas on the island. (K. C. Kim 1981, Map 2a)

Outside of the city area, there was a 46.5 percent overall increase in population. The highest growth area was Serangoon Gardens. When grouped with Braddell Heights, the two registered a gain of 290 percent. There was extensive HDB housing construction in Serangoon Gardens during the 1970s. Eighty percent of its nearly 90,000 people resided in HDB flats by 1980, compared with none in 1970. Without the population being drawn into Braddell Heights, the population in Serangoon Gardens alone still had an increase of 216 percent from 1970 to 1980. Braddell Heights is a new division created mostly from the original Serangoon Gardens and a small portion from the division of Thomson. No public housing was constructed

in Braddell Heights. More than one half of the population was still living in attap or zinc roofed housing in 1980. (K. C. Kim 1981, Table 33) Most of Serangoon Gardens was densely populated, while Braddell Heights only had a moderate density (200 persons and over per hectare vs. 50-99 persons per hectare). (K. C. Kim 1981, Map 2a)

The relatively lightly populated southwestern portion of the island is another region experiencing a large population gain. Bukit Timah, which became Bukit Timah and Bukit Batok in 1980, gained 165 percent. The southeastern part of Bukit Batok was taken from Bukit Panjang, but it was so low in density it should not have much effect on the population gain over the original Bukit Timah Division. Only eighteen percent of the population in Bukit Batok was living in HDB housing in 1980. Bukit Timah, nevertheless, had nearly eighty-one percent of its population living in HDB housing, an increase from 3.1 percent in 1970. Without counting the people in Bukit Batok, the increase for Bukit Timah still reached 104 percent. Construction of HDB housing during the 1970s brought in many people to the division which caused the large population increase.

The industrial area of Jurong, which was split into Jurong and Boon Lay, had a 110 percent population increase. The population here was more concentrated in south Boon Lay. Nearly eighty-four percent of the population in Boon Lay was living in public housing (originally built and managed by the

Jurong Town Corporation, and was handed over to the HDB in April 1982).

An interesting contrast in the distribution of the population in 1970 and 1980 is the divergence between the city area and other parts of Singapore. While the population in the city was becoming less concentrated, population outside of the city was becoming more concentrated as a result of HDB housing projects. The creation of Bedok and Ang Mo Kio New Towns had caused many neighboring divisions to experience negative population growth. For instance, Bedok New Town which covers a large part of the Division of Kampong Chai Chee, a small area of Siglap, and all of Bedok Division, is surrounded by divisions which experienced population losses. For example, Kampong UBI and Kampong Kembangan together had a forty-two percent population loss; Paya Lebar had the largest decline, fifty percent; and Changi lost twenty-four percent of its population (Map 9 and Table IV).

Bedok is a new division created from the pre-existing Kampong Chai Chee, which also lost a small area to Siglap. The population of Kampong Chai Chee together with that in Bedok had a 251 percent increase over the original population of Kampong Chai Chee in 1970. Considering only Kampong Chai Chee, the increase was about sixty-eight percent. A total of 99.6 percent of the population in Bedok Division and 87.5 percent in Kampong Chai Chee (9.4 percent in 1970) were living in HDB flats by 1980.

Ang Mo Kio New Town, which covers the southern tip of Nee Soon Division and northern part of Serangoon Gardens, also drew away people from surrounding areas. Divisions losing population include: Nee Soon with an eight percent population decline; Bukit Panjang, -13.4 percent; and Thomson, -33 percent. The share of population living in HDB housing ranged from nearly one-third to one-quarter for the three divisions. Ang Mo Kio Division, created from Nee Soon and Thomson, had ninety-three percent of its population living in HDB housing. If one adds the population in Ang Mo Kio to Nee Soon and Thomson, the divisions registered a sixty-five percent increase over their 1970 population.

Only three divisions on the island had a population growth about the same as the national average. Sembawang grew 16.5 percent; Jalan Kayu fifteen percent; and Punggol seventeen percent. All these divisions are more rural-oriented. The proportions of the population living in public housing in these divisions were about or a little over one-half of the national average in 1980 (sixty-nine percent of the total population). Of the three divisions, only Sembawang had a large HDB population increase during the 1970s (thirteenth-five percent of the population was living in HDB housing in 1980, and none in 1970). The largest, planned new town of Woodlands, encompassing parts of Sembawang and Bukit Panjang Divisions, is to be developed in the 1980s. It is reasonable to expect both Sembawang and Bukit Panjang to show a substantial population increase by 1990.

