The Interface Between the Evolving Urban Landuse and the Planning of Solwezi Urban

By

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DECLARATION

I, **Phanuel Chuka Hakwendenda** of identification number **24542342**, declare that this dissertation is a clear testimony of my personal effort and experience during field research. This report is being presented to the University of Zambia for the first time as it has never been presented elsewhere. All published work or materials used herein have been acknowledged and adequate reference given thereof.

Sign----------Date---05-06-2006---

THE UNIVERSITY OF ZAMBIA

APPROVAL

THIS DISSERTATION BY ***MR. PHANUEL CHUKA HAKWENDENDA*** **ENTITLED: "*THE INTERFACE BETWEEN THE EVOLVING URBAN LAND USE AND THE PLANNING OF SOLWEZI URBAN*" IS APPROVED AS FULFILING THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN GEOGRAPHY OF THE UNIVERSITY OF ZAMBIA.**

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ABSTRACT

This report examines the interface that existed between the evolving urban land use and the planning of Solwezi urban. This came from the realization that the problem of urban land use fragmentation, coupled with a growing number of suburban and informal housing areas, appeared to have impacted negatively on Solwezi's urban morphology and on the spatial distribution of infrastructure and services in the town. The report seeks to explain the various functions of the town and their existing patterns and how these related to the overall planning of the town in terms of land use management and service provision. In order to arrive at this interface and establish the likely causes for the current situation, literature, particularly that relating to similar studies done elsewhere in Zambia and the Third World in general, was reviewed. This was literature relating to land use and infrastructural development, management and planning and the provision of urban services in the reviewed areas. The study used both structured and semi-structured questionnaires to get first-hand information from Solwezi residents and council officers respectively. It also used a stratified random sampling method to select respondents using a list of households obtained from CSO as a basis for determining both the total sample of 90 residents and the proportional sample sizes for each residential category. Field data were then analysed both qualitatively and quantitatively using appropriate techniques.

Notwithstanding a considerable change in landuse as evidenced through reconstructed periodical maps and data obtained from the council, the study shows that there was some degree of misuse of land as indicated by some overlaps in landuse and a considerable mismatch between the use of urban land and the spatial distribution of infrastructure and services in Solwezi urban. The study further shows that the land allocated for commercial, institutional and recreational development was not adequate to cope with the rapid growth of the town. A remarkable socio-economic division existed in which poor housing standards, lack of clean and safe water supply, unsanitary conditions, poor roads and long distances to service centres were still prevalent among the low-income groups. Factors cited as likely causes for this situation included, inter alia, legacies of the colonial era, lack of adherence to zoning and building standards and regulations and, to a lesser extent, rigid

traditional practices in which chiefs owned part of the urban land. The functions of the town still showed a character that lacked distinctiveness and in which a lot needed to be done in order to reduce the existing inequalities. The report gives a brief prospective overview of Solwezi's future town plan and wraps up by citing areas of improvement in an endeavour to attain a positive and balanced interface and suggests ways on how to round off the situation.

To my lovely wife Brenda, my son Meebelo, my daughter Michelo and my parents Mr. and Mrs. Hakwendenda, I joyfully dedicate this dissertation. To you all, God bless.

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LIST OF ABBREVIATIONS

CBD----------Central Business District

CCJP----------Catholic Commission for Justice and Peace

CELTEL----------Cellular Telecommunication

CSO----------Central Statistics Office

CZ----------Commercial Zone

FNDP----------First National Development Plan

GRZ----------Government of the Republic of Zambia

HCHA----------High Cost Housing Area

HIV/AIDS------Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome

IA----------Institutional Area

IHA----------Informal Housing Area

IZ----------Industrial Zone

LCHA----------Low Cost Housing Area

MCHA----------Medium Cost Housing Area

MoL----------Ministry of Lands

NATSAVE----------National Savings and Credit Bank

NGO----------Non Governmental Organisation

NHA----------National Housing Authority

NHP----------National Housing Policy

NWSC----------Northwestern Water and Sewage Company

OBD----------Outlying Business District

PHI----------Presidential Housing Initiative

PPU----------Provincial Planning Unit

RA----------Residential Area

RZ----------Recreational Zone

SMC----------Solwezi Municipal Council

SNDP----------Second National Development Plan

SPSS----------Statistical Package for Social Sciences

SSH----------Site and Service Housing

ST----------Squatter/Shanty Township

TNDP----------Third National Development Plan

TOPSSUP----------Teachers of Primary and Secondary Schools Upgrading Programme

UN----------United Nations

ZAMSIF----------Zambia Social Investment Fund

ZTNDP----------Zambia Transitional National Development Plan

OPERATIONAL DEFINITION OF KEY TERMS

CBD: refers to the commercial part of a town usually the centre or the core area.

Conventional housing: refers to the modern type of housing as opposed to traditional housing.

Commercial Zone: refers to the parcels of land developed and used for activities involving purchase and consumption of goods and services. This includes the CBD.

HCHA: refers to housing occupied by the affluent. Their characteristics are relatively large plots of about 30m by 45m in size, high cost buildings and very elaborate infrastructure.

Home ownership: refers to the people's right to own the houses they live in through sale.

Household: refers to a group of people, often a family, who live and feed together.

IA: refers to an area which includes all activities that are associated with community organisation, protection and general social and cultural welfare. It includes schools, colleges, hospitals, police areas, prisons, ministries and other public establishments.

IHA: refers to the residential areas not legally constituted as such before occupation by its residents.

Infrastructure and services: refers to the physical and social facilities provided for the benefit of residents in a particular locality.

Integrated housing: refers to a type of housing where cells of different houses are combined with each other or with what already exists.

Landuse pattern: refers to spatial relationships of land uses

LCHA: refers to type of housing area designated for the low income section of the population. They are characterised by relatively small plots of about 12m by 27m in size, basic and simple dwellings, basic infrastructure and services and usually of high population densities.

MCHA: refers to areas usually designated for the middle class. They are characterised by medium sized plots of about 18m by 30m in size, medium cost dwellings, more elaborate infrastructure and of medium population densities.

Morphogenesis: refers to origins or history behind current structure or form of a settlement.

Morphology of town: refers to the structure and form of the town created by the spatial distribution of various town functions.

Residential Area: refers to an area which includes parcels of land which are primarily developed for dwelling purposes. This area also includes access roads, community facilities such as schools and churches, which occupy small areas.

Residential disparity: refers to the sorting out of the city's population according to social and economic criteria into distinctive neighbourhoods.

Recreational Zone: refers to areas that include activities involving indoor and outdoor assembly for entertainment.

Self-help: refers to the system of providing one's own or with others, houses without seeking help from an official organisation, especially directed towards the low income group. This is also referred to as Site and Service Housing (SSH) in this report.

Squatter Township: refers to a settlement that initially started as an unauthorised settlement and which has grown in size to become established.

Urbanisation: refers to a process by which the world is progressively becoming a more urban society with the shift from more rural and agricultural forms of living to more urban and industrial based economy.

Urban poor: refers to the lowest category of urban people with little or no income and with little or no access to most of the services provided by the town.

Urban sprawl: refers to the outward growth of a town away from the centre to cover a large area of land with buildings and other structures which have been added at different times.

Chapter 1

INTRODUCTION

1.1 Background to the Problem

1.1.1 Landuse Pattern and Urban Service Structural Organisation

Urban settlements can 'grow' in both population and area. Usually towns grow in both ways at once, often swallowing up surrounding small towns. Sometimes a town can grow in numbers without increasing its area but through infilling and by the establishment of high-rise and high density housing, permitting the increase in population on the same land area (Witherick, 1995). The same writer argues that the classic pressure of urbanisation is taking place when the proportion of people living in towns and cities increases, so that the proportion of people living in small settlements correspondingly decreases.

Urbanisation as a process developed when communities stopped depending entirely on the land for their livelihood. The development of activities other than agriculture encouraged the dominance of urban areas. Systems of transport and trade led to the concentration of large numbers of traders and others at transport nodes. This brought about the growth of specialised centres for the exchange of goods and services (Lean and Goodall, 1983).

Urban problems in all parts of the world are still far from being solved; the larger the city the more accentuated the problems become. The expressions of disorganisation, congestion and social disorder are too obvious to ignore. Herbert (1972), stresses that cities in developing countries carry the additional burdens of poverty and lack of resources and the fears of revolutionary outlets to urban problems are real and persistent. Herbert further argues that authorities in the Third World have so far failed to demonstrate an understanding of the needs of the urban poor and that the gap between the elite and the masses has widened.

In order to meet the growing demand for urban services and facilities, new organizational structures have been created in nearly all developing countries. Most cities have had long histories of local government though as problems of urban management became more complex, some activities were taken over by other organisations because local government lacked adequate administrative and technical capacity and had inadequate resources to deal with them (Cheema and Rondinelli, 1988). The same writers argue that the central government empowered urban local governments to perform many development functions but did not take necessary steps to improve their functional position. Local governments failed to mobilize their own resources effectively. Thus, in many countries, national or provincial governments took over social welfare and infrastructural development functions in cities.

Cheema and Rondinelli (1988), also argue that rapid growth of large cities was also accompanied by the creation of semi-autonomous public enterprises and statutory bodies to provide specific services like water, transport, electricity and housing. The same writers further argue that while these organisations continue to exist, development planners and policy makers in developing countries are slowly increasing interest in metropolitan planning and management in order to deal with urban problems which extend beyond an individual local government jurisdiction; to improve urban infrastructure, to increase the efficiency of some services through economies of scale, to provide a minimum level of services to the poor, to ensure a greater degree to tax equalization among municipalities and to coordinate planning and management activities in the area.

Pre-colonial Zambia was characterised by a pattern of traditional agriculture, small villages and chiefs' palaces (Rakodi, 1981). Almost all the towns and cities in Zambia are of colonial origin. The colonial policy of master-to-servant relationship can best be observed by looking at Zambia's pattern of housing in towns and cities during the horrid days of colonialism. Despite the physical zoning into sectors with various social

groupings, colonial towns or settlements exhibited the low, medium and high density areas (Turok, 1979).

It is further argued that sanitation in terms of water supply and sewerage was extremely poor. Africans were made to draw water from nearby streams or wells while pit latrines or the surrounding bushes were used to answer the 'call' of nature. Toilet facilities available were communal, squalid, humiliating and overcrowded (Turok, 1979). Urban areas were established to service the colonial enterprise for the purpose of providing a work force for the mining industry, services to the European population and a base for administration (Rakodi, 1981). It is for this reason that Solwezi was established in 1901, barely to service and support the mining function at Kansanshi (Maimbolwa, 1980).

The first buildings on the Solwezi Boma site were the administrative offices with associated high-cost (low-density) houses for the European administrators. Later, areas were set aside within the centre's boundary for the development of African housing, mainly for the Boma messengers and others employed in the settlement as part of the administrative system. On the other hand, the first services to be established in the built up settlements were basic in character, small in scale and in number, consisting of generally a primary school, a clinic, a social club and later on an airstrip which provided the quickest means of communication between the settlement and the other Zambian towns (Maimbolwa, 1980).

1.2 Statement of the Problem

The problem of fragmentation in landuse together with a significant growth in the number of suburban and informal housing areas seemed to have impacted negatively on the morphology of Solwezi and on the access and provision of infrastructure and services in the town. Not long ago, Solwezi's commercial base comprised only simple stores owned by individuals. Its road network was poor with only one major road running from the Copperbelt, through it, to other districts of Northwestern Province. On the eastern boundary of the town a mixed kind of settlement appeared that comprised modern iron-

roofed houses and a few scattered brick-walled and grass-thatched huts particularly along the eastern part of Solwezi River. A number of structures seemed to have been put up in areas whose locations required thorough investigation. Functionally and morphologically the town presented a character that was different from many of the Zambian towns along the line of rail. For instance, the Central Business District of the town could not easily be discerned by a common person.

Solwezi's poor road network and its location outside the rail line's sphere of influence made it an ideal place for the study of the interface that existed between the evolving urban land use, from the perspective of land use zoning and management, and the planning of the town in terms of infrastructural development and service delivery. In this way, various types of land use resulting from an area being in such a situation could also be unveiled. It was hoped that a clear interface between the use of urban land and the planning of Solwezi urban could be brought out in order to militate against such vices as misuse and overuse of land.

1.3 Purpose of the Study

This study was an attempt to explain the various landuses of Solwezi urban and their emerging patterns and how these related to the planning and spatial distribution of infrastructure and services in the area.

1.3.1 Study Objectives

The study sought:

1.3.1.1 to identify the major landuses of the town;

1.3.1.2 to identify causes for the present patterns of urban landuse; and

1.3.1.3 to determine the significance of the difference in the level of access to infrastructure and services among the Solwezi residents.

1.3.2 Hypotheses/Research Questions

To achieve the above objectives, this study intended to test the following:

1.3.2.1 There has been a significant difference in urban landuse over time in Solwezi.

1.3.2.2 There is a significant difference in the level of access to infrastructure and services among the Solwezi residents.

The following were the research questions:

1. What types of land use are there to denote various functions at present in Solwezi urban? *2.* What is the areal extent of each such landuse in Solwezi urban? *3.* What types of landuse changes are the causes of present patterns of landuse and where are they located in Solwezi urban? *4.* What type of differences in access to infrastructure and services are encountered among the Solwezi residents spatially? *5.* What type of pieces of land are available for further development in Solwezi urban? *6.* What are some of the regulations governing the use of urban land in Solwezi?

1.4 Significance of the Study

Towns are growing at an enormous rate, and the lives of the majority of the people in the country are affected by the decisions of the planners, developers, public authorities and private builders. So, research reports relating to urban studies provide important information to aid decision makers as well as the urban planners. For instance, a need exists to review the planning strategies that have been employed in the past so as to seek out relevant approaches for the future.

By studying the research findings the consequences of the actions taken in the past can be seen, the forces that work to shape the town can be discovered and the probable consequences of the actions taken now can be forecasted. This means that after the presentation of findings, it is easy to see the mistakes committed in the past and those that are being committed now so that corrective measures can be taken to redress the situation and avoid future recurrence of similar problems.

The findings are a precondition for further comparative studies of urban growth in Zambia in which different towns can be compared to see how they have evolved and grown as urban areas. Towns away from the influence of the rail line can be compared

with those along the rail line to see how they differ functionally and morphologically from each other.

1.5 Preview of the Study Chapters

Chapter one of this report gives the background characteristics to the study, states in categorical terms the problem and purpose of the study. Chapter Two of this report is a review of both literature covering previous work related to the study at hand and the theoretical framework that builds the foundation for the analysis of this report. Chapter Three describes the location, geographical condition of the study area and how it evolved as an urban area. Chapter Four gives a clear methodological approach to data collection adopted for the study. Chapter Five presents the research results for this dissertation. Chapter Six is a discussion of results and gives a brief overview of Solwezi's future town plan. Chapter Seven is the final and last part of the report which summarises, concludes and gives recommendations for further study, policy formulation and implementation.

1.6 Limitations of the Study

This study is limited to and primarily concerned with urban landuse and planning only although it also takes into account some development planning. Growth and settlement patterns have been dealt with as parallel studies to support the purpose of the research subject. It is always not easy to delimit functional zones under review as they merge into each other indistinctively. The classification of residential zones into high, low and medium density is just a convenient way of dividing up the study area. However, there are usually difficulties of mapping accessibility to infrastructure and services due to unclear residential developments. Maps for Solwezi have not been easy to find due to poor record keeping and informal handovers from one department to another. It may suffice to say that it is usually difficult to get information from people in a multilingual society like Solwezi where the message has to be translated into a language that can easily be understood by the local people.

Chapter 2

REVIEW OF LITERATURE

2.1 Introduction

This Chapter is divided into two parts: part one is a review of the literature related to this study while part two is a theoretical framework that builds the foundation for the understanding of the research topic at hand. It is important to stress that very little research focusing on Urban Landuse Planning has been done on Solwezi Urban apart, perhaps, from papers published by the Department of Town and Country Planning under the Provincial Planning Unit and the Central Statistics Office of Solwezi on housing and infrastructure development. In view of this, much of the literature used in this report is based on similar studies done elsewhere in Zambia and the Third World. The three theories of urban structure presented here share a common source from urban studies undertaken at the University of Chicago in the late 1930s and early 1940s. These theories of urban growth are largely descriptive and do not really provide a satisfactory explanation for the internal structure that most cities take today.

2.2 Review of Previous Literature

The nature of urbanization process in the Third World in general is quite different from that experienced by developed countries particularly at present. Most developing countries are still in the throes of a rapid and heavily concentrated urban growth, and relatively few have experienced sub urbanization (Drakakis-Smith, 1990). The same writer continues to argue that the main problems common to the overwhelming majority of Third World cities are consequently those that result from massively accelerating demands for urban services of all kinds from urban governments without the means or the will to respond. O'Connor (1983), says that Tropical Africa's total urban population is rising by over five percent per year, and that most of the individual cities by over seven percent to produce a doubling within ten years.

The work by Rothman (1972), focuses on urban development in the colonial period up to the attainment of independence. Rothman has traced the origins of the practice of providing housing tied to employment. This system provided for the accommodation of African servants at the rear of European employer's residences. As the servants were allowed to build the huts for themselves, they invariably built them from local materials based on traditional village types. This practice was extended on a larger scale to compounds on farms and contractors' premises and led to the growth of squatter compounds after independence.

Knauder (1982), has attempted a descriptive analysis of the elements of residential differentiation in Lusaka which was backed by extensive lists of figures collected during her field surveys though the data have not been subjected to any statistical test in order to probably arrive at the major dimension of disparity in access to social amenities.

Research carried out in Addis Ababa showed that 85 percent of the population live in what the United Nations defines as 'Informal Housing,' that is, shelters built illegally by migrants and that lack basic facilities. In Luande, the proportion is 70 percent and for Dar es Salaam 60 percent. Erastus Mutheira, the Kenyan Co-operative Bank Manager, has estimated that Kenya's major urban centres need 260,000 housing units to meet basic housing needs (Carr, 1997).

Knauder (1982), undertook an assessment of the Zambian government's Integrated Housing Policy of 1968. Her work looks at the degree of integration and segregation, social interaction and equality between residents in the low density areas and those in the high density areas of Lusaka.

Balbo (1993), shows that low levels of infrastructure provision are characteristic of Third World cities. This is because they do not generally obey the rules of spatial homogeneity evident in the cities of the west. By contrast the city of the western world is "a city of networks where primary infrastructure runs through different parts of the city servicing

them all under essentially similar conditions" (Balbo, 1993; 29). The same writer says that master planning as a development strategy does not work well for the Third World cities because it is based on assumptions about the state, public welfare, financial and technical resources that work for western cities and not for those of the Third World. In spite of its shortcomings, master planning continues to be a dominant approach to urban planning in many developing countries.

Development plans in many towns of developing countries have not worked as per expectations because, among others, the plans have not been reviewed and refined as per requirement by the Town and Country Planning Acts at intervals of, say, five years since they were prepared. Too long a planning period makes it difficult to project realistically the social, economic, physical and management variables on the basis of tacit assumptions. It could be that the realization of the plans has been seriously constrained by the lack of qualified and experienced technical management staff. Hiraskar (1993), says that, in fact, replanning of an existing town is more complex than planning or designing a new town.

2.3 Urban Landuse Pattern of Infrastructure and Services

2.3.1 Urban Landuse and Infrastructure Pattern

Harvey (1992), argues that urban landuse is determined by the various decisions made by *firms*, *households* and the *government* (primarily local authorities). Firms occupying shops, offices and factories have on occasions to decide whether to expand and, if so, whether to move or redevelop the existing site. He further argues that in a dynamic economy, new firms come into being and have to choose where to locate. Similarly, households decide where to live, and if many people move in a particular direction, for instance, to the suburbs, it profoundly affects the character of urban landuse. At the same time, government authorities influence landuse through the control of development, overall transport policy and the siting of roads, and by local authority house-building and comprehensive redevelopment.

Urban infrastructure and services constitute an important asset to urban living. The relatively higher living standards and greater economic opportunities they bring about are frequently characterized as a 'pull factor' for people to move from rural to urban areas (O'Connor, 1983; Lean and Goodall, 1983; Gilbert and Gugler, 1992). Choguill (1996), divides infrastructure into two components: physical infrastructure, which includes water supply, sanitation facilities, drainage, urban roads, solid waste disposal facilities and land management. The second group is social infrastructure which includes educational and health care facilities. Balbo (1993), defines infrastructure and services as physical and social facilities. This study equally uses these terms to mean physical and social facilities.

One of the most striking features of the present urban structure has been the rapid growth of informal settlements induced by the existence of development infrastructure (GRZ, 1979). The sheer growth of large urban centres has created severe infrastructural problems. As the town grows, the journey to work for many poorly paid workers who live in these spontaneous settlements far away from industry and employment in the central area, takes increasingly more time (Carr, 1997).

The influence which the town exerts on the social and economic structure of the areas helps the formation of landuse patterns. These landuse patterns of an urban community exhibit an ever changing character; a particular form of landuse considered suitable at one point may appear as a misuse at the present or in the near future. The land is misused when it is utilized for the purpose it is not intended for (Singh, 1973). The same writer says that if a residential house is used for shopping, commercial office or other unsuitable purpose, it essentially exhibits the misuse of that building in particular and that area in general. Also, large business concerns standing in pure residential areas, the location of administrative offices and heavy industrial establishments in the town centre are, by far, the most pertinent urban misuses as all these suffer from inadequate space and traffic disturbances.

The extent of separation between land used for functional activities such as commerce or industry and land used for residential purposes varies greatly from one city to another. In general it is far greater in the cities of colonial origin than in those of indigenous origin, while in most cities some areas are entirely functional; some entirely residential and others are mixed (O'Connor, 1983).

The CBD plays an important role in the process of urban growth, which greatly starts from the core by replacement of old buildings and the outward sprawl of housing activities. On the outer edges of the CBD are the high density residential areas which are often converted into slums and blighted areas consequent upon the maximum congestion and over-crowdedness of houses and people (Singh, 1973). The same writer says that the CBD has a greater tendency of vertical expansion rather than horizontal, because of the maximum friction of space created related to the peak land values. The presence of multi-storied buildings therein testifies this.

2.3.2 Organisational Structure of Urban Services

Cheema and Rondinelli (1988), identified seven main types of organizational structures used in Third World cities. These are centrally controlled bureaucracies, special provinces, state or municipal commissions or councils, two-tier systems development authorities, single-tier city or metropolitan governments, and inter-municipal cooperation. The same writers contend that voluntary organisations are also directly involved in providing urban services. Examples of such organisations are cooperatives, trade unions, political parties, women's organisations, youth clubs, neighbourhood committees, welfare associations, religious associations, rotating credit associations, self-help groups, and caste and ethnic associations. Some of these organisations are government sponsored while others are ad hoc and informal.

In Pakistan, for instance, four types of urban local governments provide services. These are town committees, municipal committees, municipal corporations and metropolitan corporations. In Indonesia, two central government offices are directly involved in

providing urban services. These are the Directorate for Town Planning, Department of Home Affairs; and the Directorate of General Housing, Building, Planning, Urban Development and Department of Public Works. In Kenya, there are three types of urban local authorities. These are municipalities, townships and counties. The Ministry of Local Government supervises, directs and controls the activities of local authorities (Cheema and Rondinelli, 1988). This is almost the same organizational structure that operates in Zambia and in other Central African countries like Malawi and Zimbabwe.

2.3.3 Services and Utilities

Rapid urbanization has substantially increased the demand for urban services through the developing world and in most countries the supply of services has not kept pace with increasing demand. Transport, low-income housing, piped water, public education, and public health services are in short supply (Cheema and Rondinelli, 1988).

Housing shortages are a serious problem in most towns in the developing countries. In every city, whatever its origins, there are areas of close packed houses and areas occupied at very low density, that is, there is high quality housing and there are areas of the crudest shacks. Variations in patterns of ownership often cut right through these other variables to complicate the total picture immediately (O'Connor, 1983). Many dwelling units or households, especially for the urban poor in most towns, are without running water and toilet facilities. Costs of standard housing units have increased so much that the urban poor are unable to buy them (Cheema and Rondinelli, 1988).

In most Zambian towns there was separate fragmented settlement development from the beginning for European and African populations. The houses for Europeans were of substantial value and high architectural quality, sited on planned layouts of individual large plots with spacious gardens and servants' quarters within the plots. Usually these houses occupied the best land near the town centre and they had all the necessary communication facilities (Knauder, 1982). The same writer says that the small proportion of Africans who were provided with housing was given low-cost houses, with almost no

facilities in locations segregated from European residential areas. These African compounds were usually far from the main places and sited in environmentally and aesthetically poor areas.

In Lusaka, for instance, European housing areas and the government centres were established along the Ridgeway because the area was attractive in landscape terms and because the land was suitable for sewage disposal by means of septic tanks. The flat limestone to the west and south, with its bad wind conditions, rocks near the surface and the liability to flooding was left for Africans (Knauder, 1982). Pressures on existing health facilities in urban areas are strong. The urban poor who are dependant on government health services are more negatively affected since the well-to-do are able to use private hospitals and clinics. In addition, lack of adequate facilities for sewage and garbage disposal, are major public health hazards (Cheema and Rondinelli, 1988).

The performance of the housing sector in Zambia during the Second National Development Plan was far from satisfactory. There were substantial shortfalls in the implementation of the housing policies and programmes postulated in the plan (GRZ, 1979). For instance, all new houses constructed by the public sector were to be for sale and the National Housing Authority (NHA) was to introduce a comprehensive home ownership scheme involving the transfer of most publicly owned houses to private ownership. In addition, the Presidential Housing Initiative (PHI) was introduced and the National Housing Policy (NHP) was approved. Presently, however, home ownership in urban areas remains the privilege of perhaps no more than five percent of the households (GRZ, 1979; GRZ, 2002). Most urban employees live in local authority rental houses, normally at heavily subsidized rents. Government and private employers still continue to provide staff housing at rents which bear no relation to the standard or cost of the house and its environment.

It has been argued that as development occurs, a three-fold specialization also appears in societies; that is, differentiation of economic and social functions among localities,

differentiation of the structure of labour in localities owing to technological specialization, and differentiation of institutions owing to the separation of functions into more or less autonomously ordered way of doing things (Rondinelli, 1983).

2.4 Urban Landuse and Planning in General

For a long time, town planners debated three things – whether the process of plan-making was totally rational; whether planning was value free; whether there was a 'best' plan for every situation (Roberts, 1999). The same writer further construes landuse planning to be a way of papering over society's cracks. She says that planning standards have long been used both in the preparation of plans, where they function as specifications, helping to define acceptable quantities of various uses of land, and in the operation of development control, which is the continuous regulation of all changes to the urban fabric, which together determine its future character (Roberts, 1999). Such key standards include, among several others, the relationship that exists between a building and its site.

