

# Maintenance and redevelopment of aged public housing estate construction essay



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Since the fire in Shek Kip Mei on 25 December 1953 that made 53, 000 people homeless, due to the shantytowns of the China immigrants were destroyed. As the population growth of Hong Kong is very fast from the five decades ago due to the immigrants and birthrate. At present, Hong Kong Government is facing the problem of density populated. For this reason, Hong Kong Government assigns Hong Kong Housing Authority to develop public housing program of “ multi story building” for immigrants to living there. Therefore, Hong Kong Housing Authority has been turn into the biggest public housing developer and the single proprietor in Hong Kong. Nevertheless, the housing condition and the practicability is the important consideration of the district, because the main concept of public housing is satisfy the basic and real need of townspeople, who cannot afford the private housing requirement.

Nowadays, there are many public housing estate are out of the current standard and outmoded owing to the time is elapse. So, Hong Kong Housing Authority launches the Comprehensive Redevelopment Programme to make an improvement of living quality to the tenant that living in old public housing estate, there are 566 target block about 231, 403 flats which was built before 1973 are demolished and the Comprehensive Redevelopment Programme was completed in January 2010. Otherwise, the Housing Authority carry out the Total Maintenance Scheme in 2006 approximately covering 600, 000 flats, the Housing Authority article showing that the main concept of this scheme is Proactive and comprehensive approach to identify maintenance problems, then Prompt response to emergencies and tenants' requests, finally, Enhanced promotional and educational programmes to

improve the maintenance quality and service in public housing estate and enhance the quality of living environment to the tenant.

At this moment in this time, Hong Kong Housing Authority had made two different programme which are maintenance and redevelopment in different period to enhance the living quality of public housing estate. Building maintenance is a method to sustainable of keeping and enhances the function of facilities of aged public housing. Redevelopment is a method that demolish the outmoded building and redevelopment, it is very complicated, because there are many factors are contained, (e. g. psychology affect of tenant, use of time, cost of finance, availability of the land).

For this reason, the purpose of this study is research the benefit and disadvantage of maintenance and redevelopment of aged public housing, express the different and difficulties to precede the redevelopment and maintenance and bring up my recommendation that base on the opinion of public and the feasibility study on the actually condition for the future building management for Hong Kong, .

## **Introduction**

In this study, I will first provide some background information of aged public housing in Hong Kong. Then, I will present a clear conceptual background of maintenance and redevelopment, such as the definition of maintenance and redevelopment, and critically review the condition of aged public housing in Hong Kong.

Then, I will evaluate and examine the intention of government policy for choice between maintenance and redevelopment of aged public housing, in <https://assignbuster.com/maintenance-and-redevelopment-of-aged-public-housing-estate-construction-essay/>

order to make the best decision between adoption of maintenance and redevelopment of aged public housing in Hong Kong.

In addition, I will outline and discuss the factors contributing to the decision. Besides, I will mainly focus on three factors, economic, environment and structural safety. And, I will then outline the advantages and disadvantages of maintenance and redevelopment, which can affect the decision between adoption of maintenance and redevelopment of aged public housing.

Finally, I will summarize the factors which can affect the decision making and provide some recommendations for the future decision making and redevelopment for public housing estate.

## **Aims and Objective**

The aim of this dissertation is to review and evaluate the decision for the old public building between maintenance and redevelopment of Hong Kong.

Objective:

A historical review the background of public housing in Hong Kong.

A literature reviews the definition of maintenance and redevelopment and compares the factor which determines the decision between redevelopment and maintenance.

Carry out research and interview with selected target building and group.

Selection of public building for case study.

A critical data analysis and information based on the conclusion drawn from all review and research.

Conclusion and recommendation based on the critical analysis and result of the research.

