

**SUCCESSFULNESS OF GOVERNMENT FUNDED  
HOUSING PROJECTS FOR LOW INCOME  
INHABITANTS IN COLOMBO AREA**

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Last but not the least my wife and parents for all their support, dedication and for giving me immense moral support and strength.

## **ABSTRACT**

### **Successfulness of Government funded housing projects for low income inhabitants in Colombo area**

With rapid urbanization and growth in population, the poor community in urban areas like Colombo, have to be provided houses in high rise buildings due to the limited available area. This research is motivated by an effort to practically address the issues and critical factors of housing for low income dwellers in the Colombo city.

To achieve that, a proper study of the current issues which makes them dissatisfied has to be carried out. And this research tries to fill up the vacuum of knowledge about the low-income housing, analyzing the research contribution of the theory, the contribution to the research industry as well as to the profession. To achieve that objective, issues related to dwellers in government funded low income housing projects were identified by carrying out a comprehensive literature survey. And through user complains and case studies these issues were recognized and confirmed. At the first phase to establish a list of the issues which are affecting the successfulness of low income housing projects, complaint registry survey and interview of professionals who were involved in mentioned projects were used. These issues were analyzed to identify most critical issues which affects the successfulness of low-income housing projects. Interviews were conducted by using professionals who are involved in such projects from different backgrounds by using identified key issues. From the interviews with the participation of different parties of these projects, several point of views were received.

With these suggestions and key points, a framework was introduced. In that particular framework key strategies which can be used to enhance the successfulness of low-income housing projects are presented with relevant implementations. Therefore, in the framework, how to enhance the construction quality by providing solutions to low quality materials and fittings and construction defects are discussed. How to overcome design and planning errors will be analyzed with suggestions.

Eventually, this particular research provides recommendations to the professionals and policy-makers who are involved in low-income housing on ways to avoid issues related with low-income housing projects. Therefore, this framework will be a proper guideline for upcoming low-income housing projects in Sri Lanka.

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## ABBREVIATIONS

UN	United Nations
CMC	Colombo Municipal Council
UDA	Urban Development Authority
SMIB	State Mortgage and Investment Bank
HDFC	Housing Development Finance Corporation
NDB	National Development Bank
NHB	NDB Housing Bank
NGO	Non-Governmental organization
CPA	Centre for Policy Alternatives
URP	Urban and Regional Policy Program
ICC	International Construction Consortium
CECB	Central Engineering Consultancy Bureau
SEC	State Engineering Corporation
QA & QC	Quality Assurance and Quality Control
NBRO	National Building Research Organization
EIA	Environmental Impact Assessment
TIA	Traffic Impact Assessment
CEA	Central Environmental Authority
CEB	Ceylon Electricity Board
WRT	With Respect To

# CHAPTER 01

## INTRODUCTION

---

### 1.1 Background

According to 'forced migration review' by Marion Couldrey & Maurice Herson (2010), most of the world population already lives in urban areas and cities with nearly 1.5 billion people living in precarious informal and slum settlements. Estimates on 2010 show that there are 505 million slum dwellers in Asia and 827 million worldwide. 'Asian Development Bank's assistance for Low Income Housing Finance in Sri Lanka' report on 2011 says that according to the United Nations Human Settlements Program (UN-Habitat), a "do-nothing" approach will increase in slum populations, with numbers going up towards nearly 900 million worldwide by 2020.

As far as Sri Lanka is concerned, lack of individual dwellings can be introduced as one of the main issues in Colombo area today. With rapid urbanization and growth of the population, the demand for houses has reached a very high and uncontrollable level. As a result of that, unauthorized houses have become a major problem. In Colombo area, most of the areas located around the rail way tracks, canals have been occupied with these types of houses. Slum occupying 900 acres are scattered on government lands, canal banks, railway reservations and low-lying areas. According to Urban Development Authority (UDA) Development of Strategic Plan (2018), there are 68,000 households living in 1,500 under-served settlements in western province. The houses they live in are not stable and the environment is not suitable for human living. The housing problem in Colombo has worsened because of the rapid population growth, increased urban poverty, spiraling land costs, high inflation and interest rates in last few decades.

These poor inhabitants have nowhere to go other than settling at these unsafe and polluted places. Socio-economic, cultural and the educational background of these people are in a very pathetic situation as a result of that. These poor inhabitants also deserve to live in a pleasant environment and improve their standard of living.

Like all the other south Asian countries, Sri Lanka has been searching for temporary solutions to this problem other than a well-structured strategic plan. According to Thushara Samarathunga's reflections on over 100 years of urban housing policies in Sri Lanka (2013) urban housing policy and its birth can be divided into three stages: prior to independence from British rule (before 1948); after independence and the civil war (1948–2008) and after the end of 30 years civil war.

Due to the lack of space and land in Colombo city, vertical housing strategy of high-rise high-density came in to the picture as a solution. Urban Development Authority (UDA) sources confirmed that during last two years, the Urban Regeneration Project has awarded contract for construction of housing apartments in nineteen sites, containing twelve storied condominium housings. Urban Development Authority (UDA) Strategic plan (2018) states that, they have invested Rs. 44,000 million and Rs. 49,000 million from 2016 to 2018 to construct 8,900 and 9,900 housing units respectively.

The high-rise housing is considered as difficult to manage because it often has too many amenities and facilities which consist of public spaces, combined electricity and water networks, etc. But the lack of anybody who takes responsibility for the maintenance of the building has become a major problem. And because of the building design issues and socio-cultural issues, people are reluctant shift from their current slums to these houses. Some of these housing projects are affected by government policies and funding issues.

Some of the countries are not considering high-rises as a solution for low-income housing because of significant failures occurred in the past. But some countries have been using high-rise housing for low-income people successfully in order to aid the living conditions of the dwellers who live in shanties. In Sri Lanka, a very few researches have been carried out in this sector and they attempts to recognize the problems of the government funded low income housing projects in Colombo area. The main idea is by recognizing current issues adding value to these people's lives by giving proper recommendations to upcoming low-income housing projects in Colombo area.

## **1.2 Problem statement**

Even though the lack of dwellings for low income community has become a major problem in the Colombo city, this is yet to be fully addressed by any government. Most of the times the governments have taken the opportunity out of this issue to raise their political images. Even though they have implemented some sort of projects, the issue can be seen still unsolved mostly. Therefore, this problem should be addressed according to a well-structured plan taking all the stakeholders in to account.

Having mentioned that, there were few projects as well as on-going ones in order to full-fill these housing requirements. But sadly, most of the projects have failed to address and find answers to the actual requirements of the people. Most of the time, the people are not satisfied with what has been provided to them. There are conflicts between suppliers, professionals and the beneficiaries. Their true needs have not been identified and addressed and instead of that they have been provided some space to live with their family. Therefore, most of the people resist living in these houses due to various reasons. Lack of researches which have been conducted to explore these issues can be seen as a major problem.

## **1.3 Aim**

Aim of this research is to provide recommendations to enhance the successfulness of low-income housing projects through a structured identification of related issues.

## **1.4 Objectives**

- Identifying issues related to users in government funded low income housing projects in Colombo area through user complains and case studies.
- Analyzing issues and identifying recommendations to overcome these issues with the aid of expert views.
- Developing a framework to overcome critical issues in these projects.

### **1.5 Methodology**

A literature survey was done by referring articles, books, government publications, journals, reports, related dissertations in order to identify the issues related to this particular research area. By considering the facts found in literature review, user complains were reviewed in some low-income projects. Four case studies were carried out with some low-income housing projects located in Colombo area. First two case studies were based on the user complains of the housing projects. User complaints were gathered from the existing complaint registers. Then the third case study was done with the aid of letters, petitions and other relevant evidence and documents. Fourth case study was carried out by taking some terminated construction sites in to account. Based on the literature findings, user complains and case studies, the facts which are affecting these low-income housing projects were recognized and listed out. After a proper study of these facts, user complaint data were analyzed and issues which has a more effect on users were recognized. Similarly, these critical issues were pointed out from the other case studies as well.

Then expert interviews were carried out in order to identify suggestions and solutions to earlier found critical issues. Sample was selected from four different parties related to low income housing projects. Twenty-five number of professionals were selected covering consultancy sector, contractor party, design related and from administrative background. Four different types of interview structures were prepared using different types of questions which comes under the recognized key factors in order to conduct semi-structured interviews. Finally, interviews were conducted in order to extract expert views to recognize reasons, proposals and suggestions to key issues related to low income housing projects.

### **1.6 Scope and Limitations**

The study was limited only on the housing projects which are for low income people. And it will further concentrate on government funded housing projects which are constructed in Colombo area. Low income housing projects has most problematic areas out of all the types of houses. Colombo can be described as the heart and the financial

hub of the country. Urbanization has become a major issue and most of the lands are acquired by authorities for development work. Therefore, Colombo city was chosen for the study. And the government funded projects are the ones which has more problems in funding, legislation and regulations. Therefore, there is a national and social requirement of a proper framework and suggestions to overcome these problems for future similar projects.

### **1.7 Arrangement of Chapter Breakdown of the Research**

#### Chapter 01 - Introduction

Discusses the background to the research topic, research problem, aim and objectives, scope and limitations, methodology in brief.

#### Chapter 02 – Literature Review

Reviews the existing literature to identify the factors with related to the government funded low income housing projects.

#### Chapter 03 – Research Methodology

Describes the research methodology which was adopted for this study consisting research approach, data collection and analysis techniques in detail.

#### Chapter 04 – Data Analysis and Results

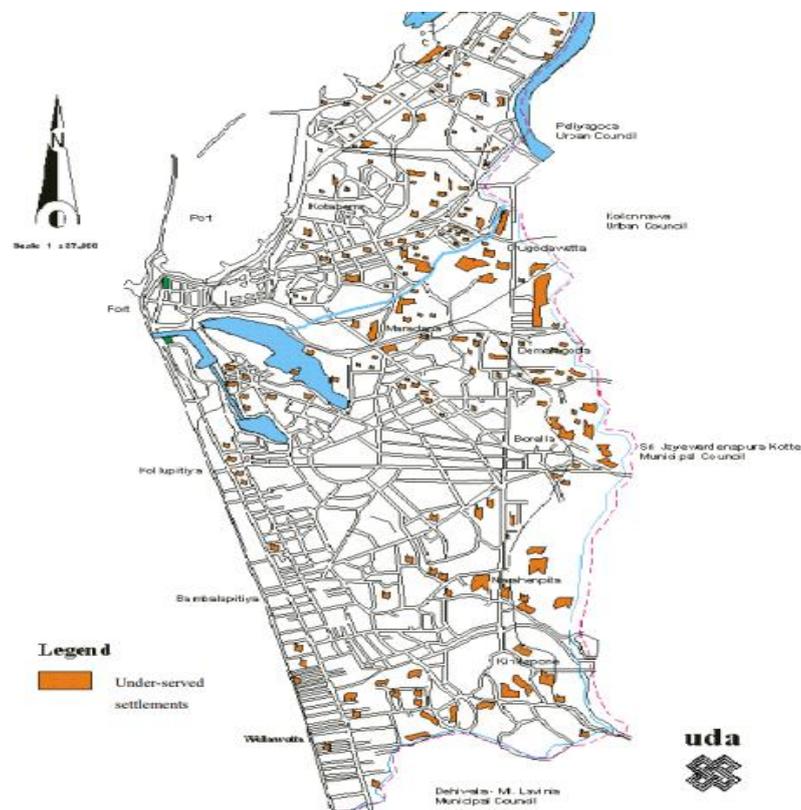
Presents the analysis of the collected data and research findings.

#### Chapter 05 – Conclusion and Recommendations

Concludes the achievements of research aim and the objectives and further consists of recommendations.

## 2.1 Introduction

The main purpose of this chapter is to search and evaluate the literature on housing for low-income people and their stance on these houses. Furthermore, the problems in these projects and completed houses will be discussed as well. This chapter specifically provides an overview of previous studies in order to identify the factors that affect the satisfaction on public low-income housing.

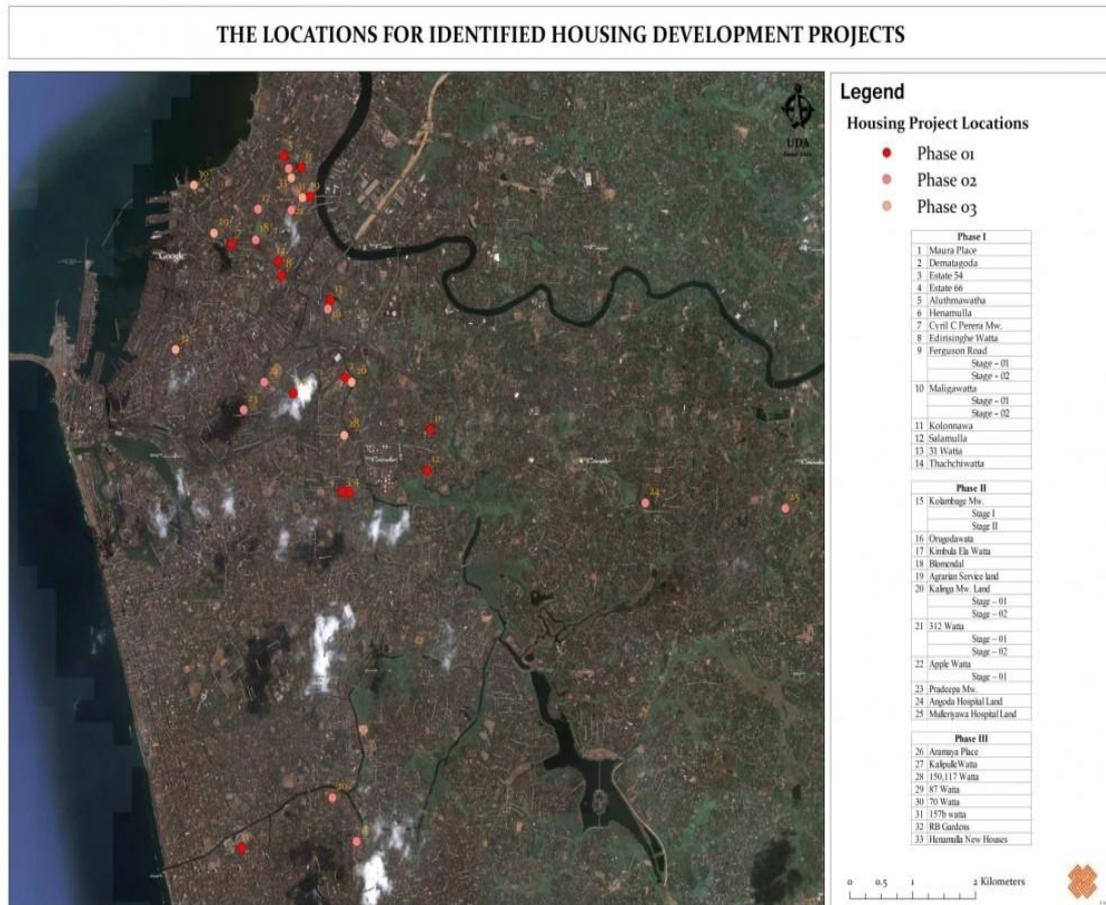


*Figure 2. 1 Under-served settlements map of Colombo area*

Source: UDA official web site

As far as Colombo city is concerned, most of the low-income people live in shanties which does not have good living conditions. As shown in the figure 2.1, the most of the area in the city has been occupied by these dwellers, which makes a strong negative impact on the city image as well.

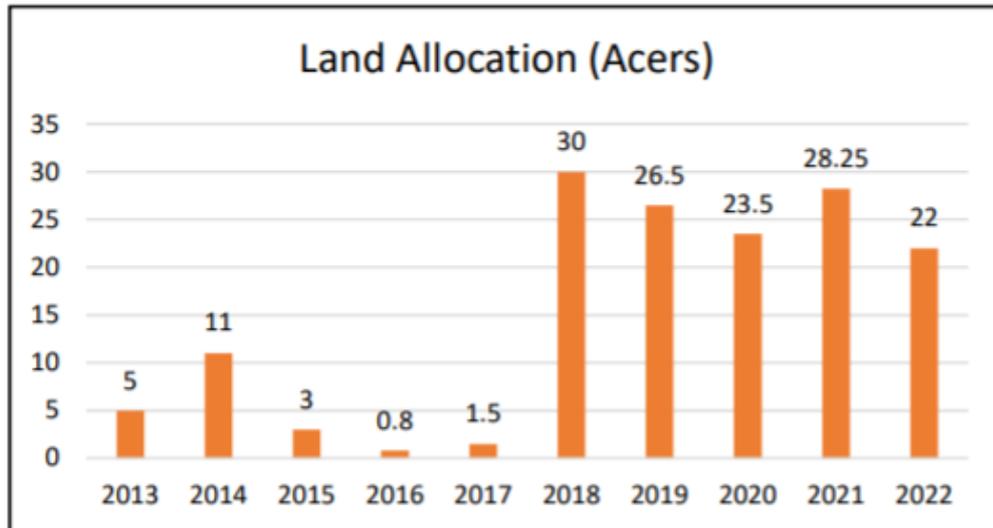
UDA has been working on this matter for a long time now and the figure 2.2 illustrates the locations which have been identified for housing development projects in Colombo city.



**Figure 2. 2 Identified Housing Development Projects:**

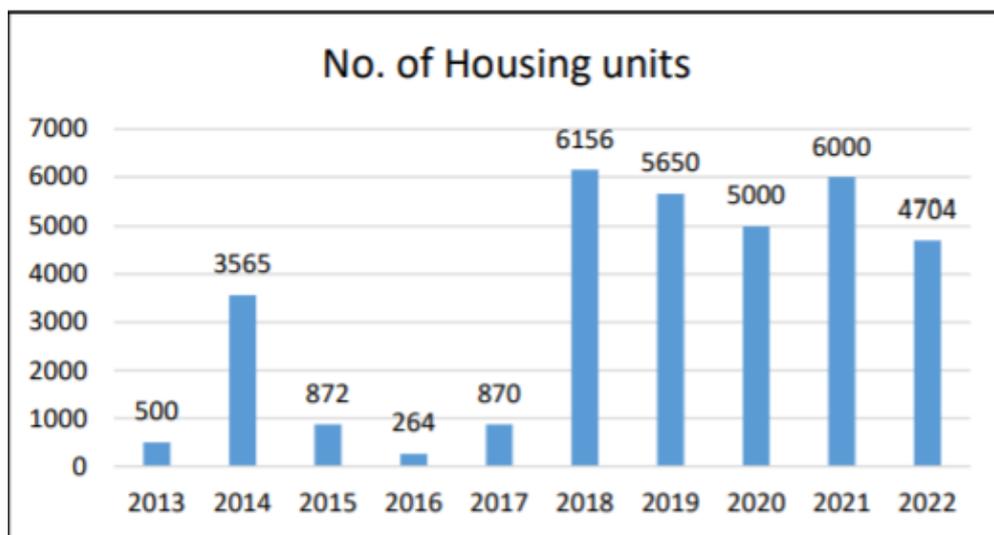
Source: UDA official web site - urban regeneration programme

A comparison of the land allocation for Urban Regeneration projects have been shown in figure 2.3. Unavailability of lands which are located nearby town area has become a huge problem when finding answers to this housing problem. The affected people are usually reluctant to go for remote areas due to their life style issues. Housing units provided and forecasted through-out years have been shown in the figure 2.4. According to UDA Development of Strategic Plan 2018, UDA has provided 6,071 no of housing units for last 5 Years and will provide 27,510 more housing units from year 2018 to 2022.



*Figure 2. 3 Land Allocation for Urban Regeneration Houses*

Source: UDA Strategic Plan 2018



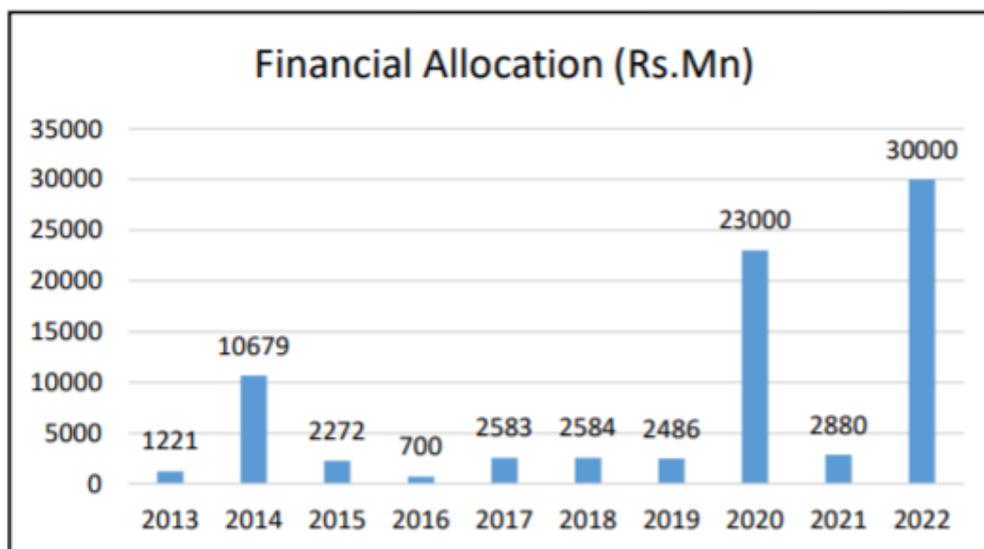
*Figure 2. 4 Number of housing units' comparison*

Source: UDA Strategic Plan 2018

Finance for these low-income housing has become a major issue now. It can be seen that the government's fund allocation is not matching the housing requirement of the city. Figure 2.5 illustrates how the financial allocations are being made and forecasted through-out the years.