Considering the information highlighted above, it is clear how the population growth pattern is affected by HDB housing development in Singapore, as well as how the Concept Plan is leading housing development. The planned southern belt (Chapter 3, page 48) is already much developed, especially the eastern part. Since the direction of the development is now emphasizing the west side and the ring area around the water-catchment area in the island's center, the future population growth can be foreseen to occur largely in the ring area and the western portion of the island.

ECONOMIC AND SOCIAL IMPACTS OF HDB HOUSING

Economic Impacts:

The HDB housing projects have not only redistributed population and created new urban centers, but have also promoted economic growth and changed the spatial pattern of economic activities. The large scale public housing program began at a time when the unemployment situation was severe in Singapore. Within less than a decade, the problem was relieved. Full employment was achieved in the early 1970s. The employment situation has remained excellent since, even during the recent world-wide recession. The contribution of public housing construction to employment opportunities may be viewed in two ways: the jobs brought by the construction itself, and the employment within HDB estates.

It is estimated that building 10,000 units of public housing a year would create 15,000 jobs directly and indirectly. At present, the HDB is building an average of 30,000 units a year. (T. C. Ling 1983, 169) In 1970, about seven percent of the labor force, or 46,000 people, were working in the construction sector. In the same year construction contributed 5.4 percent to the gross domestic product and 6.8 percent in 1973. (Hassan 1977, 15; S. H. K. Yeh 1979, 170) The percentage of the labor force in the sector was 6.7 percent in 1980, and the actual number of workers increased to 72,300. (K. C. Kim 1981, Table 29) There are many foreign workers in this sector. (Pang and Khoo 1975) Between 1966 and 1972, HDB built over eighty-five percent of the dwelling units constructed. For 1971 and 1972, the share was ninety-three percent. (S. H. K. Yeh 1979, 170) Since HDB construction has continued to increase, the share of the labor force in construction can be assumed to have increased as well.

Within the HDB estates two areas have been providing employment to the residents and non-residents: industrial firms and shops and hawker stalls (street vendors originally) in the commercial center of each estate. The reserved land for light and clean industries, such as textile and electronics, in HDB estates, encourages entrepreneurs to build firms there. The convenient location attracts semi-skilled and non-skilled females to take part-time or full-time jobs in such firms. These firms accounted for twenty-two percent of

the manufacturing labor force in 1972. About 38,900 people were employed. Of these, 28,600 were females, and 10,300 were males. (Pang and Khoo 1975, 245) Together, they contributed nine percent of the total manufacturing output. (Hassan 1977, 16) Two-thirds of these firms, mostly owned by local entrepreneurs, employed fewer than 100 workers. The others were larger firms employing nearly 400 workers, and were generally owned by foreign investors. The HDB estimated in 1972 that by 1975 another 14,900 industrial workers would be needed, but only 12,400 would be available. Of these, fifty-eight percent (7,200) would be female. (Pang and Khoo 1975, 250) Therefore, a labor shortage was anticipated. To make up this shortage the Republic has recruited workers from neighboring countries, and even gone as far as South Korea and Taiwan for female workers in recent years.

Commercial centers in HDB estates are mainly located at neighborhood or town centers. The original shops and hawker stalls in squatter or slum areas were relocated to these centers. About 32,000 people were employed in these shops and hawker stalls in 1972. Many of them were self-employed. In contrast to manufacturing workers in HDB estates, more males were working in these shops and hawker centers than females (20,000 vs. 12,000). (Pang and Khoo 1975)

During the early stage of public housing development provision of employment opportunities was not a major consideration. (L. H. Wang and T. H. Tan 1981, 233) The main

economic activity areas were in the Central Area, as a commercial center, and Jurong, the industrial estate. Few jobs were near or in HDB estates. Most HDB residents had to travel some distance to work. When the HDB began to reserve industrial land and build multi-functioned town and neighborhood centers, jobs were created within or adjacent to the estates. Factories and commercial activities were no longer confined to the original two areas as they spread out to other parts of island. However, the Central Area and Jurong are still the largest employment centers, and probably will remain so in the future.

