Cape Peninsula
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TRANSFORMATION OF URBAN PLANNING PRACTICES USING GEO-SPATIAL TECHNOLOGY IN MANAGING RAPID URBANISATION IN HARARE: ZIMBABWE

by

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DECLARATION

I, Danai Gladman Machakaire, declare that the contents of this thesis represent my own work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed Date

ABSTRACT

Political independence for Zimbabwe in 1980 brought about fundamental socio-economic changes which impacted on urbanisation trends in the country. For instance the removal of colonial influx control laws and regulations which had previously served to curtail rural-urban migration marked the beginning of a new developmental era characterised by rapid urbanisation. Political and economic downturns later experienced in the country in the last decade of the twentieth century and after resulted in massive de-industrialisation, company closures and high unemployment. These changes impacted significantly on the spatial structure of cities which had to firstly adapt to socio-political integration, and had to later focus on the basic challenges of providing shelter and alternative means of employment in a depressed economy. The physical and spatial manifestations of such changes included the rapid growth of informality, the collapse of urban infrastructure and the apparent disregard for the colonially styled urban development management frameworks.

This research consequently evaluates the performance of current urban planning frameworks and practices in the face of such changing circumstances. This is against a backdrop of the apparent failure by urban planning to transform in line such development trends. The study explores the theoretical framework of rapid urbanisation, urban planning, and technological innovation in urban development management systems. The main focus of the study is on the transformation of planning practices and frameworks. Geo-spatial technology (GST) is mainly used as a demonstration and methodological tool for analysis and evaluation.

The methodology is made up of two contrasting case studies based in the CBD of Harare (Zimbabwe's capital city) and Epworth (an informal settlement on the outskirts of Harare). The CBD case study measures the performance of planning frameworks within a formally planned set up whilst the Epworth case study demonstrates the (in)effectiveness of current planning practices to contemporary urban development challenges.

The main findings of the research support the need to have mobile planning frameworks and tools that have the capacity to promptly respond to fast changing developmental trends. The other main finding highlights the positive relationship between impartial participation in planning and high level of success in achieving planning objectives.

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DEDICATION

To my father Abishai Zeuringa Machakaire who is a retired Geography lecturer, educationist and an academic of notable repute. I derived great inspiration from your own academic achievements and great words of encouragement whenever you uttered the following remarks “… you have to complete what you started.”

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DEFINITION OF KEY TERMS AND CONCEPTS

Geo-spatial technologies (GST):

A phrase which collectively refers to a variety of technologies which include remote sensing, global positioning system (GPS), geographic information systems (GIS), information technologies, and field sensors, that help in capturing, storing, processing, displaying and disseminating information tied to a particular location (Goodchild, 1996). GIS in particular has been widely used in urban planning the world over as a spatial decision support system that improves communication, data analysis, and spatial analysis especially in situations that are characterised by rapid change and large volumes of data (Van Niekerk, 2008; Alberti, 2009; Carter et al., 2009; Ahmed & Ahmed, 2012).

Spatial Planning Frameworks (SPFs):

SPSs are urban (and regional) development management tools primarily designed to guide and respond to processes of urban development (Faludi, 2010). Such tools include planning legislation, regulations and statutory plans such as master plans, local plans, structure plans and spatial development plans prepared at local, metropolitan, district, provincial and national levels. These include instruments tailored to measure capacity and constraints imposed by physical infrastructure and social service constraints like zoning, bulk factors, bye-laws (health, security) and urban design guidelines.

Planning practices:

Planning practices embrace all manner of planners and urban development managers' (structured and unstructured) responses to the urbanisation process. The techniques used by planners in managing (guiding, facilitating and manipulating) urban development, together with the planning values and cultures that emerge, converge into a set of behaviours and cultures of social practices that underpin or become a 'conventional' wisdom or 'professionalised' way of doing things often used to legitimise action under several disguises – protection of public interest or property values, consistency, social justice or rule of law, etc.

Rapid Urbanisation:

A process where the pace of growth of (an) urban population/area(s) far outpaces the capacity of urban economies to sustainably absorb increasing population (in terms of jobs for instance), as well as that of urban governance institutions to cope with provision of

support services (with respect to expansion of physical infrastructure and social services), often leading to informalization (Knox and McCarthy, 2005).

Efficacy:

The value and usefulness of engaging certain tools to achieve desired developmental goals.

Transformation:

A structured process of managing change in a manner that brings positive developmental outcomes and processes to greater numbers of people in a given society (Harrison et al. 2008).

Predictive accuracy:

The capacity and precision of techniques used to forecast and project future development trends.

Prescriptive efficiency:

A measurement of the level of amenability with, or departure from predetermined rules, standards and regulations in a development process.

Responsive capacity:

The responsive capacity of a spatial development plan is its ability to manage development in rapidly changing circumstances.

Urbanisation:

Urbanisation is the net increase in urban populations due to factors such as natural population growth, in-migration, often resulting in an increased demand for socio-economic activities, infrastructure services and land for settlement purposes. Other definitions of urbanisation refer to the rate of converting rural agricultural land into urban or the subsequent increase of the ratio of urban dwellers over rural dwellers.

ACRONYMS

3-D	Three Dimensional
CA	Cellular Automata
CBD	Central Business District
CHOGM	Commonwealth Heads of Governments
COU	Change of Use
CZI	Confederation of Zimbabwe Industries
DCA	Decision Consequence Analysis
DPP	Department of Physical Planning
DEM	Digital Elevation Model
DOSZ	Dialogue on Shelter for the Homeless People in Zimbabwe Trust
ELB	Epworth Local Board
EMA	Environmental Management Act/ Agency
EO	Earth Observation
GIS	Geographical Information Systems
GAM	Goals Achievement Matrix
GPS	Global Positioning System
GST	Geo-Spatial Technology (ies)
LA	Local Authority
LP	Local Plan
LP17	Kopje Market Square Local Plan Number 17 (Harare)
LP22	Harare Central Area Local Plan Number 22
MP	Master Plan
NIMBY	Not in my backyard
NAM	Non Aligned Movement
OM/RO	Operation Murambatsvina/" Restore Order"

PBS	Planning Balance Sheet
PIM	Plan Implementation Monitoring
PPP	Public Private Partnership
RTCP	Zimbabwean Regional Town and Country Planning Act
RS	Remote Sensing
SACN	South African Cities Network
SDI	Slum Dwellers International
S-G	Surveyor General
UDI	Unilateral Declaration of Independence
UG-PSS	Urban Growth Planning Support Systems
UNECE	United Nations Economic Commission for Europe
UN Habitat	United Nations Human Settlements Programme
USA	United States of America
WADCO	Ward Development Committee
WUP	Water Utility Partnership
ZIMASSET	Zimbabwe Agenda for Sustainable Socio-Economic Transformation

CHAPTER ONE: INTRODUCTION TO THE STUDY

1.1 Background to the study

Current planning frameworks and practices in Zimbabwe lack the capacity to track and monitor the dynamics of hyper urban growth. In Harare, the wide spread growth of informal markets, small businesses and traffic volumes has drastically altered the traditionally mono-functionally zoned urban form as manifested by a myriad of factors which include denser space utilisation, mixed land use patterns and the chaotic invasion of public spaces by traffic. These rapidly changing urban growth trends have also been cited as some of the reasons behind the degeneration of municipal services such as water supply, sewerage and solid waste management in Harare (Kawadza & Chirisa, 2011; Chanza & Chirisa, 2011). Severe backlogs in service delivery were similarly cited amongst the major challenges which inhibit the achievement of Millennium Development Goals (MDGs) in African cities (UN-Habitat 2012).

Most cities in southern Africa were established by European colonialists and were moulded along the guides of 'modernist town planning' in the west whose overarching design principles were underscored by efficiency, functionality and "state represented" public interest (Rakodi, 1995; Watson, 2009; Chipungu, 2011). "State represented public interest" in this case refers to the notion which purports that planning legislation and decisions made by government planners represent and protect public interest. Contrary to the above, Wekwete (1997) and Toriro (2008) argued that planning frameworks in pre-colonial Zimbabwe were mainly designed to cater for the capitalist and selfish interests of the settler community (colonialists) by maximising the productive capacity of space utilisation at the expense of the interests of local communities, and therefore do not necessarily represent public interest.

Urban development in post-colonial Southern Africa is currently characterised by rapid population growth, increasing informality, shrinking economies, poor infrastructure development, social breakdown, service deficiencies and inadequate land administration (Rakodi, 2006; The Economist, 2010; Owusu, 2011; Parnell & Walawege, 2011). Such manifestations of rapid urbanisation pose a serious challenge to the coping capacity of the apparently static and rigid planning frameworks, urban development management

instruments and practices. There is a growing local and international concern that planning frameworks and practices that are not proactive, communicative and strategic (UN-Habitat, 2009) will ultimately fail to manage rapid change, and will also fail to meet the universally accepted development goals for cities guided by principles of productivity, sustainability, inclusivity and good governance (Borraine, et al., 2006; Berrisford, 2013). Ballaney and Bindu (2002) further argued that the use of out-dated maps, data collection and analysis techniques makes planning a time-consuming exercise to the extent that development occurs unabated during the lengthy plan preparation period, thus defeating the purpose of the whole exercise.

The world-wide advent for democracy has ushered in a marked increase in the role played by communities in shaping urban landscapes in that urban planning activities are no longer just expected to be the preserve of expert planners but a product of collective action by all stake holders. Local governance and planning practices in Zimbabwe are similarly expected to play their part in this global participatory planning phenomenon by embracing more public participation in planning and decision making (Chatiza, 2010; Chirisa, 2010). The increased involvement of non-technical players in the planning process and decision-making has a subsequent bearing on the quality of tools used for planning in that they need to be more interactive, communicative and informative. Geertman (2002) argued that the trend towards interactive and participatory planning will inevitably make planning practice more complex and increasingly dependent on information and communication technology.

The political problems and economic collapse experienced in Zimbabwe at the turn of the twenty first century, was marked by the demise of a formerly well-established industrial sector which then led to massive unemployment whose levels reached the 70% mark by the year 2005 (IMF, 2005). The collapse of the manufacturing sector with various Confederation of Zimbabwe Industries (CZI) surveys suggesting that industrial capacity utilisation was operating at 39.6% in 2014 was subsequently succeeded by the phenomenal growth of informal markets which currently account for an estimated 80% of the gainfully employed urban populace of Zimbabwe (African Economic Outlook, 2014). Spatial planning frameworks and policies remained static and increasingly failed to positively respond to the rapid in-formalisation of the economy as exemplified by the Zimbabwe government's hostile invocation of certain sections of the country's Regional Town and Country Planning Act

(revised in 1996) which authorised the demolition of the so called “illegal informal businesses and settlements” during the infamous ‘Operation Murambatsvina /Restore Order’ of 2005 (Tibaijuka, 2005; Kamete, 2007).

Questions are also being raised on the adequacy and suitability of public participation in planning as entrenched in the current processes. The use of newspaper adverts calling for “representations and objections” to expert-driven and pre-determined planning objectives is tantamount to manipulating public opinion to agree with views and values expressed in plans whose formulation they are not part to. Berrisford (2013) supported the latter view when he argued that there is a reality gap between what planners would want to see reflected in urban planning legislation and the reality of people’s lives in modern African cities.

In Zimbabwe, the consultation process itself still segregates and it is rarely exhaustive since most planning procedures specify that only registered property owners get consulted in the planning process much to the exclusion of the informal sector players and small scale traders who, ironically, now constitute the majority stake holders in the economy of most African cities (Saungweme et.al, 2014).

The application of strict zoning regulations and stringent planning standards has failed to maintain the colonial- style and ordered urban landscape in the central business district of Harare which is now currently characterised by unplanned for activities such as informal trading, densification of commercial activity and mixed land uses. There is glaring mismatch between current zoning regulations/provisions and the nature of activities and land uses in the current urban set up. Other manifestations of hyper urban dynamics in Harare include the chaotic takeover of parking areas and public spaces by public transport (mini-buses) operators, traffic congestion and the increase in the number of water and sewer pipe bursts. The demands caused by high building occupancy rates and large volumes of pedestrian and vehicular traffic far exceed the original design capacities of existing infrastructure and pedestrian precincts in the city centre (Kawadza & Chirisa, 2011; Chanza & Chirisa, 2011).

The mere existence of strict development control conditions, zoning regulations and a well-defined development protocol for urban areas in Zimbabwe in the form of planning and development acts, land regulations, building standards and well-manned local planning authorities still failed to prevent the development of a large informal settlement near Harare

known as Epworth Township (Butcher, 1986, Chitekwe-Biti et al, 2012). The informal settlement experienced unabated rapid growth since independence in 1980 in spite of the national government's intolerant policies towards informality. What is peculiar though is the fact that such growth occurred outside the confines of any known urban planning frameworks. Spatial planning in Epworth was further inhibited by the non–existence of cadastral data in the area.

1.2 Statement of the research problem

The urban development challenges highlighted above point towards the need to have development management tools that are adaptive to rapid change, are easy to update, participatory and have the capacity to handle large volumes of data. Contrastingly, current planning frameworks and practices are fairly static and rigid and the situation is further exacerbated by the inadequacy of data and information needed to inform the planning process. Urban planning in Zimbabwe is mainly dependant on out-dated, unreliable or simply unavailable spatial data (UN Habitat, 2008; Chirisa, 2012). This is against a background where urban planning is predominantly spatial in that it mainly seeks to systematically design activities in a manner that ensures that certain spatial goals are achieved (Van de Brink et al., 2007; Ryan, 2011). In this regard, the research further explores and tests the application of geo-spatial technology in evaluating urban development management.

The study examines the role, ability and capacity of current spatial development frameworks and practices in acting as guidelines and catalysts for urban development. The research evaluates the accuracy and the adequacy of the forecasting and predictive techniques used in the formulation of current spatial planning frameworks. The second objective of the study is to measure and demonstrate the level of success or failure of current urban planning and development practices in dealing with the hyper-changing urban development trends brought about by the current rapid urbanisation scenario being experienced in Harare.

The research problem seeks to explore the extent to which current spatial planning frameworks and practices in Zimbabwe are failing to manage rapid urban development and the resultant manifestations of rapid change. Therefore, there is a need to carry out research which exposes the relationship between current development trends, challenges and planning practices.

1.4 The research questions

The research question is a two thronged assessment of planning practices and tools in Zimbabwe. The first part of the question is directed towards evaluating the capacity of current planning frameworks and legislation to appropriately respond and manage urban development. The second part of the question assesses the (in)effectiveness, in performance, of current practices. The main research question can thus be stated as follows:

What is the nature and extent of the (un)responsiveness of planning frameworks and practices to current urban development challenges in Zimbabwe?

Two interrelated sub-questions further streamline and define the specific areas of investigation. These sub-questions also bring in the context of the selected case studies into the purview of the research.

- What has been the efficacy of current planning frameworks as tools for managing urban development in Harare CBD and Epworth?
- What have been the main urban planning responses (practices) to the manifestations of rapid urbanisation processes in Harare CBD and Epworth informal settlement in the past 14 (2000-2014) years?

1.5. Research Objectives

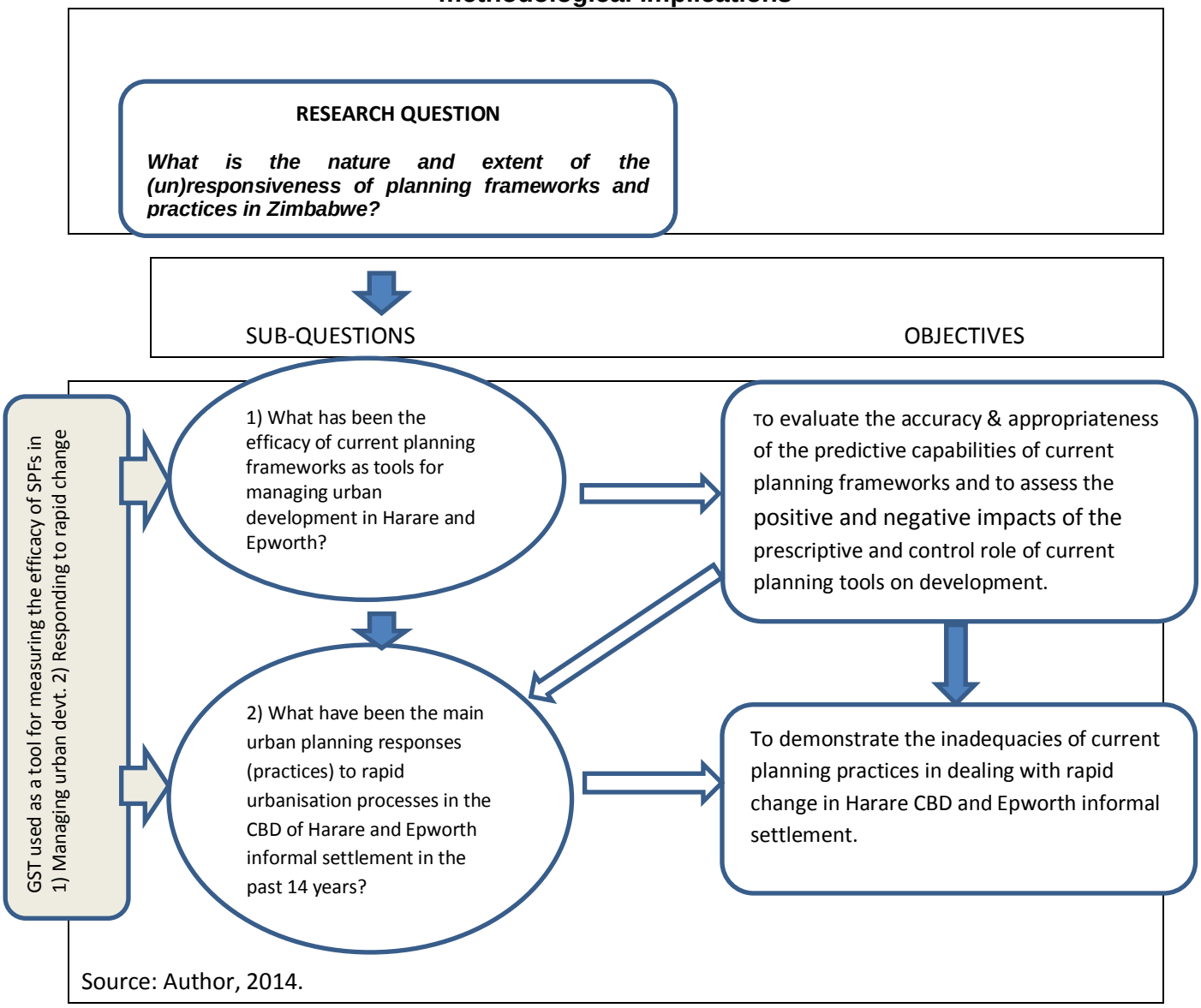
The research objectives justify the need to pursue the above stated research question and sub-questions. The use of two contrasting case studies in answering the research questions is meant to present the varying degree of planning responses in areas guided by different sets of planning frameworks designed for contrasting environments. The first case study is more linked to the first sub-question and the first objective because the area has more existing established planning frameworks and tools covering the central business district of Harare than is the case with Epworth informal settlement. The CBD case study therefore puts more focus on measuring the performance of current planning frameworks.

The second case study demonstrates the manifestations of failing planning practices in the face of rapid change and informality. The context for the study typifies incremental and reactive responses to urbanisation challenges.

The first objective is an evaluation of the accuracy and appropriateness of the predictive capabilities of current planning frameworks and an assessment of the positive and negative impacts of the prescriptive and control role of such planning tools on development.

The second objective seeks to demonstrate the inadequacies of current planning practices in dealing with rapid change and informality in Harare Central Business District and Epworth informal settlement. Figure 1.1 illustrates the inter-relationship between the research question, sub-questions, methodological implications and the tools used in carrying out the research.

Figure 1.1: Relationship between the research question, sub-questions, and methodological implications

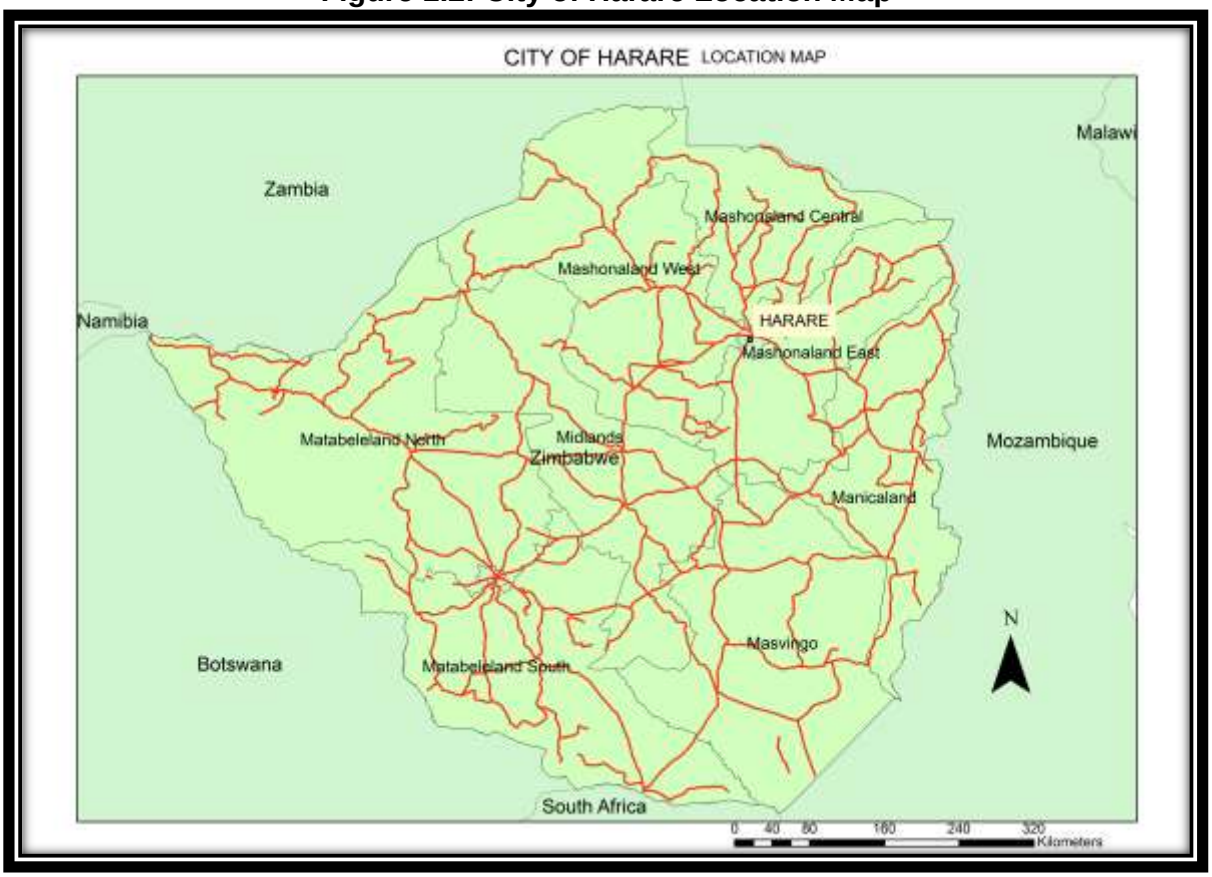


Source: Author, 2014.

1.6 Historical background and contextual analysis of the Study Area

This section presents a brief historical and contextual analysis of the case study areas. The case study areas are made up of two contrasting land use districts located in the greater Harare metropolitan area. Harare is the capital city of Zimbabwe and it is can be geographically located on the world map on geographical coordinates 31°1'46.92"E, and 17°51'49.68"S (see Location Map, Figure 1.2).

Figure 1.2: City of Harare Location Map



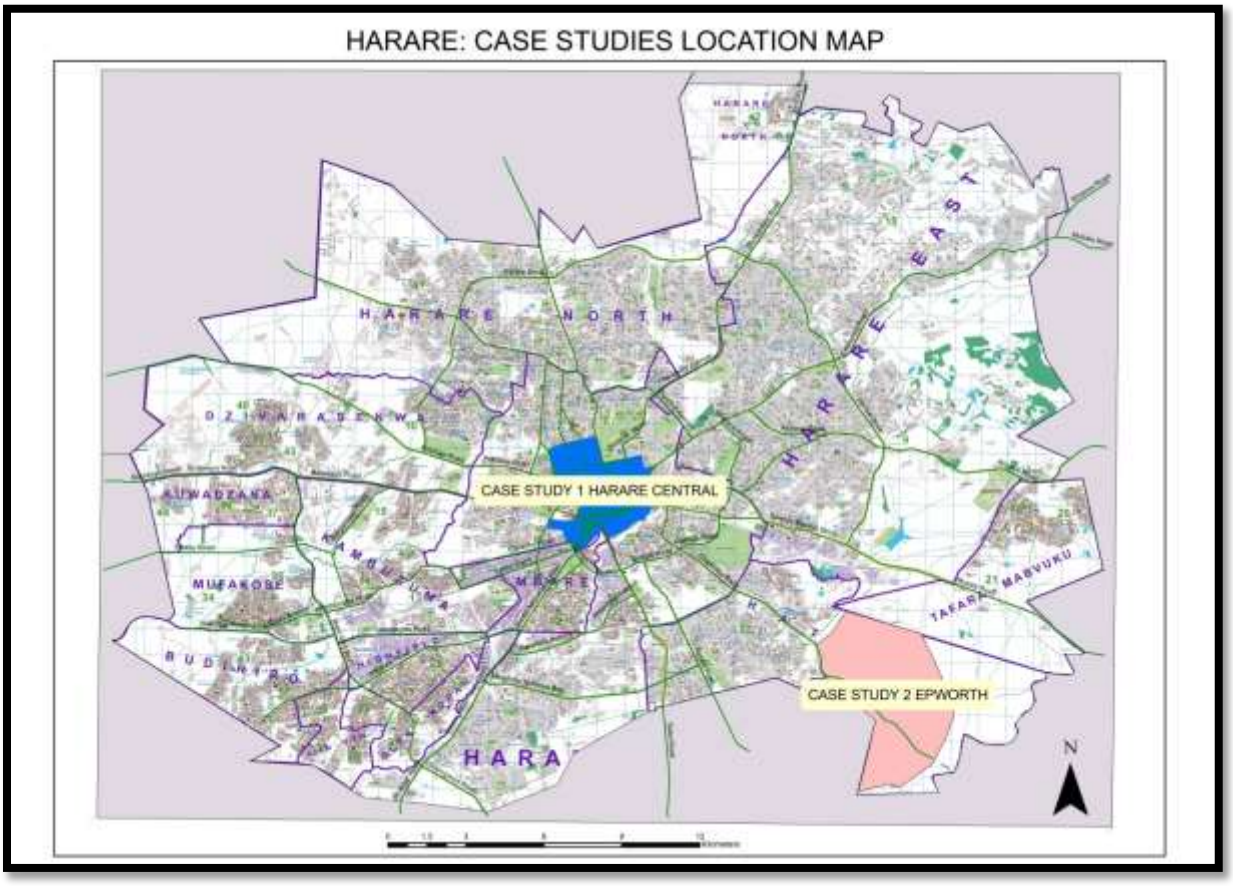
Source: GIS Data Depot

The city of Harare was initially established by British colonial settlers in 1890 and it was then known as Fort Salisbury (Wekwete, 1987; Toriro, 2008). The term fort was borrowed from the concept of fortified towns and cities in medieval Europe whose design was mostly influenced by the need to protect citizens from the vagaries of potentially hostile neighbours. In Harare, the fortification concept was applied through the use of well-defined urban edges such as main roads, railway lines and open spaces that separated communities according to their race and social status. Historically, Fort Salisbury was founded as the last of a series of strategic fortified settlements (starting from Forts Macloutsi, Tuli, Victoria and Charter) along trading routes that became the route of colonial occupation by Cecil Rhodes' 'Pioneer Column' that signalled the formal occupation of the Zimbabwe by white settlers and the creation of (southern) Rhodesia (Kay, 1970:39). The ideological concept which creates segregated settlements that are physically buffered by edges remains embedded in the design principles that currently guide planning in the city of Harare (Potts, 2006; Kamete 2009).

The city's historical development has since gone through considerable socio-economic and political transformations in the following manner: Firstly industrial development during the first half of the twentieth century brought about the need to control the influx of migrant labour from the rural areas when Influx control laws were introduced to curtail rural urban migration (Wekwete, 1987). Planning policies and legislation were mainly designed to prevent urban sprawl and to enhance European settler standards which were then mainly guided by form and functional considerations such as economy, convenience, aesthetics and functional efficiency. These planning values are still encapsulated in the preamble of the current Regional Town and Country Planning Act of 1976 which was marginally amended in 1996. The latter act sets the legislative framework for the preparation and administration of the current spatial development frameworks in Harare which include the Harare Combination Master Plan and a number of Local Development Plans.

The two case study areas are Harare Central Business District (case study 1) and Epworth informal settlement (case study 2). The CBD is centrally located and Epworth is located on the south-eastern side of the city (see Case study areas map Figure 1.3.).

Figure 1.3: Locality Map for Case Study Areas



Source: Surveyor General Zimbabwe

1.6.1 Study Area 1

Case Study Area 1 is an area covering the Central Business District of Harare and it is currently defined by the boundaries of the Central Area Local Development Plan Number 22 and Kopje Market Square Local Development Plan Number 17 (see map on Figure 1.3.). Both these plans were prepared after the country's independence and they were in some way seen as a means with which to rebrand the city as the country started to open up to the international community. Of particular note was the city's hosting of the Non Aligned Movement (NAM) conference and the Commonwealth Heads of Government (CHOGM) summit held in 1986 and 1991 respectively.

The Local Plans designated the whole area into distinct single land use zones such as shops, offices, institutions, road reservations and parking areas. Land use management in the area is guided by land use tables which specifically list the classes of permitted uses, non-permitted uses and uses that may be permitted with the local authority's "special

consent". The plans also stipulated the permissible bulk factors, site coverage, building lines, parking requirements and building heights.

Rapid urbanisation trends in Harare, however, brought about new forms of land uses and activities which were not forecasted in the preparation of the Local Development Plans covering the CBD area. Such activities include, the proliferation of informal sector businesses, the subdivision of large departmental shops into small shops and market stalls, high population increase, traffic congestion, a higher demand for parking space, informal touting, a phenomenal increase in the number of public transport vehicles passing through the city centre and a higher demand for public infrastructure facilities such as water supply and sewerage.

1.6.2 Study Area 2

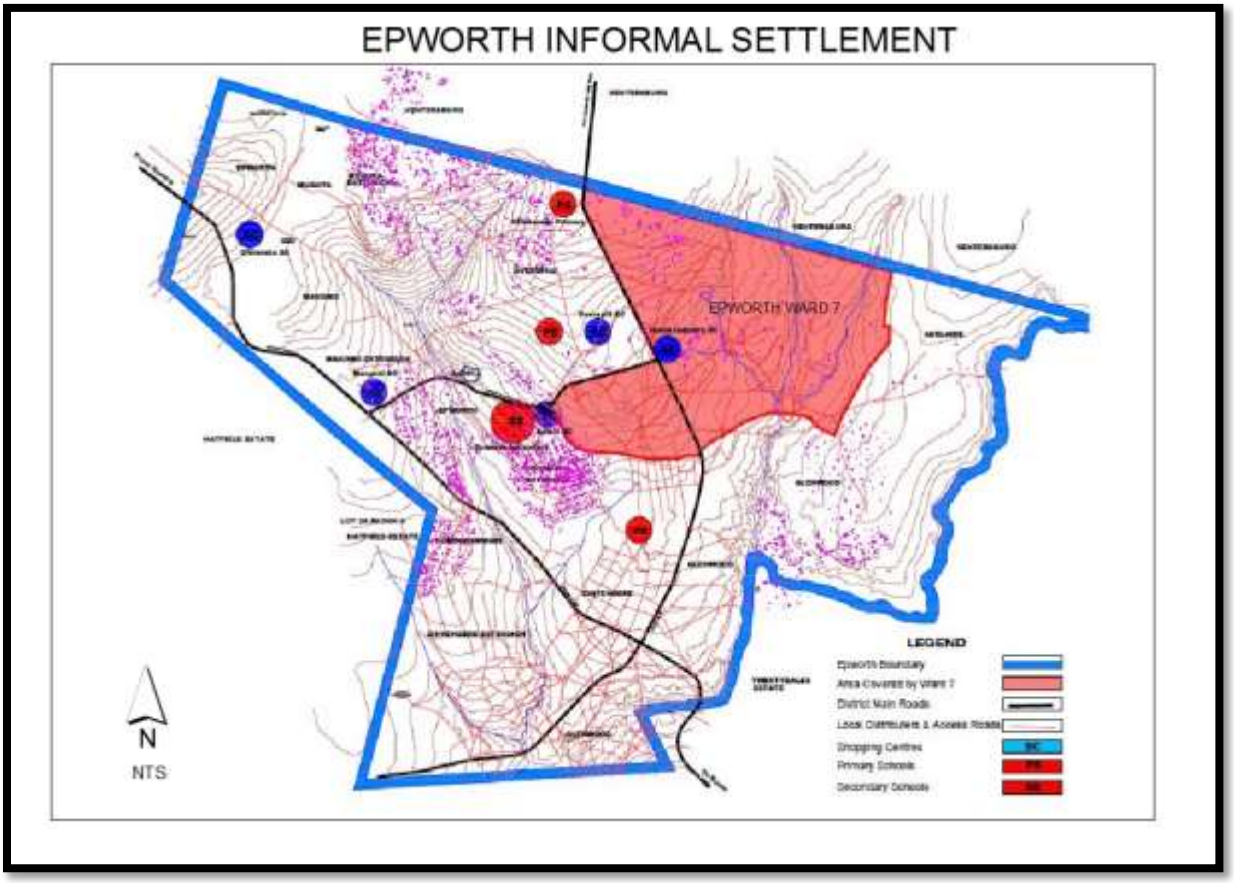
Case Study Area 2 is part of a large informal settlement located on the south-eastern side of the City of Harare. The boundaries of the area are defined by an administrative ward represented by a single councillor in the local authority area. The study area is known as Epworth Ward 7 and its location and extent is illustrated on the Locality Map on Figure 1.4.

Epworth is an informal settlement which is located 10 kilometres south-east of Harare city centre and it is home to approximately 130 000 people (Chitekwe-Biti et al, 2012). The settlement initially consisted of farming land that belonged to Methodist Church missionaries which was gradually occupied by refugees of Zimbabwe's war of liberation in the1970s. At independence the rate of occupation accelerated as more immigrants came to seek greener pastures in the city. Residential development in Epworth therefore remained organic (unplanned) since it mainly came into existence as a result of the developmental over-spilling effects of the City of Harare. The area is mainly occupied by low income earners and unemployed people who could not afford to purchase or rent residential properties in Harare.

The main character of this area is that it is currently realising rapid population growth and that most of its development was carried outside the provisions of any predetermined planning frameworks. Ward 7 was ideally selected for case study purposes because it went through a rigorous community initiated formal planning exercise in 2011 which sought to deal mainly with the issues related to securing tenure for the residents. A non-governmental

organisation known as Dialogue on Shelter for the Homeless People in Zimbabwe (DOSZ) actively assisted the community with the plan preparation process through data collection and GIS mapping. Particular interest in selecting the area for the case study is in assessing the manner in which both the planning authorities and the communities responded to the planning exercise in a non-formal set up.

Figure 1.4 : Epworth Informal Settlement Locality Map



Source: Author and Epworth Local Board 2014

1.7. Assumptions

The research makes the following assumptions:

Land use change based on GIS change analyses and remote sensing data is a more reliable indicator for measuring compliance and non-compliance with spatial plans.

The extent of departure from the prescriptive confines of planning frameworks denotes failure by planning authorities to manage urban development.