By analyzing these three graphs it is evident that in recent past years, the supply of the houses and allocation of funds has not been addressed by the authorities. Therefore, the

planning amount after 2018 has a huge difference compared to last years. However, the implementation of these plans remains as a big question due to the frequent political and policy changes which occur in the country recently.



*Figure 2. 5 Fund allocation comparison*

Source: UDA Strategic Plan 2018

## 2.2 Concept of Housing

Housing is one of the basic and essential needs of the mankind. A house is defined as a home, shelter, structure which is a place for habitation by humans. (Gilbert 2007). According to United Nations Universal Declaration of Human Rights, housing can be introduced as the right of all the people in the world. United Nations in 1948, formed a set of standards which are recognized globally for all the people, without any qualification. A house is where it reflects man's expectations, values, aspirations, and the social and cultural identity of its people and of whole community (Deheragoda 2004). Needs a house for a man is shown in the table 2.1.

Considerable amount of people in the world today are living without a proper shelter despite the cultural roots of housing in human civilization. According to Musterd (2010), the lack of proper houses which are habitable expanded as a world-wide problem. This issue is becoming a major problem in third world countries. For an example in Sri Lanka, due to major issues including rapid urban population growth,

poverty and unplanned urbanization, poor economic and development strategies, this issue is becoming a huge problem in urban areas like Colombo. According to Urban Development Authority (UDA) Development of Strategic Plan (2018), there are 68,000 households which can be seen in 1,500 under-served settlements in western province.

*Table 2.1 Need of a house*

NEEDS FOR HOUSING		
1	Shelter	Need for privacy, food consumption, sexual behaviour.
2	Security	Need for stability, protection, freedom from fear, structure.
3	Comfort	Need for freedom, reputation, prestige, dominance, dignity, attention.
4	Socialisation and self-expression	Relation with people and places, homes and neighbourhoods.
5	Identity	Need to create a mark of identity for oneself. An address provides an individual with this type of identity.
6	Aesthetics	Need for order, symmetry, colour, texture, system and structure.

**Source: Dayaratne & Kellett 2008**

Currently, the Municipal Council of Colombo administrative area has 3729 hectares. As indicated by to the Population and Housing Census, Sri Lanka had a population of 19 million with a 1.1% of annual growth rate in 2008 (Department of Census and Statistics, 2010).

The rapid growth of the population can be seen as one of the major reasons to these housing problems. Through years, the growth of the population is taking place in a drastic rate as shown in table 2.2. Therefore, matching these numbers when finding solutions to this housing problem, is becoming a major challenge day by day.

**Table 2. 2 Population density & growth rate of Colombo (1870-2010)**

<b>POPULATION DENSITY AND GROWTH RATE OF COLOMBO (1870–2010)</b>				
<b>Census Year</b>	<b>Extent (Ha)</b>	<b>Population</b>	<b>Density (P/Ha )</b>	<b>Growth Rate (%)</b>
1871	2448.6	98847	40	-
1881	2448.6	110509	45	1.18
1891	2448.6	126825	52	1.48
1901	2720.6	154691	56	2.2
1911	3091.1	211274	68	3.66
1921	3350.3	224163	73	0.61
1931	3368.4	284155	84	2.67
1946	3438.4	362074	105	1.83
1953	3593.9	425081	118	2.48
1963	3710.4	511639	138	2.04
1971	3711	562430	152	1.24
1981	3711	587647	158	0.45
2001	3729	647100	173	0.45
2010	3729	682046	182	0.46

*Source: Centenary Volume, Urban Development Authority 2010*

### 2.3 Public Housing

Robert Collinson (2015) states in his research paper ‘Low income housing Policy’ that, public housing the government’s first main housing program for low-income community, was established by the 1937 Housing Act. He states that it was funded by the central government but developments of public housing are authorized and managed by local governments, which controls siting, tenant selection and design.

Public housing can be introduced as a form of housing authority which is owned by the government. Social housing is rental housing which is managed and owned by the state or non-profit sector.

## **2.4 Under-served Settlements and Low-income Housing**

‘Under-served settlement’ is the term which accepted commonly which is used for all the uninhabitable housing located in Colombo city (UDA 2011). If settlement is not providing a lifestyle which is healthy, not having a safe environment for its community and which is legally not approved, the Urban Development Authority considers it as ‘under-served’.

According to ‘High-Density High-Rise Low-Income Housing: An Appropriate City Planning Solution for Colombo, Sri Lanka by Thushara Chaminda Samarasinghe (2013), ‘Low-income’ term differs from one place to another place and what is seen as low-income in a developed country could be an upper income level in another developing country. Finding solutions to low-income housing is a debatable fact which is often connected with housing and household income. Fixing boundaries to define low-income and low-income housing is not an easy task. After considering Central Bank’s 2008 Colombo poverty profile (2008) and present socioeconomic data on the inhabitants of Colombo, there is a definite income bracket which correlates to ‘low-income’. But, in the re-housing programs of the government, not only income, but also the place they live must be taken in to account in defining a low income. Therefore, low-income people for this particular research can be defined as the people who lives in under-served settlements in Colombo area by not considering official poverty profile and individual household income.

In other south Asian countries also the term of ‘Low income housing’ is used, other terms used world-wide are social housing, public housing and affordable housing. (Dayaratne & Kellett, 2008). Even though there are variations in these words, the main idea is the same – it is defined as houses that are designed for groups which are unstable economically in society and are subsidized by the government or any other organization.

## **2.5 Urban Housing Policies in Sri Lanka:**

As reported by Business Times on 18.03.2012, until 2011 low income high-rise housing was not considered in the urban plan of Sri Lanka. After that, the government has tried to convince urban slum people in order to relocate to nearby high-rise housing units by

reclaiming already occupied lands for development work. Urban policies up to date in Sri Lanka are mentioned below.

- (Before 1948) British colonial period - pre - independence
- (1948 to 1969) The origin and evolution of the urban housing policy
- (1970-1976) Socialist housing policies
- (1977-1983) Housing Policy
- (1977–1983) The hundred thousand houses program
- (1984-1989) One million houses program
- (1990-1995) 1.5 Million houses program
- (1994-2005) Compact city development
- (2005-2010) ‘Mahinda chinthana program
- 2009 Onward - Relocation of the under-served settlement program  
(Reflections on over 100 years of urban housing policies in Sri Lanka - Thushara Samaratunga\* , Daniel O, Hare 2013)

## **2.6 Housing and Environment:**

Lazenby, M.(2007) highlighted that there are four types of environments implying on man.

- Physical environments
- Socio-cultural environments
- Psychological environments
- Physiological environments

Therefore, causes of inadequate supply of affordable housing can be divided in to social, physical, financial and institutional causes. Effects of this problem are also can be categorized in to social, physical and financial effects which has been elaborated in the Figure 2.6 with their causes and effects.

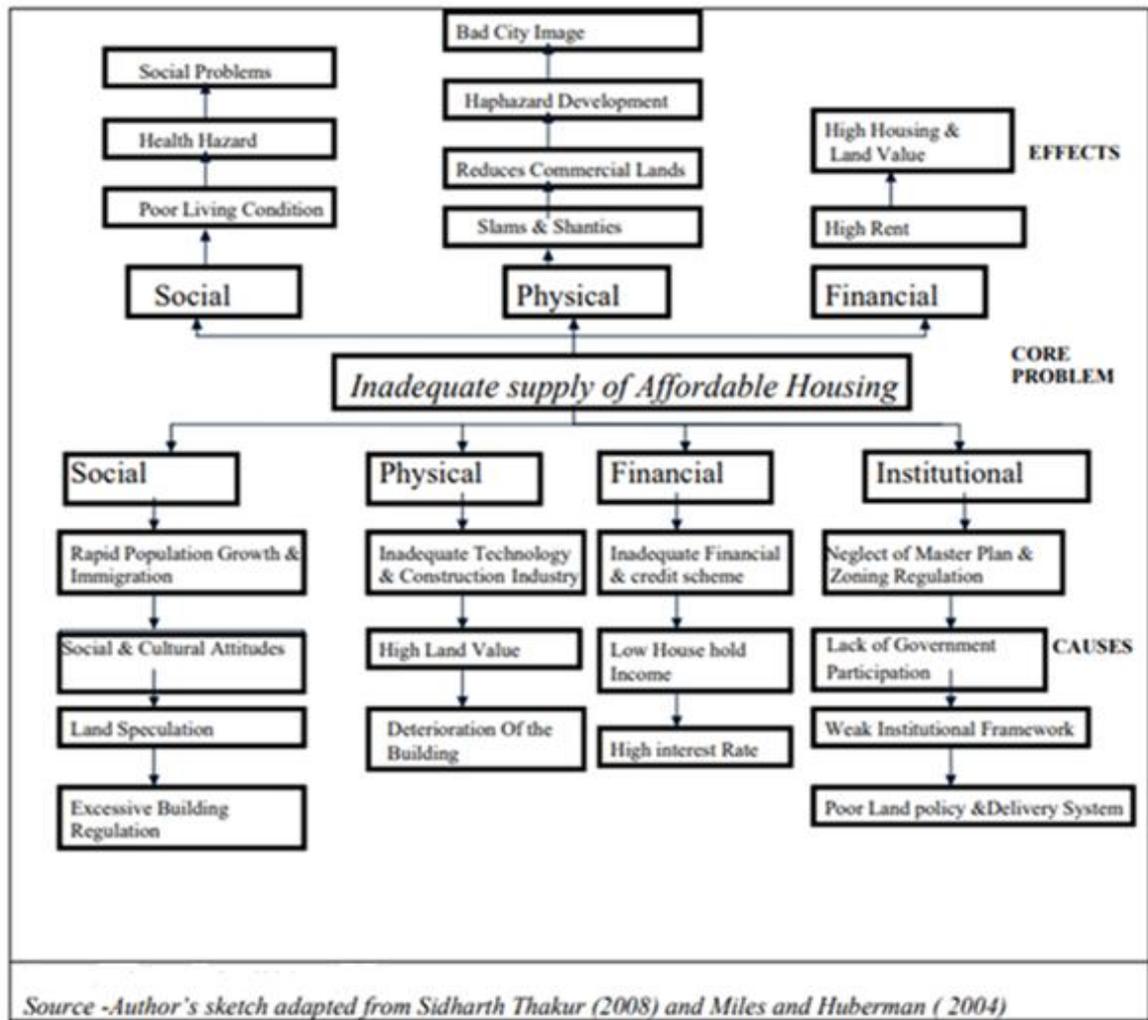
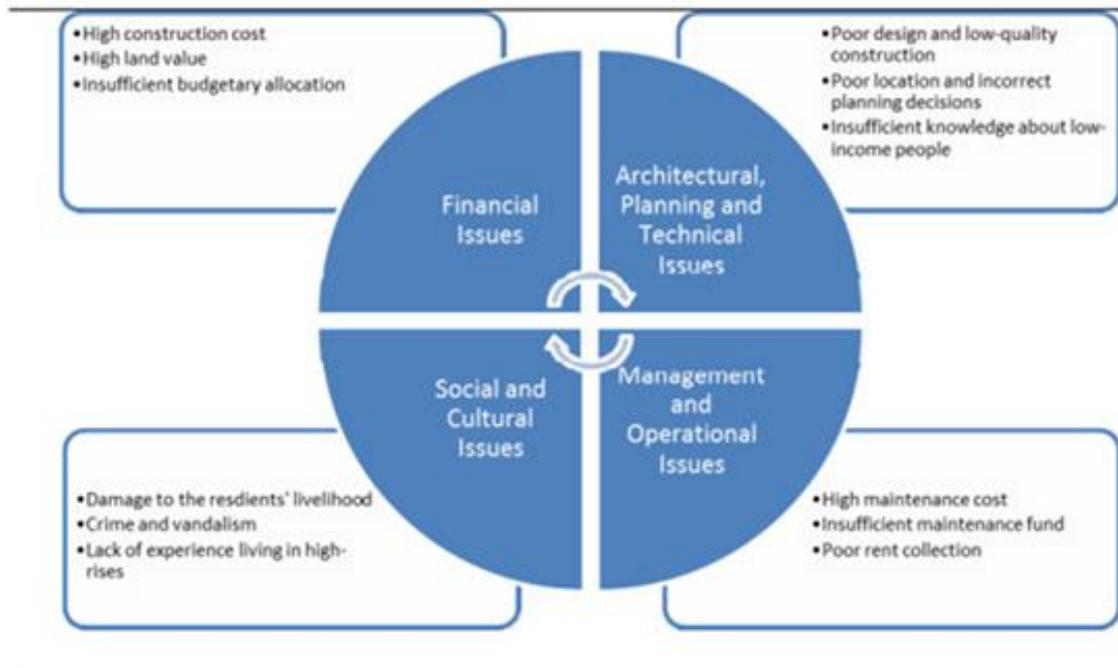


Figure 2. 6 Problem tree analysis

## 2.7 Evaluation of Successfulness of Low-income Housing Projects

Successfulness of low-income housing projects can also be analyzed with causes and effects. Generally, these issues can be categorized in to financial issues, social and cultural issues, technical issues and management issues as stated in the Figure 2.7 evaluation model by Samarathunga (2011). Therefore, the successfulness can be evaluated by an evaluation model which consists of different issues which are affecting low income housing projects.



Source: Author's sketch : Samaratunga, 2011

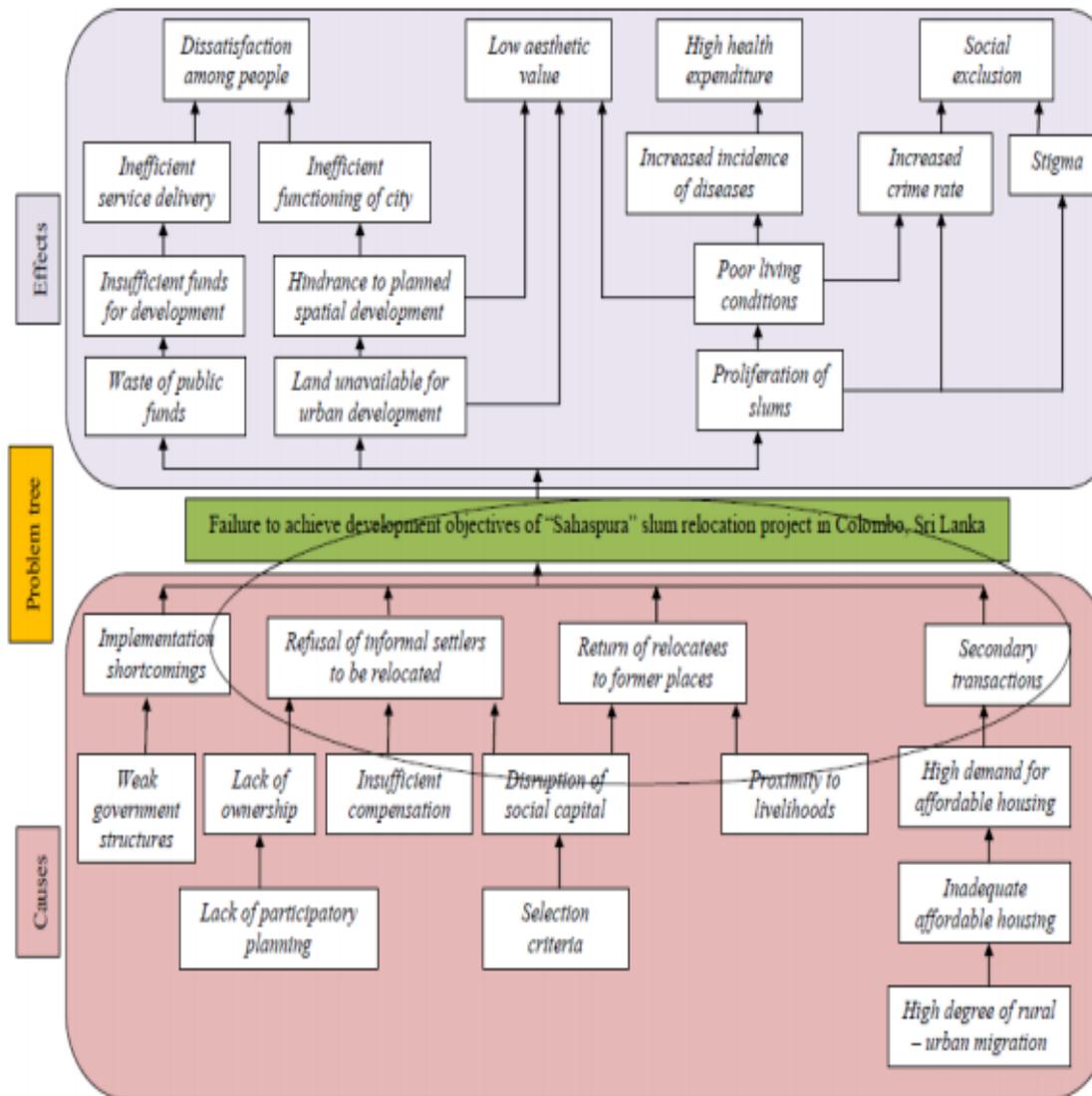
**Figure 2. 7 Fund allocation comparison**

According to Mohit (2010) residential satisfaction of low income low cost houses can be divided into sub categories as mentioned in the table 2.3. Variables which affect each component are mentioned in it.

**Table 2. 3 Residential satisfaction of public low-cost housing**

<b>RESIDENTIAL SATISFACTION OF PUBLIC LOW-COST HOUSING</b>	
<b>Components</b>	<b>Variables</b>
Dwelling unit features	Dwelling unit features refer to the floor plan of dwelling unit, for example living, dining, bedroom, kitchen, bathroom, toilet and drying areas and ventilation.
Dwelling unit support services	Support services outside the dwelling unit, for example corridors, staircase, balconies, electricity supply, water supply, sewerage, drainage, telecommunication, lifts and fire-fighting systems.
Public facilities	Open space, play areas, parking, prayer and multi-purpose halls, perimeter roads, pedestrian walkways, public phones, local shops and food stalls.
Social environment	Noise, crime, accidents, security and community relations.
Neighbourhood facilities	Distances to town centre, school, police station, hospital, market, shopping centres, public library, religious building, LRT, bus and taxi stations
<i>Source - (Mohit, et al., 2010)</i>	

‘Sahaspura’ housing project was one famous and biggest low income housing projects in Colombo area. But according to Samaratunga, C. (2013). ‘Sahaspura’: the first high-rise housing unit complex for low-income community in Colombo area it has been said that it was criticized later for number of issues. Sahaspura has 14 storeys with elevators in it. It actually failed to fulfill its objectives and community needs as a project. Analysis of causes and effects of ‘Sahaspura’ project are briefly mentioned in the figure 2.3 by considering the causes, problem tree and effects.



**Figure 2. 8 Factors contributing to the failure of development induced resettlement**

Source: S.L. Dhammika K. Wijayasinghe (2010)

In a study of ‘Factors contributing to the failure of development induced resettlement- A Sahaspura case study stated that the entire development target of the resettlement project was not achieved. It can be studied by referring the figure 2.8 problem tree.

Therefore, it is important to investigate what makes these families to reject the project in order to correct any mistakes that could have been made. As far as global projects are concerned, the Pruitt-Igoe public high rise housing project is a famous example as an utter failure. According to Wikipedia, it was initially occupied in 1950s in the US city of St. Louis, Missouri. Conditions as well as standards of living in Pruitt–Igoe started to fall down drastically soon after 1956. After 1960s, it got very popular for

poverty, crime and then all the 33 buildings were removed by demolishing. This particular project has become an icon of failure of urban housing and of planning in public-policy. All the issues related to this particular project also can be put into four main sub areas:

- 1) Issues in cultural and social
- 2) Technical issues - Architectural, planning & designing
- 3) Financial issues
- 4) Operational and management issues

Therefore, it can be seen from these examples and case studies that these issues in all low-income projects now a days can also be put in to these four categories for a perfect analysis. Through this categorization it is much easier to recognize issues and their solutions from a good analysis. Therefore, these four main categories will be discussed according to the carried-out literature survey.

### **2.7.1 Social and cultural issues**

Social and cultural background is very important factor in these low-income housing projects. Even if all the other areas have been addressed and this social cultural issues are not been considered, it will be not a successful project for sure. The Pruitt-Igoe development made some huge blunders in the aspect of social of the housing project right from the start. Carelessness in the basic design could result in big damages to the whole society. According to Hoffman “The Pruitt-Igoe structures were very successful, but the designers ignored the very basic social requirements”.

#### **2.7.1.1 Reluctance to change their life styles**

A common issue in these projects is that the people are reluctant to change from the life they are used to. According to Hisham (2012) Attitudes of the people who live in these lands is the vulnerable part in this procedure and the successfulness needs active participation from the community. Interference of the central government and good community leadership is also needed in this particular process because of the risk and time factors. Mainly the willingness of the relevant people to participate are also crucial as stated in STP & REEL (1999). Forced evacuation or relocation is the final result of this thinking pattern. But according to authorities, that method is no longer in use and

instead of that a proper negotiation between the people, developer and city authority are the key strategies which should be practiced. But the main issue is this process is lengthy and during this process time poor dwellers has to suffer. In this case constant monitoring and strong three-party agreements play a big role to overcome these issues.