Hiraskar (1993), defines town planning as an art of shaping and guiding the physical growth of the town creating buildings and environment in order to meet the various social, cultural, economic and recreational needs and to provide healthy conditions for both the rich and the poor to live, to work and to relax, thereby bringing about the social and economic well-being of the majority of the people. The same writer further argues that one of the major objectives of town planning is to preserve the aesthetics in the design of all elements of town plan which include preservation of trees, natural greenery, improved types of domestic buildings and buildings of civic dignity and beauty, architectural control on public as well as semi-public buildings, churches, mosques and buildings of cultural and historical importance.

According to the principles of town planning, Hiraskar (1993), argues that there should be no haphazard *laissez faire* method in planning and that the system of zoning should be strictly followed. The town should be divided into suitable zones such as residential zones, commercial zones, industrial zones, recreational zones and so on. The same writer

further argues that housing accommodation to various classes of people should be allowed to develop. If slums exist or begin to develop, they should be pulled down by making some alternative arrangements of accommodation in transit camps for dishoused persons. Civic amenities like shopping centres, dispensaries, schools, nursery, and so on should be provided to all the residents.

The growth of the town should be controlled by the provision of a green belt, which is an open strip of land all round the town or city reserved for a special purpose of limiting the growth of the town. This belt is reserved for intensive cultivation of vegetables, fruits, and so on and it also serves as a sanitary cordon to prevent the formation of slums. The touchstone of what constitutes planning is the matter of proper relationship and provision of several units to make a harmonious whole (Hiraskar, 1993). He suggests a general landuse plan for a town as given in Table 3.1.

Table 2.1 Proposed landuse plan for a town

Landuse	Percent Landuse Coverage
Residential use	50-55
Commercial use	2-5
Industrial use	10-12
Institutional use	8-10
Recreational/Open area use	10-15
Communication use	15-18
Special use	5

The percentages given in Table 2.1 are average figures for guidance and may vary for each town

2.5 Urban Landuse Planning Policy and Control in the Third World

Planning in the past has created unsatisfactory settlement which caused an inefficient use of resources, increasing development costs and has produced an unequal distribution of benefits and costs. The lack of well coordinated planning has caused urban problems such as squatter townships, air and noise pollution, urban congestion of all kinds, poverty, unemployment, biological hazards, inability to dispose of waste and shortage of water supply and energy (Rakodi, 1981; Carr, 1997).

The colonial policy contributed to discontinuous, amorphous urban structures, described as "urban sprawl". Urban land was of a mixed ownership pattern, partly government owned (crown land), partly individual owned (freehold). The colonial government did not acquire freehold land for urban development purposes which led to uncontrolled private development (Blankhart, 1981). The same writer says that at independence, Zambia inherited an urban pattern characterized by general low densities, poorly integrated in functional sense and by wide disparities in housing conditions. He says that in both the high density and low density areas, little economic activities, such as marketing and workshops, were found. The urban development policies after independence focused on changing the segregated urban pattern and on the provision of adequate shelter and services for the fast growing population.

As a complete departure from the colonial segregated housing policy, government introduced, in 1968, a new housing policy intended to integrate residential areas with houses of various costs (GRZ, 1979). This became known as the Integrated Housing Policy; the policy which required that the planning of residential units should be integrated by the interlocking of cells of a community, focused on new developments only and not on existing developments. It is argued that this is one of the reasons why the policy has had little impact up to now (Blankhart, 1981; Knauder, 1982).

The power to impose any restrictions on landuse so as to meet the social and economic demands of the people has increasingly come to be seen as an incident of state territorial powers. It is generally accepted that in the exercise of its powers, a state can impose laws and regulations in respect of landuse, town and country planning, building standards and conservation of forest reserves (Mbao, 1982).

Landuse planning and control is today conceived as an adjunct of good government and a central feature of the regulatory function of government. Over the years, landuse planning has become predominantly an instrument of 'social engineering' in which conflicting pulls of political philosophy, economic interests and ethical values constantly struggle for

recognition against a background of history, tradition and legal techniques (Mbao, 1982). Mbao further says that landuse planning is the traditional and most explicit means of establishing a guidance framework for landuse decisions.

Generally, efficiency of landuse controls depends, not only on the institutional capacity and the political will to carry them out, but also on the strength of the countervailing pressures with which they are confronted. Mbao (1982), further says that density controls may not be enforceable despite legal sanctions and enforcement agencies if the supply of urban land is tightly constrained while the population expands rapidly.

Without control over development and use of land and buildings, no planning can be successful. The objects of development control are to control private development as per required standards in relation to public health, safety and convenience to encourage private interest with public interest in all the aspects of development, to prevent the conflicting demand and misuse of land and to control and prevent over-crowding on land (Hiraskar, 1993). Development control is statutory in nature and the planning authority has the power to punish the defaulters.

2.5.1 Government Policy Responses

Cheema and Rondinelli (1988), identify two broad government policies dealing with urban development. First, are the policies and programmes which were designed to provide urban services and, second, are other policies dealing with facilitation of urban development within the context of national development strategies. The writers put forward the following as some of the policy responses that the government agencies at national, regional, metropolitan and municipal levels have implemented. These include plans to improve and expand the facilities for *water supply* in many developing countries; free *compulsory education* up to the age of 14 and the expansion of private schools and technical training facilities; formulation of *transport policies* and plans for urban areas; financing and construction of *public housing* schemes by public agencies and sometimes by private initiative.

Three broad types of policies have been implemented by governments in developing countries in order to extend basic services to slum and squatter settlements. First, *laissez-faire policies* have simply ignored the existence of slum and squatter settlements. Second, *restrictive policies* are used to reduce the size of slum areas by excluding them from urban services, removing and relocating residents to urban periphery and evicting them from their homes, to redevelop the area. Finally, *supportive policies* seek to improve conditions in slum and squatter settlements in cooperation with local residents. These policies also seek to legalise the tenure of plots on an ownership or leasehold basis, renovate existing structures, provide urban land and housing sites and services for the low-income families, and offer assistance for self-help housing (Cheema and Rondinelli, 1988).

Planners and policymakers in the Third World are increasingly recognizing the need to improve the social and economic conditions of slum and squatter settlements. In Kenya, for instance, policies and programmes aimed at assisting low-income urban residents have included slum and squatter improvement programmes, sites and services projects and low-cost housing schemes. Through these and other programmes, the government has attempted to increase the access of the urban poor to mass produced houses and to provide them with employment opportunities (Cheema and Rondinelli, 1988).

Cheema and Rondinelli (1988), has identified seven sets of policies to ensure adequate services to the urban poor. First, government could expand the direct provision of urban services by strengthening municipal government capacities. Second, *market surrogates* could be used to increase the efficiency of responsiveness of public agencies which are responsible for providing services. Third, the cost of providing services could be lowered by initiating changes in methods of delivery. Fourth, self-help and service upgrading by the poor could be actively supported. Fifth, the private sector participation in service delivery could be encouraged and private-public cooperation could be increased. Sixth, efforts could be made to further increase the demand for services among the poor by generating more employment opportunities and higher incomes. Finally, efforts could be

made to change the distribution of the urban population and encourage migration to small and intermediate-sized cities (Cheema and Rondinelli, 1988). The same writers argue that the Habitat study of slums and squatter settlements consider rehabilitation and upgrading to be the most appropriate type of policy response for providing urban services to low-income communities since they place considerably fewer demands on public funds since the people's contribution can be more easily mobilized for them.

2.5.2 Institutional Constraints

Cheema and Rondinelli (1988), identified some of the following as institutional constraints to policy implementation in the Third World:

2.5.2.1 Lack of effective coordination among agencies involved in providing urban services;

2.5.2.2 Lack of trained personnel to provide urban services in, for instance, engineering and urban management;

2.5.2.3 Highly centralized control over delivery of urban services in most developing countries;

2.5.2.4 Limited public participation in planning and implementing urban services and facilities as one of the most crucial constraints to the effectiveness of policies and programmes;

2.5.2.5 Lack of clarity in the allocation of functions and responsibilities to agencies at different levels of government, which has impeded the effective delivery of urban services;

2.5.2.6 Weak resource base of urban local governments which has hindered the effective provision of urban services and

2.5.2.7 Weak monitoring and evaluation systems in urban areas.

2.6 Urban Land Tenure

Mulimbwa (1980), holds that land tenure, which is the mode of holding or occupying land, influences the degree to which the public respond to housing policies. Whether or not an individual employer or lending institution should invest in housing depends on the security of tenure.

Very little has been written on land ownership in African cities as a factor influencing urban structures (O'Connor, 1983). The same writer says that in most traditional African tenure systems, land is not owned by individuals, but is held in trust for the community by local chiefs, who allocate it to families for their use. Normally, this means for farming, but the same principle may apply to tiny plots on the city margins sought largely for a dwelling place. Houses are regarded as personal property, and may be bought and sold, but this does not extend to the land on which they stand. Such traditional practices are now changing in many areas. O'Connor (1983), further says that in various other countries, traditional tenure systems were totally displaced within the emerging urban areas when the colonial rule was imposed. Sometimes, the government became the owner of the land, much of which was then leased to individuals or companies for both commercial and residential use.

In Lusaka, in 1969, census data indicated that 8,000 dwelling units were rented from the City Council, 5,800 from central government bodies, 2,100 from private employers and 5,500 from individual land lords, while a further 14,200 were occupied by their owners. On the Copperbelt, there was much less private ownership, and also less government housing, as many workers were housed by the mining companies (O'Connor, 1983). Land tenure in urban areas of Zambia is based on a 99-year lease and is governed by the Land Act of 1975 which vested "all land" in Zambia "absolutely in the President" to be "held by him in perpetuity for and on behalf of the people of Zambia" (Mulimbwa, 1980).

2.7 Theories of Urban Structure

The mapping of information about a town reveals a spatial pattern. Such patterns have been studied and used as the basis for the creation of urban theories (models) which help in the understanding of urban concepts. Several of these theories were developed in the United States of America and have since been found to be useful in understanding all towns and cities (Witherick, 1995). The same writer says that theories are both generalizations and simplifications. They make simplifying assumptions such as the prevalence of an isotropic surface in order to bring into clearer focus those factors that

have a major impact on the urban pattern. Herbert (1972), says these theories have, however, become more obviously inadequate as urban systems have become more complex and as contrasts between cities in different parts of the world are more clearly identified.

2.7.1 Concentric Zone Theory

Harvey (1992), argues that although a concentric pattern of urban landuse follows logically from the Von Thunen analysis, it was not until the 20th Century that research on actual patterns of landuse emerged. The best known theory of urban landuse that arose from an examination of the historical development of Chicago in the 1890s, is the Concentric Zone theory postulated by E.W. Burgess. The theory attempts to provide a descriptive framework for the spatial organisation of urban landuse (Harvey, 1992; Herbert, 1972). The key argument in this theory is that, as the town gets bigger (i.e. in terms of area and population), it grows outwards from its centre of origin. As more growth takes place, concentric zones are formed resulting in such landuse zones as 1. the CBD (the loop), 2. the zone of transition (inner ring), 3. the low-class residential (the zone of workmen's homes), 4. the high-class residential (the zone of better residence) and 5. the commuter zone (Carr, 1997; Harvey, 1992; Herbert, 1972; Munowenyu and Pritchard, 1997; and Witherick, 1995)

2.7.2 Radial Sector Theory

The Sector theory of urban landuse is regarded as the second of the classic theories of urban spatial form. The theory took the form of a CBD with series of sectors emanating from it. The theory is basically an elaboration of the concentric zone theory by allowing for the development of more irregular patterns. It concentrates on the location of housing in urban areas (Harvey, 1992; Herbert, 1972). The key argument here is that the growth of the town is around a single nucleus with functional zones being determined by transport route from the CBD (Carr, 1997; Munowenyu and Pritchard, 1997). Herbert (1972), contends that various residential areas took the spatial form of sectors, extending from the central city towards the periphery, and were thus in apparent contrast with the concentric

zones suggested by Burgess. The common elements were the focal nature of the CBD, the presence of a transition zone, which was clearly identifiable in American cities.

2.7.3 Multiple Nuclei Theory

The third classic theory of urban landuse was that named the Multiple Nuclei theory. Its main distinctive quality was its abandonment of the CBD as a sole focal point, replacing it by a number of discrete nuclei around which individual land uses were geared (Herbert, 1972). Unlike the other two theories, the key argument here is that large cities have a structure which is essentially cellular, with the growth of the town being around several separate centres (nuclei) instead of being around just one centre. This situation results when separate specialised activities develop in different parts of a town. Each of these activities forms a nucleus for growth (Carr, 1997; Harvey, 1992; Munowenyu and Pritchard, 1997).

The three models mentioned above represent a means of classifying different city growth patterns: a CBD, older inner industrial area and newer suburbs with expanding shopping and office sub-centres. They present a basis on which further analysis can be undertaken rather than being a rigid way of looking at every city. With regard to residential disparity, each of the three theories explains the same basic principle, whether emphasis is placed upon concentric zones, sectors or nuclei and so they must be regarded as being complementary to one another rather than exclusive. However, Harvey (1992), argues that though these theories suggest how cities grow, they fail to explain why they grow. Similarly, Balbo's (1993) argument with respect to the growth patterns of Third World cities hinges upon the lack of unity within the diversity of urban functions.

2.7.4 Central Place Theory

The concept of central place theory was developed by Walter Christaller in 1933 from a study in Southern Germany and has since then been applied in most continents to explain the spatial distribution, the number and size of a specific kind of urban services within a large area. It is important to note that much of Van den Berg's (1983) work on central

place theory was rather rural based and does not bear a very direct relation to landuse and planning in urban areas such as Solwezi.

The studies of service centre system in Zambia show a great variety because they are mainly descriptive and planning recommendations are not their main aim. In his application of the central place theory to the distribution of social services in Southern Province, Van den berg (1983), identified three kinds of centrality: service centrality, employment centrality and population. Van argues that of the three types of centrality, service centrality appeared to have been the basic criterion used for the designation of tertiary, secondary and primary service centres and service sub-centres while the other criteria offering only slight adjustments. Van den Berg (1983), further says that the acceptance of the existing distribution of centres as the basis of future development is open to dispute because as long as the distribution of service centres is not explicitly related to population distribution, it is impossible to decide whether or not the existing pattern of service centres is satisfactory.

2.8 Residential Disparity

Residential disparity in urban areas can be measured using Factor Analysis to derive the major dimensions of disparity. The idea is to use the factor that expresses most of the dimensionality in the data to compute an index value that relates each respondent's access to infrastructure and services on a common scale. The methods combine social, economic, demographic and housing characteristics with the object of establishing what common patterns exist in the data (Knox, 1995; Roberts, 1999).

According to Abu-lughod (1969), most studies of residential disparity using the above stated technique identify one major dimension which discriminates among the sub areas within the city. This is the factor which rates to the socio-economic rank of residents and relates occupation, education, rent, income, housing quality and density of dwelling units' occupancy. Abu-lughod further says that the socio-economic factor frequently accounts for the largest proportion of the variance in the correlation matrix.

Chapter 3

THE STUDY AREA

3.1 Location and Size

Solwezi is situated in the Northwestern Province of Zambia with its extent between latitudes 11° 45' S and 13° 30' S and between longitudes 24° 49' E and 27° 37' E. It is bordered by the Democratic Republic of Congo in the north, the Chingola, Lufwanyama and Mpongwe districts in the east, Mwinilunga district in the west and Kasempa district in the south. It is the provincial administrative town of Northwestern Province. Solwezi district covers an area of 30,261 square kilometres, which is 24 percent of the total area of 125,826 square kilometres for the entire Northwestern Province. Being the study area, Solwezi urban covers an area of 50 square kilometres, a portion of only 0.2 percent of the total area of Solwezi district (GRZ, 2000b).

3.2 Climate, Relief and Drainage

Solwezi experiences the tropical plateau type of climate with annual temperatures averaging between 18° and 21° C. It lies in the high rainfall zone of the country. It experiences the hot-wet season that stretches up to six months, from October to April; the cold-dry season from May to July; and the hot-dry season from August to September. Solwezi normally has high rainfall ranging from 1,300 to 1,400mm per year (GRZ, 2000b). Most of the rainfall comes in thunderstorms with a strong influence from the Congo airmass. The district has two types of soils; Barotse sands, which are sandy and acidic, found mainly in the southern part of the district and the sand veldts which are loamy, found in the eastern and northern part of the district. Much of the soil is leached in many places because of heavy downpours.

Solwezi lies in the highland region in an area that separates the Zaire River system from the Zambezi River system. It is situated on an upland traversed by the Solwezi River almost midway. On the southern part of the town is a marshy area though the land continues to rise towards the north and west up to Mwinilunga. On the eastern part of

Solwezi River, the land rises gradually from the river banks to the Kansanshi area. The drainage is fairly good though with a few gullies created by heavy downpours. Much of Solwezi urban is concentrated on the western part of the Solwezi River.

3.3 Population

Solwezi district has a population of 203,797, which is 38 percent of the total population of 538,350 for the entire province. Out of this population of Solwezi, 102,241 are males and 101,556 are females. It has an urban population of 69,098 of which 34,755 are males and 34,343 are females. Solwezi district has a total of 38,546 households while Solwezi urban has a total of 13,066 households (GRZ, 2000a; GRZ, 2000b). The population of Solwezi continued to increase from 52,979 in 1969, 92,773 in 1980, 137, 728 in 1990 and 203,797 in 2000, thus registering a growth rate of 5.8 percent between 1969 and 1980, 3.0 percent between 1980 and 1990 and 4.0 percent between 1990 and 2000.

Table 3.1 Population distribution and annual growth rate in Solwezi

Population				Percent distribution				Density (persons/sq. km)				Percent growth rate		
1969	1980	1990	2000	1969	1980	1990	2000	1969	1980	1990	2000	1969-1980	1980-1990	1990-2000
52979	92779	137728	203797	22.9	30.7	31.4	34.9	1.8	3.1	4.6	6.7	5.8	3.0	4.0

Source: CSO (2000), Lusaka

Solwezi's population has increased tremendously of late due to the opening of the Kansanshi mine. This has attracted a number of people from all walks of life especially from the depressed Copperbelt. As far back as 1974, the urban boundary for Solwezi had already been marked. Since then, Solwezi remained a district council until in 1996 when it attained its status of municipality. (See Figs. 3.1 and 3.2).

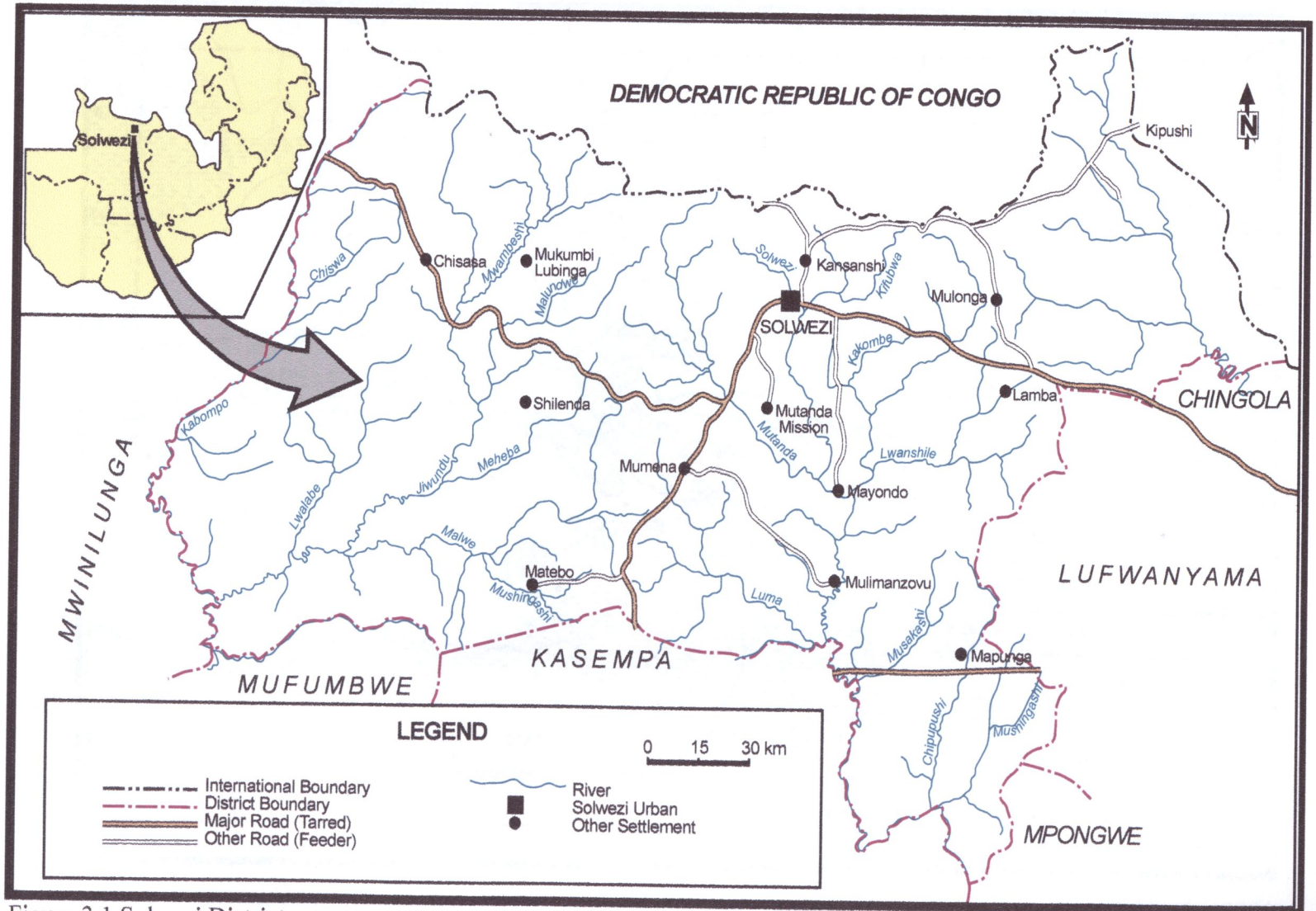


Figure 3.1 Solwezi District

Source: Adapted from Solwezi Municipality, 2004

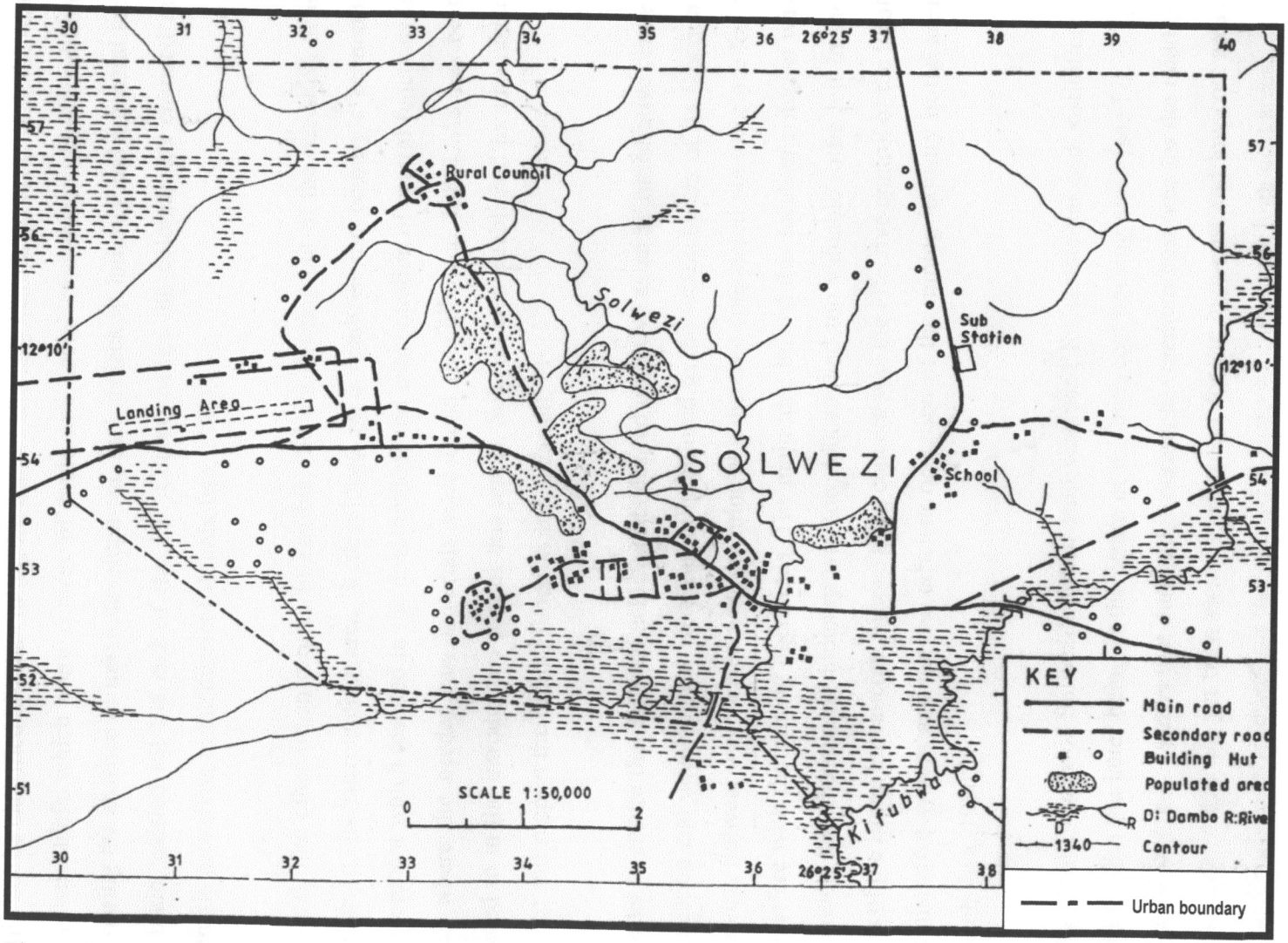


Figure 3.2 Solwezi Urban, 1974

Source: Adapted from Survey Department, Lusaka, 2004

3.4 The Morphogenesis of Solwezi Urban Landuse

Prior to the colonial era, Solwezi was only a small settlement whose size and function could not be classified as urban or a town centre. The only significant areas were the seats of tribal chiefs which were centres of trade and social ceremonies. The conditions favouring the absence of urban development, such as lack of industry and a general lack of trade, existed till the end of the 19th Century when the colonial era changed the scenario prevailing in the district (Maimbolwa, 1980).

Solwezi, like other urban centres in Zambia, did not develop out of the needs of, or in service to, its surrounding area. It developed as a result of the country's economic development which resulted in the development and concentration of central functions in areas where the needed raw materials were found (Maimbolwa, 1980). As has been alluded to in the introductory part of this report, Solwezi was established to administer, service and support the mining function at Kansanshi.