1.9. Significance of research

The main significance of this research lies in the fact that it uniquely tackles the rapid urbanisation problem with the idea of crafting technology-aided solutions to specific problems not only pertinent to the city of Harare situation but also relevant to other (southern) African cities facing similar predicaments. The approach also sets a framework for using GST tools in evaluating planning practices and performance in towns and cities that are characterised by rapid change and informality, more so in other southern African cities in countries such as South Africa and Namibia which have the following similarities with the city of Harare:

They were originally planned to exclusively serve the interests of the colonial settlers without taking into account the needs and the values of the indigenous people.

They either underwent or are currently going through processes of transformation which seek to redress situations of fragmentation and exclusivity created by years of racial segregation.

They experienced or are still experiencing rapid population growth due to natural growth, rural urban migration and the removal of colonial influx laws which served to limit in-migration into urban areas.

There is rapid and haphazard growth of informal settlements and informal businesses.

The democratisation of local governments, calls for the growing role of public participation in planning and the increased involvement non-technical players in decision making is also a common feature in southern African countries.

Most of the operative planning frameworks were originally crafted along the guides of the European cities and they are fast becoming ineffective as urban development and management instruments.

The local planning authorities for Harare and Epworth will directly benefit from the research in that it exposes the gaps and inadequacies of planning practices and processes in their own areas of jurisdiction. The research will act as a pilot for more comprehensive evaluation of the performance of urban planning frameworks in Harare and can also be developed into a standard tool and yardstick for not only measuring urban planning performance but

suggesting the emergence of new and effective planning and management practices and instruments.

The research also seeks to identify cost-effective and appropriate ways of developing Geo-spatial data bases for towns and cities in the developing world. This can be done through the appropriate use and digitisation of existing maps, plans, aerial photographs and cadastral data complimented with the use of cheaply available web-based mapping and satellite imagery. Such data bases could then be used to prepare the framework for GIS and remote sensing based urban development management practices. The study will therefore go a long way towards dispelling the assertion that “urban areas in developing countries do not use Geo-spatial technology (GST) because it is expensive to establish geo-data bases”.

Recommendations on the way forward could pave the way for further research and planning systems’ upgrading within rapidly urbanising cities. The applied research methods used in this research will demonstrate and test the significance of GST application to current and future urban development challenges.

1.10. Organisation of study and report

Chapter 1 introduces the research topic through some detailed presentation of background and context to the research problem. The formulation and presentation of the research problem, questions, sub-questions and objectives then follows. The context of the research, identification of research problem and questions and the formulation of objectives are also presented in this part of the report.

Chapter 2 is a critical review of the pertinent literature which is divided into three categories which are: 1) The challenges of Urbanisation 2) Spatial planning as an urban development management tool and the transformation of planning practice and 3) New innovations and the application of geo-spatial technology in planning. These three categories are reviewed from global, regional and local contexts and viewed chronologically according to their historical development. The literature review seeks to firstly give the researcher an insight into the subject matter, then secondly to identify the extent of existing research in area of study and it finally identifies the knowledge gaps that need to be addressed by this study. The review of literature also helps in streamlining the area of focus. The last part of the

chapter looks at the conceptual framework of the research. The chapter begins to define what Mouton (2009:114) described as the “key concepts and the theoretical validity” of the concepts discussed in the study. The theoretical framework brings together the theoretical relevance of the study topic and it also links the key concepts and the research methodology to the research problem. The measurement tools and performance indicators for spatial planning frameworks are laid out in this part of the study.

This dovetails into Chapter 3 which explains the research design and the methodologies used in carrying out the research. The chapter also gives details on the sources and types of primary and secondary data, the study time period, data analysis methods and tools used. Spatial data and demographic data are the main data sources used in carrying out the research. This section of the study also explains the sampling techniques used. Data analysis is mainly done using Geo-spatial technologies analytical functions. Some of the quantitative data is analysed with the aid of Micro-soft excel software.

Chapter 4 presents the findings of case study 1 as it mainly seeks to evaluate the predictive accuracy of current planning frameworks and to assess the impact of the prescriptive and control role of current planning tools on development. This chapter basically reviews the content and integrity of current planning frameworks in an environment that has been subjected to formal planning practice for some time.

Chapter 5 is grounded on the findings of objective 2 which sought to demonstrate the inadequacies of current planning practices in dealing with rapid change and informality in Harare. Findings on the study and performance management of current planning practices in Epworth informal settlement are presented and analysed.

Chapter 6 is a critical discussion of the findings of the research. It discerns the meaning of the findings and also presents conclusions that summarise the significance of the research in the context research to the objectives spelt out in chapter 1 and literature reviewed. The conclusion also makes a summary of recommendations of the study with respect to theory, policy and practice.

1.12. Chapter Summary

The chapter presents a background to the research problem by amply demonstrating that the founding principles that underscore current planning practices and frameworks in Zimbabwe were based on the values and experiences of the country's former (British) colonial masters. The city of Harare's original urban form was consequently influenced and shaped by foreign values. The social transformation which was ostensibly ushered in by political independence was not adequately complimented by corresponding reform in planning practices.

The chapter also observed the emergence of new forms of urbanisation determined by local and external factors which inter alia include rapid urbanisation, globalisation, technological advancement, policy variations, cultural diversity, de-industrialisation and rapidly changing investment patterns resulting in the continuing shift from the conventional predictable resource driven type of urbanisation to less predictable market-led types of urbanisation.

The focus of the study is clearly streamlined into two objectives. The first objective is an evaluation of the content of frameworks and it is also sets a performance management criteria.

The second objective places emphasis on measuring and demonstrating the actual performance of planning practice in managing urban development.

2.0 CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction and background

This chapter starts by outlining some of the major challenges and opportunities brought about by the processes of urbanisation and rapid urbanisation as presented by several authors on the subject. Arnal (2010:161) contended that “Cities are the greatest concentration of poverty, but they also represent the best means of escaping it.” The latter statement potentially summarises the urban development challenge in that it places the onus of transforming urban poverty into prosperity on the hands of urban development managers and it also identifies urban areas as the most appropriate context for socio-economic transformation.

The review on urbanisation draws upon the works of Knox and McCarthy (2005), Cohen (2006), Madanipour (2007), UN-Habitat (2009), UN-Habitat (2010), Cities Alliance (2012), and UN-Habitat (2013), to give a global perspective on urbanisation processes. We then zoom into the works of Robi (2011), Cummings (2011) and Potts (2012) for a regional and African perspective before finally looking at articles by Dewar et al. (1982), Munzwa and Wellington (2010) and Chirisa (2008), among others, for a localised Zimbabwean context. This part of the review is meant to bring a better understanding on the complex nature of urbanisation which is supposed to be managed by planning practice.

The study then moves onto exploring the role of urban planning in managing cities’ development by chronologically tracing the development and transformation of planning practice in response to the ever changing nature of urban development. The section critically looks at the internal and external factors that affect the practice of planning under the following sections:

There is a section on the aims, challenges and contradictions of town planning which explores articles by Hall (2002), Watson (2009), Faludi (2010), and Cities Alliance (2012) by discussing the different views and debates that characterise the theory and practice of planning with the idea of exposing the unpredictable nature of the subject.

The following section addresses the politics of planning as it mainly applies to the global, regional and local contexts (Harrison 1994; Colenutt 1997; Di Gaetano and Klemanski

1999; Cuthbert, 2006; Freund, 2007; Kamete, 2007; Kamete, 2009; Njoh, 2009; Chipungu, 2011; Kawadza and Chirisa, 2011).

Discussions on the impact of the terms/ policies of equity, inclusivity and exclusivity are reviewed through selected books and articles by Boraine et al. (2005), UN-Habitat (2009), Turok (2012) and UN-Habitat (2012).

There is another section which discusses the conflict which comes with the growing need to adopt people centred policies in environments that are heavily influenced by market forces (Blowers and Evans, 1997; Colenutt, 1997; Mattingly, 1998; Healey, 2007; Innes and Booher, 2010; Patel et al. 2012; Todes, 2012).

The last area of focus on the role of urban planning in development management discusses the impacts of the application of top-down approaches against bottom-up processes in planning and urban development (Fainstein and Fainstein, 1996; Taylor, 1998; Hall, 2002; and Pal, 2008)

The third part of the literature explores the innovations in planning practice with particular reference on the qualities, performance and relevance of the various tools, instruments, methodologies and technologies that have either been used and or are currently available for use in urban planning. The application of geo-spatial technology (GST) in facilitating the new planning approaches is given special attention in the review because it is the main approach and tool selected for evaluating the efficacy of planning practice in this research. Some of the works reviewed include articles by Van Den Brink, et al., (2007), Bhatta (2010), Silva, (2010), Wu, et al., (2010), Ryan (2011), Shen (2012) and Biti-Chitekwe, et al. (2012).

2.2 The urbanisation challenge

The world is urbanising at a fast rate and it is estimated that more than half of the world's entire population will be living in urban areas by the year 2025 (UN-Habitat, 2010). Africa has the highest rate of urbanisation and the lowest rate of economic development with Zimbabwe's rate of urbanisation expected to rise from 38.25% in 2010 to 64.35% in 2050 (ibid) - See table 2.1.

Table 2.1: Southern African Nations' Urbanisation 1950-2050 (%)

Country	1950	1960	1970	1980	1990	2000*	2010*	2020*	2030*	2040*	2050*
Angola	7.58	10.44	14.96	24.30	37.14	48.99	58.50	66.0	71.62	76.37	80.54
Botswana	2.72	3.06	7.83	16.48	41.93	53.22	61.13	67.59	72.69	77.14	81.66
Lesotho	1.35	3.42	8.61	11.45	13.97	19.97	26.88	34.55	42.35	50.21	58.06
Mozambique	2.38	3.67	5.78	13.11	21.10	30.69	38.43	46.27	53.70	60.75	67.39
Namibia	13.41	17.91	22.29	25.07	27.66	32.37	37.98	44.41	51.49	58.59	65.34
South Africa	42.23	46.62	47.81	48.43	52.04	56.89	61.70	66.56	71.32	75.68	79.57
Swaziland	1.75	3.91	9.71	17.85	22.91	22.64	21.37	22.29	26.24	32.52	39.50
Zambia	11.50	18.15	30.35	39.82	39.41	34.80	35.70	38.92	44.71	51.56	53.36
Zimbabwe	10.64	12.61	17.36	22.37	28.99	33.76	38.25	43.92	50.71	57.67	64.35

*Projections
Source: WUP 2009

These high increases in urban population are mainly a result of the combined factors of rural-urban migration and natural population growth in the existing cities. One of the biggest causes of rural urban migration is the widely held notion that urban life ushers in higher living standards that bring prospects for more jobs, higher incomes and access to better educational facilities, health facilities and other social amenities (Cohen, 2006). Knox and McCarthy (2005) and Arnal (2010) also observed that although cities are widely positively viewed as engines for economic growth and centres for cultural innovation and social transformation, they can also represent the greatest concentration of poverty, disease, social breakdown and environmental degradation. They further argued that the manner in which urban development is managed plays a significant role in shaping the resultant character and form of cities with the main challenge coming from a situation whereby the urban areas' capacity to absorb increasing populations is over-stretched to an extent where they cannot further support the increased populace with the expected jobs, housing, social facilities and infrastructural services. Although the above cited views all agree on the fact that rapid urbanisation/ population growth is real in the developing world, they do not seem to explore the possibility of such growth inversely determining the way with which cities should be managed. One is persuaded to argue that it is this growth which determines the form and character of the city in the developing world more than mere management practices.

2.2.1 Problems of rapid urbanisation

The origins of contemporary urban growth management policies and practices that are currently practised in southern Africa can be traced back to European and American countries which introduced laws and regulations which were essentially designed to protect society from the negative effects of unbridled market forces of industrialisation (which were the major drivers of rapid urban development) during the industrial revolution and the 'Fordist' development eras of the early to mid-twentieth century. Such effects subjected the low working classes into inhuman living conditions characterised by overcrowding, pollution, poor sanitation and housing shortages (Taylor, 1998; Di Gaetano and Klemanski, 1999). Modernist planning which gave birth to master planning that is currently practised in most colonial cities was therefore underpinned by principles of economy, convenience and physical beauty. This type of planning was described by Silva (2010) as being rather static,

anti-social and physical. Blowers and Evans (1997:153) similarly labelled the mode of town planning in colonial cities as having been "…essentially, local, physical, restrictive and negative aiming at orderly suburbanisation". Watson (2009) also affirms the fact that most contemporary urban development management systems practiced in Africa either owe their origins and or are still currently influenced by urban planning systems in Europe and other cities in the west. She however, criticised this form of planning for being insensitive to the realities of the African cities which are characterised by a fierce contestation for urban space between market forces and the poor. She further asserted that the main reason why poor communities end up locating in unplanned areas is that they will be seeking to avoid the costs associated with formal land regulations and servicing. The main point that clearly comes out of these observations point towards the need to come up with urban development frameworks that are proactive, pro-poor and inclusive. There is a clear mismatch between the needs and values of the urban poor (who ironically currently constitute the majority of urban dwellers in Africa) and the regulatory frameworks which manage urban development.

Similarly the city of Harare in Zimbabwe was originally designed to be a replica of European cities in the former colonial power's country Britain, catering for a limited number of white settlers (Dewar, et al, 1982; Freund, 2007). According to Myers (2011) infrastructure provision in the colonial city was used as a marker of inclusion and exclusion for the colonizer/civilised and the colonized/savage. He also contended that such cities were never designed to service the population that currently occupy them. In making an overview of the planning system in Zimbabwe, Munzwa and Wellington (2010) also reiterated that spatial planning frameworks and policies that were designed to manage the city's development were moulded on the British standards. They further claimed that the efforts of post-colonial governments to de-segregate the city only managed to replace racially based fragmentation with a socially based (class) type of fragmentation and exclusion of poor communities. The authors outline the source of the problem of fragmentation and exclusion in Harare but they fall short of proffering any solutions to the problems thus opening up scope for further research on the types of solutions needed. They are nevertheless a clear pointer towards the need for transformation of urban development management and planning thinking and practices.

Although inequality and fragmentation of urban settlements in southern African cities are widely considered to be a manifestation the racial segregation policies of pre-independence

governments, post-colonial efforts to appear globally competitive only served to consolidate the status quo as social class segregation systematically replaced the racial component (Turok, 2012). (UN-Habitat 2010) noted that southern African cities in particular have huge disparities characterised by world-class cities with market driven investments such as glamorous shopping malls, gilded entertainment zones, upper class suburbs, gated communities on one hand and over-crowded resource and services deprived townships on the other hand. There is fierce contestation for urban land which is highly skewed in favour of the elite who can afford the high rentals and purchase prices associated with the most prominent sites whilst the urban poor are often relegated to the most peripheral sites or the most physically disadvantaged areas such as wetlands and polluted areas. Harrison (1994) referred to a dual city concept which is characterised by the juxtaposition of glamour with decay where elite classes fully integrate with global forces to match first world city standards as the poor fail to defend their spaces. Cities have thus become arenas for the further marginalisation of the poor and that reflects poorly on the performance of planning practices which are theoretically supposed to be guided by the noble principle of protecting public interest and social justice.

Urban development in southern Africa was initially associated with either mining or industrial development and economic booms which in turn raised prospects for employment and better living standards. Changing economic factors, political instability and other externalities which inter-alia include globalisation, fluctuations in the value of local currencies and the competiveness of local economies against the global markets (Hague & Jenkins, 1997) have since reversed the socio-economic developmental role of cities. Post-colonial African cities are no exception to the latter phenomenon and they were consequently described "…as dysfunctional and dangerous", because the expected prerequisite rapid industrialisation and economic development failed to take place (Freund, 2007:142). Inevitably poverty and unemployment become rampantly associated with rapid urbanisation in developing countries as more people continue to flock into cities that fail to be self-sustaining in terms of jobs creation, infrastructure, housing and other social amenities (Cuthbert, 2006). Cummings (2011:5) likens African cities to patients suffering from the "late urbanizers' syndrome" whose symptoms are rapid urbanisation that is coupled with very low rates of economic growth. These cities are also credited with the urbanisation of poverty and bringing higher concentrations of poor people together.

Such situations have calamitous negative impacts which include environmental degradation (Cohen, 2006; Cummings, 2011) and the reduction of communities' capacity to contribute revenue towards service provision resulting in the reduction of the local authorities' financial and institutional capacity to manage development (Wekwete and Rambanapasi, 1994; UN-Habitat, 2010; Robi, 2011). Myers (2011) identified poor management practices as being chief among the factors that exacerbate the authorities' inability to solve urbanisation problems. Implicitly poor planning is part of such practices.

The growth of informal settlements on ecologically sensitive land such as wetlands, the wanton destruction of forest areas in order to give way to human settlements and provide cheap energy (firewood for cooking) increase the rate of environmental degradation by human settlements (Turok, 2012). Other environmental problems associated with rapid informal settlements growth are ground and water pollution caused by the cities' inability to provide adequate and proper sewage and solid waste disposal facilities. Crowded and over-populated settlements tend to over load sewerage systems and exhaust water supplies often leading to poor sanitary conditions which promote the spread of communicable disease epidemics such as the cholera outbreaks experienced in Harare in the years 2008-2009 (UN-Habitat 2010).

The failure by cities in most developing countries to provide adequate housing and employment opportunities for their growing populations has often resulted in the growth of informal settlements and businesses. Informality becomes a serious problem to urbanisation when city managers adopt attitudes of denial and policies of elimination (Cities Alliance, 2012). In Harare, the outright dependence on mono-functional zoning systems entrenched in the current planning frameworks was used to justify the ruthless destruction of flourishing informal sector businesses in the city (Kamete, 2009; Chipungu, 2011). The failure to adapt to change and the outright rigidity of master planning drastically contributed to the failure of urban systems in developing countries since societal values are constantly changing as the urban populations constantly invent new livelihoods strategies and survival tactics (Silva 2010). Again planning appears to be self-contradictory when it ends up victimising the same people that it is supposed to protect (Kamete, 2010).

Traffic congestion due to inadequate public transport systems, increasing distances to work and the growing numbers of commuters from peripheral settlements scattered around primate cities is another major source of urban development problems (UN-Habitat 2010). The energy shortages in Harare due to the constant breakdowns of the power generating

plants and the inadequacy of supply from the national power grid further dampens the prospects for meaningful economic growth since there is insufficient electricity to support the sustenance and growth of manufacturing activity in the city. Urban citizens are often left without any option but to ply on neighbouring forest areas in search of alternative sources of energy for cooking and domestic heating in the absence of electricity. Such practice grossly undermines the universally acclaimed goal for sustainable development (ibid).

Urban planning in developing countries is further inhibited by the unavailability and the unreliability of data used for planning purposes (Cohen, 2006: UN-Habitat, 2009). Potts (2012) argued that urbanisation rates in Africa are often exaggerated and inaccurate. She cited studies previously carried out by herself in Zimbabwe (Potts, 2010) and those carried out in contemporary sub-Saharan Africa by (Currey, 2010) which highlight case studies of some de-urbanising African cities and also further argued that the element of circular migration (representing a section of the population which actually moves back to the rural areas from urban areas) is prevalent and is not sufficiently captured in urbanisation projections. Nevertheless her observations expose the capriciousness of databases used for planning in most African contexts. Rapid land use change and land cover change caused by economic uncertainties strengthen the case for the need to have more reliable and up to date and easy to manipulate spatial data (Klosterman, 1995; UN- Habitat, 2009).

2.2.2 Opportunities of urbanisation

Rapid urbanisation can bring prospects for greater socio-economic transformation if well managed. According to (Robi, 2011) population growth has the effect of fuelling the economy with fresh supplies of labour and it improves economies of scale. He further argued that the increased demand for housing brought about by rapid urbanisation can present perfect opportunities for the expansion of the construction industry by creating larger markets for locally produced building materials thus leading to economic growth. He highlighted the issue of skilled labour influx into the areas being developed, marked increases in the revenue and tax base from formal employment and the increasing demand for construction equipment and furniture as the main benefits that are associated with increased housing construction.

Urban areas present the ideal context for proper land use management and environmental preservation. Madanipour (2007) argued that the only way that nature's land can be turned into a tool for humans who come together in large numbers is to segment space and assign

it a functional value in what he termed a city of reason where time and space are accounted for and used functionally. The allocation of value to urban land therefore stimulates the efficient and productive utilisation of resources. Planning's environmental management role was supported by Cohen (2006) when he suggested that the high population densities in cities minimises the effect of development on ecosystems because the actual footprint of settlements on the natural environment is restricted to defined urban boundaries.

Cities also provide modern living conditions, high employment opportunities, higher health standards, literacy and social mobility. The conglomeration of public amenities and infrastructure such as roads, electricity, communication networks not only has the effect of reducing the per capita costs of providing such facilities but also increases their accessibility to greater numbers of people (ibid.).

Similar views were previously raised by Knox and McCarthy (2005) who suggested that cities act as centres for technological innovation and they can also be used to prevent the further segmentation and occupation of agricultural land by human settlements since they can be capacitated to absorb increasing populations. All the above mentioned positive attributes of cities development tend to support the need to have a compact city concept which may only be achieved through a system which carefully monitors and manages urban development from the wasteful effects of sprawl.

2.2.3 Urbanisation and development management history of Harare

This section of the literature review is meant to bring about a deeper understanding of the contextual background of the case study areas. The city of Harare (originally called Fort Salisbury) was established as a small administrative centre in the southern African British colony of Rhodesia (current day Zimbabwe) by a group of British colonial settlers known as the Pioneer Column in 1890 at the foot of a kopje called Harare. According to Freund (2007) the town was established on an entirely new site which had not been previously occupied by native African people and therefore it can be typically classified as a colonial city. The prefix "Fort" appeared on the town's name because fortification was a notable and necessary element of the early colonial towns because of the perceived need to protect the white settlers from both physical attack and disease epidemics presumably from potentially hostile and disease-carrying natives (ibid.). The key design parameter for the early colonial city then was segregation and it was underscored by racial theories. Such a parameter

immensely contributed to the current form of the city which tuned and set the tone for current planning practises and frameworks.

The exclusivity of the colonial towns was further strengthened by urban design standards that aimed to match the standards in the colonial power's country Britain (Njoh, 2009; Lindell, 2010; and Kamete, 2012). Economic development due to increased agricultural production, mining activity and the establishment of manufacturing industries propelled the growth towns thus attracting local labour and other foreign immigrants. The settlers' desire to curtail the movement of undesirable non-white immigrants into cities saw the introduction of several influx control measures which culminated in the promulgation of the following pieces of legislation:

The Urban Location Ordinance of 1906 which stipulated that only the employed Africans could stay in urban areas.

The Natives (Urban Areas Accommodation and Registration Act) of 1946, insisted on restricting entrance into towns and cities by non-whites to permit-holding job seekers and wives with registered marriages only. The act also encouraged the provision of singles accommodation to workers by employers.

The Natives (Urban Areas Accommodation and Registration Act) of 1951 insisted on the registration of all non-white urban residents.

The Vagrants Act of 1960 which empowered local authorities to remove all unemployed black people from the cities.

Although the above stated 1906, 1946, 1951 and 1960 laws were subsequently repealed as the cities and towns failed to contain growth due to industrialisation and natural population growth, influx control measures remained in place in the form of housing control regulations and later through the enactment of the African Registration and Identification Amendment Act of 1972 requiring all Africans to carry identity documents at all times (Dewar et al. 1982).

It therefore follows that influx control played a very significant role in restricting and guiding urban growth during the colonial era. The successive planning acts and regulations that were enacted and invoked to manage urban development ruthlessly dealt with the already subdued threat of squatter settlements through removals and demolitions. The success and adequacy of the planning frameworks then was artificially aided by such racially motivated urban growth control measures - a view that was supported by Dewar, et al, (1982), who argued that although the influx controls had an effect in slowing down the growth of cities

and containing the possible menace of over-crowing, slums development and informality, they only managed to delay the problem.

The pace of urbanisation and economic development for Harare was accelerated by political influence in the period 1953-1965 during the Federation of Rhodesias and Nyasaland and in the period 1965-1979 during the Unilateral Declaration of Independence (UDI) by the Rhodesia Front government (Wekwete and Rambanapasi, 1994). The city of Salisbury (now Harare) was the federal capital and so it benefited from the Federations' bulk productive investment. Under the UDI era the country was subjected to international trade sanctions and the government adopted a policy of import substitution which was an introspective inward looking approach which boosted industrial activity through the establishment of local factories which locally produced goods that the country needed (ibid).

According to Munzwa and Wellington (2010) the post-independence era, following the 1980 attainment of political independence in Zimbabwe, saw the new government coming up with policies that attempted to de-racialise cities but only marginally impacted on desegregation of the spatial distribution of urban land and other resources. The removal of urban influx restrictions marked the beginning of a new era of rapid urbanisation that was not proportionally complimented by commensurate economic development. The urbanisation rate of the Zimbabwe increased from 5.01% in the period 1970-1980 to 8.62% in the following decade without corresponding rates for economic development (WUP, 2009).

The post-colonial urbanisation trajectory in Harare can be paralleled with the development trends that were experienced in the United States and Britain during the post second world war era. Cities such as Detroit Boston, Massachusetts and Michigan in the USA, and Birmingham and Bristol in the United Kingdom experienced massive suburbanisation of the middle classes into the peripheral areas which was coupled with the dispersal of retail, office and industrial activities from central business districts to shopping malls, office parks and industrial parks (Di Gaetano and Klemanski, 1999). Such economic function dispersal led to the impoverishment of inner city populations and the subsequent functional decay of urban infrastructures in the CBDs due to the urban local authorities' failure to collect adequate revenue (from disempowered communities) for service provision and maintenance (ibid).

Economic decline and political instability during the decade 2000-2010 led to a sharp increase in the level of informal business activity, as the capacity of urban local authorities

in Zimbabwe to provide basic services such as water, electricity and sanitation also diminished at a much faster rate.

2.3 Spatial planning in urban development management

2.3.1 The aims, challenges and contradictions of town planning

The discourse on planning theory is constantly entangled in debate surrounding the role, basis and context of planning. Although tradition views planning as a function of national governments whose application and thrust varies according to geographic and socio-economic contexts (UN-Habitat, 2009), more recent perceptions of planning practice consider it to be more of advocacy representing various interest groups and a mediating tool between governments and competing stakeholders (Chitekwe-Biti, 2013). In both the afore-mentioned roles it appears that political ideology, economic status and social values have a competing influence on the policies and practices that shape development agendas.

According to Hall (2002) the purpose of urban planning is to provide a spatial structure of activities and land uses which are in some way better than those that would obtain without planning. He however pinpointed the ambiguity of the dictionary definition of term planning which can either be a noun meaning the physical representation of an end product (a plan/ blue print) or a verb representing the means of achieving something. The ambivalence that is associated with the term planning is also reflected in the misunderstandings and the contradictions that are associated with planning practice. Urban planning is frequently entangled in weighing the importance of the means and process against the physical representation of the end product. Whilst Zimbabwe and a number of other developing countries still use the modernist ways of master planning that are more concerned with predicting and prescribing the physical representation of cities and towns through the production of end-state physical plans and control of development, the current strategic spatial planning approaches championed by international organisations such as the UN-Habitat, USAID, the Municipal Development Programme (MDP) and the World Bank propose a complete shift from controlling development to that of steering it (Cities Alliance, 2012). They argue that planning should be flexible rather than prescriptive and should focus on a few actions that steer development rather than be comprehensive.

Master planning as tool for urban development management presumably fails because it is static, finite and its implementation is mainly based on the assumption that it will be backed by a strong state with adequate public funding and effective control measures (Blowlers and Evans, 1997). Unfortunately the situation in Zimbabwe is characterised by a poorly

performing national economy and under-funded local authorities which are consequently under-capacitated to implement master plan proposals (Chatiza, 2010). The outright dependence on state institutions for urban development management therefore presents insurmountable challenges on such processes.

2.3.2 Planning power and politics

The influence of politics on planning was viewed as a major weakness of planning practice by Colenutt (1997) who declared that it tends to be guided by the ideology of the ruling party. The view was more radically echoed by Cuthbert (2006) who claimed that planning is fundamentally used as an instrument for class politics and a method for social control and liberation (Cuthbert, 2006). Other elaborate views on the same subject were raised earlier by Di Gaetano and Klemanski (1999) who came up with four possible governing agendas in development politics which are; pro-growth; growth control; social reform and caretaker. They argued that the pro-growth agenda reduces dependence on regulations, provides services and infrastructure, and promotes capital and skills development. This form of policy guideline gives less attention to growth control thus undermining the role of land use management frameworks and practices. Inversely the growth control agenda is described as being dependent on the use of planning and land use planning regulations to control the rate of growth and uplift environmental protection. The social reform agenda focuses on providing houses and social services to disadvantaged communities whilst the caretaker agenda seeks to reduce the role of governments in decision making to strategic decision making.

Although the influence of politics on planning appears universal, the selective use of planning controls and regulations to suit economic agendas appears more applicable to economic power houses that can determine their own development agendas than to the southern African context which mainly subscribes to the dictates of previous colonial policies and external economic influence by stronger nations and global markets. Turok (2012) cited the contradiction between the policies of equity and inclusivity pursued by the successive post-independence governments in southern Africa and the reality on the ground. Such policies remain empty rhetoric because economic externalities and separatist undertones imposed by preceding colonial governments remain embedded in current planning frameworks and practices.

The clearer picture though is the fact that foreign or locally directed political agendas have a telling influence on planning practices and policies. The major challenge to planning though is that it needs to incorporate the dynamism related to the political environment that affects it. Castells (1992) as cited in Harrison (1994) bluntly challenged planners to change in the face of a changing world. These views aptly support the need to develop urban management practices that can easily adjust to suit the development policies of the government of the day in a strategic manner that maintains the foci of planning initiatives.

In Zimbabwe, manifestations of rapid urbanisation such as informal settlements and businesses occupied and operated by the urban poor were used as a political tool by politicians who conveniently declared them as "untouchables" when they appeared to bolster the ruling party's support base (Chirisa, 2008). The development of backyard shacks and informal vending was apparently given a free reign in Harare and Epworth during the first two decades after independence in 1980 in spite of the existence of strict development control measures and regulations, when the informal community was perceived as a strong support base of the ruling party. The same informal structures were ruthlessly demolished and removed during a slum clearing programme code named "Operation Murambatsvina/ Restore Order"(OM/RO) of 2005 when their occupants ostensibly switched their political allegiance to opposition parties. The government and urban local authorities used the operation as a demonstration of force and control by conveniently invoking the power that was bestowed upon them by colonial planning laws and regulations (Tibaijuka, 2005; Potts, 2006; Kamete, 2009; Chipungu 2011). The three authors vividly portray the Zimbabwean experience as a clear demonstration of how planning controls can be clearly manipulated to facilitate and suite political agendas.

2.3.3 Equity, inclusivity or exclusivity

UN-Habitat (2009) highlights the achievement of socio-spatial equity and sustainable development as being central to the role of planning. Other definitions of urban planning are however more concerned about the need to control the production and reproduction of profit from development in the allocation of space for the collective consumption of social goods (Cuthbert, 2006). These two views perceptibly demonstrate the interchangeable shift in emphasises by planning to suit its different social, environmental and economic roles.

The terms equity and inclusivity are interchangeably used in the quest for social justice in planning. The achievement of true equity is seemingly utopian in market-led development approaches advocated for by the capitalist players who predominantly champion the cause for cities as centres for economic development. They therefore prefer the use of the nimbler term “inclusivity” to replace the more radical term “equity” spearheaded by social justice movements representing poor communities. The interchangeable use of these two terms in setting planning agendas can only exacerbate the ambiguity of the role of planning in development processes.

There is a patent conflict between the social objectives of planning and the inherent out-dated (market) principles guiding current planning frameworks. Traditional planning approaches are still based on the principles of physical functionality and aesthetics which translate and culminate into single land use zoning, and the fragmentation of space in a manner that promotes social class segregation which is often branded as “exclusivity” in business and marketing terms (Turok, 2012; UN-Habitat, 2012). The need to preserve property values and the enhancement of the functional efficiency of business and its supporting infrastructure play a crucial role in influencing the content and outcome of such spatial development frameworks, particularly in situations where cities aim to attain the competitive city status driven by the urge to attract foreign investment, tourism and global competiveness (UN-Habitat, 2009). This obsession with the need to maintain aesthetically pleasing physical appearance of cities results in further exclusion and marginalisation of the poor who end up moving into the less regulated peripheral areas of the city resulting in urban sprawl. It is therefore quite clear that the planning quagmire remains entangled between the principles of equity, inclusivity and exclusivity.

2.3.4 People-centred versus market-centred approaches

Blowers and Evans (1997) emphasised the importance of town planning in dealing with contemporary urbanisation as that of remedying malfunction through creating ideal conditions for harmonious living, beauty and convenience. They however admitted that ideals and reality rarely coincide because the outcomes of planning activity are heavily influenced by property owners, the educated and the articulate middle class. Therefore the notion that purports that value based planning activity yields just ends cannot go unchallenged because a process that is susceptible to being entirely driven by the socio-

political and economic status of individual groups of people cannot be impartial. Town planning is according to Colenutt (1997) torn in between the concerns of the people and the property market and it ultimately represents a value system that places markets above people. Property market objectives mean very little to the disadvantaged communities and in most cases they worsen the quality of life of poor people (ibid).

The global push for the transformation of government to governance urges the participation of all stakeholders in the planning process. Harrison (1994) simply described urban governance as a shift from managerialism concerned with the provision of services and social facilities to entrepreneurship which has more focus on promoting local economic development. One sad outcome of such a process is the fact that powerful real estate developers and speculators are the ones who emerge as the most influential participants equipped with the necessary resources and power to influence the outcome of planning processes. Healey (2007) argued that economic competiveness trumps all the other forces that purport to have a stake in governance while singling out the environmental movement as the only other force that posed some formidable challenge to that status. The pursuit for social justice is according to Healey (2007) much more than the even spread of resources but should imply the total eradication of exploitation of some social groups (mainly the poor) by others (such as the capitalist elites). In planning terms the spatial manifestation of social justice seeks to engage and empower citizens in poorer communities to get greater attention and better access to resources (ibid).

All the literature cited in the previous paragraph points towards concluding that modernist planning approaches suit the private developers' agenda whose key motivation is profit making more than the strategic spatial planning approach which advocates for the adoption of pro-poor policies. Todes (2012) criticised master planning for failing to understand the dynamics of economic and social change in rapidly urbanising developing countries. For instance, the production of master plans is a state funded activity whose implementation is also funded by the state such that governments end up providing infrastructure for the benefit of private capitalist elites only. The provision of major infrastructure services in cities in terms of master plan proposals is usually sponsored by the state without anticipating the role of private property markets and the possible impact of such activity on land values. Profit making private businesses such as upper class shopping malls, gated communities

and industrial parks tend to locate along major traffic routes and infrastructure trunks resulting in the further marginalisation of poor communities who end up moving to more affordable peripheral sites that have lower land values. As such government efforts subsidize the well to do capitalist enterprises at the expense and the peril of the urban poor. The failure by planning systems to link infrastructure provision to land use zoning which protects the poor is consequently highlighted as a major planning weakness (Todes, 2012).

UN-Habitat (2009) observed that the business sector out-manoeuvres all other social groups in the quest for participation in planning and development since it has more resources and better access to financial institutions to protect its interests. Governments are consequently pushed into compromising their pro-poor policies because they are coerced into public-private partnership (PPP) deals by unscrupulous dealers disguised as genuine partners in service and infrastructure provision (ibid). Although PPPs are a welcome means of forging participation in development they often neglect the principles of social inclusion, equity, sustainable development and service provision because the private sector partner is motivated by the capitalist objectives of profit making. This goes to support the assertion that such development approaches do not fully accommodate community values and priorities, and therefore reduce the poor access to urban space.

Innes and Booher, (2010) argued for more representative participation through a process called collaborative planning. The collaborative planning approach propounds a face to face dialogue involving all stakeholders who have conflicting perspectives. They argued that such an approach yields consensus, brings more legitimacy to decisions and it eliminates the problem of fragmented governance.

