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A CASE STUDY OF ZAMBIA

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Minoo Safai-Amini

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DETERMINANTS OF HOME IMPROVEMENT IN SELF-HELP HOUSING: A CASE STUDY OF ZAMBIA

By

Minoo Safai-Amini

A DISSERTATION

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ABSTRACT

DETERMINANTS OF HOME IMPROVEMENT IN SELF-HELP HOUSING: A CASE STUDY OF ZAMBIA

By

Minoo Safai-Amini

This dissertation studies the impact of an aided self-help shelter program in Lusaka, Zambia, and has two main objectives. First, to present an empirical analysis of the differences and similarities in the housing improvement activities of site-and-services households, who were beneficiaries of a 1972 Zambian housing program involving greater security of tenure, to two nontenured groups: squatters (temporary/unauthorized) and councils (state employees renting their houses from the government). The second objective is to identify the determinants of housing improvement among the housing groups comprising the population of this study.

The data used in this study are extracted from a secondary source: a 1973 survey that took place in Lusaka, Kitwe, and Ndola, respectively the three largest cities in Zambia. The survey produced an extensive data set from which a subsample of male heads-of-household in Lusaka was selected to be analyzed in this study.

The empirical analyses in this study are based on a set of hypotheses which focus on the relationships between tenure security and patterns of housing improvement and maintenance by low-income dwellers. The literature on housing investment behavior focuses on the responses of households to a number of improvement indicators such as tenure security, income, and presence of renters--indicators that may vary with specific characteristics, such as education, length of occupancy, urban experience, and age of the household members. The analytical techniques used in this study are cross tabulation, nonparametric tests, and regression analysis.

The analysis of housing improvement activities for the Lusaka sample led to two main conclusions. (1) There is no significant difference in the home improvement activities between tenured groups and nontenured groups in this sample. Thus, the findings in this case do not indicate that the greater security of tenure granted by the government to the site-and-services households stimulated increased self-help improvement to housing. (2) Housing improvement determinants vary by type of housing group. However, housing improvement indicators among the site-and-services group does not adhere to the established patterns in the literature. For this group, perception of home ownership and the state of repair of the house are the most important determinants of dwelling improvement.

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

Sheltering The Poor In Urban Zambia

After Zambia gained Independence in 1964, economic growth in urban areas, relaxation of colonial controls on the population movement, and freedom of residence led to a very heavy rural to urban migration. The shortage of good quality housing that had worsened under colonial rule left independent Zambia with an almost impossible task of providing homes for the new urban Africans (Seymour, 1976). As a result of political and economic changes, a large number of rural families, seeking employment, were attracted to urban areas. Many of these migrants, unable to find accomodation in municipal and government housing areas, built their own housing on public or private land, in contravention of land-use controls and similar laws. During the 1960s the unauthorized, or squatter settlements mushroomed in and around large cities in Zambia, particularly around Lusaka the capital city. As Seymour (1973) indicated, of Lusaka's African population of 110,000 in 1963, 47% lived in municipal townships, 22% in domestic quarters on employers' premises, 10% in government or private compounds, and 21% in unauthorized settlements.

To tackle the problem of unauthorized settlements, in

1968 the post-colonial government adopted a new policy, termed aided self-help, which was modeled after the progressive development projects implemented and tested in other developing countries (Churchill, 1980).[1] The government introduced the site-and-services projects under which the land owned, purchased, or expropriated by the government was subdivided, serviced, and allocated to low-income families and squatters. Underlying the implementation of the new policy were two main themes. One was the realization that it is economically impossible to respond to growing low-income housing deficits in urban areas with the provision of ready dwellings. The other was the observation that low-income settlements evolve and improve progressively when provided with certain essential conditions, such as public infrastructure and proximity to sources of employment. The self-help housing program in Zambia, therefore, was geared towards two main objectives: (1) home ownership and (2) self-help activities. The new policy, titled the site-and-services and upgrading projects, provided a sharp break with previous policies, as the emphasis was on establishing project design standards on the basis of what low-income households would be willing to pay for shelter and services. In fact, the new housing projects were deliberate attempts by the new government to deliver to low-income dwellers those features of housing which provided them with the most incentive to construct or improve their existing housing.

To date, however, few systematic efforts have been

undertaken to study the consequences of the self-help housing projects in urban Zambia. The lack of research on the African squatter communities leaves the policy makers who seek to encourage self-help incentives with little guidance, either in selecting effective public strategies or in anticipating likely outcomes. The main purpose of this study, therefore, is to present a documentation of a self-help project in Lusaka, Zambia, and thereby to contribute to the understanding of the problems and shelter needs of the poor in low-income settlements.

Theory of Self-Help Housing

The theory of self-help housing was popularized by John F. C. Turner (Turner et al., 1972). Based upon his suggestions, self-help is initiated when dwellers control the major decisions and are free to make their own contribution to the design, construction, or management of their housing. According to this framework, tenural status must be resolved with low-income households who live in squatter areas, as the threat of eviction or eradication operates as continuous disincentives to invest in and to improve the physical structure of the house. In these cases, when eviction is threatened or deemed likely, investments are usually made in consumer durables such as radios, televisions, and furniture.

Turner's work promotes the view that governments are best advised to help the poor to help themselves. Such a recommendation has as additional virtue that self-help

housing often produces superior shelter to that provided by governments--only because the poor understand more clearly the role that housing plays in their lives. Turner has consistently argued that shelter should not be judged only in terms of whether it has a good roof, adequate drainage, or would satisfy the standards of higher income groups, but also whether housing suits the needs of particular poor families. In an earlier paper (1971), he presented the view that all families have three basic needs: security, identity, and opportunity. In the context of housing, the poor value proximity to unskilled jobs (opportunity) higher than they value ownership (security) or high-quality standards of shelter (identity). In 1976, on the basis of another empirical finding in South America, Turner emphasized the importance of security of tenure in the consolidation process among poor dwellers in squatter communities:

> Without a high level of confidence that they will be permitted to retain the land, no family will willingly invest time and money in consolidating their dwellings (pp. 71-76).

Housing Demands in Developing Countries

In developing countries, a practical counterpart to Turner's idea has been planning on the basis of effective demand for housing. The effective demand is based on the demonstrated behavior of individuals and is revealed through surveys on how households actually spend their limited resources on housing and other goods and services. Studies

of the effective demand for housing relate actual spending patterns to measurable influences on spending, e.g., household characteristics such as income and family size, the relative price of housing compared to other goods and services, and the condition of the overall housing market. The empirical studies of housing demand undertaken by Burns and Grebler (1977), Follain and Renaud (1980), World Bank (1981), Jimenez and Keare (1984), and Malpezzi and Mayo (1987) have been used to explain the patterns of regularities of housing demand in developing countries. These regularities then have been used to develop the foundation of prescriptive policies for housing market intervention in developing countries. For example, studies by Burns and Grebler (1977) and Malpezzi and Mayo (1987) have shown that there are systematic differences in housing demand that are related to both income and city size. To meet the shelter needs of the poor, the housing planner must establish the level of effective demand for housing and then plan in a way that is consistent with demand. Specifically, their research demonstrates that, within cities, the share of household budgets allocated to housing declines as income increases. However, as economic development proceeds, the same share of household budgets allocated to housing increases among households at all income levels.[2]

Government Intervention in the Housing Market

In general, housing markets operate by inputs such as land and, labor, finance, materials, and infrastructure

combined with supply-side agents such as landlords and developers to produce housing services for homeowners and renters. Homeowners, and to a lesser degree renters, are also producers of housing services to the extent that they maintain and improve their dwellings (Mendelsohn, 1977).

An implication of the Burns/Grebler relationship for housing strategies in developing countries has been direct intervention by governments in the housing market to initiate or stimulate production of housing for the advantage of the lower income households. Governments in developing countries have utilized this broader housing strategy to promote overall economic efficiency and effectiveness of the housing sector.

The most well-known example of the government's direct intervention in the housing market is the state sponsored self-help housing projects. These projects address two needs: (1) improving existing substandard housing and (2) creating new units. The first of these has been addressed by slum upgrading projects, which not only ensure individual households security of home ownership and better access to credit for remodeling or improving their housing, but also upgrades the communities' infrastructure such as water supply, sewerage, electricity, roads, and sidewalks. The second need, which emphasized construction of new housing stock, has been addressed by the site-and services programs. These projects usually provide both community infrastructure and serviced sites on which families are encouraged to construct their own homes. The two approaches are

complementary so that adding new housing reduces the expansion of squatter settlements, and thus the need for upgrading. Consequently, both types of projects help to provide affordable housing and infrastructure to low-income residents by utilizing the residents' own savings together with institutional credit. To meet affordability, the project design calls for lowering standards such as zoning and building codes, promotion of more self-help in construction of shelter and community facilities, and the production and use of low-cost building materials.

The basic assumptions of the aided self-help projects as documented by the World Bank (World Bank, 1974) were as follows:

(1) The assumptions regarding the demand included:

   i. Households could spend 20 to 25% of their income for housing provided in the project.

   ii. The low-income households would be willing and able to invest on progressive improvement of their houses and related services. In other words, it was expected that other than monthly charges for the provision of services and the building material loan, low-income households would be willing and able to invest an additional percentage of their income on progressive improvement of their houses. This assumption was based on the hypothesis that low-income households, who were once considered illegal squatters, would be motivated to invest in housing once they were issued formal "occupancy licenses" and leasehold titles of their land.

(2) The assumptions regarding supply of housing and related services included:

   i. The cost of development of primary infrastructure and community facilities, such as multipurpose centers, and the cost of house construction would be minimized by use of self-help and mutual help labor.

ii. The participating households would improve and build their houses with self-made building materials (such as sun dried bricks or soil cement blocks).

iii. The expected monthly charges for participating in the various plans of upgrading and site-and-service options were derived on the assumption that the price increase, between the time of project planning and project implementation, would not be more than 32%.

iv. Building material loans were expected to be supplemented by other financial sources available to project participants, such as personal savings and loans from employers or relatives.

In many cases, however, these assumptions were not supported by empirical findings due to shortcomings of the project implementation or the lack of data on self-help activities of the poor. Studies indicate that these assumptions are by no means valid in many developing countries, which frequently have systems of land tenure that are neither clear nor commonly understood.[3] In addition to this generic problem, self-help projects are often implemented on the assumption that resources are or will be available for such high-priority projects. In fact, in most Asian or African cities, sufficient resources are rarely available to project planners due to challenges by elite groups traditionally protected by zoning laws that maintain residential segregation on the basis of class. The positive correlation that exists between the national wealth and the quality of housing requires that governments pay close attention to improving the housing conditions of their poor majority. Efficient intervention, however, requires detailed knowledge of the local and cultural factors that

characterize the housing market parameters, housing demand, and supply behavior within a country.

Home Improvement Studies

Over the past three decades, the widespread acceptance of the self-help concept has generated extensive interest among housing scholars and urban planners. Only recently have their experiences regarding the efficiency and effectiveness of the state sponsored self-help policies been documented in the academic or professional literature. Strassmann (1980) was one of the first to identify home improvement indicators in low-income households. In upgrading projects in Cartagena, Colombia, he found a strong relationship between home improvements and tenure status of the households. A majority of homeowners at all income levels reported at least one improvement, such as adding a room or two. Other factors determining home improvement were household size, public infrastructure, and the age of the members of the household. In addition, almost two-thirds of the households studied financed these improvements through self-help, savings, or loans from relatives. Studies by Burns and Grebler (1981), Jimenez (1982, 1983, 1984), and Struyk (1982) report similar findings; these studies are particularly noteworthy for their estimation methods and the conclusions reached. For instance, Struyk and Lynn (1983) developed a conceptual model which distinguished three common stages in the upgrading or improvement process: (1) Initial settlement; (2) Savings

accumulation-internal upgrading; and (3) Complacency-external upgrading. The major stimuli for upgrading of the dwellings among squatters are identified to be external factors such as improved community infrastructures, the ability to obtain secure title to the site, or needs of the households to accomodate family members or a renter. At any stage in the process, the potential role of external shocks to stimulate upgrading has been emphasized.

As a whole, the literature related to low-income housing with Struyk and Lynn's work emphasizes the influence of security of tenure, income, and the number of renters on the rate and magnitude of home improvement. In the case of tenure security, studies show that housing improvements frequently occur in response to an increase in land prices induced by greater home ownership opportunities, and stronger perception of security of tenure (Mandelsohn, 1977). If the perception of home ownership is low, however, or if individuals are not allowed clear title (legal title) to the land, incentives for investment in new construction and upgrading are discouraged--often with the consequence that infrastructure investment can neither be made nor maintained by occupants because of inadequate cost recovery.

In addition, the perception of tenure among squatters differs depending on the type of urban land market. Among developing countries, land tenure has deep roots in national and ethnic cultures and is reflected in an enormous variety of concepts. In many Asian and African countries, it is frequently impossible to determine the actual state of title

to a piece of land because it is so clouded with a variety of familial and societal claims. On the basis of the above argument, Struyk & Lynn (1983) and Ward (1976) have criticized the established viewpoints in the housing investment literature saying that using certain standard determinants such as security of tenure, presence-of-renter, or the dwelling characteristics to analyze housing investment may not be realistic. That is, housing investment indicators can only be determined through careful scrutiny of such factors as the urban land market; cultural and environmental constraints, and religious or tribal attitudes; or rights of possession in the country where the project takes place.

A major point of this study is that despite the overall validity of self-help projects, the use of arbitrary or unestablished rules in planning site-and-services projects is inconsistent with evidence on what households actually spend on housing. One of the most common of these is the assumption that the average household should spend between 20% and 25% of its income on house rent. In the case of Africa, this is generally an unrealistically high proportion of income to be given to housing alone, especially considering the relatively large average household sizes and relatively low income levels (Okpala, 1987, pp.143-145). Kear and Parris (1982) have also criticized the conventional wisdom regarding the assumption of the shelter projects in developing countries on the grounds that the income of a household is a difficult parameter to calculate. Similarly,

while it is frequently assumed that infrastructure investments are strong incentives to occupants in squatter settlements to invest in housing improvement, often this appears not to be the case. In addition, the influence of other socio-economic and cultural factors, especially the personal characteristics of household members--as they are influenced by cultural and local factors--on housing improvement are not clear. As yet, little research has been done on the consequences of such aided self-help projects in diverse land markets in developing countries. In view of the potential benefits of such programs, it is clear that more research needs to be done.

Research Problem

This research questions one of the key assumptions of the site-and-services and squatter upgrading projects--that households provided with greater security of tenure and basic infrastructure use their own labor to make investments in and improvements on their dwellings.

Even with accelerating rates of project development, the efficiency and effectiveness of these types of projects in providing adequate shelter has only recently begun to be researched by the academic community. The popularity of self-aided housing projects in developing countries is an indication of the financial ability of squatter dwellers to respond to certain incentives. Only a small number of studies have been devoted to careful documentation of housing investment/improvement activities in developing

countries. Further, little is known about the impact of self-aided housing policies in countries with variant levels of national and urban prosperity. Research on housing has tended to focus on a small number of middle-income countries, with the lowest income countries in Asia and particularly Sub-Saharan Africa underrepresented.

The variations in cultural, social, and environmental conditions must be taken into account before any housing program can be implemented. In each country, the policy makers should recognize the appropriate incentives and channel the self-help activities of low-income households. This is especially true in Zambia which, since Independence, has been faced with a pressing problem and massive growth of squatter areas. Since 1966, expansion of the low-income housing stock has been the major focus of the National Housing Policy. Survey findings in other developing countries strongly indicate that increased security of tenure and increased income positively influence the likelihood of home improvement. But little is known about the effect of home ownership reform and aided self-help housing projects in rapidly urbanizing countries like Zambia, where the rise and growth of illegal settlements has been--and will likely remain one of the striking phenomena within the field of housing construction and planning. In this context, the research questions in this study are:

(1) How does stronger security of tenure provided to households in site-and-services projects affect their housing improvement activities?

(2) How much home improvement is reported? What sorts of households improve their dwellings?

(3) How are housing improvement activities affected by income and demographic characteristics such as age, education, and urban experience?

Study Objectives

The primary objective of this study is to analyze the consequences of ownership acquisition and rights gained through participation in a self-help housing program in Lusaka, the capital city of Zambia. For this purpose, the study analyzes the results of a survey of housing improvement activities at three types of low-income housing areas. Comparisons are made between improvement activities reported by the site-and-services groups who were beneficiaries of a housing program involving greater security of tenure and two other groups, squatters and renters, who were nonbeneficiaries.