## **History of public housing in Hong Kong**

The appearance of public housing in Hong Kong mainly due to the fire in Shek Kip Mei on 25 December 1953, the fire destroyed the makeshift homes of refugees from Mainland China, leaving 53, 000 people homeless. After the fire, and facing a surge of immigrant population, then the government launched a public housing program to introduce the idea of “ multi story building” for the immigrant population living there, thus commencing a programme of mass public housing, providing affordable homes for those on low incomes. Some scholars have argued that the government has been overstating the role of the fire in the history of public housing in Hong Kong.

Nowadays, public housing facility is the weightiest position of the society. Public housing estate major provided a home for peoples who can't afford the private accommodation in real need, because the rates of public housing are really lower than private housing. At present, there are 169 public housing estate (about 656, 000 public rental flats and residence around 2. 2 million people) under the Housing Authority's (HA) management scope.

## **Research methodology and significant of study**

Research is a process, which is the way to get the answer and question to hypothesis in different way of this study and support the conclusion from

information of the research. Furthermore, methodology is use for prove the truth of the assumption, the methodology that is choose from literature review (e. g. news, article, journal, book) and investigation for target person (e. g. group interview, individual interview, questionnaire).

## **Chapter outline**

Chapter one is the Introduction of this study, in this part, the history of Honk Kong public housing estate is introduced first, then define the main focus of this study clearly and explain the source of information about this study. Therefore, a clear concept of this study provided for the reader from this chapter.

Chapter two is the Literature Review, in this chapter, the definition and characteristic of maintenance and redevelopment are identify by literature or article or journal, after that, the factor of influence that between maintenance and redevelopment is recognize base on the concept findings of maintenance and redevelopment, the important information from the article or journal are recap and compare the data on the most relevant.

Chapter Three is the Methodology, in this part is to make a critical review on the decision for the old public building between maintenance and redevelopment of Hong Kong. The methodology consists of a literature review, followed by questionnaire survey and the subsequent interview. The conclusion from the analysis of the results of questionnaire and interview surveys would be served as a ground for formulating the recommendations.

Chapter Four is the Findings and Data Analysis, in this part all information and data that collected would be organized in this chapter and detailed <https://assignbuster.com/maintenance-and-redevelopment-of-aged-public-housing-estate-construction-essay/>

discussion and analysis would be presented from the interview and the questionnaire.

Chapter Five is the Conclusion and Recommendations, in this chapter, final conclusion and recommendations will be made based on the discussion, collected information and analysis made in Chapter three and four.

## **Literature review**

### **Definition of Maintenance**

According to British Standard 8210 defined maintenance as the combination of all technical and administrative action intended to retain an item in, or restore it to, a state in which it can perform its required function. And the previous version of British Standard (BS 3811: 1964) stated that maintenance as a combination of any actions carried out to retain an item, or restore it to, an acceptable condition. There are few components are identified from the above definition.

According to the British Standard stated that Action not only related to the physical execution of maintenance work, also concerned with its initiation, financing and organization. The notion of an acceptable condition, which implies and understanding of the requirement for the effective usage of the building and its parts, which in turn compels broader consideration of building performance,

Chartered of Institute of Building offer the followings definition of maintenance: ‘ Works undertaken in order to keep, restore or improve every facility, e. g. every part of building, its services and surrounds, to an agreed

standard, determined by the balance between need and available resources’.

The committee on Building Maintenance recommended the adoption of the followings:

Definition of maintenance: ‘ Work undertaken in order to keep, restore or improve every facility e. g. every part of building, its services and surrounds to a currently acceptable standard and to sustain the utility and value of the facility.

Proper maintenance can extend the useful life of a building substantially.

Renovation of old buildings is sometimes a viable alternative to redevelopment as it causes much less disruption to the affected residents. It can also improve the environment and reduce the need for urban renewal from the Planning environment and Lands Branch, 1996

British standard (BS 3811: 1984) classified maintenance as three parts as follow,

- i. Planned maintenance; described as organized maintenance and carried out with forethought, control, and the use of records to predetermined plan.
- ii. Preventive maintenance, it is carried out at predetermined or to other prescribed criteria and intended to reduce the likelihood of an item not meeting an acceptable condition.
- iii. Running maintenance, which can be carried out whilst an item is in service.