In general, shops and hawker stalls in neighborhood or town centers are expected to satisfy day-to-day needs. A neighborhood or town center usually includes a market, supermarket, sports centers, theater, bus terminal and some restaurants. Postal and banking offices have been added in recent years. A study done by Y. M. Yeung in the early 1970s indicated that a majority of people did food shopping within their estates. But there was a difference between income groups in shopping for other goods like clothes and shoes. Poorer people were more likely to fulfill their needs in the estates. Higher-income people were more likely to travel to the Central Area for certain goods. (1973) However, at the time when Yeung's study was conducted, no HDB housing was built beyond the city boundary, and existing housing estates were less self-contained. During the 1970s, a majority of the newer HDB housing was built in more outlying areas, and was more self-contained. Higher-

order goods shops began to emerge in the newer urban centers. The average number of shopping trips to the Central Area by HDB residents should have decreased in the recent past.

Social Impacts:

The most immediate impact of the large-scale HDB housing program in Singapore was that the housing shortage was relieved in a rather short period of time. By imposing an income ceiling on applicants for HDB housing, it also played a role in redistributing the country's resources. The poor got a chance to share the nation's wealth through government programs. Hence, social as well as political tensions were reduced. Other impacts attributable to the HDB housing program include some success in encouraging small family size, improving the quality-of-life of people and breaking down socioeconomic and ethnic segregation.

At the inception of HDB housing development, when the housing shortage was severe, only families of five people or more qualified for inclusion. This seemed to encourage larger family size. The annual population growth rate at that time was 2.8 percent. (Saw 1980) As a part of a policy to lower the rapid population growth, the required family size was reduced to two in 1967. Along with an intensive family planning campaign, the population growth rate was down to 1.2 percent in 1980.

Even in earlier days of high in-migration, the nuclear-family was a norm in Singapore. In 1957, 63.5 percent of the families were nuclear. The share increased to 71.3 percent in 1970, and seventy-eight percent in 1980. (K. C. Kim 1981, 10; Census Report 1970) Change in qualification for HDB housing permitted young couples to choose having only one or two children, or none at all. The average household size dropped from 5.35 persons in 1970 to 4.71 persons in 1980. (Census Report 1970; K. C. Kim 1981, Table 33) Reducing the required family size for a HDB flat certainly played an important role in the drop in family size (the average was 4.78 persons per household in 1957).

The most significant impact of the HDB housing program in Singapore is the improvement in the quality-of-life for people in general. The improvement may be viewed from two aspects: the female labor-force participation, and the living environment. The female labor-force participation brings extra income to a family, and also affects fertility. The living environment is improved from many standpoints, notably better sanitation, and better and larger personal living space.

The female labor-force participation in Singapore has been increasing; from eighteen percent in 1957 to 25.7 percent in 1970, to 34.5 percent in 1980. (Saw 1980, 182; K. C. Kim 1981, Table 26) From 1970 to 1980, the actual number of economically active females grew 1.5 times. The increasing level of active participation of female workers can be expected

to have improved living standards of families.

Studies done in the past indicated that moving to HDB housing may have caused some economic hardship for some families, especially the involuntarily relocated residents. A study conducted by the HDB in 1972 showed that the average rent and utility spending for the resettled households in HDB estates was twice as much as before resettlement. (S. H. K. Yeh 1975) In Hassan's survey of the same year, more than fifty percent of the residents experienced a change in household expenditures. Of these, well above ninety percent experienced an increase in various living expenses. However, the household income was slightly higher than before. (Hassan 1977, 84) A similar survey was done again the following year (1973). The average monthly household income increased nearly S \$ 130. It reached S \$ 375 a month, compared with an average of S \$ 247 before resettlement. (S. H. K. Yeh 1975) Such a big jump in the average household income may have been largely contributed by female workers.

There are no statistics to show how much the active female labor-force participation affects fertility. However, from the 1980 census report, the average number of persons in each housing unit tends to be smaller in the HDB flats than the national average of 5.14. The divisions with higher percentages of the people living in HDB housing such as Alexandra, Ang Mo Kio, Bedok, Marine Parade, Queenstown, and Toa Payoh, had,

respectively, an average number of persons in each housing unit of 4.67, 4.74, 5.02, 4.96, 4.88, and 4.82. Other divisions with lower shares or none at all living in HDB housing, like Braddell Heights, Chua Chu Kang, and Upper Serangoon, had, respectively, 6.15, 6.95, and 5.92 persons per housing unit. (K. C. Kim 1981, Table 42) These figures suggest that fewer persons in each HDB housing unit may be related to lower fertility among residents.