Secondly, the study addresses a number of conceptual and methodological issues related to analyzing housing improvement. The literature emphasizes the influence of security of tenure, income, dwelling characteristics, and renters on the rate and magnitude of home improvement. In the analysis of home improvement, the usual procedure is to measure a number of household characteristics such as tenure status, income, and number of renters. A determination is then made of the extent to which variations in those characteristics relate to (and thereby are assumed to

predict) variations in home improvement activities or behavior (that is, the quality or quantity of improvements made or observed). Thus, the following steps will be taken to accomplish the study objectives:

1. Determine whether stronger security of tenure provided to the site-and-serivces households in the Lusaka sample induced a greater number of improvements.
2. Explain the sources of variations in the home improvement activities of the three sub-populations in the sample.

Organization of the Study

The dissertation is organized in five chapters. Following the introductory chapter, a review of relevant literature is presented. In chapter II, relative to the study objectives, the following topics are reviewed: squatter settlements, self-help housing, and low-income housing policies in developing countries. The survey of literature also discusses which theories of housing investment have been found valid in explaining the home improvement process among low-income urban dwellers in developing countries. The final section in Chapter II presents an overview of the housing situation and squatter upgrading projects in Zambia. The third chapter discusses the source and the nature of the data utilized in this study, the method of data analysis, variable definitions, and model specifications. In Chapter IV, the study's findings are presented in detail. Finally, Chapter V contains a summary, conclusions, and discussion.

CHAPTER II

LITERATURE REVIEW

This chapter reviews the pertinent literature on urban low-income housing in developing countries. The ideological content of low-income housing policies is introduced along with a review of the state of self-help housing programs. Then, the housing situation in Zambia and the applications of the site-and-services and settlement upgrading programs are reviewed and evaluated. The review concludes with a detailed discussion of the literature on housing improvement studies, empirical findings, and met hodological issues on housing improvement.

Squatter Settlements

Squatter or unauthorized settlements are illegal communities built on urban land. The word squatter customarily applies to someone who occupies property that does not belong to him. Thus, squatters act in defiance of both the private rights and the public laws for the regulation of construction and land use laws (Grimes, 1976). The World Bank (1980) reports between 20 and 40% of all urban dwellers in the largest cities of Asia, Africa, and Latin America live in squatter or uncontrolled settlements. Tolbert and Rimmer (1985) report that almost half of the population of the cities in developing countries rely upon

informal economic activities for support; it is thus not surprising that approximately 20% of all new housing is built by the informal sector each year without any formal planning or building permission.

The existence and growth of squatter settlements is perhaps the most serious sign of the malfunctioning of the urban land markets in developing countries. Information about land owner- ship and property rights is often highly unorganized, and the growth of squatter settlements further clouds the uncertainty about property rights. Grimes (1976) argues that among the most troublesome aspects of a poorly functioning urban economy are that either property transactions lag or fail to occur, or incentives for investment in new construction and upgrading are depressed. Lenders are unwilling to extend credit to property holders without clear title, and property taxation is impeded, often with the result that infrastructure investments can neither be made nor maintained because of inadequate cost recovery.

The factors that encourage growth of squatter settlements are numerous and country specific. In general, the literature identifies several factors common to all countries:

1) Urban-rural growth imbalance due to the increasing industrial activity in the capitals or larger cities, and spread of social services in the rural hinterlands.

2) The continuing high demand for relatively low cost rental accomodation in locationally advantageous parts of the city.

3) Inflation of land prices makes it profitable not to develop inner-city lots.

4) Lack of opportunity for upward economic mobility, i.e., no access to industrial employment.

5) Lack of effective regulatory or prohibitive control of speculation by the government.

6) Ineffectiveness of public housing progams, or urban renewal projects.

Self-Help Housing

During the 1960s the literature on housing in developing countries came under the heavy influence of works by Turner (1967, 1972), Mangin (1967), Lewis (1966), and Perlman (1977). The impossibility of replacing all low quality housing with new construction had been realized when massive slum eradication projects left the displaced population without replacement housing. The view that poor urban dwellers can provide their own solution to the problems of housing gained ground in the late 1960s. Studies like those by Turner (1977) and Mangin (1967) concluded that squatter settlements often possess a community organization well suited to achieving settlement development in adverse urban environments. Thus, squatter settlements and other low-income areas were regarded as the basis for the alleviation of low income housing problems through self-help improvement. According to Turner (1977):

> Self-help has certain characteristics which are well adapted to the situation of the lower income groups. The dweller produces the building, thus the costs of

> intermediation and administration are eliminated. Local materials and rudimentary technology are used so that expensive outside inputs are hardly needed (p. 110).

The major policy recommendation in Turner's work is that governments should recognize the housing needs of poor families. Based on his observations of the squatter communities in Latin America (1967), he emphasized the importance of security of tenure in the consolidation process. In the mid 1970s the debate over self-help housing evolved into the quantitative analysis of housing supply and demand. In 1977 Burns and Grebler published an empirical analysis of housing demands in developing countries, relating stages of housing development to stages of economic development. Their findings indicate that contrary to what might be expected, the share of residential building in total output is found to be a nonlinear function; that is, the share increases with the wealth of nations up to a point but declines in the richest countries. Furthermore, most of the inter country differences in resource allocation to new construction are explained by economic determinants rather than by demographic variables describing need.

Public Sector Intervention in the Housing Market

The literature on government involvement in the production of housing focuses on two types of policies: (1) urban renewal programs, and (2) aided self-help housing policies.

Urban Renewal Programs

During the 1950s urban renewal projects became the official policy of many governments in developing countries. Grimes (1976) asserts that until the early 1970s major government housing policies in developing countries often followed the model of many developed nations, relying on heavily subsidized blocks of public housing flats with high standards of construction, infrastructure, and zoning that discouraged production of housing with lower standards, and in many cases, destruction of slum areas and squatter settlements in the name of either "law and order" or "urban renewal."

According to Abrams (1970):

> The urban renewal projects in developing countries were basically modeled after the renewal concept which had been launched in the United States in 1949. Urban renewal in the U.S. entailed the acquisition of large tracts by the public authority, replanning the area, and then reselling or leasing the land not required for public uses to private developers for rebuilding or rehabilitation (pp. 130-131).

Abrams emphasized that, in developing countries, urban renewal became a new tool in the hand of governments to increase tax revenues, to make profits on land operations, or to remove "undesirable" people from their shelters.

Also, such public housing did not reach most of the rapidly growing urban population. Despite high subsidy levels, public housing often went unoccupied for long periods of time as the result of poor location, failure to provide for sufficient infrastructure, or costs to

beneficiaries--which, even after accounting for subsidies, were higher than could be afforded. In addition, they were politically and economically costly, and, more fundamentally, failed to deal with the root causes of the squatter problems--low squatter income and insecure tenure (Keare and Jimenez, 1983).

Aided Self-Help Housing

The literature of aided self-help housing is diverse and difficult to summarize. The major issues, however, can be divided into two categories: (1) Government self-help housing policies; (2) Housing improvement studies.

Government Self-help Housing Policies

Since the early 1970s, the housing policies in developing countries have been directed toward progressive development or self-help programs. In contrast to costly policies of squatter removal, governments have increasingly begun to take more direct approaches in dealing with squatter settlements and for improving the efficiency of urban land markets. In addition, by the late 1960s, there was a major recognition by scholars, practitioners, and international aid agencies that the state housing programs should focus on the self-help activities of squatter settlers. As Abrams (1970) states, the ability of these dwellers to build substantial houses at significantly lower cost than their state agency equivalents has alerted policy makers to the potential of integrating self-help principles

and procedures into an institutional framework supported by government organizations, finance, and legislation. Jimenez (1982) writes that an important standard for measuring the efficiency of the housing sector is providing housing at prices each household can afford. In developing countries, however, achieving this state is unthinkable without public sector intervention in the housing market.

There are a variety of self-help policies discussed in the literature. Recent policies have been emphasizing site-and-services, settlement upgrading, and infrastructure and material loan programs. For the purpose of this research, each program is first described in detail, then, some of the major policy issues related to site-and-services and upgrading programs are discussed to gain better understanding of the problem in this study.

Site-and-Services. Site-and-services systems were initially designed to reach the lowest income groups by utilizing their self-help capacity as a resource. Doebele (1983) pointed out that site-and-services systems are regarded as the most important change in low-income housing policies since the 1950s. Usually, the government prepares the land and provides infrastructure. Lots are then sold or leased and the new residents either build the house themselves or contract out. Renaud (1981) asserts that site-and-services systems as a rational planning strategy were adapted to the situation of the lower income population in developing countries. Construction skills, community

organization, and personal initiatives of the poor are used to develop settlements. Government subsidies may also extend to building materials and/or cash loans (Drakakis-Smith, 1980; Mayo and Gross, 1985).

In theory, the site and services approach provides for the separation of the land, utilities, and shelter components within housing programs, thereby giving considerable operational flexibility. There is still a strong element of control in the projects, however, particularly in the choice of site, the size of the lots, and in house design. Site-and-services schemes provide security of tenure together with adequate infrastructure and the freedom to build at one's own pace. As indicated by Mayo et al. (1985), under the site-and-services assumptions, the security of tenure provided to the family would allow consolidation to take place and community action programs to be introduced.

Upgrading. The upgrading of squatter settlements is the simplest and probably most effective form of aided self-help programs. It involves the improvement of the dwellings themselves, but usually consists of the provision of basic infrastructure services, such as sewerage connections or water standpipes (Drakakis-Smith, 1980).

In principle, the main objectives of upgrading programs are to reduce the costs of housing improvement for the squatter and to avoid the residential dislocation which is involved in government squatter clearance projects.

Upgrading schemes have generally involved physical improvement of slum areas and increasing security of tenure by mapping, cadastral registration, and government sale of land to squatters--often at subsidized prices. In most cases, the impacts of such upgrading projects have been dramatic, promoting large collateral investments in property upgrading in response to improvements in infrasturcture and tenure security (Keare, 1982; Jimenez, 1982; Gilbert, 1983). The World Bank studies, such as Ingram (1984), Grimes (1976), Stern (1979), and Gilbert (1981), have reported the development and implementation of site-and-services and upgrading programs in many developing countries such as Turkey, Chile, India, Pakistan, and Iraq. These projects have generally promoted investment in property upgrading in response to improvements in infrastructure and tenure security. As Jimenez (1984) argues, closer examination of the benefits of these projects tends further to indicate that benefits are proportionately greater for the poor than for more financially secure households, for larger rather than smaller families, and for households living in relatively new squatter areas.

Community Infrastructure and Material loan Programs. The housing trends and policies discussed in the following pages are hybrid settlement improvement programs that started to emerge during the 1980s. Governments in developing countries have begun to take a more comprehensive view of the physical needs of depressed areas and to

encourage the development of small and informal businesses, local production cooperatives, and credit unions. One example is a community infrastructure (network) program not involving direct investment in housing, that concentrates public funds on improvement of those physical infrastructures which the people found most difficult or impossible to organize and construct by themselves. This program is popular in countries where permanent low-income communities, characterized by generally inadequate physical infrastructure and social services, have been developed around major urban centers. They are viable communities, however, where occupancy confers considerable right of possession for the resident, unlike slum or squatter settlements where residents have no rights of occupancy. For example, Indonesia with the World Bank assistance developed the Kampung Improvement Program (KIP) which involved the upgrading of infrastructure in some of the poorest residential neighborhoods in Jakarta (Herlianto and Gulati, 1985). The KIP program was an attempt to meet minimum infrastructure needs of large numbers of the urban poor at low cost. Implemented since 1974, the KIP did not involve direct investment in housing, but concentrated on providing paved roads and footpaths, drainage ditches, communal water taps, sanitary latrines, garbage bins, and social services such as schools and health clinics (Taylor and Williams, 1982).

Two other complementary programs of upgrading called "MMINUTE" (Metro Manila Infrastructure Utilities and

Engineering) and "PROGRESS" (Program for Removing Sewage from Streets) proved to be effective policies in metro Manila, Philippines. Both approaches deal with areas in the city which lack essential services but are not slums. These programs are mainly involved with secondary and tertiary networks of streets, drainage, public sanitation, and water supply (Taylor and Williams, 1982).

Another program that has proven effective is an "area" approach to upgrading which focuses on providing tenure and services to depressed areas on a block-by-block basis. An example is a metro-wide program of slum improvement called ZIP (The Zonal Improvement Program) implemented in metro Manila. The components of the program include land tenure for the structure owners; provision of roads, footpaths, piped water supply, and playgrounds; and assistance to small-scale businesses. In addition to housing programs such as ZIP in the Philippines, there are programs known as "livelihood" programs for assisting small-scale enterprises. Usually, government agencies specializing in business operations take a leading role in evaluating the operation of informal and small-scale enterprises and providing incentive programs to assist them (Taylor and Williams, 1984, p. 252).

Housing Improvement Studies

In contrast to the number of studies which examine the theoretical aspects of low-income housing and the changing policies toward it, very little work in the empirical

literature concerns the efficiency and effectiveness of these types of projects to provide adequate shelter or to stimulate increased home improvement through self-help.

Burns and Shoup (1981) examined the effects of residential control and ownership in two self-help housing projects and one squatter upgrading in El Salvador. They reported that the self-help groups who built the houses themselves, and who actively participated in the management process were more inclined to report home improvement than were other groups. In addition, the relationship between home improvement and security of tenure for the self-help groups was found to be quite strong. Their findings, similar to Strassmann (1980), support certain justification for the state self-help housing projects which grant security of tenure to the beneficiaries.

Jimenez (1982, 1983, 1984), who introduced econometric models in the analysis of housing improvement, reported similar findings in the relationship between the value of the house and tenure status of the residents. In 1982 he estimated the value of squatter dwellings for a sample in the Tondo-Foreshore area of Manila in the Philippines. The dependent variable consisted of two indicators--the appraisal of the owners and that of a professional appraiser. The independent variables consisted of various indicators measuring the structural quality of the dwelling unit, services available, and measures representing the size of the unit. The results of the study showed that the determinants of the value of squatter dwellings as reported

by squatters were very similar to those of appraisers' evaluations in the formal market. Particularly, significant statistical relationships were reported between the value of the house and housing characteristics such as quality of the structure, sanitary services, and the neighborhood.

Jimenez (1983) used the same data set in the Philippines to study the extent and the speed of house upgrading activities among households in self-help housing projects. With the use of hedonic price analysis, the housing values were compared before and after project implementation during a three-month interval. The findings reported that housing values in the two periods increased between 30 to 40% indicating that self-help housing projects were successful in stimulating housing investment.

In contrast with Jimenez, who analyzed the level and extent of home improvement using a simultaneous model of demand and supply, Struyk (1982) and Struyk & Lynn (1983) reported different approaches for exploring home improvement activities in self-help housing projects. Struyk (1982) identified the economic determinants of upgrading in Seoul, Republic of Korea. The dependent variable was the percentage of change in the average size of dwelling units both in 1970 and in 1975, and the independent variables were the number of dwellings in single-unit structures, the ratio of households to the dwelling units, household size, the number of units built between 1970 and 1975, and floor area per household. An ordinary least square regression model was used to estimate the model. The study concluded that

substantial increase in new construction was mainly associated with greater upgrading of the existing stocks (by home owners).

In an effort to find the indicators which determine squatting behavior, Struyk and Lynn (1983) studied the home improvement behavior of residents in upgrading projects in Manila, Philippines. Ordinary least square regression and probit technique were used to measure improvement (upgrading of the existing units). Three indicators representing the dependent variables were used to measure upgrading: 1) the strength of building materials, 2) the type of toilet available in the dwelling to the owner-occupant, and 3) the amount of floor area. The model was estimated separately for owners with and without renters in the house. The statistical results supported two important conclusions: First, a strong positive relationship exists between tenure status of households and the likelihood of home improvement/investment. Second, the home improvement behavior of homeowners who rent rooms differs significantly from that of homeowners without renters.

Methodological Trends in Home Improvement Analysis

The basic framework of housing improvement research used in current practice has been introduced above. In reviewing the literature, two research trends are evident. First, there has been a growing interest in the use of economic analysis for estimating the monetary value of dwellings in the squatter settlements. Usually, the

researcher is interested in exploring economic determinants and the extent of upgradings or improvements made over time. A simultaneous model of demand and supply is used to explore the patterns of expenditures on housing investment (Jimenez, 1982, 1983, 1984; Struyk, 1982; Malpezzi and Mayo, 1987). The main purpose of the researcher using this approach is to provide evidence on the economic determinants and the extent of housing investment in project areas following intervention over time (Mendelsohn and Mayo, 1977; Struyk, 1982; Jimenez, 1982, 1983, 1984; Malpezzi and Mayo, 1987). In this approach, the value of the house is used as a predictor of how housing quality (e.g. quality of building materials, running water, and sanitary facilities) changes over time. The data collected from such a study usually contains panel (before and after) information on housing values for a sample of dwellings. The researcher compares the average housing values before project implementation with those after project implementation, adjusting for price changes. To control for possible price changes, the hedonic price technique is used, the basic premise of which is that there exists a reasonably well-fitting relationship between the price of the good in question and the characteristics of that good.