The multi-story concept in residential buildings was a new one for Sri Lanka. It arrived from Europe by the Britis. Samarathunga (2001) states that the Sri Lankan people prefer to use their normal houses which are single unit which has open spaces around these people with close social interaction among the community. But due to the rapid growth of population, growth of economy, security of lands, high real estate value and variations in cultural norms, this has changed drastically in urban areas. And these changes have affected the traditional living cultures and life styles as well. This has prompted towards a new concept which is called the high-rise. As stated by C.T Samarathunga in his paper 'High-Density High-Rise Low-Income Housing: An Appropriate City Planning Solution for Colombo', in the early 60s, this concept of high-rise housing had been introduced for middle-income people in the area Colombo. But in 70s and 80s, multi-storied housing was used on low-income housing and started having 3 to 5 storied housing unit blocks for low-income dwellers

According to the article on Geo Sri Lanka 'Rehousing the poor in Colombo, repeating the mistakes?' by Phil Brighty (2016) not having enough space has been a major concern in these housing units. Most of the new coming apartment is around 400 square feet. The 'one apartment per house' policy has raised more eye brows because it has resulted in some apartments filled with 14 people. The lack of space has affected life styles and employments and businesses of majority of these poor community. Schools of these poor children are now located far away from their homes. These problems has prompted them to change or rather completely stop schooling.

#### **2.7.1.2 Social sustainability through social recognition**

As far as social sustainability is concerned, social sustainability through social recognition can be introduced as one of the most important factors. Good housing can be given by the central government to these people, but recognition socially in the community has to be developed by themselves. The social neglecting of the most these

people has become a common problem now a days mostly because of the lack of recognition by formal sector. As stated by Niriella(2005) the dwellers of Sahaspura have developed their recognition later with compared to earlier status. But, they are still considered as shanty residents and largely looked down upon from others. ‘‘Sahaspura’’: the first high-rise housing project for low-income people in Colombo’ by Samaratunga (2013) states that, If people are to get a good recognition from the society, they have to be financially strong, socially and developments must target mental and behavioral statuses as well.

‘A study on housing approaches for low income in Srilanka with special reference to their socio-spatial organizations’ by D.D Bogahawatta(2004) mentions that there is no ‘profit’ factor to the government by providing houses for low-income people. Due to that each and every strategy should be economical to make such projects viable. It has been stated that the socio-spatial organization is very important within the low-income dwellers unlike high or middle-income community. They are being forcefully socialized because of many reasons and these issues have a big effect on sociability of these people.

Concentrating on political and economic aspects by forgetting the socio cultural qualities of the people has caused many problems on their living styles. In the dissertation ‘Extensions & modifications in low income housing’ by A De Silva (2011) states that, the community do their own alterations and modifications to the built form completely forgetting the rules and regulation, in order to achieve the qualities which have been lost. In order to give better living conditions within affordable economic conditions is not an easy task, especially for the low-income community

### **2.7.1.3 Forced evictions**

As mentioned in the research paper ‘The right to adequate housing following forced evictions in post-conflict Colombo by Collyer, Amirthalingam and Jayatilaka (2017), forced evictions are mainly introduced as a human rights violation. Forced eviction can be defined as the removal against their will of communities from their houses and lands without the provision of, and access to, necessary forms of legal (CESCR 1997, para 4). According to the authors development in urban areas almost costs some to shift their

homes and this cannot be called forced eviction. In Sri Lanka, it is generally called 'resettlement' and the history runs for a longer period of such incidents related to development, natural disasters and conflict. But how ever according to Prera, I. CPA Report – 'Forced evictions in Colombo high rise living', during the period of Mahinda Rajapakse government, there were so many complains made by the community about forced eviction by using army officers. However this forced eviction or moving people by force without having a proper agreement with them should be completely eliminated in these low income housing projects.

### **2.7.2 Architectural and planning issues**

As mentioned earlier 'Pruitt-Igoe' considered as the end of modern architecture due to its complete demolition. According to Domingo (2011) it symbolizes a faith loss in abilities of Architects in order to design an answer to issues and high-rise public housing. As stated by Hauge (2012) engineering issues, technical issues, planning, architecture and design, are reasons to the failure of high-rise housing for low-income community in the past. Therefore, professionals must also take responsibility for these types of mistakes failures in housing projects.

'Adapting to urban displacement by Marion Couldrey & Maurice Herson (2010) has seen that the major obstacle is to build-up paths of coping with the current system of municipal and other organizations. According to the authors, inter-agency cooperation is one of the major reasons in successfulness of humanitarian work operations in town area community but the range of interlocutors is substantial and consists of central governments, line departments of all type of governments, service-providing agencies urban councils and departments which are related to technical, faith-based groups and academia and police forces, organizations based on community.

According to 'High-Density High-Rise Low-Income Housing: An Appropriate City Planning Solution for Colombo by Thushara Chaminda Samarathunga (2013), at the stage of designing, the architects has a major act to play in these low-income housing projects. Many of the risks related with these projects can be eliminated with a properly planned and creative design. But generally what happens is majority of the low-income housing unit complexes are designed by taking financial factors in to account.

According to ‘Low cost housing a continuous struggle’ by Peter A. Erkelenis(2007), Factors need to be considered in low income housing designing are mentioned below.

- Availability of local materials
- Applicable building regulations
- Building traditions
- Climate
- Patterns of technologies
- Difference in culture
- Availability of land & title deeds

### **2.7.3 Financial Feasibility**

Another major factors in the successfulness of land exchange and land sharing programs are increased land value, high property market and stable economy. The main concern is private investors might not consider about the social uplift of the poor community since their target is mainly profit oriented and they invest only in projects which are profitable to them. Today most of the housing projects are funded by local as well as foreign banks. On the other hand, according to the UDA (2018) there are certain projects which has foreign private sector investors such as VGC housing project located at Colombage mawatha.

### **2.7.4 Management and maintenance issues**

It has been experienced the fact that high-rise housing complexes are not easy to manage, whether it is government or private. According to ‘High-Density High-Rise Low-Income Housing: An Appropriate City Planning Solution for Colombo’ by Samaratunga (2013) it often consists of so many facilities with passenger lifts, areas, water, current and drainage lines. But the lack of management and proper distribution of responsibility for the proper management has become a major problem. Having a proper management corporation is very important factor in order to look after the management and maintenance work. Samaratunga (2013) furthermore states that, it is important that the governing entity has sufficient funds in order to keep the housing units in proper condition. Lack of maintenance has become a major problem in these

low-income high-rise buildings and housing associations of these housing complexes do not often have sufficient funds to undertake day to day or regular maintenance.

According to the author Samaratunga(2010), reluctance to occupy houses and problems in collections of rent has become the reason for the lack of the finance for management and maintenance, what has seriously affected to the standards of the housing units. Mainly in Sri Lanka since the low-income community believes that the responsibility of the government or other authorities for the proper maintenance and management, an attitude change must be there from the society. Previously, there was no need to have a proper entity for these complexes and the management was carried out by a housing ministry common amenity board. But since the Sahaspura project this particular system was changed and now it is a must to form a management entity which has the responsibility for maintenance of the building and facilitating the community of these housing projects. But even with this requirement, most of the housing projects has failed to keep a proper maintenance due to many reasons.

According to ‘Design of a Preventive Maintenance & Management Mechanism for Public Urban Housing Schemes’ by Deepika Fernando (2010), there are some important factors to be covered in recognizing the areas connected to management and maintenance which includes,

- Surface runoffs and storm water drain
- Solid waste management
- Sewerage & other waste water systems
- Public areas like stairways, corridors, gardens and open areas, playing areas, parking and community areas etc.
- Supply systems of drinking water like water sumps, water lines, pumps, water storage tanks etc

## 2.8 Mechanisms adopted by the government to persuade the inhabitants to be relocated and resettled in “Sahaspura”

According to ‘Factors contributing to failure of development induced resettlement projects’ by S.L.D.K Wijayasinghe (2010), during project implementation stage information seeking program and marketing program and for target group was introduced. However, it could have been better if consulting them during the project planning stage on the type of housing, design and allocation of housing units was taken place. According to the author, the project did not address the requirements of community and includes many features that are not satisfied to the people. The procedure used for of compensation was not transparent. The compensation was only concentrating on assets which are physical and no attention was paid to socio-economic aspects of the community. He further more adds that forced evictions never happened during the implementation and effort was made to persuade target group in order to resettle and relocate in “Sahaspura”. Evaluation criteria for making a sustainable living environment in Sahaspura housing project which was done by Samarathunga (2011) is stated below.



*Figure 2. 9 Sahaspura- Criteria of evaluations for making a sustainable living environment*

Source : Samarathunga (2011)

## **2.9 High density high rise housing policies development in Colombo area**

Samaratunga (2010) in the research paper ‘High-density high-rise low-income housing: An appropriate city planning solution for Colombo, Sri Lanka?’ stated that most of the key informants of his research liked the prevailing policy of housing being used in high-rise housing for low-income community in Colombo area. He has been critical of the forced eviction method of the government of slum dwellers which had been criticized as a severe violation of ethics and human rights of the people. He furthermore adds that in 1999 when the concept of high-rise housing came in to the picture, some protests were there due to the lack of knowledge about the concept and its adaptability. Most of professionals in the country doubted that high-rise development is not going to be a good alternative proposal.

### **2.9.1 Potential effect of the regulations of local government on low-cost housing**

Local governments in Sri Lanka limits land use in different ways. According to ‘The Affordable Housing Shortage: Considering the Problem, Causes and Solutions’ by Ron Feldman (2002), local government can be specific in materials which can be used, the method of construction and the housing units features. Government also gives regulation of macro-land use finding the full available land for different sorts of housing like multi-unit apartments and units of houses permitted for particular area. As stated in the paper, local governments by forecasting fees also affect production of houses on development and wanting those to come across a long mechanism of approvals and documentations.

By raising the quality of materials, using good practices, and coordinating the design of a community, some of these regulations can enhance the quality of houses. On the other hand, in low cost housing, these regulations might have a particularly deleterious effect. Limiting the total number of housing units produced can be happened due to this process. He further more adds that methods of construction, materials standards, and management also makes an impact on the cost due to the requirement of the builder to buy more quality and expensive materials or avoid building methods in order to reduce the cost of construction.

### **2.9.2 Land and Urban Planning: Issues and Challenges for a New Urban Agenda**

‘National Report for Third United Nations Conference on Human Settlements Habitat III (2015)’ describes that system of planning in Sri Lanka is comparatively good at macro levels; but at micro levels some serious issues on some areas can be seen. It strongly recommends that the implementation strategy should be reviewed and revised. But since at the levels of local authority, planning not being decentralized and even where it is, the local authorities are not good enough technically to do tasks, planning at micro level seem to be ad hoc and fragmentary. Negotiations with investors and relevant parties in order to concentrate on aids which could get from a project cannot be taken as the norm.

### **2.9.3 Challenges and critical factors for a new urban agenda: Urban governance and legislation**

According to ‘National Report for Third United Nations Conference on Human Settlements Habitat III 2015’ national Constitution is under review; modern thinking on decentralization and devolution could come in to the picture. Local authorities empowering has also been considered in the scope of plans and corrections in framework in which local authorities are functioning and the connection to central and provincial government will be considered to be changed. An updated way of planning which addresses almost all the levels has been in the discussions. Provisions in the constitution which the powers which are used by local authorities cannot be decreased or eliminated will make sure those updates will provide strength to local authorities. Would there be a considerable increase in the capacity of local authorities remain as a question considering the Centre-oriented state structure of Sri Lanka.

### **2.9.4 Developing urban land management, including addressing urban sprawl**

Within town areas management of lands is directly related to planning of urban development. Adopted methods of government authorities in order to manage urban land effectively connect to regulation, planning and standardization aspects. As far as level of urban planning is concerned, land use of land is legalized by the recognition of areas for activities which have been specialized. According to ‘National Report for Third United Nations Conference on Human Settlements Habitat III 2015’ building footprints, floor area-ratios, building height restrictions and total allowable square

areas have been used to maintain a tab on intensity of activities of different areas that fulfills requirements of transport. Government authorities are using the authority to convince owners to change the land parcel shapes in order to prevent future buildings on irregular shaped sites affecting the city image. Use of lands for housing projects are also legalized in order to optimize densities, infrastructure, drainage waste disposal, sewerage and provision of amenities of public. Access to education and health facilities should be taken in to account as well.

The greatest environmental issue of UN Habitat III Country Report- Sri Lanka (Page 15) states this is the reducing of cultivation areas which act as areas of water retention in rain seasons. Middle-class community reduction from urban areas making low-income and rich community in the urban area might not be desirable when considering diversity aspects.

### **2.10 Success Factors for Housing Projects**

The theory of housing adjustment was presented by Morris and Winter on 1975 which presented a framework in order to evaluate cultural norms and the adjustment of housing behavior of families, by considering family norms. He stated that, families are taken as judging their housing considering family and cultural norms. When housing does not meet these factors, this provides dissatisfaction, tend to decrease the normative deficit. Residential adaptation, mobility and family adaptation are the ways of adjustment used in order to decrease such deficits, and are undertaken when the restrictions on the behavior could be eliminated. (Morris & Winter, 1975). This particular theory has been used by many researchers in order to evaluate the complex process of decision-making regarding housing society of America. But, the main idea of this theory is not only to geographical location or a specific field of housing and it is used for future research work in low-income housing, non-metropolitan and metropolitan women, rural households and older-age ones. (Steggell, et al., 2003).

Residential satisfaction can be taken as a major area used to judge the success of housing project and the housing adjustment theory can use to explain residential satisfaction in high- rise low-income housing in Colombo as well as searching ways to develop the conditions of living in housing for low-income community.

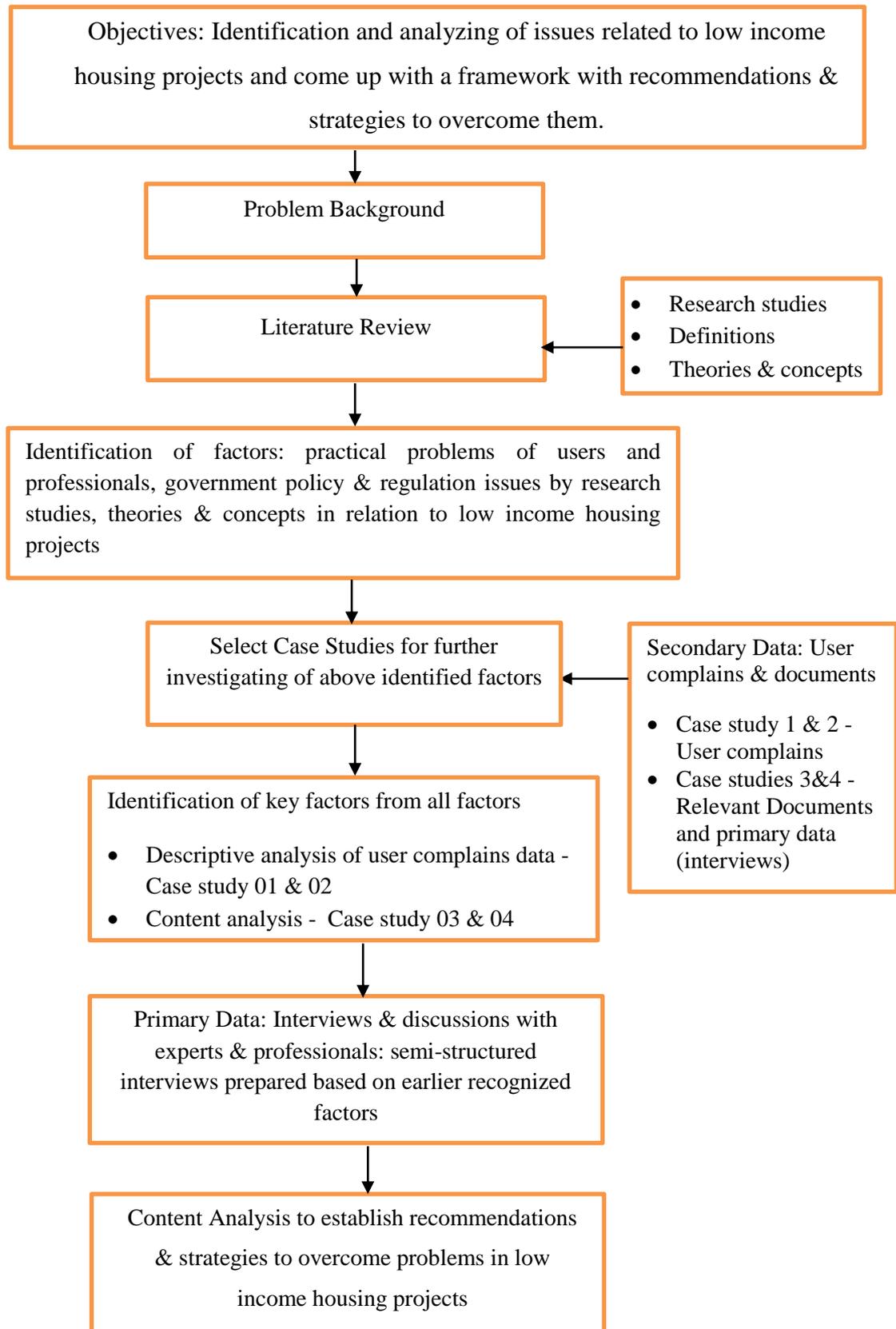
According to Jones (2012), low income people, are categorized into four different types groups of communities. The first group uses the chances to enhance their living condition and chase away the slum background from their lives. Other ones, although they have gone out from slums to these houses, do not express about the opportunity they were given and do not think about any improvements in their living styles. The other ones try to re-sell their houses and try to go back to their normal slums. So that, it is very important to consider about Theory of Slums in this particular research and it gives a better platform and framework in order to carry out the selections to relocate to these houses. Residential satisfaction can be introduced as a major criteria used in order to judge successfulness of low-income people. According to Mohit, et al., (2010) satisfaction of low-income housing relies on the management of the surroundings and facilities.

According to Mohit, et al., (2010), variables that has a strong effect on residential satisfaction contain few components. They are dwelling unit features, dwelling unit support services, non-sheltered components public facilities, social environment, neighborhood facilities. So, this particular model can be taken as a tool to judge the successfulness of housing for low-income dwellers in Colombo area and gives a basis for forming a theoretical framework in this particular research.

#### **3.1 Introduction**

This particular chapter discusses the procedure and structure used for this research study. It describes the research process and accordingly describes the research design including research approach, data collection and analyzing techniques in detail.

Firstly, research process will be illustrated with the help of relevant diagrams and figures. There, the steps which are used to carry out the research will be shown. Step by step how the research is carried out in order to achieve objectives from the data collection methods to ways of analyzing methods will be described. Research process consists of a series of steps in the desired sequence that is necessary for the effective execution the research (Kothari, 2004). Research process for this research can be described and illustrated by Figure 3.



**Figure 3. 1** Research Process of the Research

### **3.1.1 Research Strategy**

As far as Research strategy is concerned, it set up methodical procedure to address the research problems as definitely as possible. It could be either quantitative approach with stress on collecting of numerical data and concerns on numbers or qualitative approach with emphasize on analysis of complex data in terms of its content or native interpretation (Taylor, 2010)

According to Taylor (2010), research approaches can be divided into two different categories namely qualitative approach and quantitative approach. Survey researches and experimental researches are coming under quantitative approach where case study, ethnography, action research and grounded theory approach can be taken under qualitative approaches.

Both of these methods will be used in this particular research. User complains will be collected by a quantitative survey. And case studies will be looked at as a quantitative approach. There are four different case studies (Figure 3.2). In phase 01, user complaint registries are looked at and interviews of the professionals who are involved in relevant projects are carried out. These user complaint data are analyses quantitatively. And the data received from the interviews are analyzed qualitatively by using content analysis method.

After analyzing, the critical issues are recognized and these facts will be used as a basis for the semi-structured interviews which will be conducted by using professionals and experts who are from different backgrounds. This is a qualitative method and the content analysis method will be used to extract the recommendations given by the professionals.

## **3.2 Type of data**

### **3.2.1 Primary data**

Primary data could be either qualitative or quantitative. Qualitative research can be data based on meanings expressed by words which intends to give insight and understanding what can be categorized in-to different groups. (Saunders, 2003). A quantitative

research methodology has seeking data based on meanings deduced from numbers which end up in numerical and standardized data. Quantitative data analysis is used in diagrams and statistics (Saunders, 2003)

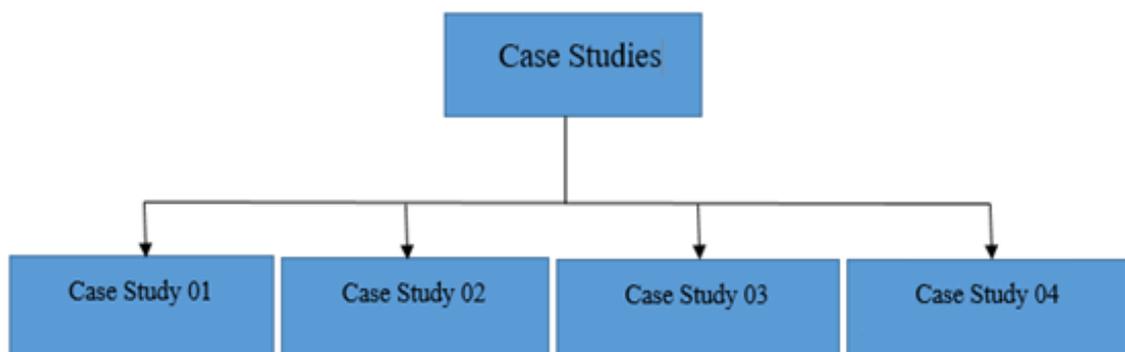
### 3.2.2 Secondary data

Secondary data can be introduced as research data which has previously been collected and can be accessed by researchers. It is the opposite of with primary data, where data can be collected directly from the source.