Such figures are consistent with the general experiences in the West and more advanced developing countries: the more female participation in the labor-force, the more likely that fertility will be lower. The HDB survey in 1973 showed that there were fewer young children in HDB housing than the national average. A little over thirty-three percent of the HDB population was age 0-14 in 1970, compared with 38.7 percent for the country in the same year. (S. H. K. Yeh 1979)

Many studies up to now have strongly indicated that HDB residents were generally satisfied with their new living conditions and environment. An HDB survey in 1973 showed over ninety-five percent of the residents thought their living conditions were either satisfactory or acceptable. The rating of the quality of children's playground was lower, seventy-seven percent. A more recent survey, by T. C. Ling in 1980, also reported a higher score, with ninety-three percent of the resettled residents indicating satisfaction with the estates where they lived. (1983, 182) Such high rating of HDB housing

may be attributable to the carefully planned external environment, and modern equipment in living facilities.

Even though, because of the high-rise form, density in HDB estates is higher (projected to be 360 persons per acre), personal living space is larger in HDB flats than other housing. In some slum areas, average personal living space ranged from 4.5 to 8.7 square meters per person. In HDB flats, it ranged from 9.9 to 20.7 square meters per person. (Liu 1975)

In addition to increases in living space, the facilities in HDB flats are also much improved when compared with conditions experienced by the typical residents in their previous homes. The photos in Yeh's and Y. M. Yeung's books clearly show the contrast. Kitchens and bathrooms are equipped with modern and sanitary facilities. A related study conducted by Hassan in 1972 showed over ninety percent of the residents were satisfied with water and electricity supply, and nearly eighty-five percent were satisfied with privacy and ventilation. Living space received the lowest rating except for rent, seventy-four percent. Only twenty percent of the sample residents were satisfied with the price of rent. (Hassan 1977, 49)

In terms of the external environment, Hassan's study also reported relatively high satisfaction among HDB residents. The most satisfactory rating was given to marketing and shopping facilities, ninety percent. Cleanliness of neighborhood and public security were eighty-seven and eighty-four

percent, respectively. The least satisfactory rating given was for the prices of goods, forty-one percent. The next lower ratings were given for recreational facilities for adults, fifty-eight percent, and play facilities for children, sixty-three percent. (Hassan 1977, 49) A HDB study in 1973 showed a similar response, but with much higher "satisfied" and "acceptable" scores on each item in its survey. There was one very significant response in the HDB survey. Nearly fifty-two percent agreed that employment opportunity for women was changed for the better. (S. H. K. Yeh 1979)

The most unique feature of HDB housing in Singapore may be the breakdown of ethnic and social segregation. Ethnic and social segregation in Singapore began at the time when Raffles established the port. In his plan, each ethnic group was to inhabit a distinct area of the town. (Neville 1969, 52-53) Even though reality did not exactly reflect his plan, ethnic groups did form their own communities in most parts of the island. HDB housing projects provided a chance to integrate these groups.

In Hassan's study, sixty percent of the sample households responded that there were more other races in their present than former neighborhood. (Hassan 1977, 77) T. C. Ling's study in 1980 also showed fifty-three percent of the HDB residents had the same response. Ling's study further found that a majority, eighty-three percent, got along with neighbors well; only 1.6 percent did not. Malays and Indians had higher

responses, 90.4 and 89.3 percent, respectively, indicating that they got along with neighbors. Only 80.4 percent of the Chinese residents responded in a similar manner. In 1973, a HDB survey showed eighty-six percent of its residents was Chinese, 8.9 percent was Malays, and 4.2 percent was Indians and Pakistants. Such ethnic integration is also a reflection of a national policy which encourages people to identify themselves as Singaporeans instead of otherwise.