The hedonic price relationship is often expressed in a linear form:

$$V = P_0 + P_1C_1 + P_2C_2 + ... + P_kC_k + e \qquad (1)$$

In the above model, V represents the price (or value) of the

house, and Cs represent the characteristics of the house, such as number of rooms, lot size, and quality of building materials. Usually, the estimated value of the house before project implementation (V_1) is compared with the estimated value of the house after project implementation (V_2). Inferences regarding housing investment can then be made by comparing the change in housing value over the two periods. i.e., ($H_a = V_2 - V_1$). In this approach, the dependent variable is composed of different measures representing the value of the house. Two commonly used measures are the appraisal of the owners and that of professional appraisers. The independent variable measures the structural quality of the dwelling unit (e.g. cement, wall finish, concrete foundation), and the size of the unit. The adaptation of this method requires that the researcher have access to detailed housing quality data and information on the value of the dwellings for two points in time. The main obstacle facing the present researcher in adapting the above method was that the available information was a one-time description of housing activities of the three housing groups in the Lusaka sample.

Second, there has been a continuing emphasis upon the use of explanatory models to predict or explain the relationships between certain housing indicators (e.g. characteristics of the house, improvements made) and variables indicating some components of housing supply and demand activities (e.g. tenure security, income, number of renters). This approach emphasizes the use of multivariate

regression analysis for both qualitative and quantitative exploration, and probit or logit analysis to explore the likelihood of housing improvement (Burns & Shoup, 1981; Struyk & Lynn, 1983). The major assumption in these studies is that those who have gained tenure rights are more inclined to invest in subsequent, and perhaps continual, improvement of their dwellings. Basically, home improvement is considered a function of ownership status, characteristics of the house (e.g. number of rooms, quality of sanitary facilities, state of repair of the exterior and interior), and socio-economic and demographic characteristics of the dwellers (income, education, urban experience, duration of stay). This relationship can be expressed as:

$$\text{Housing Improvement} = f\ (C_1, C_2 \ldots\ldots C_n) \qquad (2)$$

where housing improvement represents all lasting capital investments in the house, and Cs represent the characteristics of the house or the dwellers. In this approach, the researcher is interested not only in whether an improvement is made, but also investigates the variation in behavior between groups benefiting from one form of housing intervention--usually home ownership title--and those groups with different or no property rights. In this context, the dependent variable is the rate/number of improvements reported and the independent variables are income, type of tenure, quality of toilet, number of floors, number of renters, and years lived in the

structure. In addition, the number of improvements are correlated to respondents' demographic characteristics such as education, household size, urban experience, age, and occupation to explore the influence of socio-economic factors on improvement activities of the dwellers.

In addition to the above methodological trends in the literature, there is also a strong indication that researchers are placing greater emphasis on the usefulness or justification of the self-help housing projects and the role of government in the production of housing in low-income markets. This may be due to criticism made by Marxist analysts who believe that self-help housing programs do not tackle the causes of inequality in the housing market yet they perpetuate the status quo in the capitalist society (Burgess, 1977; Glaser, 1985).

In summary, the conceptual findings in the literature can be outlined according to the following:

a. Owner-occupant responses to economic incentives in deciding whether to improve their housing appear to be similar universally. This is a direct reference to the rationality of the poor in respect to their housing behavior. This condition, however, is valid only when tenure security and ownership arrangements permit the property to be readily used as collateral or adapted to different uses over time. Security of possession varies greatly from country to country, and in some cases land-use laws discourage private investment on the property. Under these conditions, recognition of the incentives that promote

private investment on the land in different cultural settings are very important before the housing projects can be implemented.

b. The expansion and upgrading of existing stocks are more economical than building new units. Therefore, the cost of home improvement among low-income groups is much lower than the cost of building new units.

c. Squatter housing markets behave similarly to the conventional markets, making a simple household survey a reasonably effective way to obtain the required information for housing market analysis.

The basic framework of housing improvement research in low-income housing markets which provided the guidelines for the empirical analysis in this study has been introduced above. The next chapter presents an overview of the survey materials from which a sample was drawn, and specific methodological issues that guided model specification and data analysis.

Housing Situation in Zambia

The literature on Zambia is dominated by studies focusing on social and political aspects of the urbanization process. Attention to housing issues, particularly that of squatter settlements, became more prevalent when the World Bank and other international aid agencies became involved in economic development projects in Zambia during the 1970s. For the purpose of this study, the social and political events that led to the development of the squatter areas and

the present housing policies in Zambia are reviewed. Studies actually focusing on the housing market behavior and housing improvement are relatively scarce. The literature reviewed is summarized into three sections:

(1) Urban development and housing policy during the colonial period

(2) Characteristics of squatter settlements in urban Zambia

(3) Housing policies after Independence

Urban Development And Housing Policy During the Colonial Period

Baldwin (1966) is one of the first studies providing a complete profile of the housing situation in Zambia before Independence. The policy of the colonial government was to provide housing for all urban workers. The white European workers were attracted to Zambia by high wages and the provision of high quality housing by mining companies. Two separate urban environments have emerged: one modern, well equipped, expanding gradually and in an orderly fashion; the other poor, on the periphery of urban areas, unserviced, and proliferating rapidly.

Peil and Sada (1984) report the right of Africans to live in urban areas was conditional upon their being employed. The pass laws prohibiting unemployed migrants from urban areas, were strictly enforced while those allowed in towns had housing provided by their employers in employee compounds. Some workers were not provided with housing, but were allowed to build their own huts on land owned and

controlled by expatriates. In practice, however, some unauthorized settlements had been established by squatters' expatriate employers and landlords. Consequently, the major part of the housing stock in the high-and middle-income housing sectors was supplied by employers, whether government or private companies. In summary, in the low-income housing sector, employers, city councils, and individuals supplied most of the housing.

Home Ownership in Squatter Areas

Seymour (1976) provides a complete profile of the causes of squatter settlement growth in urban Zambia. The rapid increase in the urban population of Zambia immediately after Independence accounts in part for the considerable unsatisfied housing demand within the towns and cities at that time. In addition, there was accelerated migration due to economic expansion and the removal of controls on movement, which brought large numbers of people, mainly wives and children, into the towns. The search for better income opportunities has been another important factor underlying rural-urban migration, and, consequently, squatter settlement expansion.

The population grew by about 67%, at an average annual growth rate of 9%, during the 1963-1970 period. From 1969 through 1974, the total urban population grew by 38% at an average annual rate of 7% (Nyathi, 1978). Thus, the interaction between the economic growth process, the population growth rate, and the high rate of urbanization in

Zambia created an enormous physical need for housing which the prevailing institutional framework failed to meet. The National Housing Authority (1972), Muller (1979), Simons (1976), and Nyathi (1978) provide descriptions of the ecology of squatter settlements in various cities and townships in Zambia. According to Simons (1976):

> Housing standards in self-help areas generally fall below the official standards prescribed in town planning and building regulations. Most shanties, however, are superior in size and quality to the traditional dwellings of villagers, of whom four out of five live in one or two roomed houses, built of mud-packed poles or sun-dried bricks, with roofs of grass or thatch. Although some settlements have built roughly in rows, most of the houses are irregularly spaced and are intersected by a network of uneven tracks and paths--closer inspection often reveals that the original houses were actually built in clusters around a central space--on the lines of a traditional village, but as new settlers arrived, they built their houses on vacant land between the older houses so it is now difficult to detect older groupings and the analogy with a village group can easily be overdrawn. Improved services, provided by funds from town councils, may stimulate shanty owners to build bigger and better houses but can hardly reduce significantly the great disparities between high cost suburbs and high density low cost settlments (pp. 20-23).

Turok and Sanyal (1980) and Schlyter and Schlyter (1980) report the nuclear family group predominates in the squatter settlements as elsewhere in the urban areas, with a smaller average household size than in rural areas. But even if the extended family does not share the same territory, family ties remain close and the extended family is an important social security agency. Residents of squatter settlements can buy or sell a house freely but have to apply to the local leader for permission to build a house. This was in line with tradition in many parts of

Zambia--a newcomer has to stay with a relative or friend until he is known in the area, at which time he can apply to the village headman to build his own house. A survey of George compound in Lusaka in 1976 showed that on arrival in the settlement, only 17% occupied their own houses, usually as tenants, and 68% stayed with relatives. According to Turok and Sanyal (1980):

> Although almost half of squatter households were renters, in most settlements home ownership was popular as it removed the expense of monthly rent and the house could be enlarged according to family needs or to make additional income by letting out rooms. A homeowner had little security of tenure; his continued residence depended on his being accepted by his neighbors and by the local leadership. However, within the wider legal structure of Zambia no home owner in a squatter settlement had security of land tenure (p. 7).

Government Housing Policies After Independence

The Zambian housing policy after Independence is well documented in the works of Seymour (1973; 1976), Martin (1977), and Collins (1973). When Zambia became independent, the new government inherited racially segregated towns with spacious, well-constructed European suburbs and crowded, poorly built townships for Africans. Much of the low-cost housing had been modeled on segregated housing for Africans in South Africa--cheap, uniform structure and minimal services (Seymour, 1973).

During the 1960s the economy of Zambia was in crisis with falling copper prices. At the same time, rural poverty forced a massive influx of people into the towns. The government had little choice but to try to keep building

standards as low as possible for affordability and to maximize the supply of new houses. Housing policies of the government were identical with those of the colonial regime. However, the expansion of industrial, commercial, and administrative activities, especially between 1963 and 1969, further increased the economic disparity between urban and rural areas (Martin, 1977). At the same time, pass laws established by the colonial regime were abolished. New opportunities, such as paid employment, the availability of enormous vacant areas of peri-urban land left by white farmers who fled the country, and the inability of landlords to control the settlements or to collect rents because of the political situation, resulted in the massive growth of squatter settlements in urban areas (Seymour, 1975 ; Nyathi, 1978).

Although squatting was condemned as illegal and unauthorized, settlements which grew most rapidly were those within walking distance of the city's employment center where the main concentration of the squatter population settled. New settlements grew up on vacant land, with newcomers extending the traditional system of freehold land tenure to urban areas, in defiance of landowners.

To overcome the massive growth of squatter settlements, the Zambian government policy of providing housing was modified in favor of resettling squatters into site-and-services compounds. The purpose of the project was to establish owner-occupied housing for low-income households (Bamberger et al., 1982); site-and-service programs were

seen as the most effective way of accomplishing this. The government provided serviced plots on which settlers could build their own houses to approved standards with the aid of loans provided by the international agencies. According to the World Bank (1982):

> In Lusaka, the largest and fastest growing city in Zambia, housing problems are acute. Thus, a sites and services project was developed with $3 million of World Bank funding to upgrade and service 17,000 dwellings in four major squatter settlements, to prepare 12,000 residential plots, and to provide loans for home improvements and construction (p. 116).

In 1965 the first official housing program set out to reduce the standards of low-cost house building and launched aided self-help housing. Under this program, the "normal" site-and-services schemes were introduced; these were considered the most effective way of providing cheap owner-occupied housing with full services for low-income households. However, as Ndulo (1983) explains, the normal site-and-services projects proved to be too expensive for most families. Too few houses were being built and those that were built were financially out of reach of most families. Therefore, in 1968 a new version of the program, partially serviced "basic" site-and-services projects, were introduced. The goal of the program, Zambia's Second National Development Plan (1972-1976), was to upgrade all improvable squatter areas in the country and to provide some 70,000 site-and-services plots (Ndulo, 1983).

The following year another site-and-services scheme was begun with minimally serviced plots provided. However,

people refused to move to new site-and-services areas, and the schemes came under criticism as potential slums (Turok and Sanyal, 1980).

The unpopularity of the earlier site-and-services programs are blamed on the following factors:

1. Cost: they proved to be too expensive for low-income households.
2. Distance: their location long distances from places of employment, and cumbersome, lengthy plot allocation procedures.
3. Security of Tenure: the issue of security of land tenure in site-and-services schemes was not yet settled. Unlike in medium and high cost areas, site-and-services plots were not legally surveyed and registered, with no provisions for security of mortgage or loans.

In January 1972, the Zambian government introduced a revised low-income policy recognizing the needs of squatters to improve the settlements. The Second National Development Program adopted the policy of squatter upgrading in the place of demolition. The idea of upgrading had been introduced by a team of Swedish architects who visited Zambia in 1969 (Martin, 1976). Basic services such as water supplies, sewers and sewage disposal, roads and streets, and other commercial services were provided to already settled squatters. In 1974 a new policy of upgrading selected squatter areas was introduced. The local councils were authorized to assure security of tenure and access to improved public facilities to low-income households of squatter settlements (Collins, 1973; Seymour, 1985).

Thus, in the second half of the 1970s the government of Zambia adopted the policy of upgrading, which proved to be not only the cheapest, but also the only way of improving the conditions of most urban squatters. Ndulo (1983) asserts that the upgrading policy was adopted by the Zambian government to revise the shortcomings of the site-and-services scheme and to encourage property ownership for motivated and qualified residents. Upgrading was proposed only for self-improving settlements inhabited by those already in relatively stable employment; the tendency of these squatters to identify themselves as property owners made them naturally conservative, and it was implied this tendency should be encouraged. In addition, it was believed that upgrading squatter settlements would foster social mobility, upgrade the "middle" class status of the squatters, and integrate and absorb the residents into the mainstreams of the socio-political system (Stern, 1975).

The impact of urban housing projects in Zambia has been studied by researchers affiliated with the National Housing Authority in Zambia, and international agencies such as the World Bank and International Labor Organization. Simon and Seymour (1976), and Turok and Sanyal (1980) critically examined the housing projects in squatter areas in Lusaka. Despite this, no attempt has been made to investigate the patterns of housing improvement activities among the urban poor in Zambia. Studies on housing demand have been done for middle-income countries, particularly Latin America, and a few other countries such as Korea and Egypt. The modest

research that has been done suggests important similarities in patterns of housing investment or improvement among middle-income developing countries. The known factors influencing housing improvements are: tenure security, income level, rent-paying renters, dwelling characteristics, infrastructure, and services. But whether these patterns hold for other, less developed countries is not known. With the view that the Sub-Saharan African countries are underrepresented in the housing investment literature, this investigation hopes to channel more research into this area.

CHAPTER III

DATA AND METHODOLOGY

This chapter presents the research procedures employed to accomplish the study objectives. The chapter begins with a discussion of the research methods used in the 1974 Zambian Housing Survey, from which the data for the present study was obtained. The research methods utilized by the original researchers are described in three parts: (1) The source and nature of data, (2) Survey design, and (3) Instrumentation. Second, the population and the sample selected for this research, the variable selection, and specific methodological components of the study are discussed in detail.

The Source And Nature of The Data

This study is a secondary analysis of data gathered in a survey in which this author was not involved. The survey took place in 1973 in Lusaka, Kitwe, and Ndola, respectively the three largest cities in Zambia. Under the direction of professor David S. Wiley--formerly of the Department of Sociology, University of Wisconsin, Madison--the project was entitled "The Zambian Housing Survey." Its primary purpose was to provide the Zambian National Housing Authority information on urbanization, housing, and employment in high density areas.

The original study focused on two major areas:

General Problem: Urbanization in Zambia and individual access to urban services.

Special Focus:

A. Scope of squatter housing problems in three cities: Lusaka, Kitwe, and Ndola.

B. Demographic characteristics of the population of three types of urban housing:

   1) authorized (government and mine housing), 2) unauthorized (squatters), and 3) site-and-service (municipally organized, self-help housing).

C. Housing histories and evaluations by residents, including evaluation of needs and priorities.

D. Urbanization of individuals: attitude and behavior.

E. Status attainment by households, i.e., access to education, occupation, income.

F. Individual experiences concerning health and crime.

G. Characteristics of housing area ecologies as obtained from formal leaders of compounds.

The survey was jointly funded by Midwest University Consortium in Internationl Activities, Inc. (MUCIA), Ford Foundation, National Institute of Mental Health (NIMH), and the Rockefeller Foundation.

For the purposes of the present study, the researcher utilized data related to the respondents' housing activities, compound evaluation, and socio-economic and demographic characteristics. In the following sections, the sample design and instrumentation adopted by the original researchers for the total study are described.[4] The population and sample for this research, variable selection, and definitions are then discussed at length.