## **Definition of Redevelopment**

Redevelopment means that the society shall demolish and redevelop the old dilapidated building with poor living condition into a productive and desirable use in order to utilize the land resources.

Hong Kong Housing Authority described that the redevelopment and clearance aims to improve the living standard for residents in older estates and to ensure that facilities and benefits do not lag too far behind the newer estates.

The opinion focuses on demolishing old and dilapidated buildings which providing poor living conditions and improving living conditions by assembling large pieces of land for comprehensive planning and the restructuring of the community through providing better and appropriate community facilities and open space. (P. K. Kam 2002)

Housing Authority stated that the land use within the community, new opportunities may be identified which may lead to better planning and development within the district, including opportunities for housing. (HKHA)

Redevelopment as an effective means to comprehensively revamp an old area by upgrading the street design and the community amenities as well as to better utilize the in shortage supply of land resources. (Urban Renewal Authority)

Comprehensive housing renewal can provide greater open space and community facilities. Typical objective include: suitable re-housing; increased

amenities; community preservation' architectural conservation and fiscal outcomes, among others that base on Couch 1990, Rapkin 1980

## **Factors which Determining the Decision between Redevelopment and Maintenance**

The reason for redevelopment mainly as the following:

Replacement of whole elements of components

When the whole elements of components are functionally unsatisfactory; incur high maintenance or running costs and aesthetically unacceptable (Lee Maintenance Management), the components will be redeveloped.

2. Design constraints, lack of amenities

Since, the public's expectation for improving the standard of living environment is rising. A redeveloped component will provide a better living environment to the residents. Areas concern such as to improve the condition, value and life span of public housing assets, enhance local communities and support the local construction industry.

3. Maximize the usage of land

Redevelop a component not only can increase the efficiency of land usage, but also provide a better integration of transportation and commercial facilities and the provision of new district facilities.

4. Change of plot ratio

Plot ratio control was under the Building Ordinance is a device used by planning authorities, to restrict the amount of floor space provided in new building in relation to their site area. The population grows at (the rate of population growth is roughly one million per decade in Hong Kong) roughly a million every decade in Hong Kong. With limited land resources, further increase in density in high of housing development is inevitable. In addition, provide more occupancy ratio, the occupancy ratio of 2. 23sq m per person that had been established in the 1950s and changed over time to 4. 25sq m per person in the 1980s, up to date, the current occupancy ratio stands at 7 sq m per person.

### Economy

The large assembly of land through the Comprehensive Development Area (CDA) concept has two major benefits from the planners point of view, Booth (1996) and Listokin (1974); Waver and Blabcock (1979); all cited by Tse (2001)

The CDA sites can achieve the maximum plot ratio;

It can achieve a better designed layout and block disposition and provide adequate communal facilities for the development.

structural and building safety

American Planning Association elaborated that the building in which it is unsafe for persons and unhealthy to live or work due to dilapidation; deterioration; defective design or physical construction; inadequate utilities;

lack of ventilation, light or sanitary facilities contamination by hazardous substances and redevelopment might be considered.

The reasons for maintenance mainly as the following:

#### 1. Environmental impact

Environmental impacts arising from the demolition, construction and operation of the redevelopment project and related activities, therefore the environmental impact of maintenance works are much better to avoid and minimize the potential environmental impacts to the public.

#### 2. Long time for the completion of new estates

The total lead-time for the completion of new estates is about 4 years including: planning, design, tendering and construction.