It therefore appears that the problem of participation is not so much about its absence, but more about lack of equal opportunity to participation and unequal influence on the planning process.

2.3.5 Top-down versus bottom-up processes

Tugwell (1939) as cited by Pal (2008) outlined the origins of town planning in the late nineteenth century as having been underpinned by the belief that planning could only be carried out by expert planners who were trained to mediate scientific knowledge and action, and that ordinary people could not match that scientific mind. Planning was therefore

perceived as a scientific process of producing comprehensive plans. The scientific approach was further consolidated in the USA where scientific decision making technologies popularly known as cybernetics (control and guidance of complex systems) were later developed in the mid-twentieth century. Such top down approaches to planning remained deeply entrenched in planning processes and planning education to such an extent that they still have a telling effect on contemporary planning practices (Hall, 2002).

The model of democratic participation which advanced the idea of citizen participation was mainly incorporated into planning in the 1960s and 1970s when the wave of democracy that swept across Western Europe and the USA started viewing town planning as a political process whose objectives could only be determined through value judgements (Taylor, 1998). Socialist perspectives of urban governance also challenged the role of urban planning in asserting the authority of capitalists over the working classes (Marx and Engels, 1959).

In Britain the idea of the public participating in the formulation of planning objectives and policy was intimated through the “Skeffington Report” of the planning advisory group which was instituted to give an input into the Town Planning Act of 1968. The report proposed a model of participation which worked within the existing framework of representative democracy and an improvement in the sharing of information between planners and the public (Taylor, 1998). The report recommendations fell far short of the kind of citizen empowerment anticipated by Arnstein’s ladder of citizen participation (Arnstein, 1969). It is however, important to note that the current Zimbabwean Regional Town and Country Planning Act of 1976 (amended in 1996) was almost a replica of the British Act of 1968 and its provisions for public participation are a reflection of the “Skeffington” report. In the USA planning was roundly castigated for failing to understand the way cities functioned by authors like Jacobs (1961) and Alexander (1965). Table 2.3 gives an overview of the types of processes that have been applied to planning as expounded by Fainstein and Fainstein, (1996).

Table 2.2 TYPES OF PLANNING PROCESSES AND APPROACHES

TYPE	TRADITIONAL	DEMOCRATIC	EQUITY/ADVOCACY	INCREMENTAL
Political Theory	Technocratic	Democratic	Socialist	Liberal
Who Plans?	"Expert" planners	"The public". In practice those who can advance their interests.	Planners and communities advancing the interests of the poor, racial or ethnical minorities.	No planning. Policy makers weighing marginal advantages of limited number of alternatives for short run.
Type of Process	Top down	Participatory; allowing "all" voices to be heard.	Bottom up or representative. Participation (of excluded groups) is an ideal but not a necessary condition.	Step by step, working out compromises among a multitude of interests. Atomised decision making.
Objectives	Rational, scientific Planning.	Process (who governs?) more important than results. Acting in the public interest: rule of the majority.	Results (who gets what?) more important than the process. Increasing equity. Examining distribution of costs and benefits.	Small or incremental changes from existing policies.
Conflicts	Planners are not free from class or special interest biases, so they end up serving particular social interests generally fitting the predispositions of the upper classes	Popular will may conflict with the interests of deprived groups. Dilemma: is there a genuine democracy without representation of interests of typically excluded groups?	Equity planning is not always democratic, since it will favour distributional goals even in the absence of supportive public.	Ends and means are not formulated, so decision makers may not work out means to achieve socially desirable goals. Strategies to cope but not to solve problems.

Source: Fainstein and Fainstein, 1996. As elaborated by Irazabal, 2005:60.

The analysis on table 2.2 also relates planning and development approaches to political ideologies and it gives a clearer illustration of the weaknesses of such approaches. The other most significant row on the table is the one which identifies the possible conflicts in all the different planning approaches. All such conflicts relate to different values by different interest groups thus underlying the need for conflict mediation in planning.

Pal (2008) contended that there is a current growing awareness and acknowledgement among development and planning practitioners that there is a need to empower communities in the process of decision making so that planning outcomes reflect the actual values and norms of targeted communities. Differences on the approaches used in the planning process have a significant bearing on the values reflected in the plan outcomes.

Examples of bottom-up processes are reflected in the planning approach used by Slum Dwellers International (SDI) which is a network of poor urban communities existing in 33 countries. SDI adopted a pro-poor approach to politically negotiate and resolve the concerns of informal settlements' dwellers on issues relating to land tenure, housing, livelihoods and service provision. SDI affiliated communities in countries like India, Kenya, Namibia, Zimbabwe and South Africa have effectively undertaken self-enumerations, settlement profiling, vacant land surveys and mapping exercises. Members were trained to use spatial and visual maps with the aid of Geographical Information Systems (GIS) to produce plans for their local areas which were later adopted by responsible authorities as acceptable bases for informal settlement upgrading programmes (Patel, et al. 2012). The bottom-up planning process is seemingly very appropriate for the successful implementation of pro-poor development strategies. The main set back in to the adoption of that approach in Zimbabwe though is that it lacks the legislative and institutional support of current spatial planning frameworks (Chitekwe-Biti, 2012).

2.3.6 Current master planning and economic planning approaches in Zimbabwe

This section makes an analysis of the legislative part of the Zimbabwean Regional Town and Country Planning Act (RTCP) that currently provides for the preparation and specifies the content of urban Master Plans (Zimbabwe, 1996). Table 2.3 summarises the process and content of master plan preparation as specified in the current planning legislation. The RTCP act which was crafted in 1976 and marginally amended in 1996 does not in any manner seem to relate to the economic policies of the country. The successive policies of

the post-independence government started with the “Growth with Equity” policy statement which highlighted the need to promote equitable development and poverty eradication through trickle-down. The current economic policy known as the Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZIMASSET) similarly acknowledges the need to promote equitable development and sustainable development (Zimbabwe, 2013). Contrastingly an analysis of the master plan preparation process outlined in table 2.4 shows that the process is still wrought with rigidity, lack of consultation and it still promotes the maintenance of exclusive colonial standards which further continue to marginalise poor communities. Economic policies and planning frameworks are therefore perennially incompatible and contradictory, thus leaving space for manipulation and abuse by politicians who selectively invoke laws and regulations that suit their immediate agendas (Chirisa, 2009).

Table 2.3: An Analysis of Part IV of RTCP ACT (Master and Local Plans)

SECTION	SUB-SECTION	CONTENTS	COMMENT
13. Study of Planning Area	1)	Local authority (LA) studies planning area looking at factors that it considers likely to affect development	Traditional *Geddesan approach: Survey-Analysis-Plan
	2)	LA consults with neighbouring LAs when studying or reviewing areas under their jurisdiction.	No direct consultation with the public. Therefore limited public participation.
14. Master Plan	1)	LA decides to prepare master plan or may be directed by Minister to do so.	Top-down decision making process.
	2)	LA formulates polices regulating land use, buildings, environmental conservation, economic development &traffic movement. Set out relationship of proposals to neighbouring areas. Relate proposals to study.	Rigidity entrenched in blue-print planning approach. Expert-driven goal formulation.
	3)	LA consults neighbouring LAs & other statutory bodies with regards to coordination of policies, compliance with study. Comply with regional plan of area. Give regard to economic development & natural resources. Carryout phasing.	No public participation. Expert driven plan preparation.
	4)	LA indicates & gives priority to areas earmarked for comprehensive development.	No obligation to relate to community values or economic dictates.
	5)	LA prepares master plan written statement together with a proposals map.	Rigid end-state blueprint planning.
	6)	Master can include proposal on neighbouring area outside LA boundary.	Complete disregard for local community values.
15. Publicity	1)	LA may take steps to consult who so ever they wish to on master plan proposals.	Non-obligatory informing exercise which is neither consultation nor participation.
	2)	LA adopts own master plan and places it on public exhibition for two months. Calls for objections or representations.	Informing exercise which is neither consultation nor participation.
The16. Submission & determination of master plan	1)	LA submits draft master plan, report of study & report of objections, representations to Minister.	Top-down decision making
	2)	Minister may return draft for additional information and/or more publicity	Minister not free from personal bias on issues.
	3)	Draft master plan re-submitted to Minister. Minister may refer objections to Administrative Court for determination.	Only the affluent objectors can afford legal representation. The poor remain marginalised.
	4)	Minister makes decision to approve master plan and specifies date it comes into operation.	

Source: Author, 2015.

*Geddesan approach: Planning approach proposed and made popular by one of the 20th century post Second World War British planning founders of modernist planning Patrick Geddes which consisted of three fundamental stages in the planning process which are survey $\rightarrow$ analysis $\rightarrow$ plan.

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An analysis of the Zimbabwean Master and Local Planning process outlined in Table 2.3 shows that current planning processes mainly use a top-down approaches since the local authorities and the minister responsible for planning are the ones who have the ultimate say in determining the need to prepare the plans and are also mandated with the responsibility for formulating development policies and setting plan objectives.

Public participation is mainly left to the discretion of the preparation authority thus subjecting the value of participation to the biases of the planning experts and elected officials only. The Local Authorities are also given the power to choose who to consult in the planning process. The public can only make comments on ideas that would have been predetermined by the LAs and they do not have the power to effect any amendments to such ideas since such powers are vested with the minister. The only other option available for the public to suggest changes to draft plan proposals is through appealing to the Administrative Court. The procedure is elitist in that the poor communities can hardly afford the legal costs associated with litigation. The Administrative Court is literary an arbiter of administrative rules and less of substance or deep process as the critique of participation in planning literature suggests.

The planning act also clearly stipulates the expected contents of the planning process which have to be a physical blue print in the form of a proposals map tied to a set of policies to guide implementation in a given time frame. The current process is therefore wrought with rigidity since the sections which deal with possible amendments to the plans are almost as cumbersome as the preparation process itself.

2.4 New innovations and the application of Geo-Spatial Technology in urban planning systems

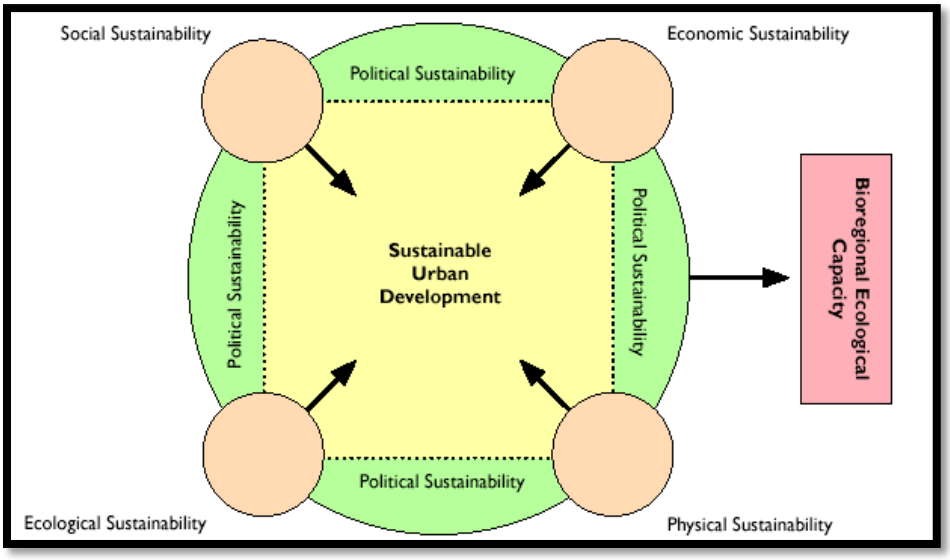
The need for new innovations in urban planning systems is justified by Collie (2011) who claimed that there is a growing tension between the views of the city practitioner and the city itself as viewed from street level. The meaning of space from the panoramic eye of the planner is described as being totalising and utopian in that it aims to fragment the heterogeneous nature of everyday life. Urban planning can no longer be the outright prerogative of individual expert planners but should be a concerted effort that integrates the

views of different stakeholders and the dictates of an assortment of other economic, socio-cultural, political and environmental factors that influence development (UN-Habitat, 2009; Innes and Booher, 2010).

2.4.1 Strategic planning to attain sustainable development

The meaning of sustainable development in urban planning translates in the making of cities that are liveable, productive and inclusive (SACN, 2007; UN-Habitat, 2009). Some of the principles that underscore the sustainability of human settlements include democratic governance, environmental performance, social security, and market reforms in the housing sector (UNECE, 2008). According to Allen and You (2002) urban sustainability can only be achieved when development objectives are formulated in a manner that evenly balances socio-economic, ecological and physical factors in a politically enabling environment (see figure 2.1). Urban planning therefore assumes an integrative role that consequently places a challenge on the quality of its tools and methods.

Figure 2.1 The Five dimensions of Urban Sustainability



Source: Allen and You (2002).

This section reviews literature on the qualities and the types of planning responses that are needed in order to adequately achieve the sustainable developmental goal of cities.

The use of information based technologies such as the internet, geographic information systems and virtual reality (e-planning) is a trendy development in urban planning which should not only be viewed as a mere shift from paper based to computer based planning

systems, but as a positive development that is employed to introduce better participation, communication, efficiency and integration in the transformation of spatial planning from being a mere physical planning process to a sustainable development planning process. Silva (2010) singled out e-planning as having the unique advantage of being able to integrate different information technologies as well as promoting interaction amongst multiple urban stakeholders. He however acknowledged that e-planning should not be misconstrued as a value neutral professional activity since it is a tool that can be manipulated (by elites) to reflect societal values and judgements. The other roles of e-planning suggested by the same author are that of on-line planning services. Examples of such services can include the use of the internet in communicating pre-planning advice, electronic on-line submission of planning applications and on-line consultations, commentaries and complaints about planning decisions. Such services can provide immense savings in terms of time and costs to both the planning authorities and the public.

Musakwa and Van Niekerk (2013) proposed the development of a decision consequence analysis (DCA) model for sustainable development which accurately captures and allocates costs such as environmental damage, pollution and land consumption. In their study of land use processes in the town of Stellenbosch in South Africa they demonstrated how Earth Observation (EO) or Remote Sensing (RS) data and GIS can be used to develop a DCA process that assists in the simplification of sustainable land use management. Complex problems such as sustainable development are increasingly broken down into smaller units that allow particular components to be accurately analysed within the context of the overall problem. That particular study is a demonstration of how the contents and the accuracy of planning frameworks can be improved through the use of GST. Although the use technology goes a long way towards lessening the burdens associated with detailed manual analyses in determining social costs, its application should be mainly restricted to that of aiding decision making which still remains the prerogative of societal values.

In arguing for more strategic approaches to urban planning Cities Alliance (2012) claimed that the processes that drive urbanisation have gone far beyond the reach of Local Authorities' control, since it has been reduced to a contest for space between market forces and the low income households. In such a situation planning assumes a political and

mediatory role which seeks to orient and maximise on opportunities heralding a complete departure from the traditional control role of conventional modernist planning.

2.4.2 Computer Based Public Participation

There are three factors which apparently invariably affect the level of public participation in computer based planning which include limited access to computers; low levels of computer literacy and poor appreciation of geo-spatial technology. Silva (2010) argued that most of the present resistance to information and communication technologies is due to weak digital literacy which will eventually diminish and disappear when all analogue systems of communication are inevitably replaced by digital ones. The increased use of mobile phones in both the developed and the developing world is also cited as an important contributor towards the appreciation of digital technology. He went further to suggest that mobile phones can easily be turned into tools for citizen participation in communicative planning. That notion is supported by Bhatta (2010) who noted that the continuous advancement in the manufacture of computers and GIS software will continue to have a price reduction effect which will eventually improve the availability of computers and geospatial technologies to even the poorest of communities.

Members of the public fail to make meaningful comments and contributions towards spatial planning because most plan presentations are made in two dimensional plan-views resembling what would be seen from an aeroplane or a map which hardly has any meaning to untrained public eyes which prefer to judge the landscape from what they perceive at eye level view (Ryan, 2011). Increased sophistication in digital technology provides for the generation of three dimensional (3-D) images, digital elevation models (DEMs) and a variety of other visual tools that better represent the landscape as people perceive it (ibid.)

In supporting the use of computers in public participation, Wu, et al. (2010) suggested the publication of 3-D drawings on the internet using the more easily available ***"pdf"*** digital formats. They further argued that the internet is one of the best ways of sharing planning information citing IWS (2009) which claimed that the number of internet users in the world exceeded the 1.6 billion mark by the year 2009. The integration of globe-visualisation technology with web-service technology is also portrayed as a stimulant which arouses public interest to participate through its visualisation capabilities which include the zooming in from a macro-view of the whole city to the zooming out to a micro-view at window level.

The application of internet based participation however remains selectively context-based to suit the targeted user populations in the developing world which still has poor communities that neither have access to personal computers nor public internet facilities. Perhaps the linking of attitudinal research with spatial references as suggested by Ryan (2011) comes into play on making decisions on where and how to selectively apply technological public participation methods. He suggested exploring ways of linking social relations, values and attitudes to spatial patterns that are geo-referenced as way of coming up with spatial plans that truly integrate social and ecological values.

2.4.3 Technology-aided plan preparation techniques

Cities Alliance (2012) and UN-Habitat (2012) suggested that one of the most effective methods of evaluating plan performance is that they have to be made simple and clear enough to be understood by all. In visual terms the representation of spatial data through geo-visualisation and geo-simulation techniques goes a long way towards presenting spatial plans in a way that can be easily understood by non-technical stakeholders such as city councillors, ordinary citizens and business representatives (Shen, 2012). Other suggested geo-visualisation methods include overlaying geo-referenced plan proposals on Google Sketch-Up, or Google Earth images as a way of improving the residents' understanding of the relationship between the plan and the historical landscape.

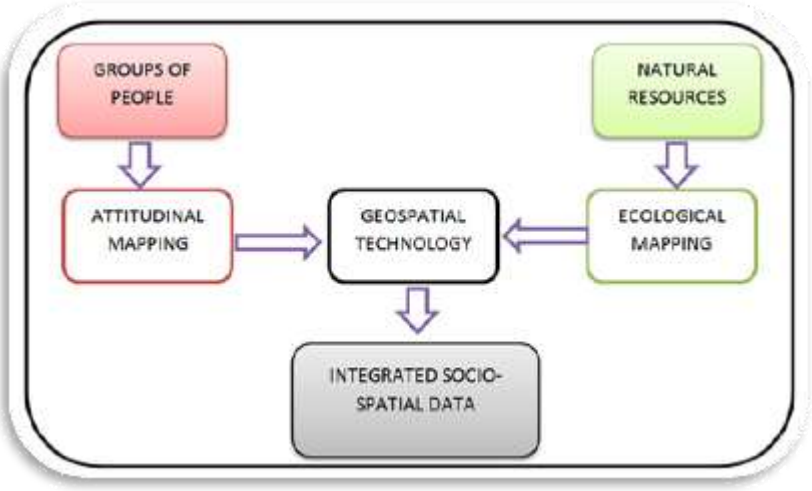
The normative principles for guiding urban planning towards the achievement of sustainable cities development suggested by UN-Habitat (2009) include i) the ability to recognise and respond to current and impending environmental and natural resource issues; ii) the ability to be flexible and to act on opportunities presented by informal practices and groups and community based groups; and iii) the ability to recognise and respond to cultural, socio-economic and spatial diversity at all scales. These three principles tend to support the use of GST in planning which has the proven ability to improve integration, communication, inclusivity and adaptation to rapidly changing situations.

Shen (2012) suggested the use of Urban Growth Planning Support Systems (UG-PSS) as a quick and efficient method of carrying out urban growth control analysis. The (UG-PSS) tool is described as being capable of solving complex urban growth environmental problems through the integration of multi-disciplinary knowledge such as flooding control, eco-zone protection, noise prevention and disaster prevention. He cited the successful application of

(UG-PSS) in Beijing which is one of the world most populated cities where over sixty growth control factors were included in the study of urban growth conditions. The system is also used as a tool for retrieving ecological data from aerial photography and it applied the Cellular Automata (CA) system for simulating land use change using irregular data parcels. CA simulation has a proven ability to track and contain urban sprawl thereby capacitating the urban planning system with the necessary information to control the consumption of land resources and the achievement of increased social equity in development. One definite advantage of using the CA modelling system over that of out and out fieldwork is that it uses existing historical data sets to simulate future urban forms thus attaining significant savings in terms of time (ibid).

Ryan (2011) argued that there is a dire need to understand environmental changes from a human perspective as it helps planners to better understand the reasons why and how the environment is changing and this can only be achieved through a system that allows researchers to map public perceptions on the landscape in a manner that can be easily linked with other ecological models such as bio-diversity and water quality. According to Ryan (2011) the other main strength of using geo-spatial technology in social planning is that it can bridge the gap between the individual as a unit of research and their spatial location as another. This is made possible when terrain models that indicate areas of strong support for development proposals and low points for particular views are mapped and geo-referenced to match topographic and cadastral maps (see figure 2.2).

FIGURE 2.2. Using Geo-spatial technology to link socio-economic data with ecological data in space



Source: Author 2014.

2.4.4 The time factor in spatial planning

Urban development occurs within an environment that is constrained by time, space, meaning, value and action (Madanipour, 2007). The latter author highlighted the significance of the relationship between time and change arguing that all urban functions are explicitly planned according to a system of time. He supported his argument by claiming that space has to be treated with extreme care because it is a finite resource and one such method of achieving that is through the use of accurate measurements. Time is essentially described as the fourth dimension of measurement. The importance of the time element is reiterated by Silva (2010) who criticised master planning in the developing world for being a lengthy process which is often over-taken by rapid development to an extent that plans get out-dated before their formulation is complete.

The normal practice of master planning in Zimbabwe is divided into two fundamental components consisting of a study and a written statement that are both accompanied by a static proposals maps (Zimbabwe, 1996). The study part of the master plan fundamentally covers the same issues that can be addressed by a GIS and remote sensing based urban analysis exercise (Bhatta, (2010). A typical urban analysis carried out using remote sensing data is capable of analysing and integrating different activities and uses such as land uses, transportation, infrastructure, economic and demographic changes, environmental concerns (such as energy consumption pollution and noise). Urban growth analyses and growth projections are critical to improving urban researchers' understanding of growth rates, the spatial complexities of growth and measuring sprawl. Remote sensing also has the advantage of using space-borne sensors to make quick data acquisitions over large areas at a pace and cost which cannot be compared to the traditional field data collection methods used by land surveyors and planners. Satellite based maps are also more detailed and they depict landscape features in a clearer way (ibid).

2.5. Chapter summary

The review of literature on urbanisation shows a clear distinction between the urbanisation trends of the colonial and the post-colonial periods in Zimbabwe. The pre-colonial urbanisation trends were relatively more predictable because they were driven by conventional factors such as the initial establishment of administration centres for colonial governments, new mining ventures and industrial booms. The post-colonial urbanisation

trends are less predictable because they are now characterised by rapid change and economic uncertainties attributable to a variety of factors which include political instability, economic downturns, and global competiveness. Moreover, the application of development control conditions during the colonial era was artificially aided by influx control regulations which managed to limit urban growth to predictable levels. Political independence and democratic aspirations unleashed pent-up or waves of frustrated urbanization that resulted in such rapid urbanization that not only needed capacity and resources to manage but simultaneously called for expanded dealing with an expanded and empowered citizenry and not mere subjects or residents. The use of long term blue print plans in managing urban development has consequently become inappropriate in situations that are now characterised by rapid change.

Growing urban poverty which is manifested in the form of high unemployment and the mushrooming of informal settlements is rapidly altering the colonially designed outlook of urban settlements in southern Africa as the poor constantly invent new spaces and livelihood survival strategies to defend their continued existence in urban areas. Contemporary urban planning theory ably tackles poverty and rapid urbanisation problems through more participatory planning discourses such as strategic planning (Faludi, 2010; Cities Alliance, 2012), collaborative planning (Innes and Booher,2010; Healey, 2006), communicative planning (Healey, 1996). These approaches are hailed as the most appropriate vehicles for bringing poorer communities on the economic developmental board.

Urban development can still present worthy prospects for economic development and better environmental management regardless of the changing social structure dominated by informality. Such development can only be achieved if the development management style is transformed to accommodate and embrace informality and rapid urbanisation as the result of the exclusionary nature and rules of formality - markets and globalization (Tapela and Tonkin, 2012).

The literature also exposes the vulnerability of planning practice to manipulation by political and capitalist forces. These political and economic powers seemingly find it easier to exploit modernist planning whose theoretical base is grounded in principles that were suited to promote business interests and private property values through social class segregation

and land use zoning. Master planning is portrayed as rigid and immobile and should therefore be replaced by more pro-poor planning approaches that are more socially inclusive. The weaknesses and strengths that are associated with the global shift from government to governance, and the centrality of state developmentalism are also explored with particular emphasis being placed on the need to ensure that a reasonable balance is achieved between the needs of business groups and the poor.

The literature draws a clear linkage between current urbanisation trends characterised by rapid growth and change, and democratic governance with the need to have urban management tools that are mobile, flexible and accurate. The application of geo-spatial technologies such as GIS and remote sensing are appropriately cited as being effective in improving communications, participation and accuracy in both the preparation and administration of planning frameworks. The geo-visualisation tools of GIS have the unique advantage of being able to integrate the manner with which multiple stakeholders in the planning process understand and appreciate spatial data representations.

GST applications also have the added advantage of expediting data collection, analysis and manipulation thus making the whole planning process faster and more relevant to its own context before the probable rapid change occurs.

3.0. CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1. Background

This chapter explains the methodological approaches used in this research and how the choice of tools relates closely with the research objectives and topic. The research methodology fundamentally comprises of two case studies located within the urban district of Harare. The study methodology is purposely designed to demonstrate the application of geo-spatial technology in transforming urban practice whenever appropriate.

The use of conventional quantitative spatial data obtained from manual land use surveys and social research techniques such as field observations, questionnaires and manual mapping were used as part of ground truth verification and data augmentation in the absence of up-to-date secondary sources of socio-economic and spatial data. The combination of manual and technologically based methods of data collection and processing were meant to demonstrate how simple geo-data bases can be created for use in urban development management even in situations of limited resources and GST awareness.

3.2. Conceptual framework

The literature reviewed partially blamed poor planning practises for the current urban development problems in most developing countries in that development trends and the factors that shape urbanity have drastically changed in the past half century without a corresponding change in the nature and form the planning frameworks that are currently in use. Madanipour (2007) highlighted the significance of the relationship between time and change through viewing time as the concept that measures the duration of events. He postulated that urban functions are explicitly planned according to a system of time.

The choice of Harare CBD (case study 1) as one of the case study areas for the measurement of the efficacy of planning frameworks and practices was done in view of the latter theoretical concept which links space, time value and action. Case study 1 comprises of a commercial district which is covered by two local plans (town [spatial] planning frameworks) which have clearly defined spatial boundaries, designated functions (land use zones) and operational time frames. The measurement of land use change is then appropriately used as the main indicator for plan performance in case study 1. Case study 2

which covers Epworth informal settlement also employs the land use change element as a one of the research tools.

Poor communication is an aspect that frequently featured in the purported reasons for planning practice's failure to competently manage urban development. Perception and understanding are according to Van Den Brink et al. (2007) processes that take place at individual level in the private realm also known as visual thinking. Communication which takes place in the public realm was subsequently defined as visual communication whilst spatial cognition which is the discipline that focuses on issues related to the perception and understanding of the spatial environment is an important component spatial planning (ibid). The methodological approach of this research relies heavily on the use of geo-visualisation tools as a way of effectively communicating and exploring the research problem which is primarily spatial in nature.

Part of the literature review explores the value of communicative and collaborative planning in pro-poor planning as proffered by the works of Healey (2006); Innes & Booher, (2010), and Forester (1999) at the global scale and the works of Watson (2009), Patel (2012) and Chitekwe-Biti (2013) at regional and local levels. These proponents of communicative and collaborative planning theories claimed that such approaches are very effective in fostering community participation and voluntary community compliance with development processes. Attempts to apply such methods of planning were made in Epworth informal settlement which was then consequently selected as an appropriate context for case study 2.

Plan evaluation according to Hall (2002) should be according to two main variables which are; economic considerations and value systems. He argued that although the cost/benefit analysis is a useful method of evaluating planning, it is more suitable to business and less applicable to public decision making where other values cannot be easily quantified in monetary terms. He suggested that plans should be evaluated against their own aims and objectives. He also cited Lichfield's Planning Balance Sheet (PBS) which places economic values to imponderables without rendering all the values in a common metric. The main weakness of the PBS is that the weighting of different value areas does not easily satisfy different groups of people. Other plan evaluation techniques cited by the same author include:

Professor Morris Hill's Goals Achievement Matrix (GAM) which places different weights to different objectives whilst recognising the fact that different groups of people have different value systems.

Plan Implementation Monitoring (PIM) is a method which checks divergence from the planned course of action.

Case study 1 methodology employed modified versions of some of the latter methods suggested by Hall (2002) through a qualitative research approach which sought practising planning practitioners' rating of the stated aims and objectives of local development plans. GIS analyses were also used to measure the level of local plans compliance with their stated development conditions which related to building lines, site coverage and land use zoning.

Case study 2 used a modified version of the PBS and PIM when it applied a scoring system to rate community values in evaluating the plan for Epworth Ward 7. The land use change analysis component in Epworth also measured the level of compliance with the zoning proposals of the layout plan for Epworth Ward 7.

The other area of focus in the study is the impact of the changing nature of urban governance which is shifting from managerialism to entrepreneurism in planning practice (Harrison, 1994; Todes, 2011). Todes (2011) suggested that land use management regulations should be shaped contextually and they should only be applied where they are meaningful to the people. Therefore context, in all its forms and manifestation (social, economic, ecological and political) is very important. The two case studies in this research focussed on assessing the continued relevance of the application of mono-functional land use zoning in two contrasting urban districts which are the formally planned Harare CBD and the informally established Epworth informal settlement.

The qualitative component of the two case studies was mainly influenced by Collie (2011) who observed that the life history of the city cannot be understood by relying on quantitative data and economic theories alone hence the need to consult with different stakeholders in the development process. These views were also supported by Sager (2013) who argued that the collaborative planning theory is grounded on the application of the Condorcet jury theorem which states that the number of reasonably informed decision makers increases the likelihood of a right decision. The theory supports the rationality of democratic decision making which tends to rely on majority views. The research design therefore consequently relied on qualitative views obtained from local authority planners, engineers, councillors, development committee members, property managers and other key development practitioners such as private sector planners and non-governmental organisations.

3.3 Research design

The research design is mainly grounded on the comparative theory as it seeks to measure the performance of planning tools against their stated objectives and evaluates planning practices against normative standards and principles.

3.3.1 Study methodology

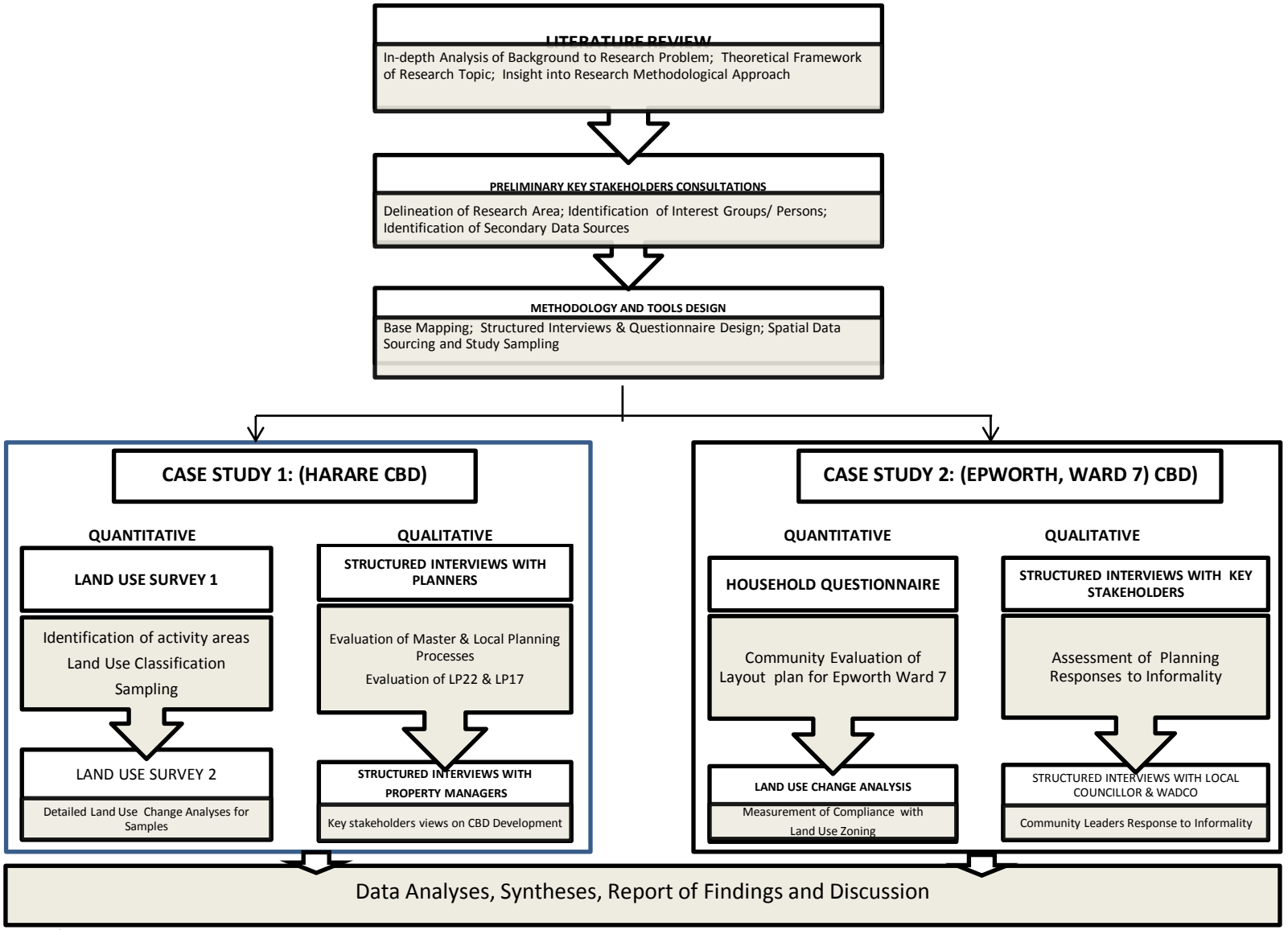
Mixed methods of research were mainly employed in this study since the sequencing of the fieldwork was designed in a manner that ensured that the initial stages of the study served to inform and refine the preceding methodologies in terms of sampling and areas of focus. The evaluation of the sharpness/ bluntness of planning tools in Harare CBD went through three stages which were the quantitative analysis of change of use records in the local authority's register which in turn provided insights into the urban land use change patterns. The information was used in formulating questions for structured interviews which sought qualitative verification and evaluation of the main urban development challenges in the study areas. The final part sought a quantitative assessment of the achievement of urban planning's tangible spatial goals and it employed GST aided quantitative and spatial techniques.

Similarly, the comparative study of Epworth informal settlement also employed mixed methods of research whose sequence was slightly different because it started with the qualitative approach which was meant to inform and sharpen the preceding quantitative and spatial methods of research. The Epworth study was that different because it focussed more on urban planning responses than on planning tools.

3.4 Work breakdown structure

The work breakdown structure for the two case studies is made up of the following sequential stages; literature review, mapping, key stakeholder consultations, land use surveys, land use change analyses, socio-economic surveys, data analysis and report of findings. There were a few variations to the study approach which were meant to suit the different case studies and the sequence of activities was designed to ensure that the outputs of the preceding activities inform the inputs of the ensuing activities as illustrated in figure 3.1.