Sample Design

Data collected for the total study involved two randomly selected samples. The first sample focused on the households as the unit of analysis, whereas the second focused on the individuals. The two samples were then integrated in such a way that selection of the household sample further led to selection of individuals within the households, making it possible to relate individuals and their characteristics to a particular type of household. The households chosen in each city were located in various housing units or compounds as they are more commonly known. A cluster sampling was used to identify compounds from which the sample of the households were selected. The compounds in the household sample consisted of the following three residential units, categorized by housing management:

a) Council housing: Historically, council housing has been the dominant form of housing in Zambia. Residents were the beneficiaries of the government housing subsidy program. Some were managed by city councils, others by particular companies (whether mining, processing, construction, etc.). Thus, occupancy was often tied to employment. The council housing comprised 36.9% of the household sample.[5]

b) Site-and-services areas: Houses in this category were managed by municipalities. Under the site-and-services and aided self-help program, residents were provided with infrastructure, greater tenure security, and ownership rights. The legal ownership title for these areas was

offered for the first time under the new legislation in August 1974. The site-and-service housing comprised 18.9% of the respondents in the household sample.

c) Squatter areas: The houses in this group were mainly unauthorized with uncertain tenancy and ownership rights. The informal areas in all three cities housed more than 40% of the population.[6] The squatters comprised 44.2% of the household sample in the original study.

Description of the Original Survey Instrument

The survey instrument for the total study consisted of 150 questions, divided into in several sections. Questions were designed to gather data on the following major categories:

1) Social and Economic Factors:
   a. Age, sex, district, etc.
   b. Income, occupation, etc.
   c. Migration variables, e.g., years of urban residence, years lived in current residence, etc.

2) Housing and Compound Evaluation:
   a. Evaluation of housing services,
   b. Decisions on housing improvements and services,
   c. Attitudes and plans toward housing and services, etc.

3) Aspirations, plans, and personal evaluations:
   a. Educational aspirations for children,
   b. Occupational aspirations,
   c. Plans to settle in town or village

The instrument included nine questions which were answered by the household member with whom the interviewer had initial contact. These questions covered names, ages, languages, educational status, and length of residence of all household members. Six questions answered by the

interviewer, based on observation, covered characteristics of the house including availability of electricity; size and shape of house; wall, roof, and door composition; and the state of repair of the house. Thirty-three questions answered by all respondents covered residential history, ethnic background, religion, occupation, income, and health.

Female heads of the household responded to another 19 questions on their evaluations of their residential situation, their likes and dislikes about the compounds. All female respondents answered 5 questions on their fertility and infant mortality. Male heads of the household answered 37 questions on their evaluations of their residential situation, number of improvements made and number of urgently needed repairs, and decisions and aspirations. Respondents selected randomly for the second part of the study answered another 41 questions on residential history, friendship patterns, perceptions of urban and rural life, and organizational affiliations. These were not utilized in the current analysis, however, because of the interest in using households rather than individuals as the unit of analysis. The total sum of households from all compound types in all three cities (Lusaka, Kitwe, and Ndola) formed the household sample and the number of cases involved were 3,200.[6]

Population and Sample

This study is the analysis of secondary data obtained from the Zambian Housing Survey, a multipurpose survey conducted in 1973. The database contained information on housing attributes, activities, evaluations, and respondents' socio-economic characteristics, which made it appropriate for home improvement studies. Table 1 shows the population distribution of the entire sample from which a subsample of male household heads was selected to be analyzed in this study.

Table 1. POPULATION BY CITY AND COMPOUND

	GROUP			
	SQUATTERS	SITE-AND-SERVICES	COUNCILS	TOTAL
City	Count	Count	Count	Count (%)
Lusaka	967	254	434	1655 (51.8)
Ndola	209	184	307	700 (21.9)
Kitwe	235	166	437	838 (26.3)
TOTAL (%)	1411 (44.2)	604 (18.9)	1178 (36.9)	3193 (100.0)

The households in each city lived in one of three types of compounds or housing units, squatters, site-and-services, or council/employers. The main focus of data analysis in this study, however, was based on the city of Lusaka. The reasons for this selection were as follows:

a) The Lusaka subsample contained more than 50% of the respondents from all compound types in the household sample, and was thus large enough to give credence to research findings.[7]

b) Residents in all three types of residential compounds responded to questions pertaining to their tenure status, the most urgently needed improvements, quality and quantity of improvements made on their houses, and the presence of a renter in the house. The database also contained detailed information on the respondents' socio-economic characteristics, useful in analyzing the relationship between housing improvement and individuals' personal characteristics.

c) Almost all the questions pertaining to housing activities, repairs, improvements made, and housing evaluations included in the questionnaire were intended for the male heads of households. Thus, it was from the responses of 1,655 male household heads that relevant variables for this study were selected.

d) All questions intended for the female section of the questionnaire were irrelevant to the purpose of this research. The females responded to questions regarding their fertility, infant mortality, and evaluations of their residential situation. Although the researcher could conceivably analyze some of the female responses in the housing evaluation category, closer examination of the responses revealed the majority of responses by females on housing evaluation were either left blank, were "don't know"

responses, or were missing data. Consequently, the females were totally excluded from the analysis in this study.

Limitations

All research is subject to some limitations, and the present study is no exception. First, the present researcher had no any role in the data collection efforts. Although housing and compound evaluation was a part of data collection efforts, the survey was not designed solely for the study of housing improvement. Consideration of the design and implementation procedures used in the original study led to the assumption that available data were reliable and valid.

Another limitation of the study concerns the timing of the data collection and sampling, which took place from June-August 1974. The respondents were interviewed once during this three-month period. Thus, the data represents a one-time description of the housing activities of the respondents, and relies mainly on the respondents' recall of quality or quantity of housing improvements made. (The findings of the present study, therefore, depict phenomena during a specific period in 1973 in Zambia, and should be interpreted with that in mind.) A broader application would require follow-up study on the consequences of the housing upgrading policy in Zambia.

Conceptual Framework

A substantial amount of research in the economic development literature has examined the benefits of low-income shelter projects in developing countries. Much of this research is based on the effective demand theory, which argues that housing policies that are rooted in the actual behavior of urban households have greater likelihood of success than do those based on arbitrary normative standards.[8] Empirical studies on housing demand have tried to gain insight into the benefits of providing certain services such as running water, sanitation facilities, and community infrastructure in urban development projects. During recent years, however, research efforts have been focused on the relationships between tenure security and patterns of housing expenditures on housing improvements by low-income dwellers.

The econometric housing models employed by Jimenez (1982, 1983) and Malpezzi and Mayo (1987), for example, use as the dependent variable a measure of value to determine all types of improvements made by housing beneficiaries. Usually, a pricing technique is developed to compare the average value of housing before and after project implementation. The most accurate estimate of value would be the price of the house at the time of purchase. The difficulty of obtaining data on housing transactions and the lack of information about the characteristics of the housing markets in developing countries limit the application of this method by other researchers. This limitation

particularly proved to be true for the present researcher. The data set did not provide any information on the price or the value of the houses in which the respondents lived, preventing the use of the above method in this study.

Another method, employed by Struyk and Lynn (1983), Burns and Shoup (1981), and Ward (1976), explain housing investment as a function of certain indicators. For example, the method employed by Struyk and Lynn uses all types of physical improvements reported by dwellers as the dependent variable. In their theory, the fact that a household has made improvements to its house means that the net effect on housing quality is positive.[9] Improvements made are determined by measuring indicators reported by the dwellers, such as the number of rooms added, general additions to and expansion of the house interior and exterior. This study uses this latter theoretical framework to develop an analytical model of the housing improvement activities undertaken by the participants of the site-and-services and upgrading project in Lusaka, Zambia. The site-and-services group are considered to be with tenure and the squatters and the councils (renters) groups are without tenure. On the basis of the above conceptual backgrounds, the study seeks to identify the determinants of home improvement among the households surveyed in this sample.

Variable Selection

The selection of the appropriate home improvement variables is crucial in studying the improvement activities

of the participants of the self-help projects. Jimenez and Struyk (1983) suggest that selection of the home improvement variables be guided by an explicit theory or hypothesis. The current literature emphasizes the influence of security of tenure, income, and presence of renters on the rate or magnitude of home improvement activities. In testing this relationship, the choice of the dependent variable is important because it is this variable which a particular theory attempts to explain. As defined by Mendelsohn (1977), home improvement includes essentially all lasting capital investment/improvement in a building, such as replacement, alterations, and repairs. Jimenez (1983) defines housing improvement as any structural improvement made by homeowners to their dwellings at a pace and with methods dictated by their own tastes and resources. According to these definitions, a widely varied choice of indicators (variables) can be used to measure housing improvement activities. In this study, the choice of variables was limited to the database available to the researcher, and variable selection began with a preliminary review of the original survey instrument which led to the selection of three groups of variables/questions:

Household Characteristics

The information concerning type of compound, and socio-economic and demographic characteristics of households were derived from the following questions in the original questionnaire:

Q.1 What is the name of your compound code?

Q.90 Did you or your family build any part of this house?

Q.90b Did someone build this house for you?

Q.91 How did you get the plot of land on which you are living?

a. Did you build on it?
b. Did you get permission from UNIP?[10]
c. Did you get permission from City Council?
d. Did you get this plot from previous occupier/ previous owner?
e. Did you rent from a landlord?

Q.16 How many years of your life have you lived in town? (Responses recorded in total number of years)

Q.9 How long have you lived in this household?

Q.9a What is your age?

Q.20 Up to what grade or standard did you reach in your education? (Responses recorded as total years of education.)

Q.26 How much money do you receive at the job you are working presently? (responses recorded in Kwacha per month.)

Q.28 Do you get a house allowance for your job? If yes, how much do they give you per month?

Q.29 How much money per month do you make from other jobs?

Housing Activities & Evaluation

The following questions pertained to housing evaluation and activities of the households.

Q.95 Did you make any improvement on your house in the last twelve months, such as adding an extra room, etc.

Q.95a What did you improve?

Q.15 What is the state of repair of this house?

Q.16 What repairs need to be carried out in this house?

Q.96 What do you think needs to be repaired most urgently?

Q.90 Did you or your family build any part of this house?

Q.98 Do you have anybody in this house who pays rent to you?

Q.56. Are you very happy, happy, unhappy, or very unhappy with your house?

Housing Attributes

The information about the physical characteristics of the compounds as observed by the interviewer were derived from the following questions in the survey instrument:

Q.11a How many buildings are a part of this house?

Q.12 What is the main material out of which this house's roof is made?

Q.13 What is the basic material out of which the walls of this house are made?

Q.14a How many conglomerate/slatted doors are there on this house?

Q.14b How many wood doors are there on this house?

Q.14c How many metal doors are there on this house?

Q.69 How many rooms are in this house?

Q.72 What type of toilets are there in this house?

The above variables were merged from the original file into a subfile, using control variables to check for consistency and level of significance in order to detect possible errors in the distribution of variables. A cross-tabulation was obtained for selected variables by compound

type. The consistency check included variables such as the number of improvements, any improvement made, and housebuilding to be checked against type of the compound reported. For example, the number of households in each compound who responded "yes" to whether they made an improvement had to match with the number of households who reported at least one type of physical improvement on their houses. Additionally, squatters and the site-and-service households reported participation in house building, but council households, who mainly rented the government subsidized housing, did not.

Variable Definition

In the preceeding section, three groups of variables were selected for examination in this dissertation. The three groups of variables are related to the following areas:

a. Housing activities and evaluations

b. Household characteristics

c. House characteristics

Variable names and their descriptions are listed in Tables 2, 3 and 4.

Table 2. Housing Activities and Evaluation

Variable	Keyword
1. Improvements Made	ANYIMP*
2. Types of Improvement	TYPIMP**
3. Repair Condition of the House	STORP***
4. Satisfaction with House	HPHO +
5. Build House	BLDH ++
6. Renters Present in the House	LOGER +++
7. Assistance in House Building	HELP#
8. Number of Buildings	BLDGS##
9. Plot Permission	PLOTFRM###

* Respondents were asked if they made any improvements during the previous 12 months. For the purpose of statistical analysis, dummy variables were used to record responses (Yes=1; No=0).

** Respondents were asked about the types of improvements they made on their houses. Responses were recorded in 7 categories: 1. Everything; 2. Size; 3. Roof; 4. Floor; 5. Window; 6. Walls; 7. Others.

*** Respondents were asked about the state of repair of their house. Responses were recorded as: 1=Need major repair; 2=Need minor repair; 3=Good; 4=Very good.

\+ Respondents were asked to indicate if they were happy with their house. The responses were recorded: 1=Not Happy; 2=Happy; 3=Very happy.

++ Respondents were asked if they had built their houses. Responses were recorded as 1=Built house; 2=Did not build house.

+++ Respondents were asked if they had a renter present in the house. Responses were recorded: 1=Yes; 2=No.

\# Respondents were asked if someone helped them to build their house. Responses were recorded as: 1=Yes; 2=No.

Respondents were asked to indicate how many buildings were part of their household. Responses were recorded as single or multiple.

Respondents were asked to indicate how they got the plot of land on which they lived. Responses were recorded in five categories.

Table 3. Household Characteristics

Variable	Keyword
1. Tenure status	*
a. Squatters (non-tenure)	GRP1
b. Site-and-services (tenured)	GRP2
C. Councils (renters)	GRP3
2. Total income per month	** INCOM
3. Duration of Occupancy	+ LENGTH
4. Urban experience	++ TOWN
5. Education	# EDUC
6. Age	## AGE
7. Occupation	+# OCCUPATION

* Respondents were asked to indicate the name of their compound. The type of compound represented the legal categories for each household group. Based on the respondents' answers, three codes were used to identify the tenure status of each group: GRP1= Temporary; GRP2=Tenured; GRP3=Renters.

** Responses were recorded in Kwacha per month.

\+ Responses recorded in number of years.

++ Responses recorded in number of years.

\# Responses recorded in number of years.

Responses recorded in number of years.

+# Responses were open ended; a variety of numeric codes were used by the original coders to identify different job categories. The researcher could list seven major job descriptions, from no job to construction worker.

Table 4. House Characteristics

Variable	Keyword
	*
1. Quality of roof materials	ROOF
	**
2. Quality of walls	WALL
3. Number of doors	+
a. Conglomerate	CDOOR
b. Wood	WDOOR
c. Metal	MDOOR
	++
4. Number of rooms	NROOM
	#
5. Type of toilet	TOILT
6. Electricity	ElECTH##

Scale of responses for each variable include:

* 1=Thatched; 2=Cardboard; 3=Corrugated asbestos; 4=Metal; 5=Wood; 6=Canvas.

** 1=Grass; 2=Pole or Dogga; 3=Cardboard; 4=Kimberly brick; 5=Corrugated metal; 6=Concrete; 7=Wood.

\+ 1-2; 3-4; 5-6; 7+

++ 1-2; 3-4; 5-6; 7+

\# 1=Bucket; 2=Pit; 3=Flush; 4=Aqua or others.

1=Yes; 2=No

Model Specifications

Housing investment models formulated by Jimemez (1982) and Struyk (1983) explain home improvement as a function of ownership status, characteristics of the house (e.g. number of rooms, quality of sanitary facilities, state of repair of the exterior and interior), and socio-economic and demographic characteristics of the dwellers (level of income, length of stay, urban experience, etc.). Accordingly they express this relationship in the linear form:

$$Y = b_0 + b_1X_1 + b_2X_2 + \ldots\ldots + b_kX_k + \text{error terms} \quad (3)$$

The model specification adopted in this study therefore relects the above formulation. An estimating equation was derived to test the study's hypothesis:

$$\begin{aligned} \text{ANYIMP} = b_0 + \; & + b_1\text{BLDH} + b_2\text{STOFR} + b_3\text{LOGER} + \\ & b_4\text{TINC} + b_5\,\text{LENGTH} + b_6\text{TOWN} + b_7\text{EDUC} + \\ & b_8\text{AGE} + e \end{aligned} \quad (4)$$

The dependent variable (ANYIMP) is based on the household responses to question 95 and 95a in the survey, in which households were asked about the number of improvements made on their houses during the previous 12 months. The responses were recorded into yes/no for each subpopulation in the Lusaka sample. The dichotomous (nonmetric) nature of these responses to be used as the dependent variable in regression equations dictated the use of a modified regression model, i.e., Weighted Least Square regression

(WLS). The rationale for using such a method and other possible alternatives is discussed in the next section of this dissertation.

The independent variables included in the model are total monthly income (TINC), whether the household head built his house (BLDH), presence of renters (LOGER), and state of repair (STOFR). The purpose of the inclusion of these variables was to examine their effects on the home improvement activities of the households in the Lusaka sample. In addition, the independent variables in the equation representing selected personal characteristics of the respondents are total monthly income (TINC), length of stay (LENGTH), education (EDUC), urban experience as measured by number of years in town (TOWN), and age of the head of household (AGE). Their inclusion reflected the hypothesis that home improvement activities of the site-and-services differed from the other two groups with respect to personal characteristics such as education, income, length of stay in compound, urban experience, and the age of the respondent.