Not only has ethnic integration been promoted through the HDB projects, socioeconomic integration is incorporated into the projects as well. In each estate there are blocks for small flats and large flats. Lands are also reserved for private housing development. All residents utilize the same neighborhood center and town center. Moreover, the housing projects have been used to enhance family ties in recent years. Extended families have priority to apply for flats next to each other. (Asianweek Feb. 10, 1984)

PROBLEMS OF HDB HOUSING DEVELOPMENT

Since the public housing programs are well designed and there is flexibility to revise projects whenever needed, there are relatively few problems to be mentioned. A major problem, especially in more recent years, is the rising prices of HDB flats. Another problem relates to a policy of building more larger flats. Gradually, the poor sector of society will not be able to choose government housing when they have to pay

for more costly, larger flats. The sharp price increase in 1981, followed by a declaration that the "cheap public housing era was over" by the Minister for Law and National Development, has already transferred one Parliament seat to the Worker's Party. This was a dramatic change. The first time the ruling party, PAP, did not hold all of the seats in the Parliament in fifteen years. (T. C. Ling 1983, 173; H. C. Chan 1982)

The 1980 census reported there was still fifteen percent of the population living in attap and zinc-roofed houses (down from 33.6 percent in 1970). (K. C. Kim 1981, Table 33) Because of increases in rent and sale prices, many of the lower-income people may never get a chance to improve their living conditions by gaining admission to government housing. The public housing program in Singapore would, therefore, be drifting away from its original purpose of rehousing the poor.

Other somewhat minor problems include: 1) too much noise, 2) lack of sufficient playgrounds for children, and 3) the height of flats. In Hassan's study, of all the unsatisfactory items, noise rated the highest. (Hassan 1977, 59) This is related to the insufficient amount of playground for children. Many parents of families living on higher floor felt uneasy letting children play on the ground floor where they could not keep their eyes on them. These children, therefore, played in the hallways, disturbing neighbors with their noise.

Interestingly enough, Ling's study showed 71.6 percent of the residents had no intention of moving out, and another 16.4 percent would move to other HDB flats. (1983, 179) Both Ling's and Hassan's studies indicated more residents preferred low-rise housing. In Hassan's study, the height of flats was second after noise in characteristics disliked by HDB residents. (1977, 59) In Ling's study, 37.7 percent preferred high-rise flats, while 46.4 percent preferred low-rise; and 15.9 percent did not mind either type. (1983, 189) Since the population growth rate seemed very likely to stabilize at somewhere around 1.2 percent in the near future, and the population is unlikely to reach four million as projected in the early 1970s, the HDB should be able to lower the projected density in its estates (360 persons per acre), hence lower the height of its buildings to meet people's preferences.

FUTURE OF HDB HOUSING DEVELOPMENT

In the Concept Plan of Singapore, it was projected that seventy percent of the population would be living in government housing by the year 1992. (Campbell 1970, 51) Because of the rapid rate of increase in the HDB population, T. C. Ling forecast a new figure of eighty to eighty-five percent by 1992. (1983, 177) However, taking over of Jurong Town Corporation's public housing and HUDC's middle-income flats has already raised the HDB population to seventy-five percent of the national population in 1982/83. By 1992, the percentage could be even

higher than Ling's prediction.

Based on a medium estimate, a total of 188,000 housing units would be needed for new households between 1981 and 1990. To meet a backlog and for replacement, another 96,200 units would be required during the same period. (Chander, Karunanayake, Vera, and Yeh 1979, 44) These figures, combined, project a need for 284,200 dwelling units. Since the HDB has been providing most of the housing on the island, with a pace of building nearly 30,000 units a year, the HDB should be able to meet the housing needs in the future.

Thus far, the HDB development has concentrated more on the eastern and southern portions of the island, as planned in the SCP. Development in the future would be directed more to the western portion of the state, and around the water-catchment area. Ang Mo Kio New Town is already well developed on the east side of the water-catchment. Woodlands and Yishan New Towns in the north of the water-catchment, Bukit Batok, Jurong East and West New Towns in the west side of the island are to be emphasized during the 1980s. It is foreseeable that the island of Singapore will be developed in planned manner as outlined in the Concept Plan.