Primary as well as secondary data collection methods will be used to increase the quality of the research. Literature review, internet, research of documentary, analysis of case studies and interviews of key informant are the major data collection tools which are being used. By taking the facts found in literature review in-to account, user complains were reviewed in some low income projects.

### 3.2.3 Case studies

The ‘user complain books’ which have been maintained by relevant authority at completed sites as well as their head office were referred as secondary data to collect user complaint data as mentioned in figure 3.2. Case studies of existing completed projects were studied as well.



*Figure 3. 2 Break down of case studies*

**Table 3. 1 Details of Case studies**

Case studies	Location	Number of housing units
01	Maligawatte	480
02	Henamulla	722
03	Wanathamulla	1148
04 - Project A	Kirulapana	384
- Project B	Torinton place	364
- Project C	Maligawatte	4000
- Project D	Colombage mawatha	1776

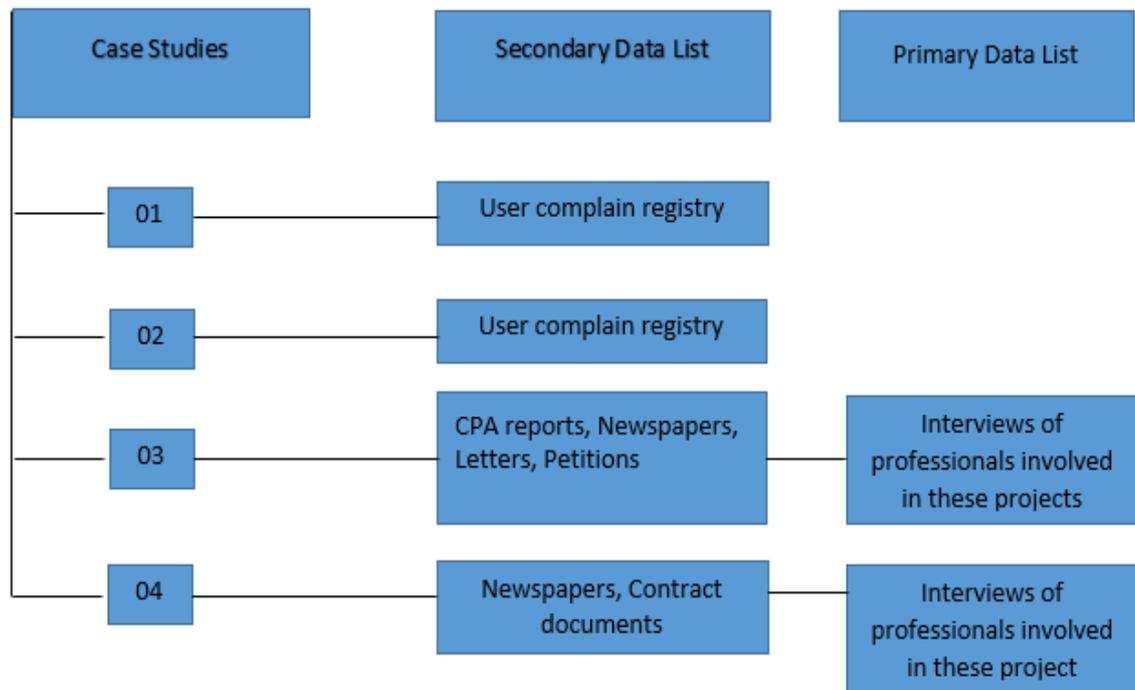
Case studies were carried out with some related low income housing projects located in Colombo area. Based on literature findings, user complains and case studies, the facts which are affecting these low income community were recognized and listed out. After a proper study of these facts, user complaint data were analyzed in two housing projects and issues which has a more effect on users were recognized. Similarly, these critical factors were pointed out from a detailed case study of one housing project. Another three projects were reviewed briefly which has been stopped due to various reasons. Therefore, the factor affecting to these low income housing projects were recognized from the preliminary survey.

Mainly this data collection was carried out in-to two phases using,

Phase 01 – Case studies

Phase 02 – Expert interviews

Phase 01: To establish issues related to low-income housing projects in Colombo area



**Figure 3. 3 Primary and Secondary Data – Phase 01**

In this first phase, basically user complain registries were surveyed in Case study 01 and 02. For case study 03 and 04, relevant existing documents were surveyed with expert interviews who have been involved in those projects.

### 3.2.3.1 Case study selection

Government funded low income housing projects which are located in Colombo area are the target projects which were used for the study. In case study 1 and 2, two projects which have been used by the people but within the defects liability period were selected. For case study three, a project which has been completed some time ago and being used by the people was selected. Then in the case study 4, terminated projects were selected. Target projects involved two completed functioning projects which are inside one year period after completion and two functioning project which were opened few years back, three projects which had to be stopped during construction stage due to various reasons.

### 3.2.3.2 Key factors affecting low-income housing projects

Previously identified factors which were recognized from the literature survey were categorized under four topics. And the list of factors are mentioned below.

*Table 3. 2 Key factors affecting successfulness of low- income housing projects*

List of factors affecting successfulness of low-income housing projects
1. Affordability
• Monthly payment of the houses
• Amount of water bill
• Amount of electricity bills
• Opportunities of Jobs
• Opportunities of business
2. Dwelling unit
• Design of the building and houses
• Quality in construction
• Building materials and finishing quality
• Floor area of the house
• Number of bed rooms and sizes
• Sizes of kitchen & living area
• Enough storage space
• Telecommunication facilities
• Quality of plumbing work
• Quality of home fittings
• Privacy of the house
• Availability of space for drying of clothes
• Availability of sanitary facilities
• Security of the house & properties
• Possibility for future improvements of the house
• Number of available lifts
• Quality of the electrical fittings & supply

3. Neighborhood
• Attractive neighborhood & community links
• Issues due to neighboring alcohol & drugs uses
• Attitudes of neighbors
• Educational & social level of neighbors
4. Accessibility component
• Distance to hospital
• Distance to public transport services
• Facility of common assembly hall
• Availability of school & educational facilities
5. Housing Amenities /Facilities component
• Price of goods & services in close proximity
• Availability of recreational & sporting facilities
• Availability of parking area
• Facilities for waste water & garbage disposal
• Availability of firefighting facilities
• Cleanliness of the housing environment
• Management & maintenance of the building
• Noise level of the housing environment
• Availability of storm water drainage system
• Operating & management of lifts
• Availability of wash rooms in common areas

### 3.2.4 Expert interviews

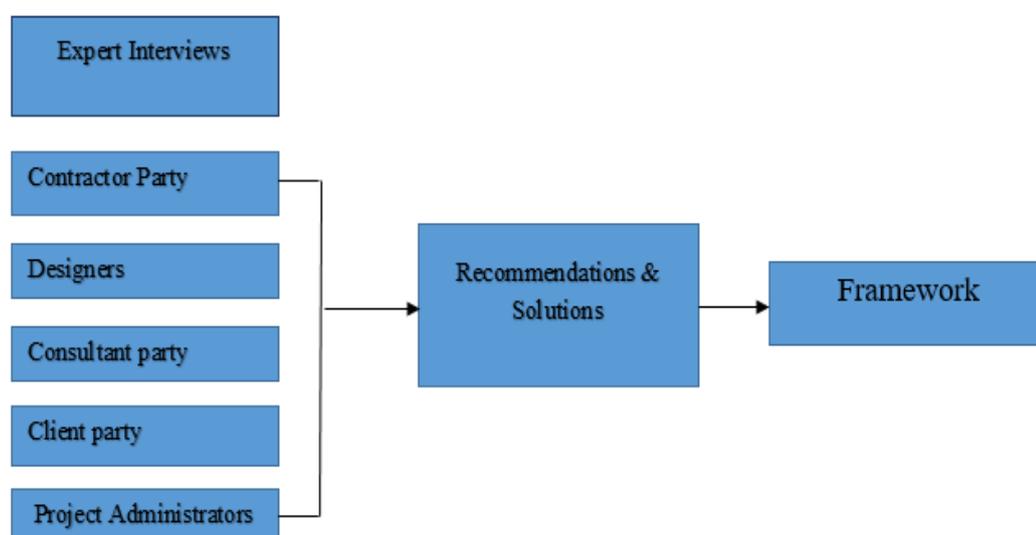
For this particular research interviews were used as a primary data collection method. For that, professionals who are related to low income housing projects were selected. The previously collected from the secondary data were used for this interviews.

One major aspects of qualitative research is deciding the correct sample and the right number in order to conduct the interviews, so choosing and contacting the key informants is critical but also a hard task which takes more time. Since the key informants have specific knowledge and experience about a particular area, expert interviews are used in qualitative researches. In order to understand the practical situations well these information can be very useful which might not be received from secondary sources. (Dwyer & Limb, 2001).

In this particular research, number of professionals were interviewed including experts in local housing industry, representing both government as well as private sectors. Participants were chosen from professionals who are related and have valuable experience in low-income housing projects in Colombo.

Twenty-six number of professionals were selected covering project consultancy groups, contractor party, design related and from administrative background. All participants have experience in low-income housing projects in Colombo. Experience, knowledge and designation were used as the basis for selecting experts as interviewees.

Phase 02: After recognizing critical issues related to low-income housing projects in Colombo area, finding solutions and recommendations through expert interviews



*Figure 3. 4 Expert interview break down – Phase 02*

In the second phase, expert interviews were carried out in order to get the recommendations and strategies which can be used to reduce or solve the current problems related to low income housing projects. These interviews were semi-structured ones and the critical factors recognized from the phase 01 were used to prepare this guideline for the interviews.

#### **3.2.4.1 Interview structure design**

Semi structure was used as the guideline for the interview. The list of key factors affecting successfulness of low-income housing projects for government funded projects was developed based on the detailed literature review and preliminary survey. Then, the questionnaire was structured in order to get the professionals perception and suggestions with related to low income housing projects in Colombo area. Four different types of interview structures were prepared using different types of questions which comes under the recognized key factors to conduct semi- structured interviews. Interviews were conducted to extract expert views to recognize reasons, proposals and suggestions to issues related to low income housing projects.

There were four different types of questioners for professionals from five different backgrounds.

- Contractor party
- Project Consultant party
- Client party
- Design background
- Administrative officers

The questioner was mainly prepared based on key important points which were recognized from the preliminary survey after carrying out a quantitative and qualitative analysis. They are,

- Quality in construction
- Building materials and finishing quality
- Quality of plumbing work
- Quality of home fittings

- Floor area of houses
- Monthly payment of houses
- Amount of electricity and water bills
- Attractive neighborhood & community links
- Availability of school & educational facilities
- Facilities for waste water & garbage disposal
- Management & maintenance of the building

List of professionals who were interviewed are mentioned in the table 3.2 and four structures which were used for the interviews (Annexure 01) are attached at the end of the report. Interview reference code is indicated in the below mentioned table which will be useful to recognize the key factors mentioned by each interviewed professionals in the chapter 04.

**Table 3. 3 Details of Professionals interviewed**

Background	Designation	Company Background - Sector	Total Experience	Reference Code
Construction	General Manager (Design & Built)	Private	21	CN 01
	Project Manager	Private	08	CN 02
	Project Manager	Semi-government	12	CN 03
	Construction Manager	Private	8	CN 04
	Project Engineer	Private	16	CN 05
	Site Supervisor	Semi-government	06	CN 06
Consultancy	General Manager	Semi-government	24	CY 01
	Project Manager	Semi-government	15	CY 02
	Resident Engineer	Semi-government	07	CY 03
	Resident Engineer	Semi-government	07	CY 04
	Civil Superintendent	Semi-government	03	CY 05

Background	Designation	Company Background - Sector	Total Experience	Reference Code
Designing	General Manager (Design & Built)	Private	21	DE 01
	Chief Engineer (Designs)	Semi-government	21	DE 02
	Chief Architect	Semi-government)	18	DE 03
	Senior Design Engineer	Private	13	DE 04
	Design Engineer	Semi-government	07	DE 05
Client (Technical)	Senior Project Engineer	Government	16	CL 01
	Project Architect	Government	18	CL 02
	Project Engineer	Government	06	CL 03
	Project Engineer	Government	06	CL 04
	Electrical Engineer	Government	08	CL 05
Administrative Officers	Additional Project Director -Technical	Government	21	AD 01
	Director HR	Government	18	AD 02
	Director Finance	Government	19	AD 03
	Director in Project Management	Government	22	AD 04
	Head office Clark	Government	07	AD 05

### **3.3 Data analysis**

#### **3.3.1 Identification of critical factors**

Descriptive analysis is helpful in recognizing patterns within the research data. This has been used to describe data distributions. Most effective factors for the successfulness of low-income projects can be identified.

In this particular research the data collected from the user complaint registry was analyzed. Number of user complains were recorded under the relevant categories and analyzed by using quantitative method in order to find the most critical issues out of the list.

#### **3.3.2 Establishing recommendations and strategies**

In order to recognize recommendations and develop strategies to overcome problems in low income housing projects, content analysis method was used. Content analysis was described by Holsti (1969) as "any technique for making inferences by objectively and systematically identifying specified characteristics of messages". This is used in order to analyze texts to generate inferences regarding the factors which leads up to messages and the effects of these messages on receivers. (Frankfort - Nachmias and Nachmias, 2008).

Firstly this particular method was used in the preliminary survey, in order to analyze the case studies and identifying key points and issues related with selected projects.

Secondly method of content analysis was used to analyze data and opinions which were collected during interviews. By using the content analysis, framework including suggestions to improve the successfulness of low income housing projects was created.

**3.4 Summary**

This particular chapter presented a description and justified the research methodology adopted in order to achieve the aim and objectives of study. Through an extensive literature survey and a study on user complains, issues related to users in government funded low income housing projects in Colombo area were studied and pointed out. Data collected from the preliminary survey was analyzed and key factors affecting the successfulness were pointed out. Interviews were carried out based on the critical factors recognized. Then after a content analysis, suggestions were taken in to a framework which can be used to enhance the successfulness of future low income housing projects.

#### **4.1 Introduction**

The research methodology adopted to collect and analyze data was described in Chapter three. Through this chapter, the collected data from preliminary survey and interviews will be analyzed as mentioned in the methodology.

This chapter contains main two sections. First section summarizes the findings of the preliminary survey. And critical factors will be recognized by a statistic and descriptive analysis. Second section is for the analysis of the facts absorbed by interviews. Content analysis method will be followed in order to analyses these facts.

#### **4.2 Critical factors for failure of low income housing projects**

##### **4.2.1 Literature findings**

After referring number of research papers, reports, government publications, web sites it was able to find 42 number of critical factors which affects the successfulness of low income housing projects. Those key factors can be categorized in to four different categories as follows;

01. Financial and governmental
02. Social and cultural
03. Technical
04. Management and operational

Under these each category there are number of factors from the literature survey. These factors were used as a basis to carry out the research.

## 4.2.2 Case study findings

### 4.2.2.1 Case study one

This housing complex was vested, constructed on the Urban Renewal Project, with the community on 2017. Approximately 400 families who were living in Epalwatta, Maligawatta due to be removed to implement Colombo Capital Project, were offered housing units in this. The Housing Complex is fifteen storied and has four elevators.. It has been spent Rs. 450,000 for each unit while the total expenditure of the housing complex is Rs. 2160 million. The project was done by the Urban Development Authority, under the guidance of the Ministry of Megapolis and Western Development.

After the completion of the project and after making this project open for the public, normally there is a one-year period of defect liability. During this period, the contractor is liable for all the defects and should repair them. Normally a formal person from the client or contractor, consultant will be present at the housing complex in order to communicate, manage and solve these problems. An official record of these complains will be maintained in a register. In this book, complains will be recorded block wise and house wise. A sample copy of a page of this document will be attached. (Annexure 02). In addition to that, there is a complain register maintained at relevant client's head office as well. Severe complains not covered by the register which is at the site will be recorded in this particular document.

After having a proper study in the literature survey, the main issues of these dwellers were identified. And further more after going through these complain registries, these points were further identified and confirmed. Then these factors were recorded under five main categories of Affordability, Dwelling unit, Neighborhood, Accessibility component and Housing Amenities/ Facility component. A comparison of these issues raised by the people were recorded after recognizing their main issues. User complaint numbers results are mentioned in the table 4.1

**Table 4. 1 User complaint records - case study 01**

<b>Factors affecting users</b>	<b>Number of Complaints</b>
1. Affordability	
- Monthly payment of the houses	33
- Amount of water bill	17
- Amount of electricity bills	13
- Opportunities of Jobs	8
- Opportunities of business	6
Total	77
2. Dwelling unit	
- Design of the building and houses	6
- Quality & durability in construction	28
- Building materials and finishing quality	30
- Floor area of the house	15
- Number of bed rooms and sizes	6
- Sizes of kitchen & living area	3
- Enough storage space	2
- Telecommunication facilities	2
- Quality of plumbing work	24
- Quality of home fittings	28
- Privacy of the house	27
- Availability of space for drying of clothes	5
- Availability of sanitary facilities	1
- Security of the house & properties	8
- Possibility for future improvements of the house	9
- Number of available lifts	6
- Quality of the electrical fittings & supply	12
Total	212

<b>Factors affecting users</b>	<b>Number of Complaints</b>
<b>3. Neighborhood</b>	
- Attractive neighborhood & community links	16
- Issues due to neighboring alcohol & drugs uses	6
- Attitudes of neighbors	8
- Educational & social level of neighbors	4
<b>Total</b>	<b>34</b>
<b>4. Accessibility component</b>	
- Distance to hospital	3
- Distance to public transport services	10
- Facility of common assembly hall	2
- Availability of school & educational facilities	17
<b>Total</b>	<b>32</b>
<b>5. Housing Amenities /Facilities component</b>	
- Price of goods & services in close proximity	3
- Availability of recreational & sporting facilities	14
- Availability of parking area	4
- Facilities for waste water & garbage disposal	19
- Availability of firefighting facilities	7
- Cleanliness of the housing environment	10
- Management & maintenance of the building	21
- Noise level of the housing environment	3
- Availability of storm water drainage system	10
- Operating & management of lifts	8
- Availability of wash rooms in common areas	5
<b>Total</b>	<b>110</b>

**Table 4.2 Comparison of Results with key factors highlighted (w.r.t-with respect to)**

<b>Factors affecting users</b>	<b>C.S 01</b>	<b>% w.r.t sub total</b>	<b>% w.r.t Grand Total</b>
1. Affordability			
- Monthly payment of the houses	33	43	7
- Amount of water bill	17	22	4
- Amount of electricity bills	13	17	3
- Opportunities of Jobs	8	10	2
- Opportunities of business	6	08	1
Total	77		
2. Dwelling unit			
- Design of the building and houses	6	03	01
- Quality & durability in construction	28	13	06
- Building materials and finishing quality	30	14	06
- Floor area of the house	15	07	03
- Number of bed rooms and sizes	6	03	01
- Sizes of kitchen & living area	3	01	01
- Enough storage space	2	01	0
- Telecommunication facilities	2	01	0
- Quality of plumbing work	24	11	05
- Quality of home fittings	28	13	06
- Privacy of the house	27	13	05
- Availability of space for drying of clothes	5	02	01
- Availability of sanitary facilities	1	0	0
- Security of the house & properties	8	04	02
- Possibility for future improvements of the house	9	04	02
- Number of available lifts	6	03	01
- Quality of the electrical fittings & supply	12	06	03
Total	212		

<b>Factors affecting users</b>	<b>C.S 01</b>	<b>% w.r.t sub total</b>	<b>% w.r.t Grand Total</b>
3. Neighborhood			
- Attractive neighborhood & community links	16	47	03
- Issues due to neighboring alcohol & drugs uses	6	18	01
- Attitudes of neighbors	8	24	02
- Educational & social level of neighbors	4	12	01
Total	34		
4. Accessibility component			
- Distance to hospital	3	09	01
- Distance to public transport services	10	31	02
- Facility of common assembly hall	2	06	0
- Availability of school & educational facilities	17	53	04
Total	32		
5. Housing Amenities /Facilities component			
- Price of goods & services in close proximity	3	03	01
- Availability of recreational & sporting facilities	14	13	03
- Availability of parking area	4	04	01
- Facilities for waste water & garbage disposal	19	17	04
- Availability of firefighting facilities	7	06	02
- Cleanliness of the housing environment	10	09	02
- Management & maintenance of the building	21	19	05
- Noise level of the housing environment	3	03	01
- Availability of storm water drainage system	10	09	02
- Operating & management of lifts	8	07	02
- Availability of wash rooms in common areas	5	05	01
Total	110		