In order to ensure that Solwezi achieved its desired objective as an administrative centre, its location and development were carefully tailored to the requirements of its function. Likewise, Solwezi was located near the mine at a distance considered not too close for it to interfere with the mining operations. The main idea behind this location criterion was the notion that the mining industry was too delicate and too valuable to be left in the hands of the Boma bureaucrats, whose main concern was the effective control of the local administrative system and not the efficient operation of the mining industry in the area (Maimbolwa, 1980).

In the 1970s, much of Solwezi's urban land was used for residential and institutional purposes with the latter being in the centre of the high-cost housing areas (see Fig. 3.3). The same Figure 3.3 shows that during this period, the medium-cost area for the middle-income groups had not yet been established except for the high-cost and low-cost areas and the illegal squatter townships that existed in sharp contrast to the high-cost areas.

Most of the low-cost housing areas that exist at present, such as Helen Kaunda (Hospital) and Messenger compounds, and the Magrade medium-cost housing area, were once populated areas that started as illegal settlements on the fringes of the developing Solwezi urban. It is interesting to note that Kandundu which was a low-cost housing area in 1974 has remained a low-cost housing area up to the present time despite its considerable areal expansion. Contrary to it, Magrade compound which was once a populated and illegal settlement during the same period is now a medium-cost area.

During the same period, the commercial area with its thinly built up business area, was confined only to a small section of the developing Solwezi urban. Most of the transport routes that existed during this period were beyond the status of being called secondary roads as most of them were mere tracks created by people who commuted to the Boma site probably for shopping, for some business or for work. The surrounding urban fringe was, on one part, still a garden area which was, perhaps, reserved as a green belt by the colonialists and on the other part a dambo (sees Fig. 3.3).

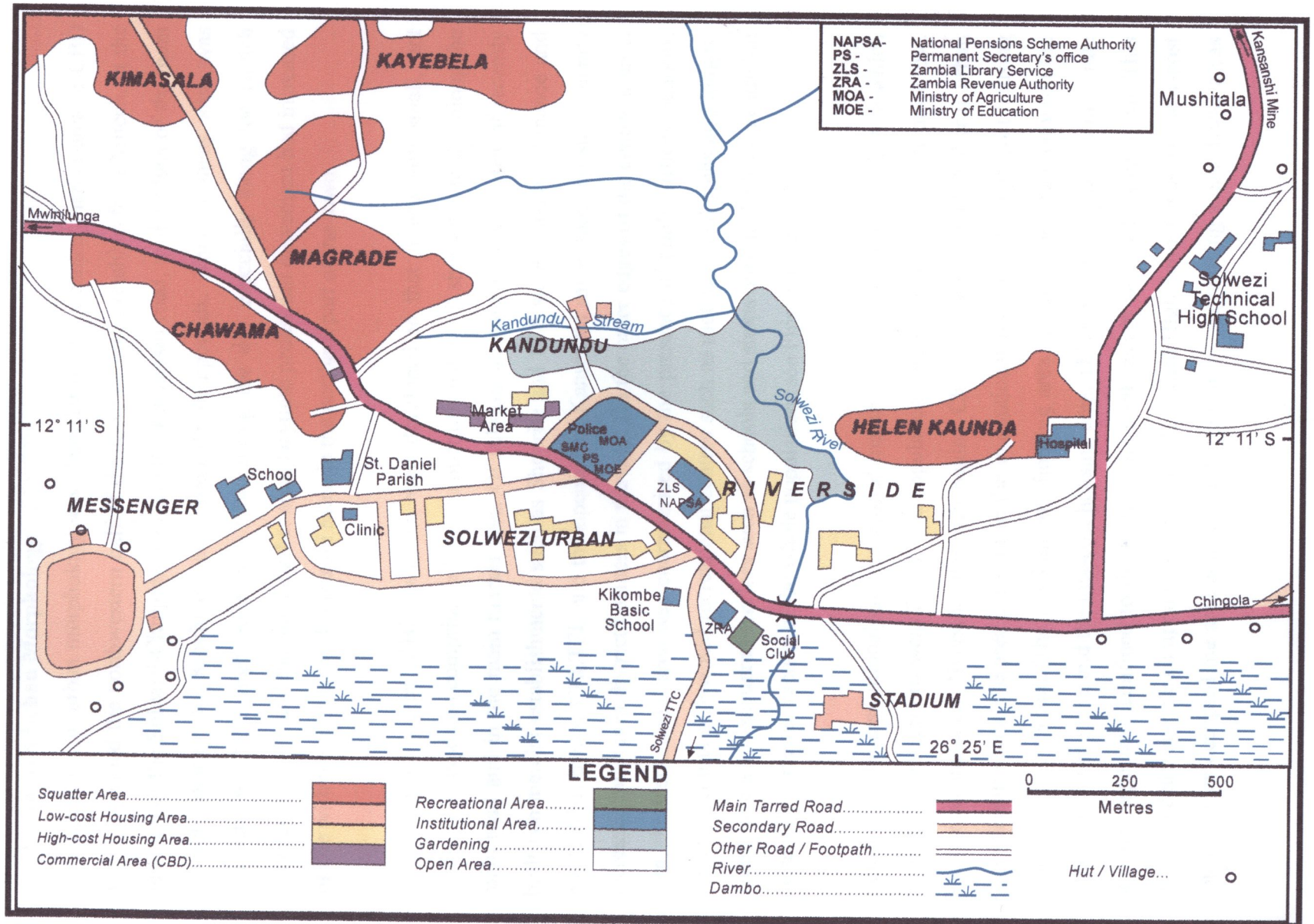


Figure 3.3 Solwezi Urban Landuse, 1974

Source: Adapted from Survey Department, Lusaka 2004

3.4.1 Solwezi's Urban Morphology

Solwezi's current urban morphology was characterised by a central market area or CBD which occupied the northwestern half of the town centre, stretching from Mitech, at the junction of the Solwezi-Chingola road and the Kansanshi road, to the edges of the main market adjacent to Kandundu and Magrade compounds. This business area was characterised by a high pedestrian flow during the day especially along the stretch between Shoprite and the main market area. Daytime pedestrian movement had increased of late with the opening of Kansanshi Mine in the northern part of the town.

The commercial area (CBD) was not well developed in that it was still small, not centrally located and comprised a large number of small retail shops that trailed along the main road and in the main market area. Of substantial value was a number of recently built commercial establishments such as Shoprite and PEP stores, Stanbic, Finance and NATSAVE banks, CELTEL and the opening of Kansanshi mine, that had subsequently increased inter/intra-district business in the area. On the outer edges of the central market area, the institutional area was characterised by the presence of public offices, schools, churches, courts of law and recreational centres such as motels, social clubs and lodges. There were a few scattered services such as schools and shops outside the town centre but these only served a fraction of the whole population (see Figs. 5.1a and 5.1b).

Adjacent to the institutional area developed mainly the high-cost housing area in which the high-income groups were found. The population densities in this area were quite low. Such areas included Riverside, the area behind Changa-Changa motel, Solwezi urban (Low-density) area, the area adjacent to the institutional zone and the high-cost housing area down the stadium. The medium-cost housing area occupied the space between the high-cost housing area and the low-cost housing area. This was characterised by moderate densities especially confined to the eastern and northeastern side of Solwezi town. This area included Magrade compound and Solwezi Technical High School area. The low-cost housing areas occupied the area adjacent to the medium-cost housing areas. These areas

included Kandundu, Messenger and Helen Kaunda (Hospital) compounds, which had relatively high population densities (see Fig. 5.1a).

The industrial area, though not yet developed, pre-empted the land adjacent to the low-cost housing areas. The industrial base in Solwezi was almost inexistent with an exception of the newly opened Kansanshi Mines which lay about fifteen kilometres outside Solwezi urban. The squatter townships occupied the urban fringe on the western and northwestern part of the town. They included areas like Chawama, Zambia,, Mitech, Kimasala and Kayebela compounds. These were generally unauthorised and populated settlements that were located far on the edges of Solwezi urban (see Fig. 5.1a).

Unlike towns like Lusaka which seem to have blended elements of all the three models of urban landuse in their morphology, Solwezi appeared to take a slightly different picture. It is evident from our developing knowledge of urban landuse models that the most common features of the three models is that there is a progression of residence from the high-cost residential, being closer to the main business area, to the low-cost residential being farther away from the central town. Solwezi showed a scenario that put the already disadvantaged low-cost residential area far away from the main market area while the advantaged high-cost residential area closer to the central town. The squatter townships being the furthest from the town centre suffered both economic and social injustices of being isolated and living in deplorable conditions and having little or no access to essential household amenities.

3.5 Reasons for Selecting the Study Area

3.5.1 The researcher wanted to study a town away from the influence of the rail line with a view to finding out how it would vary functionally and morphologically from other rail line towns of Zambia.

3.5.2 Being a material developer and a part-time lecturer for Teachers of Primary and Secondary Schools Upgrading Programme (TOPSSUP), the researcher wanted to contribute positively to the changing local geography of the area.

3.5.3 Being a Solwezi resident and a self-sponsored student of Geography at the same time, the researcher found it far cheaper, in terms of research costs, to study a town within the vicinity than studying a town away from home.

3.5.4 The researcher was fascinated by the nature of urban transformation that was taking place in the area due to mining.

Chapter 4

METHODOLOGY

4.1 Research Design and Instruments

The actual fieldwork was done between March 2005 and July 2005 because not all the required data could be obtained at the same time. During this period, survey maps were examined and field observations done to try and explain the evolving urban landuse. Literature was reviewed on both the growth of Solwezi and its prevailing landuse patterns.

4.1.1 Primary Data

Primary data were collected using interview schedules and questionnaires from various sections of the population. The semi-structured interview schedule covered issues of landuse while the structured questionnaire covered issues of planning with a view to obtaining information on access to infrastructure and services. Both questionnaires were aimed at collecting information from a stratified random sample of 90 residents that were chosen from high-cost, medium-cost, low-cost and squatter township areas of Solwezi. Semi-structured interviews were particularly administered to the Solwezi Municipal Council officers and town planners.

4.1.2 Secondary Data

Secondary data were obtained from the University of Zambia library, Central Statistics Offices of Lusaka and Solwezi, Survey Department, Lusaka, Town and Country Planning Department of Solwezi, Solwezi Municipal Council and Solwezi library.

4.2 Sampling Procedure

4.2.1 Sampling Frame

A list of households with population figures was obtained from the Lusaka Central Statistics Office. This provided the sampling frame on which the sample survey was based. The population data obtained from CSO provided the basis for deciding the

proportional sample sizes for each residential category. Study communities were chosen from the list using random numbers.

4.2.2 Residential Stratification

The study area was divided or stratified into high-cost, medium-cost, low-cost and squatter according to the CSO and local authorities' classification of residential areas. The stratification was based on plot sizes which were categorized as follows: high-cost (30m by 45m), medium-cost (18m by 30m) and low-cost (12m by 27m). Using this stratification as a guide, residential areas were allocated to these categories and study communities were chosen from these lists using random numbers. Sample sizes and their corresponding percentages are given against each study community in Table 4.1.

Table 4.1 Sample stratification and allocation

District	Population	Res. category	Area (sq. km)	Sampled area	Sample size	%Sample
Solwezi	69,098	High-cost	6.75km²	Riverside & urban area	12	13
		Med-cost	9.50km²	Magrade & SOTECH area	16	18
		Low-cost	1.40km²	Hospital & Messenger	24	27
		Squatter	0.90km²	Chawama & Zambia comps.	38	42
		Total	18.50km²		90	100

Source: Field Observations

4.2.3 Selection of Respondents

This was achieved by assigning random numbers to each household. In this way every household had an equal chance of being included into the sample for interviews. In the event that some respondents were not willing to participate, another was chosen at random using the list of random numbers. A similar method was used in the squatter townships where housing units were rarely arranged in order. Occasionally, respondents were picked randomly at the market for interviews and this worked quite well for squatter townships. Many of the people sampled showed willingness to fill out the questionnaires except that most of the squatters could not read and understand English. So in most cases

questions were read out in the local language and then responses were translated and recorded by the assistant researcher.

4.3 Methods of Data Analysis

This study employed three types of quantitative techniques that were carefully chosen on the basis of the available sets of data in order to help explain the validity and direction of the research questions and hypotheses. These were Factor Analysis, Chi-Square/Fisher's Exact test and t-test.

4.3.1 Factor Analysis

This report employed Factor Analysis to establish the level of access to infrastructure and services for each residential category in Solwezi urban based on the major dimension in the data. The method does this by identifying groups of variables with similar patterns of variation, reduces them in number and then expresses them in terms of new variables called factors. Each factor reflects a group of variables which are strongly correlated. The relative contribution of each variable to the overall component is shown by a loading which is based on the statistical correlations between the variables. It is the variables with high loadings in either direction which are significant or usually most of the total variance in the data will be accounted for by the first two or three factors. Twenty-six variables, as shown in Appendix A (I), were entered in SPSS Factor Analysis for statistical computation. A detailed procedure of how this technique was carried out is given under Analysis of Data below while the output is shown in Appendix A (II) of this report.

4.3.2 Chi-Square/Fisher's Exact Test

The report also employed Chi-Square/Fisher's Exact test technique basically for the purpose of establishing whether or not there was any significant difference in access to infrastructure and services among the Solwezi residents. The technique does this by comparing the obtained set of *observed* frequencies in given categories with a set of *theoretical* or expected frequencies within them. Fisher's Exact test automatically replaces Chi-Square in the computation when any cell in a given category has expected

frequency less than five. The same variables that were entered for SPSS Factor Analysis were also entered in SPSS Chi-Square/Fisher's Exact test for statistical computation. The Chi-Square technique was preferred because it is possibly the most suitable test when data are in nominal or frequency form for individuals in mutually exclusive categories such as in high-cost, medium-cost, low-cost and squatter areas, which involve the counting of a number of persons or responses as they occur under them. The output and the interpretation of Chi-Square/Fisher's Exact test results are shown in Appendix B of this report.

4.3.3 T-Test

Lastly, the same study used the t-test (critical ratio) technique basically for the purpose of establishing whether there was any significant difference in the use of land in Solwezi urban between the years 1974 and 2004. The technique does this by comparing two sets of scores (in this case, 1974 and 2004 scores) to establish whether or not an observed difference is of such a magnitude that it can explain change in landuse. Nine variables were entered for manual calculation using the Means for Correlated Groups Difference Method based on the simple formula:

$$t = \frac{\bar{d}}{SD/\sqrt{N}}$$

where, $\bar{d}$, the mean sample difference
SD, Standard Deviation
N, number of cases in a group

A detailed procedure of how the t-value was calculated is given under Analysis of Data below.

4.4 Analysis of Data

The analysis of data involved a critical examination of the information obtained from both interview schedules and personal observations to try and establish causes for the evolving urban landuse patterns and the nature of accessibility to facilities in Solwezi. Table 5.1 which shows the 1974 and 2004 landuse scores obtained from the council, was made to help determine whether there was any significant change in landuse over time.

The data set for the original landuse coverage was obtained from the council while the current 2004 landuse scores were calculated from the existing cadastral maps that were used in the distribution of plots. Other frequency tables on accessibility to facilities only established estimated distances from the CBD. This was to enable the researcher to establish whether or not land and facilities were evenly distributed.

The data set in Table 5.1 was subjected to the t-test to determine whether there was any significant difference between the 1974 and the 2004 urban land uses. This enabled the researcher to determine whether or not to accept the hypothesis. The technique was preferred because it establishes whether or not the two sets of scores have a mean difference so significant as to suggest change in landuse.

Table 4.2 Calculation of t-value

Landuse	**Landuse scores**				
	1974 [Km²]	**2004 [Km²]**	**1974-2004 Difference [D]**	**$d - \bar{d}$ (X)**	**X^2**
Residential	2.50	15.50	13.00	9.19	83.54
Squatter	0.80	0.90	0.10	-3.71	13.76
Commercial	0.05	0.30	0.20	-3.61	13.03
Institutional	0.05	0.50	0.40	-3.41	11.63
Industrial	0.03	0.50	0.50	-3.31	11.00
Small holding	0.50	13.00	12.50	8.69	75.52
Recreational	0.03	0.50	0.50	-3.31	11.00
Open space	0.03	0.30	0.30	-3.56	12.67
Special use	4.50	11.50	7.00	3.19	10.18
Σ	**8.50**	**42.80**	**34.50**		**242.33**

Formula: $\mathbf{t} = \dfrac{\bar{d}}{SD / \sqrt{N}}$

Where, $\bar{d}$, is the mean of sample differences

SD, Standard Deviation

N, number of cases in a group

$$\bar{d} = \frac{\Sigma d}{N} = 34.5/9 = \mathbf{3.83}$$

$$\mathbf{SD} = \frac{\sqrt{\Sigma x^2}}{N-1} = \frac{\sqrt{242.33}}{9-1}$$

$$= \frac{\sqrt{242.33}}{8} = \sqrt{30.29} = \mathbf{5.50}$$

$$\therefore t = \frac{\bar{d}}{SD / \sqrt{N}} = \frac{3.83}{5.50 / \sqrt{9}}$$

$$= 3.83 / 1.83 = \underline{\mathbf{2.093}}$$

Interpretation of t. test results

The hypothesis to be tested was whether there was any significant difference in landuse over time in Solwezi by making a comparison of the 1974 and 2004 landuse scores so as to establish whether the area in the respective categories, as given in Table 4.2 above, has changed significantly over time. Our null hypothesis assumes that $\bar{d}$ is equal to zero, where **d** is the difference in landuse between each pair of landuse categories under consideration. Thus,

Ho: There has been no significant difference in landuse over time in Solwezi.

H1: There has been a significant difference in landuse over time in Solwezi.

The change observed in this case has been tested by the t-value as shown in the calculations above, where $\bar{d}$ is 3.83 and **SD** equal to 5.50, thus setting the confidence level at 90 percent (i.e., 0.10 level of significance) and the rejection region with 8 degrees of freedom set at $|t| \geq 1.860$. So, evaluating **t** from the formula,

$$\frac{\bar{d}}{SD / \sqrt{N}},$$

t-value becomes, $\frac{3.83}{5.50 / \sqrt{9}} = \mathbf{2.093}$

The t-calculated falls outside the range within which, the null hypothesis would be accepted. It can be clearly seen that $\bar{d}$ is not equal to ($\neq$) zero. So our conclusion therefore is that there has been a significant change in the area in different categories under observation. This can be confirmed from the calculations above where the average increase is set at 3.83 sq. km of land with the greatest change recorded in land for residential, commercial and small holding use.

Combined table-and-graph charts were made for each facility according to residential categories. These were carefully drawn using Microsoft Excel (see Figs/Tables. 5.2 to 5.21 pp. 53 to 69). The summarised data sets were then entered according to the SPSS programme for statistical analysis of accessibility in each residential category. The Chi-Square test was performed on the appropriate data sets entered.

Taking a slight shift from Kangwa's (2000) use of Factor Analysis to establish people's access to each individual infrastructure and service, this study used Factor Analysis to establish the level of access for each residential category under study so that the maximum number of factors expected to be produced from the analysis and corresponding to the number of these residential categories, was four. The raw data set which was used for this analysis is also included in Appendix A (I) of this report.

The level of accessibility was computed based on the major dimension in the data. The Factor Analysis values computed in this manner gave scores (loadings) for each residential category as a measure of their level of accessibility to facilities. The values are products of the factor score coefficients [see Appendix A (II)]. The data display is in the form of frequency tables and graphs. The frequency distribution graphs, each with a frequency table attached below, have bars each showing the frequency of occurrence of each residential category on each of the variables measured. Where there is no measurement (a 'zero' value), the shading is shown on the floor (x-axis) of the graph. The order in which the bars appear is determined by the data input indicated on the legend.

4.4.1 Factor Analysis Procedure

From the research responses 26 variables as shown in Appendix A (I) of this report were entered in the data matrix in SPSS Factor Analysis for each of the 90 respondents. These related either directly or indirectly to the issue of accessibility to infrastructure and services. From these data, the SPSS programme computed a 4 by 4 correlation matrix as shown in Appendix A (II) of the same report. This was followed by the computation of a set of initial statistics showing the variable communalities, factor eigen values, percentage and cumulative percentage of variance and an initial matrix (i.e., a 4 by 2 matrix).

4.4.2 Factor Selection

The sizes of the eigen values give an idea of the explanatory 'power' of each factor. The larger the eigen value, the greater is the explanatory power of the associated factor. The eigen values are therefore used to determine which factors are important for the analysis. Normally factors with eigen values of greater than one (1) are regarded as important. The 'break of slope' technique is also used to decide which of the factors are important. In this case the eigen values from the initial statistics have been plotted against each of the factors. The resulting graph takes an elbow shape (see Fig. 4.3).The elbow bend signifies the least important factor.

Table 4.3 Results of Factor Analysis

a) Total Variance Explained

	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.654	66.350	66.350	2.518	62.946	62.946	2.358	58.952	58.952
2	1.002	25.041	91.390	.393	9.830	72.776	.553	13.824	72.776
3	.231	5.769	97.160						
4	.114	2.840	100.000						

Extraction Method: Principal Axis Factoring.

b) Factor Matrix

	Factor	
	1	2
VAR001	.931	-.124
VAR002	.916	-.241
VAR003	.880	.272
VAR004	.195	.496

Two factors extracted: 11itineration required

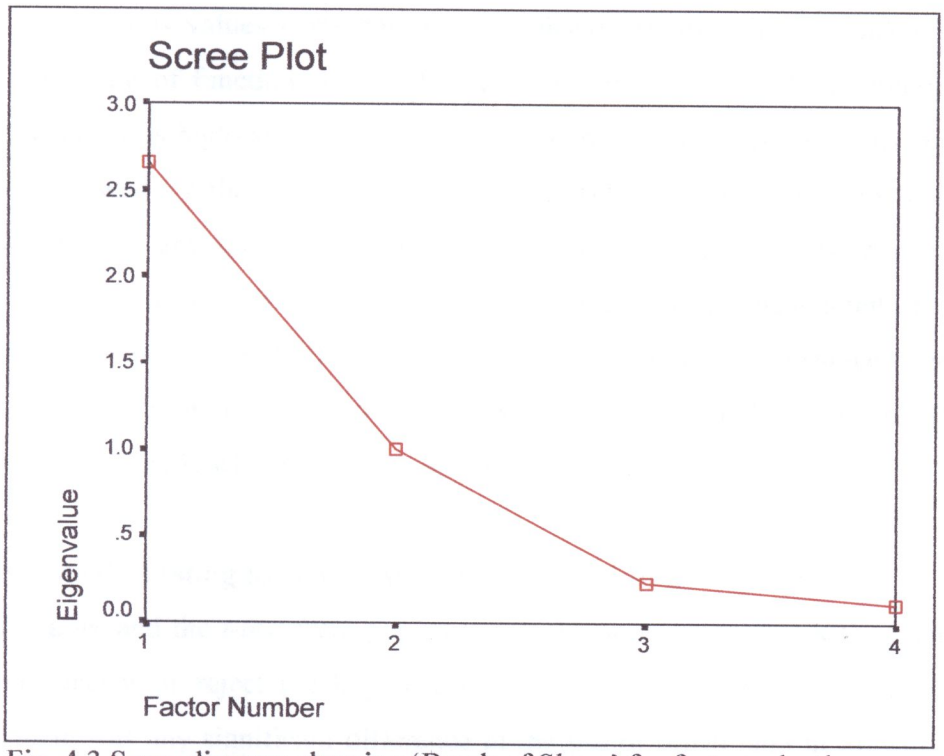


Fig. 4.3 Scree diagram showing 'Break of Slope' for factor selection

The two factors extracted in this analysis have high loadings as shown in Table 4.3. Factor 1 relates to the high income groups and may be called primary economic status (wealth) factor where most of the households had the ability and economic means to get access to better services. Factor 2 relates to the medium class and may be called secondary economic status factor where a good number of households had relative ability and economic potential to get better services. From Fig. 4.3 therefore, factors 1 and 2 are important factors and these have been extracted from this analysis. Factors 1 and 2 are strongly associated with the presence of most of the household facilities such as electricity, good sanitation, proximity to facilities and good walling and roofing materials. Such facilities as walling and roofing materials, bedroom type and size, tenancy status, to mention but a few, are in this report, indirectly treated as accessibility factors because certain classes of people may or may not have access to such facilities due to their economic status. The poor, for instance, may not afford to live in a house built out of concrete blocks because, notwithstanding their will to do so, they don't have the means to buy cement or blocks, thereby limiting their access to good walling materials.

The Factor Analysis values computed above indicate that though the residential areas showed a mixture of functions in which houses of various cost and size intermingled, places designated as high-cost areas still had the highest level of accessibility (66.350% variance) followed by the medium-cost areas (25.041% variance), the low-cost areas (5.769% variance) and the squatter areas having the least accessibility level (2.840% variance). This is shown in Table 4.3 where eigen values indicate the amount of variance accounted for by the factor. Both the percentage and cumulative percentage of variance indicate the relative importance of the factors while the communalities indicate the total variance in any variable which is accounted for by the factors.

4.4.3 Hypothesis Testing for Landuse and Access to Services

The *Chi-Square* and the *t-test* were performed on the appropriate data sets to determine whether to accept or reject the hypotheses at hand. The first hypothesis was to test whether there was any significant difference in the use of urban land in Solwezi during the period ranging from 1974 to 2004. The idea was to find out whether or not the change in landuse that seemed to have taken place over time was so significant as to create a considerable impact on the development and planning of the town. The **t**-value obtained, together with its interpretation, is shown in the analysis above. The second hypothesis was to determine whether there was any significant difference in access to infrastructure and services among the Solwezi residents. The results of the hypothesis testing are included in Appendix B of this report.

The null hypothesis tested for landuse postulated that there was a significant difference in landuse over the period under study (sig. level, 0.10; $t_{obs.}$ 2.093; $t_{crit.}$ 1.860 with df equal to 8). The results appear to be supported by Table 5.1 of this report which shows that more than 85 percent of the urban land in Solwezi was currently under utilisation. The change, which was also visible by visual inspection of the study area, had been intra-sectoral, that is, confined within the limits of the town's functional zones, with residential, small holding and special use zones recording the greatest change.

The second hypothesis on access to infrastructure and services also indicates that there was a significant difference in access to household facilities under consideration between the sampled high and low-cost areas ($\chi^2 = 71.005$, df = 18 and p = 0.000); medium and low-cost areas ($\chi^2 = 62.524$, df = 25, and p = 0.000) and between the low-cost and squatter areas ($\chi^2 = 56.543$, df = 32 and p = 0.005). The Chi-Square test was chosen because it is restricted to nominal data that are frequencies of individuals' occurrence in mutually exclusive categories. Appendix B from the SPSS output displays results of the Chi-Square, a Continuity Correlation, the Likelihood Ratio and Mantel-Haenszel test for linear association. The results needed to determine the significance of difference in access to facilities are the Chi-Square and Fisher's Exact probability results.