#### 3. Lower operation and maintenance cost in the long run

Preventive maintenance concept has developed in Housing Authority. In view of the fact that regular repair and maintenance cannot fundamentally solve the problems arising from ageing, such as water seepage in the balcony, rusting of water pipes, wear and tear of concrete, etc. the Housing Department is exploring ways to upgrade or maintain aged estates comprehensively in order to improve tenants living environment Building rehabilitation is one of the options being explored in dealing with aged estates.

#### 4. High construction costs are not cost-effective

Tight budget of Housing Authority incurring such high construction costs is not cost-effective and will also affect the environment during construction stage.

## **Advantages of redevelopment**

There are several benefits for the Housing Authority during redevelopment. First of all, the rationalization of land use and the opportunity for increasing housing production, particularly for Housing Authority redevelopment site where boundaries may be modified to optimize development intensity.

The ability to bring in other resources to facilitate redevelopment of existing public housing estates, including the private sector and other quasi-government agencies. This could enable some older estates to be redeveloped for higher and more productive uses that would otherwise remain for a long time due to a lack of suitable replacement housing.

One of the benefits is that the improvement to the physical conditions of the area that would benefit existing public housing residents and at the same time enhances the attractiveness and desirability of Housing Authority developments.

Besides, the greater diversity of land use and type of developments will assist in improving the socio-economic mix in the area and provide housing residents with more choices and housing opportunities.

Furthermore, construction jobs created by the development of new buildings and new infrastructure and the remodeling in existing buildings

Redeveloping building can stop the spread of deterioration and blight of aging building and improving the safety and environment of adjacent areas

## **Deficiencies of redevelopment**

Government's redevelopment programs have the following deficiencies:

Migration of vast number of people is a complicated process requiring detailed planning, monitoring and documentation. A high percentage (up to 40%) of Hong Kong population is housed in Public Housing Estates. An extensive re-housing and redevelopment program is required, which exerts heavy pressure on manpower, time and money.

Demolition of a building is a costly process. Moreover it creates construction waste undesitably unavoidably. The waste, if unsuitably reused, can result in pollution of the environment and depletion of resources. Also noise and visual pollutions can become nuisances to nearby residents.

New estate designs are often based on economic values. Also, cost efficiency and high practicality had been the approach adopted in the new developments, lacking in the encouragement of communal interactions. The new estates have more monotonous and self-enclosed living environment.

## **Significances and Advantages of Maintenance**

According to David Highfield (2000) defined that the cost of refurbishing and re-using and existing building is generally considerably less than the cost of demolition and new construction since many of the building elements are already constructed.

One of the principles advantages of opting of refurbishment and re-use of existing building – rather than demolition and construction – is that, in the majority of cases. The renewed or redeveloped accommodations will be available in a much shorter time. And the shorter contract duration reduces the effects of inflation on building costs, also the overall development period could be shorter and reduces the cost of financing the scheme

The work required refurbishing and existing building would normally take considerably less time than the alternative if demolition, site clearance and the construction of a new building. Time savings, during the pre-contract design, planning permission and building works phases of development.

The client obtains the building sooner and therefore begins to earn revenue from it (e. g. rentals, retail sales of manufacturing profits) at an earlier date.

With the increasing cost of new-build work, effective maintenance of existing building stock is becoming more important and building maintenance now represents a significant proportion of construction output.

About unstable supply of construction works, according to Patricia Hillebrandt (2000) stated that the determination of demand for construction activity is a very complex affair and heavily depends on the policy of government either directly through its intervention in the public sector, or through its influence on the general level of economic activity in the private sector.

The standard of maintenance achieved has an important influence on the quality of the built environment and there seems little doubt that society will

continue to expect higher standards in new and existing buildings.

Nowadays, maintenance is a significant and important part of the work of the construction industry.

The environmental advantages, one of the many ways in which energy consumption can be reduced is to recycle and re-use existing resources as much as possible, in preference to consuming even more energy by replacing them. E. g. when major alterations are made, will generally use less energy than demolition and new build.