Model Estimation

The data in this study consisted of three subpopulations, among which only the site-and-services households had tenure rights. Thus, the data were restricted to three subsections from which the researcher could infer differences in home improvement activities between the three subgroups in the sample, but not the

change of behavior over time. On this basis, the site-and-services households with tenure were considered to be the experimental group in this study, while the squatters (no tenure) and the councils (renters) were the control groups.

For each of the groups, two multiple regressions were performed, relating improvement activities for each group to the independent variables (see previous section). The linear regression analysis usually assumes that the dependent variable is continuous, the independent variables have no restrictions on their values, and the error terms are randomly distributed and are not correlated. In this study, however, the dependent variable consisted of a nonmetric, dichotomous variable for which dummy variables were created to record yes and no responses (scored one if made any improvement; zero if no improvement). When a dummy variable takes the place of the dependent variable, the regression equation becomes one of the Linear Probability models. Since the dependent variable (Y_i) can take only two values (i.e., Y_i= 1 if an event occurs, but Y_i= 0 if the event does not occur), the discussion must be in terms of the probability of that event occurring. The same is true for the error terms. The use of such a Linear Probability Model, however, violates one of the most important regression assumptions concerning the constancy of the error term which is $E(e_i)=0$.[11] Since the error term is heteroscedastic, ordinary least square regression estimate will not produce the smallest possible sampling variance, thus the $\hat{b}_k$ becomes inefficient. As a result, the

estimates of standard error are biased, as are the significance tests. Therefore, any hypothesis test (e.g. the t and F test) or confidence interval based on these sampling variances will be invalid, even for very large samples.[12]

The use of a dummy variable in place of a dependent variable, the heteroscedasticity, and solutions to this problem have been extensively discussed in the statistical and methodological literature (Lewis-Beck, 1980, pp. 39-42; Aldrich and Nelson, 1984, pp. 12-19; Norusis, 1988, pp. 357-363; Willink, 1988, pp. 175-185; Kohler, 1988, pp. 611-614). Among the various statistical techniques used to correct estimation problems associated with a nonmetric dependent variable, two methods are quite popular among scholars in the housing investment literature.[13] The first method, known as the Weighted Least Squares (WLS), is a simple modification of ordinary least square regression technique, and the second is a nonlinear approach which uses two popular techniques of probit and logit regressions. Both alternatives were explored in this dissertation. However, to avoid redundancy, only the findings from the WLS analysis are reported. The rationale and details of each method are explained in the next section.

Methodology

The standard treatment for solving the heteroscedasticity problem is to conduct a Weighted Least Squares Regression, which involves a transformation

procedure to restore the constancy of the variance of the error terms. This study adopted a transformation procedure outlined by Aldrich (1984, pp. 10-15) and Fomby et al. (1984, pp. 340-342).[14] To provide a valid estimation of the regression equation with a binary dependent variable, (e.g. zero and one), one should transform the model to produce a set of weighted estimators. Four steps are involved in constructing weighted coefficients for each variable in the regression equation. The first step is to conduct an ordinary least square regression (OLS) of dependent variable on all the independent variables in the model:

$$Y_i = b_o + b_1X_{i1} + b_2X_{i2} + \ldots + b_kX_{ik} + e_i \quad (5)$$

or, in the general case, using the summation notation:

$$Y_i = \Sigma b_kX_{ik} + e_i \quad \text{or,} \quad Y_i = \hat{Y} + e_i \quad (6)$$

The next step is to construct a set of weights (W_i) for each observation. That is, multiplication of each observation on the dependent and independent variable by the square root of the reciprocal of the variance of the random variable (e_i).[15]

$$W_i = 1/[(\hat{Y}_i)\ (1 - \hat{Y}_i)]^{1/2} \quad (7)$$

The third step is to transform the model by multiplying each variable by the weight. That is, to transform the model so that each term (i.e., for each observation i) of the estimated regression equation, including the intercept is multiplied by this weight:

$$W_iY_i = W_ib_0 + b_1W_1X_{i1} + b_2W_2X_{i2} +...+ b_kW_kX_{ik} + W_ie_i \quad (8)$$

Finally, regression analysis is conducted in the usual manner so that the Y_is are regressed on weighted X_is. Statistically, this transformation procedure corrects the heteroscedastic covariance matrix of the disturbance vector. Therefore, the standard error of the slope of the weighted least square estimates is the valid one to conduct the hypothesis test and confidence interval estimates.

The calculations of the Weighted Least square regressions in this study were accomplished by using the SPSSx program. The program, however, does not provide a routine procedure for the calculation of weights. For this purpose, the researcher followed the method derived by Aldrich (1984) for the calculation of weighted regressions. The detailed procedures for calculation of weights on the SPSSx program are presented in Appendix A. It should also be noted that to check whether the above transformation procedure is correct, the researcher conducted a test on one example cited in Aldrich's book using the SPSSx program (Aldrich, 1984, pp. 15-19). The SPSSx results showed similar findings as Aldrich's example, thus verifying the validity of the procedure adopted for this study.

The alternative method of data analysis for correcting the heteroscedasticity is a nonlinear model such as logit or probit regressions. The major reason for using this technique is the criticism attached to the linearity assumption under the WLS method. The major characteristic

of the WLS is that the observed values for dependent variables are limited to the interval from 0 to 1. Therefore, the estimated coefficient must be interpreted as a probability of times an event occurs. As a result, the estimated equation may provide predicted or fitted values outside this range. On this basis, many researchers believe that the linearity assumption of this method is unrealistic in most cases. According to Fomby, 1984:

> While the linearity assumption may be appropriate over a range of values of the independent variable, it is certainly not appropriate for either extremly large or small values (pp. 342-344).

An alternative solution is a nonlinear probability approach that guarantees all predictions to be within the range of (0,1). The most widely used nonlinear probability models in the housing investment literature are logit and probit regressions. As is indicated by both Aldrich and Fomby, et.al, the results of the logit or probit regressions may be used to check the validity of the WLS findings. If the sample is large enough and the models are correctly estimated, the WLS estimates produce similar statistical properties, i.e., both procedures are asymptotically (large n) equivalent. With large samples, therefore, the result should be very similar.[16] As indicated earlier, this alternative method of estimation was also explored in the course of this study. The estimated coefficients using the probit procedures provided estimates very similar to the WLS results, supporting the validity of the method of data analysis used in this study.

CHAPTER IV

DATA ANALYSIS

The population chosen for this study was selected from a total sample of 3,200 households surveyed in 1974 in the three largest cities in Zambia: Lusaka, Kitwe, and Ndola (See Table 1). A subsample of the male household heads in Lusaka was selected, and their responses provided the data for the present study.

The first part of this chapter presents a summary profile of the three housing groups in the Lusaka sample. The information presented is based on all 1,655 male household heads who were surveyed in Lusaka, the capital city of Zambia. The description provides an aggregate picture of the variants in selected Households' socio-economic and demographic and house characteristics, housing activities, and evaluations between the tenured households (site-and-services) and nontenured households (squatters and councils).

The second section of this chapter presents the application of the housing improvement model to Lusaka. The discussions focus on the results of regression analyses performed to explain the variations in housing activities among the households in this study.

Population Characteristics

The households in Lusaka lived in one of three types ofcompounds or housing units, squatters, site-and-services, and council/employers. Table 5 shows the population distribution of the sample according to compound type or housing groups. In addition, the information presented on the compound categories of Table 5 implies the legal occupancy status of the dwellers.

Table 5. NUMBER OF RESPONDENTS IN LUSAKA

Housing Group	Number of Respondents	Relative Size *
Squatters	969.0	58.4
Site-and Services	254.0	15.3
Council/ Employers	434.0	26.2
Total	1655.0	100.0

* Percentage is based on valid cases.

The squatters in the sample lived in compounds built on illegal land, constituting the nontenured population of this study. The residents of site-and-services compounds were mainly the beneficiaries of the new housing reform act of 1972. Under the Second National Development Plan (SNDP, 1972-1976), the residents of these compounds were provided with legal titles to their homes (IBRD, 1974). Accordingly, the residents of the site-and-services compounds constituted

the tenured population of the sample. Finally, the councils residents were governmental employees who rented their plots from the town council, historically the most most predominant form of housing in Zambia. Before Independence, mining companies, the government, and other major employers provided housing with attendant services for their employees. After Independence, however, the government reduced public housing construction by encouraging owner occupation of dwellings through promotion of self-help housing programs (Seymour, 1973). Thus, the council compounds constituted the renter population in this study. The average age of male household heads for the Lusaka sample was 37 years, but when responses were compared across compounds, the site-and-services respondents were slightly older than the other respondents (Table 6).

Table 6. AGE BY TYPE OF COMPOUND

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
AGE	Count*	%	Count	%	Count	%
< 18	4	0.4	0	0.0	0	0.0
18-26	157	16.2	31	12.2	72	16.6
27-34	256	26.5	63	24.8	95	21.9
> 35	552	57.1	160	63.0	267	61.5
Total	969	100.0**	254	100.0	434	100.0

* Number of valid cases for each group.
** Total percentage.

Most respondents had attended school but had minimal education. Among the housing groups, squatters had the lowest level of education and councils had the highest, with 36% having more than 6 years of education (Table 7).

Table 7. EDUCATION

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
EDUC***	Count*	%	Count	%	Count	%
< 1	235	24.30	51	20.1	54	12.44
1-3	382	39.50	96	37.79	95	21.89
4-5	222	22.95	71	27.95	190	43.78
> 6	128	13.25	36	14.17	95	21.89
Total	967	100.00**	254	100.00	434	100.00

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.
*** Education reported in number of years

The average monthly income of male heads of household was 73.3 Kwacha (1 Kwacha is valued at approximately $1.40 in 1973 U.S. currency), but the actual individual income varied widely between compounds (Table 8). The squatters appeared to be the poorest group, while the councils residents reported the highest income (55.94% earned more than 80 Kwacha). About 49% of squatters and 46% of the site-and-services reported to have a renter in their house as an additional source of income (Table 9).

Table 8. INCOME

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
TINC	Count*	%	Count	%	Count	%
< K 40	261	30.90	58	25.80	55	13.20
41-60	264	31.30	59	26.20	76	18.20
61-80	140	16.60	29	12.90	48	11.50
> 81 K	179	21.20	79	35.10	238	57.10
No Response	123		29		17	
Total	967	100.00**	254	100.00	434	100.0

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.
+ 1 Kwacha is valued at approximately US$ 1.40

Table 9. RENTER IN HOUSE

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
LOGER	Count*	%	Count	%	Count	%
No Renter	438	50.9	135	54.0	429	99.3
Have Renter	422	49.1	115	46.0	3	0.7
No Response	109		4		2	
Total	969	100.0**	254	100.0	434	100.0

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.

The amount of rent charged varied between K 5-50, the average being K 21.

The average length of residence in all compounds was about four years. When responses were compared across compounds, it appeared that the newcomers (less than one year) were mainly from squatter compounds (Table 10).

Table 10. DURATION OF OCCUPANCY

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
LENGTH***	Count*	%	Count	%	Count	%
< 1	279	28.79	60	23.62	112	25.80
2-3	123	12.69	22	8.66	59	13.59
4-6	303	31.27	75	29.52	86	19.81
> 6	262	27.24	97	38.19	177	40.78
Total	969	100.00**	254	100.00	434	100.00

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.
*** Length of occupancy is reported in number of years

The same information held true when the urban experience (number of years in town) was compared across compounds. The squatters had the least urban experience and the council residents had the highest level of urban residency (Table 11). In all three categories, more than 92% of household heads had jobs. Almost half of the employed respondents were doing semiskilled, manual labor. Others were skilled manual workers and clerical workers (Table 12).

Table 11. URBAN EXPERIENCE

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
TOWN***	Count*	%	Count	%	Count	%
< 4	101	10.40	5	2.00	7	1.60
5-9	223	23.10	30	11.90	42	9.70
10-14	149	15.40	44	17.30	52	12.00
15-19	119	12.30	44	17.30	77	17.70
20-24	119	12.30	36	14.20	89	20.50
> 25	256	26.50	95	37.40	167	38.50
Total	967	100.00**	254	100.00	434	100.00

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.
*** Urban experience reported in number of years

Table 12. OCCUPATIONAL CATEGORIES

OCCUPATION*	Count	%
No Job	107	6.7
Clerical/ Teacher	310	18.7
Driver	340	20.5
Mechanic	139	8.3
Sales Person	93	5.6
Restaurant-Operator/Helper	150	9.1
Construction-Worker	365	22.0
No Response	151	9.1
Total	1655	100.0

* Occupational categories reported for all respondents in the Lusaka sample

House Characteristics

The houses in all types of compounds were single family dwellings (Table 13).

Table 13. TYPE OF BUILDINGS

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
BLDGS	Count*	%	Count	%	Count	%
Single	879	90.71	224	88.19	402	92.63
Multiple	90	9.29	30	11.81	32	7.37
Total	96	100.00**	254	100.00	434	100.00

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.

The building materials from which the houses were made varied widely from cardboard for the roof to concrete block walls. The majority of squatter houses (78.24%) were of kimberly brick walls (dried mud brick) and resembled rural-type homes. In contrast, the majority of the site-and-services (80.63%) and councils residents (96.94%) lived in houses with concrete block construction which resembled urban-type housing (Table 14).

In addition to lower quality houses, the majority of squatters (98.69%) had no electricity. Among those in all three groups who had electricity, over 39% were site-and-services and 38.71 were councils (Table 15).

Table 14. QUALITY OF BUILDING MATERIALS

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
WALLS	Count*	%	Count	%	Count	%
Grass/ Cardboard	19	1.98	9	3.53	0	0
Mudbrick (Kimberly)	748	78.24	35	13.83	10	2.32
Corrugated Metal	20	2.09	5	1.97	4	0.93
Concrete/ Brick	169	17.67	204	80.63	416	96.74
No Response	11		1		4	
Total	967	100.00**	254	100.00	434	100.00

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.

Table 15. ELECTRICITY

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
ELECTH	Count*	%	Count	%	Count	%
No Electricity	943	98.69	146	60.83	258	61.28
Had Electricity	13	1.31	94	39.17	163	38.71
No Response	11		14		13	
Total	967	100.00**	254	100.00	434	100.00

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.

Toilet facilities in all groups varied from bucket to pit, flush, and aqua. Over 97% of the squatters and 70% of the site-and-services reported to have pit. Flush toilets were found primarily in councils compounds (76%), compared to only 3% of the squatters and 9.6% of the site-and-services (Table 16). The findings suggest that the councils and site-and-services houses were nearly identical in terms of having permanent construction; however, the councils had better sanitary services.

Table 16. TYPE OF TOILET

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
TOILT	Count*	%	Count	%	Count	%
Bucket	0	0.00	48	19.10	1	0.23
Pit	935	97.50	176	70.10	99	22.81
Flush	3	0.30	24	9.60	324	74.65
Aqua	18	1.90	3	1.20	3	0.60
No Response	11		3		7	
Total	967	100.00**	254	100.00	434	100.00

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.

The Effect of Tenure on Housing Investment and Activities

Tenure status is an important variable in housing investment theory, the expectation being that housing supply activities by homeowners (e.g. alterations, repairs) escalate with increased security of tenure. However, the most difficult task in evaluating the effectiveness of the shelter projects is the definition and measurement of tenure. For one thing, security of tenure varies enormously among developing countries. Land tenure and home ownership rights have deep roots in national and ethnic cultures and is reflected in a wide variety of concepts among different nations. Deobele (1978, p. 104) has noted that in Africa, for example, the land recording system is totally inadequate by modern standards due to tribal ownership or traditional concepts such as that land belongs to whoever wishes to work it. This problem of clouded titles, in Zambia particularly, has been aggravated by large-scale squatting in urban areas. As reported by Simon (1973):

> Migrants who invaded the towns after independence in search of opportunities for better living were placing heavy burdens on local authorities and created conditions that resulted in far-reaching reforms of laws and housing policies (p. 19).

The site-and-services projects initiated in squatter areas during the late 1960s and early 1970s were direct government responses geared to reforming the tribal system of land ownership found throughout the country. The urban housing projects, in particular, were implemented to answer the system of the acquisition of rights that has been

aggravated by "adverse possession."[17] One main feature of housing reform in Zambia was the emphasis on the separation of ownership of structure from the ownership of the underlying land. Under the site-and-services program, the government was offering 99 year leases to beneficiaries who had established long-term residence on the plots. In a study of low-income housing development in Lusaka, Turok and Sanyal (1980) stress the above point by reporting that although dwellers could enjoy home ownership rights, no homeowner in Zambia had complete security of land tenure. Continuation of residence depended on being accepted by neighbors and the local leadership. Thus, within the socialist political structure of Zambia, no homeowner in squatter settlements had total security of land tenure. How did such a situation affect the housing improvement activities of the respondents in this sample? If no homeowner had complete ownership security, how did the provision of the site-and-services affect the perception of tenure of its beneficiaries? To answer the above questions, it was necessary to analyze the precise legal categories involved, the perception of the occupants of their ownership rights for both the house and the plot on which they were residing in relation to housing activities and improvements they made.