4.5 Problems Encountered

Not so much was done on aerial photography as earlier required due to the scarcity of aerial photographs. Many of those that were available were not very appropriate for this study because they were taken in 1956 far before the study period. The Solwezi Master Plan from which much of the literature on original landuse coverage could probably be obtained was not available.

Some respondents, especially in the high-cost and medium-cost housing areas, took time to answer the questionnaires causing unnecessary adjustments to the study time table. In some cases, information was pleaded for and some residents passed very bad comments like 'Who told you that the information you want is best found at this home? Why can't you try other homes?' In some squatter townships, the survey was mistaken to be a recruitment exercise for people to work in the mines and this made most of the respondents to give up when they learnt that the exercise was purely academic. In certain cases, some people demanded for money for them to allow you collect information from them. Lack of adequate finances made it even extremely difficult for the researcher to write up the final report.

Chapter 5
RESULTS

5.1 Solwezi's Urban Landuse Pattern

The present landuse and zoning in Solwezi reflected, to a large extent, the influence of colonialism which segregated African settlements from European areas and provided better facilities in the latter and only the barest minimum in the former. The post independence era saw the growth of informal settlements such as Chawama and Zambia townships. Of recent and substantial development was the emergence of major shopping centres like Shoprite, Pep stores, banking institutions like Stanbic and Finance banks, high-cost housing units down the stadium, a nursing school and the Kansanshi mine. Despite this substantial change in development, the question of who built where (location) in Solwezi had always remained a secondary issue that had not been taken seriously as most of the new structures were located in areas where they were a misuse (see Figs. 5.1a and 5.1b). Most striking was the mixed character of residential development which showed that though the town was divided into high, medium and low-cost areas, it was quite hard to distinguish such residential stratification because housing units tended to mingle and merge into each other's boundary unsystematically and unattractively. From a glance one might be deceived to think that the Integrated Housing Policy had been successful in Solwezi unless they took time to see the actual situation on the ground.

There was uncontrolled mushrooming of guesthouses, business houses, and lodges that did not seem to meet the required planning and architectural standards in residential and institutional areas. The most affected areas were Helen Kaunda, Riverside and Magrade compounds and the Solwezi Secondary School area where either some housing units had been turned into guesthouses or guesthouses had been built close to houses or institutions. The situation seemed to suggest that it did not matter where the structure was located and the function it was intended to serve as long as one had the financial backing and showed willingness to build. Makeshift selling points, locally known as tuntemba tended to

disfigure and overcrowd the shop frontages and the main street which was already too narrow to allow further road expansion.

Table 5.1 Solwezi's Urban Landuse

Category	Landuse (in Sq. km)		Landuse (in percentages)		Percent increase in 2004		Percent unused land	
	1974	2004	1974	2004	%	times	1974	2004
Residential	2.50	15.45	5.00	30.90	518.0	5.18	30.40	4.60
Squatter	0.80	0.90	1.60	1.80	12.5	0.13	-	-
Commercial	0.05	0.25	0.10	0.50	400.0	4.00	0.50	0.10
Institutional	0.05	0.45	0.10	0.90	800.0	8.00	0.90	0.10
Industrial	0.03	0.48	0.06	0.96	1500.0	15.00	0.94	0.06
Small holding	0.50	13.00	1.00	26.00	2500.0	25.00	26.00	1.00
Recreational	0.03	0.48	0.06	0.96	1500.0	15.00	0.94	0.06
Open space	0.03	0.28	0.06	0.56	833.3	8.33	0.54	0.06
Special use	4.50	11.50	9.00	23.00	155.6	1.55	22.80	8.44
Land used	**8.49**	**42.79**	**16.98**	**85.58**				
Land unused	**41.51**	**7.21**	**83.02**	**14.42**			**83.02**	**14.42**
Total land	**50.00**	**50.00**	**100.00**	**100.00**				

Source: Solwezi Municipality

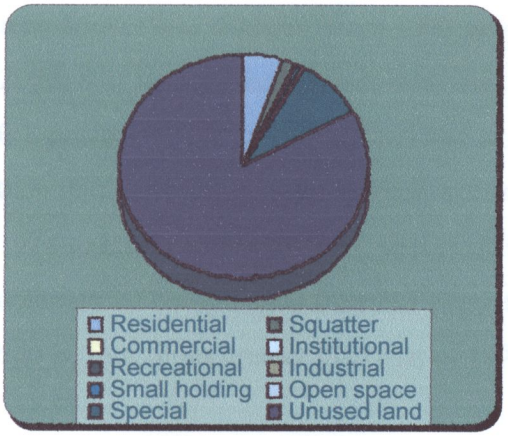


Fig. 5a Solwezi's urban landuse 1974

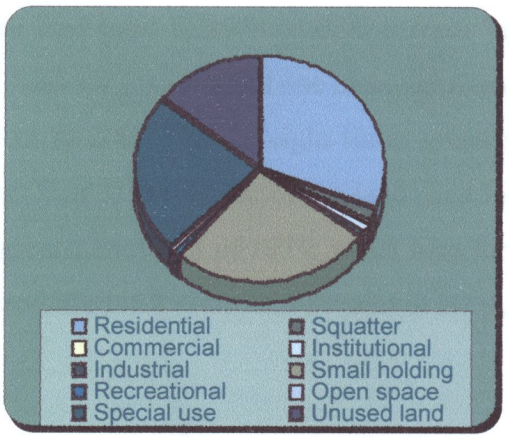


Fig. 5b Solwezi's urban landuse 2004

Table 5.1 shows that only 16.98 percent of the total urban land in Solwezi was under utilisation in 1974 while about 83.03 percent of it was lying unused. This is possibly due to the fact that during this period, much of Solwezi was rural and that the population of the area was still small. Such a situation could also have been partly attributed to the existence of a kind of land tenure system in the area which regarded part of the urban land as traditional and was to be held in trust by the chiefs. A comparison with the 2004 data reveals that there has been a substantial change in landuse over time with 85.58 percent of

the total urban land being currently covered with various types of infrastructure (compare Figs. 3.3 and 5.1a).

The same Table 5.1 shows that all the landuse categories under review showed some increased change in utilization with the greatest percent change recorded in land for residential, small-holding and special-use respectively. Thus, land for residential use changed from five percent of the land used in 1974 to 30.9 percent in 2004, that is, 5.18 times greater than that of 1974. Land for small-holding use changed from one percent of the land used in 1974 to 26 percent in 2004, that is, 25 times greater than that of 1974. Furthermore, land for special use changed from nine percent of the land used in 1974 to 23 percent in 2004, that is, 1.55 times greater than that of 1974.

Table 5.1 further shows that land for industrial use changed from 0.06 percent of the land used in 1974 to 0.96 percent in 2004, that is, 15 times greater than that of 1974; land for recreational use changed from 0.06 percent of the land used in 1974 to 0.96 percent in 2004, that is, 15 times greater than that of 1974; land for institutional use changed from 0.1 percent of the land used in 1974 to 0.9 percent in 2004, that is, eight times greater than that of 1974; land for open-space use changed from 0.06 percent of the land used in 1974 to 0.56 percent in 2004, that is, 8.33 times greater than that of 1974; while land for commercial use changed from 0.1 percent of the land used in 1974 to 0.5 percent in 2004, that is, four times greater than that of 1974.

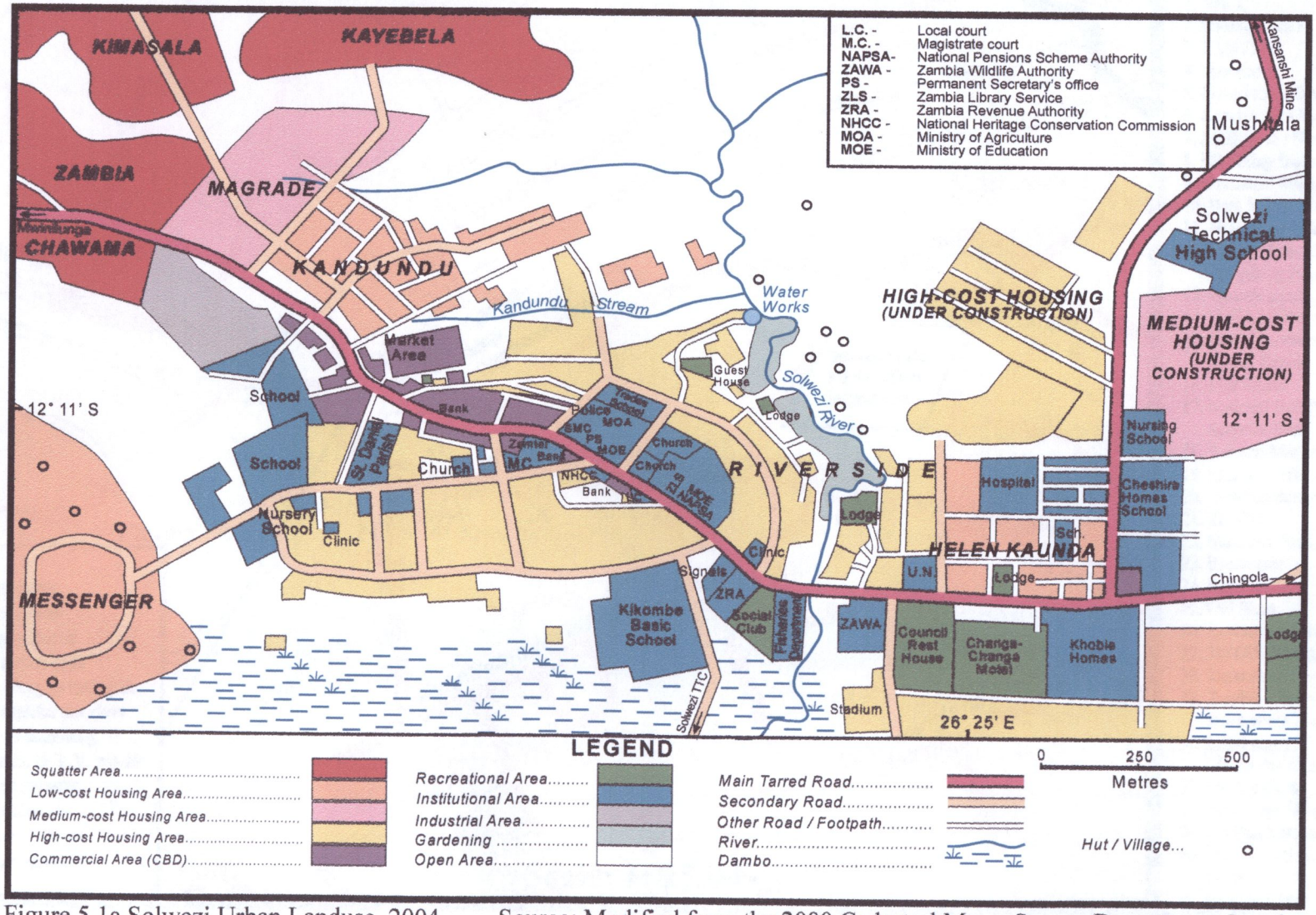


Figure 5.1a Solwezi Urban Landuse, 2004 Source: Modified from the 2000 Cadastral Maps, Survey Department, Lusaka

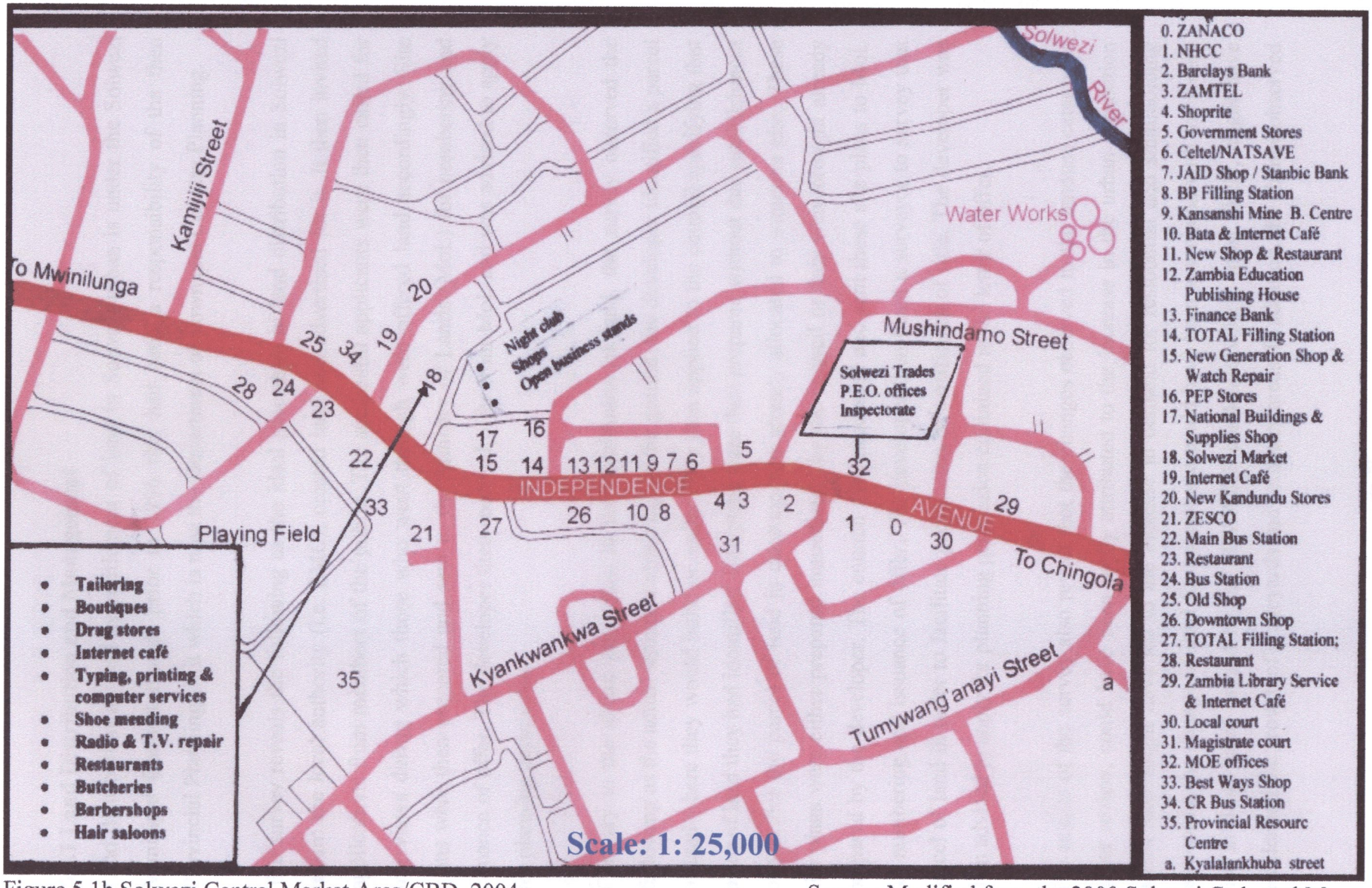


Figure 5.1b Solwezi Central Market Area/CBD, 2004

Source: Modified from the 2000 Solwezi Cadastral Maps

5.1.1 Land Distribution and Management

Land distribution as well as entitlement of land in Solwezi urban is under the Solwezi Municipal Council though prior to 1996 this had been a responsibility of the then Provincial Planning Unit which is now the Department of Town and Country Planning.

The survey reveals the following as the ideal procedure in land distribution in Solwezi urban: the local authority (i.e. SMC), created land and advertised for it. It then invited applications from members of the public. The successful applicants were then called for interviews during which those who went through were offered land accordingly. Site plans were then prepared and sent to the Ministry of Lands (MoL) for numbering and issuance of offer. The developer then received offer from MoL and was advised to apply for planning permission.

Contrary to the above procedure in the distribution of land, the survey observed the following as the actual situation obtaining on the ground: the developer identified a parcel of land where they would build or settle. They then applied to the council specifying that piece of land they had identified. Site plans were then prepared without due establishment of whether the parcel of land in question was already allocated to someone else. These site plans were either prepared immediately by the council or they were brought already prepared by the developer. The council then processed and sent these site plans to MoL for numbering and issuance of offer. The developer then hired a surveyor to survey that parcel of land in order to facilitate preparation of certificates of title. The developer was then advised to apply for planning permission contained in the letter of offer.

The results of the survey also reveal that the changes observed in the landuse categories under review, could have been partly attributed to the increase in the urban population which later might have led to the increase in demand for residential and smallholding land while the change in land for special-use could have been associated with the recent rise in death rates caused by the HIV/AIDS pandemic which, most likely, might have accelerated the growth of graveyards and cemetery areas. In addition, the change observed

in the land for commercial and recreational use could have been attributed to the recent opening of the Kansanshi mine which might have, most likely, led to the increase in inter/intra district business and a considerable demand for commercial and recreational land in the area.

5.1.2 Occupational Structure

Apart from administrative, institutional, commercial and other functions that provided Solwezi a town landscape, the occupational structure was also remarkable. About 67.75 percent of the sampled residents of Solwezi in all the residential categories were in gainful employment, 24.75 percent in self-employment while about 7.5 percent were neither employed nor self-employed. From the employment statistics given above, the survey shows that 29.25 percent of the sampled residents in all the residential categories were involved in various types of business, 14 percent in teaching, 16 percent in civil service and a larger portion of 40.75 percent in other activities particularly in the nursing profession (see Figs. 5.1.1 and 5.1.2).

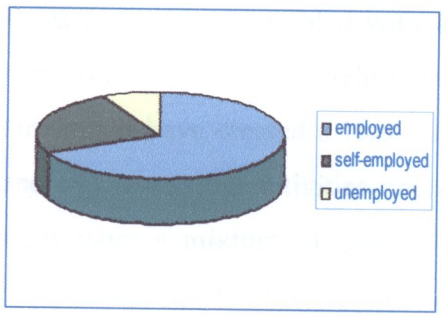


Fig. 5.1.1 Employment Status

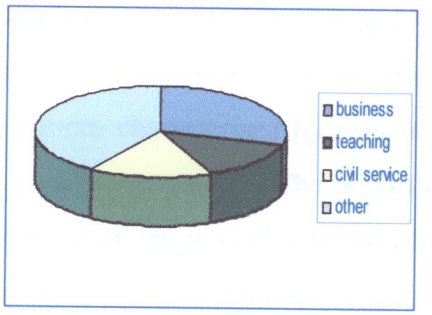


Fig. 5.1.2 Type of Occupation

5.2 Causes for the Present Urban Landuse Pattern in Solwezi

In analyzing the causes of the current landuse pattern in Solwezi urban, it is worth noting that urban land was still cherished as a basic commodity and was largely owned by people who had the economic ability and, to a declining extent, by chiefs; thus, reflecting the concentration of economic power in the hands of the few. Speculation and subdivision on urban land, which was the result of freehold tenure system of the colonial legacy and still seemingly a profitable venture of the few moneyed elite, tended to drive land prices out of reach of most families. Though the Solwezi Municipal Council was now providing plots

to individuals for what they called "a service charge of only K200, 000 per plot," it could only be afforded by the same privileged few.

Efforts to control land uses by the government through the council were inevitably met by strong resistance from influential groups and as a consequence there was a general lack of adequate land use planning and control. One of the town planners interviewed during the survey said that the council did not seem to follow the zoning requirements and regulations and rarely did they adhere to planning and building norms. A further consequence of high land prices was that illegal, high-density squatter settlements were formed by urban peasants as their way of "fighting back" and establishing a place to live in the town. This similar situation, coupled with the issue of freehold tenure, could have led to the mushrooming of Zambia, Chawama, Kimasala, Kayebela, Kanema and other squatter townships of Solwezi.

It is observed that inadequacy of urban transport as evidenced in the general absence of roads in the town, coupled with lack of landuse planning and control, was one of the many other factors that might have created the current urban pattern in Solwezi. This in turn might have created a linear and mixed landuse pattern characterised by residential and non residential activities operating on the same or adjacent parcels. The residential areas were a mixture of new and old fashioned houses of varying plot sizes which covered inadequate areas because urbanization had exceeded their old boundaries.

The results of the survey also reveal that lack of development plans in the past, coupled with irregular handovers from one department to another, was cited to have been among the many other causes for the current situation. The existing main commercial area in Solwezi was too narrow to permit the development of high-ways such as the intended dual carriage way. Worse still, most of the council officers were not qualified, let alone the top management. This per se might have affected the smooth running of the councils especially in the distribution and management of land.

The sale of government houses during the first MMD government created a lot of housing shortages in the town resulting into so many people looking for land on which to settle. The growing unemployment had equally been directly attributed to people's informal efforts to set up small businesses and other activities in order to maintain a living. The recent opening of Kansanshi mine had led to a growing number of misplaced residential, commercial and recreational developments like guest houses, business houses and lodges.

5.3 Access to Infrastructure and Services

5.3.1 Type of house

Conventional housing was the most widespread and commonest type of housing in most urban areas of Zambia. In the case of Solwezi urban, the results of the survey reveal that about 100 percent of the HCHA, MCHA and LCHA residents occupied detached houses while only 17 percent of the STs had the privilege to live in detached houses. Most of the people in the STs (about 83percent) lived in other unclassified and poorly constructed type of houses. The results just show how widespread the disparities were and how serious the issue of housing was in Solwezi [See Fig. 5.2].

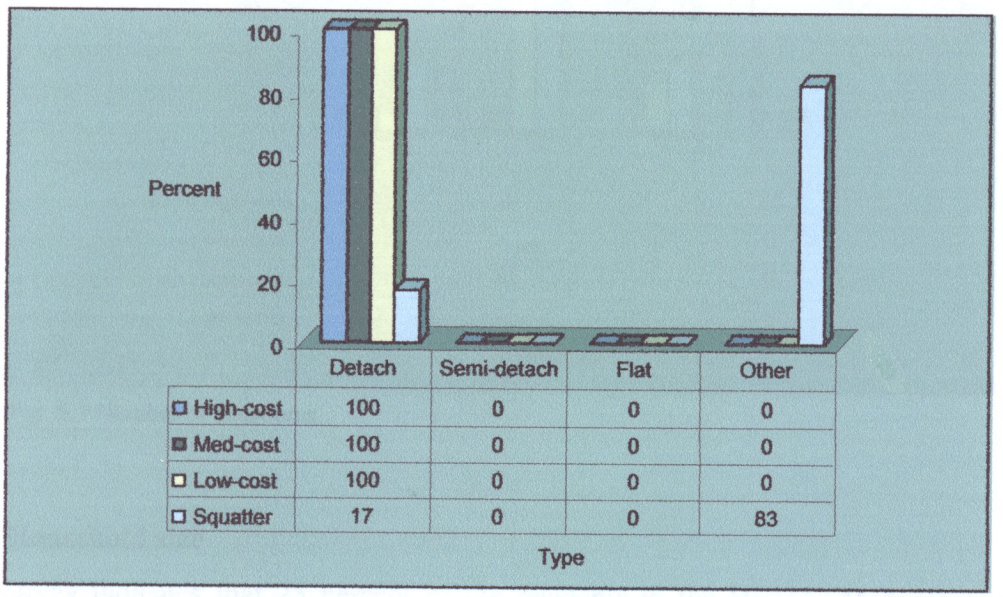


Fig. 5.2 Type of house

5.3.2 Number of bedrooms

The results of the survey reveal that none of the people in the HCHA and MCHA, only five percent in the LCHA and 20 percent in the STs were reported to have been occupying housing units of only one bedroom. Equally none of the people in both the LCHA and MCHA, about 80 percent in the LCHA and 60 percent in the STs were reported to have been occupying housing units of two bedrooms. Most of the people, 50 percent in the HCHA, close to 100 percent in the MCHA, 15 percent in the LCHA and 20 percent in the STs were reported to have been occupying housing units of three bedrooms. Except for the HCHA whose residents (50 percent of them) were reported to have been occupying housing units of four bedrooms each, none was reported in the rest of the RAs. This indicates that most of the housing units of the people in the low-income group were only of two bedrooms while those of the high-income group were bigger and spacious housing units of three to four bedrooms each [see Fig. 5.3].

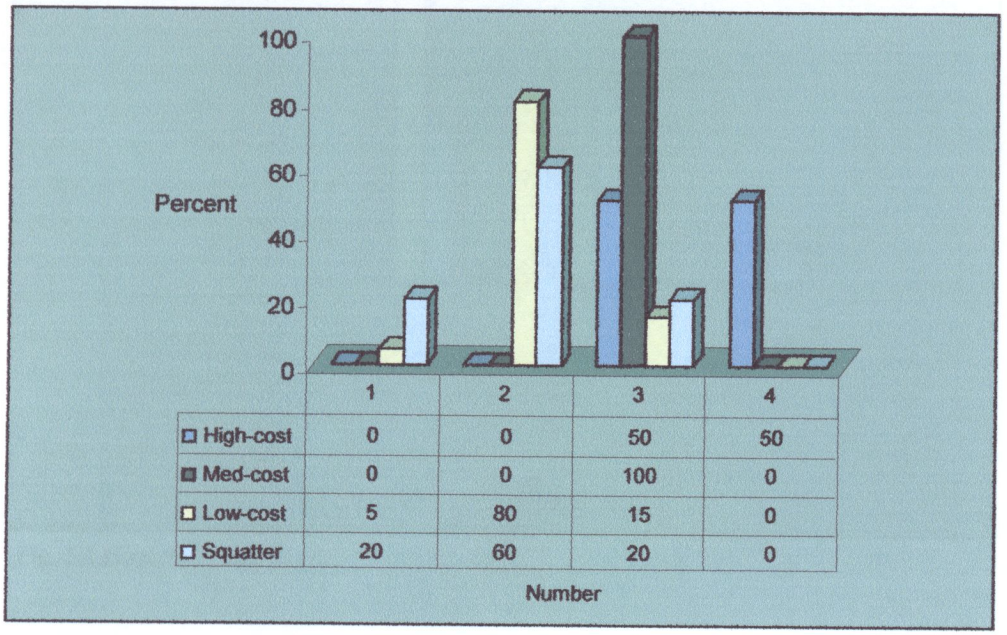


Fig. 5.3 Number of bedrooms

5.3.3 Household size

The survey indicates that 25 percent of the residents in the HCHA, 45 percent in the MCHA, 75 percent in the LCHA and 41 percent in the STs had a household size of 0-5 people. The majority of the people, that is, 63 percent in the HCHA and 55 percent in the

LCHA had a household size of 6-10 people with 25 percent and 52 percent of them being in the LCHA and the STs respectively. Only a fraction of the sampled respondents had a household size of 11-15 people (i.e. 12 percent in the HCHA and seven percent in the STs). This means that a lot of people had to struggle to look for houses of not less than three bedrooms as currently most of the households were too large. Out of the recorded household sizes above, 50 percent of the households in the HCHA, MCHA and LCHA and 45 percent in the STs had household sizes of 0-5 people of 18 years and above. On the other hand, 44 percent of the people in the HCHA, 45 percent in the LCHA, 50 percent in the LCHA and 43 percent in the STs had a household size of 0-5 people of below 18 years. The survey shows that there were more adults who were still dependant and needed to have their own shelter [see Fig. 5.4].