4.2.2.1.1 Affordability issues in Case study 01

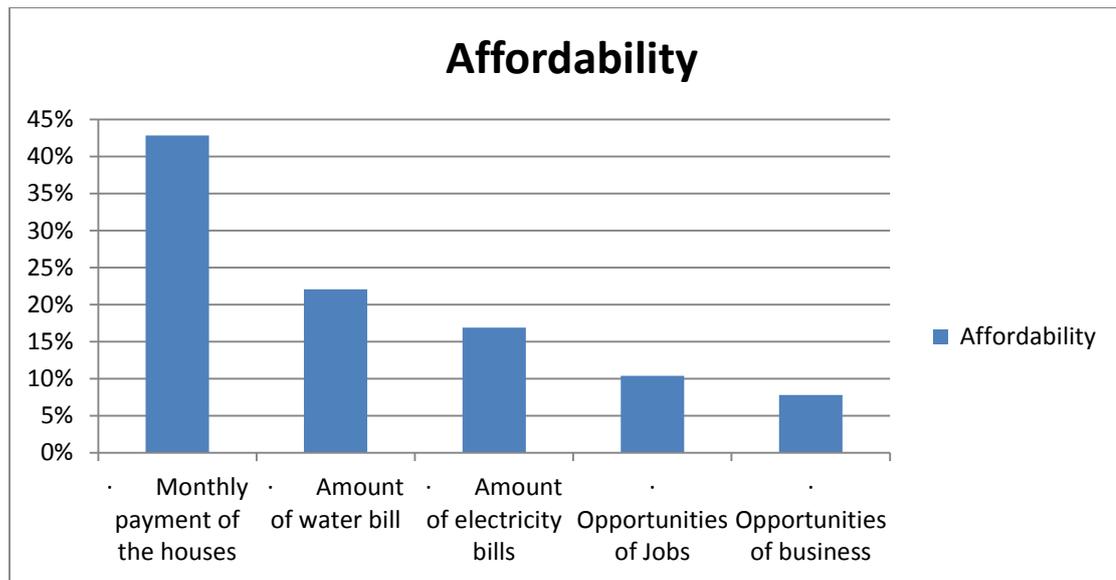


Figure 4. 1 Affordability issues in Case study 01

4.2.2.1.2 Dwelling unit issues in Case study 01

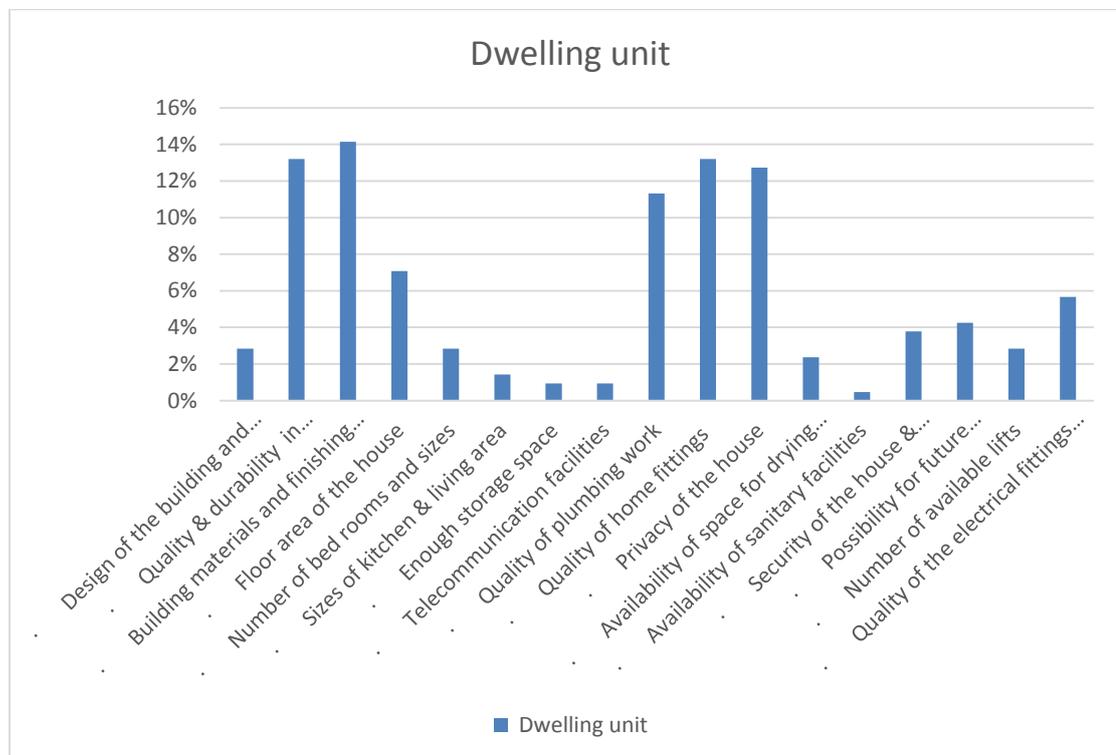
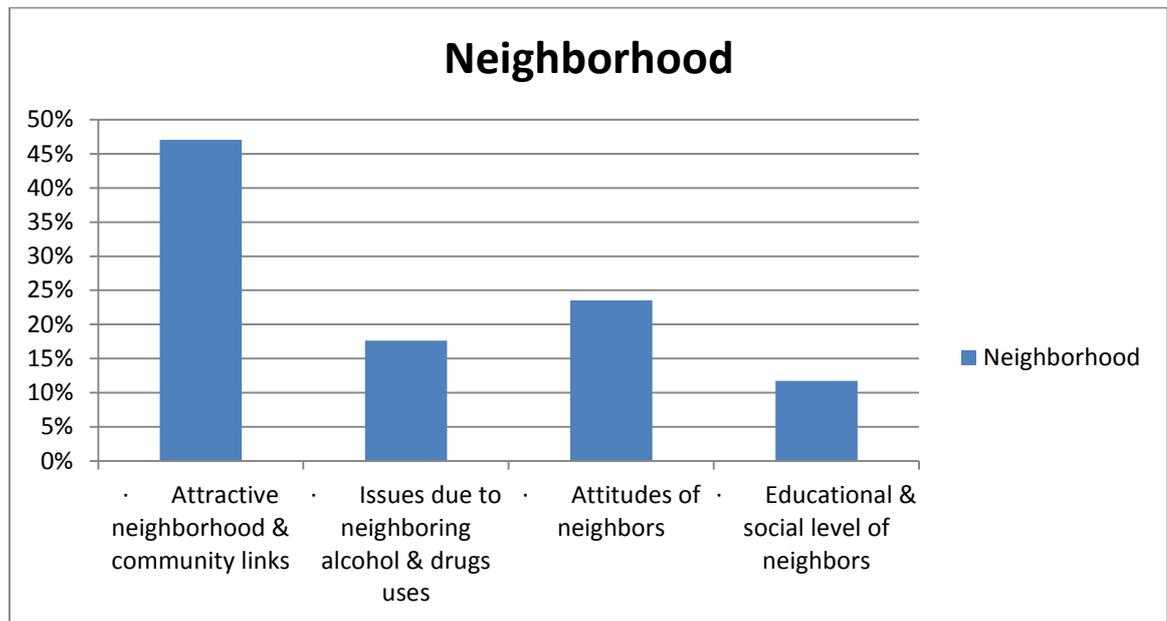


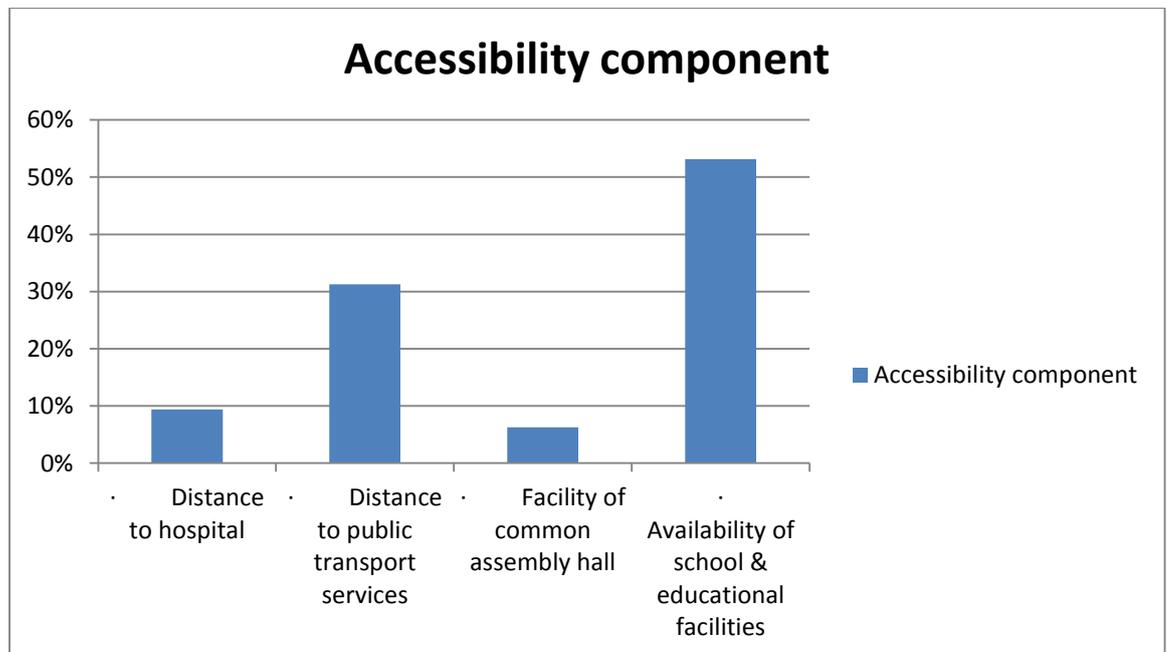
Figure 4. 2 Dwelling unit issues in Case study 01

**4.2.2.1.3 Neighborhood issues in Case study 01**



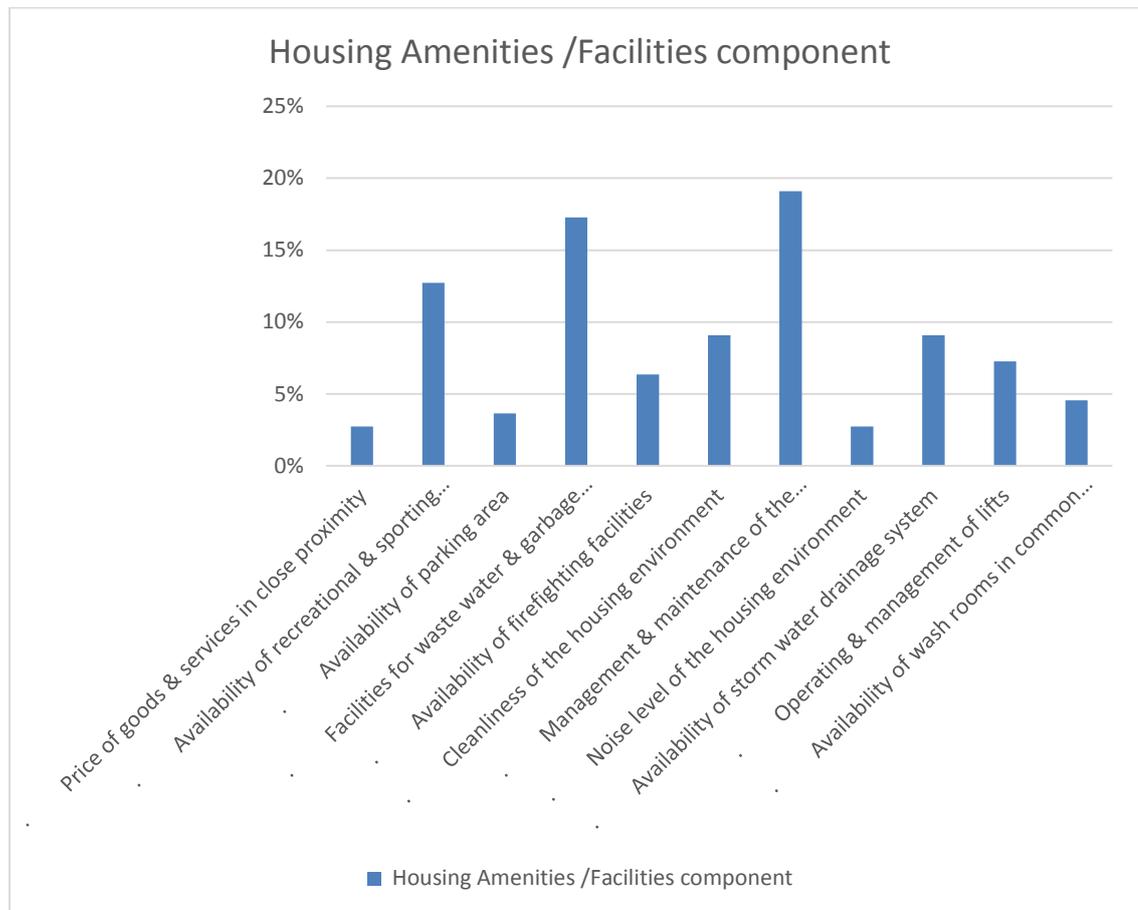
*Figure 4. 3 Neighborhood issues in Case study 01*

**4.2.2.1.4 Accessibility component issues in Case study 01**



*Figure 4. 4 Accessibility component issues in Case study 01*

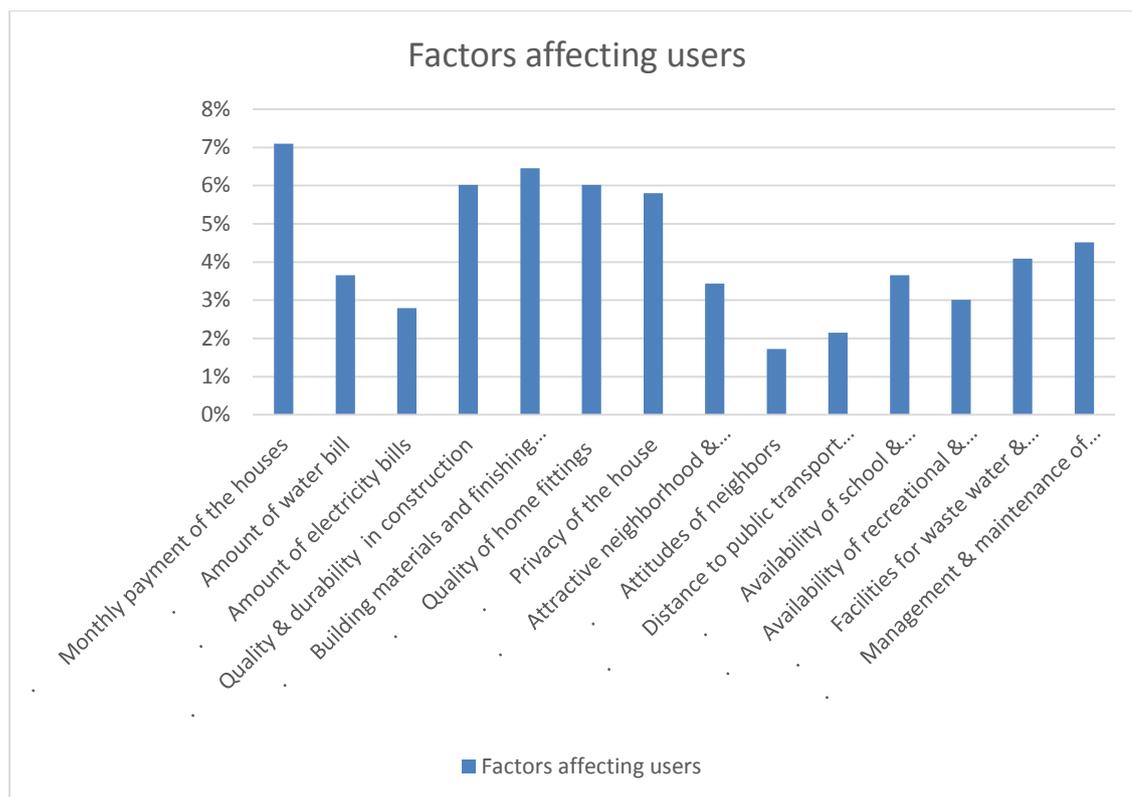
#### 4.2.2.1.5 Housing Amenities/ Facilities in Case study 01



**Figure 4. 5 Housing Amenities/ Facilities in Case study 01**

#### 4.2.2.1.6 Key factors in Case Study 01

After analyzing every fact comes under each category, main points were recognized which has higher percentages of user complaints.



**Figure 4. 6 Summary of key factors in Case Study 01**

#### 4.2.2.2 Case study two

This housing complex was vested with the public on 2018. Every unit has two bed rooms and all necessary facilities which costs Rs. 4 million for construction and services. The cost for the entire housing unit with fifteen floors is Rs2.88 billion. Poor families who lost their homes because of development programs in Colombo 14, Bluemandhal, 318 Watte and 87 Watte, were relocated in a housing scheme which consists of 722 units. The housing project consists of two 15 storied blocks and is located at Henamulla, Colombo 15.

But after several months the dwellers of these houses started complaining about few issues in these houses. Most of the issues are in related with psychical issues of the houses. A forum which has been formed by the dwellers made an official compliant to the client regarding these issues on 10.07.2018. A copy of the letter and issues are attached at the end of the report. (Annexure 03). They had stated in the letter that they

have occupied these houses nine months ago and these issues came up. They had requested to solve these problems as soon as possible.

A sample copy of user complain registry which is there in the housing complex office will be attached. (Annexure 04) In addition to that, there is a complain register maintained at client's head office as well. Severe complains not covered by the register which is at the site, will be recorded in this particular document.

The same process implemented for the case study was repeated for this case study as well. The main issues of these community were identified after going through these complain registries, these points were further identified and confirmed. These factors were recorded under five main categories like it was done for case study 01. A comparison of these issues raised by the people are recorded block wise after recognizing their main issues. User complaint numbers results are mentioned in the below table Block wise

**Table 4. 3 User complaints records – case study 02**

<b>Factors affecting users</b>	<b>Number of Complaints-Block A</b>	<b>Number of Complaints-Block B</b>
1. Affordability		
- Monthly payment of the houses	20	22
- Amount of water bill	12	13
- Amount of electricity bills	16	15
- Opportunities of Jobs	8	11
- Opportunities of business	5	7
Total	61	68
2. Dwelling unit		
- Design of the building and houses	7	6
- Quality & durability in construction	20	21

<b>Factors affecting users</b>	<b>Number of Complaints-Block A</b>	<b>Number of Complaints-Block B</b>
- Building materials and finishing quality	24	26
- Floor area of the house	12	18
- Number of bed rooms and sizes	15	15
- Sizes of kitchen & living area	9	8
- Enough storage space	2	4
- Telecommunication facilities	1	3
- Quality of plumbing work	24	21
- Quality of home fittings	31	29
- Privacy of the house	2	3
- Availability of space for drying of clothes	1	2
- Availability of sanitary facilities	10	12
- Security of the house & properties	4	6
- Possibility for future improvements of the house	3	2
- Number of available lifts	7	7
- Quality of the electrical fittings & supply	15	13
<b>Total</b>	<b>187</b>	<b>196</b>
<b>3. Neighborhood</b>		
- Attractive neighborhood & community links	12	14
- Issues due to neighboring alcohol & drugs uses	5	4
- Attitudes of neighbors	6	5
- Educational & social level of neighbors	4	8
<b>Total</b>	<b>27</b>	<b>31</b>
<b>4. Accessibility component</b>		
- Distance to hospital	3	2
- Distance to public transport services	6	8
- Facility of common assembly hall	2	3
- Availability of school & educational facilities	13	13
<b>Total</b>	<b>24</b>	<b>26</b>

<b>Factors affecting users</b>	<b>Number of Complaints- Block A</b>	<b>Number of Complaints- Block B</b>
5. Housing Amenities /Facilities component		
- Price of goods & services in close proximity	3	2
- Availability of recreational & sporting facilities	8	9
- Availability of parking area	2	3
- Facilities for waste water & garbage disposal	13	12
- Availability of firefighting facilities	4	9
- Cleanliness of the housing environment	8	9
- Management & maintenance of the building	13	14
- Noise level of the housing environment	3	9
- Availability of storm water drainage system	6	8
- Operating & management of lifts	9	7
- Availability of wash rooms in common areas	4	3
<b>Total</b>	<b>78</b>	<b>89</b>

Comparison of Results with key factors highlighted are mentioned in the table 4.3.