Figure 3.1: Work Breakdown Structure



Source: Author: 2014

3.4.1 Review of methodologies of evaluation of performance

A review of literature on urbanisation processes, urban development management and innovative ways of urban planning was carried out in order to derive indicative trends in urban development challenges and planning responses globally, regionally and locally. In this section a similar scan on methodological approaches to research in the subject area was used to streamline the focus and contribution of the study. The literature similarly identified a conceptual framework of the study which informed the research design and methodological approach. The key inputs of the literature scan include:

- Review of local and international literature on urbanisation, urban development management and urban planning systems.
- In-depth study of the qualities of past and current planning tools and frameworks globally, regionally and locally.
- Inspecting and reviewing of land use management records and spatial planning frameworks covering the two case study areas.

3.4.2 Sources, methods and tooling

The information from the study was obtained from the library, the internet, local authority offices and some records from the relevant government departments. The key outputs of the literature review consisted of;

Past and current urban development challenges, opportunities and strengths of the urbanisation process, urban development management responses to challenges, innovative and technological approaches to urban planning, indicators for further research and focus of study and methodological guidelines for the research.

3.5 Stakeholder consultations

A qualitative approach was employed to obtain information and views from stakeholders. Personal interviews and focus group discussions were held to that effect with selected key stakeholders. The main groups of stakeholders identified for consultation included, local authorities, government departments, planning practitioners, non-governmental organisations, and property managers.

3.5.1 Key stakeholders consultations for case study 1

The list of stakeholders consulted qualitatively for case study is specified on columns 1 and 2 on table 3.1. All the consultations were done in the form of face to face structured interviews with the researcher. The format of the structured interview questionnaires are listed in the appendices of this research document. The key outcomes of the interviews can be classified into five groups which are:

- Collection of raw data for use in assessing compliance with planning intentions.
- Acquiring spatial data for use on the ensuing base mapping, land use surveys and change analyses in the research.
- Identification of some of the acute urban management problems and their concentration areas.
- Identification of researchable variables for the quantitative aspect of the study and future research prospects.
- Assessment of the rate of responsiveness or unresponsiveness of current planning frameworks and practices to rapid development.

Table 3.1: Key stakeholder consultations for Case Study 1

Stakeholder Group	Consulted persons/ professions	Data Collected	Purpose of Information and/ Research Objectives Met
Harare City Council	City Planner and Town Planning Staff	Local Plan 22 & Local Plan 17 Maps & Documents	Data and base maps for evaluating planning frameworks
		Change of Use Register for Harare CBD	Data for measuring level of compliance with planned intentions
		Views & experiences in urban planning, & public participation in planning	Qualitative analysis of planning practices & frameworks
		An evaluation of LP17 & LP22	Measuring level of compliance with planned intentions
		Application of Geo-spatial technology in planning	Assessing level and views on value of technology in urban planning
	Projects Engineer	Service Provision	Assessing the coping capacity of public infrastructure in the city as a means of evaluating plans against their set objectives
	Transport Planner	Traffic management and public transport	Determination of planning responses to transport and traffic problems in the city
		An evaluation of LP17 & LP22 objectives on transport & traffic	Qualitative view on level of compliance with specific plan objectives on transport & traffic
Government	Department of Physical Planning	Planning policy and guiding frameworks/challenges & responses	A qualitative analysis of past and current planning policies & the state's responsive capacity to current development challenges
		Enforcement of planning laws & views on transformation of planning	An assessment of the regulatory or facilitative role of the state in development management
		Planning's Institutional & administrative framework	Analysis of types of urban governance in the country
		An evaluation of LP17 & LP22 objectives	Qualitative assessment of the level of compliance with plan objectives
		Application of Geo-spatial technology in planning	Assessing level and views on value of technology in urban planning
Planning Practitioners	Private planning consultants	Scope of works	Establish private developers' needs for comparison with plan objectives
		Views on planning policy & practice evaluation of LP 17 & LP22	Qualitative assessment of frameworks and practices
		Technology in Planning	Value of technology in planning
Estate developers	Property managers	Types & duration of tenancy	Land use type and change analysis
		Property markets, occupancy & values	Role of markets in development & impact of planning on development
		Participation in planning	Determining the role accorded to key stakeholders in planning
		Service provision	Assessment of quality & adequacy of service provision

Source: Author. 2015.

3.4.2 Key stakeholders consultations for case study 2

The list of identified key stakeholders for Epworth included the local authority engineer, the councillor and members of the Ward Development Committee (WADCO) for ward 7 which was selected as a sample for the case study area. One-on-one interviews were separately conducted by the researcher with the former two stakeholders and a focus group discussion was held between the researcher and members of the WADCO (see picture on figure 3.2).

Figure 3.2: Researcher (on the extreme right) having a focus group discussion with WADCO members in Epworth ward 7

Source: Author, 2014.

Other separate face to face interviews were held with members of DOSZ (a non-governmental organisation that is currently assisting the local community. Details of the qualitative research carried out in Epworth are illustrated on table 3.2. The key outcomes of the key stakeholders' consultations in case study 2 were analysed qualitatively and the findings provided information which helped the researcher in determining the value of public participation in the informal settlement, the role of informal governance structures, and an indicator of the local community's values and needs.

Table 3.2: Key Stakeholder Consultations for Case Study 2

Stakeholder Group	Consulted persons/ professions	Data Collected	Purpose of Information and/ Research Objectives Met
Epworth Local Board	Local Board Engineer	Land use management/ development control processes	Current development management frameworks, problems & responses
		The state of infrastructure & service provision in Epworth	Service & infrastructure situation relative to formal settings
		Governance issues	Land delivery & local administrative structures
		Technology application in planning development management	Assessing level and views on value of technology in informal settlements planning.
	Ward 7 Councillor	Comments on contents & implementation progress for ward 7 layout plan	Community leader's views on plan intentions & appreciation of the planning process and contents.
		Community leader's vision on development	Qualitative view of local values.
	Ward Development Committee	Views on ward 7 layout plan community perceptions & expectations as per community representatives.	Local leaders' & community views on plan intentions & appreciation of the planning process and contents.
		Community expectations on role of public participation in planning and development.	Qualitative analysis of local community leaders views on public participation in planning and community development.
		Views on role of Technology in Planning	Local appreciation of technology use in communication, planning and development.
		Comments on ward 7 layout plan contents & implementation progress	Evaluation of compliance with plan intentions.
Non-Governmental Organisation	Dialogue on Shelter for the Homeless People in Zimbabwe Director and Projects Coordinator	Community-based planning	Information on NGO's experiences in community development and planning in Epworth.
		Governance Issues in Informal Settlements	An assessment of the land delivery and development management systems in informal areas.
		Views on the application of current planning frameworks in Epworth.	Demonstration of the unresponsiveness of current planning frameworks to informality. Suggestions of the ideal approach.
		An evaluation of layout plan for layout ward 7	Measurement of plan implementation success/ failure.
		Participation in planning	Determining the role accorded to key stakeholders in planning

Source: Author, 2014.

3.5. Case study area definition, base mapping and sampling

This part of the study sought to create common mapping frameworks for the spatial aggregation of different datasets. The exercise was carried out separately for the two case study areas. The Harare city centre area mapping was easier to prepare because it was developed from existing cadastral maps and local development plan proposals maps whilst the Epworth area neither had cadastral mapping nor local development plans. The city centre case study adopted existing cadastral boundaries (individual stand boundaries) as the units for research analysis because most of the existing data relating to land use zoning, ownership and occupancy is so aggregated.

The approach was different in Epworth where individual buildings were adopted as units of study/analysis because the case study area does not have any defined cadastre. An overlay of the proposed layout plan for ward 7 was imported from AutoCAD into ArcGIS software and it was then used as the basis for measuring compliance with plan intentions.

3.5.1 Harare city centre base mapping

The first step in the preparation of the base map for case study 1 was the compilation of a digital geo-database from existing paper copies of maps acquired from the Surveyor-General's (S-G) office. This exercise was necessitated by the fact that both the S-G's office and Harare Municipality did not have any digital mapping covering the city centre. The researcher purchased hard paper copies of the S-G's 1:5000 topo-cadastral maps covering Harare city centre. The maps were then scanned and saved in the ***JPEG*** format with a fairly high resolution of 600 dpi. ***Mosaicking*** (which is a process of electronically merging continuous map series or images) was the next stage which was done firstly through cropping off some metadata from the scanned S-G maps and then the cropped maps were saved and opened using ArcGIS 9.3 software where they were geo-referenced and saved to create a ***mxd***. format file named ***casestudy1***.

The second step in the mapping exercise involved placing satellite imagery overlays on the ***casestudy1.mxd.*** map file. Satellite images from the year 2014 from Google Earth-Pro covering the Harare city centre were downloaded by the researcher and they were also saved in the ***JPEG*** format. The saved satellite images were then added into the ***mxd.*** file as raster layers and geo-referenced as overlays over the topo-cadastral information. The

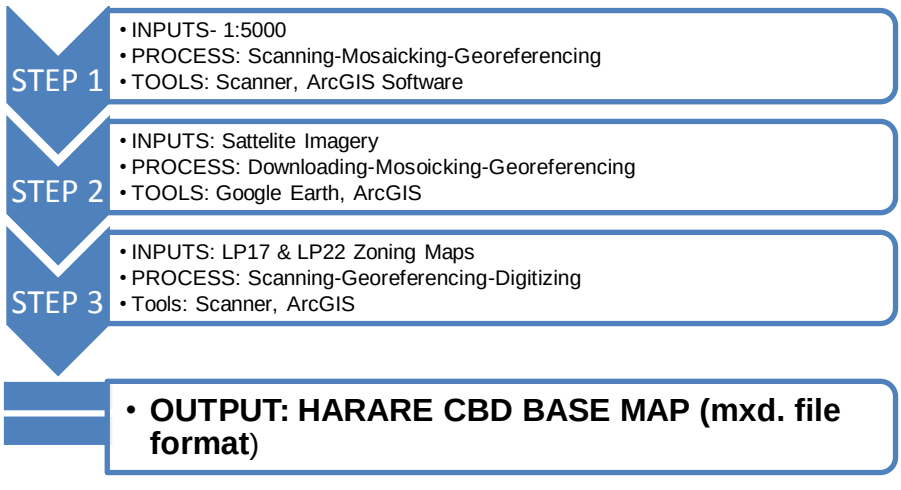
researcher decided to use Google Earth-Pro imagery over other remote sensed spatial data sources for the following reasons:

- Up-to-date remote sensed data is generally unavailable in government and local authority offices in Zimbabwe.
- Most of the existing aerial photography covering Harare appeared grossly out-dated since most of it was taken in the 1990s and earlier. Such photographs could only be obtained from private aerial survey companies and they were very expensive to purchase.
- Google Earth-Pro had a relatively higher spatial resolution than the other web-based sources of remote sensed data such as Google Maps and Yahoo Maps.

The researcher decided to download several images covering smaller areas of Harare CBD before mosaicking them because one gets a clearer image of the whole study area in that way.

Step 3 in base map preparation involved purchasing hard paper copies of the zoning proposals maps for Local Plan 17 and Local Plan 22 covering Harare city centre from the municipality. The proposals maps were also scanned mosaicked and added to the ***mxd.*** map file as a raster layer and geo-referenced. The base mapping process is summarised through figure 3.3. The study boundaries for the two local plan areas were then combined and digitised to form the new case study area boundary.

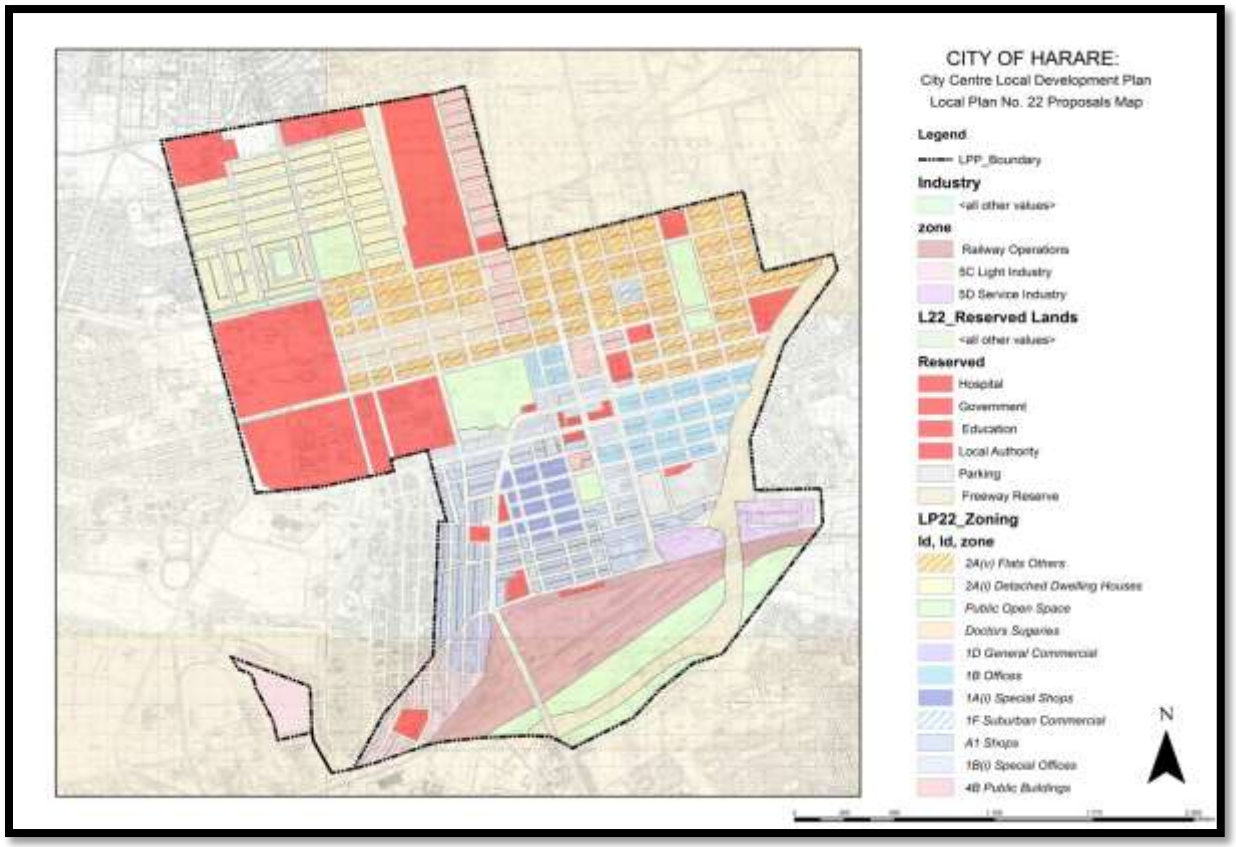
FIGURE 3.3: BASE MAPPING PROCESS FOR HARARE CBD



Source: Author, 2014.

The proposed land use zones, reservations and planning boundaries from LP17 and LP 22 were then digitized and saved as shape files on the CBD base map. The map on Figure 3.4 is an illustration of the complete base map with land use zones and planning boundary digitised from LP22.

Figure 3.4: Harare CBD Base Map



Source: Computed by author (November 2014)

3.5.2. Epworth base mapping

The case study base map for Epworth was prepared using a different approach because the area neither had local planning zoning maps nor S-G topo-cadastral maps. The researcher however managed to get some high resolution satellite imagery for the year 2010 from Dialogue on Shelter for the Homeless People of Zimbabwe (DOSZ) who were involved with assisting the local communities in Epworth ward 7 with planning and housing development. Ward 7 was then selected as the appropriate sample for the case study firstly because it had some form of spatial data for use; and secondly because it had an approved

layout plan which would form the basis for quantitative spatial analysis of the informal settlement. A rapidly developing residential area which had been planned to accommodate houses, a primary school, one secondary school, a shopping centre, one clinic and several open spaces was further demarcated as a sample for further land use change analysis. The main reasons for selecting the area as a sample for further study were:

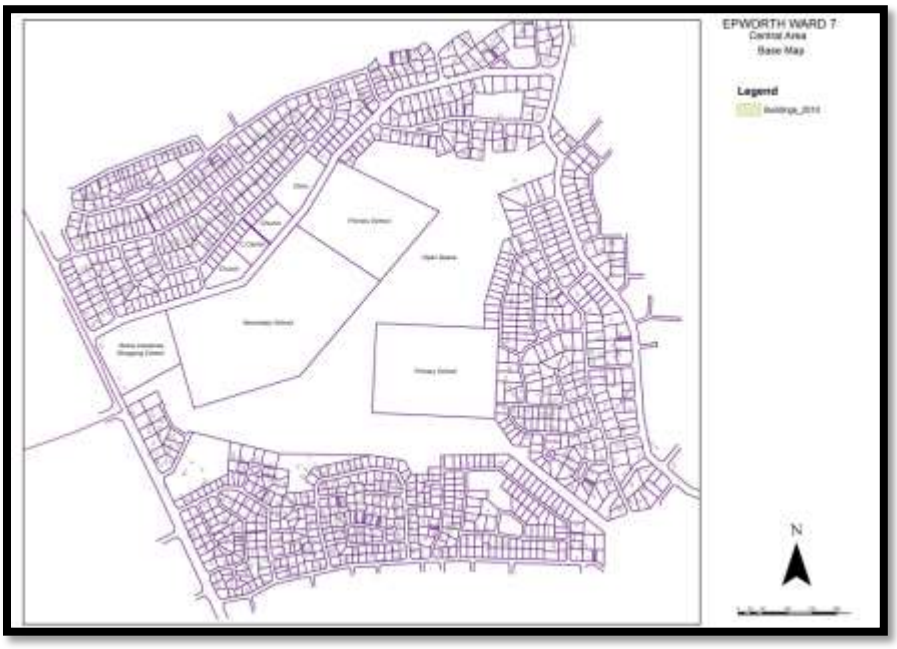
1. The information obtained from the consultations with the ward councillor, members of the WADCO and the local authority engineer had revealed the existence of several encroachments by human settlements on the areas that had been reserved for public amenity purposes in terms of the approved plan for Epworth ward 7.

2. The researcher had also made some physical observation of the alleged encroachment during a site observation exercise.

3. The local authority officials had also disclosed that the shopping centre in that area had been created as way of trying to centralise informal business activities on designated nodes against the normal informal business practice which tended to be haphazardly located on activity areas and streets. The shopping centre had been appropriately named “Home Industries Shopping Centre.” The study therefore sought to test the validity of the local authority’s assumptions.

The researcher then used ArcGIS to digitise existing features such as buildings, roads, infrastructure services and other notable natural features in the selected area. A portion of the approved upgrading layout plan covering the area was then imported from AutoCAD format into ArcGIS and the ***shape_files*** for the features digitised from 2010 imagery were overlaid to create a base map for case study 2 (see map on Figure3.5).

Figure 3.5: Base Map for Case Study 2 Sampled Area



Source: Epworth Local Board, 2014.

3.6. Land use surveys and urban growth /change analyses

The two case studies employed urban growth and land use change analyses to measure and demonstrate the nature of (un)responsiveness of current spatial planning frameworks in Epworth and Harare CBD. The main difference in the spatial change analyses for the two case studies is that case study 1 used S-G maps and zoning maps to measure patterns of land use change; while in case study 2 one had to depend on the use of remotely sensed data from Google Earth-Pro to produce statistical data useful in quantitatively assessing urban growth and land use change. The definition of units of measurement is a key methodological issue in any urban growth analysis which according to Bhatta (2010) can either be aggregated to cover larger homogeneous analysis zones or disaggregated to cover individuals or households. He further described urban growth as a pattern in a static phenomenon (in this case Harare CBD) and as a process in a dynamic phenomenon (Epworth informal settlement). He also advised that the application of such methods helps us understand how the world is changing in terms of urban growth rates, spatial configuration of growth, discrepancy in expected growth and the magnitude of sprawling.

3.6.1. Land use change analysis in Harare CBD

The data obtained from key stakeholders was analysed and the resultant information was used to identify the areas that were mostly characterised by rapid change. Such areas were then marked on a printed hard copy of the base map for case study 1. The marked areas were then adopted as the basis for sampling a preliminary land use survey. The researcher employed two research assistants who carried out the land use survey covering the selected area. The survey involved identifying all the buildings that were located in the selected area by their stand numbers, recording the number of floors per building and recording the use or nature of business carried out by the occupants of each and every floor in the buildings. The exercise also sought information related to the provision of off-site parking serving the identified buildings.

An analysis of the results of the preliminary physical survey led to the identification of larger stand blocks for more detailed land use change analyses. This was done through selecting blocks which contained buildings that exhibited a wider variety of land uses. The methodology for carrying land use change analysis in the CBD case study was influenced by the key finding of the preliminary land use survey which showed that the area was not experiencing any lateral spatial growth since it was already fully built up. The evident type of change observed in the area was in the form and function of existing structures which were being converted from one land use group to another.

The procedure followed in carrying out the land use change involved the reclassification of land uses in order to create a standard format of land use classes for the two local plans covering the study area. Four activity areas with different characteristics namely commercial area, residential flats, detached housing area and offices were then demarcated as the samples for more detailed land use change analysis. Manual land use surveys covering the sampled areas were then carried out by research assistants. The selected units of analysis in this case were blocks of stands whose edges were defined by road boundaries. The observed land uses were then plotted on a map using the reclassified land use scheme.

The existing land use maps were compared with the planned land uses zones using ArcGIS change detection techniques and cross tabulation. The land use change analysis procedure details are fully presented on table 3.3.

Table 3.3: Land use change analysis for case study 1

ACTIVITY	INPUT	METHOD/TOOL	OUTPUT
Base Mapping	S-G Maps, Zoning Maps & Satellite imagery	Mosaicking & Geo-referencing	Base Map
Planned Land Use Classification	LP17 & LP22	Merging LP17 & LP22 Shape files & Editing attribute tables in ArcGIS	Combined Land Use Zoning Map
Creating separate shape files for sample areas zoned uses	Combined Land Use Zoning Map	Exporting selected data for sample areas	Sample areas shape files for zoned uses
Existing Land use classification	Land use survey findings	Microsoft excel tabular analyses of LUS findings	Existing land use classes for sample areas tables
Creating separate shape files for sample areas existing land uses	Sample areas shape files for zoned uses & Existing land use classes for sample areas tables	Exporting data from Sample areas shape files & Editing attribute tables of the export files in ArcGIS	Sample areas shape files for existing land uses
Rasterisation and Cross-tabulation	Sample areas shape files for zoned uses & Sample areas shape files for existing land uses	Conversion of the two sets of sample maps from vector to raster and cross-tabulation using ArcGIS	Land use change maps and dbf. file format tables depicting the areal extents of land use change

Source: Author, 2014.

3.6.2. Land use change analysis for Epworth Ward 7

The preliminary analysis of the qualitative data obtained from the key stakeholders' interviews for Epworth indicated that there was substantial spatial encroachment by households onto spaces that had been reserved for public facilities and amenity. The researcher subsequently decided to measure this purported phenomenon as a way of investigating non-compliance with planning intentions. Individual houses were adopted as the unit of analysis for measuring change in the area for the following reasons:

The spatial change caused by informal housing development did not appear to be forming any regular patterns that could be aggregated easily.

The whole area did not have any surveyed cadastral boundaries or any other physical conspicuous edges which could define specific land parcels.

The base map for the area selected as the sample was overlaid onto the 2010 satellite image for Epworth using ArcGIS 9.3 software. All the 2010 building structures that fell in the sample area were then digitised and a shape file named 2010 buildings was saved. A satellite image covering the same area for the year 2014 was downloaded from Google Earth-Pro and the same procedure as above was followed to create a shape file named 2014 buildings. The two building shape files were then ***rasterised*** and cross-tabulated using a procedure similar to the one outlined in table 3.3.

A land use change map and a table which indicated the numerical extent of encroachment onto land parcels that had been reserved for other purposes different from residential uses was then produced.

3.7 Household survey for Epworth case study

A household survey was carried out as part of the quantitative investigation on the value of the upgrading lay-out planning process in Epworth ward 7. The questionnaire had questions which mainly sought to establish the employment profile of the local community and its impact on local planning values and expectations. The survey was also mainly meant to assess the value and level of public participation in planning and Epworth. The other main purpose of the exercise was to verify the findings deduced from the contributions on community expectations made by the key stakeholders interviewed in the earlier part of the fieldwork.

The household survey was also designed to collect data which generally represented community values. These community values were then compared with the layout design standards for low income residential areas that are currently being used by the state and local authorities.

3.7.1 Sampling for household Survey

The study sample for Epworth was ward 7 as explained in the earlier part of this chapter. The entire ward consists of not less than 7000 households (Dialogue on Shelter for the Homeless in Zimbabwe Trust, 2010). The ward is administratively divided into five sections whose leaders constitute the ward development committee. The researcher chose to evenly distribute 20 questionnaires per section. This type of sampling was based more on the need

to get views that are spatially evenly distributed across the whole ward than getting a sizeable representation in terms of percentage of the total population.

3.7.2 Household survey methodology

Two research assistants carried out face to face interviews with the respondents. The research assistants were accompanied by the relevant section leaders when they administered the questionnaires. The presence of the section leaders during the interviews was meant to defray any possible suspicions on the intentions of the exercise.

3.8. Limitations of the methodology

The unavailability of a geo-data base in Harare presented a major limitation to the application of geo-spatial technology in carrying out the research therefore a new data base had to be created from the S-G.s 1: 5000 map series, zoning maps and ***Google Earth*** images. The exercise was time consuming and the accuracy of the mapping depended on the precision of the geo-referencing exercise. The spatial resolution for ***Google Earth Pro*** is relatively low when compared to that of geo-eye high resolution normally used for image analysis purposes. The research ended up resorting to the use images covering smaller portions of the study area which had to be mosaicked through geo-referencing. That exercise was not only time consuming but it also compromised the accuracy of image analysis and digitising of features that constituted part of the base maps.

The part dependence on qualitative data obtained from key stakeholders who have been involved in planning practice in the case study areas was partially subjected to bias since it is normal human tendency to defend their normative actions and resist any possible transformation fearing that it may be misconstrued as incompetence on their part. However, the research design tools for interviews were designed to minimise such bias since they mainly consisted of less challenging open ended questions.

There was some reluctance and in some cases refusal by some property managers to participate in the in the interviews who saw the whole exercise as a waste of their valuable time which could be put to more productive use. The interviewer had to exercise extreme patience and in some instances had to resort to the use of an apologetic and polite approach in order to get any response.

A sizeable number of the respondents of the household questionnaire were suspicious of the presence of WADCO members (section leaders) during the interviews fearing that it could be a ploy to coerce them into paying development levies to the local authority. The researcher however tried to allay such fears by repeatedly stating that the interviews were for academic purposes only.

3.9 Chapter summary

The chapter clearly established a link between the issues reviewed in the literature and the research methodology by acknowledging that urban growth is a complex process which is influenced by a multiplicity of factors which include government and local authority policies, local community values, and market dictates. The research methodology therefore appropriately selected two contrasting case studies areas which are typically patronised by relevant key stakeholders who were then identified as the subjects of the study. The context for case study 1 typically represents market-led urbanisation since it is an arena which ideally manifests the contestation for access to productive space by the elite (represented by large business operators, property developers and property managers) and the urban poor (represented by vendors, street kids and transport touts). Case study 2 represents the resultant manifestations of unprecedented urban growth (informal settlements), the spatial footprint of urban poverty and the exclusion of certain groups of people from the urban development management praxis.

The research methodology also recognised the varied patterns of urban growth which can be categorised into land use change and spatial growth. Harare CBD which is a formally planned built environment is fittingly investigated using methods that interrogate land use change whilst Epworth which is characterised by rapid informal settlements growth applied the spatial urban growth analysis techniques.

The application of a mixed research approach method was selected to ensure that spatial quantitative research methods and qualitative methods complimented each other in contexts which had limited primary and secondary data.

4.0 CHAPTER FOUR: EVALUATION OF CURRENT SPATIAL PLANNING FRAMEWORKS IN HARARE CENTRAL BUSINESS DISTRICT

This chapter presents the findings of an appraisal of the spatial planning frameworks that are being currently used as tools for the management of development in Harare CBD. The results also demonstrate the positive and negative impacts of planning practices on urban development and standards of living in the city.

4.1. 'Change of use' (special consent) applications register

The first part of the consultative part of the research started with an inspection of the register for change of use (COU) applications for the Harare central region covering a period stretching from 2008 to 2014. The purpose of that exercise was to try and assess the types, direction and magnitude of 'departure applications' submitted to Harare City Council (HCC). The second objective of the exercise was to establish how diligently such applications were being attended to as a means of evaluating planning response to changing urbanisation trends. The third objective was to obtain a clear pointer on a possible sampling frame to base field work in the city's central region case study. The researcher would then be able to identify the major activity areas in the case study.

The main limitation in analysing the COU register was that of having to deal with a hand-written tabular document which appeared incomplete. The register consisted of columns which had information relating to application number, names of applicants, stand number/ addresses of the properties involved, current land use zoning, the type of use applied for, and the decision reached on the application. The most disturbing part of the register was that the last column on the decision reached on the applications hardly had any information. On being asked to explain the reason why some columns were blank the municipal officer concerned simply explained that it was either an omission or the application had not been determined yet. The implications of that indecisive response persuaded the researcher to assume the following conclusions on the system:

i) There is inefficient record keeping in the section dealing with such applications and that the hand written registration system is too out-dated and may not always be

available for updating since there were several officers dealing with COU applications in the office.

ii) COU applications are apparently taking too long to determine to the extent that no one bothered about updating the register or very few such applications had ever been determined since 2008 (see table 4.1).

iii) The third assumption was that the manual registration system tended to restrict access to that document to the concerned officers only, thus shutting the door for any meaningful monitoring by the supervisors or managers of the system.

In order to make sense and facilitate analysis of the bit of information contained in the register, I had to start by entering all the records on a computer spread-sheet using Micro-soft excel. The computerised record (which I managed to complete in one day) generated so much interest amongst the municipal officers to the extent that they ended up asking for copies on a flash disk. The soft copy of the register made an immediate impact in that at least all the officers who had computers in their offices could get easy access to it better still if the computers were to be networked so that they could all easily update and follow the register from their desk tops.

The other major finding was that the register was not linked to the forward planning section which is responsible for preparing master and local plans. The researcher felt that the local and master plans section needed to be well aware of the trends in terms of the most sought after land uses. The first part of the analysis for the change of use register was to categorise the new applications into broader land use groups as illustrated in table 4.1.

Table 4.1: Change of use applications 2008 to 2014: Harare central district

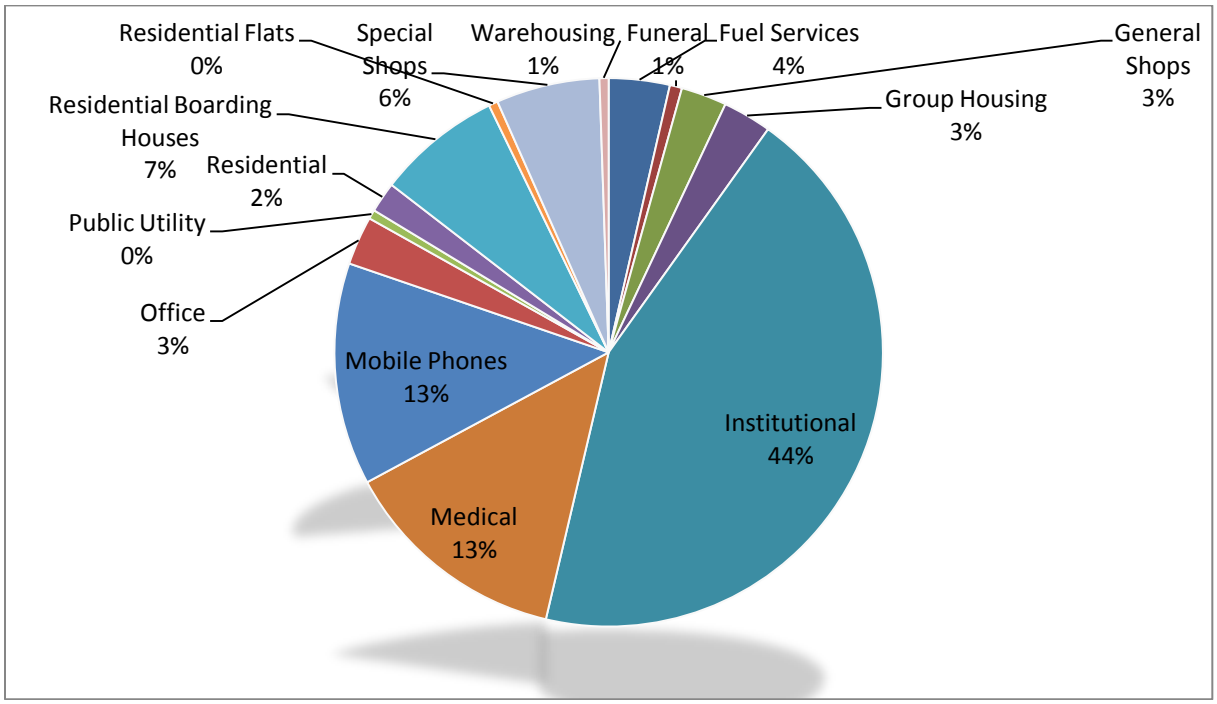
Use Applied	No. of Applications Submitted
Fuel Services	20
Funeral Services	4
General Shops	15
Group Housing	16
Institutional	244
Medical	75
Mobile Phones	73
Office	16
Public Utility	3
Residential	10
Residential Boarding Houses	41
Residential Flats	3
Special Shops	34
Warehousing	3
TOTAL	557

Source: Harare City Council/ Author

A summary of the classified land uses as illustrated on the pie chart in figure 4.1 clearly showed that the most of the sought after land-use types were in the institutional sector with 44% followed by the medical and mobile phone sectors which had 13% each, residential boarding houses with 7% and specialised shops with 6%. The pattern showed an increase in the demand for institutional uses which included applications for crèches and training centres. One interesting observation was the large number of applications in the mobile phone sector which apparently signified an increase on the use of technology in the city.

The results also gave an indication on the areas which were the main targets for land use change. An inspection of the addresses of most of the applications for institutional and medical uses showed that such applications mainly targeted the areas that had been originally earmarked for residential detached houses and residential flats in terms of the current local development plans. The other use-groups that featured fairly prominently in this initial analysis included special shops, general shops, fuel services and offices. The focus for further study and sampling therefore appropriately selected areas which had been initially earmarked for offices development in terms of the Harare Central Area Local Plan 22 and Kopje Market Square Local Subject Plan Number 17.

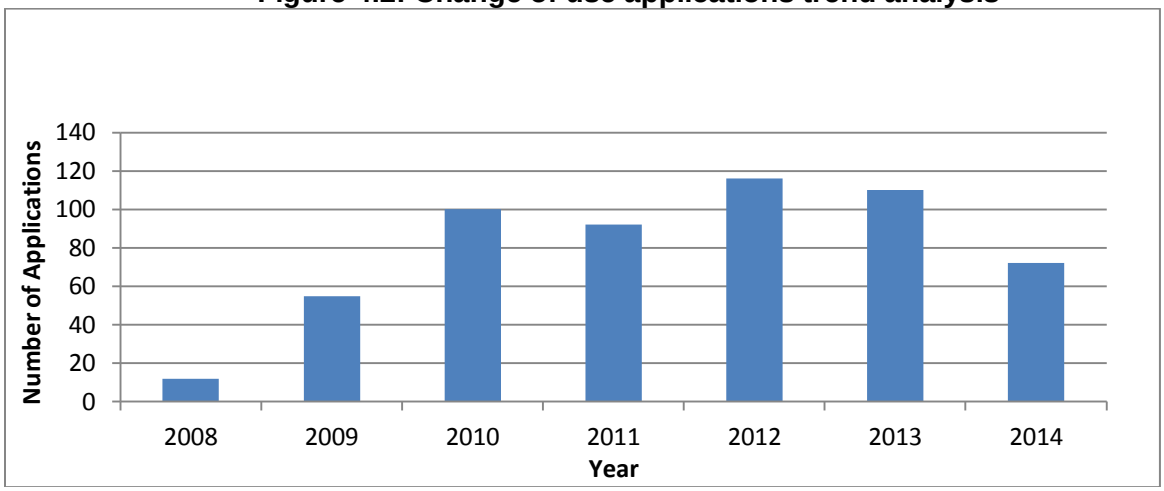
Figure 4.1: Harare central area change of use applications 2008 to 2014



Source: Harare City Council/ Author

An analysis of the change of use trends in terms of the number of COU applications received per month was plotted on the column graph in figure 4.2. The graph illustrates a very irregular frequency in the number of monthly applications for change of use thus supporting the notion that land use change is very unpredictable and cannot be easily managed by predictive and immobile planning frameworks.