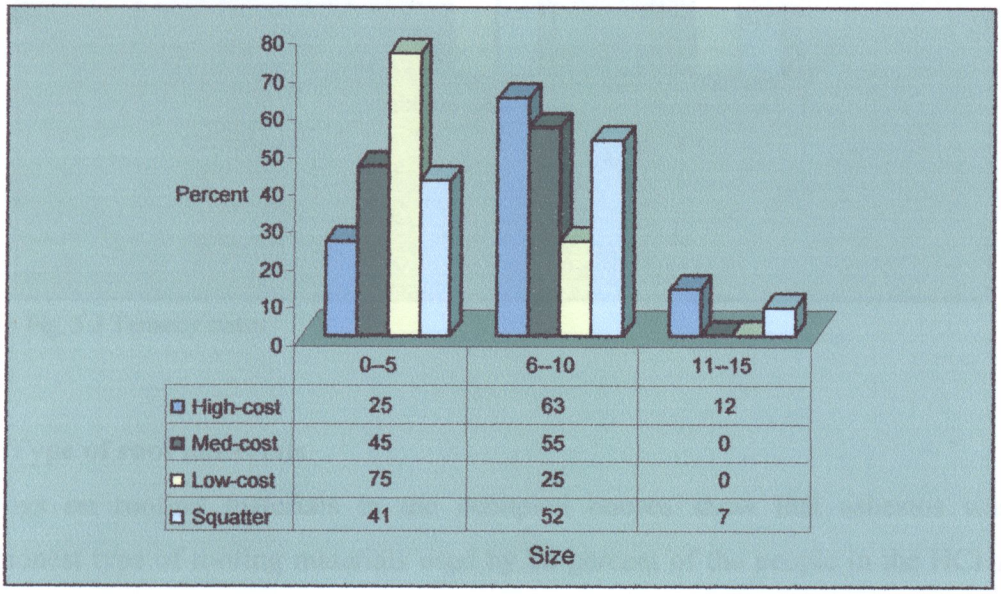


Fig. 5.4 Household size

5.3.4 Tenancy status

The information on tenancy was obtained by asking the heads of the households the basis on which they occupied the housing units they lived in. The survey results reveal that the majority of the households, that is, 88 percent HCHA, 91 percent MCHA and 65 percent LCHA lived in rented houses with only 20 percent in the squatter STs. On the other hand, most of the households in the STs (80 percent) lived in poorly constructed houses of grass

thatch. Only 35 percent, nine percent and 12 percent of LCHA, MCHA and HCHA respectively lived in their own dwellings. The 80 percent of owner occupancy in the squatter townships is just an ironical indication of the extent to which unauthorised housing had reached, as the government took no effort, whatsoever, to see who constructed what, where and how. The policy of house ownership was still very far to be achieved in Solwezi as can be seen in all the three levels of residential housing where renting was predominant with an exception of the STs [see Fig. 5.5].

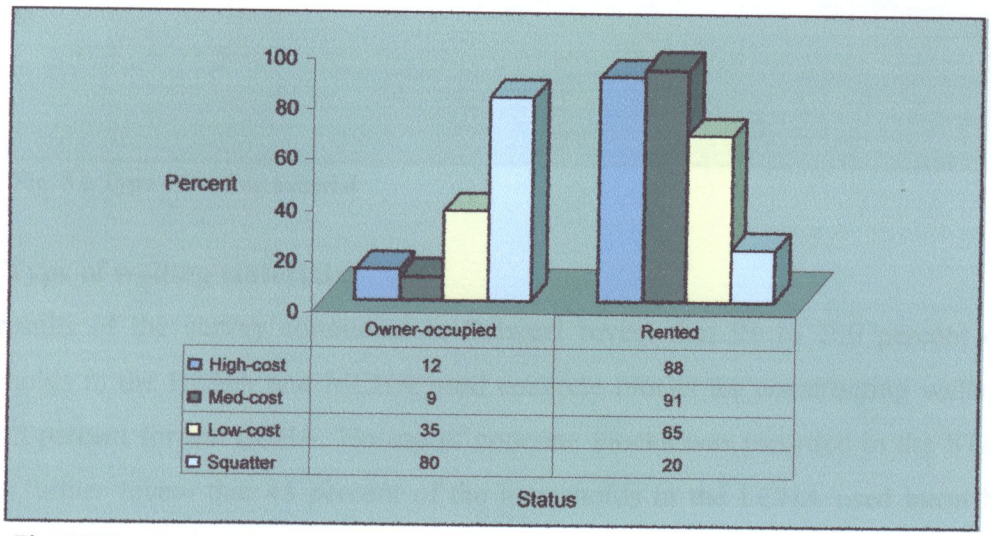


Fig. 5.5 Tenancy status

5.3.5 Type of roof materials

Findings on roofing materials in the occupied houses show that asbestos was the commonest type of roofing materials used by 88 percent of the people in the HCHA, 82 percent in the MCHA, 95 percent in the LCHA and none in the STs. The second common roofing material was corrugated iron with 23 percent use in the STs, 18 percent in the MCHA and 12 percent in the HCHA and only seven percent in the LCHA. The STs were far below standard in terms of housing with most of the squatters only going for cheaper roofing materials [see Fig 5.6].

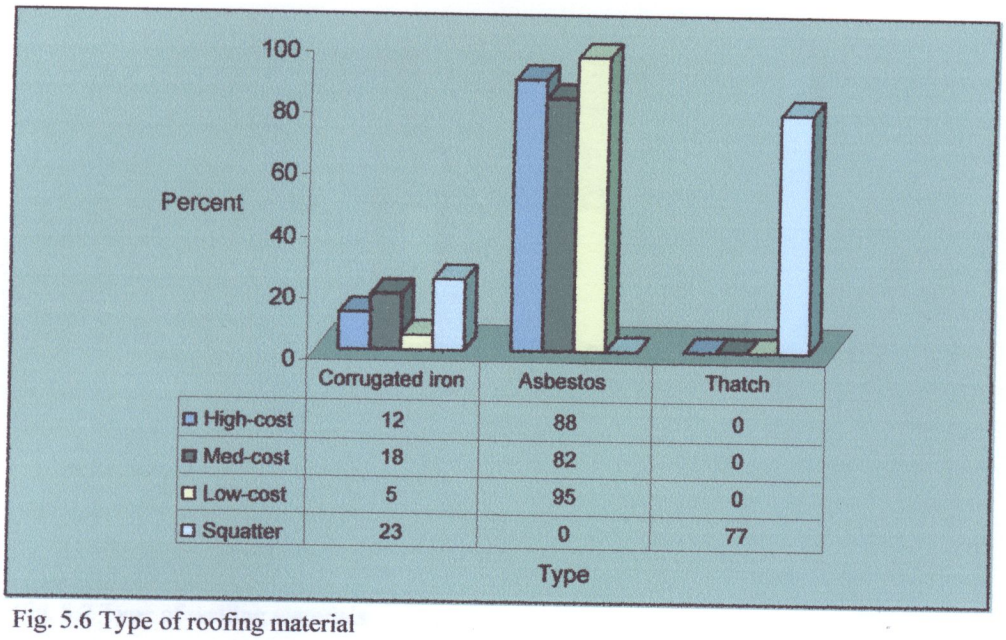


Fig. 5.6 Type of roofing material

5.3.6 Type of walling materials

The results of the survey conducted in Solwezi reveal that 91 to 100 percent of the households in the HCHA and MCHA used concrete blocks for constructing walls, with only 45 percent for the LCHA. No use of concrete blocks was recorded in the STs. The results further reveal that 45 percent of the households in the LCHA used burnt bricks with nine percent and seven percent for the MCHA and STs respectively. No use of burnt bricks was recorded in the HCHA. About 90 percent of the households in the STs used mud bricks for wall construction followed by 10 percent in the LCHA. No use of mud bricks was recorded in both the HCHA and the MCHA. Again income levels seem to have contributed greatly to this present pattern of housing with the low-income group (LCHA and STs) accessing the cheapest and poorest construction materials as they could not afford to buy or make their own concrete blocks. On the other hand, no one seemed to care as even the government had lent a deaf ear to crucial issues of raising housing standards in the STs. The results of using such cheap and poor wall construction materials usually manifested itself when the houses failed to withstand the stormy rainy seasons as was the case in the year 2,000 when most of the Chawama and Zambia squatters were left homeless [see Fig. 5.7].

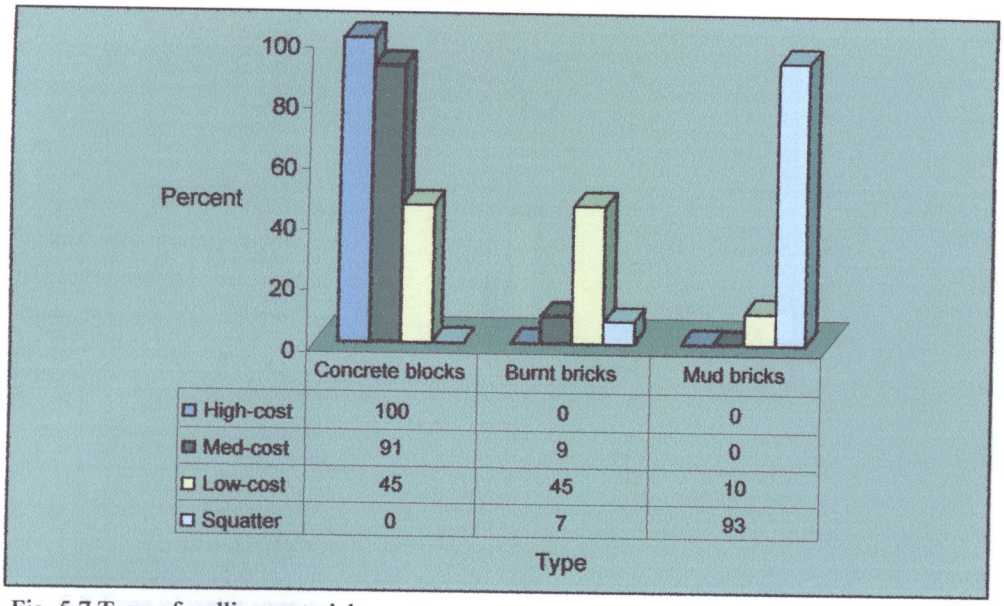


Fig. 5.7 Type of walling materials

5.3.7 Type of water sources

The sources of water considered for Solwezi urban were piped water inside and outside the house, boreholes, wells and streams or rivers. Among these water sources, piped and borehole water were regarded as clean and safe sources of water supply, whereas, well and stream were considered unclean and unsafe sources of water supply. The survey conducted in Solwezi reveals that 100 percent, 82 percent and 50 percent of the HCHA, MCHA and LCHA households respectively had access to clean and safe water supply with most of the houses having inside taps. Not a single household in the STs had a tap inside their houses. In contrast, 93 percent of the households in the STs had unclean and unsafe water sources with most of them (93 percent) drawing water from unprotected wells. A negligible number of households were recorded getting water from a borehole while none was recorded drawing water from a stream or river. This means that the majority of the people in the STs and some of those in the LCHA had little or no access to clean and safe water supply [see Fig. 5.8].

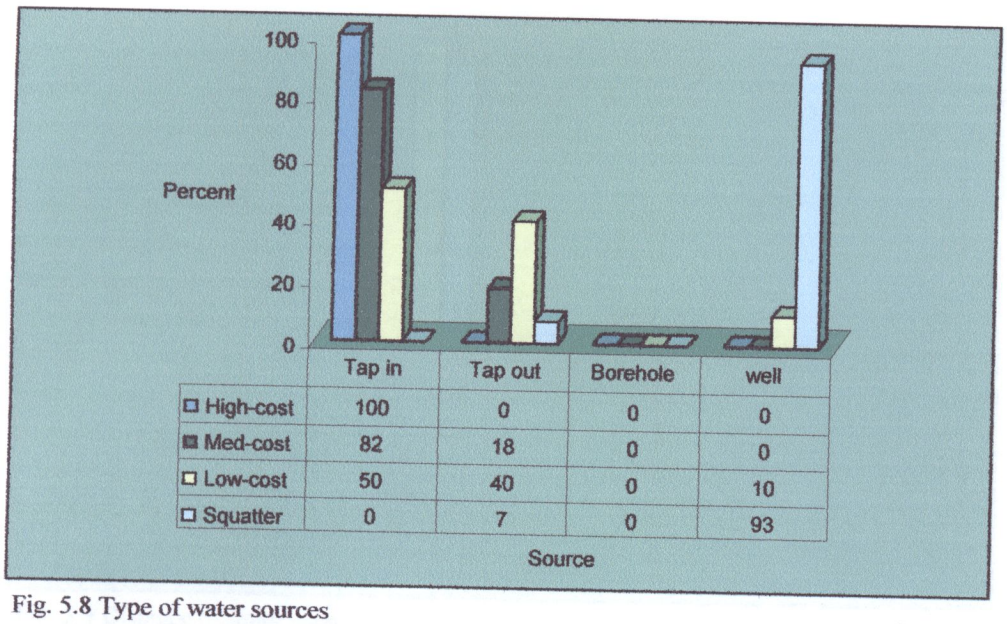


Fig. 5.8 Type of water sources

5.3.8 Distance to water sources

The information on distance was used to measure the level of accessibility to the sources of water supply. The results of the survey reveal that most of the households in all the residential areas of Solwezi were within a 50m-distance of water supply. Most of the households, (i.e.100 percent in the HCHA and MCHA) had taps inside their houses while 100 percent of the households in the LCHA and 93 percent in the STs had taps and wells respectively within the vicinity of 50m. Only two to seven percent in the LCHA and STs respectively covered a distance of between 50 and 100m to get to the source of water. Though the survey indicates a high percentage of access to water supply of about 93 percent in the STs, most of it was unclean and unsafe to use as it was drawn from contaminated wells located near pit latrines. No wonder there was sometimes an outbreak of diarrhoeal diseases especially during the rainy season [see Fig. 5.9].

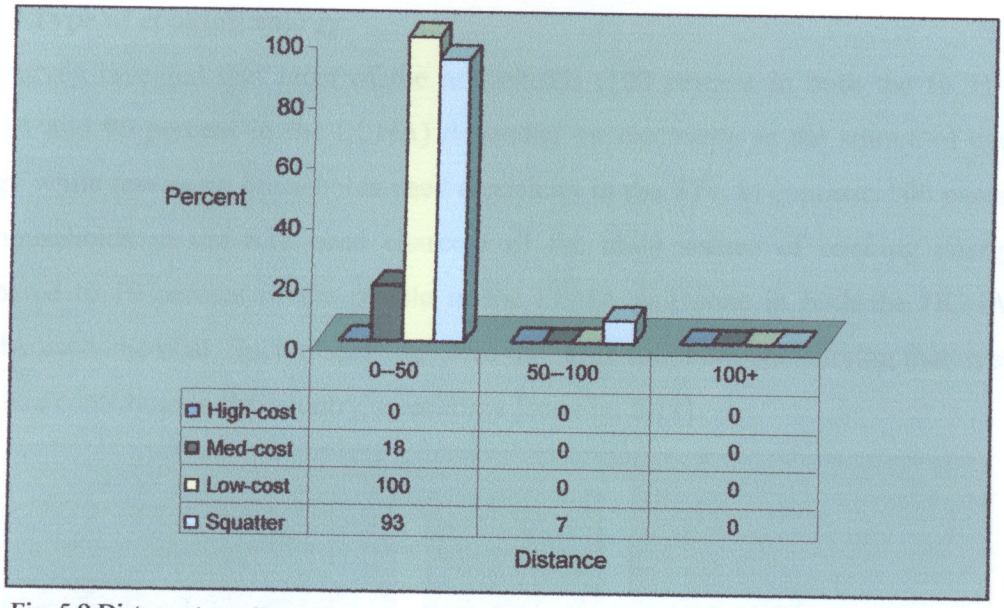


Fig. 5.9 Distance to water sources

5.3.9 Type of lighting energy

The survey also collected information relating to the main type of energy used for lighting by households. The findings reveal that most of the households (i.e.100 percent in the HCHA and MCHA and 90 percent in the LCHA), depended on electricity for lighting, with only three percent in the STs. In sharp contrast, 97 percent of the squatters depended either on gas or candle for their lighting energy [see Fig. 5.10].

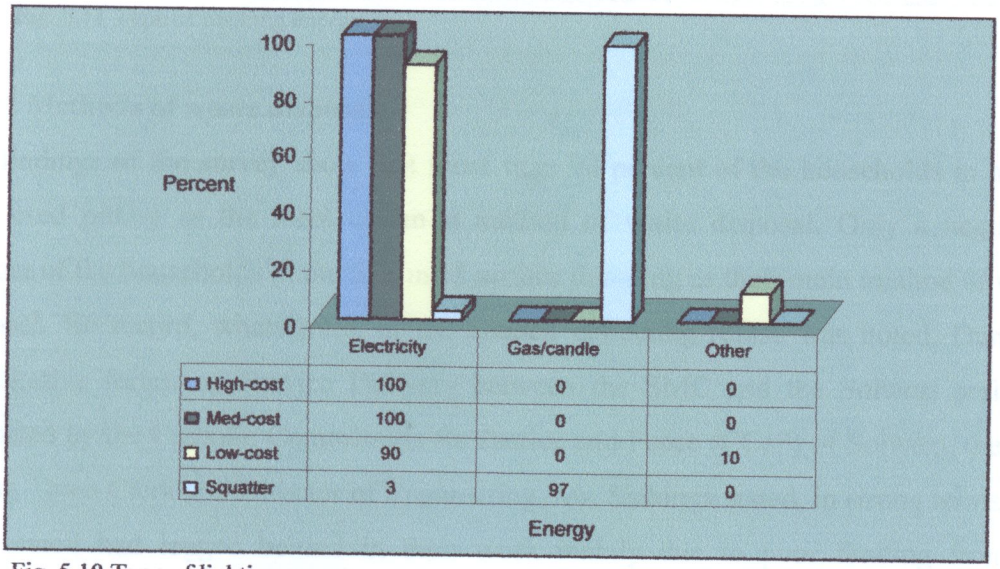


Fig. 5.10 Type of lighting energy

5.3.10 Type of cooking energy

The survey revealed that most of the households (100 percent in both the HCHA and MCHA and 90 percent in the LCHA) depended on electricity as the source of cooking energy while few or no households used electricity in the STs. In contrast, 100 percent of the households in the STs used charcoal as the main source of cooking energy, as compared to 10 percent of the people in the LCHA and none in both the HCHA and MCHA used charcoal. Such disparities were too large to ignore considering that even the squatters contribute to the country's economy [see Fig. 5.11].

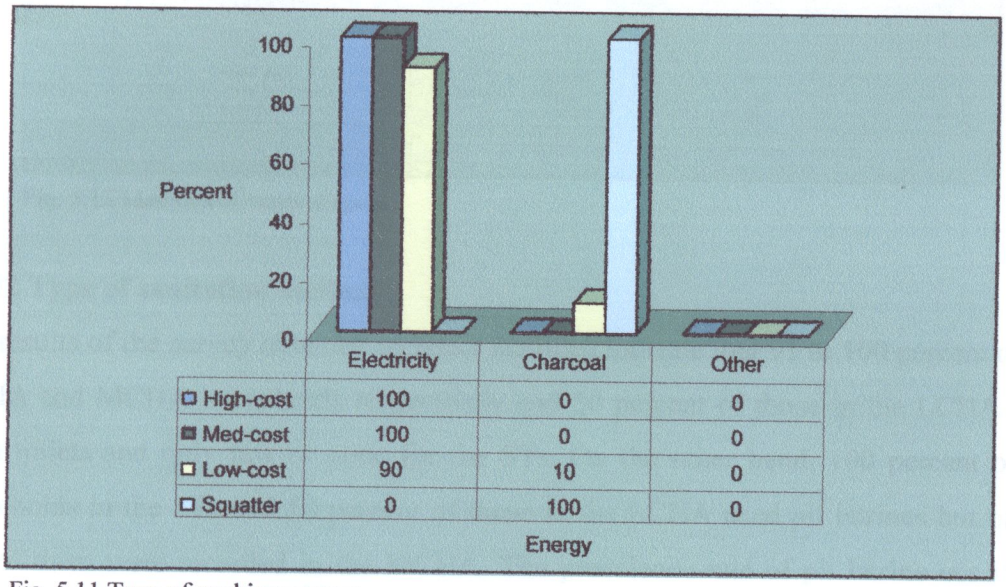


Fig. 5.11 Type of cooking energy

5.3.11 Methods of waste disposal

The findings of the survey show that more than 98 percent of the households in all the RAs used pitting as the most common method of waste disposal. Only a negligible number of the households in the STs used surface dumping as their main method of waste disposal. No record, whatsoever, of the council collecting refuse was noted. During a consultative forum on Service Delivery between the SMC and the Solwezi residents organised by the Catholic Commission for Justice and Peace (CCJP) of Solwezi, the then Acting Town Clerk and Director of Engineering, Mr. Sichinga stated, in strong terms, that the council had lagged behind in their work mainly due to poor funding from the government [see Fig. 5.12].

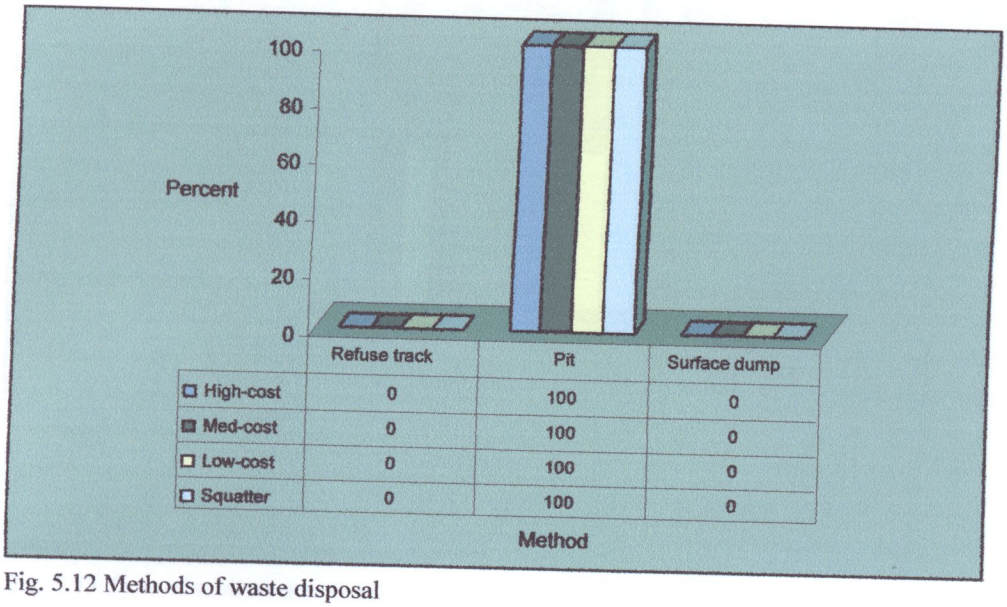


Fig. 5.12 Methods of waste disposal

5.3.12 Type of sanitation method

The results of the survey obtained on toilet facilities indicate that 91 to 100 percent of the HCHA and MCHA households respectively and 50 percent of those in the LCHA used flush toilets and only few or none for the STs. On the other hand, 100 percent of the households in the STs and 50 percent of those in the LCHA used pit latrines but only a few of them were recorded in the MCHA. The prevalence rate of pit latrine use in the LCHA and part of the MCHA shows that latrines in those areas were only used on days when there was no water for use in the flush toilets [see Fig. 5.13].

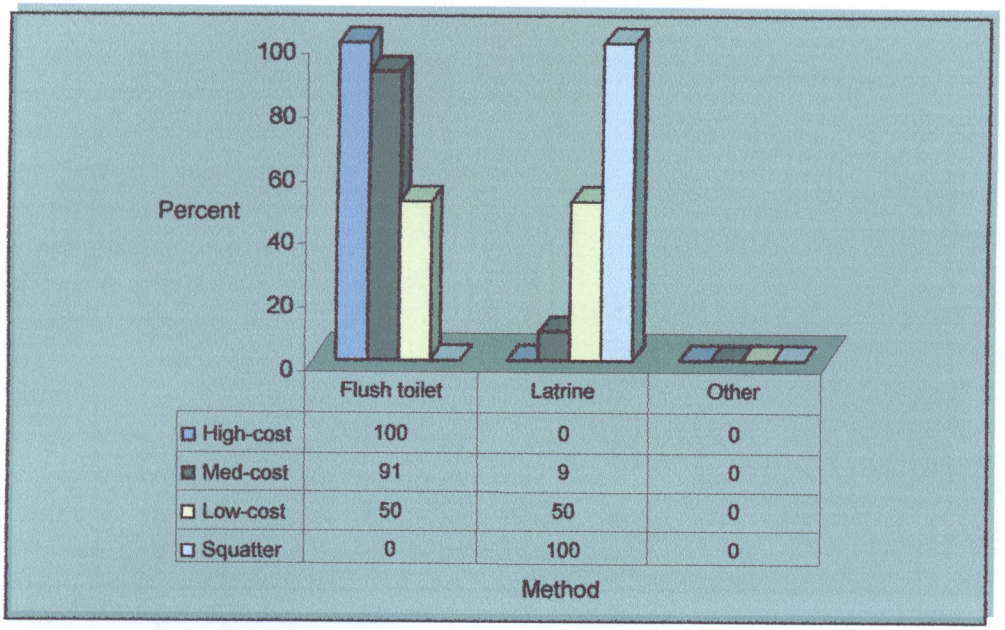


Fig. 5.13 Type of sanitation methods

5.3.13 Length of journey to work

The time it took to walk to a facility was another measure of accessibility to facilities. The survey reveals that most of the households (i.e. 72 percent) in both the HCHA and MCHA lived within a walking distance of only ten to 20 minutes to get to their work places while only 45 percent of the households being in the STs and LCHA. In contrast, more than 60 percent of the squatters and 30 percent of those in the LCHA lived within a walking distance of 20 to 40 minutes from their places of work. This means that the STs and the LCHA households that were already disadvantaged economically were forced to walk long distances to get to their places of work. This situation presents a sharp contrast to the Indian housing pattern where the low income groups are housed nearer their shopping centres and work places just outside the town centre [see Fig. 5.14].