There the factors which has highest percentages of complaints are highlighted

*Table 4. 4 Comparison of Results with key factors highlighted (w.r.t - with respect to)*

<b>Factors affecting users</b>	<b>C.S 2 - A</b>	<b>C.S 2 - B</b>	<b>Total</b>	<b>% w.r.t sub total</b>	<b>% w.r.t Grand Total</b>
1. Affordability					
- Monthly payment of the houses	20	22	44	34	06
- Amount of water bill	12	13	25	19	03
- Amount of electricity bills	16	15	31	24	04
- Opportunities of Jobs	8	11	19	15	02
- Opportunities of business	5	7	12	09	02
<b>Total</b>	<b>61</b>	<b>68</b>	<b>129</b>		

<b>Factors affecting users</b>	<b>C.S 2 - A</b>	<b>C.S 2 - B</b>	<b>Total</b>	<b>% w.r.t sub total</b>	<b>% w.r.t Grand Total</b>
<b>2. Dwelling unit</b>					
- Design of the building and houses	7	6	13	03	02
- Quality & durability - in construction	20	21	41	11	05
- Building materials and finishing quality	24	26	50	13	06
- Floor area of the house	12	18	30	08	04
- Number of bed rooms and sizes	15	15	28	08	03
- Sizes of kitchen & living area	9	8	17	04	02
- Enough storage space	2	4	06	02	01
- Telecommunication facilities	1	3	4	01	01
- Quality of plumbing work	24	21	45	12	06
- Quality of home fittings	31	29	60	16	08
- Privacy of the house	2	3	5	01	01
- Availability of space for drying of clothes	1	2	3	01	00
- Availability of sanitary facilities	10	12	22	06	03
- Security of the house & properties	4	6	10	03	01
- Possibility for future improvements of the house	3	2	5	01	01
- Number of available lifts	7	7	14	04	02
- Quality of the electrical fittings & supply	15	13	28	07	03
<b>Total</b>	<b>187</b>	<b>196</b>	<b>383</b>		
<b>3. Neighborhood</b>					
- Attractive neighborhood & community links	12	14	26	45	03
- Issues due to neighboring alcohol & drugs uses	5	4	09	16	01
- Attitudes of neighbors	6	5	11	19	01
- Educational & social level of neighbors	4	8	12	21	02
<b>Total</b>	<b>27</b>	<b>31</b>	<b>58</b>		

<b>Factors affecting users</b>	<b>C.S 2 - A</b>	<b>C.S 2 - B</b>	<b>Total</b>	<b>% w.r.t sub total</b>	<b>% w.r.t Grand Total</b>
<b>4. Accessibility component</b>					
- Distance to hospital	3	2	05	10	01
- Distance to public transport services	6	8	14	28	02
- Facility of common assembly hall	2	3	05	10	01
- Availability of school & educational facilities	13	13	26	52	03
<b>Total</b>	<b>24</b>	<b>26</b>	<b>50</b>		
<b>5. Housing Amenities /Facilities component</b>					
- Price of goods & services in close proximity	3	2	05	03	01
- Availability of recreational & sporting facilities	8	9	17	10	02
- Availability of parking area	2	3	05	03	01
- Facilities for waste water & garbage disposal	13	12	25	15	03
- Availability of firefighting facilities	4	9	13	02	02
- Cleanliness of the housing environment	8	9	17	05	02
- Management & maintenance of the building	13	14	27	08	03
- Noise level of the housing environment	3	9	12	02	02
- Availability of storm water drainage system	6	8	14	04	02
- Operating & management of lifts	9	7	16	05	02
- Availability of wash rooms in common areas	4	3	07	02	01
<b>Total</b>	<b>78</b>	<b>89</b>	<b>167</b>		

4.2.2.2.1 Affordability issues in Case study 02

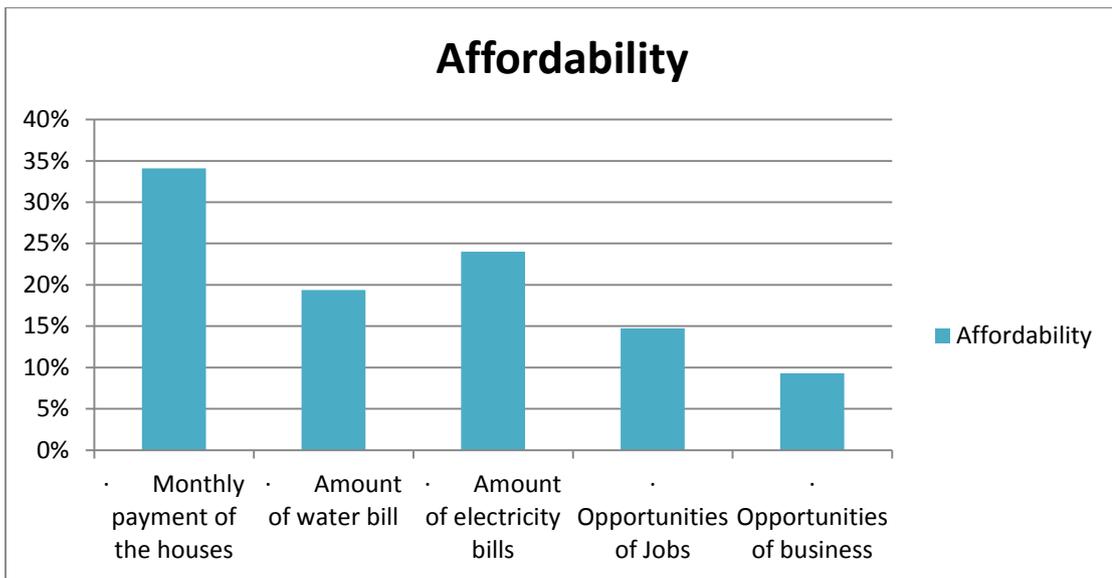


Figure 4. 7 Affordability issues in Case study 02

4.2.2.2.2 Dwelling unit issues in Case study 02

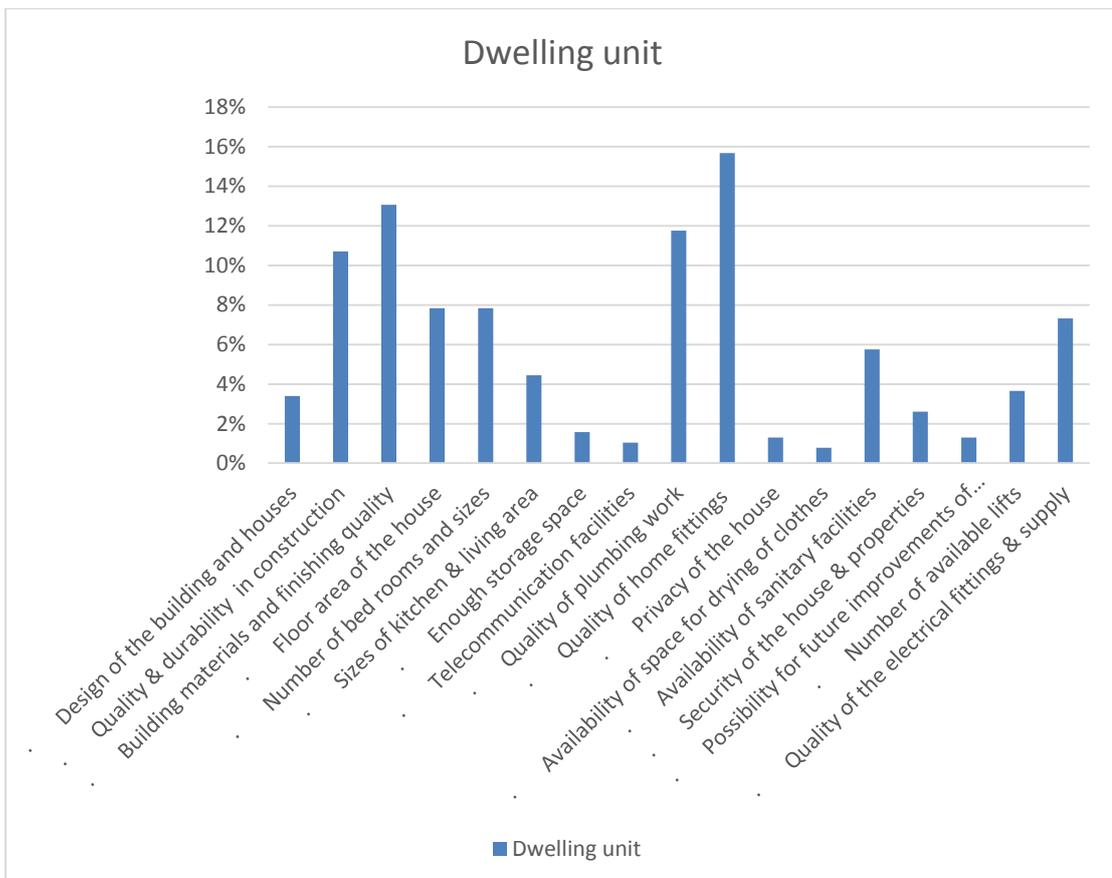
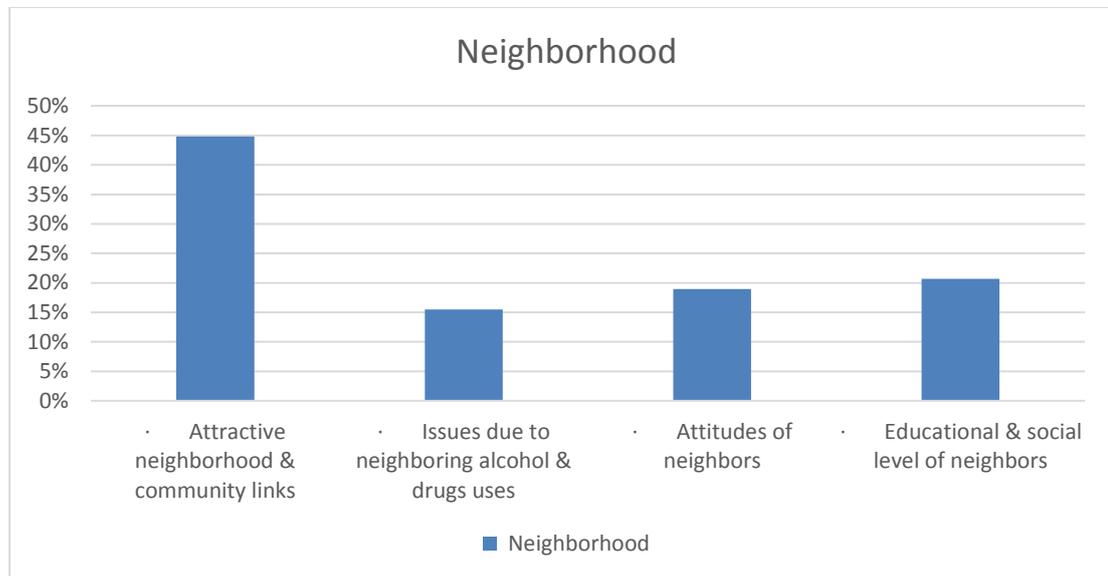


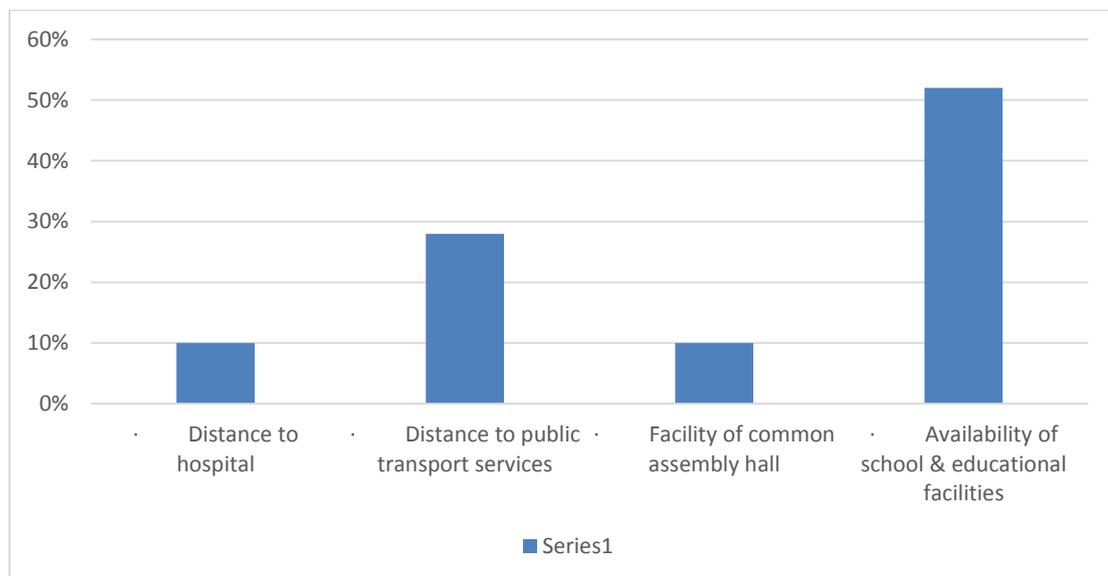
Figure 4. 8 Dwelling unit issues in Case study 02

**4.2.2.2.3 Neighborhood issues in Case study 02**



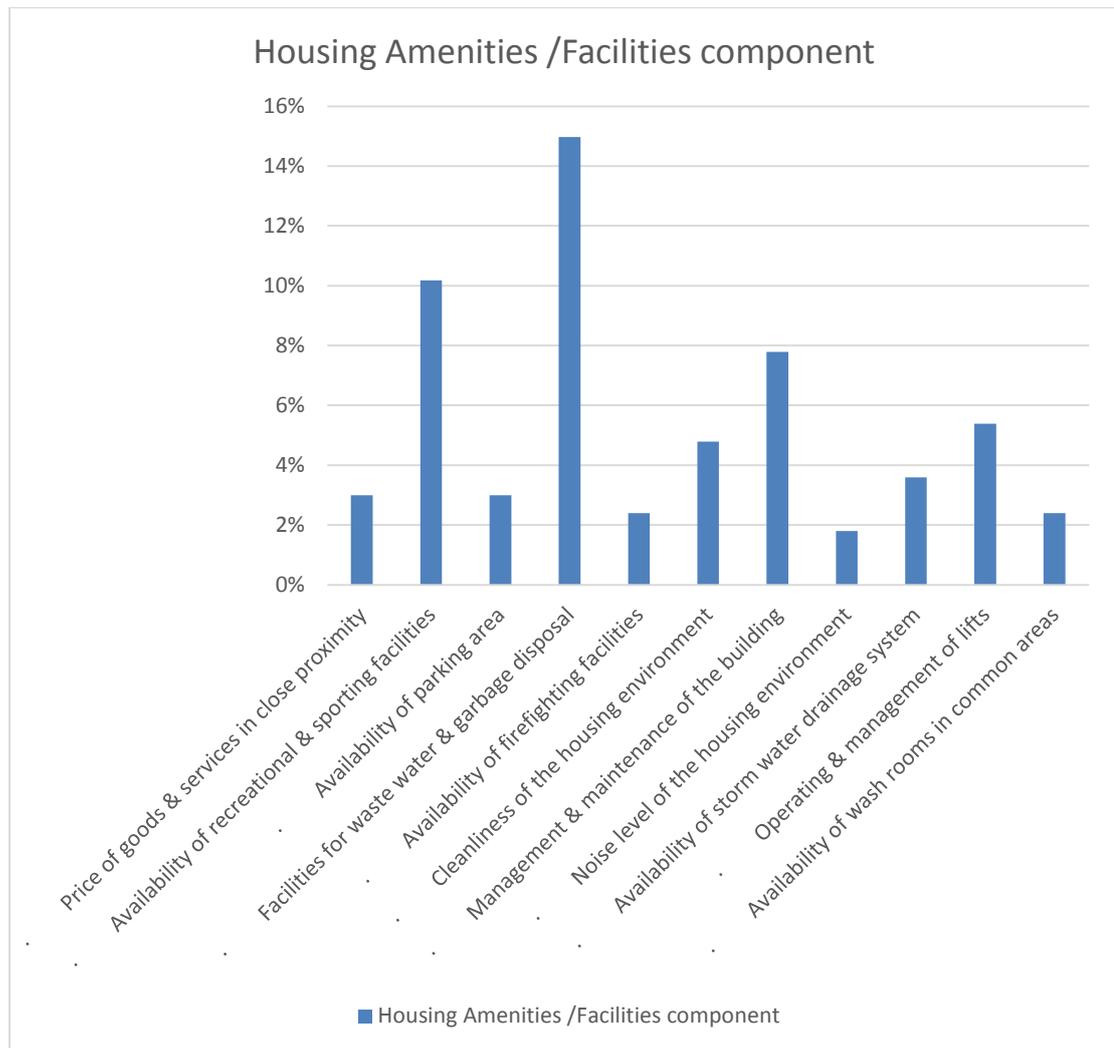
**Figure 4. 9 Neighborhood issues in Case study 02**

**4.2.2.2.4 Accessibility component issues in Case study 02**



**Figure 4. 10 Accessibility component issues in Case study 02**

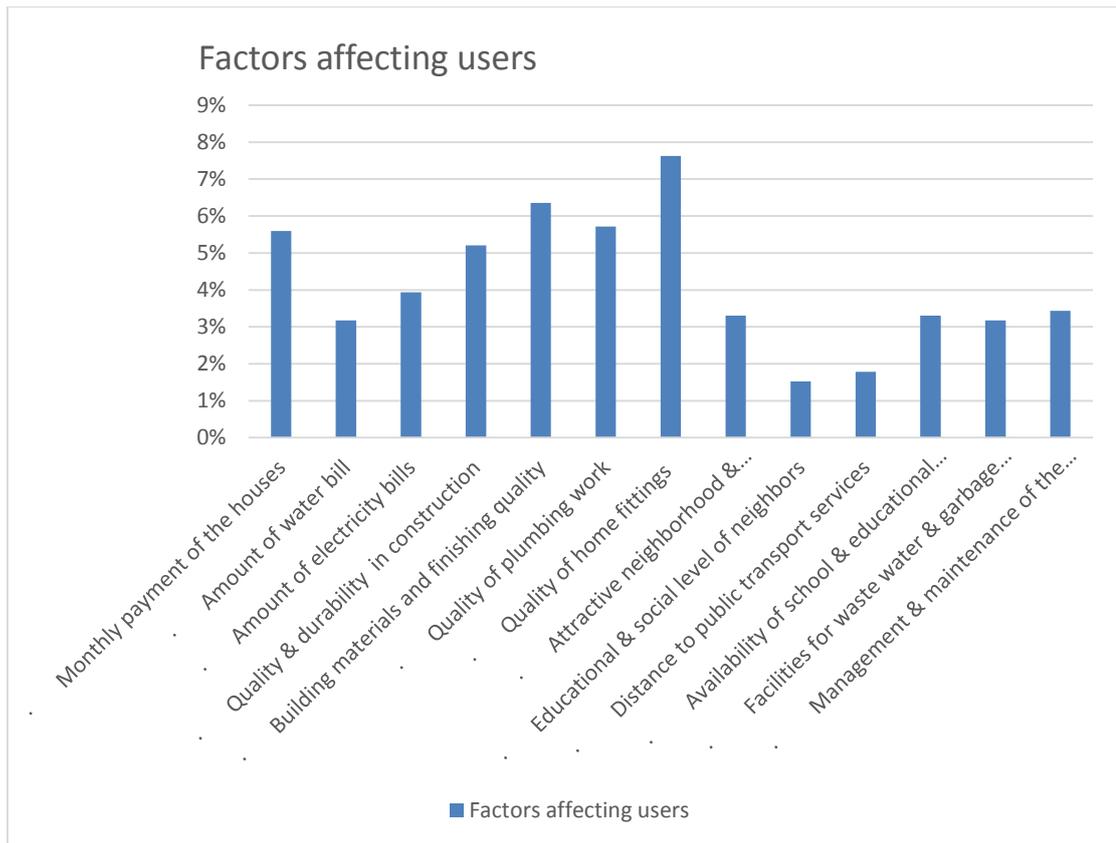
#### 4.2.2.2.5 Housing Amenities/ Facilities in Case study 02



**Figure 4. 11 Housing Amenities/ Facilities in Case study 02**

#### 4.2.2.2.6 Key factors in Case Study 02

Main points were recognized which has higher percentages of user complaints main points were recognized



**Figure 4. 12 Summary of key factors in Case Study 02**

Therefore, the key issues related to the successfulness of low income projects were recognized

- Monthly payment of the houses
- Amount of water & electricity bills
- Quality in construction
- Building materials & finishing quality
- Floor area of houses
- Quality of plumbing work
- Attractive neighborhood & community links
- Availability of school & educational facilities
- Facilities for waste water & garbage disposal
- Management & maintenance of the building

### 4.2.2.3 Case Study three

As the case study three, two building complexes which are located nearby were chosen. These housing projects are located in Wanathamulla constructed for low-income people in the area and was open to the public on 2014. This complex was constructed with the aid of the Ministry of Defense and Urban Development secretary. This has 1,148 houses in 12-storey buildings. One complex consists of 718 houses while the other has 480 houses. Each unit has been constructed at a cost of Rs.8 million which consist of 450 square feet.

This particular project and the critical issues of this project was analyzed with the help of published reports, newspaper articles and interviews conducted with professionals who were involved in these projects. Reference of the interviewed professionals are as mentioned in the Chapter 03 table 3.2.

Key issues pointed out from the case study 03 is mentioned below. Those will be explained briefly.

- Forced evictions
- Unbearable payment plans
- Restricted area of houses
- Loss of financial security
- Maintenance problems and lack of care for disabled persons
- Utility bill issues
- Lack of proper firefighting system
- Income mismatch
- Breakdown of community life

#### 4.2.2.3.1 Forced evictions

According to the interview held with CL 01, during the year 2013, '34Watta' people and nearby dwellers in Wanathamulla area has been informed that they will be provided houses in proposed housing complex which was to be built next to their land. The officials furthermore has told them that their current houses would be demolished and the land is going to be taken by the Ministry of Defense and Urban Development. The

dwellers had been asked request new houses in the upcoming project and were given the break-down of the payments as well. Since these dwellers were not satisfied with this particular payment plan, some residents got together and filed a petition at the Human Rights Commission questioning the demolition of the houses according to 20.08.2014 the Island newspaper.

According to 28.02.2014 'The Island' newspaper article called 'Wanathamulla abduction: Red pejero has replaced white van syndrome' reported about an abduction. The secretary of the Wanathamulla Housing Protection Society was who has expressed ideas against these new housing complex, was abducted and later released.

But later, the relevant authority officials had convinced the most of the residents in '34 watta' to leave their homes and move into the new apartment. By issuing letters to residents who were not ready to move, they were given options of compensation or new apartments at nearby housing complex. Most of the people has become victims by military and other officials, adjoining houses being demolished, and disturbances to electricity and water supply.

After this particular incident, four people filed a writ application in the Court of Appeal against the relevant authority and other actors challenging the directive issued that they should move to the housing units given or accept compensation proposed [CA (Writ) 283/14]. (Annexure 05) They had mentioned that the proposed compensation had definitely undervalued their home and that the new apartments were much smaller as far as space is concerned compared to their current homes. And the most importantly they held title deeds to the lands going back to 1979 and claimed that the relevant authority was acting outside the legal framework in the acquisition of their land.