Figure 4.2: Change of use applications trend analysis



Source: Harare City Council/ Author

There was an exponential rise in the number of change of use applications received in the period 2008 to 2010, and then there was a slight decrease in the period 2010 to 2011. There was yet another fairly sharp increase in the number of applications in the period 2011-2012 and another decrease in the period 2012 to 2014. This observed irregular nature of the change of use applications trends gave an initial pointer towards the unpredictability of land use change. These figures should however not be taken as an accurate reflection of land use change since there was no record of the unauthorised land change activities in the city.

4.2. Policy and trend analysis

The researcher interviewed a total of 13 professional officials - nine planners and one principal engineer responsible for projects in the City of Harare, two deputy directors from the government's Department of Physical Planning (DPP) and one planning consultant from a private firm. The main objective of these interviews was to critically review the processes, contents and efficacy of the current planning practices in Harare. Structured questions interrogated the respondents on issues relating to the management of rapid urbanisation and the changing developmental trends associated with such processes. The questions were structured to specifically stimulate response and discussion under the following sub headings (see structured interview questionnaire in Appendix 1):

- Problems related to the current planning process with regards to the preparation of master and local plans.
- The contents, detail and accuracy of master and local plans.
- The role and adequacy of current planning frameworks in dealing with informality, inclusivity, equality, sustainable development and globalisation.
- Public participation in planning.
- The application of geo-spatial technology in planning.

4.2.1. The plan preparation process

The planners highlighted the inadequacy of funding as a major stumbling block in the planning process. The reasons given for that were quite varied but the most frequent ones were as follows:

i. The idea of making planning a state-funded process was mainly criticised by the government and local authority planners who claimed that government and local authorities did not have adequate resources for that purpose.
ii. Local authority councillors and other political decision-makers fail to fully comprehend and appreciate the value of master planning because it has medium to long term objectives. They would rather fund projects and programmes that appear to have immediate returns.
iii. Shear ignorance and lack of understanding on what the whole process is all about by the decision-makers.
iv. Plan preparation procedures were also described as being too elaborate and time consuming to the extent that they ended up being too expensive and unaffordable.

The other problem which regularly featured amongst the public sector planners was that the process tended to be influenced and in some instances hijacked by private players bent on facilitating their own business interests. The reasons for that were also fairly varied and the main ones were as follows:

i. The private sector had the money to hire private planners and sway the process in their favour. The elite understand the meaning of planning more than ordinary citizens because they constitute the greater numbers of private property-owners, they are generally more educated and they can afford to buy newspapers in which planning information is procedurally advertised.
ii. In cases of conflicting interests between different stakeholders groups, the views of more affluent groups normally prevailed over those of the poor because the former group has the financial and political muscle to impose its will.

The third major concern was the fact that the plan preparation process tended to take too long to such an extent that plans became out-dated before they are approved. The reasons given for that weakness in the system were as follows:

i. Base map preparation takes too long.
ii. Plans are unnecessarily too comprehensive and the statutorily laid out approval process was too lengthy to the extent that the product of planning became out-dated before implementation. The city planner lamented that planning practices

failed to cope with the rapid pace of change as he further contended that "…we need to shoot a moving target" (Gandiwa, 2014).

iii. Planners' incompetence either due to lack of relevant experience, out-dated or less relevant planning education, poor exposure to current development trends and lack of in-house staff development programmes was also blamed for the lack of efficiency in plan formulation.

iv. Economic instability and a rapidly changing socio-economic environment were also mentioned as some of the reasons for the apparent failure by planning authorities to produce plans in time.

Lastly the other commonly mentioned problem was that of dependence on inaccurate out-dated base mapping, manual and analogue mapping techniques and unreliable data sources. This problem they said resulted mainly from:

i. Dependence on inaccurate census data.
ii. Inconsistent spatial data units due to differences between enumeration districts and administrative districts and enumeration time frames.
iii. Unavailability of geo-spatial data banks.

4.2.2. The contents, detail and accuracy of master and local plans

The discussion on the contents and the amounts of detail covered in master and local plans (MPs and LPs) drew different reactions from the practising planners. One school of thought mainly represented by those planners who had more experience in the preparation and administration of MPs and LPs tended to believe that there was nothing wrong with the contents of such plans if they are prepared in accordance with the RTCP Act. They argued that such plans needed to be very comprehensive and holistic, because they represented all aspects of urban life. They even argued that comprehensiveness had nothing to do with rigidity claiming that the legislation gave planners enough discretionary powers to manage change. They however, admitted that MPs and LPs were not constantly reviewed as is prescribed in the RTCP Act and they blamed that on the inadequacy of funds.

The second group of planners felt that the plans were too generalised with an unnecessary standardized approach hence they fail to suite different types of situations. They blamed the lack of innovativeness by some planners for practice's failures claiming that too much effort was wasted on irrelevant detail. They were generally in support of the idea of preparing

local subject plans which were selectively detailed to suit specific problem areas. Some in this group even suggested that comprehensiveness in plans was synonymous with rigidity. They also argued that comprehensive plans take too long to prepare to the extent that they do not only overstretch the planning budget but they also fail to achieve their intended purpose because they would have been overtaken by the rapid pace of development and change.

The third group mainly consisting of the younger planners felt that current planning frameworks were too rigid and immobile and they cannot cope with the needs of modern society. Some in this group even went further to suggest mixed use zoning and periodical zoning which ensured that business continues even after the traditional working hours. This they argued would promote the full utilisation of existing infrastructure and it would also reduce congestion since there would be no peak hours and peak business periods – some form of the '24 hour [trading] city especially in central area and central places.

All the interviewees however, seemed to generally agree that the major shortcomings of the MPs and LPs were centred on the lengthy time period taken in the preparation and approval of plans and that there was a need to carry out more regular reviews of the plans.

4.2.3 Informality, inclusivity, equity, sustainable development and globalisation

All the twelve planners interviewed said that the current master and local plans did not have any room for informality at all as they were designed for formal settings only. Most of them were however, sympathetic and appreciative of the role played by the informal sector and they suggested that means and ways should be found to accommodate that sector of the economy. The deputy city planner even went on to suggest that zoning regulations should be flexed when he frankly avowed that "…zoning should not be cast in stone" (Kasiyamhuru, 2014). The question of informality sparked so much interest in the planners to the extent that some of them ended up suggesting that the clause "not permitted" should be removed entirely from MPs and LPs.

There was also a general consensus on the fact that current planning frameworks in Zimbabwe were generally quiet on the trendy planning concepts of inclusivity, equality and sustainable development. One planner even went on to suggest that the LPs and MPs were still very much guided by colonial values and they served to promote ***NIMBYism.*** He even

went on to suggest that the current type of planning in the country was failing to be proactive citing the manner in which planning decisions are either over-shadowed or overtaken by the Environmental Management Act (EMA). He claimed that the planners are too passive thereby failing to defend their own professional turf (Chimowa, 2014).

4.2.4 Public participation in planning

The discussions on participation were structured to find out how practising planners rated the extent and value of public participation in terms of consultations and information exchange. The interviews also solicited the respondents' views on the need to involve the public in the actual formulation of plans.

The most common response to the question which asked the planners to rate the level of public consultations in the planning process was that it was grossly inadequate since there was a tendency to consult the so-called "key stakeholders" only leaving out the general public. Others even described the whole process as elitist since only a privileged few had access to the offices where MPs and LPs are placed on public display for comments. There were suggestions that the planning process could be made more consultative through the use of public meetings. The idea of consulting the public through questionnaires was also criticised because it tended to lead and limit the public into making contributions on ideas that were already pre-meditated by experts.

The manner in which planning intentions and plan proposals were communicated to the public was also described as inadequate and selective since it was only done through newspapers. It was also argued that only a limited number of people had access to newspapers and that reading the newspaper section which contained town planning adverts was the preserve of a few elites.

There were mixed reactions to idea of public participation in the actual design and formulation of plans. The more conservative planners categorically declared that the role of formulating plans had to be done by expert planners who were trained to do so. They even claimed that the whole process was too technical for ordinary people to understand and so there was no point in involving them anyway. One planner who seemed to be disciple of the 'Geddesian' approach went on to suggest that the surveys carried out during the initial stages of plan preparation were more than enough.

The second group of planners was of the idea that the public failed to identify with the plans because the whole planning process had a top-down approach which negated the whole essence of participation. They went on to suggest that the planning should be transformed into a bottom-up process and that public awareness and education programmes needed to be instituted in order to stimulate more interest from members of the public (Khanda, 2014; Vhutuza, 2014).

One of the senior planners in government blamed the representative type of participation which places elected officials at the centre of communication between the public and the technocrats. He doubted both the competence and the sincerity of such officials in communicating planning related information (Chimowa, 2014).

4.2.5 The application of technology in planning

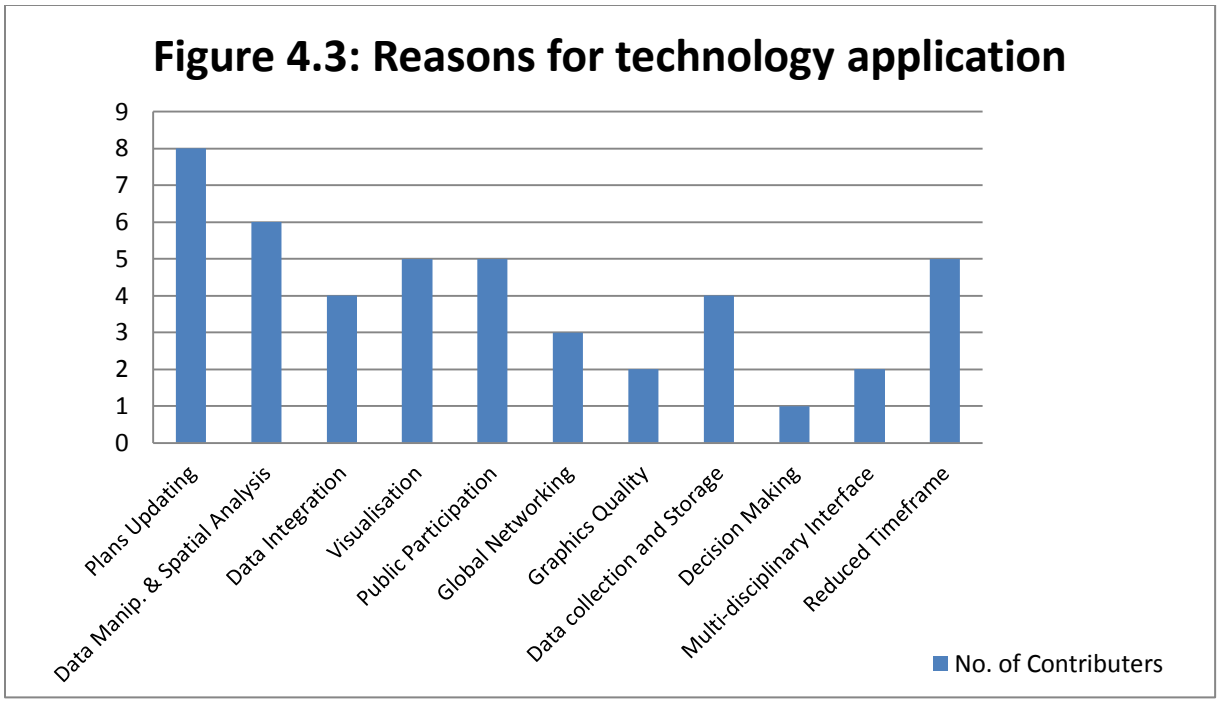
All the planners who were interviewed agreed that the application of technology in the preparation of LPs and MPs in the municipality of Harare was either very limited or non-existent. Some even went on to complain that they did not even have access to computers in their respective organisations because the decision-makers did not fully appreciate the value of computerised planning systems.

The idea of using computer-aided planning systems and GIS was unanimously agreed upon by all the interviewees. There was again high levels agreement on the need to introduce computer-based forms of technology as a tool that would aid planning. Some of the major reasons cited in support of the need to use technology in planning are illustrated on table 4.2 and the bar graph on figure 4.5.

Table 4.2: Technology Application in Planning

Issue/aspect of use of technology	Sample	Agree (independently suggested)	Non-committal
The system would make the updating of plans and spatial data easier	12	8	4
There is a need to use the improved spatial analysis and data manipulation tools that come with GIS and other information technology systems	12	6	6
Easier data sharing and integration	12	4	8
The use of clearer visualisation tools and satellite imagery would stimulate more interest on planning from the non-technical stakeholders involved in the process	12	5	7
Improved public participation system could take advantage of the widespread use of social media such as the internet and mobile phones	12	5	7
Technology will improve the local planners our linkages with other professionals locally and internationally	12	3	9
Computers produce better graphics and they improve plan presentations	12	2	10
Information technology facilitates easier data collection and it has a generally higher storage capacity	12	4	
GIS and CAD systems generate more detailed and more accurate base maps and spatial plans.	12	2	10
Technology application aids and facilitates decision more making	12	1	11
GIS presents a platform which facilitates linking spatial information with other management activities such as budgeting, revenue collection and plan implementation	12	2	10
Technology application reduces the time required to collect and analyse data, prepare maps, and carry out reviews during the plan preparation process (5).	12	5	7
Frequency	12	4	8

Source: Author, 2014.



Source: Author, 2014.

Although the planners were interviewed using a qualitative approach, the number of similarities that appeared in their responses to the need to apply technology in planning influenced the researcher to analyse the responses quantitatively as indicated on figure 4.3 above. The most widely cited reason for wanting to use technology in planning was that of ease of updating plans thus affirming the popularity of the view which suggested the need for more constant plan reviews expressed in 4.2.2. The second most popular reason was the desire to use the extra-ordinary data manipulation and spatial analysis tools associated with GIS. The other popular reasons cited were the visualisation, time reducing and participatory qualities of GST. Although eleven of the twelve planners interviewed confessed that they neither had skills nor exposure to using GIS or any other related GST applications, they enthusiastically welcomed the idea of technology with the hope that it will assist them with networking, aid decision-making, improve sector coordination and facilitate high quality graphic presentations.

There were mixed views on the cost implications of applying technology in planning with some suggesting that the acquisition of software and the compilation of geo-data bases were too expensive. Others argued that the whole process would be cheaper in the long to medium term since the ultimate outcome would be less dependency on primary data sources and manual manipulation techniques in spatial planning.

4.3. Planners views on aims and objectives of local plans 22 and 17

This section focused on the preliminary evaluation the roles of Harare Central Area Local Development Plan Number 22 (LP22) and Kopje Market Square Local Plan 17 (LP17) was mainly done qualitatively through structured interviews. The interviewees were seven planners who - either -participated in preparing the local plans or were directly or indirectly involved with administering the provisions (aims and intents/objectives) of these plans. The questions directed at the planning practitioners were aimed obtaining their views on how they rated the plans' achievements measured against their stated goals and objectives. The researcher took full cognisance of the possibility of personal bias of the respondents in support of own tasks and familiar systems and therefore acknowledges that the findings of this part of the study are tentative indicators of the extent of the urban development problems in the CBD. The assumption though was that planners' views were sincere and they helped the researcher to determine and parcel out individual areas for more detailed analysis using quantitative methods. Other interviews held with property managers in the city were also partly used to verify/triangulate some of the findings of this section.

4.3.1. Assessment of achievement of aims and objectives of Local Plan 22

Records at the City of Harare show that the plan preparation process started before 1992 when some land use surveys were carried out and the actual approval of plan was only attained in March 2000 (City of Harare, 2000). The plan has therefore been operative for fourteen years and this research consequently adopts the year 2000 as the base year for the study. I start by presenting a brief synopsis of the aims and objectives as stated in the plan before proceeding to make a synthesis of the comments that were made by three different planners on the achievement of the objectives of Local Plan 22.

Aim 1: Commercial Development

To further strengthen the economic base of the city centre in order to attract more investment thereto and offer more options for development in general and utilisation of stands in particular.

The plan aimed to achieve this by firstly increasing floor area factors and offering more accommodation and options for business. Secondly it sought to enlarge the area for higher intensity development without detracting the physical identity of the central commercial

area. The last objective involved enhancing supportive commercial zones to the core by appropriate use and density provisions (City of Harare, 2000).

Interviewed planners commented that the plan failed to anticipate the possibility of economic down-turns which prompted the extraordinary growth of informal businesses in the city centre (mainly street vendors) which resulted in increased pedestrian traffic volumes and this in turn turned away the anticipated commercial development from the CBD (see pictures on figure 4.4).

Figure 4.4: Street vending that has taken over some public spaces and street pavements in the CBD of Harare

Source: Author, 2014.

Related to the unforeseen economic trends, respondents also felt that the plan objectives were based on the wrong assumptions and predictions which had anticipated the growth of large scale commercial businesses. The interviewees alluded to the fact that although there was some form of increased density in the CBD it did not take the forecasted route/form which would require increased floor area factors for large departmental stores. In fact the opposite happened as larger buildings were actually subdivided to accommodate much smaller shops (See figure 4.5).

Figure 4.5 A Building along Kaguvi street in the CBD of Harare that was subdivided into small shops for use by small businesses

Source: Author, 2014

Aim 2: Integrated residential and social development

The aim was to ***ensure the continued existence and protection of a lively residential, social and economic environment in the immediate vicinity of the commercial centre***. The objectives with which to achieve this goal were to provide more intensive residential and concomitant development in the inner city residential zones; to encourage more investment in the inner city neighbourhood by providing a controlled mixture of land uses; and, to encourage the continued existence and growth of local commercial centres in residential neighbourhoods (City of Harare, 2000).

All the respondents concurred that this goal was partly achieved. They however raised questions on what they described as an unanticipated take-over of residential space by commercial activity which was moving away from the congestion and decay of the CBD. Respondents could however not be drawn into making estimates of the percentage progress in the achievement of this goal in the absence of empirical support.

Aim 3: Community and Health

The objectives with which to achieve the goal were ***to make provision for strong and viable zone where public assembly and similar activities may be established without***

threat from economically powerful uses. The plan proposed to achieve this by designating a large area where medical practices and ancillary uses can be freely established and to retain if feasible land designated for educational purposes.

The planners interviewed were of the opinion that this goal was partially achieved since it managed to create a vibrant medical zone in the area. One of the respondents however, castigated the plan for having failed to provide mixed land use zones which she described as an absolute necessity in that area (Khanda, 2014).

Aim 4: Traffic and Transportation

To create and enhance conditions which ensure high accessibility and efficient circulation in the planning area as a whole and commercial zones in particular by all modes of transport.

The objectives were to maintain and enhance an efficient hierarchy of roads in the planning area to allow for full choice of routes by road users according to nature and destinations of journeys. Secondly, the plan sought to establish easily identifiable, accessible and capacious parking streets within the fabric of the commercial area. Lastly, the plan would allow private sector participation in providing parking, retaining freeway reservations, enhance safety of pedestrians by establishing malls and pedestrian streets, designate routes and termini for public transport which ensure absolute convenience and safety.

Planners interviewed felt that that the plan failed to provide an efficient road hierarchy as it could not even prioritise and reflect on the city master plan proposal to create ring roads thereby resulting in the current situation where too much traffic passes through the central area unnecessarily. They also cited the current re-designation of major roads in the CBD into one way street as a fire-fighting after-thought which was never proposed by the plan. One planner suggested that the plan should have had a strategic component which addressed the financing and implementation of the proposed ring road system. Observations by the researcher also confirmed the chaotic nature of traffic flow in the city centre where pedestrian and vehicular traffic mix indiscriminately as illustrated on figure 4.6.

Figure 4.6: Chaotic pedestrian and vehicular traffic mix within the CBD of Harare

Aim 5: Environment and Amenity

The plan aimed *to* ***retain, strengthen or add features, structures and design elements which enhance beauty attractiveness and overall amenity in the environment of the planning area.*** The objectives here were to ensure relative proportions of physical developments that were in keeping with desirable human scale, to ensure high quality of finishes of mass structures, street furniture and contribute to high quality of urbanity and attractive streetscape, ensuring high standards of cleanliness and to ensure the regular and efficient clearing of up and removal of refuse. The other objectives mentioned the need to continue to maintain and improve public areas, public and private open spaces for the optimum benefit of the public; maintain and establish new public and civic facilities for the optimum benefit of the public; and maintenance and protection of structures of outstanding beauty and historic monuments.

The respondents were all unimpressed with the performance of the plan in so far as the provision of recreational facilities and public spaces citing the degeneration of previously well landscaped public places like Africa Unity Square and Harare Gardens, also pinpointing the absence of public toilets in such areas as another major drawback in that respect. All 5 planners interviewed also unanimously agreed that the city had failed to maintain the high standards of cleanliness mentioned in the plan. They saw the opposite having actually occurred citing the volumes of refuse increasingly mounting in the city and public spaces. Some even claimed that there was no longer any refuse collection service to talk about (see pictures Figure 4.7).

Figure 4.7: Neglected services in the Central Business District of Harare

Some vendors have resorted to burning refuse in streets

Indiscriminate refuse dumping within the CBD

Rampant dumping and burning of refuse in service lanes

Blocked storm water drains in the CBD

Source: Author, 2014.

One planner claimed that the plan had also failed to address urban design standards and heritage issues since the quality of new development coming up in the city are of much lower architectural standards than prescribed. He also claimed to know of some buildings of historical value which were supposed to be protected in terms of the National Monuments

and Museums Act which had been demolished in order to give way to the construction of 'more modern' buildings (Mukoto, 2014).

A separate questionnaire administered on property managers also sought their views and rating of the quality and adequacy of municipal services in the city. All of them concurred with the observation that solid waste management in the city had deteriorated to a very low level (see table 4.3).

Table 4.3: Property managers' rating of service provision within Harare CBD

	Property Manager 1	Property Manager 2	Property Manager 3	Property Manager 4	Property Manager 5	Property Manager 6	Average rating of service	% rating
SERVICE	**Service provision rating out of 10 where 1 is the lowest and 10 is the highest**							
Water Supply	10	8	4*	10	9	9	8.3	83%
Electricity	9	6	6	9	9	9	8.0	80%
Parking	6	5	4*	4*	4*	2*	4.2*	42%
Solid waste management	5	2*	3*	5	1*	1*	2.8*	28%
Public Transport	10	9	4*	10	4*	8	7.5	75%
Sewerage	10	8	7	9	9	9	8.8	88%

*Mark below 50% of the total possible mark in its category

Source: Author, 2014.

Table 4.3 above clearly illustrates how lowly solid waste management and parking were rated by the property managers interviewed. Solid waste management was the lowest ranked with an average percentage score of 28%. These results impact negatively on the achievements of LP22's goals 4 and 5 which had clear intentions to provide adequate and safe parking and to ensure cleanliness in the city.

4.3.2. Assessment of achievement of goals of Local Plan 17

Kopje Market Square Area Local Priority Plan Number 17 was prepared in the 1980s and it was formally approved in 1990. The plan specifically aimed to address three problem areas on the western part of Harare city centre which were disorderliness, chaotic traffic flow and poor parking (City of Harare, 1990). Accordingly, the plan only formulated three goals which were the provision of proper land use zoning, efficient traffic management and the provision of adequate parking facilities.

The researcher identified three planners who either took part in the plan preparation process or were part to administering the plan. These planners were interviewed and the specific objective of the structured interviews was to seek their rating of the plan's performance in terms of achieving its stated goals again notwithstanding the possible bias by the practitioners.

Goal 1: Land use zoning

One out of the three planners interviewed openly declared that the land use zoning goal had a high level of success because it managed to turn what he referred to as a "red light district" into a vibrant business zone. He however, claimed that the general economic melt-down in the country had prevented the area from realising its maximum development potential. The view was supported by the second planner who claimed the plan's progress was hindered by the lack of resources on the part of the expected implementers of the plan. The third planner however, claimed that the single use zoning concept advocated for by the plan had failed totally because the area was now mostly characterised by mixed land uses.

Goal 2: Traffic management: Provision of safe and efficient vehicular and pedestrian traffic circulation.

All the three planners (also referred to planner 1; 2 and 3) agreed that the plan had failed dismally to accomplish the above stated goal. They however cited different reasons for the plan's purported failure to achieve the goal. Planner 1 claimed that the failure was due to an external factor which was the unanticipated emergence of smaller commuter omni-buses into the public transport scene. He therefore blamed government policy changes for derailing the plan's intentions. He further claimed that a simple review or amendment of the plan could have done the trick but he could not give the reasons for the failure to carry out such amendments.

Planner 2 simply described the plan's intention on managing traffic in the area as disastrous and he said the current conversion of some major roads in the area into one way streets was simply a crisis management approach to a much bigger problem.

Planner 3 who also happened to be the transport planner for the city admitted that the transport management plan as presented in LP17 was failing because it was based on inaccurate projections of the traffic volumes. She claimed that the traffic study that was carried out prior to the formulation of the goal were not detailed enough to be used as a basis for proper transport planning.

Goal 3: provision of adequate parking and public commuter interchange

The three planners all admitted that the issue of parking for private and public vehicles in the area was chaotic and inadequate. They all attributed the problem to plan proposals that were apparently made based on wrong estimates and forecasts on traffic volumes and parking requirements.

The comments made by these planners who were all part of the plan preparation team for LP17 gave the impression that the current planning frameworks being used in Harare were prepared using inaccurate estimates, poor predicting techniques and inadequate data collection. Another clear message which came from the planners was that it was necessary to carry out regular plan reviews since planning needed to keep pace with changing circumstances. Failure to anticipate changing situations and making the necessary plan amendments in the face of a rapidly changing scenario suggests the use of alternative tools. GST and the use mobile planning tools and frameworks provide such an alternative.

Figure 4.8: Vehicle owners are resorting to parking on public spaces just outside the CBD of Harare

Source: Author, 2014.

4.4 Findings of the property managers interviews

Interviews were also carried out on six different property managers responsible for leasing out and managing some buildings within case study 1 area. The managers were identified as key stakeholders in urban development because they represent property owners and developers. Moreover their institutional knowledge on land/building values, building occupancy, land/ building and property markets was solicited as a yardstick for assessing the performance of current spatial planning frameworks.

The property managers interviewed only gave the interviewer information related to buildings within the commercial core of the CBD. The interviewees were collectively responsible for managing a total of 44 buildings within the central business district of Harare. The rentals for the buildings are based on rates which range from US$8 to US$15 per square metre (see table 4.4).

TABLE 4.4: Summary of buildings and rentals per month

Company Name	**No. of Buildings**	**Average Rentals per m^2**
Robert Root Estate Agency	8	US $10
Jena Properties	5	US $9
Executive Development Real Estate	4	US $15
Kennan Properties	2	US $12.50
Executive Development Real Estate Branch 2	4	US $12
Southgate and Bancroft	4	US $8
TOTAL	27	
AVERAGE RENTALS PER m^2		US $11.08

Source: Author, 2014.

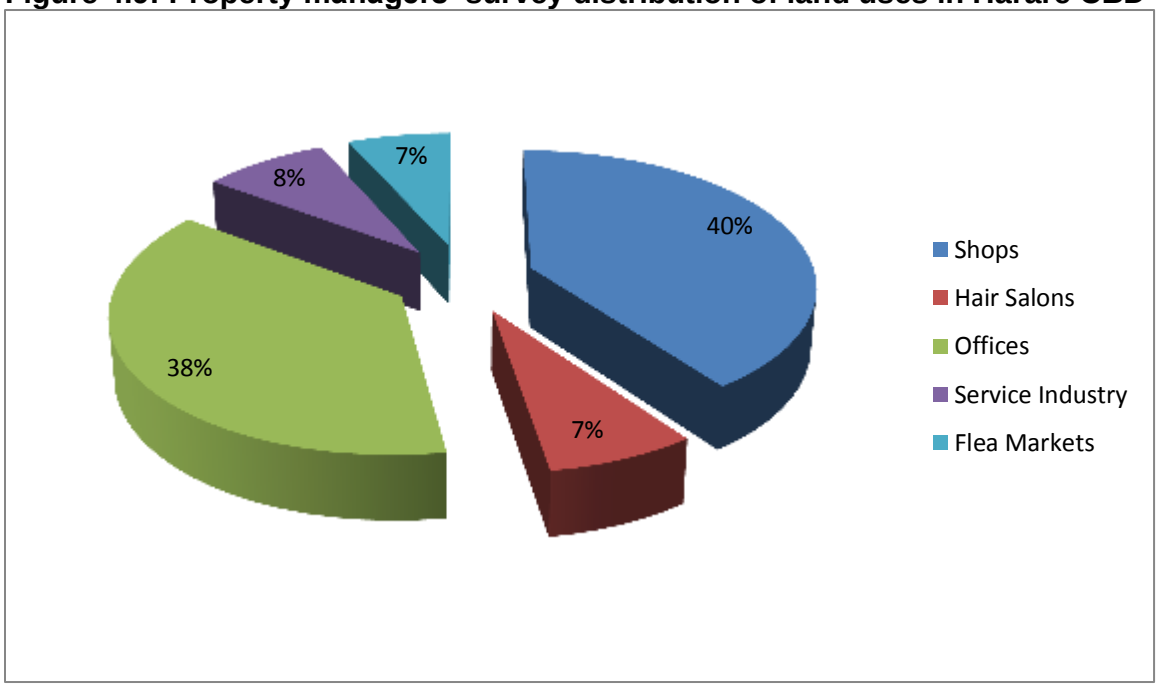
4.4.1. Land Use and Value of Rentals

Property managers were asked if there were any significant changes on the rentals charged for the buildings they have managed in the past five years and the reasons for such changes if any. Most of the developers indicated that there was a general decrease in the value of rentals a fate which they blamed the deteriorating economic situation in the country. They however said that they had since devised coping strategies which saw them resorting to subdividing shops and offices into smaller units so that they could realise the desired amounts of rentals per square metre. They also had opted for more flexible rental

conditions which accommodated some of the tenants' wishes which resulted in them sub-leasing some of the space within the properties to smaller businesses.

They acknowledged the fact that although most of their registered clients carried out the permitted businesses in terms of town planning zoning, they never really bothered to check which activities the sub-leased tenants were involved with and so they could not make specific estimates on the numbers involved. They generally were of the opinion that the activities of the sub-let tenants were varied and were in most cases outside the permitted uses. Given the city's planning department's laxity in dealing with 'change of use' applications and register referred to earlier, the flouting of planning, licensing and related provisions through sublets by property managers is perhaps not surprising. Three of the five property managers admitted that their registered tenants occupied and used buildings for purposes that contravened the permitted use zones. 40% of the floor space rented out by the managers was still occupied by shops whilst 38% was occupied by offices with service industries, hair salons and flea markets accounting for 8%, 7% and 7% respectively (see pie chart on figure 4.9).

Figure 4.9: Property managers' survey distribution of land uses in Harare CBD



Source: Author, 2014.

According to the information supplied by the property managers, an analysis of the distribution of activities showed that there was some element of mixed uses within buildings

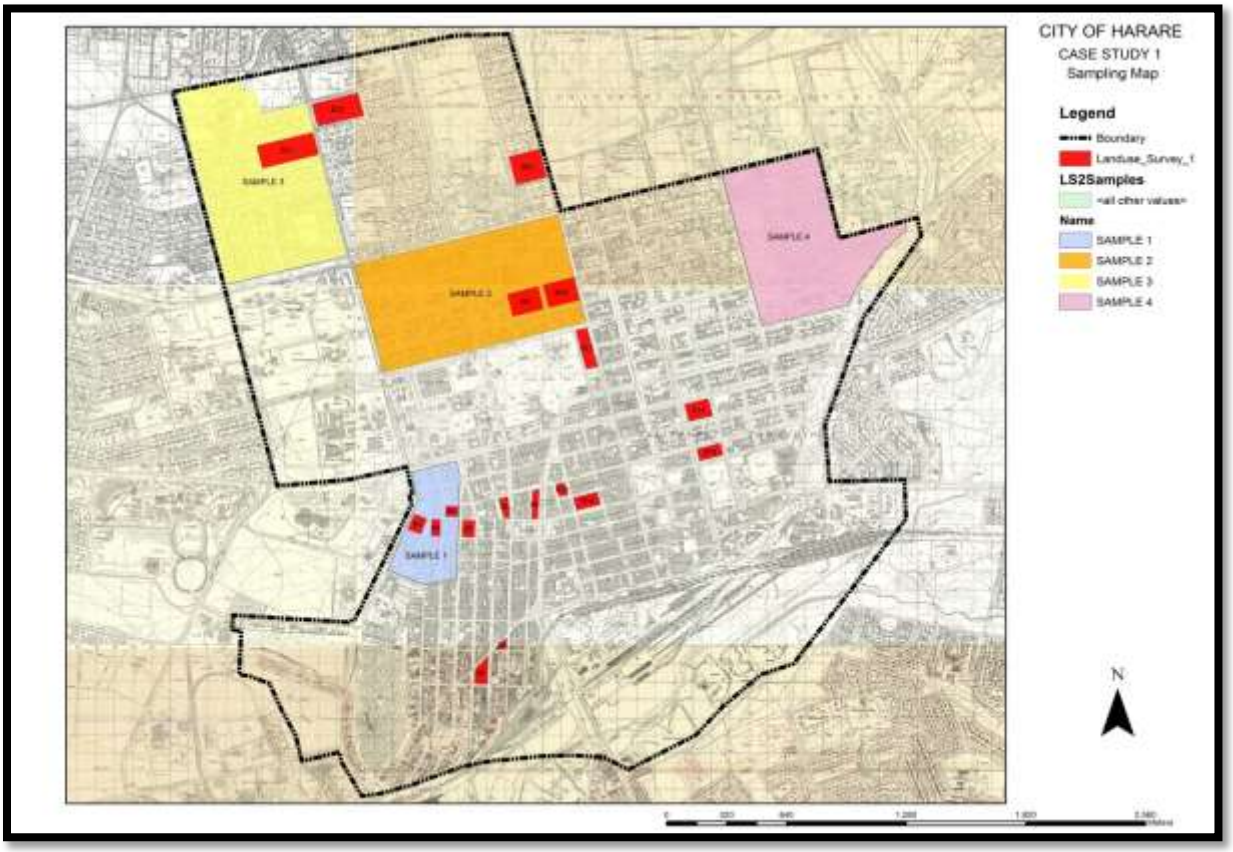
in the CBD. The study then went on to focus on analysing the land use patterns in the CBD by embarking on physical land use surveys of some selected stand blocks.

4.5. Findings of land use surveys and change analyses

Two types of land use surveys were carried out referred to here as Land use Survey 1 and Land use Survey 2 respectively. The first survey involved the physical identification of activities in all the buildings located in the blocks of stands that were randomly selected to reasonably represent the coverage of the area within Case Study 1 in the central area of Harare. The details of the data gathered in the survey were recorded on forms whose format is shown in Appendix 7.

A preliminary analysis of the findings of land use survey 1 gave a primary indicator of the existing land use patterns in the central business district of Harare. A comparative analysis of this primary indicator with the land use zoning maps for the city enabled the identification of larger focus zones for more representative study sample frames for Land use Survey 2 in this study. The map on figure 4.10 shows the areas which were covered by the two land use studies in case study 1.

Figure 4.10: Distribution of sampled study areas for land use survey 1 and land use survey 2



Source: Author. 2014.