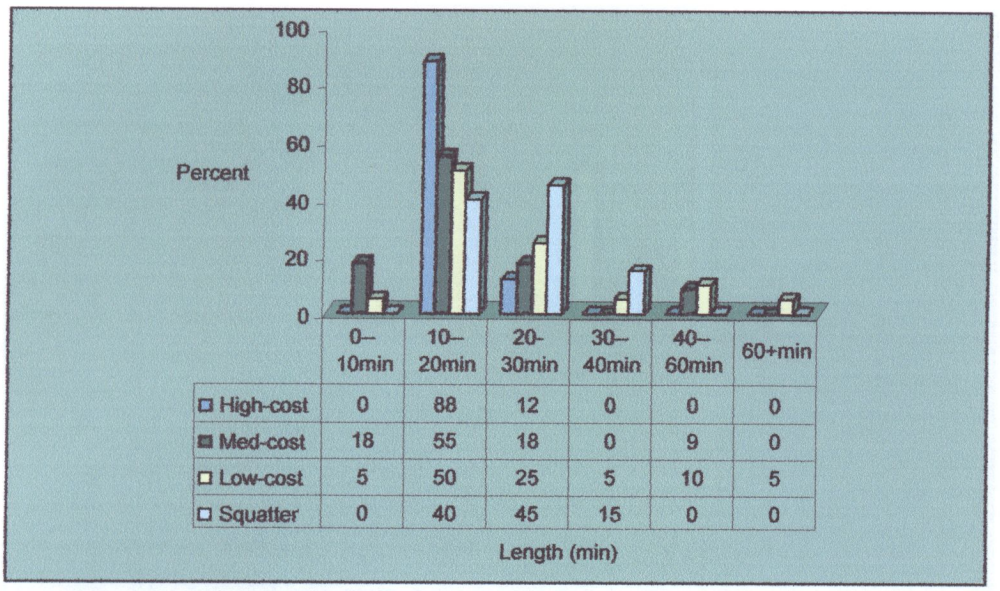


Fig. 5.14 Length of journey to work

5.3.14 Type of transport to work

The method of getting to work was another measure of accessibility to transport facilities. The survey included information such as transport by car, by minibus, by taxi, by foot and by employer. The survey results reveal that five percent of the households in the STs and none in all the other RAs used a car to get to their places of work. Thirty-eight (38) percent of the households in the HCHA, 64 percent in the MCHA, five percent in the LCHA and 10 percent in the STs used a minibus to get to their places of work. Thirty-eight (38) percent of the households in the HCHA, 18 percent in the MCHA, 55 percent in the LCHA and only few to none in the STs used a taxi as transport to their places of work. About 25 percent of the respondents in the HCHA, 18 percent in the MCHA, 35 percent in the LCHA and 85 percent in the STs moved on foot to their places of work. Only five percent and none in all the other RAs used the employer's transport to get to their places of work. The results show a clear stratification based on economic status in which a good number of people in the high-income group (i.e. 38 to 64 percent of them) were able to use either a taxi or a minibus whereas the majority of the people in the low income group (i.e. over 85 percent) were only able to move on foot to get to their places of work [see Fig. 5.15].

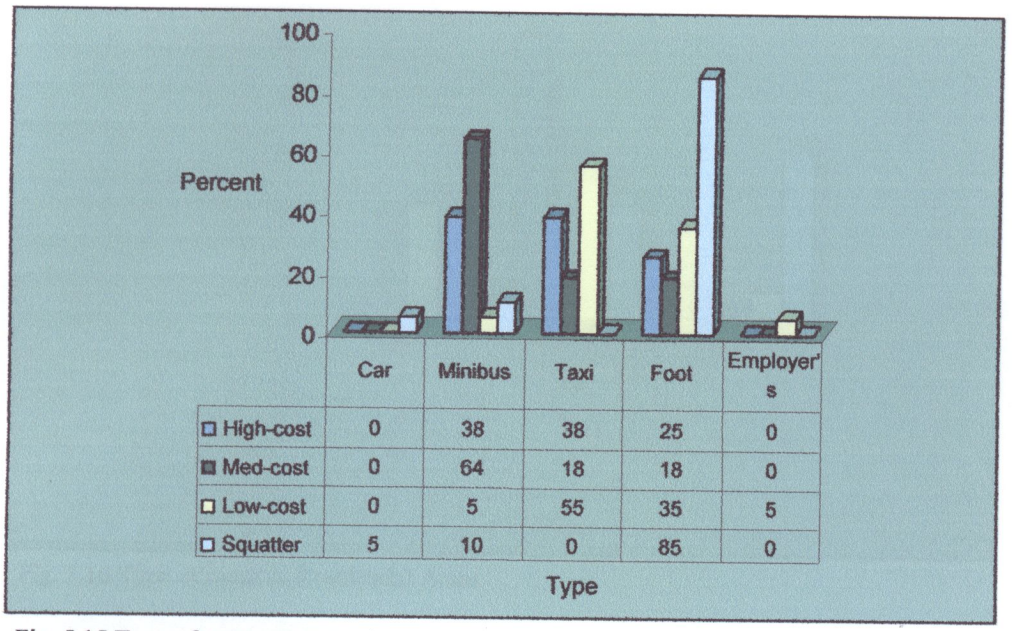


Fig. 5.15 Type of transport to work

5.3.15 Type of roads in RAs

The survey was also intended to find out the type of roads in all the residential categories. Information on type of roads ranged from tarred, gravel and dirt roads. The findings reveal that about 100 percent of the households in all the RAs reported to have roads of which 100 percent of the people in the HCHA, 64 percent in the MCHA, 50 percent in the LCHA and 40 percent in the STs used gravel road. Only less than 36 percent of the households in the MCHA and LCHA had some access to tarred roads. These are most likely the compounds which are located along the main Chingola-Sowezi Road and the Kansanshi Road. Otherwise more than 60 percent of the households in the STs and about 10 percent in the LCHA had only access to dirty roads. The results just show how critical the issue of roads was in Solwezi [see Fig. 5.16].

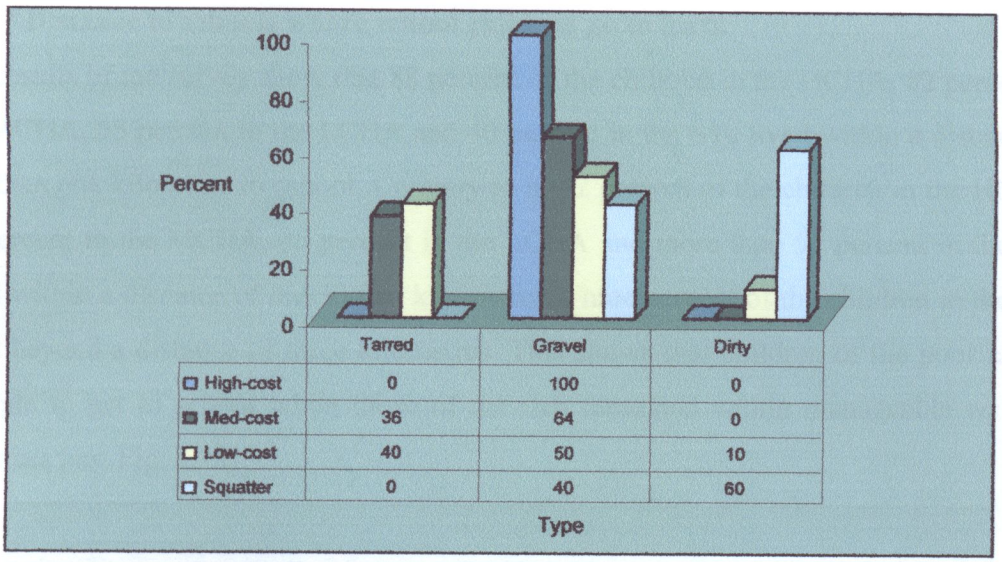


Fig. 5.16 Type of roads in Residential Areas

5.3.16 Type of schools where school children go to learn

The information about the type of school the children went to ranged from government, private and other. The survey reveals that 82 to 100 percent of the households in all the sampled residential categories had their children going to government schools. Only about 18 percent of the households in the MCHA had their children going to private schools. Most of these children going to private schools came from school compounds in the MCHA [see Fig. 5.17].

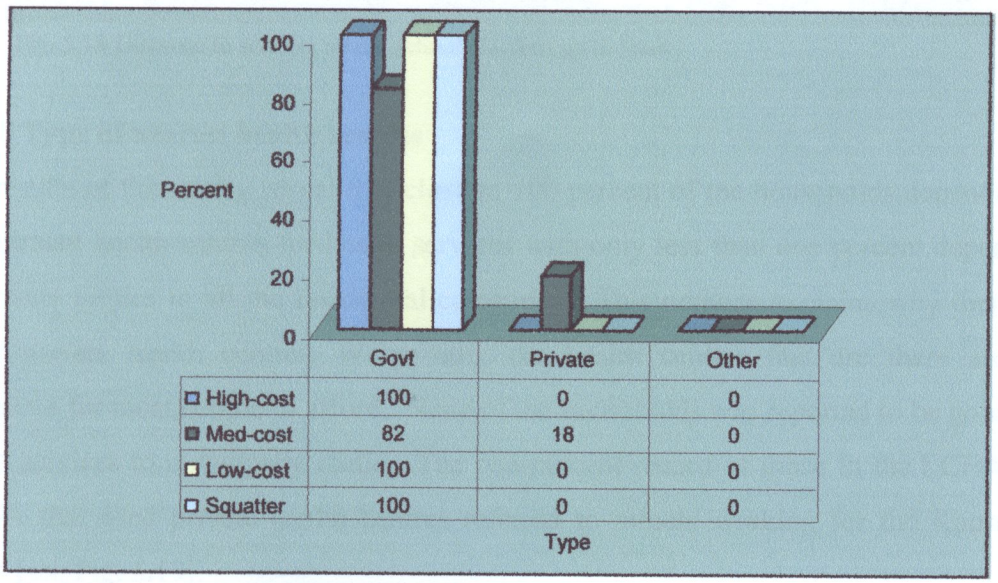


Fig. 5.17 Type of schools where school children go to learn

5.3.17 Distance to schools where school children go to learn

The results of the survey show that 88 percent of the children in the HCHA, 82 percent in the MCHA, 55 percent in the LCHA and 40 percent in the STs lived within a distance of less than one kilometre to school. Contrary to it, 12 percent of the children in the HCHA, 18 percent in the MCHA, 45 percent in the LCHA and more than 51 percent in the STs lived within a distance of one to two kilometres. Three percent of the children in the STs *lived beyond a distance of three kilometres. This shows that children of the poor had to struggle to get to school while those of the rich remained within manageable walking* distances [see Fig. 5.18].

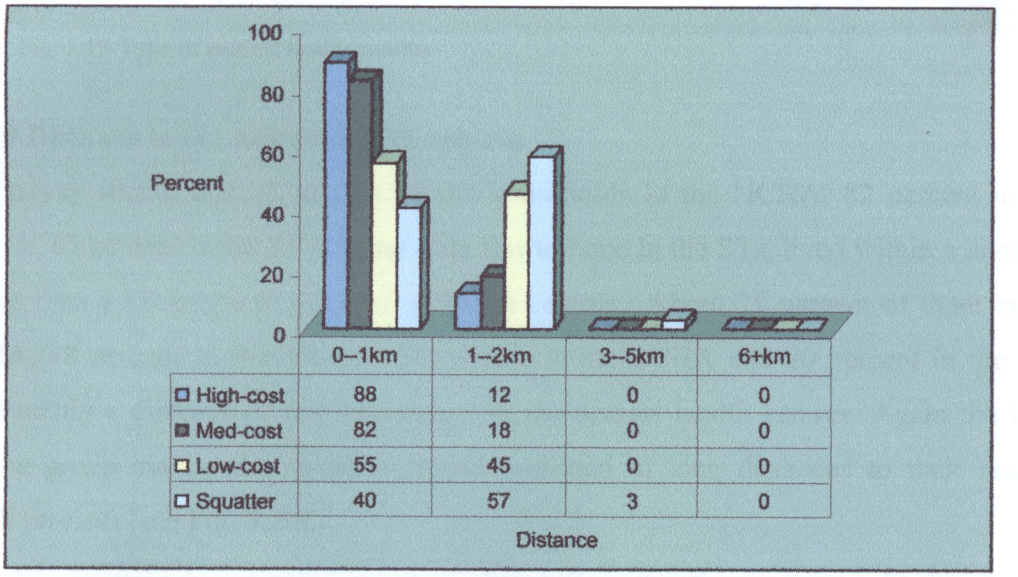


Fig. 5.18 Distance to schools where school children go to learn

5.3.18 Type of nearest health centres

The results of the survey reveal that close to 100 percent of the households depended on government health centres for health services with only less than one percent depending on private clinics in all the residential categories. This perhaps explains why there are fewer private health centres. Worse still, the health centres that are there are too expensive for most people to afford. None of the households was reported to be going for health services to a company clinic. The one-percent record of those in the LCHA and MCHA that used private health centres referred to miners working for the Kansanshi mines [see Fig. 5.19].

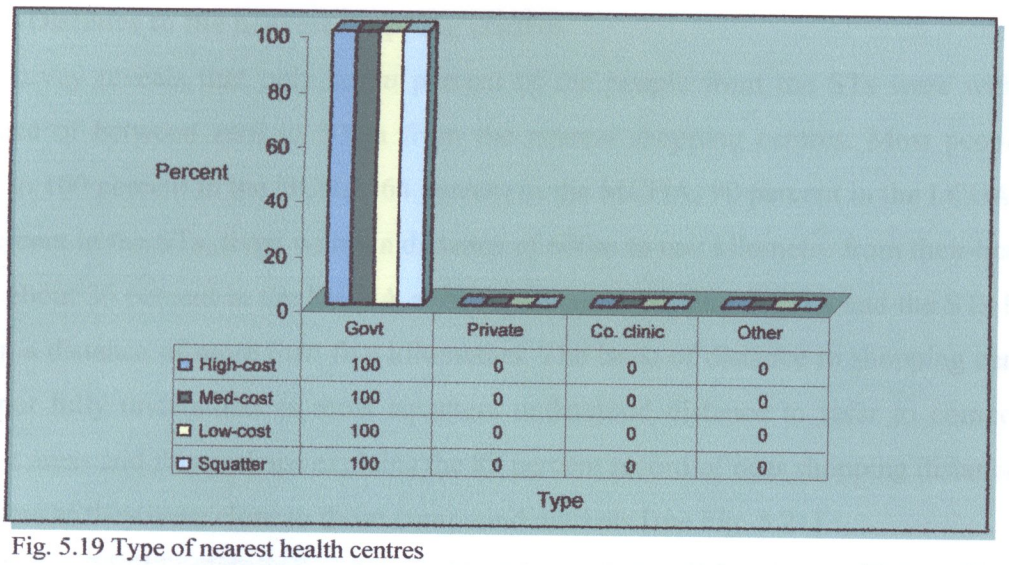


Fig. 5.19 Type of nearest health centres

5.3.19 Distance to the nearest health centres

The survey shows that 75 percent of the households in the HCHA, 82 percent in the MCHA, 65 percent in the LCHA and only few to none in the STs, lived within a distance of less than a kilometre to the nearest health centres. About 25 percent of them in the HCHA, 18 percent in the MCHA, 30 percent in the LCHA and 20 percent in the STs lived within a distance of five kilometres to the nearest health centres. Again the low-income group mainly the squatters, were subjected to long distances to their nearest health services [see Fig. 5.20].

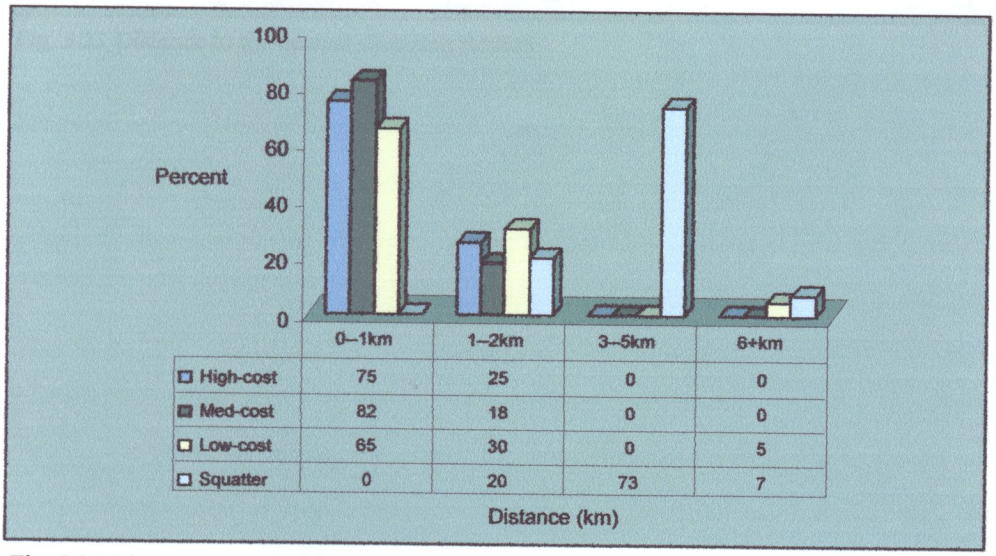
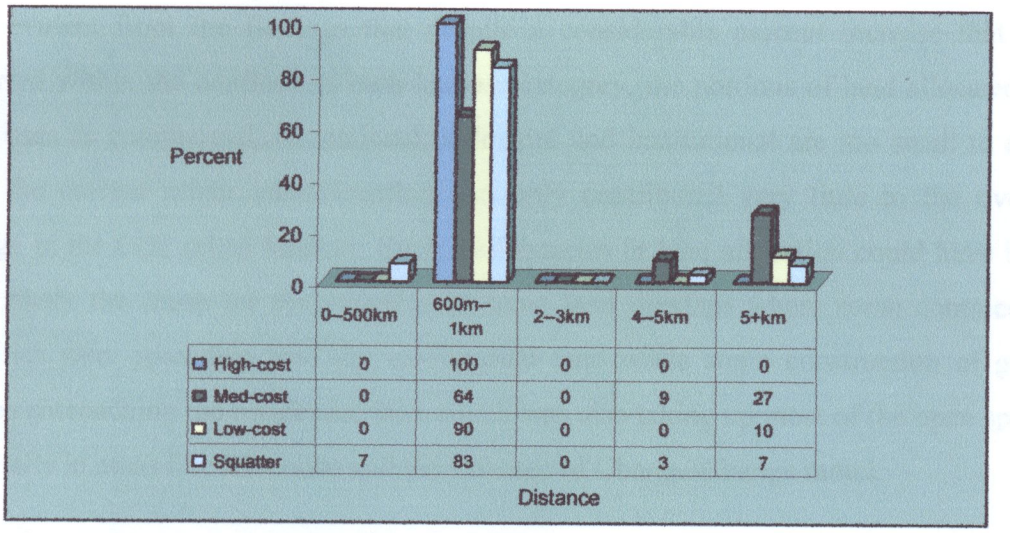


Fig. 5.20 Distance to nearest health centres

5.3.20 Distance to the nearest shopping centres

The survey reveals that only seven percent of the people from the STs were within a distance of between zero to 500m from the nearest shopping centres. Most people of close to 100 percent in the HCHA, 64 percent in the MCHA, 90 percent in the LCHA and 83 percent in the STs, lived within a distance of 600m to one kilometre from their homes. Only about 36 percent in the MCHA and 10 percent in both the LCHA and the STs lived within a distance of more than five kilometres. The issue of distance to shopping centres was not fully understood as most squatters understood distance to refer to compound market areas and this perhaps explains the 83 percent record of near shopping distance for squatters as they were close to those compound markets [see Fig. 5.21].



	0–500km	600m–1km	2–3km	4–5km	5+km
High-cost	0	100	0	0	0
Med-cost	0	64	0	9	27
Low-cost	0	90	0	0	10
Squatter	7	83	0	3	7

Fig. 5.21 Distance to the nearest shopping centres

Chapter 6

DISCUSSION OF RESULTS

6.1 Current Landuse Pattern and Causes

It is generally argued that any pattern of development reflects not only current influences but also past influences and the physical contrasts which operated as the settlement pattern developed. The findings reveal that land in Solwezi urban had undergone a considerable change and it is likely that several other factors besides the ones identified by this study came into play to shape its urban morphology and landuse pattern.

It is evident from the findings that despite a considerable percent increase that had occurred within the confines of each landuse category, the portions of land allocated for such uses as commercial, recreational, industrial and institutional are too small to cope with the current urban transformation and only contributed very little to the overall change in the total urban landuse. Such inadequacies in land allocation could have been most likely the cause for the presence of some land overlaps where some commercial activities were spreading into the institutional land while some construction of guest houses encroaching the residential land which was also taking up most of the open space, especially in areas like Riverside and the frontage of Changa-Changa motel.

The survey further reveals that unnecessary wrangles over land were reported to have occurred among the Solwezi residents due to the general lack of adequate control over the use and distribution of urban land where, occasionally, one piece of land could be allocated to more than one developer. One of the Solwezi residents interviewed during the survey lamented that in Solwezi it was no longer a necessity to apply for a plot of land which one could not get using formal procedures. Instead one just needed to hunt for it. Suffice to say that if such a situation was to continue unattended to, Solwezi would, most likely, become one of the fast developing urban shanties in Zambia.

From the current researcher's point of view, it is most likely that replanning of Solwezi urban could pose a big challenge and a costly venture to undertake as the area seemed to suggest need for a complete overhaul of the situation and perhaps planning for a new Solwezi somewhere on a virgin land. Despite this change in landuse and a considerable degree of development that had occurred in the area, the road network had remained with little or no change for quite sometime.

6.2 Access in Response to Planning and Spatial Dimension

It is generally argued that urban areas can neither exist nor survive with mere reference to the ideals and objectives which are created to go with them. There must be a minimum and preferably an optimum of certain mechanics, supplies and services in urban areas to make them most productive and pleasing places to live in. Reference here is made, in particular, to facilities and services such as the ones mentioned in Chapter Five that need to be planned in a manner that fosters a balanced interface and optimum gratification.

The results of this report reveal that there were major shortcomings in the capacity of Solwezi urban to cope with the pressing service demands. The situation seemed to be magnified by unfortunate errors in the provision of basic facilities to particularly the lower income groups. Most critical in Solwezi was the housing situation which showed a distinctive division in the condition of housing units between the lower and higher income groups. The survey shows that the quality of the housing stock, existing in the squatter areas of Solwezi, was generally poor, and internal crowding within dwelling units was common (an average of 6-10 persons per housing unit). One of the most striking features was that the majority of them could not afford even the cheapest permanently completed housing units that were either built by the government or private enterprise. It appeared that planning of housing units in the past, and to a lesser extent at present, had been directed towards costly constructed units which do not take into account the needs of the poor.

It is observed that most of the Solwezi urban residents had access to water supply though much of it, particularly in the lower income group, was unclean and unsafe for drinking. Wells, as sources of drinking water in the squatter townships, were located too close to pit latrines, with the result that when there was too much water in the rainy season, the refuse from the latrines backed up into the wells that supplied drinking water leading, sometimes, to outbreaks of cholera and dysentery. This critical situation, coupled with the difficulties that resulted from these illnesses connected with it, was compounded by the fact that from the beginning, the planning of Solwezi urban did not foresee and anticipate a widespread creation of squatter townships.

A noticeable improvement in the water sub-sector in Solwezi could be directly attributed to efforts to commercialise the water and sanitation services through the establishment of the Northwestern Water and Sewerage Company (NWSC) in the area. Nevertheless, while water service provision appeared to have improved in some areas where water utility campaigns had been launched, the level of service in supplied areas of Solwezi urban had continued to deteriorate. This had mainly been due to the company's inheritance of old and dilapidated infrastructure from the council, low water tariff collection from poorly paid Solwezi residents, inadequate funds for operation and maintenance and inadequate qualified personnel in water management. Further more, the town still found it difficult to keep pace with urban growth in trying to develop adequate supply as well as in building and maintaining the pipe distribution system as most of the pipes were old and almost finished. A good example was the Solwezi Technical School area where most of the pipes were leaking.

The journey to work, shopping, health and educational services for the majority of Solwezi residents who lived at a distance from the town centre where most of the facilities were found, took increasingly more time as most of them had to move on foot. There were few or no shopping centres in most residential areas of Solwezi urban let alone the substandard central market points found in the squatter townships where simple commodities like salt, kapenta, soap, candles and vegetables were sold and bought. The

absence of residential shopping centres could be explained by the fact that it would not be viable for anyone to set up shopping services in small residential areas where the people's purchasing power is low and where not enough people would use this service to make it a worthwhile, profitable venture. This is perhaps why relatively more expensive and less frequently required goods and services such as cloths, radios, TV's, shoes, tailoring services, electrical fittings, to mention but a few, were made available in the town centre where the resident population provided a market demand which was further reinforced by people coming from various other smaller residential areas.

The current level of education, health and related social services was not commensurate with the increasing demand from the growing population of Solwezi urban. For instance, it was quite evident that health problems were particularly acute in the areas inhabited by lower income groups but health facilities serving these areas were the most inadequate and often located far away from the areas. Solwezi urban, for instance, had only two government health centres that served the Solwezi community while the other existing private health facilities were not reachable by most of the people let alone the rich.

The pattern of transport in Solwezi, as has already been alluded to, reflected the disparities of interest between the high income groups and the poor masses. Many of those in the lower income groups walked to get to many places that offered basic facilities and a few of those who happened to be fortunate enough used bicycles as transport. It is evident from the foregoing that a number of things and planning strategies, some of which have been identified in Chapter Seven of this report, needed to be applied in order to fully realize a balance between provision and spatial distribution of services.

The results of the survey also show that employment levels were comparatively higher in the high income groups and lower in the low income groups particularly among the squatters. Such high levels of employment in the high income group could be associated with a correspondingly high level of education in those areas as every employer would want to employ skilled labour. Most uneducated squatters, who could not find a formal

job, resorted to carrying out small-scale businesses in order to maintain a living. The opening of Kansanshi mine could have had some positive effect on the levels of employment.

6.3 Solwezi's Future Town Plan: A Prospective Approach

One professional planner once said:

> No progress can be made without reference to the city's present or future residents. For many centuries civic design was in the hands of dominating elites who developed successive, rather arbitrary concepts to mirror their own particular values. The regimentation and inequality of early Mesopotamian, Indian, Egyptian and Roman civilizations was well expressed in the strict gridiron patterning of their streets, and their frequent recourse to vast monumental features. Ancient Greece, with its delight in intellectual experimentation, produced more artistic groupings of buildings, ... such as the central part of Athens, the Acropolis ..., which are still regarded as perfect models by some civic design experts (Heywood, 1974; 146).