Chapter 5

CONCLUSION AND IMPLICATIONS OF SINGAPORE'S EXPERIENCE

Summary:

After two decades of development, HDB housing program in Singapore is not just providing housing units per se to its residents, but also providing a way of life. The HDB development had guided people about choices of where to live, where to shop, where to work, and where to entertain. It also has created a certain kind of environment for its residents. People are living in clean and decent housing. The high-rise buildings are functionally efficient, esthetically designed.

Through HDB development, population on the island is no longer clustered in the small section of the Central Area and its surroundings. Programs were implemented to disperse population to both the eastern and western sides of the island. Now development has been added toward the northern part of the island. Both censuses of 1970 and 1980 clearly showed a pattern of population growth following closely with HDB housing development. In divisions with extensive HDB construction rates of population increase have been much higher than the national average. In divisions with less or no HDB construction population gains have been either close or below the national average; in many cases there was a trend of decline.

Even though the overall density of the island was as high as 3,907 persons per square kilometer in 1980, (K. C. Kim 1981) the more evenly distributed population has reduced the crowdedness people experienced before. This desirable change has been enhanced by the increase in personal living space through vigorous HDB housing development.

Singapore's Unique Features:

In general, public housing development in Singapore is impressively successful. The population has been more evenly distributed; a few planned urban centers have been created; the economy has been stimulated; and people have been enjoying a better quality of housing. There are many reasons for this success. The first reason, and also the one most often mentioned by scholars, is the tough and determined leadership by a government committed to provide decent housing for its people. In the early 1960s, when the housing shortage was severe, the HDB began its program with the building of smaller, emergency flats. When the housing shortage was no longer a pressing problem, the HDB began to build larger flats. At the same time, it began a redevelopment program to demolish the emergency flats, and rehouse the people from older flats to better and newer ones. Such an effort demonstrates the government's intention. As there was a capacity to provide its people with better housing, the government did not hesitate to do so.

A second reason for Singapore's success is that of careful planning. The first thing the HDB undertook after it was established was the estimation of the housing needs for the decade of the 1960s. This was followed by two five-year plans to build the required number of needed units. Later, with the formation of the Concept Plan, the neighborhood principle and the new town idea were incorporated into the planning program. The HDB has since evolved more comprehensive land-use planning for all estates and new towns. Furthermore, the interior design for flats and the external environment have been improved over time. Employment opportunities, children's schooling, shopping needs, and transportation convenience have been considered when selecting a new location for planned developments. Such a comprehensive planning approach has made HDB housing attractive to people and fostered associated development of economic activities.

Realization by the government that people desire to own their own homes has no doubt played a key role in the acceptance of HDB housing. The government first allowed people to purchase HDB flats in 1964. In 1968, the government instituted the Central Provident Fund as a source of money for home payments. The government also provides loans for people to buy their flats. All these policies benefit those lower-income people who would not have been able to own a home if not for these government policies. By owning their homes, people would take better care of their properties. Such a positive response

makes it easier for the HDB to manage its estates. By early 1983, two-thirds of the HDB residents had purchased their homes.

Relaxation of an income ceilings, along with building larger flats, indicates that the government does not intend to keep HDB housing at a social welfare level. This attitude can only be welcomed by those with middle income for whom private housing is too expensive to purchase. The policy allows as many people to own their homes as possible.

Another action that has been effective is the government's attitude toward HDB residents. That is, the HDB continues to be responsible for servicing and maintaining sold and rented properties. The government or the HDB does not simply put people in HDB housing then leave them. The HDB regularly paints the flats it builds every five years. There are servicemen on call twenty-four hours for an emergency such as a stuck elevator. Also, older elevators have been replaced by newer ones. In 1983 a total of thirty-three area offices were located in different HDB estates. These area offices were established not only for residents' convenience in paying rent or home payment, but also were responsible for resolving all types of problems locally.

Besides all the government housing policies, there are other factors which have played a role in Singapore's successful public housing program. First, with the small

size of the city-state, it has been relatively easier to have comprehensive planning than would be the case in a big country.

The small size also allows the country to avoid troubles with various rural problems. First of all, rural-urban migration hasn't been causing problem for Singapore's government. Before Singapore was separated from the Malaysia Federation in 1965, migration from the Malayan Peninsula was very much like rural-urban migration in other developing countries. Since 1965 international migration has been restricted. The low level of in-migration is balanced by out-migration. In fact, there was a net out-migration in the mid-70s. Secondly, without a backward rural area requiring large amount of government funds, the government has been able to place more resources into its housing programs on a per capita basis.