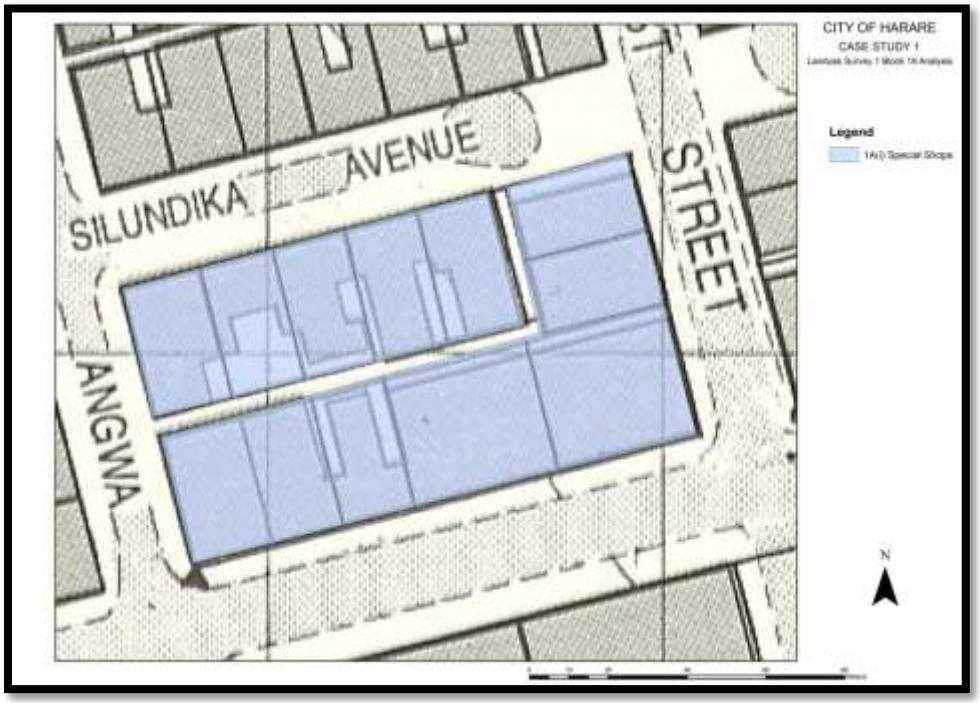
4.5.1 Land use Survey 1: Results and change analysis

In analysing the results of the findings of land use survey 1 the processes started by determining the land use classes for each and every stand in the surveyed blocks. These land use classes were exactly the same with those specified either in LP17 or LP 22 depending on which planning area they were located. The existing land use class maps were compared with the existing land use zone maps using the cross-tabulation procedure in ArcGIS as specified on table 3.3 in chapter 3 of this study. Blocks 19 and 22 were subsequently selected for further analysis in this section of the report because they represented two contrasting sets of results. Block 19 is located in the heart of the commercial area and a comparison of the existing land use zones with the zoned land uses show 100% compliance with planned land use zoning whilst Block 22 located in a zone reserved for detached residential houses indicates about 75% departure from the zoning intentions with only 25% compliance.

4.5.1.1 Block 19 Analysis

The existing land use map for block 19 showed that the block had maintained the original zoning intentions of LP22 (represented by the light blue colour on map in figure 4.11) which had designated the whole area for special shops.

Figure 4.11: Land use zone compliance map for Block 19



Attributes of 1A(i) Special Shops

FID	Shape *	Id	Zone	Off_site_P	Actual_FAF	Area
0	Polygon	0	1A(i) Special Shops	13	9.7	1274.76
1	Polygon	0	1A(i) Special Shops	10	7	1250.75
2	Polygon	0	1A(i) Special Shops	0	6	611.788
3	Polygon	0	1A(i) Special Shops	2	6.8	621.805
4	Polygon	0	1A(i) Special Shops	12	1.7	672.355
5	Polygon	0	1A(i) Special Shops	8	3.9	653.186
6	Polygon	0	1A(i) Special Shops	8	5.4	640.348
7	Polygon	0	1A(i) Special Shops	6	2.6	644.65
8	Polygon	0	1A(i) Special Shops	15	1.8	692.286
9	Polygon	0	1A(i) Special Shops	11	2.9	1314.77
10	Polygon	0	1A(i) Special Shops	5	5.2	645.749

Extract from ArcGIS attribute table for block 19 with additional calculations representing floor area factors, off-site parking and stand areas

Source: Author, 2014.

A further inspection of column number four of the attribute table for Block 19 shows that there is 100% compliance with the zoning proposed in LP22 (see figure 4.2). GIS data manipulation tools were then used to calculate the other common planning variables such as floor area factors (FAF) and the number of on-site parking bays per stand. The results of

these calculations were then used to further measure the level of compliance with LP 22. The method used for calculating the floor area factor is depicted in appendix 9.

The next type of analysis used Google Earth satellite image overlays to simply count the number of off-site parking bays that serve the individual plots on block 19, the results were then compared with the standard for parking provision in the area which according to LP22 is supposed to be provided to satisfy a standard of 1 parking bay per 100 m^2 of rentable floor space. The information on floor space measured and calculated from satellite imagery as explained in step 2 in appendix 9 was used to calculate the prescribed number of parking bays (see table 4.5). This method of calculating compliance with parking standards is also subject to error when one assumes that all the floors observed from image analysis are rentable floor space. Some floor space can actually be occupied by parking garages and service ducts which cannot be classified as rentable space. Ground verification of the method was therefore used in order to confirm or rectify the assumption.

TABLE 4.5: Analysis of parking data from Block 19

Plot/ Reference No.	Total floor area (m^2)	Prescribed No. of Parking @ 1 bay/ 100m^2 floor space	Existing Parking Bays	Difference
0	12365	123	13	-110
1	8755	87	10	-77
2	3670	36	0	-36
3	4228	42	2	-40
4	1143	11	12	+1
5	2560	25	8	-17
6	3458	34	8	-26
7	1676	16	6	-10
8	1246	12	15	+3
9	3813	38	11	-27
10	3358	33	5	-28
Total		457	90	-367

Source: Author, 2014.

The information on table 4.5 indicates a significant deficit in the provision of parking facilities when measured against the prescriptions of LP22. There are only 90 off-site parking bays out of a total possible of 457 representing a meagre 20% compliance with the parking standard in the plan. In other terms the plan suggests that Block 19 required an additional 367 parking bays to be fully compliant with the plan. These figures obviously pose questions on the accuracy and the appropriateness of both the predictive and forecasting techniques used in either the formulation of the parking standard or the application of development conditions in land use management by the relevant authorities.

4.5.1.2 Block 22 analysis and findings

An analysis of the findings of the land use survey carried out on Block 22 is presented in this section. Unlike block 19 which was located in a commercial area, block 22 is in an area zoned for residential purposes in terms of LP22 and it therefore presents different contextual challenges and land use change characteristics. The block consisted of twelve plots measuring approximately 2500 m^2 each and they all fell under zone 2(i) detached dwelling houses (represented by the yellow colour) in terms of the current local plan covering the area which is LP22 (see maps on figure 4.12).

The results of land use survey 1 however show that the existing land uses in block 22 had now changed drastically since only 3 buildings on residential stands remained compliant with the intended zoning out of the original number which was 12. The block is now made up of 7 offices stands, two medical facility stands and three residential stands. This new land use pattern was edited onto a shape file that was exported from the block 22 shape file using ArcGIS 9.3. A satellite image covering the same area was also downloaded from Google Earth-Pro and it was overlaid onto the existing land use file for further analysis (see maps on figure 4.12).

Figure 4.12: Block 22 Land Use Change Maps

Residential Block 22 original land use zoning as per Local Plan 22

Residential Block 22 existing land use and building cover map

Source: Author, 2014.

The maps were juxtaposed for visual comparison purposes. The yellow colour on the map on the right hand side represents the three residential stands which retained their zoned land use whilst the light blue and light pink colours represent the seven office stands and the two medical stands respectively. The footprints of the buildings observed from the 2014 satellite image for the block were also digitised and they are represented by features that are coloured dark pink on the map. The data from the attribute tables of the two maps were cross-tabulated in order to come up with a more detailed land use change analysis (see table 4.6.

Table 4.6: Land use change data analysis for Block 22

Zone	Zoned Area (m^2)	Gain/Loss from 2A(i) Detached Dwelling Houses	Gain/Loss from 1B Offices	Gain/Loss from 3A Doctors Surgeries	Current Area (m^2)
2A(i) Detached Dwelling Houses	30419.38	0	-17821.47	-4967.52	7630.39
1B Offices	0	+17821.47	0	0	17821.47
3A Doctors Surgeries	0	+4967.52	0	0	4967.52

Source: Author, 2014.

The figures in table 4.6 show that the area earmarked for residential purposes in Block 22 had declined to a mere 7630.39 m^2 in 2014 (at the time of land use survey 1) from 30419.38 m^2 in the year 2000 (when LP22 was approved) representing only 25% compliance with the zoning plan. Indications of the latter result are that the plan failed to anticipate massive land use change in the residential zone.

The other variable that was used as a demonstration for measuring plan compliance is site coverage. Existing buildings were digitised from a geo-referenced 2014 Google Earth satellite image. The building areas were then calculated using ArcGIS from the attribute table of the resultant buildings' shape file. Data from the attribute tables of the buildings shape file and the existing land use file was the exported to Microsoft excel for further analysis (see table 4.7). The percentages of the building areas (column 4 in table 4.7) over stand areas (column 3 in Table 4.7) were then calculated and the results were recorded in column 6 of table 4.7.

Table: 4.7. Analysis of Attribute Data Table for Block 22

Stand Number	Zone	Area	Building Area (m^2)	No. of Buildings	Site Coverage
3000	1B Offices	2655.84	574.02	1	21.61%
3001	2A(i) Detached Dwelling Houses	2582.22	203.96	1	7.90%
3002	2A(i) Detached Dwelling Houses	2595.09	227.71	1	8.77%
3003	1B Offices	2661.85	289.22	2	10.87%
3004	1B Offices	2498.65	263.12	2	10.53%
3005	1B Offices	2563.6	289.6	1	11.30%
3006	1B Offices	2563.38	905.93	5	35%
3007	3A Doctors Surgeries	2402.95	439.04	2	18.27%
3008	1B Offices	2481.37	259.61	2	10.46%
3009	2A(i) Detached Dwelling Houses	2453.08	270.9	1	11.04%
3010	3A Doctors Surgeries	2564.57	267.25	1	10.42%
3011	1B Offices	2396.78	381.82	3	15.93%
TOTAL		30419.38	4372.18		
	AVERAGE			1.73	14.34%

Source: Author, 2014.

The key finding was that there was 100% compliance with the development condition in LP22 which stipulated that the maximum site coverage by buildings should not exceed 35% of the stand area. The question which arises though is the appropriateness of a 35% maximum site coverage condition to an area which is predominantly covered by office and medical buildings. One would assume that the standard was meant to preserve and enhance privacy, exclusivity and high property values through the provision of lavish garden spaces for low density residential areas. The same principles were less likely going to be applicable in an offices zone which could be influenced more by the need to increase rentable floor space a condition that could necessitate the reduction of the seemingly idle garden space to the barest minimum.

4.5.2 Land use Survey 2: Results and change analysis

The results of land use survey 1 and the generalised observation of the land use patterns in the entire area covered by case study 1 were then used to identify four larger samples for a much more representative land use change analysis. These areas are depicted on Map 4.1 and they are labelled samples 1 to 4. The selection was also done in a manner which

ensured that each sample covered an area which was zoned for a land use group that was different from the other.

4.5.2.1 Land use re-classification

The first part of the exercise was that of combining the two zoning maps for LP17 and LP22 and this was done through merging the two shape files for local plans using ArcGIS to produce a new shape file named ***Zoning_Merge_Map***. The attribute table of this new file was then opened and a new field named land use was created. This new field served to provide a standardised land use classification scheme which facilitated the re-classification of the land use zones from the two local plans into broader land use classes such as commercial, residential, medical, public buildings, funeral and educational (see table 4.8).
Table 4.8 gives a clearer picture of how the specific land use zones from the two local plans were combined into the broader land use fields. The main motive of creating the standard land use class was to enable the researcher to carry out a GIS change analysis based on a method which compares change from common land use platforms.

Table 4.8 Land Use Block Classification Scheme

ACTIVITIES	LAND USE CLASSIFICATION
Shops	COMMERCIAL
Offices	
Restaurants	
Guest Houses	RESIDENTIAL
Detached Residential	
Residential Flats	FLATS
Doctors' Surgeries	MEDICAL
Clinics	
Hospitals	
Medical Laboratories	
Funeral Parlours	FUNERAL
School	EDUCATIONAL
Crèche	
Training Centre	
Church	PUBLIC BUILDINGS
Community Hall	
Public Buildings	
Government Offices	GOVERNMENT
Local Authority Offices	
Where uses other than the predominant use constitute 50% or more when measured against the total uses (inclusive of the predominant use)	MIXED USE

Source: Author, 2014.

4.5.2.2: Sample 1 Kopje commercial area land use survey findings and change analysis

The area for sample 1 is covered by Local Plan 17 and its extent is defined by Nelson Mandela Avenue which forms the northern boundary, Rotten Row Street to the west, Robert Mugabe Avenue to the south and Mbuya Nehanda Street to the east. The area was mainly zoned for shops and offices in terms of the plan. These two uses were then inclusively classified under the commercial land use class in terms of the broader land use classification scheme outlined in 4.5.2.1. The other land use zones in in the sample included proposals to create a bus terminus and a parking garage. These were placed under the broad land use class for transport (see map on Figure 4.13).

A physical land use survey was then carried out in the area for sample 1. The land parcels formed by individual stand blocks defined by street boundaries were adopted as the units of analysis in the survey. The actual number and type of business activities currently occupying the stand blocks were recorded on survey forms whose format is shown in the appendix 8. The same information was then recorded on a spread sheet in Micro-soft excel for further analysis and classification (see table 4.9).

Table 4.9: Land Use Survey 2 Sample 1 Analysis

COLUMN	**A**	B	C	D	E	F	G	H	I	J	K	L	M	N
Block No.	Residential	Flats	Medical	Guest Houses	Shops	Restaurants	Office	Funeral	Church	Education	other	Predominant Use	% Mix	Classification
1	0	0	0	0	1	0	5	0	0	1	0	Office	29%	Commercial
2	0	0	1	0	3	2	2	1	0	0	1	Shops	70%	Mixed Use
3	0	0	1	0	3	0	5	1	0	0	1	Office	44%	Commercial
4	0	0	0	0	0	0	2	0	0	0	0	Office	0%	Commercial
5	0	0	0	0	8	1	4	3	1	0	1	Shops	53%	Mixed Use
6	0	0	3	0	7	3	3	1	0	0	0	Shops	59%	Mixed Use
7	0	0	0	0	22	2	0	0	0	0	1	Shops	12%	Commercial
8	0	0	0	0	10	0	1	1	0	0	2	Shops	29%	Commercial
9	0	0	2	0	15	1	1	0	0	0	1	Shops	25%	Commercial
10	0	0	0	0	4	0	10	0	0	0	0	Office	29%	Commercial
11	0	0	0	0	20	1	1	0	0	0	0	Shops	9%	Commercial
12	0	0	1	0	15	0	1	0	0	0	0	Shops	12%	Commercial
13	0	0	1	0	12	1	1	0	0	0	0	Shops	20%	Commercial
14	0	0	0	0	12	1	6	2	0	0	0	Shops	43%	Commercial
15	0	0		0	14	0	3	0	1	0	0	Shops	22%	Commercial
16	0	0	0	0	20	1	0	0	0	2	1	Shops	17%	Commercial
17	0	0	0	0	15	3	1	0	0	0	1	Shops	25%	Commercial
18	0	0	0	0	25	0	6	0	0	0	1	Shops	22%	Commercial
19	0	0	0	0	24	1	3	0	0	0	2	Shops	20%	Commercial
20	0	0	0	0	27	1	0	0	0	1	2	Shops	13%	Commercial
21	0	0	0	0	21	2	1	0	0	0	2	Shops	19%	Commercial

In the analysing the data on table 4.9 the current activity (existing use) with the highest frequency per block was identified and recorded on column L under the heading 'Most Predominant Use'. The sums of all the uses recorded on columns A to K were then added and the answers were divided by the values in the predominant use column multiplied by 100 in order to up with the percentages of land use mix per block which were recorded on column M. The values recorded in column M were therefore calculated using the following formula: $M = \frac{(\sum n - L)\ 100}{\sum n}$

Where:

M is the percentage of land use mix as shown on column M on Table 4.9.

$\sum n$ represents the sum of the values of all land uses as indicated on columns A; B; C; D; E; F; G; H; I; J; and K.

L represents the value of the predominant use.

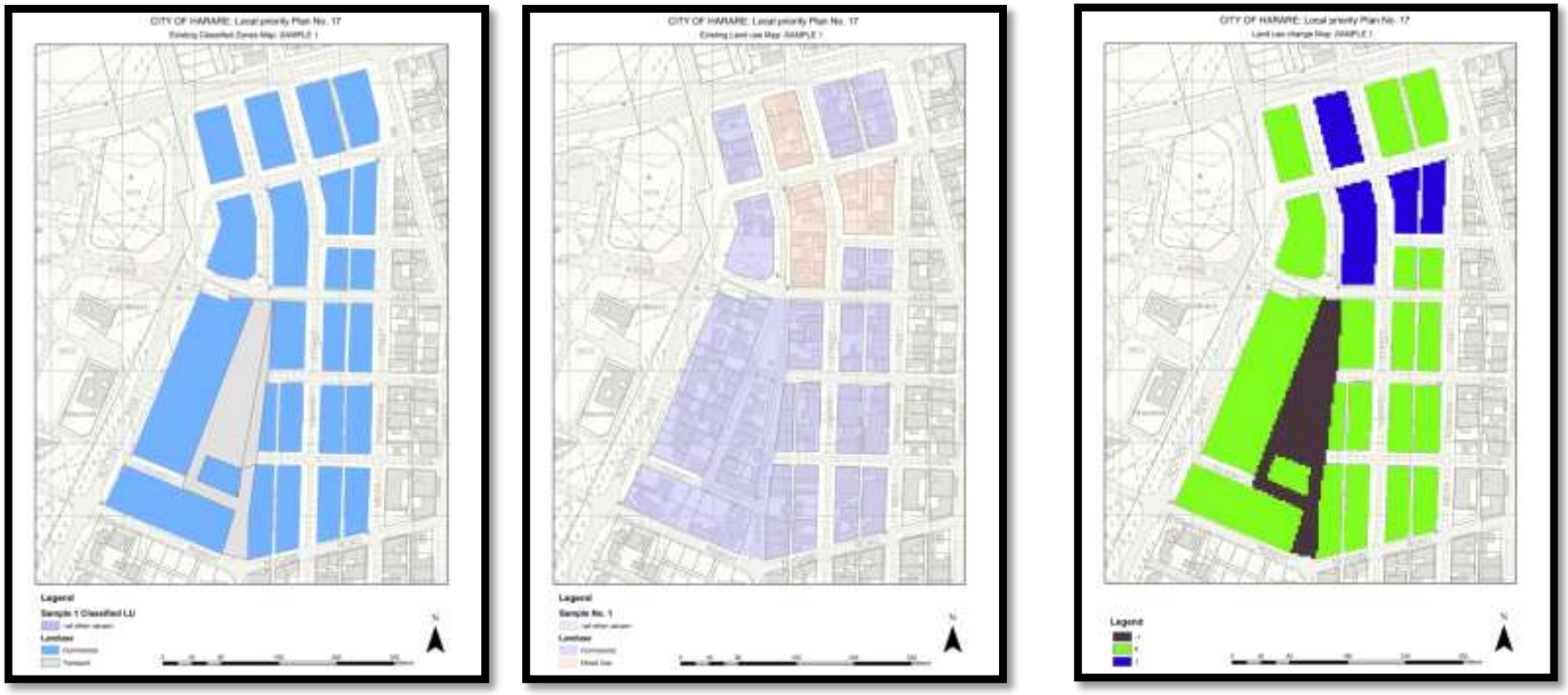
Where the value of M is 50% or more the whole block was then classified as a mixed use and where the value of M is below 50% the block was then allocated the predominant use's classification zone (see example).

If there were 14 office uses and the total number of uses (inclusive of the predominant use) on the block was 20 then the percentage mix would be $M = \frac{(20-14)}{20}$ x 100 = 30%.

In such an instance the value of the predominant use (offices) exceeds the percentage of land use mix and since offices fall under the broad land use class commercial in terms of the reclassification (outlined in the broad land use classification in table 4.8) would be COMMERCIAL.

Two separate maps for sample 1 were created through exporting 26 land parcels from ***Zoning_Merge_Map*** referred to in 4.5.2.1. One of the maps was named ***"Zoned Land Use Map for Sample 1"*** and it had twenty four land parcels in the commercial land use class and two in the transport class (see Figure 4.5). The second map had its attribute table edited to suit the land use classification carried out after the analysis of Land use survey data outlined in table 4.8 and it was named "***Land Use Survey 2 Sample 1 Existing Land Use Map"***. The latter consisted of two land use classes which are the commercial zone and the mixed land use zone. Four land parcels classified as commercial as depicted on the first map (on the left hand side) on Figure 4.13 changed to mixed use whilst the two transport parcels changed to commercial (see the middle map on Figure 4.13).

Figure 4.13: Land use change maps for sample 1



1. Zoned Land Use Map **2. Existing Land use map** **3. Land use change map**

Source: Author, 2014.

The three maps were juxtaposed on the previous page for the purposes of carrying a visual comparison of land use change from the zoned uses to the existing land use. The first two maps from the left hand side on figure 4.13 were then converted from vector to raster format and they were cross tabulated in ArcGIS for the purposes of carrying out a mathematical differentiation of the land use change. The visual result of the cross tabulation exercise came out in the form a single land use change map (see map on the right hand side on Figure 4.13). The map depicted the commercial areas which were not affected by change in green, the transport zone which changed to commercial in black and the commercial areas which changed to mixed use in blue. The mathematical data obtained from the cross tabulation was then summarised and presented in a clearer format which quantifies the spatial land use change in terms of area (m^2) as displayed on table 4.10.

Table 4.10 Land use change summary table for Sample 1

	Zoned Area (m2)	Gain/Loss from Commercial (m^2)	Gain/Loss from Transport (m^2)	Gain/Loss from Mixed Use (m^2)	Current Area (m^2)
COMMERCIAL	108154.26	0	+18569.59	-17521.99	109201.79
TRANSPORT	18569.92	-18569.92	0	0	0
MIXED USE	0	17521.99	0	0	17521.99

Source: Author, 2014.

The figures in table 4.10 show that the area earmarked for commercial purposes in Sample 1 marginally increased from 108154.26 m^2 in 1990 (the date when LP17 was approved) to 109201.79 m^2. The entire 18 569.92 m^2 reserved for the development of a bus terminus and a parking garage was taken up by commercial activities whilst, a total land area of 17521.99 m^2 changed from commercial use to a mixed use zone.

These results clearly show that LP17 proposal to create a transport zone in the area completely failed to take off in the 14 years that the plan has been operational. The analysis also show the coming up of a completely new class of land use known as the “Mixed Use” class which took up 17521.99 m^2 from the 108154.26 m^2 which had been originally zoned for commercial purposes representing a 16% non-compliance with the zoning proposal.

4.5.2.3 Sample 2 residential flats area land use survey 2 findings and change analysis

Sample 2 is made up of an area bounded by Josiah Tongogara Avenue to the north, Prince Edward Street, Hebert Chitepo and Second Street to the west, south and east respectively. The maps for the sample were created through extracting data from ***Zoning_Merge_Map*** using the same procedure outlined in 4.5.2.2. The extracted data was made up of a total of 48 land parcels.

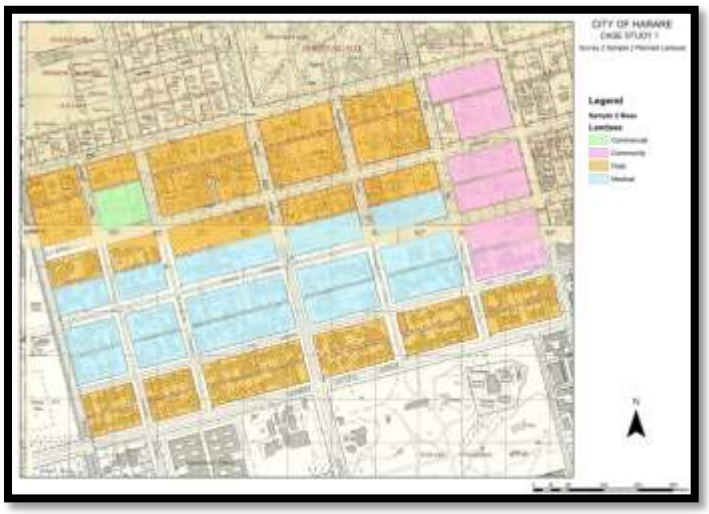
The resultant zoned land uses map for the area showed that LP22 designated one land parcel for commercial purposes, 6 for community use, 26 for flats and 15 for medical purposes. The units for land use change analysis in this sample were stand blocks which were defined by access roads as boundaries. This meant that in most instances one would find two land parcels that were only divided by a narrow service lane being referred to as one block. There were however a few exceptions where the narrow service lane also formed the demarcation between two land use zones. In the latter instances the unit of analysis was based on the differently zoned land parcels (see maps on figure 4.14). Sample 2 therefore ended up with only 24 blocks being defined as the units of analysis.

The findings of land survey 2 were analysed in Microsoft excel using the same procedure described in 4.5.2.2. The analysis came up with new land use classes for the different blocks as shown in column N on table 4.10. The second map was then edited and to suit the classified land uses in the analysis table for sample 2 (see Table 4.11 and the first map on Figure 4.14).

Table 4.11: Land use survey 2: Sample 2 Analysis table

COLUMN	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Block No.	Residential	Flats	Medical	Guest Houses	Shops	Restaurants	Office	Funeral	Church	Educational	other	Predominant Use	% Mix	Classification
1	0	3	3	1	2	0	0	0	1	1	0	Flats/ Medical	73%	Mixed Use
2	1	4	0	0	0	0	3	0	0	0	0	Flats	50%	Mixed Use
3	0	4	0	0	0	0	2	0	0	0	1	Flats	43%	Flats
4	4	5	4	0	0	0	2	3	1	0	1	Flats	75%	Mixed Use
5	2	5	2	0	0	0	0	0	0	0	0	Flats	44%	Flats
6	1	2	1	2	0	0	4	3	0	0	0	Office	69%	Mixed Use
7	2	1	2	0	0	0	1	0	0	0	0	Residential/Medical	67%	Mixed Use
8	0	3	3	0	0	0	0	0	0	0	0	Flats/ Medical	50%	Mixed Use
9	1	6	1	0	0	0	5	0	0	0	1	Flats	57%	Mixed Use
10	0	2	3	1	0	0	0	0	0	0	1	Medical	57%	Mixed Use
11	0	7	1	0	1	0	0	0	0	1	1	Flats	30%	Flats
12	4	2	4	1	1	0	0	0	0	0	0	Residential/ Flats	66%	Mixed Use
13	0	6	1	0	0	0	1	0	0	0	1	Flats	25%	Flats
14	0	10	1	0	0	0	1	0	0	0	0	Flats	9%	Flats
15	0	0	4	0	0	0	1	0	1	0	0	Medical	33%	medical
16	0	9	3	0	0	0	2	0	0	0	0	Flats	36%	Flats
17	1	5	2	0	0	0	1	0	0	0	0	Flats	44%	Flats
18	1	5	1	0	1	0	0	0	0	0	0	Flats	38%	Flats
19	0	7	0	0	0	0	0	0	0	0	0	Flats	0%	Flats
20	0	1	0	1	4	0	0	0	1	1	1	Shops	50%	Commercial
21	3	8	1	0	2	0	3	0	1	0	0	Flats	56%	Mixed Use
22	1	6	0	0	0	0	1	0	0	0	0	Flats	25%	Flats
23	0	8	0	0	0	0	1	0	0	0	0	Flats	11%	Flats
24	1	5	2	0	2	0	1	0	0	0	1	Flats	58%	Mixed Use
TOTAL	**22**	**114**	**39**	**6**	**13**	**0**	**29**	**6**	**5**	**3**	**8**			
Average													**44%**	

Figure 4.14: Land use change maps for sample 2



1. Land Use Survey 2 Sample 2 Zoning Map

2. Existing land use map for sample 2

Source: Author, 2014. **3. Land use change for sample 2**

The maps showing zoning and existing land use and land use change were all juxtaposed for the purposes of carrying out a visual comparison. The analysis table and the visual comparison of the land use maps show that land use change resulted in a new land use class for mixed uses which now occupies 11 blocks. The other significant visibly notable change was that the number of commercial blocks increased from one to two, the medical blocks and the community blocks decreased from 10 to 2 and 3 to 0 respectively.

The features represented on maps 1 and 2 on figure 4.14 were converted to raster format using ArcGIS 9.3 and they were compared using math and minus commands in the software. The resultant map which depicts the land use change is as shown on the third map on Figure 14. The map shows that there was massive land use change with only 12 (in red) out of the 48 land parcels in the sampled area retaining their zoned land uses.

The attribute data extracted from the cross-tabulation of the land use change maps was quantified and compared in the manner depicted on table 4.12. Most of the land use change in the area was in the form of the conversion of the zoned medical and flats land parcels into mixed use which subsequently gained 223 111.88 m^2 from the two land use classes. The other land use class which increased in size was the commercial zone which gained 7022.13 m^2 from the flats zone. The community, flats and medical zones lost 64717.20 m^2; 34899.56 m^2 and 130517.25 m^2 respectively.

Table 4.12 Summary of Land use Change in Sample 2

LANDUSE	ZONED AREA (m^2)	EXISTING AREA (m^2)	CHANGE (m^2)	% CHANGE
Commercial	10224.4	17246.53	+7022.13	
Community	64717.2	0	-64717.2	
Flats	254396.02	219496.46	-34899.56	
Medical	151914.35	21397.10	-130517.25	
Mixed Use	0	223111.88	+223111.88	

Source: Author, 2014.

The results in table 4.12 also clearly indicate that LP22 possibly failed to anticipate the development of a vibrant mixed use zone in the area. The other possibility is that the authors of the plan refused to recognise the real demand for the creation of such a land use class or they were prevented from doing so by the political and legislative frameworks that guide the planning process.

4.5.2.4 Sample 3 detached housing area land use survey 2 findings and change analysis

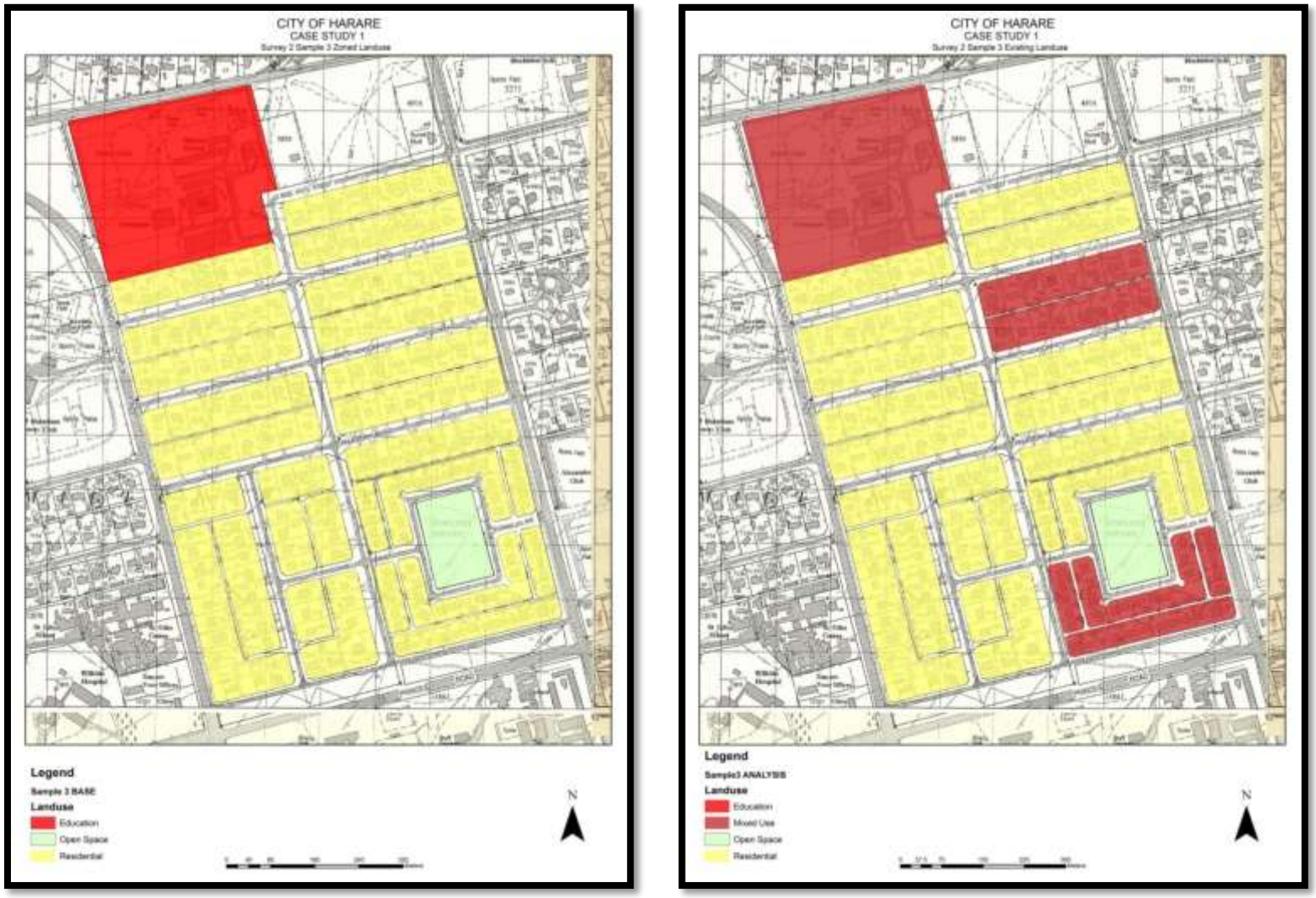
The third sample is made up of an area bounded by Marimba stream to the north, Drummond Chaplin Street, Cleveland Avenue and Prince Edward Street to the west, south and east respectively. Maps for the sample area were created using the same method used to create zoning maps and existing development maps in samples 1 and 2. The maps consisted of 27 land parcels each. The zoning map consisted of 211 residential stands, one educational stand and one open space.

The units for land use change analysis in this sample were stand blocks which were defined by access roads as boundaries. This meant that in most instances two or more land parcels that were only divided by narrow service lanes were considered as a single block. There were some exceptions where the narrow service lane also formed the demarcation between two land use zones. In such instances the unit of analysis was based on the differently zoned land parcels (see the first map on Figure 4.15). Sample 3 therefore ended up with only 12 blocks that were used as the units of analysis.

The findings of land survey 3 were analysed in Microsoft excel using the same procedure applied in samples 1 and 2. The analysis came up with new land use classes for the different blocks as shown in column N on table 4.12. The second map was then edited to suit the classified land uses in the analysis table for sample 3 (see Table 4.12 and second map on Figure 4.15).

When comparing the two maps the magnitude of land use change is quite clear with the most visible ones being the conversion of six land parcels from residential use to mixed use and the conversion of the educational area into a mixed use area as well.

Figure 4.15: Land use change maps for sample 3



1. Zoning Map for Sample 3 **2. Existing Land Use Map for Sample 3**

Source: Author, 2014.