#### **4.2.2.3.2 Payment plan for these housing schemes were unbearable**

As indicated by the interviewee CL 01 and CL 03, there was a false news spreading around that these apartments are for free. They had to spend more than million rupees to the government throughout next 20 years, with around 1 lakh inside the initial three months. Even the people had the ownership to their houses and lands had to go through these requirements. Initially they had to pay Rs 50,000 with a single instalment, and the

next instalment have be done by the third month. They had to pay Rs 3960 a month (apart from utility bills) throughout twenty years or Rs 2650 per month throughout thirty years. (The letter released to Dematagoda area dwellers on 31.10.2013 is attached at the end of the report - Annexure 06)

#### **4.2.2.3.3 Restricted area of the houses**

Limited area is a very common issue which can be seen in most of these low income housing projects. According to CPA reports and interviewee CL 01, the area of the housing unit is roughly 400 ft<sup>2</sup> and it has a living area, two bedrooms, bathroom and a kitchen. Majority of these community had bigger houses compared to their new houses, and which has number occupying houses that had more than one floor. There are several complaints saying that they had to sell a lot of their goods like furniture in order to enter these low space houses. A lot of the questions in new housing units raises not only from having to pay for them, but also because of their size. There is a problem in the policy of the URP which says an apartment for a house and not an apartment for a whole family, which creates problems to the houses which had so many families in it.

#### **4.2.2.3.4 Loss of financial security**

As stated in a letter which had been issued to dwellers regarding their relocation and process, ownership and payment details, it has been prohibited to sell and mortgage or rent a part or the whole housing unit. This can be used to all, including those who owned their previous house. This creates so many problems since it affects to the financial security of the community. This restriction will be legal, until the full payment is done 20 to 30 years after.

#### **4.2.2.3.5 Maintenance problems and lack of care for disabled persons**

According to the interviewee CL 01 and CL 04, problems in maintenance of the lifts in the buildings was a common complaint made by the residents. The Centre for Policy Alternatives report says that when they visit these two housing complexes few times, only single lift in operation in each block, resulting very long queues. These have 12 number floors and thousands of people occupy in it. The other issues is elder and disabled persons who did not have the opportunity to housing units on the ground floor

as requested by them. Majority of passenger lifts are not working for longer times and it takes a long time to get repaired by the relevant authorities.

Dailymirror 24.06.2018 reported that they have visited the seven-month-old housing complex in Wanathamulla recently. It has been stated that it is difficult to think of the complex was opened only seven months ago because most apartments are unusable already. Most of them already have cracks on the walls, building is dirty and in need of repair and the trash rooms in the hall overflow with waste. Legally, such constructions must make sure certain health and safety standards. If not, the health and safety of the dwellers may be at a huge risk.

#### **4.2.2.3.6 Issues with utility bills**

CL 05 indicated that one of the frequent complaints was that utility bills are not received monthly, and it takes more time than that which makes them to make payments. And there are criticisms about unbearably high water bills. People who previously paid less than Rs 200 monthly for water are now given bills of Rs 5000 monthly, which is a very higher value. On the other hand, they have requested to relevant authorities to issue their water bills not via the client but directly by Water Board.

#### **4.2.2.3.7 Lack of Fire Safety**

Sunday Observer newspaper and Ground views journalism paper on 11.07.2018 reported about a fire occurred in the fifth floor of this housing complex. The apartment where the fire occurred was occupied by a family of three which were not at home at the time of the incident. Everything in the apartment has burnt that night. Nothing could be salvaged

This incident was a great example of how successful these buildings firefighting system and procedures. Firefighting system of the building was having so many defects. Users were not aware of how to deal with this sort of an incident. Fire brigade has taken too much time reach the place too.



**Figure 4. 13 House which was affected by the fire.**

*Source: Sunday Observer (25.03.2018)*

After analyzing this incident with the help of Sunday observer article and interviewing one of the administrative officers from a Government Authority (AD 04), critical issues and the reasons for this particular incident were found out. The main problems which were pointed out from this incident are mentioned below.

1. No smoke detectors: These complexes does not consist of smoke detectors or alarms, either in the apartments or in public spaces of the building.
2. Maintenance problems: During the fire, the fire hose on the fifth floor have not worked. Most elevators in the buildings were broken. Some of the compartments where fire extinguishers and hoses kept have been vandalized.
3. Lack of prior evacuation training: Residents had never participated in a fire drill or evacuation since they moved in. This housing complex is a building that consists of 12 floors. More than 1000 families living in 780 apartments.
4. When the fire brigade arrived more than one hour later they were delayed in reaching to the premises as they could not make their way through the crowd gathered. Lack of communication and proper procedure to react in such situation is a concern.

5. Lack of support for people with disabilities: Apartments on the ground floor not being assigned to people with disabilities is a critical issue.

After this incident occurred, the relevant authority has called for invitations for bids for maintenance of fire protection system for ten housing projects. Ref.046/.Proc/URPCC/2018 (the document will be attached at the end of the report Annex 07). These housing projects were provided to the people several years ago. But after such an incident only they have taken this type of measures to control things which is too late.

#### **4.2.2.3.8 Income mismatch**

People had been asked to do a considerable payment of Rs 100,000 during first three months of changing houses, with a continuous monthly rental of Rs 3960 through-out twenty years, or Rs 2650 through-out over thirty years. Majority of people who faced problems by this, belong to low income group where who works on daily payment basis. This unexpected expense has prompted in huge income problem for majority of the people who on top of the monthly payments with interest payments on the money borrowed to pay the first Rs 100,000 payment.

#### **4.2.2.3.9 Breakdown of community life**

As far as their original locations are concerned, people lived in places which their houses located adjacently. Small ones attended schools together, with a secured environment where they did not want someone to mind them, doors would be kept open if people were home and poor ones went about their daily routines. Questions did persist and those dwellers were in no way living harmonious lives most of the time.

#### **4.2.2.4 Case study four**

Brief Case studies of projects got affected and terminated due to the Contractor's issues will be discussed here. Mainly four different projects which got affected by contractor's issues are discussed here. Selecting a proper contractor for these low income housing projects is very important. Most of the housing projects are criticized by the people because of the poor construction quality. And the people has to suffer when the contractor is dragging the project and unable to complete the project on time. The dwellers who lost their homes because of these projects have to live in temporary places

without a proper home due to the construction delays. Within last five years there are some housing projects which has been terminated due to such contractor issues. Some of these projects will be discussed below. This case study four consists of four case studies which got affected due to contractor's problems which will be called as Case study 4 – Projects A, Project B, Project C and Project D under Case study 04.

Professionals who were involved in these projects were interviewed in order to collect relevant data. The reference code is as mentioned in the Chapter 03.

#### **4.2.2.4.1 Project A and B**

One of the leading semi-government construction company was assigned to do the constructions. Housing project located at Kirulapana (Project A) has a project cost is Rs. 1010 million. Torinton housing project (Project B) consists housing units at a cost of Rs. 694 million. The cost per unit can be calculated as to Rs. 2.63 and Rs. 1.9 million respectively. Carpet area per unit is 400sqft number of stories is GF+11.

According to CN 03 and CN 04 it was scheduled to be completed on 01.04.2015. But they failed to continue the work of the projects due to financial issues. Eventually the project was terminated by them. Then the project was awarded to another contractor from private sector. The project was commenced again on 09.02.2018 as the former contractor failed to continue the project. Contract Agreement is attached to the report (Annexure 08)

Bids were called in order to choose suitable contractor to complete the balance work of the project being constructed in Colombo 05, consisting of 528 housing units and securing funds necessary for the same. The contract was awarded to that particular private sector contractor Ltd., for Rs.1,898 million, as recommended the government. – (Ref: Press briefing - Cabinet decision taken on 02.01.2018)

Therefore so much of public fund are wasted in such situations in order to carry out the work such as re-mobilizing, rectification work, testing and redesigning work

#### 4.2.2.4.2 Project C

The Daily mirror newspaper stated that 04.04.2016 government authorities are planning to cancel its contracts which have been awarded to Hyderabad-based Construction Company by the previous government to construct low-cost housing units for slum dwellers in Colombo area. CL 01 indicated that they have been awarded a 4,000 unit housing complexes under its Maligawatta project. This company was there to build 12,000 housing units totally. Poor performances and track record of this particular company including the collapse of the bridge of North Kolkata and the company was blacklisted more than one time because of number of issues in India such as maintenance issues, negligence and financial irregularity problems.

#### 4.2.2.4.3 Project D

This project was awarded to Indian contractor but the construction was stopped at midway due to the issues with the funds. This particular housing project is located just next to the ongoing housing project at Colombage Mawatha. The project was stopped after the piling work on 2015 September and pile caps can tie beams can still be seen. The project had been awarded to an Indian contractor and according to the conditions of contract, the investor was also found by the contractor. The investor was also an Indian company and the company has tried to get a loan from Sri Lankan bank in order to carry out the project instead of bringing in money from India. But eventually they have failed in doing that and the project was stopped due to lack of funds.



*Figure 4. 14 Abandoned site after finishing the sub structure.*

*Source: SEC Consultancy Division*

Key issues pointed out from the case studies are

- Selection criteria of the project contractor
- Past experience and reputation of the contractor
- Financial stability of the contractors

After the quantitative analysis of user complains (Case study 1 & 2) and qualitative analysis of case study 3 & 4, most critical issues affecting the successfulness of low income project were pointed out. They are Quality & durability of construction, building material, finishing quality & fittings, plumbing work defects, fire Fighting systems, limited floor area issue, amount of the electric & water bills, waste disposal and garbage collection, land acquisition and relevant approvals, issues in providing houses to people, attractive neighborhood appearance and community links, availability of schools and education of the children, management and maintenance of the buildings, reliability, past experience and reputation of contractors and issues related to Housing policies and government regulations.

These key factors were used as the basis for the interviews. Based on these factors the structure was made for a semi-structured interview.

Recognized key points were pointed out and four different types of structures were prepared based on key factors which have been recognized in the preliminary survey. These structures were used as a guide to conduct interviews. Interviews were semi structured and it was carried out based on these questions. Structure was just a basis to the flow of the interview. Four questioner structures are attached to the report in the Annexure 01.

### 4.3 Content analysis

#### 4.3.1 Critical unsuccessful factors of low income housing projects: Contractors related

Based on answers given by 26 experts, content analysis was carried out to establish critical unsuccessful factors.

##### 4.3.1.1 Quality and durability of the construction

As stated by CN 02 and CN 03 *setting the construction project periods of these high rises should be done more meaningfully avoiding tight tough schedules and night work. Then more attention can be paid to the construction quality at sites.* CN 03, 04 and 05 mentioned that *Separate QA and QC Engineer should be employed to monitor the quality at sites. Without his approval no major event can be proceeded at the site.* They were critical that these *QA and QC Engineers should have a sound knowledge as well as practical experience on the work.*

CN 01, 03 and 04 explained that *ISO quality and environment management system should be implemented in all the sites to maintain a proper and planned document controlling system.* CN 02, 04, 05 and 06 stated that *more attention should be paid for finishing work and thick motor layers should be eliminated, chicken mesh should be used to avoid cracks.* CN 01, 02, 04 and 06 said that *curing of the concrete structure should be done properly to avoid thermal cracks.* They added that *if there is a crack, the repairing work should be done immediately consulting suitable experts and materials.* According to CN 01, 02 and 04 *selecting the lands for these projects should be done more carefully not merely thinking about the accessibility component. If the lands are having poor soil conditions, more cost should be allocated for soil improving and advanced foundation and shoring work.* CN 02, 03, 05 and 06 described that *each and every site has a one year defects liability period. During that period one officer will be there at the site to take all the complaints. Then these defects are corrected accordingly.*

#### **4.3.1.2 Building materials, finishing quality and fittings**

CN 01, 02 and 06 described *the importance of all the quality and warranty certificates that should be submitted to the client via project consultant*. They further more added that *if there is an issue with fittings even after defects liability period, the supplier will be contacted and replacement or repair will be done. All the fittings should be approved by the project consultant prior to the installations*. CN 01, 02 and 04 stated that *allocated costs should be increased more than current figures, in order to pay more attention for buying good quality material and fittings*. They indicated that *Low cost materials should be chosen without harming the quality of the construction*.

CN 02 and 05 explained *poor quality raw materials or concrete should never be bought in these projects which directly affects the quality of the end product*. CN 01 and 03 saw the importance of learning from the existing projects and user complains about frequent break down of fittings. They recommended to correct these mistakes in future projects. CN 01, 04, 05 and 06 indicated that *suppliers should be chosen very carefully according a proper procedure, not only considering cost factor. More experienced and reputed suppliers with a good service should be selected*.

#### **4.3.1.3 Restricted floor area**

CN 01, 02 and 04 described that *the floor areas for these houses are not enough. But Architects can do a better job than this with this area. They should really reduce structural elements like columns and beams taking lot of spaces inside houses with a proper well planned design*. CN 04 said that *mezzanine floors should be used inside these houses in order to address the low space issue*.

#### **4.3.1.4 Quality of plumbing work**

CN 03, 05 and 06 stated that *plumbing work should be done by well trained and experienced skilled workers. Pressure testing should be carried out properly after the installation*. CN 02, 03 and 05 said that *good quality and reputed suppliers should be contacted which results in a quality durable outcome. Prior approval should be taken from the consultant submitting samples and relevant documents*. CN 01 and 03 explained that *cost provisions for fittings should be definitely revised and increased in*

*order to encourage the use of good quality materials. They further more added that they should educate and encourage the community to use the fittings properly without harming them.*

#### **4.3.1.5 Firefighting system**

*CN 01 and 03 indicated that there should use good quality sprinklers and risers for these firefighting systems. Prior approval should be taken from the consultant submitting all the relevant certificates. They added that there should be training programs and drills for the community of these low income houses to educate them how to react in a fire. CN 03 and 05 said that reputed and specialized sub-contractors should be used for these firefighting system installations. CN 05 and 06 mentioned that proper frequent maintenance should be carried out for these firefighting systems. Refilling cylinders should be done properly.*

#### **4.3.1.6 Amount of the electrical and water bills**

*CN 01, 02 and 04 stated that rain water harvesting systems should be done with the consultation of an experienced and reputed. CN 03 and 05 said that low energy consuming fittings should be used as much as possible for these houses.*

### **4.3.2 Critical unsuccessful factors of low income housing projects: Project Designers related**

#### **4.3.2.1 Quality and durability of the construction:**

*DE 01, 02 and 04 described that contractors should definitely improve their quality in construction by paying more attention to quality controlling and quality assurance. Most of the times they are unable to fulfill the design requirements with the same expected quality. They should recruit much more experienced and qualified QA & QC Engineers to monitor the construction quality at sites. DE 01 and 04 said that most of the cracks are due to poor workmanship and poor quality in construction materials. It is recommended to use good quality materials and skilled, trained and experienced workers for construction works. DE indicated that quality of sub contractor's work should be closely monitored by the main contractors.*

DE 01, 03 and 04 said that *some of the urban lands are marshy lands which has poor soil conditions*. It is recommended to use pile type foundations and soil improving methods like sand filling for the stability of the structures to avoid structural defects like cracks. They added that *soil investigation report should be done properly in order to cover maximum area of the land with more bore holes for a better study of the conditions*

DE 02, 04 and 05 mentioned that *since the number of occupancies of these houses are definitely more than the anticipated number, the imposed loads should be taken a higher value in designing of the building to avoid structural defects takes place due to overloading*. They added that *definitely the design work of these building should be paid more attention by allocating more time for free designs and proper reviews. Rushing things to start the project might cause mistakes*. DE 01 and 04 described that *design reviews should be done by a separate party to the project designer in order to eliminate mistakes which might end up in defects*. They said that *customer complains of a finished project should be studied carefully. If the complains are due to the design errors, those should be eliminated from the other projects*.

#### **4.3.2.2 Building materials and fittings**

DE 04 and 05 indicated that *contractors should not go for cheap low quality materials to save money. They should get the maximum out of the provided cost frame other than complaining*. They added that *low cost materials like cement blocks should be used without harming the quality of the construction. Low cost cements, fittings, timber, steel and other building materials should not be the way to go*. DE 01 and 03 mentioned that *as a designer at least medium quality fittings should be recommended for these houses which has more durability. Should advice the project consultant to follow quality certificates and method statements during the construction restricted floor area*.

DE 03 and 04 said that *before every housing project, there should be a proper mechanism to get the user requirements. And then the design work should be started having these community need in mind*. DE 02 and 03 indicated that *Architects should get the maximum out of the available spaces. Column beam arrangement should be finalized between the Design Engineer an Architect by giving the priority to the*

*Architect which prevents taking too much free space for structural elements. They said that mezzanine floors should be used inside these houses in order to address the low space issue.*

#### **4.3.2.3 Quality of plumbing work**

DE 01 and 04 described that *when designing or calculating the pipe network requirement for plumbing, over-designs should be done in order to cover the large number of people live per unit.* DE 02 and 04 recommended *quality pipe fittings and samples should be taken before starting the work.* And furthermore said that *pressure tests should be a must after the installations of the network.* DE 01 and 04 saw the importance of considering actual higher number of people in the design and including cleaning eyes and manholes as much as possible for cleaning work. DE 04 and 05 said that *ducts should be placed in proper areas in the design.*

#### **4.3.2.4 Firefighting system**

*Design of the Reinforcement and concrete should be done taking the effect of a fire in to the consideration according to BS 8110 code as mentioned by DE 01, 02, 04.* DE 02 and 05 said that *firefighting system should be designed considering the large number of people who live in these small houses.* DE 04 indicated that *design of the firefighting system should be given more priority even more than towards a luxury apartment complex.* According to him *smoke detectors should be added to the firefighting design*

#### **4.3.2.5 Waste disposal & garbage collection**

*Current waste water lines, sewer lines and drainage system must be studied at the beginning of each project as indicated by DE 02, 05.* *Network of the waste water disposal system and the locations of septic tanks and soakage pits should be designed properly according to DE 02, 04.* DE 02 and 04 said that *capacity of soakage pits and septic tanks should be maximized if the land area permits, in order to minimize the number of times gully reaching the land.* *Garbage collecting ducts should not be included in designs since these low level people would definitely misuse it.*

#### **4.3.2.6 Amount of the electrical and water bills**

DE 03 and 04 mentioned that *rain water harvesting systems should be designed used for flushing and other needs. It should be promoted to be included in the design by encouraging the client to make that initial extra expense. Solar panel systems should be implemented in order to reduce the current bills as mentioned by DE 03, 05. DE 03 and 04 indicated that low energy consuming fittings should be recommended as much as possible.*

#### **4.3.3 Critical unsuccessful factors of low income housing projects: Project Consultants related**

##### **4.3.3.1 Quality and durability of the construction:**

*Commitment and the attitude of the contractors towards the construction quality should be definitely improved. Should encourage them always to maintain the construction quality according to CY 02, 03, 05 CN 01, 04. Before every major work quality inspection should be done. Methodologies, procedures should be submitted and should get the approval before start that work as mentioned by CY 02, 04. CY 01, 04 CN 03, 04 said that QA and QC Engineer of the contractor's side should be directed properly in order to maintain the quality. If there is a problem with the construction quality, work must be stopped immediately. CY 03 said that Non conformities should be issued to the contractors when serious issues are with the quality.*

*Prior approved proper curing method should be used by the contractor in order to avoid thermal cracks as mentioned by CY 04. Honeycombs and corrosion of reinforcement should be avoided to minimize cracks as indicated by CN 03, 04. CY 01, 04 CN 02 said that the contractor should be directed to carry out the soil investigation properly covering major area with boreholes at the start of the project. As indicated by CN 01, 02 and 04 after the completion of each project there is a one year defects liability period. During that period one officer will be there at the site to take all the complaints. Then these defects communicated to the contractor and are corrected accordingly.*

#### **4.3.3.2 Building materials and fittings**

*Should encourage contractors to use durable, good quality materials and fitting by conveying them the idea that these houses are for poor community as mentioned by CY 02, 04 CN 01, 03. Before installation of every fittings, the prior approval should be taken from the consultant by submitting samples, relevant certificates according to CY 01, 02, 04 CN 02. According to CY 01 and 04 at every time, sample work or mock-up of these installation should be requested from the contractor.*

#### **4.3.3.3 Restricted floor area**

*At the beginning of the project, the ideas of the people should be taken in to consideration as mentioned by CY 03, 04 CN 02, 03. CY 05 CN 02, 04 said that the contractor should be requested to do mock up houses before starting the block work of other areas, in order to check the arrangement and availability of space. Then ideas should be taken from the relevant parties and authorities.*

#### **4.3.3.4 Quality of plumbing work**

*Quality plumbing fittings should be used and all the certificates and samples should be submitted by the contractors according to CY 01, 04 CN 04. Pressure testing should be monitored closely after the installation of pipes as well. Should organize awareness programs and trainings to the community about how to use these plumbing network and fittings without harming it as indicated by CY 03, 05, CN 03, 04.*

#### **4.3.3.5 Firefighting system**

*CY 04, 05 CN 05 said that details and experience of the firefighting system sub-contractors should be checked properly before the approval. Sprinklers and risers quality should be checked before installation. And frequent checks should be done to check whether the system is properly working according to CY 01, 02 CN 05. Should give a proper training and drills should be organized to educate the people about these systems as told by CY 03, 05 CN 04.*