The small size of the state also permits a one-tier government. In Singapore, a government plan does not need to go through several administrative levels before it can be implemented. The one-tier government promises efficient actions in the execution of its policies.

The nature of the population in Singapore is another advantage the island-state enjoys. Nearly all of the population is made of migrants. Up to the middle of the century, the migration streams from China, Malaysia, and India were almost non-stop. These migrants came to the island for economic reasons. They lived poorly, cheaply, and uncomfortably in

extremely crowded conditions. When given an opportunity to live in better conditions, they have been appreciative. Also because of the migrant background, a powerful elite or landlord class did not form. Once a government policy was introduced, there was no need to worry that any influential group would stand in the way.

Finally, the trend toward nuclear family on the island enhanced the preference for more housing units. Since the policy was changed so a family of two could apply for a HDB flat, more young couples choose to live apart from their families. Relatively low prices for HDB flats also helps these young couples own their new homes. Despite a large price increase in 1981, there is still a long waiting list for HDB units. A large portion of the applications on the waiting list should be young couples, or new families, because most of the older couples would have moved to HDB flats, if they were interested in living there.

SINGAPORE CONTRASTED WITH HONG KONG

To better appreciate Singapore's experience, it is instructive to contrast it with another entity with some similarities. The case of Hong Kong serves as an example. Compared with Singapore, Hong Kong does not seem to be as successful in its public housing development. Hong Kong started its large-scale public housing construction in the early 1950s, but it did not become a popular program as in Singapore. Lack of overall planning is probably the main reason. Its

program centered on the objectives of land-use control and environmental improvement. Living conditions were not a government concern. Therefore, the quality of its public housing was poor, and the Colonial Government did not intend to improve the conditions until the middle of the 1970s. Even though there is new town development, it is still a matter of piece-meal planning instead of comprehensive planning. Despite availability of a large fund for its public housing development, without better planning it is unlikely to be as successful as Singapore.

Another problem in Hong Kong is the migration of refugees from Mainland China. This parallels the rural-urban migration problem in other developing countries. Large number of the refugees cause the Hong Kong government to fall a little behind in providing public housing for its people.

So far, the Hong Kong government has focused on building housing for low-income people. Even though private housing is too expensive for some middle-income groups, the government has no plan to provide housing at an affordable price for these people. A shortage of housing continues to be a problem, despite the fact that forty-one percent of Hong Kong's people were living in public housing by 1975.

In area, Hong Kong is nearly twice as large as Singapore. Hong Kong island and Kowloon are separated by a narrow strait. The larger size and separated territories may have made it

more difficult to develop and implement a comprehensive plan. But if the Hong Kong government was determined to develop the state in more ideal way, the difficulties should be manageable with its available funds, modern technology, and capable personnel. Hong Kong's technology is ahead in its region, just as Singapore is in Southeast Asia. If Singapore can, why cannot Hong Kong succeed?

IMPLICATIONS OF SINGAPORE'S EXPERIENCE

Could Singapore's experience be applied to other countries? A quick answer is that it probably would be difficult. Few countries enjoy the advantages Singapore has: a determined and stable government, small size of the country, largely spared from rural-urban migration problems, moderate population growth rate, productive labor-force, rapid economic growth rate, and high literacy rate. A small country may not have a determined or capable government. A strong and capable government may govern a large and poor country. Most common, especially in developing countries, is a rather weak government ruling a country with a large percentage of rural population. Taiwan for example, has been learning the public housing experience from Singapore, and wishes to apply that experience. But public housing in Taiwan, particularly in the city of Taipei, has been regarded as a tumor of the administration. Lack of planning and incapable personnel are major obstacles.

It seems the government's determination, or strong and

capable leadership, is most essential in terms of providing people with decent housing. For a small country, if the government is willing to solve its housing shortage, the Singapore experience is a perfect example. In a large country, if the government has the same willingness, it could implement its project at a smaller scale such as at a one or two-county level. With such determination, any problem should be resolvable sooner or later.

Overall, the Singapore experience does not seem to have a broad application. However, it does demonstrate that a public housing program can be both effective and popular. A well-planned urbanization can be effected when a government is committed to make it so. It is a lesson for those countries troubled by their public housing projects, or suffering an urgent housing shortage.