Tenure Security

Earlier, Table 5 showed the division of households in Lusaka by type of housing compound, which implied the legal

occupancy status of the dwellers. The respondents in the sample consisted of 58.4% squatters with perilous status, 15.3% site-and-services with legal tenure status, and 26% councils who were renters.

The survey instrument was not designed to ascertain the dwellers' perception of home or land ownership rights, a deficiency which had to be overcome by a more intense analysis. Especially in the case of the site-and-services, the main beneficiaries of the new housing reforms at the time of the study, it was not clear whether they believed they owned the land as well as the buildings they occupied. The same problem regarding the perception of home ownership was evident in the responses of squatters. As reported by Van Den Berg (1978), the squatters in Zambia were of two types, unauthorized and authorized. The former were those who occupied land without the consent of both the land owner and the planning authorities, whereas the latter refers to those squatters who acquired temporary permission (usually six months) from the UNIP or City Council or a private owner, with a view to seeking title under government regulations.[18] A number of questions from the survey instrument were utilized to distinguish between the authorized and unauthorized squatters in this sample and how their perception of tenure differed from the site-and-services or that of the councils residents. Responses to questions concerning plot and house ownership status, satisfaction with house, and types of improvements made were taken from the survey instrument and analyzed in this

section. Taken together, the answers to these questions show respondents' perceptions of their tenure status, and how it affected their housing improvement activities.

Ownership Status

In the survey, the respondents were asked if they had built their own houses. The responses were used to analyze two questions:

(1) How many households built their houses themselves and thus owned the house,

(2) If the house building activities differed among the three groups.

The responses shown in Table 17 indicate that among those who responded positively, 57.4% were squatters and 58.7% were site-and-services who had built their houses themselves.

Table 17. HOUSE BUILDING AND OWNERSHIP

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCIL/EMPLOYER	
BLDH	Count*	%	Count	%	Count	%
Did Not Build House	408	42.6	102	41.3	162	100.0
Built House	549	57.4	145	58.7	0	0.0
Total	957	100.0**	247	100.0	162	100.0

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.

Apparently, despite lack of formal legal title, squatters' behavior toward house building was similar to site-and-services. As expected, none of the councils residents, who were renters, reported having built any part of their houses themselves.

To test whether responses to house building activities were truly similar in the population for both groups--squatters and site-and-services--a test of hypothesis was conducted about differences between two population proportions. The common testing procedure for differences between two proportions is as follows (Ostle and Malone, 1988; Hoel, 1971). If $\hat{p}_1 = X_1/n_1$ is from one sample, and $\hat{p}_2 = X_2/n_2$, is from a second, then the null hypothesis to test is:

$$Ho : p_1 - p_2 = 0, \text{ or equivalently, } Ho : P_1 = p_2$$

For large samples, the distribution of $\hat{p}_1 - \hat{p}_2$ is approximately normal with mean of zero and variance of $\sigma^2\hat{p}_1 - \hat{p}_2$. Thus to conduct the hypothesis test, it is possible to use an approximate Z test based on the normal approximation to the binomial as shown below:

$$Z = \frac{\hat{P}_1 - \hat{P}_2}{\sigma_{\hat{P}_1 - \hat{P}_2}} \qquad (9)$$

Note that since P_1 and P_2 are population parameters not known in advance, they are approximated by a P value obtained from the combined sample proportions.

Subsequently, if the preceding null hypothesis is rejected, then the conclusion can be made that population proportions are not the same.

Based on the above assumptions, to test the differences in the proportion of responses reported by the site-and-services and squatters in Table 17, the following hypotheses were constructed:

Ho : The same proportion of squatters built their own house as site-and-services

Using the equation (9), the computed test statistic ($Z = 0.3705$) was found to be much smaller than its critical value ($Z_{0.05(2)} = 1.96$), which led to the conclusion that Ho cannot be rejected. The result, therefore, indicates that there is no significant difference in house building activities between the two groups.

The residents were also asked, "How did you get the plot of land on which you are now living?" The responses were used to determine whether the households had legal permission to reside on the land and were, therefore, the legal owners of the plot. The results shown in Table 18 indicate that 43.9% of the squatters had permission from UNIP, 3.6% had permission from the City Council, and 43.75% either had permission or had rented the plot from the previous owners or landlord. Thus, more than 91% of the respondents in the squatter compounds were authorized, having obtained temporary permission to reside on the land, whereas only 8.6% indicated they had built on the plot with no authorization from any source.

Table 18. PLOT OWNERSHIP

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
PLOTFRM	Count	%	Count	%	Count	%
No Authorization	81	8.64	8	3.17	0	0.00
Permission From UNIP	412	43.97	36	14.28	1	0.67
Permission From Council	34	3.60	131	51.98	132	88.59
Permission By Owner	262	27.96	32	12.69	5	3.36
Rented	148	15.83	45	17.88	11	7.38
No Response	30		2		285	
Total	967	100.00**	254	100.00	434	100.00

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.

In contrast, 51.98% of the site-and-service, households in the sample had permission from the City Council, 14.28% had authorization from UNIP, a combined number (30.54%) were permitted either by the previous landlord or rented the plot, and only 3% were without authorization of any kind. The findings indicate that almost 60% of the site-and-services vs. only 3.6% of the squatters had permission from city councils (the official city authority) to occupy the plot of land on which they were residing, exemplifying the greater security of land tenure held by site-and-services as opposed to squatters. In accordance with expectations, the majority of councils residents (88.5%) reported having permission from the City Council to stay on the plots.

Finally, when asked whether someone had helped them build their house, 21.7% of squatters and 40.6% of the site-and-services respondents reported having had help (Table 19). These results, combined with the responses regarding authorized residence, indicate that a majority of the residents in squatter compounds had built their own houses but had little security of tenure. The majority of site-and-services households owned their houses and had 99-year free-hold titles to their lands either from the City Council or UNIP. Their houses were much more expensive, and residents could afford twice as much help to build a house than could squatters. The reason may be attributed to either the influence of stronger perception of tenure or higher income of this group.

Table 19. ASSISTANCE WITH HOUSE-BUILDING

	GROUP			
	SQUATTERS		SITE-AND-SERVICES	
HELP	Count*	%	Count	%
No	331	78.3	63	59.4
Yes	92	21.7	43	40.6
No Response	544		148	
Total	967	100.0**	254	100.0

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.

Repair Conditions, House Evaluations, and Improvements Made

In another question, residents were asked about the state of repair of their houses. The choice of responses were: need major repair, need minor repair, good, and very good. The results shown in Table 20 indicate that about 50% of the squatters, 60% of the site-and-services, and 75% of the councils residents' responses ranged from good to very good, indicating satisfaction with the condition of the house. Among squatters, about 50% reported their houses needed minor to major repair, the highest percentage reported for that response. In contrast, 39.7% of the site-and-services and 25.4% of the councils reported their houses needed minor to major repair.

Respondents were also asked about any home improvements they had made during the previous twelve months of their

Table 20. REPAIR CONDITION OF THE HOUSE

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
STOFRP	Count*	%	Count	%	Count	%
Need Major Repair	79	8.3	17	6.8	11	2.5
Need Minor Repair	395	41.5	82	32.9	99	22.9
Good	394	41.4	113	45.4	168	38.9
Very Good	84	8.8	37	14.9	154	35.6
No Response	17		5		2	
Total	969	100.0**	254	100.0	434	100.0

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.

TABLE 21. IMPROVEMENTS MADE

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
ANYIMP	Count*	%	Count	%	Count	%
No Improvements	713	74.5	188	74.9	367	84.6
Made Improvements	244	25.5	63	25.1	67	15.4
No Response	10		3		0	
Total	967	100.0	254**	100.0	434	100.0

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.

residency and Table 21 shows the result. Of those who responded positively, 25.5% were squatters, 24.8% site-and-services, and 15.4% councils. Again, the responses reported by squatters are very similar to the site-and-services.

Because of the small observed differences in the percentage of responses between the squatters and site-and-services groups in the sample, a test of hypothesis for testing the differences of two proportions was conducted to determine whether the population proportions are truly the same. To test the difference of two proportions (Table 21), a similar procedure was adopted as introduced earlier, using equation (9). The calculated test statistic (Z= 0.1266) was found to be much smaller than its critical value ($Z_{0.05(2)}$= 1.96). The result, as expected, implies that there is no difference between the proportion of responses of each group. The findings so far contradict the assumption that greater security of tenure provided to the site-and-services evokes a corresponding level of self-help improvements to housing.

To find out more about the nature of improvements reported by each household, another question regarding the types of improvements made by each group was analyzed. The types of improvements made were numerous and multiple, ranging from adding a room or another building, strengthening building materials, adding a flush toilet, to adding doors or windows. To organize these responses, after a close scrutiny of the codebook, eight major categories

were developed. Table 22 shows the major categories of the improvements made by housing groups.

Table 22. TYPES OF IMPROVEMENTS MADE

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
TYPIMP	Count*	%	Count	%	Count	%
Every-thing	724	79.4	198	83.2	370	88.3
Size	125	13.7	19	8.0	10	2.4
Roof	14	1.5	8	3.4	6	1.4
Floor	4	0.4	2	0.8	1	0.2
Window	10	1.1	1	0.4	7	1.7
Latrine	7	0.8	2	0.8	3	0.7
Walls	25	2.7	6	2.5	20	4.8
Others	3	0.3	2	0.8	2	0.5
No Response	57		16		15	
Total	969	100.0**	254	100.0	434	100.0

* Number of valid cases for each group
** Total percentage is based on the number of valid cases.

As the results show, the largest percentage of responses for each group falls in the "everything" category. Everything consisted of constructing another unit, adding a garden, finishing present house, fencing yard, adding plumbing, decorating, and planting trees or shrubs. The second category in Table 22 corresponds to increasing the "size" of the dwelling, and the type of improvements in this category

consisted of adding rooms, such as a kitchen, latrine, or balcony, or enlarging the latrine. The distribution of those who indicated they had enlarged their houses was: 13.7% squatters, 8% site-and-services, and 2.4% councils. The distribution of responses in other categories in Table 22 is very small. To find out whether the population of squatters and site-and-services groups were identical to or different from one another in the types of improvements they reported, a Mann-Whitney test, which is a nonparametric test was, employed. This test is appropriate for testing the hypothesis of whether the samples come from the same population. It analyzes the differences between the paired observations in the sample, also taking into account the magnitude of their differences. Specifically, in this procedure the test statistic referred to as the **U Test** is defined as the largest possible value of W and its actual value (where W equals the rank sum of sample A).[19]

$$U = \left[(n_A \cdot n_B) + \frac{n_A(n_A + 1)}{2} \right] - W \qquad (10)$$

The sampling distribution of U can also be approximated by the normal curve (Kohler, 1988. p.452). Accordingly, the normal deviate from Mann-Whitney test is found by:

$$Z = \frac{U - u_U}{\sigma_U} \qquad (11)$$

Following the above formulation for testing the hypothesis that the two sample populations have equal probability distributions. The SPSSx program (M-W subcommand) was

utilized to rank all the cases in order of increasing size and compute the test statistics U and Z and their probability level. The results reported a Z= -1.103 and U= 105030.5. Given the decision rule, the calculated Z statistic found to be much smaller than its critical value at 0.05 level. In addition an extreme value of U indicates a nonrandom pattern, thus, either figure indicates that the hypothesis of equal samples cannot be rejected. That is there is no significant difference between squatters and site-and-services in the type of improvements they reported.

The question remains, however, whether the households' improvement activities differ according to income levels, although they do not differ significantly by group membership. To answer this question, an approach similar to that in Table 22 was used to find the association between the improvements and income levels. First, a cross-tabulation was obtained to see how income had influenced respondens' improvement activities (Table 23). Subsequently, a Kruskal-Wallis test was employed to determine whether types of improvements reported by households varied by income levels (Sincich, 1989; Kohler, 1988; SPSSx User's Guide, 1986). As a nonparametric test, the Kruskal-Wallis rank sum test is an extension of the Mann-Whitney U test and is appropriate for determining whether more than two populations of interest are identical to or different from one another (Kohler, 1988. p.465). Usually, a test statistic K is computed according to the following:

Table 23. TYPES OF IMPROVEMENTS MADE BY INCOME LEVEL

	INCOME							
	<40K		41-60		61-80		>81 K*	
TYPIMP	Count**	%	Count	%	Count	%	Count	%
Every-thing	253	82.7	235	78.6	118	76.6	191	79.3
Size	33	10.8	46	15.4	22	14.3	31	12.9
Roof	4	1.3	4	1.3	5	3.2	5	2.1
Floor	1	0.3	1	0.3	1	0.6	2	0.8
Window	2	0.7	4	1.3	1	0.6	4	1.7
Latrine	2	0.7	1	0.3	2	1.3	2	0.8
Walls	9	2.9	8	2.7	4	2.6	4	1.7
Others	2	0.7	0	0.0	1	0.6	2	0.8
Total	306	100.0***	299	100.0	154	100.0	241	100.0

* 1 K (Kwacha) is valued at approximately US$ 1.40
** Number of valid cases for each group.
*** Total percentage is based on the number of valid cases.

$$K = \left[\frac{12}{n(n+1)} \left(\sum \frac{W^2_t}{n_t} \right) \right] - [3(n+1)] \qquad (12)$$

It should be mentioned, however, that the sampling distribution of K is identical to Chi-square distribution if each sample (category) contains more than five 5 observations. Then the sampling distribution of K can be approximated by a X^2 distribution with a x -1 degrees of freedom. Considering the above assumptions the following hypotheses were formulated to test the association of improvements with income presented previously in Table 23:

Ho : There are no differences in improvements by varied income categories

The computation of the test statistic was accomplished by using K-W subcommand of the SPSSx program. Given the decision rule, the observed Chi-square (X^2= 2.6071) was reported to be smaller than its critical value at 0.05.[20] Accordingly, the results indicate that the hypothesis of no difference cannot be rejected, which means that the improvements activities of the households in this sample did not vary by income.

Finally, the households surveyed were asked whether they were very happy, happy, or not happy with their houses. The results in Table 24 show that 89.9% of squatters were either happy or very happy, while 87% of site-and-services, and more than 71% of the councils reported being either happy or very happy. Despite having perilous status,

squatters were most happy with their houses and most willing to improve them.

TABLE 24. SATISFACTION WITH HOUSE

	GROUP					
	SQUATTERS		SITE-AND-SERVICES		COUNCILS	
	Count*	%	Count	%	Count	%
Not Happy	149	16.2	31	13.1	117	28.1
Happy	485	52.7	125	52.7	214	51.3
Very Happy	287	31.1	81	34.2	86	20.6
No Response	48		17		17	
Total	969	100.0**	254	100.0	434	100.0

* Number of valid cases for each group.
** Total percentage is based on the number of valid cases.

Summary

This section discusses both the similarities and differences between the tenured and nontenured groups in the sample. The squatters' responses to house construction and maintenance indicated that they considered themselves owners almost to the same extent that site-and-services did, and, moreover, they appeared to work at improving their dwellings at the same rate as site-and-services. The findings in this sample do not indicate that the greater security of tenure granted by the government to the site-and-services households had stimulated a greater amount of self-help improvements to housing. Thus, the findings contradict the

empirical results in the literature that greater security of tenure would stimulate investment in housing improvement among site-and-services beneficiaries. Relating the above findings to the information available in the Zambian literature about the characteristics of the three subgroups of this sample allows for the following interpretations of the study's findings:

First, about 90% of the squatters surveyed in this sample were "authorized": they had temporary license from the UNIP (political authorities) to reside in the compounds. To legitimize their ownership, they were involved in maintenance activities as much as possible with the hope of gaining legal titles to their homes or lands. It is possible to infer, therefore, that a renewable occupancy license for this group had given them adequate perceived security to persuade them to invest equal effort in housing improvement and maintenance. Doebele may be correct when he argues that the effect of tenure on investment in improvement varies within countries:

> What is true in one country is not necessarily true in another. In Africa a renewable license to occupy may give enough feeling of security to persuade its holder to make substantial housing investment, whereas, in Latin America, a twenty-five year lease may not be sufficient to elicit a similar response. Thus, in squatter areas in particular, the amount of investment seems to be closely correlated with the perception of risk of removal, irrespective of technicalities of legal titles (p. 66).