Housing Authority stressed that maintenance can facilitate early defect deterioration and rectification. This can avoid the additional expenses arising from further deterioration and it enables building elements and services installations to be replaced at the optimum time in order to achieve the maximum serviceable life (Press Release: Home CARE Maintenance for Public Housing Estate, 1 March, 2001)

## **Disadvantage of Maintenance**

Although maintenance is beneficial to the aged building and many articles are supporting this view, but there are no perfect views of any matter, so in this part, the disadvantage of maintenance is shown as the follows:

The resultant standard of living may not live up to contemporary expectations.

Very limited potential for positive impact with regard to land use and building performance.



The current mismatch in housing type supply and demand and the general inefficient layout of the site would remain.

This approach does not count for the relatively short life span of the existing housing.

## **Deterioration and Obsolescence**

The life cycle analysis by Flanagan (1989), which includes the following items:

Physical deterioration; economic obsolescence; functional obsolescence; technological obsolescence; social obsolescence; location obsolescence; legal obsolescence; aesthetic and visual obsolescence; image obsolescence; and environmental obsolescence.

Based on Aikivuori (1995) asserts that the defects of building are relative, not absolute and therefore difficult to measure objectively. The replacement due to obsolescence is not technically rational since it does not optimize the use of structures until the end of their durability. Since corrective replacement is defined as the project aimed at deteriorated structures in unacceptable physical condition.

According to Taylor (1980) proposes that deterioration has no part in the accumulated inferiority caused by obsolescence and the deterioration and obsolescence are 2 separable issues. Both Taylor (1980) have categorized the causes of replacement into these 2 classes, e. g. deterioration and obsolescence.

Thus, Aikivuori (1995) view the reasons for the decision to initiate a redevelopment project as a basis of the demand. The phenomena causing redevelopment are classified into 5 categories in his study as follows: failure in the building due to deterioration: change in use: optimization of economic factors: subject features of the decision maker: and the change of circumstances.

## **Life Span of Building Components**

Base on the main theme of this study, the life span of building components is a very critical part to provide the sustainable development environment and enhance the value and practicability of the aged building. Also, it is a critical part to affect the decision between maintenance and redevelopment, so the building components should be coordinate with the methodology to present result that meet the international standard, the methodology is really simple to included multifarious application and give a suitable advice of the analysis or review for different type of building in Hong Kong or other country.

According to the related RICS journals “ Assessing the Life Expectancies of Building for Life Cycle Costing” by Ashworth (1996) bring up the idea is about the rate of depreciation of building components depend on different information or data supporting and the selection of relevant life span reviews. Base on the theory from this journal, the expectancies may be uncertain, due to a proper design and maintenance arrangement or physical deterioration and obsolescence affect or the quality of refurbishment phase. Anyhow, different types or use of building have different refurbishment lives and the argument of expectancies incidence is important than overall

building life span.

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Macdonald (2003) indentified the building requirement and intention of life is at least 50 years or above, if there is good workmanship in construction stage and arrange inspection and maintenance work on cycle. Actuality, most of the building may be demolished before the end of time and rebuild, if there is any economical profit of that place or may be change the use of building to meet the new requirement.

Base on the information from RICS, the serviceable life span of aged public housing can be extending about 10-15 years, due to a systematic and cycle maintenance arrangement. Therefore, the aged public housings are structurally safe, that mean it is unnecessary to demolish and redevelopment.

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The life span components of public housing estates as follow:

Building Components

Life Span (year)

Window glazing

20

Plumbing

25-30

External wall tile

20-25

Vinyl sheet or tile

20-30

External paint

5-10

Internal wall paint

5-10

Waterproofing, bituminous coating

10

Wooden door

20-30

Hence, there are many factors affecting the life expectancy of building components and need to be considered when making replacement decisions, including the quality of the components, the quality of the installation, level of the maintenance, weather and climatic conditions and intensity of their use. Some components remain functional but become obsolete because of changing styles and styles and taste or because of product improvement.