One point should be made before closing this study. That is in the past two decades or so, Singapore has become a highly disciplined society. When the government wished its people to follow a certain policy or program, an intensive propaganda effort ensued. As one author wrote in his recent article about Singapore, "Singapore citizens have been made to feel they are on a lifeboat and there is no land in sight." (Lorenz 1982, 14) The government set up rules to follow for almost every aspect of life, from length of hair of a male to how many children a couple should/could have; from environmental maintenance to where people should live. The result may be

that a society is too well in ordered (or controlled). The economic prosperity may promises a high living standard, but some kind of vitality and creativity may be missing. At the same time, the strict rules are concurrent with an increase in crime rate, mental disorders, loneliness, and so on. Minor problems today may gradually become major social problems. To some people, the rigidity has created a situation where, as Kraar put it, "Indeed, the miniscule country seemed to have everything except a soul." (1980, 29)

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PUBLIC HOUSING, POPULATION REDISTRIBUTION,
AND URBAN DEVELOPMENT IN SINGAPORE

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ABSTRACT

In December 1959, Singapore gained its independence from Britain. The People's Action Party (PAP) won a majority in the Parliament and became the first, and the only government so far, for the new state. When the new government came into office, housing shortages and high unemployment were the more urgent problems needing to be resolved. The new government quickly formed the Statutory Bodies of Housing and Development (HDB) and the Economic Development Board (EDB) to deal with these problems.

This study focuses on HDB's housing program and its impacts. The relationship between population distribution and HDB development is particularly examined. The method applied here is to compare the population growth and the percentage of people living in HDB housing in each census division to determine the degree of relationship. The HDB Annual Reports and census reports of 1970 and 1980 are the main data resources.

The HDB began its task by estimating housing needs for the decade of the 1960s. A goal was set to build 110,000 dwelling units within two five-year plans. The target was exceeded. The backbone of the housing shortage was broken. Meanwhile, along with the EDB's effort, the unemployment rate was reduced. Full employment was achieved in the early 1970s.

With a decade's effort, the HDB public housing program won the confidence of the people, and its projects were increasingly more popular. In 1973, the government announced that it would construct middle-income housing for those who could not afford expensive private housing, and whose income was too high to be eligible for a HDB flat. HDB housing construction increased substantially. By 1980, four five-year plans had been completed; the target and the number of units actually completed in each plan exceeding the previous one. In early 1983, HDB announced that seventy-five percent of the nation's population was residing in its housing.

The success of the HDB program has permitted the government to utilize housing projects to develop the island according to a master plan. A Concept Plan of Singapore (SCP) was introduced in 1971. As part of the Plan, several new towns were to be created on the different parts of the island. Each new town was to be connected with expressways and public transportation, and industrial lands and a town center are to be provided. The new towns were to be self-contained for day-to-day needs except for employment. The major employment centers remain in the Central Area, the main urban center, and Jurong, an industrial center. Industrial firms and commercial centers in HDB estates provide full or part-time job opportunities for HDB residents, especially females. By early 1983, fourteen new towns had been constructed.

The HDB housing programs not only brought social and

economic changes in Singapore, but also played a role in redistributing the population. Before the HDB began its projects, the population was highly concentrated in the south of the island, namely the Central Area. After two decades of public housing development, the population has been dispersed to different parts of the island. The censuses of 1970 and 1980 clearly indicated that wherever large HDB estates or new town were located, there were large population increases. Thus the government's efforts have dramatically transformed the island's social and economic morphology.

To emphasize Singapore's achievements, Hong Kong's public housing development was compared. Hong Kong began its public housing program in the early 1950s, and yet in terms of popularity and percentage of people it has rehoused, its program is not comparable with Singapore's. The major reason for this difference is that there is no comprehensive plan in Hong Kong. Also the government is not as determined and committed as Singapore's government in providing its people decent housing.

Singapore has been unusually, and perhaps uniquely, successful in its public housing program. There are advantages that Singapore enjoys that have contributed to its success: strong leadership, a determined government, a prosperous economy, the small size of the country, a highly skilled work-force, and political and social stability. Few countries are fortunate to share similar conditions. Thus, the applicability of Singapore's experience is necessarily limited.