Table 4.13: Land use survey 2: Sample 3 Analysis table

COLUMN	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Block No.	Residential	Flats	Medical	Guest Houses	Shops	Restaurants	Office	Funeral	Church	Educational	other	Predominant Use	% Mix	Classification
1	17	0	2	0	0	0	4	0	0	2	0	Residential	32%	Residential
2	6	0	0	0	0	0	3	0	0	0	0	Residential	33%	Residential
3	11	0	0	0	0	0	2	0	0	0	0	Residential	15%	Residential
4	18	0	3	0	0	2	13	0	0	0	0	Residential	50%	Mixed Use
5	18	0	1	0	0	1	15	0	0	0	0	Residential	49%	Residential
6	11	0	0	0	0	0	5	0	0	0	0	Residential	31%	Residential
7	11	0	0	0	0	0	5	0	0	0	0	Residential	31%	Residential
8	11	0	1	0	0	0	4	0	0	0	0	Residential	31%	Residential
9	7	0	1	0	0	1	8	0	0	0	0	Office	53%	Mixed Use
10	9	0	0	0	0	1	6	0	0	0	0	Residential	44%	Residential
11	6	0	0	0	0	0	2	0	0	0	0	Residential	25%	Residential
12	0	0	0	0	0	0	0	0	1	2	3	Education	50%	Mixed Use
TOTAL	125	0	8	0	0	5	67	0	1	4	3			
AVERAGE													37%	

Source: Author, 2014.

A closer inspection of table 4.13 shows some of the limitations of adopting larger units of analysis in carrying out a land use change analysis. Column N on the table shows that the number of residential blocks at the time of the land use survey were 9 which mean that the residential use zone only lost two blocks due to land use change since the original number of zoned residential blocks was 11. These figures represent 22% land use change in the residential zone.

If individual residential stands were used as the unit of analysis the same table shows in column A that the number of residential stands at the time of the land use survey had gone down to 125 from the 211 counted from the zoning map. This change represented a 41% land use change in the same residential zone.

The researcher however still went ahead to make a cross tabulated comparison of the zoning and the existing land use maps for sample 3 using residential blocks as the unit of analysis. The resultant of the latter exercise was saved under the name ***Land Use Change Map for Sample 3***.

The summarised version of the figures depicting land use change extracted from the attribute table of the ***Land Use Change Map for Sample 3*** is presented on Table 4.14. It shows that the educational and the residential zones lost 96712.80 m^2 and 75087.65 m^2 respectively to the mixed use zone. The open space zone remained unchanged at 17139.50 m^2.

Table 4.14: Summary of land use change in Sample 3

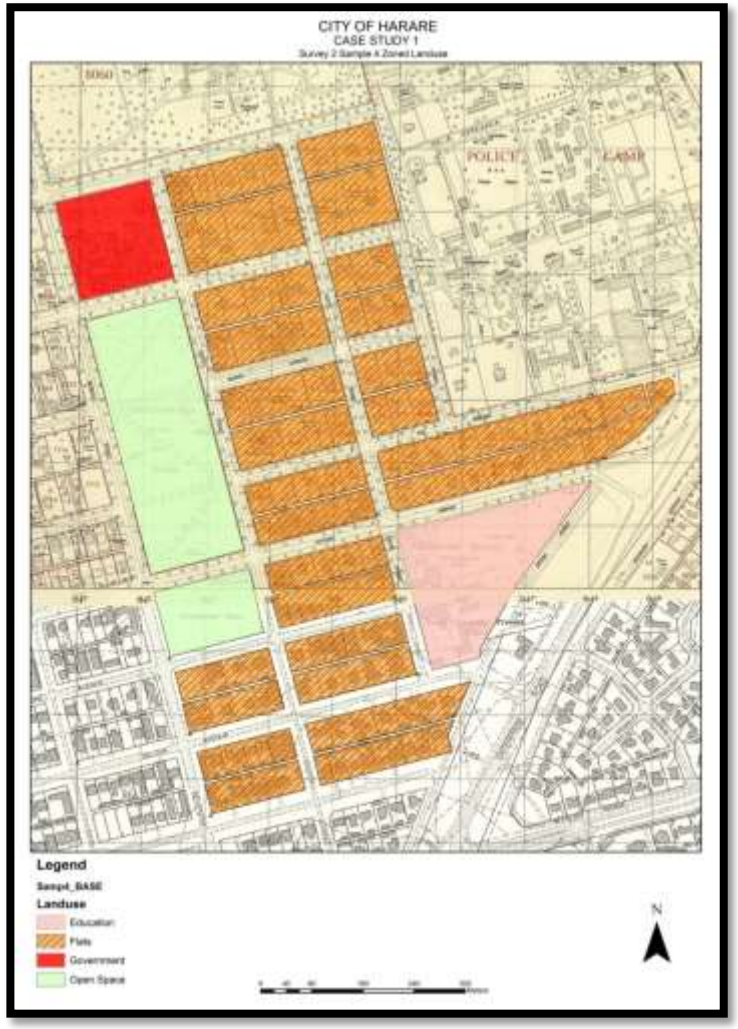
LANDUSE	ZONED AREA (m^2)	EXISTING AREA (m^2)	CHANGE (m^2)
Education	96712.8	0	-96712.8
Open Space	17139.5	17139.5	0
Residential	389212.74	314125.09	-75087.65
Mixed Use	0	171800.45	171800.45

The actual percentage of land use change in the residential zone calculated from table 4.13 is 19%. This figure is much closer to the 22% calculated from the change in the number of residential blocks. The difference in the results of the change analyses caused by the use of different units of analysis go a long way to suggest that the accuracy of change analyses is proportionally dependent on the size of the unit of measurement. The second observation from that is that the size of the unit of analysis can depend on the scale of the phenomenon being investigated. For example in this case if one was investigating land use change in terms of broad land use zoning the choice of the stands block as a unit of analysis would still be appropriate but if one was investigating the magnitude of change for the purpose of making an estimates on the average number of individual stands that change use in a small neighbourhood then the use of the individual stand as the unit of analysis would be more appropriate.

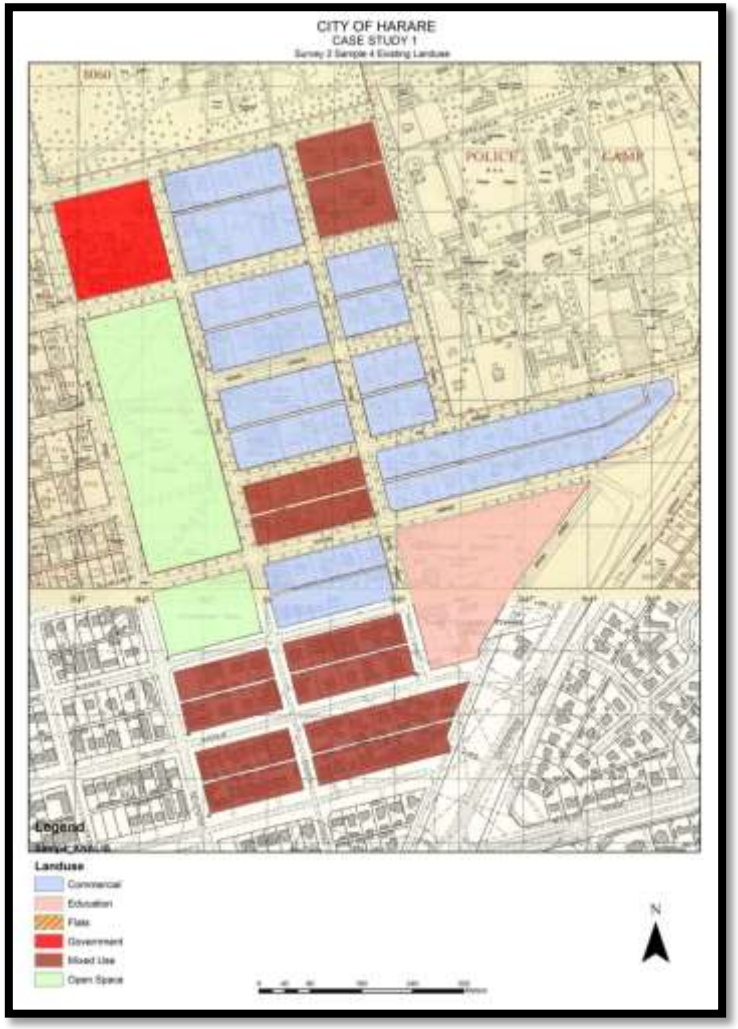
4.5.2.5 Sample 4 flats and educational area land use survey 2 findings and change Analysis

The last sample is made up of an area bounded by Tongogara Avenue to the north, Seventh Street, Central Avenue and Enterprise Road to the west, south and east respectively as shown on Figure 4.16. The same procedure for land use change as used in samples 1 to 3 was applied. The maps on Figure 4.16 show the land uses as per LP22 zoning and as per land use survey respectively. The information on first map shows that LP22 zoned 26 land parcels for flats, 1 educational, 1 government and two open spaces. A comparative analysis of the current situation obtaining as depicted on the first map on Figure 16 shows that all the land parcels which had been zoned for flats had changed into either mixed land use or commercial which in other terms mean that there was 0% compliance with the ‘Flats’ zoning proposal. The only uses which retained their zoned uses in the area are those whose ownership is vested in the government or the local authority namely educational, government reserve and public open spaces (see the second maps on Figure 4.16).

Figure: 4.16 Land use change maps for Sample 3



1. Land use Zoning Map for Sample 4



2.Existing Land Use Map Sample 4

Source: Author, 2014

A mathematical comparison of the figures extracted from the attribute data tables of the maps on Figure 16 is presented on table 4.15.

Table 4.15: Summary of Land use Change in Sample 4

LANDUSE	ZONED AREA (m^2)	EXISTING AREA (m^2)	CHANGE (m^2)
Education	41766	41766	0
Flats	264259	0	-264259
Government	23956.5	23956.5	0
Open Space	77288.8	77288.8	0
Commercial	0	160569.01	+160569.01
Mixed Use	0	103690.22	+103690.22

Source: Author, 2014.

The figures on the table show that the flats zone lost 160569.01m^2 and 103690.22 m^2 to the commercial zone and mixed use respectively. The implications of this inconsistency between the zoning plan and existing uses point towards failure by to plan to anticipate the change in local values and market demands. Questions can also be raised on whether the planning process actually incorporated public participation in decision making when most of the area was zoned for a use which was later changed. The other possible explanation to the scenario was that changing value systems prompted the massive land use change. Although the two views above can be subjects for further research, they still suggest the weaknesses and the inadequacy of current planning frameworks and practices in Zimbabwe. A critical underlying shortcoming is the capability and/or willingness of town

planners and urban development managers to understand (and predict) the functioning of land and property markets

4.6. Chapter Summary

The chapter analysed the findings of the field work that was carried in Case Study 1 which covers the central business district of Harare. The field work was conveniently organised into stages that progressively fed each other with information. The first parts of the fieldwork were mainly qualitative and they served to streamline the areas of focus for the ensuing stages. The qualitative part of the study also tapped into the vast reservoir of intuitional and institutional knowledge inherent in development practitioners. The initial findings also assisted in designing the research tools for the ensuing stages of field work.

The first section of the chapter took advantage of the existence of a register for land use change in the central business district of Harare. The register appeared to be incomplete for the period reviewed and exposed the recording keeping challenges at the local authority offices. The register appeared to the preserve of a few officers in the Harare Central Region planning office and was therefore hardly available to the forward planning section which needed to keep abreast with current trends so that they could make more informed decisions in the planning process. It also suggested that the planning section of the municipality was failing to take advantage of some of the data sources that could assist in monitoring and executing their development management duties more efficiently. The data from the COU register provided insights into the new types of businesses and land uses that are becoming trendy in the city. A typical example is the demand for sites needed for the establishment of mobile phones base stations. An analysis of the register also indicated the unpredictable nature of land use change which apparently fluctuates without a clearly discernable pattern.

Interviews held with planning practitioners signalled some key problems that were encountered in the current plan preparation processes. Chief among the problems identified was the inadequacy of funding for planning which is still mainly regarded as a state funded process. The other types of problems highlighted included decision makers' failure to appreciate the real value of planning; the dominance of business (market) over public (community) interests in decision-making, the inflexibility of current planning frameworks in

view of the rapid pace of development and planning's dependency on out-dated data sources and maps.

The chapter also managed to uncover the contrasting views of planners on the appropriateness of current planning frameworks with some arguing that there was no need to review them whilst others were of the opinion that they were out-dated rigid and immobile. Both parties though seemed to agree that the current master and local plans were failing to manage rapid urbanisation in the city of Harare. There was general agreement that the current planning frameworks were designed for formal settings only and they had little or no room to accommodate informality, and other new concepts in planning which advocate for sustainable development. The dominant belief in the rational comprehensive model intent of planning often suggested a reification of spatial plans as 'being' able to resolve what are social, economic and political issues that result from tensions and contestation over urban resources (power, central locations and market forces).

The other qualitative part of the chapter assessed the level and value of public participation in planning and then the level and value of technology application in planning in Harare. The predominant view on participation was that the level of participation in the planning process was grossly inadequate and the planning system in the city was failing to realise full value from participation. The other argument was that full participation was never going to be realised for as long as top-down approach remained entrenched in the current planning processes. Technology application was unanimously hailed as a necessary step that would transform the planning system in the country through its ability to expedite plan preparation and updating, superior data storage and sharing capabilities, clearer visualisation tools, better graphics qualities and more accurate mapping capabilities.

The last part of the qualitative part of the chapter focused on appraising the achievements of Local Plans 17 and 22 in the city of Harare through interviews which sought expert opinions on the achievement of the plans' stated aims and objectives. The major findings on the evaluation of the aims and objectives of Local Plan 22 are summarised as follows:

The objective which set to enhance commercial development in the CBD failed mainly because it focussed on physical aspects of development only and therefore it consequently

failed to anticipate and accommodate the possible impacts of socio-economic variations for instance the emergence of widespread informality, traffic congestion and the subsequent relocation of commercial businesses to other sites outside the CBD.

The goals which sought to ensure the existence of a lively residential, social and economic environment and to create a zone for community and medical facilities in the vicinity of the commercial centre were viewed by most planning practitioners in the public sector as a partial success because the area mainly retained the prescribed land uses particularly citing the establishment of a vibrant medical zone in the area. However, the research findings from land use change analyses exposed more dimensions in the quantification and evaluation of planning frameworks. For example the densification of space utilisation and the emergence of mixed land uses had a significant impact on the adequacy and appropriateness of current planning frameworks and tools (standards and regulations used in urban development management).

Traffic and Transportation had failed dismally since the authorities had failed to raise funds for the construction of major roads and freeways resulting in traffic congestion. The objective clearly lacked an implementation plan which linked the proposals to funding and monitoring.

The aim to retain and strengthen environment and amenity had preposterous symptoms of failure manifest in the observed unkempt state of public spaces and lack of maintenance of buildings and public infrastructure. Again the main problem in the achievement of this goal is the tendency to view the plans as end products which provide solutions to identified problems rather than as flexible processes and guidelines for managing development.

True to the observation in the preceding paragraph there was an assertion by the local authority planners that the proposed provision of a parking garage and commuter interchange had failed to take place due poor prioritisation of issues by the planning authorities.

Local Plan 17 was adjudged by planners in the City of Harare's development control and forward planning sections to have been successful in bringing about orderliness (to an area that had been previously described as a red-light district) through land use zoning and

development control. The evaluation of the impacts of land use zoning in the commercial areas of the city carried out by the researcher using land use change analyses showed high levels of compliance in some areas with the results of land use survey 1 on a sampled block of commercial stands named block 22 showing total compliance with land use zoning. Similarly the results of the land use change analysis for Sample 1 in the commercial area of LP17 show 84% compliance with the commercial zoning. The unanswered question though relates to the role of land use zoning in promoting the universally accepted goals of inclusiveness, productivity and sustainability (UN-Habitat, 2012). The other main observation on the questionable shortfall of over reliance on zoning relates to its (in)ability to respond rapid change. There is definitely a need to develop and employ other tools which can appropriately respond to change.

Some of the findings from the interviews with property managers managed to reveal the fact that a significant number of large buildings in the CBD of Harare had been subdivided into smaller shops which could accommodate smaller businesses as part of a coping strategy by the owners who were failing to attract the large business operators who had been anticipated by the current planning frameworks. This is a clear indicator of the changing character of the CBD.

The plan had failed to achieve its goal of providing safe and efficient traffic circulation in the area since most of its proposals were based on inaccurate projections and data. The finding tends to support the need to further explore the application and use of more accurate techniques and tools in making planning decisions.

The quantitative part of the chapter which mainly employed the land use change analysis approach was mainly used to firstly verify the findings of the qualitative part of the research and to secondly quantify the level of compliance with or departure from the goals of local plans 17 and 22.

Notable failures to comply with parking requirements, floor area factors and anticipating mixed use zoning were however exposed by the land use change analyses in the commercial areas. The results of the GIS supported evaluation of floor area factors and parking provision amply demonstrated that some the formula used to predict future space requirements in urban planning are either inaccurate or inappropriate. The findings also

point towards a need for adapt to rapid change through the use of modern technology (GST) and or alternatively changing the nature of urban management tools.

Land use change in the four sampled areas in Case Study 1 also showed that there is an increasing demand for the previously unanticipated land use class for mixed uses. In Sample 4 the mixed use zone consumed 22% of the land area that had been reserved for the development of residential flats. These results are a demonstration of how GST can be used to monitor and measure change as part of the urban development management process.

5.0. CHAPTER FIVE: CASE STUDY 2 EPWORTH INFORMAL SETTLEMENT

This chapter presents the analyses and findings from case study 2 which focussed on Epworth informal settlement. This part of the research seeks to demonstrate and evaluate planning responses in an informal settlement which is an 'unplanned' area that is characterised by rapid urban change and is typically classified as a manifestation of rapid urbanisation in Harare. A mixed approach research method was used and it is basically divided into three parts.

The first part of case study 2 consisted of interviews with key stakeholders who included the local authority's engineer, two members of a non-governmental organisation known as Dialogue on Shelter for the Homeless People of Zimbabwe (DOSZ) that was involved in assisting local communities with in-situ informal settlements upgrading work, a local councillor and some six members of the Ward Development Committee (WADCO) who represented the ward that was sampled for purposes of this study. That part of the study contributed information towards the socio-economic, political and contextual analysis of the study area. Such information was useful to the identification of key planning issues and the nature of the development management frameworks and tools in the area.

The second part of the study was quantitative in approach. Two research assistants administered face to face interviews on 91 members of the community residing in different parts of Epworth Ward 7. This part of the study aimed at correlating planning practice in the area with community values. The questions were mainly based on issues derived from the literature review and the qualitative study. The main thrust of these questions focused on governance, livelihoods and the role of public participation in planning. The questionnaire also sought respondents' views on the previous and current planning efforts in their area. The exercise was also a way of assessing social perceptions and views on the role of planning and development interventions from the community's own lenses.

The last part of the case study was a geo-spatial evaluation of an in-situ upgrading planning exercise carried out in Epworth Ward 7 in 2011. It was basically a quantitative analysis meant to detect the level of spatial compliance with the land use plan. Individual buildings were used as the units for measuring this change. Satellite images from the year

2010 were adopted as the basis for measuring change and they were compared with images downloaded from Google Earth in 2014.

5.1. Key stakeholders interviews findings

A preliminary interview with the local authority engineer which sought his views on what he perceived to be the main problems in managing development in the informal settlement, revealed the confusion and conflict regarding the administrative roles of the local authority vis-a vis that of powerful community leaders. He explained that the source of the problem lay in the fact that most of the land in the informal settlement was either acquired or distributed informally by members of the community. The community originally developed its own administrative and managerial structures without the assistance of the government - a predicament which was now posing problems for the authorities who are now currently seeking to either replace these structures or at least reorient them to align with government and local government policies. These views were echoed by the projects coordinator from DOSZ who preferred to describe the problem as being that of lack of mutual respect between the local authority and the community leaders. She cited situations where the local authority's role was reduced to that of being reactive only because the power to distribute and parcel out land (spatial planning) lay in the hands of the community leaders. The provision of infrastructure services such as piped water, sewerage and roads was described as being very difficult and expensive because most community-generated land use layouts for the settlement were irregular and chaotic.

The situation is further worsened by the fact that the local authority does not have legal planning powers over the settlement which is considered to be state land and therefore falls under the responsibility of the Ministry of Local Government's Department of Physical Planning (DPP). The respondents claimed that such a situation was unpalatable because the planning authorities for the settlement are based elsewhere and they have other areas to attend to hence they fail to remain constantly in touch and up to date with the day to day developmental issues and problems of Epworth informal settlement. Politics was also mentioned as a factor that plays a major role in influencing the outcomes of development processes in the area as politicians were bent on establishing their territorial dominance as they moved in to take advantage of the administrative gaps that they identified in the governance of the settlement.

The technocrats operating in area however strongly recognised and appreciated the inherent social capital in the settlement and they pointed out that it was a very positive attribute for the development processes in the area. They acknowledged that the existence of ward development committees (WADCOs) which coordinated and represented local communities on development issues greatly assisted the processes of communication.

Both the local councillor and the engineer confirmed the fact that it was not easy to collect revenue for service provision and maintenance of infrastructure from the public citing poverty and unemployment as being rampant in the area. The absence of a proper register and inventory of households in the informal settlement exacerbated the revenue collection system therefore further undermining Epworth Local Board's capacity to provide basic services such as water, sanitation and community facilities such as schools, clinics and other public amenities that are ordinarily associated with residential areas.

5.1.1. Overview of the planning process in Epworth informal settlement

On planning, the engineer and his technical partners from DOSZ mentioned that there was a serious conflict between urban planning's rationale of orderliness and aesthetics as stated in the country's planning frameworks and the basic survival needs of an informal community. The view was strongly supported by the local councillor and members of the WADCO who singled out land use zoning requirements as being impossible to enforce in their areas of jurisdiction. They claimed that the situation of informal employment rampant in the area required the creation of multi-purpose spaces which could not be possibly restricted to single land uses such as the conventional residential and commercial zones favoured in the current planning frameworks. They further claimed that the idea of restricting business activity to designated nodes negatively affected the operations of informal traders whose locational dynamics were mainly dependant on changing market trends. They claimed that functional orderliness and aesthetics were a very low priority in their community since the issue of livelihoods and basic survival took precedence.

The technical team also identified a lack of consistency in governance as a major problem in that the policies of the local authority were not linked to central government policies citing the decision by the local authority to embark on a policy of in-situ informal settlement upgrading not being complemented by DPP's insistence on the need to comply with strict zoning requirements in the planning of the area. They suggested that there was a hollow

void and contradiction in the planning system in that it did not have a protocol for informal settlements planning.

5.1.2. The current planning frameworks for Epworth

Urban planning in Epworth informal settlement was described as a piece-meal disjointed effort which is mainly initiated by local communities and lacking a strategic spatial planning framework which spelt out the developmental vision for the area (Mudimu, 2014). This view was supported by most of the household respondents who raised the following reasons for supporting the view:

There is a general lack of appreciation on the long term benefits of spatial planning by local communities who seem to be more interested in attaining more immediate and tangible goals such as the security of tenure and the provision of basic services such as water and toilets.

The existing statutory frameworks do not seem to cater for informally developed/developing situations and that Master and Local plans are too prescriptive to be able to deal with informality.

Epworth informal settlement has however had a number of layout planning exercises carried out in the area and the planning was mainly funded by local communities whose main objective was as stated earlier the desire by local residents to secure permanent tenure in the form of title deeds. Such layout plans were mostly prepared by private planning consultants on behalf of organised community groups which funded such processes up to the stage where they could be title surveyed. Most of these layout plans covered small sections which do not even constitute administrative wards. These plans were described by the interviewees from DOSZ as having been mainly a physical exercise of defining land parcels for registration purposes. The most notable planning effort to date is the production of a layout plan for the whole part of Epworth Ward 7.

The group discussion with members of the WADCO revealed the fact that the ward leadership appeared to look well beyond the physical aspects of planning as they expressed the intention that they expected the process to assist in the formulation of new policies and regulations that would be used to guide the area's development in future.

DOSZ undertook to assist the community with a more comprehensive approach to settlement planning by embarking on an in-situ upgrading plan for Ward 7 in 2010. The exercise was the first concerted joint-effort by the community, the local authority and a non-government organisation to introduce pro-poor planning approaches and methodologies to settlement planning in the area. The planning process involved members of the local communities in producing a strategic plan, which was then followed by self-enumerations, profiling and mapping. The final layout plan was prepared with the assistance of private planning consultants and approved in terms of section 43 the RTCP Act in 2011. This research therefore uses this Epworth Ward 7 plan as a framework and sample for case study 2.

5.1.3. Planning practices in Epworth

The biggest technical difficulty identified by development practitioners interviewed who participated in the preparation of layout plans for Epworth was the shortage, and in some instances the unavailability of spatial data to base their plans for the area. The situation was made worse by the informal methods of land delivery which are characterised by rapid development which in most cases ended up outpacing the Local Authority's planning intentions and capacity to monitor. The WADCO chairman claimed that the rate of population growth in the settlement was alarmingly high and they had lost track of the actual numbers of people residing in their ward.

The engineer confessed to having problems in trying to reconcile planning standards that were originally crafted for formal settings with the actual reality of conditions in informal settlements. He however, described the planning approach that his council was beginning to use in Epworth as cumbersome because it required 'too much' consultation with residents and members of the public. The councillor for Ward 7 confirmed that land use zoning requirements were almost impossible to enforce because the amount of mixed use activities were too overwhelming as the community did not appear to place any value on the need to separate land uses any way.

On its own part the community representatives (WADCO) claimed that it meets regularly to review its own strategic plan. They however, failed to elaborate or explain the relationship between the strategic plan review meetings and the layout plans as the processes appeared to be running in parallel. They claimed that the implementation of the approved

layout plan for their ward had already started manifesting symptoms of failure because there was an influx of new settlers who had occupied some of spaces which had been reserved for public facilities and that the plan was becoming too expensive to implement. Members of the community were being asked to contribute funds towards the servicing of the plan contrary to the majority view that such was the responsibility of the government and the local authority.

They also felt that the state (through the local authority) should take the lead in implementing the plans since they were the legitimate planning authorities, who also had the vested responsibility to provide infrastructural services.

Some members of the community felt cheated because they had smaller plot sizes after the plan and the survey and yet they were being asked to contribute the same amounts of money towards servicing with those who had much larger stands.

The local authority for Epworth confirmed that it is quite concerned about its inability to properly manage the above stated manifestations of rapid urbanisation and it had responded by instituting mitigating measures which included the adoption of a policy which permits the regularisation of informal settlements and the establishment of development committees in every administrative ward. Although the policy on regularisation was a pragmatic approach to a pertinent problem in the area, it was not complimented by support from the higher levels of government.

The ward councillor and the WADCO belatedly raised other community development related problems pertinent to ward 7 which they seemingly thought were not part of the planning agenda. These included, housing shortages, unemployment, poor sanitation, unavailability of electricity, poor road networks, illiteracy, social delinquency, prostitution, crime and security. The ward committee seemed to be of the impression that all these issues were supposed to be tackled outside the planning realm whose focus should be land subdivision only.

5.1.4. Participation in planning

The discussion on public participation in planning was divided into two parts. The first part of the discussion sought to establish the levels of participation being used in the planning

system in Epworth whilst the second part solicited the interviewees' opinions on the value of such approaches.

All the interviewed persons except for the ward councillor were of the view that the kind of participation entrenched in the current planning frameworks was inadequate and was largely contributing to failure by the planning process to interrelate with concerns of members of the community. Some of the strong sentiments raised in support of the argument above were:

i) Planning survey methods that are used to identify community needs were biased as they often had leading questions which misrepresented community wishes, more so when there was a general lack of awareness and appreciation of the impacts of planning decisions on communities (Muzamindo, 2014).
ii) The current planning frameworks bestow too much decision making powers on authorities who end up being the leaders and the judges instead of being mediators (Chitekwe-Biti, 2014).
iii) Representative participation was not ideal because it can be very subjective and the communication of information through third parties leads to distortion (Mudimu, 2014; Zvareva, 2014).

There was however a general sentiment that information communication through public meetings had tended to improve both the consultative and informative aspects of participation in Epworth. All the interviewees commended the planning approach which was carried out in Epworth Ward 7 for being much more inclusive through the involvement of local communities in enumerations, and mapping exercises championed by DOSZ.

There were mixed views on the role of participation and the involvement of locals in the actual formulation of plans. The local authority engineer felt that attendance of budget preparatory meetings and the submission of complaints to the LA's 'Complaints Register' by members of the public constituted adequate participation in planning. The ward councillor contended that the role played by members of the public in raising funds which went towards the planning and pegging of their stands was in itself a contribution towards full participation in planning.

The importance of the role of participation in planning was repeatedly mentioned and supported by all the stakeholders consulted. The strongest views in support were expressed by the director of DOSZ who asserted that people tended to associate with processes they participated in formulating because they had a material stake in it and participatory approaches assisted managers in developing ways of mediating conflicts (Chitekwe-Biti, 2014).

5.1.5. Application of geo-spatial technology in planning

All the respondents appeared to be very appreciative of potential role of GST application in planning and managing development. The suggested modes of application of GST can be divided into three subject areas which are: spatial planning, development management and communication.

5.1.5.1 Spatial planning:

The technical respondents to the interviews who included the engineer and DOSZ representatives recounted the convenience of using satellite imagery to update base maps used in the planning of Epworth Ward 7. They also highlighted the importance of using web-based sources of spatial data in dealing with areas which hardly had any reliable spatial data. The other advantages of GST applications in spatial planning they mentioned were the ease with which information could be shared. They however expressed concern over the low levels of GIS literacy in the local authority and the Department of Physical Planning.

5.1.5.2 Development Management:

The suggested areas of GST application on development management side of the planning dialectic were the monitoring and control of development and developing spatially-linked billing systems for municipal rates. The LA also disclosed that they had started using GPS receivers to develop utility maps for their area.

5.1.5.3 Communications:

The ward councillor and members of WADCO said they were very impressed with the way GIS had been used in the mapping and enumeration exercise carried out in Epworth Ward 7. They also appreciated the manner in which the technology had improved their visual understanding of spatial planning.

5.2. Epworth ward 7 household survey

The ward is administratively divided into five sections. The household survey initially intended to cover 100 people sampled at 20 per section. The actual number of interviews which was carried out missed the target by 9 and so the number actually covered ended at 91 and the breakdown of figures according to sections and gender is as shown on the table below.

Table 5.1: Household survey respondents' profile

Section	Male	Female	Total
S1	13	7	20
S2	18	2	20
S3	7	4	11
S4	9	11	20
S5	9	11	20
TOTAL	56 (62%)	35 (38%)	91 (100%)

Source: Author, 2014

5.2.1. Employment

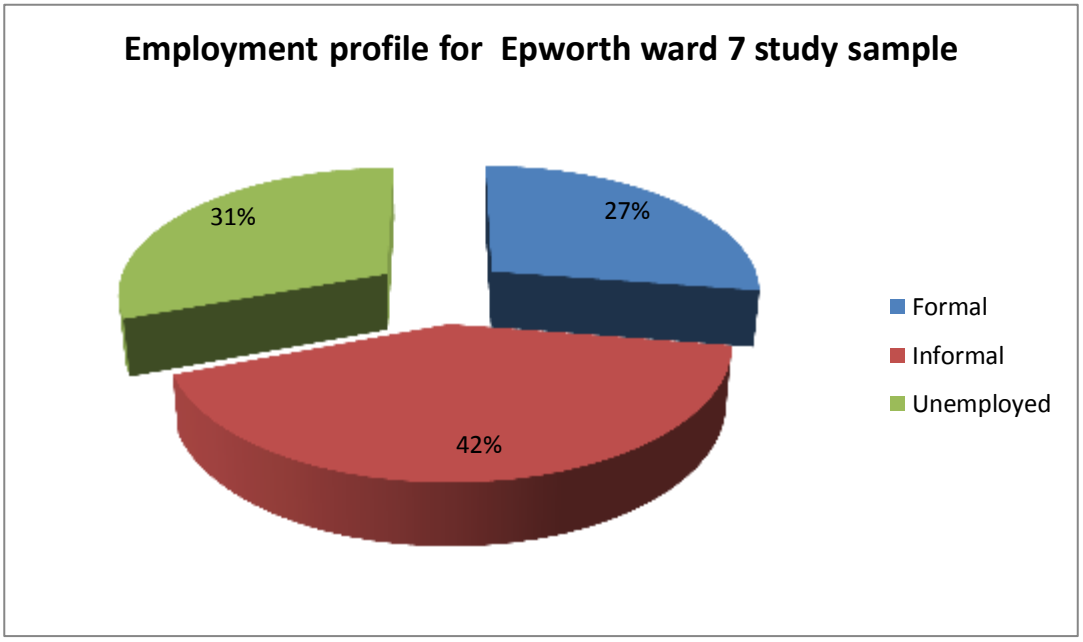
The survey revealed that 25 of the respondents representing 27% were formally employed whilst 38 (42%) were involved in some informal business and 28 (31%) were totally unemployed. These results show that the majority of those who were economically active were self-employed in the informal sector representing 60% of the gainfully employed respondents. The figure of those involved in informal activities could be understated as some respondents claimed that they were not employed either because they could not fully understand that being involved in informal business was a form of employment or they had suspicions about the implications of claiming to be earning some income since they had been recently asked to contribute funds towards development in the ward. Table 5.2 gives a summarised breakdown of the ward's employment profile.

Table 5.2: Household survey: Employment profile

Section	Formal		Informal		Unemployed	
	Male	Female	Male	Female	Male	Female
S1	3	2	3	1	7	4
S2	8	0	7	1	3	1
S3	1	2	1	1	5	1
S4	3	2	6	6	0	3
S5	3	1	4	8	2	2
Total	**18**	**7**	**21**	**17**	**17**	**11**
Total	**25 (27%)**		**38 (42%)**		**28 (31%)**	

Source: Author, 2014

Figure 5.1: Analysis of employment data for Epworth Ward 7 sample survey



Source: Author, 2014

Most of those who claimed to be informally employed said that they were either working from their homes or were involved in selling different kinds of goods from the street and

other public spaces in Epworth. When randomly asked about their choice of business location some of the street vendors claimed that they wanted to operate from busy places such as bus stops, main roads and busy shopping centres because that is where the market is. They were not in favour of being located on designated places which do not have much business activity. They also claimed that it was more beneficial for them to operate from undesignated places because they will not be required to pay for licences and rentals to the local authority (see pictures on fig 5.2.). These pictures showed that some business structures which had been constructed on designated formalised smaller trading sites were either unoccupied or abandoned. This tended to support the view that the small business operators only preferred to operate from places which already appeared busy.

Figure: 5.2.
1. A section of Overspill road in Epworth showing informal businesses operating from the street (left)
2. Home Industries shopping centre's abandoned business structures (right)

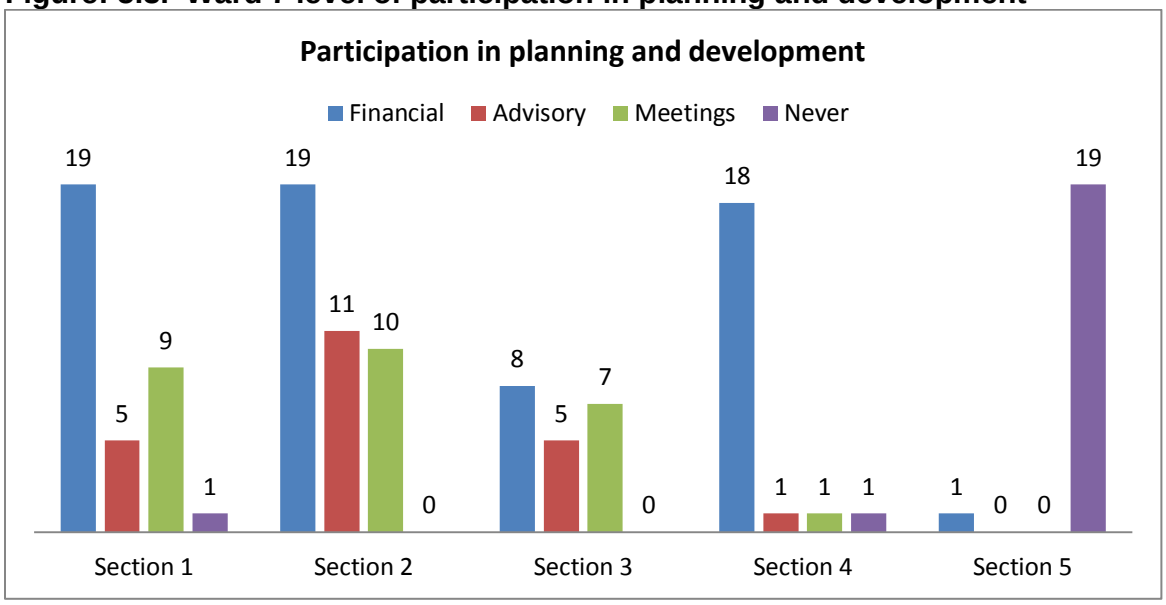
Source: Author, 2014

5.2.2. Participation in planning and development for Ward 7

An analyses of the responses obtained from a public questionnaire administered to 91 people in ward 7 revealed that most of the respondents had participated in one way or the other towards the planning and development of their ward. Most respondents claimed to have made some financial contributions towards the production and survey of the layout plan. Fewer numbers participated in an advisory capacity through social surveys and consultations when the plans were being prepared and others attended public meetings. The frequencies of the number of responses were analysed according categories of participation such as; financial contributions; advisory; attending public meetings and they

were aggregated according the five administrative sections in the ward (see column chart on figure 5.3).