#### **4.3.3.6 Amount of the electrical and water bills**

CY 04, CN 05 said that *rain water harvesting systems should suggested to the client and qualified companies should be selected after a proper selection method – When approving electrical fittings, low energy consumption should be given a priority than the cost* according to CY 03, 04, CN 05

#### **4.3.4 Critical unsuccessful factors of low income housing projects: Project Administrator officers related**

##### **4.3.4.1 Land acquisition and relevant approvals**

*Human displacement and resettlement should be minimized wherever possible as mentioned by AD 02, 04. Should get the approvals and reports from NBRO, EIA, TIA, MCC, CEA, Water board and CEB before the commencement of the construction of each project according to AD 01, 04. AD 04 said that it should never use the method of forced eviction. Should negotiate with the community getting and considering about their requirements. Come to a proper agreement with the people and provide them with a temporary but livable places until they get a new home is important according to AD 01, 02*

##### **4.3.4.2 Issues in providing houses to people**

*Identify all project impacts and record all the losses is important according to AD 02 and 04. A detailed list of affected people and their assets should be recorded. Compensation for income losses and land losses should be paid considering the values. Planning and implementing resettlement and land acquisition activities as an integral and main part of the housing project is better. Assisting the affected parties to restore and increase, their livelihoods to better conditions than their earlier situations as mentioned by AD 04 and 05. AD 05 suggested to provide a house free of charge for those who got affected by the land acquisition to the project.*

*Mechanisms should be established to ensure sustainable self-management of the resettlement places according to AD 02, 03. AD 02 and 04 was critical of encouraging a mutually constructive relationship between the Project and the affected parties. AD 01, 02, 04 mentioned that field-based social and land marketing officer appointed by*

*the Project, Grievance Redress Committee (GRC) established at the Ministry level, Independent Grievance Panel (IGP) should be appointed to handle complaints effectively and efficiently.*

#### **4.3.4.3 Dwelling unit features including floor area, fittings and plumbing work**

*AD 01 and 04 told that community consultation and participation should be recognized as a main item of the project. Inform and hold public consultations with affected people during planning and implementation of the project should be practiced. Providing an effective avenue for expressing concerns and achieving remedies for affected persons and communities was important according to AD 03, 04*

#### **4.3.4.4 Firefighting systems**

*AD 04 said that tenders for fire protection systems management should be called on time and the selection policy should be clear and effective. Reputed and experienced companies should be selected. AD 04 mentioned that frequent checks of these systems should be done. Fire drills, awareness programs, evacuation trainings and workshops should be carry out in order to educate the community how to react in such situations. Emergency phone numbers should be displayed in the building premises. Fire extinguishers should be stored and maintained at every public place according to AD 02. When the houses are being allocated, assigning ground floor for disable people should be done as much as possible as indicated by AD 02, 04.*

#### **4.3.4.5 Payment plan for dwellers**

*AD 03 said that payment plan for the houses should be revised in order to help poor community. Part of their rent should be paid by the government. AD 02 and 03 mentioned that initial payment amount should be reduced or should give the option to people to pay it as part payments. Should give the ownership of the houses to the people before 20 years (after they pay the full amount) as it has been done now according to AD 03*

#### **4.3.4.6 Amount of water and electricity bills**

*Should give a fund contribution to utility bills for these low income people by the government according to AD 03, 04. AD 04 suggested to use low energy consumption method and fittings in the construction of these houses. Solar power and rain water harvesting systems should be implemented. Capital payments of these systems should be bared by the government as mentioned by AD 01, 04. Should inform the contractor and suppliers to address repairs and leakages in the plumbing network immediately according to AD 02, 04.*

#### **4.3.4.7 Quality of construction & durability**

*AD 01 and 04 said that selection procedures of the contractor should be done properly by considering their past similar projects. Construction quality should be given a priority. Should arrange frequent site visits and inspections in order to check the quality of work according to AD 04. During the defect liability period, after receiving complaints it must be addressed coordinating the contractor immediately as mentioned by AD 04. AD 04 stated that if there is a defect or a problem in fittings, suppliers should be coordinated to repair or replace it without consuming time.*

#### **4.3.4.8 Attractive neighborhood appearance and community links**

*AD 02 said that people should always be encouraged to have a good clean environment by organizing workshops and programs. People should be encouraged to develop mutual bonds by welfare communities, women's development comities and environmental comities according to AD 02. Awareness programs, workshops, entertainment events should be organized frequently as mentioned by AD 02, 05.*

#### **4.3.4.9 Availability of schools and education of the children**

*AD 02 and 04 said that relocating people, their children's current education set up and school locations should be considered. Should encourage the government to provide pre-schools and other educational facilities should be provided inside the premises itself according to AD 01, 02. Organizing competitions and free educational programs to these poor people by finding sponsors are important according to AD 02, 04.*

#### **4.3.4.10 Management and maintenance of the buildings**

*Government should provide financial and equipment help to the maintenance committees of these housing complexes according to AD 02, 04. Awareness programs should be organized to educate people how to use building facilities and fittings properly without harming as mentioned by AD01, 05. AD 04 told that maintenance should be properly monitored by frequent visits and checks to these houses. Fine systems should be introduced to those who harm or do not use these facilities properly. He further more added that repair should be carried out after a certain period by the courtesy of government.*

#### **4.3.4.11 Facilities to waste and garbage disposal**

*Daily garbage collection programs should be organized by allocating enough resources with the CMC according to a proper time table according to AD 01, 04. Proper places should be allocated for people to dump garbage. Fines should be introduced to the people who dump garbage everywhere as mentioned by AD 01, 02. All the current waste, sewer lines and drainage systems details should be collected from CMC and those are submitted to the designer.*

#### **4.3.4.12 Reliability, past experience and reputation of contractors**

*AD 04 indicated that selection criteria of contractors should be transparent. AD 01 and 04 said that past track record & experience in similar low income projects should be considered. Financial capacity must be given a priority as mentioned by AD 03, 04. Quality of the previous work & reputation and availability of experienced, technically sound staff should be concerned according to AD 04. Progress issues in past completed projects should be considered as well.*

#### **4.3.4.13 Issues related to Housing policies and government regulations**

*As stated by AD 01 and 02 land & urban planning Implementation strategy should be reviewed and revised. Lack of proper planning at micro levels and lack of commitment to effective implementation of planning at macro level should be addresses and avoided according to AD 02. Urban Governance and Legislation: Decentralization and devolution and empowering authorities should be done as well. More concern about*

*protecting human rights, managing urban land effectively relate to aspects of planning, standardization and regulation is important according to AD 04. Proper identification of areas and zones should be a main thing. Footprint of buildings, total allowable square areas, floor area-ratios and building height restrictions must be used to keep a tab on intensity of activities of a particular area according to AD 01, 04. As mentioned by AD 01 and 04 negotiations with land owners in order to change the land parcels shapes so that the buildings coming up on odd shaped sites would not harm the city visual image is important.*

#### **4.4 Key strategies for success and the framework**

26 key strategies were extracted from expert interview answers through the content analysis (Table 4.5)

*Table 4. 5 Key strategies recognized form the interviews*

<b>Key Strategies Identified</b>
- Minimized construction costs
- Proper management of land cost
- Reducing operational cost
- Effective management of fund allocations
- Proper governmental policies and decision making
- Reviewing & revising strategies
- Empowering local authorities, decentralization & devolution
- Community consultation and participation
- Proper plan for land acquisition and resettlement activities
- Encouraging attractive neighborhood appearance and community links
- Frequent workshops and awareness programs for environmental issues, safety, fire trainings
- System for expressing concerns and achieving remedies for affected communities
- Develop and provide education system around the area
- Proper contractors with experience, reliability and capacity
- Construction quality must be a higher priority

<b>Key Strategies Identified</b>
- Approvals from relevant authorities
- Maintenance of quality and other relevant documents
- Frequent checks at site levels
- Proper study before design stage
- Updated cost cutting construction methods and designs
- Use of good quality materials
- Proper study of past and present similar projects
- Sound firefighting system for buildings
- Proper disposal system for garbage and waste water
- Introducing fire system to avoid damages or any harm to properties
- Creating a sound and responsible management system

#### **4.4.1 Minimized construction costs**

Construction costs can be minimized by using updated construction methods and technologies. By using low cost materials without harming the quality of the work, construction cost can be reduced. By recommending these methods to the contractor the costs of these projects can be reduced and funds can be managed effectively.

#### **4.4.2 Proper management of land cost**

Most of these buildings are constructed in urban areas. Therefore land costs are very high and choosing proper lands by considering the cost factors is very crucial. Payments for the compensated parties should be done properly. When buying land from private sector, relevant approvals and valuation process should be followed properly in order to avoid corruptions and over costing.

#### **4.4.3 Reducing operational cost**

Minimizing costs at the stage of operational is also very important. Selecting proper materials, equipment and fittings are key to reduce the operational costs. Developing a proper procedures and systems for operations can be used to reduce operational costs.

#### **4.4.4 Effective management of fund allocations**

Fund allocations should be managed properly in a manner that no corruptions or misusing of funds take place. There should be transparent procedures to do the fund allocations and the management. Evaluation of the needs of people and area which these projects need the most is a key here.

#### **4.4.5 Proper governmental policies and decision making**

Policies of the government regarding these projects affects to the project completion periods and fund allocations directly. Decision making should be done effectively in a manner that no delays taking place.

#### **4.4.6 Reviewing & revising strategies**

Strategies which are used for decision making and other procedures regarding these projects are sometimes outdated. Therefore these strategies should be updated and revised. Outdated procedures results in delays and wasting of project funds. Therefore it is important to look at the modern world and get updated in order to deliver these projects in an effective manner.

#### **4.4.7 Empowering local authorities, decentralization & devolution**

Sometimes due to the lack of authority to make decisions these projects gets delayed or face problems. There local authorities should be given some power in order to make decisions. Otherwise decision making gets delayed until central government comes to conclusions.

#### **4.4.8 Community consultation and participation**

This should be done at various stages of the project. At the design stages, community ideas should be collected and should be included in project plans as much as it can be done. While the project is running comments and feed backs from them can be considered to get improved.

**4.4.9 Proper plan for land acquisition and resettlement activities**

This should be done properly eliminating methods like forced evictions. There should be a clear plan to acquire and resettle them which should be a transparent one. When resettling their former houses, number of people their income and other relevant data should be taken in to account.

**4.4.10 Encouraging attractive neighborhood appearance and community links**

There should be steps to make sure their community bonds and links. Neighborhood appearance should be enhanced. Since these houses consists of limited area this is very important.

**4.4.11 Frequent workshops and awareness programs for environmental issues, safety, fire trainings**

It is very important to have connections with the community and provide them with the information by having workshops and awareness programs. Their living standard can be enhanced by doing this.

**4.4.12 System for expressing concerns and achieving remedies for affected communities**

There should be a proper platform, system and procedures to help the affected communities. Their complaints should be taken and addressed very quickly with a proper transparent procedure.

**4.5.13 Develop and provide education system around the area**

Providing houses merely does not help these poor people. They might have lost their usual routines and educational ways. Therefore it is very important to make sure their studies go with-out any interruptions.

**4.4.14 Proper contractors with experience, reliability and capacity**

Choosing contractors is a major factor in these projects which affects directly to the project. Therefore their past experience, financial stability, past records, quality and capacity should be looked at.

**4.4.15 Construction quality must be a higher priority**

Construction quality is the key in these projects in order to deliver a quality useful product to the community. This should not be reduced because of any reason like cost cutting methods. This should be continuously monitored in projects.

**4.4.16 Approvals from relevant authorities**

Taking approvals before commencement of the projects as well as during the project is very important. With-out approvals no work should be started.

**4.4.17 Maintenance of quality and other relevant documents**

This plays a major role to ensure the quality of the construction work. ISO procedures must be followed at the construction sites. Documents like check lists should be maintained at the site for any work.

**4.4.18 Frequent checks at site levels**

Frequent checks with contractors, QA and QC engineers, consultants and client should be practiced more in order to minimize or eliminate mistakes and conflicts.

**4.4.19 Proper study before design stage**

Before the design stages, preliminary studies should be carried out properly. It can be seen that most of the projects get affected due to the lack of prior studies.

**4.4.20 Updated cost cutting construction methods and designs**

Cost cutting methods should be used for the construction with the help of modern construction technologies. Methods can be changed from project to project. Therefore recognizing good effective methods for a particular work is very important.

**4.4.21 Use of good quality materials**

The quality of materials should not be reduced because of any reason which directly affects the outcome and durability of these buildings. Prior approvals should be taken for the materials and fittings in order to avoid poor quality.

**4.4.22 Proper study of past and present similar projects**

Study of these similar projects helps in a way that it can provide the ways to correct mistakes, how to act in difficult situations and using new methods. It will be useful for decision making as well.

**4.4.23 Sound firefighting system for buildings**

Most of these buildings are high rise ones which has a higher tendency of getting affected by fires. Therefore firefighting system should be paid more attention.

**4.4.24 Proper disposal system for garbage and waste water**

Disposal systems should be properly planned and implemented. Most important thing is these should be communicated to the community effectively as well.

**4.4.25 Introducing fine system to avoid damages or any harm to properties**

Almost all the people live in these housing units lack a proper education. Most of the times it can be seen that these properties are getting damaged by the people. Therefore in order to control them fine system can be introduced.

**4.4.26 Creating a sound and responsible management system**

Management system for the buildings and houses are a key factor. Otherwise these building will be damaged and become polluted in no time which results in a waste of money. Therefore to develop a good sound system is very important.

#### **4.5 Framework for the successfulness of Low-income Housing Projects with key strategies**

The above established key strategies were used to develop the strategic framework. During the financial approval process, seven strategies should be followed as mentioned in the figure 4.15. Reduced construction and operational costs should be recommended and those should be considered while preparing estimations. By following that, cost savings can be done from the allocated funds. Proper management of land cost as well as fund allocations should be done. Decision making should be done by giving authority to local authorities.

Social and cultural strategies must be used at various stages of the project. Community consultations, social awareness works should be done by following mentioned six strategies. These strategies are useful to deliver housing units to the people, which fulfill the requirements of them. Nine technical strategies have been recognized in the framework which can be used to enhance the technical aspects of these projects. Technical issues plays a main role in the successfulness of these projects. Therefore these strategies can be used to give a good quality outcome to the all users. Even if we have fulfilled all the other aspects, with-out a proper management and operational work these housing units are not going to be in livable conditions in few months. Therefore it is critical to follow these strategies in order to maintain these housing units in a manner that it can be used for a very long period.

Financial & Governmental	Social & cultural
<ul style="list-style-type: none"> <li>- Minimized construction costs</li> <li>- Proper management of land cost</li> <li>- Reduced operational cost</li> <li>- Effective management of fund allocations</li> <li>- Proper governmental policies &amp; decision making</li> <li>- Reviewing &amp; revising strategies</li> <li>- Empowering local authorities, decentralization &amp; devolution</li> </ul>	<ul style="list-style-type: none"> <li>- Community consultation and participation</li> <li>- Proper plan for land acquisition &amp; resettlement activities</li> <li>- Encouraging attractive neighbourhood appearance &amp; links</li> <li>- Frequent workshops &amp; awareness programs for environmental and safety issues.</li> <li>- System for expressing concerns &amp; achieving remedies for affected communities</li> <li>- Develop and provide education system around the area</li> </ul>
<h3>Successfulness of Low-income Housing projects</h3>	
<ul style="list-style-type: none"> <li>- Proper contractors with experience, reliability and capacity</li> <li>- Construction quality must be a higher priority</li> <li>- Approvals from relevant authorities</li> <li>- Maintenance of quality &amp; other relevant documents</li> <li>- Frequent checks at site levels</li> <li>- Proper study before design stage</li> <li>- Updated cost cutting construction methods &amp; designs</li> <li>- Use of good quality materials</li> <li>- Proper study of past and present similar projects</li> </ul>	<ul style="list-style-type: none"> <li>- Frequent checks &amp; monitoring maintenance</li> <li>- Sound fire fighting system for buildings</li> <li>- Training &amp; awareness programs - fire drills and evacuation trainings</li> <li>- Proper disposal system for garbage &amp; waste water</li> <li>- Introducing fire system to avoid damages or any harm to properties</li> <li>- Creating a good sound &amp; responsible management system for maintenance</li> </ul>
<p>Technical</p>	<p>Management &amp; Operational</p>

Figure 4. 15 Framework for the successfulness of low income housing projects

#### 5.1 Conclusion

Low income housing has been a continuous struggle through out so many years all around the world. With rapid urbanization and growth in population, the poor community in urban areas like Colombo have to be provided houses in high rise buildings due to the limited available area. But the livability of these houses have become a major concern. Several complaints can be heard every day regarding issues with these low income houses. The satisfaction level of the community regarding these houses has raised few eyebrows. It is very important to improve the living conditions of these people by providing more facilities and fulfilling their needs. In order to achieve that, a proper study of the current issues which makes them dissatisfied have to be recognized. Therefore, the main idea in this particular research was to present a frame work with proper suggestions in order to aid future similar projects.

In order to achieve that objective, issues related to users in government funded low income housing projects were identified by carrying out a comprehensive literature survey. After going through number of existing literature, these key factors were pointed out which comes under different sub-categories. The first objective was achieved through user complains and case studies. These issues were recognized and confirmed by carrying out a survey on user complaint registries and with some case studies. This objective was achieved successfully by recognizing real critical issues which can be seen in practical low income housing projects.

Then the second objective was achieved by analyzing these already recognized issues and identifying recommendations to overcome these issues with the aid of expert views. The recognized issues were analyzed by using both quantitative as well as qualitative methods. After this analysis, most critical issues were pointed out and that was used as a base for expert interviews. By carrying out interviews with professionals who are

from several fields which are related to this low-income housing projects, it was able to come up with ideas and suggestions to use as a solution for these issues. From the interviews with the participation of different parties of these projects, several point of views were received. Construction issues, design issues, consultancy issues, administrative and decision making issues, issues with government regulations and policies were closely examined. It was able to look at these problems from several corners with it.

With these suggestions and key points, a framework was introduced. In that particular framework key strategies which can be used to enhance the successfulness of low income housing projects are presented with relevant implementations. This can be used as a guide line which can be used in every low income housing project. A proper study of presented suggestions, and implementation would be a good platform to a successful future project overcoming most of the problematic areas in low income housing projects in urban areas. Therefore, ultimately this study would be helpful to enhance the lifestyles of the poor community by addressing at least most of their issues. The third objective was achieved by developing this frame work. In the framework, key strategies to overcome problems in low-income housing projects were developed.

## **5.2 Recommendations**

Housing for low income has been a continuous failure and almost every government in Sri Lanka has failed to address the real requirements of the poor community even though they have provided them a place to live. In this particular research this problem was discussed in detail and found that most of the failures can be categorized into four main areas. Those are social and cultural, planning and technical, financial and management. Therefore, the successfulness of low income projects hugely varies on how these four variables are addressed in the projects.

It was found out that most of the issues in these low income housing projects can be avoided by the knowledge and practical experience of the professional who are involved in. Most of the problems are related to the construction quality and workmanship. Therefore, selection of proper contractors with a good knowledge levels

experience plays a crucial role in succeeding these projects. They should be encouraged to maintain quality of construction in many ways. By increasing cost provisions, introducing penalties, post evaluation of their work will make them maintain good quality in work as well as in materials and fittings. On the other hand, most of the problems arises due to the design and planning errors. Learning from past mistakes is a key factor in succeeding of these projects. Government stance is also a major factor which affects to the successfulness of these projects. The government should seriously concern about the sizes, facilities as well as maintenance procedure of these houses. Collecting community ideas and recommendations at various stages of the projects should be made as a main component of a project.

Most of the issues arises around the government policies and technical personals. Planners, Architects, Engineers, policy-makers and all other professionals who are engaged in low-income housing should pay more attention to their contributions. Therefore, it is strongly recommended to all professionals who engage in this field to pay attention to improve their knowledge, skills and experience. By doing that, the ultimate target should be to provide a good home to these poor inhabitants by taking their needs in to account. Apart from that, the government can support more research in this field and encourage for more innovative ideas.

### **5.3 Contribution and Recommendation for future Research**

During the course of this research it was able to come across so many areas related to this particular topic. This is an area which is poor people are suffering continuously in the world today. On the other hand, relevant authorities are also continuously struggling to find proper solutions to this matter. Therefore, this area is a vast one and so many topics are related to this low income housing project. Therefore, those will be presented as recommendations for future studies which will be carrying out by future researchers.

High rise housing complexes were the main focus on this particular research. But it is not the only solution for this housing problem and further research should be carried out targeting other available housing options for low-income community. Evaluation of the sustainability and affordability of housing can be recommended as two areas

which can be successfully contribute to this problem. Construction of High-rise housing complexes is not always affordable and the supply of affordable high-rises has become one of the major tasks faced by many housing professionals in the low-income sector. Sustainable housing can also become a good area since it has become a common topic in many discussions these days. Effective management of high-rises is also a controversial topic and a proper study of efficient and effective management ways of high-rise housing can contribute to this area a lot.

On the other hand, most of the affected parties of these poor houses are women and children. Factors affecting to the satisfaction of women in low income housing complexes can be a good area. Education level and facilities of these children, government contribution towards their education are also some good areas to be studied. Economical satisfaction of beneficiaries and identification of political ideologist behind low income housing projects can also be good topics for a future research.

Therefore, this particular research has shown the path and suggested several further research opportunities from various angles within the subject area. Hopefully these mentioned areas will be covered by future researchers and it will eventually contribute to the good life of these poor people who lives in these low-income houses.

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