RICS defined that the building structure may be designed using materials, components and technology that may last for about 100 years or more, depending on the quality and standards expected from users.

## **Methodology**

### **Research aim**

This research aims is to evaluate and critical review on the factor contributing to the decision between the adoption of maintenance and redevelopment of aged public housing estate in Hong Kong with determine the decision between maintenance and redevelopment in public housing estate from the questionnaire and interview and technical record of the building structure life span. The methodology consists of literature research, survey through questionnaires and interviews and reviews the opinion of tenant and government. With a view to do this, I will use the questionnaire and case study in the dissertation respectively. As a new research area, the researcher adopted a multi-faceted approach employing multiple methods for the collection of research materials.

There are several methods to do the research. The first method is to visit relevant government departments and officials in order to have a deep understanding to the research. The second method is that, by reviewing some electronic and printed documents as well as participant observations in order to have an up-dated and comprehensive understanding of the issues.

The main methodologies used for the dissertation are documentary review on relevant public housing policies particularly on the Comprehensive Redevelopment Programme (CPR) and Home CARE Maintenance in both

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printed and electronic form has been conducted. Besides, case study is used to examine the intention of government policy for redevelopment and maintenance for old public housing estate. The reasons for choosing the above case study for this dissertation can be specifically elaborated into 2 aspects: financial and environment impacts between redevelopment and maintenance that take place in public housing estates.

Furthermore, questionnaires were also used to serve the purpose of providing a through understanding of the old public housing estates physical environment, where the tenants live and socialize and their true-wish or desires on maintenance and redevelopment.

Research the existing old public housing estate in Hong Kong

In 2010, the public housing estate in Hong Kong which is less than 30 years old nearly 87% and about 13% estates were built before 1980. The most common aged public housing estate is Choi Hung Estate, Kwai Shing Estate, Lai King Estate, which is over 35 years old.

With a view to maintain the housing standards, public housing estates which are 30 years old or above are require upgrading by improvement measures or facilities. However, some other 30 plus years old public housing estates require to have redevelopment, because its structure is not fulfill the safe standard or becoming uneconomical to take maintenance.

For the reason that the oldest block design “ Mark I” to “ Mark VI” public housing estates and the former government low cost housing estates built in

the 1950s and 1960s are obsolete by today's standards, the above block designs were cleared for redevelopment in June 1999.

The Government started to redevelop these buildings in the 1970s. Up to 31 December 2004, 694 blocks of these estates containing some 249, 360 households were redeveloped.

### Review of building conditions in public housing in Hong Kong

In this section, I will present an overview of the current status of old public housing estates in Hong Kong.

In Hong Kong, the remaining early authority estates included, Shek Kip Mei Estate, Fuk Loi Estate, Choi Hung Estate. Although the living environment basically can meet the normal standards, it is not a fine condition in comparing with the public housing estate which built after 70s.

In the 1960's, there were some marginal improvement for the public housing design. The improvements not only increase a little more living space in the public housing units, but also the community facilities were significantly improved. Besides, the building block is bigger than before, the stories were increased to 16 and corridors were moved indoors, but neighborliness was discouraged by the long monstrous slab blocks.

Nowadays, all units in the ageing public housing estates are self-contained with basic facilities such as shower tray and water closet in the toilet, cooking bench and sink in the kitchen, drying rack, electricity, hot and cold water supplies etc.

In order to upgrade the facilities, a more energy-saving lift system will be introduced. Also, a security system will be installed in all rental blocks, which includes electronically controlled security gates and door phones for each unit and television surveillance system in common areas from the security counter next to the main entrance on ground floor.

## **Questionnaires Survey**

In this questionnaire, there are 10 questions to collect tenant opinion on this topic of Choi Hung Estate and Lai King Estate, also, it can collect more basic information of the selected estate

In order to ensure accuracy in the collected data by all interviewers, structured questionnaires was adopted in which similar ques