Second, as discussed earlier, the policy of home ownership in Zambia during the 1970s focused on implementing the site-and-services and upgrading projects. One of the

main objectives of the policy was to encourage participants to build or improve their own houses through self-help and mutual self-help. In practice, however, full legal titles and survey diagrams have not been prepared for them, and what is more, the evidence suggests that the home ownership implications of the site-and-services and upgrading projects have not been fully understood by either project planners or residents. Studies by Collins (1973) and Seymour (1976) indicate that the housing programs in Zambia focused mainly on the buildings without adequate emphasis on the land and security of tenure. In a critical review of low-cost housing policy in Zambia, Turok and Sanyal (1980) argued that although the main policy objective of the housing plans was to provide minimum shelter standards for all, there was still a considerable body of opinion in government opposed to development projects. In addition, the evidence of popular reluctance to participate in self-help projects also contradicts the earlier assumption of the policy makers regarding the widespread participation in communal activities in squatter settlements. In another report by Turok and Sanyal, on self-help projects in George Chawama (1980, pp. 47-49), they concluded that many people believed Zambia to be a rich country, and did not believe that people should sacrifice their own time and resources in self-help housing projects.

Third, the results of this sample indicate councils residents (renters) made the fewest home improvements of the three groups. Usually, factors such as the lack of

tenure on both the house and the land, government regulation of the housing market (e.g. rent controls), and rental restrictions imposed by strict building codes and standards may suppress incentives for investment in housing improvement for renters. In addition, renters can not recoup the value of any housing improvements if they later relocate, and substantial permanent improvements can cause the rent to increase.

An Application of a Housing Improvement Model to Lusaka

The first section of this chapter presented a preliminary description of the differences in socio-economic characteristics, tenure status, housing evaluations, and activities of the three housing subgroups in the Lusaka sample.

The remainder of the chapter is devoted to an application of the housing improvement model to the Lusaka sample. Data analysis included using the regression method for elaborating the causes of the observed differences or similarities in the housing activities of the respondents by developing a home improvement model which tested the relationship between variations in home improvement activities of the households and variations in a set of independent variables thought to be related to housing improvement. The primary purpose of such analyses is to investigate the factors that underlie the housing activities of each group and explain why the case of Zambia seems to deviate from other countries.

As described at length in Chapter 2, in the literature of housing investment, tenure status, number of renters, and level of income are hypothesized to be important determinants of housing investment in self-help housing. Studies by Jimenez (1983), Burns and Shoup (1977, 1981), Follain and Lim (1980), Struyk and Lynn (1983), and Strassmann (1980) indicate that there exists a reasonably well-fitting relationship between the investment in housing and variables indicating some components of housing supply

and demand activities. The procedures used to develop the regression model in this study are similar to those described in Burns and Shoup (1977) and Struyk and Lynn (1983), and will facilitate comparisons between results in this study and those of other investigators who have used similar analytical methods to explain housing improvement activities in comparable projects around the world. In addition, the multivariate analysis in this study incorporates selected personal and demographic variables thought to be related to housing improvement in order to explain the improvement determinants for the households in the sample. The housing investment literature has not fully explored the effects of socio-economic and demographic characteristics on the housing improvement activities in self-help housing projects in developing countries. Both theoretical arguments and empirical evidence suggest that, for example, the age of the residents or duration of occupancy may explain variations in housing activities. In a sample of southern and northern homeowners in the United States, Mendelsohn (1977) found a positive relationship between housing expenditures by homeowners and the owners' ages.[21] In another study, to determine the value of the squatter dwellings in the Tondo Urban Development Projects in the Philippines, Jimenez (1983) used an econometric model to test variation in the consumption of housing by squatters. In his analysis, he stressed the importance of demographic and socio-economic variables which may influence housing demand and supply activities among dwellers. Thus,

the researcher's main point for the inclusion of such variables was to answer questions concerning differences in the socio-economic characteristics of the respondents, and the extent to which these variables affect their housing improvement activities.

Determinants of the Home Improvement Differentials Among Housing Groups

The section below describes the findings of an analytical model as discussed above. Data analyses were performed separately to further explain and identify determinants of home improvement of the three groups: (1) site-and-services (tenured), who were the beneficiaries of the housing reform programs in Zambia in 1973; the squatter group (no tenure), who were temporary residents with no legal home ownership rights; and the councils, who were mainly renters. The following specification expresses improvement as a function of house building, condition of repair, income, presence of renter, duration of occupancy, urban experience, and education or age of the respondent:

$$\text{ANYIMP} = f(\text{BLDH}, \text{STOFR}, \text{TINC}, \text{LOGER}, \text{LENGTH}, \text{TOWN}, \text{EDUC}, \text{AGE})$$

The dependent variable, improvements made (ANYIMP), consisted of a nonmetric, dichotomous variable for which dummy variables were created to record yes and no responses. The predictor variables are building ownership (BLDH), condition of repair (STOFR), total monthly income (TINC), and presence of renter in house (LOGER). The inclusion of

the variable LOGER is based on the assumption that the improvement activities of households were positively related to the presence of a renter in the house, and the variable STOFR is included in the model to control for condition of the house. The inclusion of the variable BLDH also needs further comment. The apparent relationship between the type and number of improvements made by squatters suggested that the variable BLDH may serve as a proxy for perception of tenure by the households. The other variables, length of stay in compound (LENGTH); urban experience (TOWN); education (EDUC); and age (AGE), are included for the purpose of measuring different personal characteristics of a household which may influence their attitudes toward housing improvement. The inclusion of the variables INCOME and EDUCATION follows the standard rationale; higher income and education levels should be associated with higher spending power, and, therefore, associated with greater investment in house maintenance and improvement activities. Struyk (1983) found that homeowners with higher incomes spend more on improvements than do lower income households. The variable (LENGTH) in the model is included on the basis that the length of time the household has lived in the structure may positively influence improvement activities. Especially for squatter families who build houses on illegal land, the longer duration of occupancy may increase their chances in the future of obtaining title to the land from the government. Similarly, the variable urban experience (TOWN)--used as a proxy for number of years in town--may be

positively related to improvement activities, as newcomers to the city may have less inclination to improve their dwellings than those who already are city dwellers. Finally, the variable AGE was included in the model to test whether the age of the members of the households had any relationship to housing improvement. With the procedures outlined in Chapter 3, this equation was weighted to correct the effect of heteroscedastic results. The results of the weighted regressions are shown in Table 25.

Before interpreting the results, it should be noted that Aldrich (1983) warns the researchers against the use of the multiple correlation coefficient R^2--which is used to explain the proportion of variation in the dependent variable explained by the independent variable(s)--in the analysis involving qualitative dependent variables. The R^2 statistics in weighted regression (WLS) report the proportion of variance explained, but the variance referred to is the variance of the transformed dependent variable (Y*w), and not the original variable. (He recommends the avoidance of R^2 in analysis involving a qualitative dependent variable.)

In Table 25, the three main columns for each subgroup show the variables and the regression coefficients, with T-values reported in parentheses. The level of significance at 0.05 or less is highlighted by an asterisk (*). An F-test showing the overall fit of regression equations is also shown for all groups. Large F-values support the hypothesis that the coefficients on two pairs of the model

are different, and hence the conclusion that independent variables taken as a group are useful in estimating the dependent variable.[22]

A look at the regression coefficients in Table 25 for the site-and-services group suggests that the ownership variable (BLDH), indicating the perception of home ownership, and condition of the house (STOFR) are both strongly positive. But the income variable (TINC) is not significant, suggesting that the income of this group had no influence on the likelihood of investment in housing improvement. Similarly, the variable LOGER is not significant. This indicates that the presence of a renter and the level of income, which are recognized to be the important indicators of housing investment among new home owners, had no influence on the housing activities of the site-and-services group in this sample. This is inconsistent with previous findings in the literature that income and presence-of-renter positively influence housing improvement among the beneficiaries of the site-and-services projects. Among other variables representing the personal characteristics of the household, only the variable AGE is moderately significant, suggesting that the older the household head is, the higher the likelihood of engaging in housing improvement.

The result of the estimated equation for squatters in Table 25 shows that the variable BLDH is strongly positive, but the STOFR has a negative coefficient that is significant. In contrast to the site-and-services, for

Table 25. Weighted Regressions, Dep. Var:ANYIMP

	Site-&-Services		Squatters		Councils	
Variable	Coef	Sig	Coef	Sig	Coef	Sig
BLDH	.2193	*	.1389	*	NA	NA
	(7.46)	.0000	(7.81)	.0000		
STOFR	.0637	*	-.0242	*	-.0684	*
	(4.06)	.0001	(-2.16)	.0310	(-5.65)	.0000
TINC	.0012		.0039		.0004	*
	(0.05)	.9563	(1.88)	.0604	(2.60)	.0093
LOGER	.0585		.2397	*	-.1328	
	(1.20)	.2321	(8.36)	.0000	(-.228)	.2270
LENGTH	-.0002		.0002		.0002	
	(-.68)	.4910	(.52)	.6024	(1.96)	.3391
TOWN	.0014		-.0012		.0019	
	(0.92)	.3571	(-1.46)	.1421	(1.86)	.0627
EDUC	.0016		-.0071		.0138	*
	(0.177)	.8594	(-1.38)	.1675	(2.08)	.0377
AGE	.0350		-.02887	*	.0042	
	(1.66)	.0971	(-2.34)	.0196	(0.304)	.7610
Intercept	-.4401	*	-.0891		.3465	*
	(-5.08)	.0000	(-1.57)	.1151	(3.79)	.0002
		*		*		*
F	14.27	.0000	22.30	.0000	9.45	.0000
n	254		967		434	

Variable Definition:

ANYIMP	Var=1 if made improvement; Zero otherwise
BLDH	Var=1 if built house; Zero otherwise (note, because Councils had no responses for question #90, the variable had missing correlations for this group)
STOFR	Var=1 if repair condition good; Zero otherwise
TINC	Total household heads income per month in 1973
LOGER	Var=1 if renter present; Zero otherwise
LENGHT	Duration of Occupancy in compound by years/months
TOWN	Number of years lived in town in years
EDUC	Education of male heads of household
AGE	Age of the male heads of household
*	Coefficient significant at 0.05.

squatters the variable TINC is moderately and LOGER is strongly significant, suggesting that income--including rent they received from lodgers--may have influenced their housing improvement activities. For squatters, among other variables in Table 25, AGE has a negative coefficient that is significant. Apparently, the older the squatters, the less the likelihood of engaging in house improvement. This finding suggests that it is possible that the younger squatters who had moved to the compounds had to build and maintain their houses to a greater degree than the older residents who had already established their houses on the plot and were recognized by the local authorities.

Finally, the findings regarding the councils indicate that the variable STOFR has a negative coefficient that is highly significant, suggesting that this group, who were mainly renters, engaged in housing improvement only when the condition of the house was unsatisfactory or basic repair was necessary. In addition, the variable income (TINC) for this group has a coefficient that is highly significant, suggesting that those with higher incomes were more likely to spend their income on maintenance. It is ironic that in this sample the Councils group, who were mainly renters not engaged in house construction activities, were willing to spend money on repair and maintenance despite lack of ownership. Again, this finding points to the different characteristics of the population comprising this sample, signifying different patterns of behavior. More elaboration on the nature of such differences will be made in the

concluding chapter. Furthermore, for this group the variables urban experience (TOWN) and education (EDUC) are also significant, suggesting those who had lived in the city longer and had higher educational attainments were more willing to maintain their houses.

The analyses in this section show findings similar to the first section in that, contrary to the established ideas in the literature, in this sample the total income of the household--as measured by the total earnings of both male and female household heads (TINC)--and presence of a renter (LOGER) had no significant effect on the site-and-services. However, for the squatters as the coefficient in Table 25 indicated, the variables TINC and LOGER had in turn moderate and strong effects on the likelihood of housing improvement for this group. At this point, the following explanations may be warranted. First, squatters in this sample were mainly unauthorized residents who worked hard on establishing stronger tenure on the land on which they resided illegally. They were willing to spend their incomes on many repairs and necessary improvements and took in paying renters to help finance their housing improvements. In the case of site-and-services, as the results of descriptive statistics in the first part of this chapter showed, the majority of them were hiring help to build their houses, and, therefore, did not personally engage in house building and improvement. Thus, higher income initiated less self-help activities among this group, even though housing improvements were made. In addition, it is possible

that they may simply have completed their houses before gaining their ownership licenses.

To elaborate this point, another look at the literature of housing investment, especially works by Turok and Sanyal (1980), may be necessary. In the early 1970s, the city councils in Zambia promoted higher standards of construction and servicing for squatter communities through the implementation of site-and-services and upgrading programs. The eligibility requirements were based on income, family size, and present housing condition. Thus, only those squatters who had already completed house construction were eligible for legal occupancy licenses under the site-and-services program. It seems that the site-and-services households in this sample were former squatters who gradually upgraded their dwellings in order to gain home ownership rights. Under the program provisions, however, they were only granted the ownership titles to their buildings, not the underlying land. Thus, the lack of complete security of tenure (both home and plot ownership) may have worked as a disincentive, suppressing further investment in housing maintenance and improvement.

CHAPTER V

SUMMARY OF THE STUDY

A major interest that led to the course of this study was the documentation of the impact of an aided self-help shelter program in one of the lowest income countries in the developing world. During the 1970s the most common policy measure implemented by governments with World Bank assistance in developing countries involved urban shelter projects which addressed two kinds of needs: to encourage housing improvement and to stimulate the production of new units by self-help means. The first need has been addressed by slum upgrading projects, which involved improvement to existing areas by the provision of secure tenure and a range of basic services such as water supply, sewerage, electricity, roads, and sidewalks. The second need, the production of new housing stock, has been addressed by site-and-services projects which provide both necessary infrastructure and serviced sites on which families are encouraged to construct their own homes. Both approaches are complementary in the sense that they will enable and encourage low-income households to improve their housing through self-help, financing, and/or construction.

The major assumptions of project designs were:

1. The unauthorized areas house the poor and unemployed, and the defining characteristic of these areas

is capital shortage. Terms such as squatter settlement, slums, or unauthorized areas were used interchangeably to describe the poor settlements.

2. People in formal employment earn more than those in informal employment, and in general, informal settlements were considered to house those in the informal sector.

3. Legalization and security of tenure was considered to be the central element of upgrading and a prerequisite for services to be provided and housing improvement to take place. Thus, project planners hoped that residents would improve their houses on their own once security of tenure was ensured and basic infrastructure installed.

4. It was assumed that low-income households would be willing and able to invest on progressive improvement of their houses and related services. Thus, the affordability criteria was based on 20-25%--that is, on the average a household should spend between 20 and 25% of its income on housing.

Since the introduction of the housing projects, many developing countries have used these theoretical and conceptual yardsticks as a basis for the planning, design, and management of housing and human settlement projects. Meanwhile, major evaluation studies have been conducted by World Bank and independent scholars on the impact of shelter projects. The World Bank claims that despite many implementation problems, both types of projects have met with reasonable success. As reported by Linn (1987), the benefits of the projects in poverty alleviation are quite

substantial. Due to larger expenses associated with the site-and-services projects, slum upgrading projects have shown more potential for providing a feasible way of assisting a substantially greater number of households, especially in the poorer countries. However, recent findings reported by other researchers are not as favorable and are critical of the World Bank findings. First, there has been major criticism about the generalizations often found in the World Bank reports concerning the positive impacts of shelter projects nationally. Second, some of the major assumptions of the project design have proven invalid in many lower income countries of Asia and Africa. Third, the lack of information about the political structure, tenure policies, and socio-economic characteristics of the poor has handicapped the effective implementation of the shelter policies. In this regard, for the purposes of this dissertation an empirical investigation was conducted to evaluate the impact of one of the early shelter projects implemented in Lusaka, Zambia.

The first official housing program in Zambia began in 1965 as an attempt to reduce the building standards of low-cost housing and launch aided self-help housing. The slow and problematic progress of the site-and-services program and the increasing scale of the settlements problem led to a change of policy in the Second National Development Plan, in which upgrading of selected squatter areas was to complement the site-and-services policies with an emphasis on home ownership. During the early 1970s, a World Bank loan made

the implementation of the new policy feasible in different cities in Zambia, especially in the capital city of Lusaka. World Bank support of low-cost housing projects in Zambia was a new phenomenon for the Bank in Africa, and projects related to upgrading of unauthorized areas were relatively untried. With little prior experience on squatter settlement planning in Africa, the design of shelter projects in Zambia was based on conceptual frameworks and hypotheses derived from the experience of more advanced countries, on the assumption that the problem, and thus the solutions, would be the same everywhere. To investigate the assumptions of the site-and-services program as it was implemented in 1972 in Zambia, data analyses were performed on a sample of three low-income housing groups in Lusaka--the capital city of Zambia. The main objective of the study was to compare housing improvement activities of the site-and-services households, who were benefiting from one form of housing intervention involving greater security of tenure, to those of squatters and councils, who were either temporary residents or renters with uncertain tenancy, and to identify determinants of home improvement within each group.