Building from Heywood's quotation above, just what then would be the future ideal plan for Solwezi town that would make it a near perfect replica of a modern town? The researcher's aim was not to design a new plan for Solwezi as doing so would require, inter alia, concerted effort from various experts and stakeholders such as administrators, engineers, architects, sociologists, lawyers, doctors, technicians, investors, developers, geographers, the professional planners, the active participation of the local residents and the general public and above all, financial and material support. The researcher was only attempting to offer a simple but plausible and prospective plan that would stand as one of the possible panaceas to the current urban problems the area was facing.

It is imperative to mention that any success in master-planning would be assessed by the town's functional qualities: that is to say, whether the existing space is adequate to the people's needs, whether housing units produce maximum utility, convenience and safety, whether the shopping facilities are adequate, whether the schools and health centres are properly distributed, whether the roads are providing safety and conveying traffic speedily and cheaply and whether the journey of people from their places of residence to the places of work is convenient, safe and economic. This means that building a new town for Solwezi would mean providing houses and all the related developments, shops, clinics, roads, parks, factories, offices and services essential for the development of a town.

It is worth noting that the most important part of a master plan, which the researcher is very sure might have been ignored when designing the plan for Solwezi, was the reservation of land for road system, open spaces, and public amenities, which could not be provided for at a later date. If such precautions had been seriously taken into account, surely the current problem of increasing traffic in Solwezi, which called for the expansion of the main central road, would have been avoided. Furthermore, as regards to the zoning structure which was currently posing a big challenge to Solwezi urban, the researcher was proposing the scheme in Table 6.1 for the major functional zones of the town based on the originally designated coverage and the current demand forces from the increasing population and business.

Table 6.1 Proposed Landuse Zonation for the Future of Solwezi Urban

Landuse	**Designated Coverage**		**Proposed Coverage**	
	Sq. km	Percent	Sq. km	Percent
Residential	17.7	35.4	20	40
Commercial	0.3	0.6	5	10
Communication/Road	0	0	2	4
Recreational	0.8	1.6	5	10
Institutional	0.5	1	4	8
Industrial	0.5	1	4	8
Specialuse/Smallholding	30.2	60.4	10	20
Total Landuse	**50.0**	**100.0**	**50.0**	**100.0**

Source: Field Observations

Table 6.1 shows a deliberate attempt to increase all landuses except for special use/smallholding whose part of the land has been redistributed to categories which were either not planned for at all or which were given inadequate land but are currently on high demand from the growing population. Such areas include commercial, recreational/open space and communication/road. The special use category that is reserved for anticipated growth of informal areas such as graveyards and other special areas has been reduced to allow for a proportional distribution of land in all categories based on demand.

It was quite likely from the researcher's prediction that such a situation as indicated in Table 6.1 would require pulling down some buildings in bad or dilapidated condition to make way for more open space and public buildings. In addition, certain sections of the Solwezi community such as those that had built in the dambo west of the town and east of

the Solwezi Teachers' Training College would have to be relocated to higher areas possibly east of the town. Squatter areas would need to be upgraded to a level where they would bring sanity and at least compete favourably with those of Lusaka.

As road widening would be impossible in a situation like that of Solwezi where buildings were already too close to the main road and where demolition of such buildings would not be the best alternative, the only plausible solution would be to create a new CBD in the drier east in the area extending to Kansanshi where the terrain was fairly leveled, drainage good and where there was enough space to plan ahead for the future of the town (see Fig. 6.1). The researcher envisaged a grid network of roads not very different from the pattern shown in Fig. 5.1b but where all the roads or pathways in the inner part of Solwezi were nicely tarred in order to bring to the barest minimum the dust that created irritating looks of ugliness on buildings. His dream was a town like Siavonga, in the Southern Province of Zambia, which is equally away from the rail line but where almost every pathway in the inner town is tarred. Perhaps this new CBD could offer possibilities of coming to reality the dream of a first-class trading area overlooking the Solwezi River and the surrounding countryside. However, this would require moving Mushitala village to the fringe as it fell within the radius of the new CBD. Other costs to consider would include the tarring and expansion of the existing roads and the construction of the entire dual carriage way from the junction to the end of the bridge and the beginning of the road that joins the Solwezi-Mwinilunga Road at Magrade compound (see Figure 6.1).

The financing of such a huge project like this one above would require a serious mind. The researcher believed that as long as the Solwezi Municipal Council showed real interest and seriousness to undertake the project, the sources of funds would not pose an impossible challenge. Some municipal councils in Zambia, such as Siavonga district, have occasionally sought help from various Non Governmental Organisations (NGOs) such as World Vision, who have helped them to develop infrastructure like schools and hospitals. In addition, the Zambia Social Investment Fund (ZAMSIF) supports the development of roads and other infrastructure such as bridges in needy areas. Sometimes,

the government has, in many occasions, come in to help when funds are available. All that would be needed to get funding was to prepare a well defined and comprehensive project proposal which would clearly indicate why the SMC are doing so, how much they would want to spend on the project and the terms under which the money would be spent.

With increasing mining activity in the area, the role of mining in the future town plan for Solwezi would therefore be to improve the living conditions of the Solwezi residents by offering them with employment opportunities in the mines and in other mining related sectors; to add sanity and beauty to the town by constructing more modern infrastructure and upgrading the existing ones; to partner with government and the local authority in bringing about improved health and educational conditions in the area through continued building of more health and learning centres; to build more housing units to cater for the rising needs of accommodation in the area; and to take commerce and industry to greater heights as this is the backbone of every stable and well established town.

As alluded to in the preceding paragraphs, the researcher's aim was not to design a plan for Solwezi but was simply trying to contribute towards the betterment and aesthetic beauty of the town by offering what he thought could help solve some of the problems the area was facing. How the area would be developed in future and what type of activities may be carried out remained in the able hands of the local authorities and the government as a whole to implement such plans so that both the government as a policymaker and the planners could begin to see the practical results of their efforts. Much emphasis therefore must be placed on social enquiry to discover the right aims for plans and planners, and on the local residents in the control of their living and working environments.

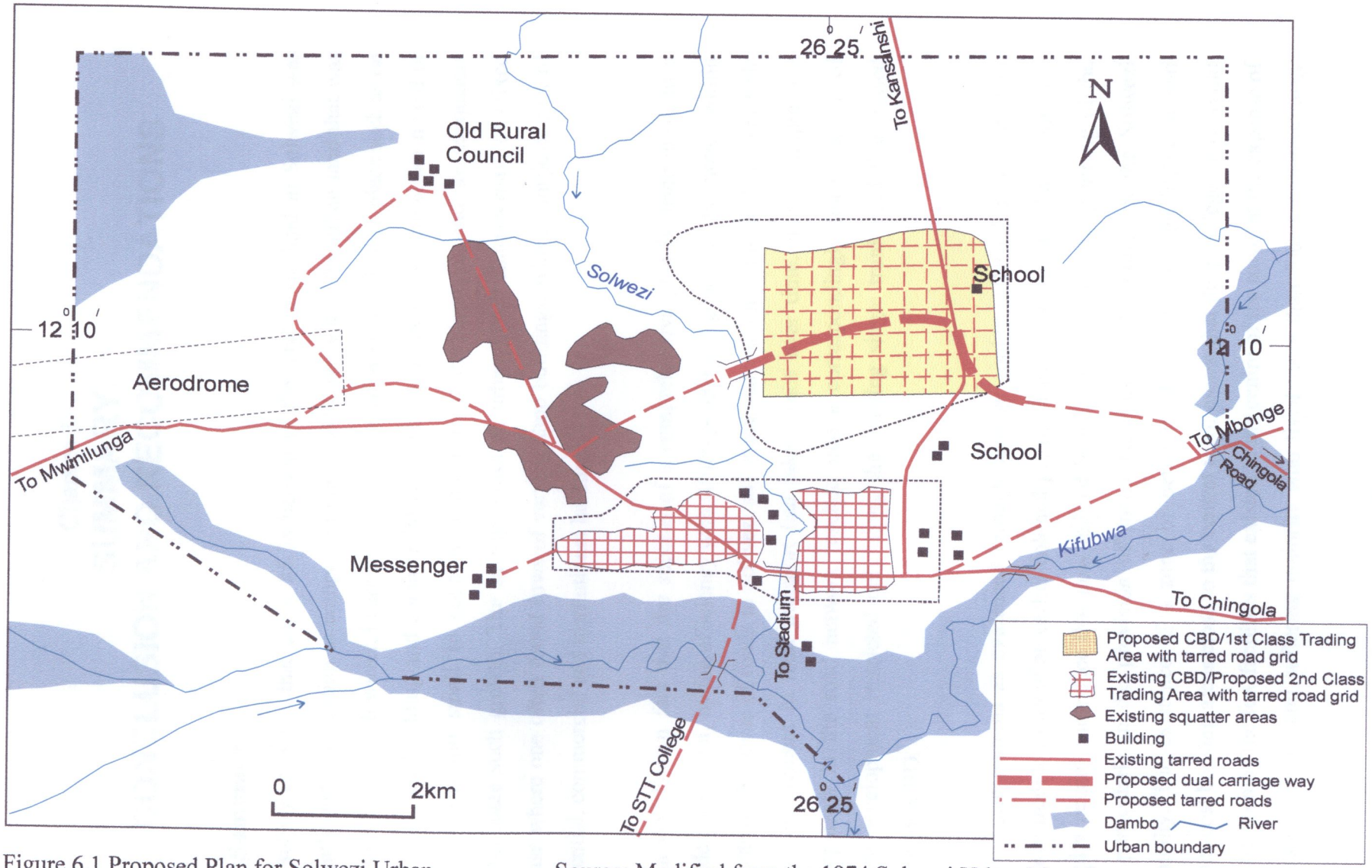


Figure 6.1 Proposed Plan for Solwezi Urban

Source: Modified from the 1974 Solwezi Urban Map, Survey Department, Lusaka

Chapter 7

SUMMARY, CONCLUSION AND RECOMMENDATIONS

7.1 Summary

The survey estimates that about 85.58 percent of the total urban land in Solwezi was currently under utilization as compared to only 16.98 percent of the urban land that was under use in 1974. However, in areas where substantial growth had taken place such as on residential, smallholding and commercial land, the town functions were either mixed or the area was too small to cope with the current development and to adequately accommodate such growth. The survey shows an urban fabric characteristic of mixed landuse where one often found rows of varying shop buildings, with an intricate mix of residential, commercial and institutional landuse.

It is a well known fact that the success of a comprehensive plan is determined, to a considerable extent, by the efficiency with which people and goods can be moved within the system. The issue of roads in Solwezi still remained a thorn in the flesh as very little or no improvement in road transport had taken place over time. Such unimpressive developments in the road network resulted into a correspondingly linear pattern of landuse development restricted only along the existing single trunk road that passed through the CBD.

The land use patterns as evidenced through landuse zoning reflected a great deal of influence from legacies of an earlier colonial period. It was such legacies that might have created a negative interface that now existed between landuse and the planning of the town particularly in the provision of social facilities to all sections of the Solwezi community. The existence of a zone of better residence, that is, the high-cost and medium-cost housing areas close to the central town meant that the privileged few would continue to enjoy the few facilities that existed in the centre of the town, at the expense of the underprivileged and suffering majority who lived more than four kilometers away

from the centre of the town. This suffering majority was consequently made to walk longer distances to get to the source of civic amenities.

The survey further reveals that a CBD of three kilometres by 30m in thickness was too narrow to permit further road expansion and to allow for further transformation of the existing road into a much needed dual carriage way.

There was a rampant and uncontrolled mushrooming of substandard guest houses, business houses and lodges that had resulted partly from lack of adherence to zoning and building regulations and standards. This situation, coupled with difficulties arising from government activities that competed for land, had brought radical changes to areas. These changes consequently culminated into the misuse of land which the council was not facing squarely.

With the rising average living standards and increased personal mobility in Solwezi, aspirations of the people were great for space, adaptability and pleasant surroundings. The choice of tenure remained very limited in Solwezi as very few or no family had a guarantee of housing and many, especially in the lower-income group, found themselves without access to a home.

This survey estimates that about 83 percent of the housing units in Solwezi were environmentally deficient. The wide inequalities in the housing situation were firmly related to the pervasive levels of class in the community where drab and deprived environment of older housing was inhabited by people who described themselves as working class while space, privacy and comfort appeared to be the privilege of the high-cost and the medium-cost residents. The survey shows that there was a considerable advantage of the minority over the majority in terms of access to infrastructure and services in Solwezi urban.

7.2 Conclusions

The process of urban transformation continues to operate today in Solwezi and many a time one found scenes of the old and the new juxtaposed, with recently cleared areas interspersed. This transformation that was taking place within the townscape of Solwezi was characterized by a complex mix of town functions and landuse. Though the town had recorded a substantial change in the use of urban land during the period under review as indicated by the t-test, much of this change was confined within residential, smallholding and commercial zones with a clearly noticeable negligence on industrial and recreational land development.

A clear unfavourable interface between landuse and service provision unveiled where most residential areas, particularly those of the lower-income group, offered very little to the people in terms of civic amenities. Factors cited as having championed this cause included, inter alia, the scramble for the little space in the fringe of the town centre and along the central road where a few basic shopping facilities were available and where the day-time population provided a market demand for people's businesses; lack of coordinated planning and adherence to zoning and building standards and regulations; irrational and inhumane colonial policies that might be responsible for the present levels of economic and social class and a rapid population growth that had resulted into a relative increase in the informal settlements.

Despite the "substandard" quality of the many dwelling units in the lower income groups, it is worth noting that these units represented a massive unaided self-help effort on the part of the lower income households and that many of these areas had considerable socio-economic viabilities. As noticed from the foregoing, squatter areas represented a substantial though not a major share of residential construction (about 0.9 sq. km of urban land). It is interesting to note that within many of these living environments, lower income people showed a remarkable ability for improvisation and coping with town life.

The survey shows a mixed character of functions in which boundaries were rarely respected and where there was a great imbalance in the spatial distribution and provision of services between the haves and the have-nots. Very few questions, if any at all, had been posed by the people concerned as to how and why certain structures in Solwezi still found their way in areas where they were a misuse and where they tended to disfigure the morphology of the town and yet such questions were at the core of many of the planning considerations. One other thing that posed a big challenge was why people in some residential areas turned housing units into drinking pubs and/or guesthouses as such kind of behaviour might be induced by other more powerful forces than just economic ones and those of the council's inability to contain with. A sane man of average education must remember that making a town an aesthetic beauty and a pleasant place to live in is not just a responsibility of the council alone but a concern for everyone.

7.3 Recommendations

7.3.1 The noticeable change of development that was taking place in Solwezi required a thorough review of the prevailing conditions during that period of transformation and also for a review of the planning authorities or agencies which were responsible for effecting those changes. For instance, there was need for the government to plan properly on waste disposal and on the creation of space for further urban expansion. This also called for the SMC to employ professionals to handle land management issues.

7.3.2 There was need for the SMC to enforce strict control of development both inside and outside the designated area of Solwezi urban in order to militate against land overlaps and cut down on the rampant misuse of land.

7.3.3 As plans were under way to have the existing major trunk road expanded so as to accommodate more traffic in Solwezi, such would only be possible if another Outlying Business District (OBD) was established away from the existing one and possibly on the land stretching from the northeastern fringe of the Solwezi town and the Kansanshi mining area, which was also fairly well drained,

undulating and large enough to allow for further road expansion and the construction of the long awaited dual carriage way.

7.3.4 Any new public service projects to be undertaken in Solwezi urban were to be designed to serve the poor. That is, attention was to be focused on ensuring that the service was afforded by the poor; it was placed where the poor lived; it took into account how many people would be served both in terms of the backlog and of the growth in demand; and it ensured that large subsidies were not incurred which would reduce the size of the programme and encourage sale to high income groups. For instance, housing was to focus on the provision of services and land for the poor rather than more costly built units which they could not afford.

7.3.5 Investment in housing in Solwezi urban was to be accompanied by the equivalent expansion in the water supply system to avoid water shortages. Water supply was to concentrate on tertiary distribution to squatter townships and was to be designed as a public sanitation system integrating supply of water and disposal of wastes.

7.3.6 In the low-cost housing areas of Solwezi urban, a suggestion was being made to give priority to the provision of clean accessible water, good sanitation, drainage and improvement of roads. Payment for these services could only be done by way of a 'poll tax' which would cover all the various services provided. The provision of communal water borne latrines, for instance, could be undertaken on a communal basis. However, the latrines could be run on user-pays basis so as to ensure that adequate standards were maintained.

7.3.7 Although squatter areas in Solwezi urban were unplanned, they nevertheless represented assets both in the social and financial terms. The areas therefore required planning and services and the wholesale demolition of good and bad houses alike would not be a practical solution.

7.3.8 A more realistic approach would be encouraged further whereby the SMC or government supplied the site foundations and services but the occupiers did the building on a self-help basis. In this way costs would be kept down and

construction would be more rapid and of a kind suitable to people's needs. Areas such as squatter townships could later be upgraded to receive other services such as schools, shopping centres and clinics. There was also need to ensure that people had secure tenure of the land on which their houses were built or else they would not have the incentive to improve them.

The researcher is of the view that the funding of the above outlined recommendations would require a serious effort by both the Solwezi Municipal Council and the Government of Republic of Zambia as a whole to lobby for funds through NGOs, donating international bodies and other aiding institutions in both Africa and abroad.

REFERENCES

Abu-lughod, J., (1969), "Testing the Theory of Social Area Analysis: The Ecology of Cairo Egypt" in the ***American Sociological Review***, vol. 34; 198-212.

Balbo, M., (1993), "Urban Planning and the Fragmented City of Developing Countries" in the ***Third World Planning Review***, vol.15, no1; 23-35

Blankhart, S.T., (1981), ***The Settlement Pattern in Zambia***, Department of Town and Country Planning, Lusaka.

Carr, M., (1997), ***New Patterns: Process and Change in Human Geography***, Thomas Nelson and Sons Ltd, London.

Cheema, G.S. and Rondinelli, D.A., (eds.), (1988), ***Urban Services in Developing Countries, Public and Private Role in Urban Development***, The Macmillan Press Ltd, London.

Chia, S.L. and Mac Andrews, C., (eds.), (1979), ***Developing Economies and the Environment; the Southeast Asian Experience,*** McGraw Hill International Book Company, Singapore.

Choguill, C.L., (1996), "Ten Steps to Substantial Infrastructure" in ***Habitat International,*** vol. 20, No.3; 389-404.

Daniel, P. and Hopkinson, M., (1993), ***The Geography of Settlements***, Oliver and Boyd, Harlow.

Drakakis-Smith, D., (ed.), (1990), ***Economic Growth and Urbanisation in Developing Areas***, Routledge, London.

Gilbert, A. and Gugler, J., (1992), ***Cities, Poverty and Development; Urbanisation in the Third World,*** Oxford University Press, Oxford.

GRZ, (2000a), ***2000 Census of Population and Housing***, National Statistics, vol. 2, CSO, Lusaka.

GRZ, (2000b), ***Zambia 2000 Census of Population and Housing, Northwestern Province***, Analytical Report, vol. 7. CSO, Lusaka.

GRZ, (1971), ***Second National Development Plan, 1972-1976***, Ministry of Development Planning and National Guidance, Lusaka.

GRZ, (1979), ***Third National Development Plan, 1979-1983***, National Commission for Development Planning, Office of the President, Lusaka.

GRZ, (2002), ***Zambia Transitional National Development Plan, 2002-2005*** Department of Planning and Economic Management, Ministry of Finance and National Planning, Lusaka.

GRZ, (2004), ***Living Conditions Monitoring Survey Report 2002-2003***, Living Conditions Monitoring Branch, Central Statistics Office, Lusaka.

Haddon, J.B.A., (1991), ***Local Geography in Towns***, the Garden City Press Ltd., Letchworth, Hertfordshire.

Harvey, J., (1992), ***Urban Land Economics,*** The Macmillan Press Ltd., Hong Kong.

Herbert, D., (1972), ***Problems in Modern Geography: Urban Geography; A Social Perspective***, Davies and Charles, London.

Heywood, P., (1974), ***Planning and Human Need,*** David & Charles Ltd., Newton Abbot.

Hiraskar, G.K., (1993), ***Fundamentals of Town Planning***, Dhan pat Rai Publications, New Delhi, India.

Kangwa, J., (2000), ***The Impacts of Urban Fragmentation on Growth, Settlement Patterns and Provision of Infrastructure and Services in Lusaka, 1905-1999***, an M.Sc. Dissertation, University of Zambia, Lusaka. Unpublished.

Knauder, S., (1982), ***Shacks and Mansions; An Analysis of An Integrated Housing Policy in Zambia,*** Multimedia Publications, Lusaka.

Knox, P., (1995), ***Urban Social Geography: An Introduction,*** Longman, Harlow.

Lean, W. and Goodall, B., (1983), ***Aspects of Land Economics***, The Estates Gazette Ltd., London.

Maimbolwa, M.M., (1980), "Urban Growth in Northwestern Province" in Johnson, D.S. (ed) ***Handbook to Northwestern Province***, Z.G.A., Regional Handbook series no. 08; 175-179.

Mbao, M.L.M., (1982), ***Legal Pluralism and its Implications for Land Ownership and the Control of Landuse in Zambia,*** M. Phil. Thesis, Clare College, Cambridge.

Mulimbwa, A.C., (1980), ***Urban Law and Housing Policy in Zambia***, LL.M. Thesis, University of Zambia, Lusaka.

Munowenyu, E.M. and Pritchard, J.M., (1997), ***'O' level Human and Economic Geography***, Longman Zimbabwe Ltd, Harare.

O'Connor, A., (1983), ***The African City***, Hutchinson, London.

Rakodi, C., (1981), ***Colonial Urban Policy and Planning in Northern Rhodesia and its Legacy***, University of Wales, Cardiff.

Roberts, M., (1999), ***An Introduction to Town Planning Techniques***, University College, London Press.

Rondinelli, D.A. (ed.), (1983), "Towns and Small Cities in Developing Countries" in ***The Geographical Review***, Vol. 73, No. 4, The Macmillan Press Ltd.

Rothman, N.C., (1972), ***African Urban Development in the Colonial Period; A Study of Lusaka, 1905-1964***, Unpublished PhD Thesis, Northwestern University, Evanston, Illinois.

Singh, R.L., (ed.), (1973), ***Urban Geography in Developing Countries***, Proceedings of I.G.U. Symposium No.15 Varanasi; The National Geographical Society of India, Varanasi 221005.

Singh, R.Y., (1979), "Gyanpur: A Typical Tahsil Headquarters" in Singh, R.L. & Singh, R.P.B. (eds.) ***Place of Small Towns in India***, National Geographical Society of India, Varanasi: NGSI Res. Pub. 21, ICRHS Pub. 3; 185-190.

Taylor, J.L., and Williams, D.G., (1984), ***Urban Planning Practice in Developing Countries***, Pergamon Press, Oxford.

Turok, B., (ed.), (1979), ***Development in Zambia***, ZED Press, London.

Van den Bergh, L.M., (1983), ***CENTRAL PLACE THEORY AND THE PLANNING OF CENTRAL SERVICE CENTRES IN AFRICA with Special Reference to Zambia***, Zambia Geographical Association Occasional Study No. 11, Lusaka.

Witherick, M., (ed.), (1995), ***Environment and People, An Integrated Course for A and AS Geography***, Stanley Thanes Ltd, England.

APPENDICES

APPENDIX A (I)

Raw Data [26 Variables] Entered for SPSS Factor Analysis

Infrastructure/service		Highcost	Medcost	Lowcost	Squatter
Type of houses		%	%	%	%
	detached	100	100	100	17
	semi-detached	0	0	0	0
	other	0	0	0	83
Number of bedrooms					
	1b	0	0	5	20
	2b	0	0	80	60
	3b	50	100	15	20
	4b	50	0	0	0
Household size					
	Zero-5	25	45	75	41
	Six-10	63	55	25	52
	eleven-15	12	0	0	7
Tenancy status					
	owner-occupied	12	9	35	80
	rented	88	91	65	20
Type of roofing materials					
	iron sheets	12	18	5	23
	asbestos	88	82	95	0
	thatch	0	0	0	77
Type of walling materials					
	concrete	100	91	45	0
	burnt bricks	0	9	45	7
	mud bricks	0	0	10	93
Type of lighting energy					
	electricity	100	100	100	3
	candle/gas	0	0	0	97
	other	0	0	0	0
Type of cooking energy					
	electricity	100	100	90	0
	charcoal	0	0	10	100
	other	0	0	0	0
Type of water sources					
	tap inside	100	82	50	0
	tap outside	0	18	40	7
	well	0	0	10	93
Distance to water sources					
	<50m	0	18	100	93
	50-100m	0	0	0	7
Methods of waste disposal					
	rubbish pit	100	100	100	100
	surface dump	0	0	0	0

	other	0	0	0	0
Type of toilets used					
	flush	100	91	50	0
	pit latrine	0	9	50	100
Methods of transport to work					
	by car	0	0	0	5
	by minibus	38	64	5	10
	by taxi	38	18	55	0
	by foot	25	18	40	85
Length of journey to work					
	<10min	0	18	5	0
	10-20min	88	55	50	40
	20-30min	12	18	25	45
	30-40min	0	0	5	15
	40-60min	0	9	10	0
	<60min	0	0	5	0
Type of roads in RAs					
	tarred	0	36	40	0
	gravel	100	64	50	40
	dirt	0	0	10	60
Type of schools children attend					
	government	100	82	100	100
	private	0	18	0	0
	other	0	0	0	0
Distance to schools children attend					
	<1km	88	82	55	40
	1-2km	12	18	45	57
	3-5km	0	0	0	3
	>6km	0	0	0	0
Type of nearest health centres					
	government	100	100	100	100
	private	0	0	0	0
	other	0	0	0	0
Distance to nearest health centres					
	<1km	75	82	65	0
	1-2km	25	18	30	20
	3-5km	0	0	0	73
	>6km	0	0	5	7
Distance to shopping centres					
	<500	0	0	0	7
	600m-1km	100	64	90	83
	2-3km	0	0	0	0
	4-5km	0	9	0	3
	>5km	0	27	10	7
Type of occupation					
	business	12	0	15	90
	teaching	0	36	15	5
	civil service	0	64	0	0

	other(nursing)	88	0	70	5
Education level of respondents					
	primary	0	0	5	30
	secondary	38	9	50	60
	post-secondary	63	91	45	3
	other	0	0	0	7
Duration of water supply					
	all time	100	91	70	100
	few hours	0	9	25	0
	other	0	0	5	0
Methods of transport to schools					
	car	0	0	0	0
	taxi	0	0	0	0
	minibus	0	0	5	0
	foot	100	100	95	100
Health provider attending to the sick					
	doctor	100	82	75	27
	clinical officer	0	9	0	0
	nurse	0	9	25	73
Employment status					
	employed	88	100	90	3
	self-employed	0	0	0	30
	unemployed	12	0	10	67

APPENDIX A (II)

Factor Analysis Output

Correlation Matrix

		VAR001	VAR002	VAR003	VAR004
Correlation	VAR001	1.000	.882	.784	.121
	VAR002	.882	1.000	.742	.059
	VAR003	.784	.742	1.000	.307
	VAR004	.121	.059	.307	1.000
Sig. (1-tailed)	VAR001		.000	.000	.135
	VAR002	.000		.000	.297
	VAR003	.000	.000		.002
	VAR004	.135	.297	.002	

Communalities

	Initial	Extraction
VAR001	.816	.882
VAR002	.791	.897
VAR003	.678	.848
VAR004	.159	.284

Extraction Method: Principal Axis Factoring.

Total Variance Explained

Initial Eigenvalues				Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.654	66.350	66.350	2.518	62.946	62.946	2.358	58.952	58.952
2	1.002	25.041	91.390	.393	9.830	72.776	.553	13.824	72.776
3	.231	5.769	97.160						
4	.114	2.840	100.000						

Extraction Method: Principal Axis Factoring.

Factor Matrix

	Factor	
	1	2
VAR001	.931	-.124
VAR002	.916	-.241
VAR003	.880	.272
VAR004	.195	.496

Extraction Method: Principal Axis Factoring.
a. 2 factors extracted. 11 iterations required.

Rotated Factor Matrix

	Factor	
	1	2
VAR001	.929	.136
VAR002	.947	1.984E-02
VAR003	.772	.502
VAR004	5.193E-02	.531

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization
a Rotation converged in 3 iterations.

Factor Transformation Matrix

Factor	1	2
1	.962	.274
2	-.274	.962

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.

Factor Score Coefficient Matrix

	Factor	
	1	2
VAR001	.398	-.112
VAR002	.547	-.603
VAR003	.068	.949
VAR004	-.049	.288

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.
Factor Scores Method: Regression.

Factor Score Covariance Matrix

Factor	1	2
1	.939	7.306E-02
2	7.306E-02	.602

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.
Factor Scores Method: Regression.

APPENDIX B

A. Chi-Square by Crosstabs: High and low-cost

Case Processing Summary

	Cases Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
VAR001 * VAR002	3901	100.0%	0	.0%	3901	100.0%

VAR001 * VAR002 Crosstabulation

			VAR002		Total
			1.00	2.00	
VAR001	1.00	Count	100	100	200
		Expected Count	97.5	102.5	200.0
	3.00	Count	0	5	5
		Expected Count	2.4	2.6	5.0
	4.00	Count	0	80	80
		Expected Count	*39.0*	*41.0*	*80.0*
	5.00	Count	50	15	65
		Expected Count	31.7	33.3	65.0
	6.00	Count	50	0	50
		Expected Count	24.4	25.6	50.0
	7.00	Count	25	75	100
		Expected Count	48.7	51.3	100.0
	8.00	Count	63	25	88
		Expected Count	42.9	45.1	88.0
	9.00	Count	12	0	12
		Expected Count	5.8	6.2	12.0
	10.00	Count	12	35	47
		Expected Count	22.9	24.1	47.0
	11.00	Count	88	65	153
		Expected Count	74.6	78.4	153.0
	12.00	Count	12	5	17
		Expected Count	8.3	8.7	17.0
	13.00	Count	88	95	183
		Expected Count	89.2	93.8	183.0
	15.00	Count	100	45	145
		Expected Count	70.7	74.3	145.0
	16.00	Count	0	45	45
		Expected	21.9	23.1	45.0

	17.00	Count	0	10	10
		Expected Count	4.9	5.1	10.0
	18.00	Count	100	100	200
		Expected Count	97.5	102.5	200.0
	20.00	Count	100	90	190
		Expected Count	92.6	97.4	190.0
	21.00	Count	0	10	10
		Expected Count	4.9	5.1	10.0
	22.00	Count	100	50	150
		Expected Count	73.1	76.9	150.0
	23.00	Count	0	40	40
		Expected Count	19.5	20.5	40.0
	24.00	Count	0	10	10
		Expected Count	4.9	5.1	10.0
	25.00	Count	0	100	100
		Expected Count	48.7	51.3	100.0
	27.00	Count	100	100	200
		Expected Count	97.5	102.5	200.0
	29.00	Count	100	50	150
		Expected Count	73.1	76.9	150.0
	30.00	Count	0	50	50
		Expected Count	24.4	25.6	50.0
	32.00	Count	38	5	43
		Expected Count	21.0	22.0	43.0
	33.00	Count	38	55	93
		Expected Count	45.3	47.7	93.0
	34.00	Count	25	40	65
		Expected Count	31.7	33.3	65.0
	35.00	Count	0	5	5
		Expected Count	2.4	2.6	5.0
	36.00	Count	88	50	138
		Expected Count	67.2	70.8	138.0
	37.00	Count	12	25	37
		Expected Count	18.0	19.0	37.0
	38.00	Count	0	5	5
		Expected Count	2.4	2.6	5.0
	39.00	Count	0	10	10
		Expected Count	4.9	5.1	10.0
	40.00	Count	0	5	5
		Expected Count	2.4	2.6	5.0
	41.00	Count	0	40	40
		Expected	19.5	20.5	40.0

	42.00	Count	100	50	150
		Expected Count	73.1	76.9	150.0
	43.00	Count	0	10	10
		Expected Count	4.9	5.1	10.0
	44.00	Count	100	100	200
		Expected Count	97.5	102.5	200.0
	47.00	Count	88	55	143
		Expected Count	69.7	73.3	143.0
	48.00	Count	12	45	57
		Expected Count	27.8	29.2	57.0
	51.00	Count	100	100	200
		Expected Count	97.5	102.5	200.0
	54.00	Count	75	65	140
		Expected Count	68.2	71.8	140.0
	55.00	Count	25	30	55
		Expected Count	26.8	28.2	55.0
	57.00	Count	0	5	5
		Expected Count	2.4	2.6	5.0
	59.00	Count	100	90	190
		Expected Count	92.6	97.4	190.0
	62.00	Count	0	10	10
		Expected Count	4.9	5.1	10.0
Total		Count	1901	2000	3901
		Expected Count	1901.0	2000.0	3901.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	71.005	18	.000	.000		
Likelihood Ratio	95.777	18	.000	.000		
Fisher's Exact Test	70.061			.000		
Linear-by-Linear Association	.006	1	.937	.939	.470	.002
N of Valid Cases	104					

a 32 cells (84.2%) have expected count less than 5. The minimum expected count is .50.
b The standardized statistic is -.079.

a) Statistical Testing for High and Low-cost Areas

Test item	Value
Significance Level (Sig.)	0.01
Degrees of Freedom	18
Critical Value (χ^2a)	34.805
Calculated/Observed Value (χ^2obs)	71.005
Calculated Value for Fishers's Exact Test	70.061
χ^2/ Fisher's Probability	0.000
Results	**χ^2calc > χ^2a, Reject Ho**

Interpretation

Ho: There is no significant difference in access to infrastructure and services between the high-cost and low-cost areas of Solwezi.

H1: There is a significant difference in access to infrastructure and services between the high-cost and low-cost areas of Solwezi.

Thus, setting the level of significance at 0.01 with 18 degrees of freedom, both Chi-Square and Fisher's Exact test values observed in the table above [i.e. χ^2, 71.005; Fisher's Exact test, 70.061] fall outside the range within which **Ho** would be accepted [i.e. $\chi^2_{obs} \geq$ 34.805].

Conclusion: There is a significant difference in access to infrastructure and services between the sampled high-cost and low-cost residents of Solwezi.

B. Chi-Square by Crosstabs: Medium and Low-cost

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
VAR0001 * VAR0002	3918	100.0%	0	.0%	3918	100.0%

VAR0001 * VAR0002 Crosstabulation

			VAR0002		Total
			1.00	2.00	
VAR0001	1.00	Count	100	100	200
		Expected Count	97.9	102.1	200.0
	3.00	Count	0	5	5
		Expected Count	2.4	2.6	5.0
	4.00	Count	0	80	80
		Expected Count	39.2	40.8	80.0
	5.00	Count	100	15	115
		Expected Count	56.3	58.7	115.0
	7.00	Count	45	75	120
		Expected Count	58.7	61.3	120.0
	8.00	Count	55	25	80
		Expected Count	39.2	40.8	80.0
	10.00	Count	9	35	44
		Expected Count	21.5	22.5	44.0
	11.00	Count	91	65	156
		Expected Count	76.4	79.6	156.0
	12.00	Count	18	5	23
		Expected Count	11.3	11.7	23.0
	13.00	Count	82	95	177
		Expected Count	86.6	90.4	177.0
	15.00	Count	91	45	136
		Expected Count	66.6	69.4	136.0
	16.00	Count	9	45	54
		Expected Count	26.4	27.6	54.0
	17.00	Count	0	10	10
		Expected Count	4.9	5.1	10.0
	18.00	Count	100	100	200
		Expected Count	97.9	102.1	200.0
	20.00	Count	100	90	190
		Expected Count	93.0	97.0	190.0
	21.00	Count	0	10	10
		Expected	4.9	5.1	10.0

	22.00	Count	82	50	132
		Expected Count	64.6	67.4	132.0
	23.00	Count	18	40	58
		Expected Count	28.4	29.6	58.0
	24.00	Count	0	10	10
		Expected Count	4.9	5.1	10.0
	25.00	Count	18	100	118
		Expected Count	57.8	60.2	118.0
	27.00	Count	100	100	200
		Expected Count	97.9	102.1	200.0
	29.00	Count	91	50	141
		Expected Count	69.0	72.0	141.0
	30.00	Count	9	50	59
		Expected Count	28.9	30.1	59.0
	32.00	Count	64	5	69
		Expected Count	33.8	35.2	69.0
	33.00	Count	18	55	73
		Expected Count	35.7	37.3	73.0
	34.00	Count	18	40	58
		Expected Count	28.4	29.6	58.0
	35.00	Count	18	5	23
		Expected Count	11.3	11.7	23.0
	36.00	Count	55	50	105
		Expected Count	51.4	53.6	105.0
	37.00	Count	18	25	43
		Expected Count	21.1	21.9	43.0
	38.00	Count	0	5	5
		Expected Count	2.4	2.6	5.0
	39.00	Count	9	10	19
		Expected Count	9.3	9.7	19.0
	40.00	Count	0	5	5
		Expected Count	2.4	2.6	5.0
	41.00	Count	36	40	76
		Expected Count	37.2	38.8	76.0
	42.00	Count	64	50	114
		Expected Count	55.8	58.2	114.0
	43.00	Count	0	10	10
		Expected Count	4.9	5.1	10.0
	44.00	Count	82	100	182
		Expected Count	89.1	92.9	182.0

	45.00	Count	18	0	18
		Expected Count	8.8	9.2	18.0
	47.00	Count	82	55	137
		Expected Count	67.1	69.9	137.0
	48.00	Count	18	45	63
		Expected Count	30.8	32.2	63.0
	51.00	Count	100	100	200
		Expected Count	97.9	102.1	200.0
	54.00	Count	82	65	147
		Expected Count	72.0	75.0	147.0
	55.00	Count	18	30	48
		Expected Count	23.5	24.5	48.0
	57.00	Count	0	5	5
		Expected Count	2.4	2.6	5.0
	59.00	Count	64	90	154
		Expected Count	75.4	78.6	154.0
	61.00	Count	9	0	9
		Expected Count	4.4	4.6	9.0
	62.00	Count	27	10	37
		Expected Count	18.1	18.9	37.0
Total		Count	1918	2000	3918
		Expected Count	1918.0	2000.0	3918.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	62.524	25	.000	.		
Likelihood Ratio	83.619	25	.000	.000		
Fisher's Exact Test	60.733			.000		
Linear-by-Linear Associatio	.047	1	.829	.832	.416	.002
N of Valid Cases	104					

a 46 cells (88.5%) have expected count less than 5. The minimum expected count is .50.
b The standardized statistic is .216.

b) Statistical Testing for Medium and Low-cost Areas

Test item	Value
Significance Level (Sig.)	0.01
Degrees of Freedom	25
Critical Value (χ^2a)	44.314
Calculated/Observed Value (χ^2obs)	62.524
Calculated Value for Fisher's Exact Test	60.733
χ^2/Fisher's Probability	0.000
Results	**χ^2calc > χ^2a, Reject Ho**

Interpretation

Ho: There is no significant difference in access to infrastructure and services between the medium-cost and low-cost areas of Solwezi.

H1: There is a significant difference in access to infrastructure and services between the medium-cost and low-cost areas of Solwezi.

Thus, setting the level of significance at 0.01 with 25 degrees of freedom, both Chi-Square and Fisher's Exact test values observed in the table above [i.e. χ^2, 62.524; Fisher's Exact test, 60.733] fall outside the range within which **Ho** would be accepted [i.e. $\chi^2_{obs} \geq$ 44.314].

Conclusion: There is a significant difference in access to infrastructure and services between the sampled medium-cost and low-cost residents of Solwezi.

C. Chi-Square by Crosstabs: Low-cost and Squatter

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
VAR01 * VAR02	3936	100.0%	0	.0%	3936	100.0%

VAR01 * VAR02 Crosstabulation

			VAR02		Total
			1.00	2.00	
VAR01	1.00	Count	100	17	117
		Expected Count	59.5	57.5	117.0
	2.00	Count	0	17	17
		Expected Count	8.6	8.4	17.0
	3.00	Count	5	20	25
		Expected Count	12.7	12.3	25.0
	4.00	Count	80	60	140
		Expected Count	71.2	68.8	140.0
	5.00	Count	15	20	35
		Expected Count	17.8	17.2	35.0
	7.00	Count	75	41	116
		Expected Count	59.0	57.0	116.0
	8.00	Count	25	52	77
		Expected Count	39.2	37.8	77.0
	9.00	Count	0	7	7
		Expected Count	3.6	3.4	7.0
	10.00	Count	35	80	115
		Expected Count	58.5	56.5	115.0
	11.00	Count	65	20	85
		Expected Count	43.2	41.8	85.0
	12.00	Count	5	23	28
		Expected Count	14.2	13.8	28.0
	13.00	Count	95	0	95
		Expected Count	48.3	46.7	95.0
	14.00	Count	0	77	77
		Expected Count	39.2	37.8	77.0
	15.00	Count	45	0	45
		Expected Count	22.9	22.1	45.0

	16.00	Count	47	7	54
		Expected Count	27.5	26.5	54.0
	17.00	Count	10	93	103
		Expected Count	52.4	50.6	103.0
	18.00	Count	100	3	103
		Expected Count	52.4	50.6	103.0
	19.00	Count	0	97	97
		Expected Count	49.3	47.7	97.0
	20.00	Count	90	0	90
		Expected Count	45.8	44.2	90.0
	21.00	Count	10	100	110
		Expected Count	56.0	54.0	110.0
	22.00	Count	50	0	50
		Expected Count	25.4	24.6	50.0
	23.00	Count	40	7	47
		Expected Count	23.9	23.1	47.0
	24.00	Count	10	93	103
		Expected Count	52.4	50.6	103.0
	25.00	Count	100	93	193
		Expected Count	98.2	94.8	193.0
	26.00	Count	0	7	7
		Expected Count	3.6	3.4	7.0
	27.00	Count	100	100	200
		Expected Count	101.7	98.3	200.0
	29.00	Count	50	0	50
		Expected Count	25.4	24.6	50.0
	30.00	Count	50	100	150
		Expected Count	76.3	73.7	150.0
	31.00	Count	0	5	5
		Expected Count	2.5	2.5	5.0
	32.00	Count	5	10	15
		Expected Count	7.6	7.4	15.0
	33.00	Count	55	0	55
		Expected Count	28.0	27.0	55.0
	34.00	Count	40	85	125
		Expected Count	63.6	61.4	125.0
	35.00	Count	5	0	5
		Expected Count	2.5	2.5	5.0
	36.00	Count	50	40	90
		Expected Count	45.8	44.2	90.0

	37.00	Count	25	45	70
		Expected Count	35.6	34.4	70.0
	38.00	Count	5	15	20
		Expected Count	10.2	9.8	20.0
	39.00	Count	10	0	10
		Expected Count	5.1	4.9	10.0
	40.00	Count	5	0	5
		Expected Count	2.5	2.5	5.0
	41.00	Count	40	0	40
		Expected Count	20.3	19.7	40.0
	42.00	Count	50	40	90
		Expected Count	45.8	44.2	90.0
	43.00	Count	10	60	70
		Expected Count	35.6	34.4	70.0
	44.00	Count	100	100	200
		Expected Count	101.7	98.3	200.0
	47.00	Count	55	40	95
		Expected Count	48.3	46.7	95.0
	48.00	Count	45	57	102
		Expected Count	51.9	50.1	102.0
	49.00	Count	0	3	3
		Expected Count	1.5	1.5	3.0
	51.00	Count	100	100	200
		Expected Count	101.7	98.3	200.0
	54.00	Count	65	0	65
		Expected Count	33.1	31.9	65.0
	55.00	Count	30	20	50
		Expected Count	25.4	24.6	50.0
	56.00	Count	0	73	73
		Expected Count	37.1	35.9	73.0
	57.00	Count	5	7	12
		Expected Count	6.1	5.9	12.0
	58.00	Count	0	7	7
		Expected Count	3.6	3.4	7.0
	59.00	Count	90	83	173
		Expected Count	88.0	85.0	173.0
	61.00	Count	0	3	3
		Expected Count	1.5	1.5	3.0
	62.00	Count	10	7	17
		Expected Count	8.6	8.4	17.0
Total		Count	2002	1934	3936

Chi-Square Tests

	Value	df	Asymp.Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	56.543	32	.005	.		
Likelihood Ratio	76.045	32	.000	.000		
Fisher's Exact Test	52.941			.000		
Linear-by-Linear Associatio	.000	1	.996	.998	.499	.002
N of Valid Cases	108					

a 62 cells (93.9%) have expected count less than 5. The minimum expected count is .50.
b Cannot be computed because there is insufficient memory.
c The standardized statistic is -.005.

c) Statistical Testing for Low-cost and Squatter Areas

Test item	Value
Significance Level (Sig.)	0.01
Degrees of Freedom	32
Critical Value (χ^2a)	>50.892
Calculated/Observed Value (χ^2obs)	56.543
Calculated Value for Fisher's Exact Test	52.941
χ^2 Probability	0.005
Results	**χ^2calc > χ^2a, Reject Ho**

Interpretation

Ho: There is no significant difference in access to infrastructure and services between the low-cost and squatter areas of Solwezi.

H1: There is a significant difference in access to infrastructure and services between the low-cost and squatter areas of Solwezi.

Thus, setting the level of significance at 0.01 with 32 degrees of freedom, both Chi-Square and Fisher's Exact test values observed in the table above [i.e. χ^2, 56.543; Fisher's Exact test, 52.941] fall outside the range within which **Ho** would be accepted [i.e. $\chi^2_{obs} \geq 50.892$].

Conclusion: There is a significant difference in access to infrastructure and services between the sampled low-cost and squatter residents of Solwezi.

APPENDIX C

A. Semi-structured Questionnaire

[To be answered by the Solwezi Municipal Council officers and town planners]

Introduction

I am a student from the University of Zambia, School of Natural Sciences, Department of Geography, conducting a research on *The Interface Between the Evolving Urban Landuse and the Planning of Solwezi Urban.* You are kindly asked to give your personal opinion and knowledge on the research topic stated. The interview is merely meant to enable me to collect useful information for my educational use. Remember that there is no wrong or right answer and be rest assured that your responses will be treated as strictly confidential.

Questions

1. What laws or urban land policies governed or govern the use of urban land?
2. How is land administered to the people of Solwezi urban?
3. How is the current land tenure system in Solwezi as compared to the past?
4. Do people have equal access to land ownership?
5. If the answer to 4 above is yes, how? And if no, what are the constraints?
6. Do you think the present pattern of urban landuse in Solwezi is right?
7. If the answer to 6 above is yes, how? And if no, why and how should it be improved?
8. Kindly suggest how best Solwezi urban land should be planned and managed for better service delivery?

End of Interview

THANKS FORYOUR COOPERATION

B. Structured Questionnaire

I am a student from the University of Zambia, School of Natural Sciences, Department of Geography, conducting a research on *The Interface Between the Evolving Urban Landuse and the Planning of Solwezi Urban.* The information required is nothing other than for educational purposes only.

Instructions

You have been selected to participate in this questionnaire and therefore you are kindly asked to complete it out. The questionnaire has a total of five (5) sections each of which has questions that should be answered by either putting a tick in the bracket against your choice e.g. A [√] Chawama or by writing the actual answer on the space provided e.g. Kankoyo. Remember that there is no wrong or right answer and be rest assured that your responses will be treated as strictly confidential.

Part I--Personal information

1. Age:
   - A. [ ] 11-20 years
   - B. [ ] 21-30 years
   - C. [ ] 31-40 years
   - D. [ ] 41-50 years
   - E. [ ] 51-60 years
   - F. [ ] 61-70 years
2. Sex:
   - A. [ ] male
   - B. [ ] female
3. Marital status
   - A. [ ] single
   - B. [ ] married
   - C. [ ] divorced
   - D. [ ] widowed

4. Education:
   A. [ ] primary
   B. [ ] secondary
   C. [ ] postsecondary (college/university)
   D. [ ] none
5. Occupation:
   A. [ ] employed
   B. [ ] self-employed
   C. [ ] unemployed

Part II

A. Housing characteristics

6. What type of housing unit do you live in?
   A. [ ] detached
   B. [ ] semi-detached
   C. [ ] flat
   D. [ ] other, please specify----------
   ---
7. How long have you lived in this house?
   A. [ ] 0-5 years
   B. [ ] 6-10 years
   C. [ ] 11-15 years
   D. [ ] 16-20 years
8. What is the tenancy status of your house?
   A. [ ] owner-occupied
   B. [ ] rented
   D. [ ] other, please specify----------
   ---

9. If your answer to 8 is A, what type of ownership do you hold for the land on which your housing unit is built?

   A. [ ] 99-year lease

   B. [ ] 14-year lease

   C. [ ] common lease

   D. [ ] none

10. How many people live in this house permanently?

   A. [ ] 0-5

   B. [ ] 6-11

   C. [ ] 11-15

11. How many of the house members are 18 years and above? ----------

---

12. How many of the house members are below 18 years? ----------

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13. How many bedrooms does your housing unit have?----------

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14. Of what walling material is your housing unit built?

   A. [ ] concrete blocks

   B. [ ] burnt bricks

   C. [ ] mud bricks

   D. [ ] other, please specify----------

15. Of what roof material is your housing unit made?

   A. [ ] corrugated iron

   B. [ ] asbestos

   C. [ ] tiles

   D. [ ] other, please specify----------

B. Shopping characteristics

16. Are there any shops where you live?

   A. [ ] yes

   B. [ ] no

17. If your answer to 16 above is no, where do you buy your goods from?

A. [ ] town centre

B. [ ] market in our area

C. [ ] place of work

D. [ ] other, please specify----------

---

18. How far is/are the shop/s from your home?

A. [ ] 0-500m

B. [ ] 600m-1km

C. [ ] 2-3km

D. [ ] more than 3km

C. Industrial/employment characteristics

19. Do you have industries(companies/factories) in Solwezi?

A. [ ] yes

B. [ ] no

20. If your answer to 19 above is yes, name some of the industries you know----------

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21. If your answer to Part I, no. 5 is A or B, what type of occupation is it?

A. [ ] teaching

B. [ ] business

C. [ ] civil service

D. [ ] other, please specify----------

---

22. How do you get to your place of work?

A. [ ] by car

B. [ ] by minibus

C. [ ] by taxi

D. [ ] by employer's transport

E. [ ] by foot

23. How long do you take to reach your place of work?

A. [ ] 0-10 min

B. [ ] 11-20min

C. [ ] 21-30min

D. [ ] 31-40min

E. [ ] more than 40min

Part III—Household Amenities

24. What type of energy do you use for lighting at night?

A. [ ] electricity

B. [ ] gas/candle

C. [ ] other, please specify----------

25. What type of energy do you use for cooking?

A. [ ] electricity

B. [ ] charcoal

C. [ ] wood

D. [ ] gas

26. Do you have roads in your area?

A. [ ] yes

B. [ ] no

27. If your answer to 26 above is yes, what type of roads are they?

A. [ ] tarred road

B. [ ] gravel road

C. [ ] dirt road

28. If you have a school-going child, what type of school does he/she attend?

A. [ ] government school

B. [ ] private school

C. [ ] other, please specify----------

---

29. How far is the school from home?

A. [ ] 0-1km

B. [ ] 2-3km

C. [ ] 4-5km

D. [ ] more than 5km

30. How does your child get to school?

A. [ ] by car

B. [ ] by taxi

C. [ ] by minibus

D. [ ] by foot

E. [ ] by bicycle

31. What type of health centre do you attend?

A. [ ] government

B. [ ] private

C. [ ] clinic at the place of work

32. How far is the health centre from your home?

A. [ ] 0-1km

B. [ ] 2-3km

C. [ ] 4-5km

D [ ] more than 5km

33. Who attends to you at the clinic/hospital when you feel sick or unwell?

A. [ ] doctor

B. [ ] clinical officer

C. [ ] nurse

D. [ ] other, please specify----------

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34. How do you dispose of your domestic/household waste?

A. [ ] by council refuse truck

B. [ ] rubbish pit

C. [ ] dump on surface

D. [ ] other, please specify----------

35. Where do you draw your water from?

A. [ ] from tap inside the house

B. [ ] from tap outside the house

C. [ ] from the borehole

D. [ ] from the well

36. If you get your water away from your house, how far is it?

A. [ ] 0-50m

B. [ ] 51-100m

C. [ ] 101-200m

D. [ ] more than 200m

37. How long is water available from your source?

A. [ ] all the time

B. [ ] a few hours, please state----------

C. [ ] on alternative days

D. [ ] once a week

E. [ ] other, please specify----------

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38. What type of toilet do you use?

A. [ ] flush toilet

B. [ ] pit latrine

C. [ ] other, please specify----------

End of Questionnaire

THANKS FOR YOUR COOPERATION

APPENDIX D

Plate 1: CBD, a hindrance to further road expansion in Solwezi urban, 2005

Plate 2: Helen Kaunda (Hospital Compound)
low-cost Housing in Solwezi urban, 2005

Plate 3: Misplaced high-cost housing in front of ZAWA offices in Solwezi urban, 2005

Plate 4: Misplaced high-cost housing in a medium cost housing area in Solwezi urban, 2005

Plate 5: New housing for the rich in Solwezi urban, 2005

Plate 6: The other side of Solwezi urban; housing for the poor (MITECH compound), 2005

Plate 8: High-cost housing down the stadium in Solwezi urban, 2005

Plate 9: Solwezi main bus station, 2005