The results of data analyses were reported in two sections in chapter 4. The first section of the chapter provided a complete profile of the households' socio-economic and house characteristics, type of tenure/ownership, and house improvement and maintenance activities by comparing the distribution of their responses

in the sample. The descriptive statistics as they related to the housing behavior and activities across groups indicate that squatters (nontenured) were equally involved in housing improvement as both the site-and-services (tenured) and the councils (renters). Overall, the findings in this sample did not show significant differences in the housing activities by type of tenure (housing group), thus not supporting the hypothesis that the stronger security of tenure granted to the site-and-services group had influenced their decision to make more improvements than squatters.

Several points should be made about the interpretations of the above finding. As mentioned earlier, the data on which this analysis is based were collected in 1973, at which time the low-income housing projects initiated under the Second National Development Plan of 1972 were a new venture for the Zambian government. Many of the components, particulary those related to upgrading of unauthorized areas, were relatively untried. Thus, the contradictory result observed in this sample could simply be due to the timing of the survey which did not allow sufficient time for the project results to become evident. However, other considerations regarding the nature of shelter projects and the socio-economic realities prevailing in that country at the time of the survey warrant closer scrutiny.

Similar to many other developing countries, the site-and-services and upgrading programs in Zambia were mainly implemented on the assumption that they represented the most effective way of providing cheap owner-occupied

housing for low-income households. In practice, however, these programs--particularly those implemented during the early 1970s--proved quite unpopular with low-income families. For example, the the majority of site-and-services projects begun during 1966-1972 involved not only resettlement of residents, but proved too expensive for most low-income residents (Ndulo, 1983). In a report published by the University of Zambia on planned urban growth in Lusaka (1974), the reasons most frequent mentioned by residents of unauthorized areas for not wanting to move to a site-and-services compound were the lack of money, and the high cost of the building and of construction materials. In a study of Chawama squatter settlements, Muller (1979) reported that the majority of families lived below the poverty level, not only because of low wages but also because their large average household sizes made it impossible for them to engage in housing improvement, despite the government's effort to provide them with tenural option, long-term leases, or community infrastructure. In addition, during the 1970s the government of Zambia was experiencing financial constraints including shortage, of foreign exchange which exacerbated the problem of financing the housing projects, and providing loans for building materials and essential equipment. In another study, Turok and Sanyal (1980) assessed the extent to which families living in low-cost housing areas could afford the range of housing options offered by the Lusaka Urban Development Project in 1973. They concluded that the assumptions of the

project design, which were based on the American experience with public housing in the sixties, were not consistent with the actual pattern of expenditure of low-income households in Zambia. They emphasize that the assumption that low-income households are willing and able to spend 25% of their monthly income on housing and related services proved to be too high a proportion to be devoted to housing. Consequently, in later projects this was reduced to a maximum of 15%. Finally, in one of the latest empirical studies reported on Chawama, which is one of the main squatter complexes in Lusaka, Rakodi concludes the following (1970):

> While the upgrading program was successfully implemented and produced an improvement in some aspects of the living conditions of Chawama residents, the ability to take advantage of project components is unequally distributed, problems of poverty are untouched, not all project design decisions are sound and problems of operation, maintenance and cost recovery persist (p. 317).

The second part of the analysis in Chapter 4 reported the result of a regression model which was developed to explore the determinants of housing improvement among the three groups of households in this sample. On the basis of the theoretical and conceptual framework introduced in Chapter 3, a home improvement model was adopted equivalent to the procedures introduced by Struyk (1983) and Burns & Shoup (1977), showing the relationship between variations in home improvements made and variations in a set of independent variables related to housing improvements. The model specifications in this study, therefore, expressed

home improvement as a function of income, home ownership, presence-of-renter, and condition of the house. In addition to these variables that are known to be related to housing improvement, the researcher further looked at the impact of various socio-economic indicators such as duration of occupancy, urban experience, education, and age of the household heads that may have affected the willingness and the ability of the occupants to engage in housing improvement. Using the Weighted Least Square regression technique (WLS), the correlation between improvements made and the set of independent variables stated in the model was tested for significance in explaining the nature of improvement activities for each group of households with secure tenure (site-and-services) and those with uncertain tenancy (squatters). Overall, the result of WLS regression regarding the site-and-services did not support the general contention in the literature of housing investment that level of income and renter presence positively influence housing improvement activities. Usually, when a variable fails to perform significantly or differently (i.e. significant in the opposite direction), it is concluded that the theoretical underpinning which that variable represents may be invalid. However, due to heterogeneity among housing markets in developing countries, particularly characteristic of housing markets in Zambia, the following conclusions are likely.

Conclusions

Despite the growth of housing investment literature in recent years, analyses of the urban housing markets in developing countries tend to focus on a small number of countries, and the lowest income countries of Sub-Saharan Africa are underrepresented. Recent studies have shown that squatter settlements upgrade themselves over time and that certain processes are common to all. However, as these vary in rate and degree according to local conditions, the degree to which the self-help housing programs are dynamic and successful is likely to vary considerably across developing countries. The rate of urbanization, the socio-economic and political situation, and the attitudes adopted by government toward their squatter populations are crucial in this respect. The findings in this dissertation indicate that the general patterns established in the literature did not hold true for the case of Zambia, primarily because of its land-tenure system, a system widely used in socialist countries. The prevailing land-use policy in Zambia, which emphasizes the separation of ownership of the structure from ownership of the underlying land, induces a different attitude toward housing investments than what might be expected in a conventional housing market (i.e.,nonsocialist). As indicated by Deobele (1978), the disadvantage of tenure systems in socialist countries such as Zambia is that they may discourage incentives for private investment in the structure. In addition, Collins (1973) draws attention to certain points about the home ownership

aspects of the site-and-services and upgrading schemes in Lusaka. He reports that the nature of the urban land market and political problems in Zambia were major constraints inhibiting self-help housing solutions. Within the legal structure of Zambia, no homeowner in a squatter settlement had security of land tenure, and the use of the Land Record Card, which represented ownership title for transferring of tenure rights via the local authority in the site-and-services areas, was confusing to the occupants.

> The Land Record Card offered no security of tenure. The land had no commercial value in that its holder could not borrow money on its security from mortgagees of various kinds (p. 12).

Another major drawback of the Land Record Card was the alienation of plots in the site-and-services areas; that is, if the owner failed to pay his rent or other charges, the local authority would repossess the holding. The effect of uncertain tenural security on the attitudes of the squatters is also substantiated by the findings emanating from regression analysis in this study. The data presented suggest that improvement activities in this sample were in large part related to the perception of tenure (BLDH), condition of repair of the house, and the age of the respondents. The perception of tenure alone was a key determinant of housing improvement for both site-and-services and squatters. That is, the perceived security of tenure, independent of legal categories involved, was a key determinant of housing improvement for both groups, resulting in increased likelihood of improvement activities.

In addition, Collins explains that the city councils in Zambia had the sole authority for implementing the policies delegated from the central government. However, they were quite inefficient in managing the sites allocated for ownership by the tenants. For example, in 1968 two sites in Lusaka--Chunga and Kauada--were designated for tenant purchase under the site-and-services program. The mismanagement involved in the transference of the sites is explained by Collins (1973):

> Some of the houses designated for owner-occupier schemes had been allocated to persons on the waiting list for rented Council housing, without the tenant being aware that these houses were designed for a tenant purchase scheme. It is not surprising that few if any of these houses have in fact been extended, since a tenant would be unlikely to extend the Council's property with his own money (p. 14).

The evidence presented illustrates the ambiguities surrounding home ownership schemes in Zambia. The system had obvious disadvantages in that it discouraged smooth transference of property to beneficiaries, hence suppressing incentives for private investment in the structure.

The lack of observed differences between the relative levels of housing improvement activities reported in the sample studied in this dissertation and the result of empirical investigation established in the literature may point to an intrinsic problem facing the successful implementation of shelter projects not only in Zambia, but also in many low-income African countries.

In the absence of tested local criteria, project

planners in Africa have adopted Western concepts and standards as operational benchmarks for the analysis of local conditions. In reality, however, housing expenditure varies greatly depending on individual aspirations and on cultural and environmental constraints. Given the serious limitations on various resources (financial, technical, institutional) in African countries, public-policy efforts on shelter should be directed at encouraging and supporting the improvement or upgrading of what people have already built for themselves. As one of the main critics of African urban management strategies, Okpala wrote (1979):

> The uncritical transfer and application of Western value systems and lack of understanding of the African urban evolutionary continuum has led to precipitation and recommendations for urban management policies and programs that have proved largely ineffective and involved much misdirection and misapplication of limited resources (p. 137).

The empirical findings in the literature have shown that low-income households are able to spend a small fraction of their income (5-10%) for housing, particularly when the socio-economic indicators have demonstrated that they may spend a higher proportion of their income (80%) on food and other necessities. In the face of acute shortages of affordable shelter and the continued expansion of unauthorized settlements in lower income countries such as Zambia, appropriate policies in this regard are those that provide poor settlements with the essential public services and facilities they currently lack; institute measures to ensure security of land tenure; revise and simplify

existing foreign-derived building codes, standards, and planning regulations to suit the local circumstances; and encourage and improve the use of local building materials, methods, and skills.

NOTES

1. The first official housing program (1965) set out to reduce the standard of low-income house building and launched aided self-help housing.

2. The major reference to this point is a cross-country empirical analysis of housing demand in developing countries conducted by the World Bank in 1981. The main findings of this study are extensively reported in Malpezzi and Mayo showing the estimated relationship between the rent-to-income ratio and average monthly household income for renters in major cities of four developing countries, Bogota, Cairo, Manila, and Seoul (1987, pp. 647-721). They reported, in each city as household's mean income increases, the observed ratio of rent to income declines, indicating that income elasticities of housing demand are less than one within each city. However, when results are compared across cities, an upward curve is observed (represented by the upward shift of the Engel curves). That is, as the general level of development increases (as measured by average household income), the average fraction of income spent on housing also increases. Specifically, as income increases among cities from Cairo to Manila, Bogota and Seoul, so does the average fraction of income allocated to housing. In their concluding remarks, Malpezzi and Mayo (1987) indicate that while there is evidence that the upward sloping relationship shown here eventually turns down as economic development proceeds, the relationship shown here is a good

approximation among the lowest income countries in the developing world, which are the focus of most internationl assistance efforts (i.e., some East or South Asian and sub-Saharan countries with a per capita income of less than $2,000).

3. For example, as reported by Doebele (1978, p. 78), in many countries like Indonesia, Iran, Turkey, and especially in Africa, where the land has been traditionally regarded as either free or a community good, squatters are reported to make substantial investment even in the absence of legal title.

4. The data were collected by a research team of six American graduate students and approximately 20 undergraduates from the University of Zambia (UNZA).

5. Council housing or employee compounds.

6. An informal area is the land occupied and used without permission from government authorities or from the owner of the land. This form of tenure, known as "squatting" or "de facto tenure," represents a high proportion of the residentially occupied area of most major cities in developing countries.

7. The original survey as reported by Dr. Wiley contained 3,200 questionnaires. However, after the computer file in which the data were stored dumped on the main frame system at MSU, only 3,193 valid cases were recorded.

8. The "arbitrary normative standards" is the term repeatedly used in the literature, particularly by Malpezzi and Mayo (1985, 1987). They criticize the housing need approach popularized during the early 1970s by the United Nations. Central to all estimates of need is the concept of "standards," most frequently implying minimum situations expressed in physical terms. The quantitative estimation of housing needs is based on the calculation of the housing deficit in number of (minimum) dwelling units--which is the sum of dwelling units needed for replacement, to correct the current shortage, and allow for population increase.

9. Like many other scholars, Jimenez (1983) criticizes this basic assumption of the site-and-services programs on the grounds that the evidence shows that although some houses have improved dramatically, some have obviously not changed or have even declined in quality.

10. The United Independent Party (UNIP) is a political party that was created to support the cause of the poor in Zambian cities. City councils consist of elected members appointed by the central government and the Ministry of Local Government and Housing. In each city, the council is responsible for providing a number of services such as water supply, sewerage, and roads, but the central government maintains responsibility for education, electricity, public transport, police, communication services, and health care.

11. The $E(e_i)$ refers to the estimated error vs. the U_i,

which is the theoretical "error." In weighted regression (WLS), the U_i are not assumed to be continuous, homoscedastic or normally distributed. Rather, they are assumed to be dichotomous and dependent upon the population parameters and the values of the independent variables. Therefore, since the error term (e) is heteroscedastic, ordinary least square regression is inefficient relative to Weighted Least Square regression.

12. The problem is mainly due to violation of homoscedasticity--one of the important assumptions in regression analysis--the assumption that the errors should have a constant variance for all values of X_i. Errors that violate this assumption are said to be heteroscedastic. Heteroscedasticity can be a problem in cross-sectional analysis, where data are collected on subjects at a single point in time.

13. The first method is the econometric housing model employed mainly by economists. The many practical difficulties involved in the specification of econometric housing models, such as the correct measurement of prices, quantities, incomes, and the choice of functional form, have led different investigators to explore alternative approaches. The alternative method is based on explanatory or predictive models used in social science disciplines such as sociology, psychology, or political science.

14. The formulation adopted in this research for the

calculation of weights is based on a procedure explained by Aldrich (1984). However, the method he proposes was originally formulated by A. S. Goldberger (1964), in Econometric theory. New York: John Wily.

15. The basic assumptions concerning the error term in linear regression are:

a. Zero mean: $E(E_i)=0$. That is, for each observation, the expected value of the error term is zero.

b. Homoscedasticity: The variance of the error term is constant for all values of X_i.

16. The calculation of the Weighted Least Squares regression and the probit and logit in this study were accomplished with the Regression and Probit procedures available in SPSSx, release 2.0.

17. "Adverse possession" refers to adverse impacts of urban squatting in urban areas. Studies indicate that as time passes, not only do squatters gain additional legitimacy according to the local or tribal laws, but they also engage in numerous informal sales, leases, and occupancy agreements which become increasingly difficult for government planners to manage.

18. The role of UNIP and the City Council in the management of squatter settlements and upgrading projects must be elaborated. The city councils were the official source to issue and implement ownership licenses to eligible

families in site-and-services and upgrading compounds. On the other hand, UNIP was also involved in issuing temporary residency permission to squatters. Numerous references in the literature concern the mismanagement of ownership licenses due to the constant conflict between UNIP and city councils concerning the management of squatter settlements.

19. The Wilcoxon rank-sum test (W test) is derived by pooling the data contained in two independent samples, ranking the combined data from the smallest value, i.e., 1 to the largest, re-creating the original two samples with rank data, summing the ranks in each sample, and finally, designating either one of these rank sums (typically that of sample A) as the test statistic.

20. Because there are X = 4 categories of income, and there is X - 1 = 3 degrees of freedom, according to Chi-Square distributions table, the critical value of $X^2_{0.05,3} = 7.815$.

21. Based on a life cycle model, Mendelsohn (1977) found the middle-age owners spend more on housing maintenance because of their patterns of saving.

22. The F-test used here refers to the test statistic for Analysis of Variance (ANOVA), useful in testing hypotheses about the overall fit of a regression equation. Usually, large F values lead to the rejection of the null hypothesis of no linear relationship.

APPENDIX A

A NOTE ON THE CALCULATION AND INTERPRETATION OF THE WEIGHTED LEAST SQUARES REGRESSION

APPENDIX A

A Note on the Calculation and Interpretation of the Weighted Least Squares Regression

By using the SPSSx program, the following steps were undertaken to estimate the Weighted Least Squares coefficients:

1) Multiple regression was performed on the data in the sample.

2) For each variable, the computer was instructed to calculate the predicted estimates of Y_i.

3) Then the weights W were determined according to the the formulas printed in Aldrich and Nelson (1984, pp. 14-16).

4) Finally, each variable including intercept was multiplied by these weights, and Ordinary Lleast Squares regression (OLS) was applied to the transformed variables.

Interpretation of the WLS Estimates

The following provides a summary of the main differences between the weighted and the ordinary least square regressions (OLS):

(1) The coefficients in WLS can be interpreted as in regression with a continuous dependent variable except that they refer to the probability of a predicted value, rather than to the level of the value itself. Thus, the estimated

coefficients in this study are referred to as the probability or the possibility of making home improvement, given the tenure status or housing type.

(2) The use of coefficient of determination R^2 should be avoided in models with qualitative dependent variables. The R^2 statistics in WLS reports the proportion of variance explained, but the variance referred to is the variance of the weighted dependent variable, and not the original one.

(3) The t-ratio, similar to OLS, provides an efficient means of significance testing for the estimated coefficients.

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