Figure: 5.3. Ward 7 level of participation in planning and development



Source: Author, 2014

The response on the question on participation showed that the level of community involvement in planning differed from one administrative section to the other. Figure 5.3 shows that section 2 had the highest number of people who claimed to have participated in the preparation of Epworth ward 7 layout plan followed by sections 1; 3 and 4 respectively. Section 5 had the least number of people who claimed to have participated.

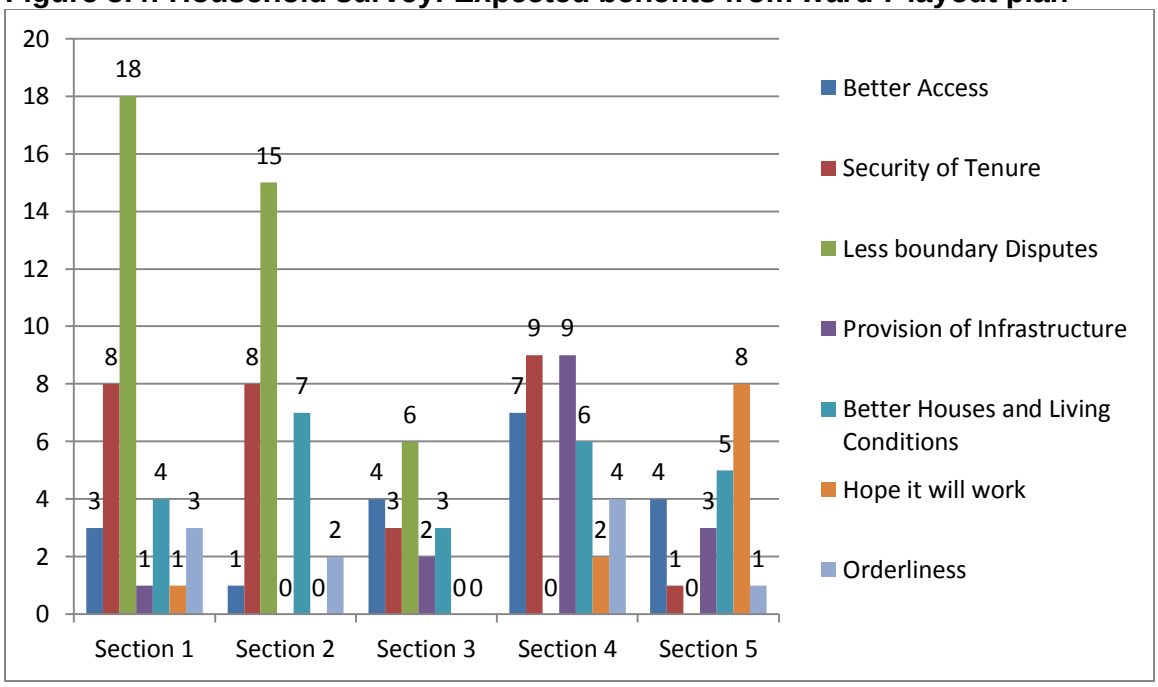
There were varied responses to a question which sought to assess the local community's developmental expectations but the most frequent were the ones listed below:

i) Planning improves road networks and access to goods and services.
ii) It is a positive step towards attaining security of tenure.
iii) Stand demarcations and pegging would be useful in solving boundary disputes.
iv) Town planning creates a framework for improving infrastructure (piped water, electricity and sewerage) leading to better public health conditions.
v) The process will lead to the construction of better houses and higher standards of living.
vi) Planning gives hope for a better future.

vii) The built environment will ultimately appear cleaner and more orderly.

The responses were therefore classified according to these seven groups and analysed according to the administrative sections. The results of the analysis are summarised in the multi clustered column chart on figure 5.4.

Figure 5.4: Household survey: Expected benefits from ward 7 layout plan



Source: Author, 2014

The results show relatively consistent types of responses from sections 1, 2 and 3 which identified the issue of solving stand boundary disputes, security of tenure and better housing conditions and higher standards of living as the top-most expectations in their areas. The latter results correspond well with the higher level of participation in plan making in those three sections. The suggestions are also quite consistent with the enumeration report which was prepared by DOSZ which suggested that one of the informal settlement's top most priorities according to the community was the security of tenure (DOSZ, 2010).

Section 5 had the highest frequency of the indecisive response "we hope it will work" which also corresponds with the fact that the section had the least number of people who participated in the plan preparation process (see figure 5.3). The other aspect that can be related to that kind of response is that of a lack of sense of belonging and sense of identity

expressed by that section of the community which did not participate in the planning process. The results of the survey go a long way towards suggesting that participation can empower local communities with knowledge just as much as it can stimulate interest in development processes.

5.3. Land use change analysis for ward 7

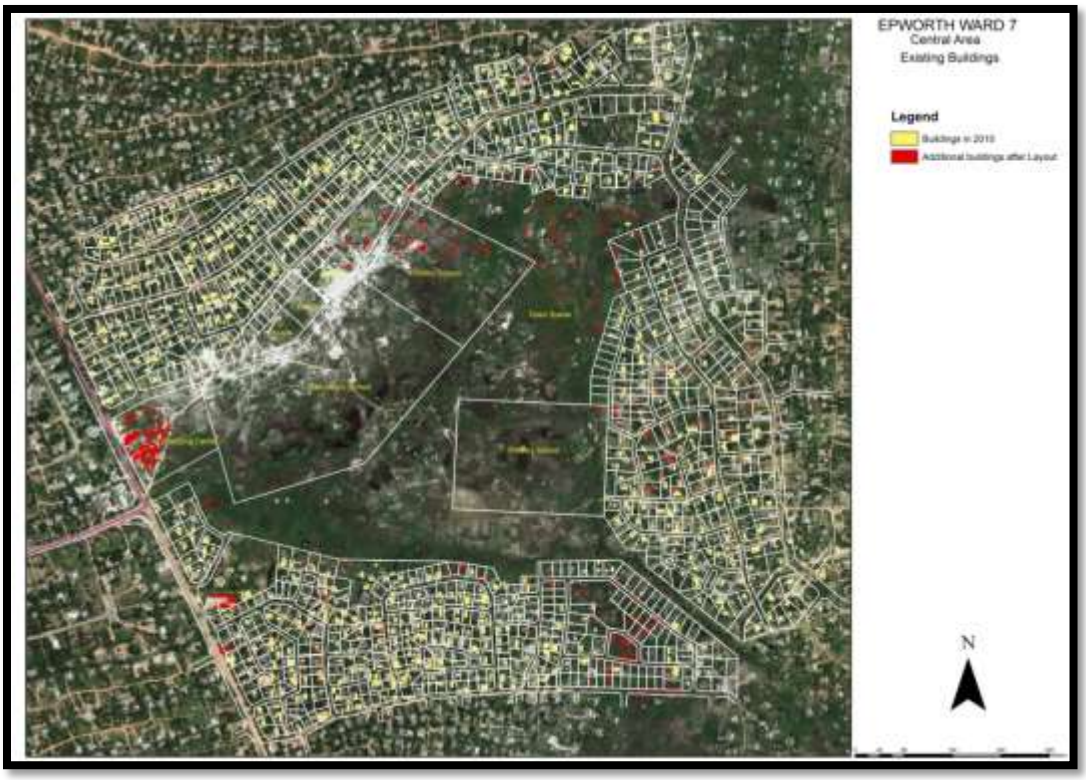
This part of the study focused on appraising the efficacy of an in-situ upgrading plan which was prepared for Epworth Ward 7. The preparation process started in 2010 and it was spearheaded by DOSZ in association with the Homeless Peoples Federation chapter for Zimbabwe. The local community participated in carrying out self-enumerations, settlement profiling and mapping. The later parts of the planning process were technical and it included the preparation of base maps and the carrying out of land and building use surveys by hired planning consultants who worked in consultation with the local authority for the area Epworth Local Board (ELB). A layout plan which subdivided the area into individual plots and identified space for public facilities was then prepared by the hired planning consultants and was submitted to the DPP for approval in 2011. The plans were however, only approved in March 2013. The local authority (ELB) claimed that the approval process took long because the approving authority continuously insisted that the plan which had initially advocated for mixed land use zoning be amended to comply with single land use zoning requirements entrenched in the current planning statutes.

The objective of this quantitative analysis was to firstly assess the level of compliance with the approved plan, and secondly to measure the appropriateness and relevance of the plan in an informal settlement setting. One of the main objectives of the layout plan was that of rationalising existing structures. In that respect the stand boundaries created by the plan were designed to accommodate the positions of existing buildings thus reducing the possibility of demolitions. The map on Figure 5.5 indicates the number buildings on a sampled portion of the plan during 2010 and the number of buildings for the same area in 2014. The building structures were digitised from a satellite image for area showing features that were captured in 2010 in order to create a shape file which was named ***Buildings_2010***. The building features from that file were then exported through the data export function in ArcGIS to create a new shape file which was then overlaid onto a satellite image for the year 2014. All the additional building features indicating those that were

constructed after 2010 were then digitised onto this new shape file named ***Current_buildings***.

The two shape files were then converted to raster format and cross-tabulated using the math and minus commands in ArcGIS 9.3. The resultant file then gave a clearer indication of the buildings that existed in 2010 (hatched in yellow) when the plan was prepared and the new structures (hatched in red) which were constructed afterwards (see figure 5.5).

Figure 5.5: Portion of Epworth ward 7 existing buildings map for 2014



Source: Author, 2014.

A cross-tabulated comparison of the attribute tables from the buildings shape files and an overlay of the new buildings over the layout plan show a significant difference in the number of building structures that existed when the plan was prepared and the situation at the time of the fieldwork (2014). The 2014 situation shows that additional structures had encroached onto sites that had been reserved for schools, open spaces, and roads in terms of the approved layout plan. Other new buildings also cut across proposed stand boundaries.

Table 5.3: Analyses of building cover change for Epworth ward 7

Row No.		Year 2010	Year 2014	Change
1	No. of building within residential stands	863	917	+54
2	No. of building in school sites	0	53	+53
3	No. of buildings in road reserves	10	30	+20
4	No. of buildings in open spaces	11	95	+84
5	No. of buildings in shopping centres	5	27	+22
6	No. buildings in clinic site	0	8	+8
7	No. of buildings in church sites	0	2	+2
8	No. of straddling stand boundaries	8	52	+44
9	Total Number of Building features	897	1176	+279 (31%)

Source: Author, 2014.

The information on table 5.3 has the following implications on the layout plan for ward 7:

Residential areas (row 1 on Table 5.3)

The number of new buildings within the existing residential stands in the sample area increased by a figure 54 from 863 in 2010 to 917 in 2014. Most of these new structures constitute second dwellings within stands which had been planned for single family occupation with one principal building. Such new developments present evidence for the complete disregard of the planning proposals which related to the residential land use zone which specified that they should be one principal building per stand.

School sites (row 2 on Table 5.3)

A total of 53 residential buildings were constructed on sites that had been reserved for the development of schools in terms of the approved layout plan. Such sites were undeveloped in 2010 when the planning process started. The unabated continual development of residential structures on such reserved sites also shows that the plan is not serving its intended purpose which aimed to reserve such spaces for the development of community facilities and schools.

Road reserves (row 3 on Table 5.3)

When the layout plan was prepared in 2010 only 10 buildings were affected by road reservations in terms of the plan. The rapid uncontrolled rate of informal housing development and informally managed land allocations changed the situation and a total of 30 residential buildings occupied spaces which had been reserved for the development of roads by the year 2014. Such a situation represents a 200% increase in the number of buildings that occupied road spaces in spite of the existence of an approved layout plan for the area.

Open spaces (row 4 on Table 5.3)

There were only 11 residential buildings occupying spaces which were designated as open spaces either for recreational or environmental protection purposes in 2010 but the figure had skyrocketed to 95 in 2014 representing an increase of 84 over 11 which in other terms translate to a 764% non-compliance factor over the plan.

Shopping centres (row 5 on Table 5.3)

The number of buildings in the sites zoned for shopping centre development increased from 5 to 27. A closer observation of these new structures on the 2014 Google Earth image show that they had regular rectangular shapes and continuous frontages which are in keeping with the commercial structural patterns normally found in shopping centres. The results of the analysis in that respect amply demonstrate a rational level of compliance with the intended zoning for those areas.

Clinic site (row 6 on Table 5.3)

The site which was designated for the development of a clinic in terms of the layout plan was encroached upon by 8 residential buildings in the period 2010 to 2014 representing an 800% non-compliance factor.

Church sites (row 7 on Table 5.3)

Only 2 residential buildings encroached onto the sites that had been reserved for church purposes in terms of the plan.

Stand boundaries (row 8 on Table 5.3)

The layout plan had made a deliberate attempt to avoid designing stand boundaries that cut across buildings and so only 8 buildings were straddled by stand boundaries when the plan was prepared. The situation was phenomenally different in 2014 since the figure had increased to 52 in 2014 representing an increase of 44 which translates into a 550% non-compliance factor.

Summary of encroachment (row 9 on Table 5.8)

There were a total of 1176 building structures in the sampled area for Ward & in 2014 against 887 in the base year 2010 which represents an increase of 279 or 31%.

5.4. Chapter Summary

The chapter started by using Epworth informal settlement as a context for demonstrating the conflicts that exist between government control measures and community based governance. This was done through interviews carried out with key stakeholders who included local authority officials (representing government), local community leaders (representing the community) and non-governmental organisation officials (representing mediators in the development process). The study showed how the major rift that existed between the values of poor communities which were guided by survival precincts, and government policies guided by orderliness contest the value-base and the role of planning in the urban development management function.

Another issue which came to the fore in the preliminary stages of the chapter was the yawning gap between planning efforts and implementation programmes in the informal settlement. The situation was even made worse by factors which limit the local authorities' ability to raise revenue for development purposes. Chief among these factors are rampant poverty in the community, and failure by the authorities to keep correct and up-to-date spatial and demographic data which could be used in revenue collection systems.

Claims were also made that the poor communities were being marginalised further by the authorities' failure to build upon the inherent social capital in the informal settlement and the cunning attitudes of politicians and local land barons who preyed on the misfortunes of

homelessness and poverty. Politicians find it easier to reinforce their dominance by denying the poor communities the right to determine their own destinies through empowerment whilst the land barons benefit financially from lawlessness and informal land delivery systems (Zvareva, 2014).

The key finding then was that both these parties who would have otherwise played a key role in facilitating urban development management in the informal settlement do not necessarily subscribe to any formal system of governance, thus exposing the local communities to the vagaries of abuse through manipulation of development processes.

The chapter also established the fact that public participation in planning had a crucial role in improving both the level of understanding and the willingness to participate in development processes.

The study explored the positive relationship between the application of geo-spatial technology in planning informal settlements and improvement in communication, participation, mapping and plan data accuracy for development planning, monitoring and implementation. This facilitative role of GST was well appreciated by both the technocrats and the ordinary members of the community who were interviewed because they had all been exposed to the application of technology in planning for their local contexts.

The employment profile for Epworth ward 7 showed that a larger proportion of the gainfully employed people in the area were involved in the informal sector and they detested the idea of being physically located on spaces which do not satisfy their market choices. The concept of enforcing mono-functional land use zoning was roundly dismissed by all the respondents of the qualitative part of the survey who claimed that it disrupts the major sources and spatial dynamics of informal livelihoods.

The study also attempted to quantify the physical manifestations of rapid development in the informal settlement through comparing remote sensed data on building features for two time instants 2010 and 2014 using GIS software. There was 31% encroachment by residential structures on spaces which had either been reserved for public use or had been restricted from further development by the plan for ward 7. The finding demonstrated the rapid pace of development and it also exemplified the community's disregard for planning

prescriptions which is a significant expression of partial failure in urban development management.

6.0 CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1. Background and context.

Urbanization in Southern Africa was, to a large extent the result of European colonization. In the exception of earlier urbanization along the eastern and western coasts where Arab, Portuguese and Dutch trading resulted in the establishment of mercantile towns on the coast, for most of the region, especially Zimbabwe, colonial settler urbanization was a more recent phenomenon in the late 19th century. The creation of these colonial towns as resource frontiers and administrative posts for driving the colonial settler economy was accompanied by various forms of social engineering, like the case in South Africa, that involved controlled urbanization of 'natives' such that late de-colonization in 1980 resulted in rapid urban influx arising from 'normalization' of urban development processes.

It is the contention of this thesis that the urban management frameworks and practices that ensued accompanied by democratization in the post-independence era were unable to cope with these new urbanization processes largely because of the inadequacies of their administrative and institutional architectures, diagnostic capabilities and the value-bases that underpinned the emerging planning practices and cultures. Consequently the current planning frameworks and practices in Zimbabwe remain untransformed and lack the capacity to track and monitor the emerging dynamics of rapid or hyper urban growth in the post-independence era. In Harare, these have manifestations in wide spread growth of informal markets, small businesses resulting in the intensification of commercial activity, increases in traffic volumes and patterns which in turn have drastically altered the traditionally mono-functionally zoned urban forms, culminating in denser space utilisation, mixed land use patterns and the chaotic invasion of public spaces by traffic. These rapidly changing urban growth trends have also been cited as some of the reasons behind the degeneration of municipal services such as water supply, sewerage and solid waste management in Harare (Kawadza & Chirisa, 2011; Chanza & Chirisa, 2011). Such situations are not only peculiar to the city of Harare but are also a common feature of other fast developing African cities such as Nairobi in Kenya were the theoretical perspectives of planning are currently transforming in response to the challenges of rapid urbanisation and informalisation (Ngau, 2013).

This section of the study presents a concluding discussion on the findings of the research. The discussion dwells on how the findings answer to the research questions, the appropriateness and the limitations of the research design, conclusions and the implications of the study results and recommendations for further related research. The research investigated three closely related issues which are changing urbanisation trends with particular reference to Harare, how they impact on planning frameworks and practices and the innovative ways with which planning could be transformed to meet current and future developmental challenges.

6.1 Answering the research questions

The main research question posed was an inquiry into the nature and extent of the unresponsiveness of planning frameworks and practices in Zimbabwe The research sought to investigate the efficacy of planning by firstly assessing the characteristics of planning frameworks and tools against the current urban development challenges and then secondly by attempting to measure the adequacy and flaws of planning responses to such challenges.

The two sub-questions were addressed using two case studies based in the central business district of Harare and the peripherally located Epworth informal settlement. The first sub-question measured to the efficacy of current planning frameworks as tools for managing urban development in Harare CBD and Epworth and the second sub-question inquired into the main urban planning responses to the manifestations of rapid urbanisation processes in the two study areas focussing on a 14 year study period (2000-2014).

Although the two case studies separately addressed both sub-questions, case study 1 was more relevant to the issues raised in the first sub-question largely because it is located in an area that has been subject to formal planning for a much longer period of time. There were therefore more planning frameworks and tools to evaluate in that area. The Epworth case study was more relevant to the second sub- question arising from its informal settlement status. The context was such that it presented development challenges to planners which did not have prescribed answers (in the form of spatial planning frameworks and development conditions) as was the case with the formal settlements where planners quickly resorted to applying statutorily approved development conditions and regulations in managing development.

6.2 Conclusions

6.2.1 Transforming the theoretical focus on planning principles

The theoretical basis for the formulation of planning frameworks is primarily dependant on the interrelationship that exists between three dimensions which are space, people and time (Madanipour, 2007). Although all three dimensions are subject to different types of change, planning emerges as a tool that needs to be used by people to manage the change sustainably. The world (Africa in particular) is currently urbanising at a fast rate to the extent that urban development management can no longer just focus on the physical appearance of cities but should equally tackle the socio-economic challenges that go with it in view of the fact space is a finite resource (Knox and McCarthy, 2005; UN-Habitat, 2009).

Most planning practitioners in Zimbabwe are still stuck in the rational comprehensive planning theoretic model which allocates too much control powers to long term end-product oriented plans (master and local plans) which is directly in contrast with the prevailing fast changing urbanisation trends. Global and regional literature reviewed in this research clearly points out the fact that most western countries which were the very proponents of the latter model have since abandoned it in favour of more strategic approaches which now advocate for policy thrusts that are driven by socio-economic and environmental factors.

The planning system in the country needs to fully involve other development practitioners such property developers, estate managers and local communities in shaping planning policies in view of the complexities that go with the rapidly urbanising and de-industrialising scenario being currently experienced in the country. Current practices wrongly misconstrue public consultations and information as citizen participation in plan making. This is made worse by the fact that the planning profession in Zimbabwe has a tendency and obligation to produce prototype plans to which the public is persuaded endorse in the name of public participation. There is therefore an obvious need to re-orient planning so that it reflects and facilitates current developmental trends.

Transformation in planning can be better achieved if the tools that are used for monitoring development are made more participatory, mobile and transparent. GST application is one sure way of creating common grounds for participation by both the technical and non-

technical stakeholders in development since it simplifies both the production and presentation of spatial plans.

The findings of the research support the development of new context based urbanisation management strategies and policies. This proposed approach encourages urban managers to view and use current development trends as the basis for better informed policy making.

This is against the backdrop the of the prevailing control minded attitude of urban managers which seeks to whip development into line with pre-determined objectives which may be out-dated and remain guided by foreign concepts. This is particularly true for situations in Africa which seem to be following a different development trajectory from that in the west. African urbanisation is mainly characterised by high population growth which is not complimented by proportionate economic growth unlike the history of cities' development in the west which had a more predictable pattern were population growth was essentially preceded by economic activity such as industrialisation (Cummings, 2011).

The context based urbanisation strategies recommended in the latter paragraph, however need to be well informed by different stakeholders such as local communities, political leaders and the business community. This all inclusive approach to planning however has a strong bearing on the communicative aspects of planning which should at least seek to create a common and level platform for participation. One way of improving both participation and communication is that of transforming the mind sets of planning practitioners and policy makers by refocusing the planning knowledge base. The communicative and collaborative planning concepts propounded by scholars such as Healey (1996) and Innes and Booher (2010) respectively could be used as a basis for developing locally formulated education curriculums and training programmes.

African cities' development is currently characterised by rapid population growth, poverty, high levels of unemployment, poor infrastructure development and rising levels of informality. These challenges need to be managed by frameworks which have the ability to adapt to rapid change. Current planning frameworks and practices in Zimbabwe remain entrenched in the colonial-style founding principles which were designed to promote, physical efficiency, aesthetics and segregation.

The research also established the need to de-mystify the apparent reification of planning which focuses on plans proffering all-encompassing solutions to development problems through physically oriented objectives, to placing more emphasis on the process of managing change. This is especially relevant to the rapidly changing African urban set up. A strategic planning approach which links spatial planning to implementation needs to be further considered as a viable theoretical basis for transforming planning frameworks (Faludi, 2010). This option is supported by the main findings of the evaluation of LP17 and LP22 in Harare which clearly identified the lack of an implementation protocol as the missing link between planning and development.

6.2.2 Transforming the frameworks and tools for planning

Development management in Harare CBD and Epworth informal settlement needs to tackle the growing challenges posed by widespread informality and rapid population growth. Such challenges include the need to cope with rapid land use change, monitoring urban growth and the provision of infrastructural services and amenity to greater numbers of people than had been originally anticipated by the current planning frameworks which were designed to cater for much smaller populations and formal settings only. This assertion was corroborated by planners from Harare city council who repeatedly admitted that the city lacked a policy framework with which to deal with informality.

Current frameworks are full of prescriptions which treat the wrong developmental symptoms much to the detriment of the growing informal practices which appear to be the new drivers of urbanisation in Harare. Such prescriptions include the rigid zoning regulations and building development conditions which inhibit the growth of the vibrant small business and informal sector. For instance, much attention is given to regulating and providing for the smooth flow and parking of vehicular traffic and large commercial buildings in the two local plans evaluated in this research and there is very little or no mention of the need to deal with pedestrian traffic and small businesses.

The land use change analyses findings also demonstrated the bluntness and inappropriateness of some of the current tools of planning through illustrations of measured land use change and other departures from prescribed spatial plan intentions and standards for parking and floor area factors.

Similarly in Epworth the study managed to demonstrate departure from planning intentions by measuring the extent of encroachment on public spaces by unauthorised settlements (see map on figure 5.4 and table 5.3). The ward 7 scenario denotes failure by both the prescriptive and predictive techniques used by planners in determining developmental objectives and demonstrates the current planning system's lack of respect for local values. It could also be possibly a situation which fell victim to the conflict of values between the 'experts' who decided that the provision of public spaces was the main priority and the 'planned for' who thought otherwise and decided to convert the public space reservations into settlements.

The conclusion that was consequently drawn from these analyses is that:

Most current planning frameworks in Harare and Epworth are failing to meet their stated objectives which remain set in formal contexts that have been outlived by current development trends that are characterised by rapid change and informality.

The management of rapid growth and change consequently requires development management tools that are accurate, adaptive to change and have the capacity to store and manipulate large quantities of data within a short space of time. The application of geo-spatial technologies (such as GIS and remote sensing) in planning has the demonstrated ability to transform the mobility and storage capacity of planning tools (Klosterman, 1995).

The study also amply demonstrated how web-based remote sensed data and available S-G mapping could be easily developed into simple and cost effective geo-data bases that could be used to carry out faster and more accurate spatial plan evaluations than would be the case using manual methods. The assertion that the city of Harare cannot afford to create geo-data bases and upgrade its planning system into a digital one is therefore not correct since this study demonstrated a simpler and cheaper way of technologizing.

The apparent failure by the city of Harare to keep up to date change of use registers for the central area further illustrates the inadequacy of the data storage and manipulation facilities in the city. The second conclusion which relates to the frameworks and tools for planning in Harare and Epworth is:

Current tools and frameworks in Harare do not have the adequate qualities and capacity to monitor, predict and manage rapid change.

The research findings also exposed the fact that the current planning frameworks are failing to monitor and predict current development trends mainly because they were based on inaccurate and unreliable data sources and projections. This is particularly so because they primarily depended on manual means of data collection which have been clearly out-paced by the rapid rate of urban development. The approval procedures and the content of the for the review of master and local plans as entrenched in the RTCP Act is too protracted and bureaucratic to an extent that renders the whole exercise inflexible and incapable of being reviewed in line with the current urban set up.

The statute which guides the production of spatial planning frameworks should therefore be revised to accommodate modern ways of data collection, analysis and manipulation and simpler approval processes.

This research also identified the usefulness GST in improving communication and participation in planning by local communities through the following means:

i) Using the geo-visualisation tools of GIS to create 3-D images and models of spatial plans that are easier to understand and follow. Such presentations not only stimulate greater interest to planning but also have the capacity to improve one's conceptualisation of planning intentions.
ii) Visual images also help in creating a common perceptual understanding of spatial concepts between technical and non-technical stakeholders in planning and development thus reducing the chances of the plan being a product of expert contributions only.
iii) Digital maps, planning reports and consultations can be easily communicated through the internet and other forms of social media that use computers and mobile phones.
iv) The use of geo-referenced attitudinal map overlays that represent community values spatially is a more accurate way of incorporating participation into development processes.

A theoretical analysis of the master and local planning procedures illustrated in table 2.4 exposes the dominance of top-down decision making in master planning whereby the local authority (presumably represented and directed by the expert planner) is mostly responsible for initiating and formulating development policies whilst the public's role in the process is appropriately classified by section 15(2) of the RTCP act as "Publicity" (Zimbabwe, 1996). The public's role in master planning is therefore implicitly relegated to that of being informed thus accentuating the non-participatory top-down approach entrenched in the very legislation which guides plan preparation in Zimbabwe. Subsequently the third conclusion which relates to frameworks is:

The legislative framework for urban planning in Zimbabwe contains undertones which ostracise the role of participation in planning. The level of public participation in the planning process is therefore limited to the discretion of planning authorities (a situation which further perpetuates the dominance of the top-down approach) therefore most of the SPFs prepared in Harare fail to be inclusive and they tend to further marginalise the poor because they are not legally obligated to do so.

Another conclusion which related to inclusivity is that:

The format of presentation and communication of information on urban plans to the public is both too technical and poorly communicated to attract any meaningful contributions to planning by ordinary people.

The other main weakness of master planning in Zimbabwe is the lengthy timeframe required to produce plans. The sentiments raised by stakeholders in the planning process are that plans become out-dated before they get approved. The time period taken to prepare LPs and MPs is too long since it takes not less than six months and one year respectively to see the processes through. Both the literature review and the field work carried out in Epworth informal settlement are in support of the view that community values change with times. It therefore follows that planning processes that take too long to be concluded compromise the efficacy of the end products (plans) leading to lesser levels of acceptance by the end users and they risk being less relevant to development management. A case in point in this study is the abandonment of the Home Industries shopping site in Epworth by the supposed end users who preferred to move to what they

perceived to be busier localities. The concluding remark in that regard is summarised in the following statement:

Lengthy plan preparation time frames negatively impact on the efficacy of planning frameworks.

GST can be used effectively to transform master planning into a shorter process without necessarily changing the laws that legitimise the process and the substance contained in the plans. GST application can expedite the process in the following manner:

The application of GIS and remote sense based urban analyses techniques in the manner suggested in 2.4.4 of this document to prepare most of the information which constitutes "The Study" part of the master plans and local plans can effectively substitute manual ways of data gathering and mapping. It will be ultimately easier and faster to obtain most of data required for the study from established geo-data bases.

The mapping and data storage facilities of GIS will also reduce the time taken to produce the large number of maps that accompany LPs and MPs.

The enforcement of mono-functional land use zoning to the letter in terms of prescribed land use groups which only recognise 'formal development' through local plans, is a practice that renders local plans tools that are insensitive to informality and rapid change.

The findings of the all the land use surveys and the change analyses in chapters 4 and 5 all support the need to recognise inclusionary/ multi-functional zones in Harare.

6.2.3 Urban governance and practices transformation

Current planning practices in Zimbabwe are failing to mediate the contestation for urban space between the urban poor (mostly represented by informality) and the elite mainly represented large business owners and property developers.

This concluding remark is mainly supported by the following findings.

i) Most planning applications, representations and or objections can only be legally done by registered property owners (with title deeds). The urban poor are therefore

effectively excluded from influencing decision making in planning since the majority of them are not registered property owners.

ii) Current planning frameworks in Zimbabwe were framed based on the principles that do not recognise informality therefore they only serve to marginalise the poor.

6.3 Limitations

There were several limitations to the research and the main ones were inadequate spatial data sources, the use of inconsistent base years for the case studies, unwillingness to participate in interviews by some key stakeholders, inaccurate base mapping, and professional biases by some key stakeholders and pessimism by some respondents over the objectives of the research.

6.3.1. Inadequacy of spatial data

The local authorities for the two case study areas do not have any geo-data banks which could be used for the purposes of creating digital base maps for the study. Most of the existing spatial plans for Harare and Epworth were hard copies and so the researcher had to go through the lengthy process of digitising and geo-referencing the maps. The accuracy of the base maps was therefore compromised since it depended on the precision of the mosaicking and geo-referencing carried out by the researcher.

The high price of acquiring high resolution satellite imagery was also a limiting factor in this research since I had to resort to using Google Earth-Pro images which have relatively lower spatial resolutions. I ended up downloading several images to cover a single locality in order to reduce the level of image distortion which can result from excessive zooming in. The images were then joined to produce larger area images through mosaicking which is a time consuming exercise that could have been saved if the right quality of imagery was affordable.

6.3.2. Inconsistency of study area time frames

The CBD for Harare is currently covered by two different sets of local plans whose dates of approval differ by a staggering ten years. Case study 1 therefore accordingly adopted two base years and the researcher had to juggle around them in order to come up with a meaningful analysis. The adoption of two base years for the same case study area was by no means any easy task since it required extra writing and data aggregation skills.

In the case of Epworth informal settlement the best available spatial planning framework that could be used as a basis for plan evaluation was a layout plan for ward 7 whose preparation process only started in 2010. The base year for the quantitative analysis of the study in that area had to be brought forward to 2010 which is well ahead of the original base year which had been set for 1980 in the research proposal. The main disadvantage of using a shorter period of time in carrying out land use change analysis was that the study could not produce a noticeable pattern of land use change for the area. The alternative approach though was to change the exercise into a localised urban growth analysis based on building counts.

6.3.3. Key stakeholders unwillingness to participate in surveys

Some of the key stakeholders in government and the private sector who had been shortlisted for interviews because of their perceived role in planning and development rebuffed the exercise by claiming that they either had more important or more profitable other business to do during that time. In other instances the researcher only got some response after several persuasive attempts. The research had to do with fewer responses than had been originally planned thus reducing the sample sizes on both the qualitative and the quantitative aspects of the research.

The household survey carried in Epworth was also wrought with some element of pessimism by some respondents who suspected that the research could be a disguised attempt by the local authorities to either evict them or coerce them into paying development levies.

6.3.4 Professional bias

The qualitative part of the research which investigated planning practice through interviews with the planning practitioners invoked some sense of professional predisposition in support of normative concepts by some of the respondents who clearly portrayed a defensive attitude. Although it was difficult to quantify and ascertain such attitudes, the objectivity of some the key stakeholders' responses could not be guaranteed.

6.5. Recommendations for further research

1. Most of the reviewed literature on urbanisation dwelt on the importance of urban development management (UDM) in shaping the character and form of cities but

does not specifically discuss how the urbanisation processes inversely influence UDM practices. There is therefore scope to further investigate the impact of rapid urbanisation on UDM and planning practice.

2. The other major finding from literature exposes the fragility of planning to political influence, market forces and change. Future research could possibly explore the dynamics of urban planning in the face of such challenging circumstances.

3. The study also identified a scope for developing land registration and revenue collection systems for informal settlements using Geo-spatial technologies.

4. Investigating the role of the informal sector in urban development with a particular emphasis on how the inherent social capital in the sector can be used to generate revenue and ideas that impact on development processes is another possible area for future research.

5. Finally the research identified the need to explore the potential role of GST in improving land use management, participation and decision making in the urban

References

Africa Economic Outlook, 2014. Grain Fish Money Financing Africa's Green and Blue Revolution: Africa Progress Report 2014

Ahmed, B., & Ahmed, R. 2012. Modeling Urban Land Cover Growth Dynamics Using Multi-Temporal Satellite Images: A Case Study of Dhaka, Bangladesh, *International Journal of Geo-Information* 1: 3-31.

Alberti, M. 2009. *Advances in Urban Ecology: Integrating Humans and Ecological Processes in Urban Ecosystems*. Washington: Springer.

Allen, A and You, N. *Sustainable Urbanisation Bridging the Green and Brown Agendas*. London: The Development Planning Unit University College of London.

Arnstein, S.R. 1969. A ladder of citizen participation. *Journal of the American Institute of Planners*, 35(2) :16-24.

Ballaney, S. and Bindu, N. 2002. *Application of Satellite Imagery and GIS in the Preparation of Development Plans: A Case Study for Tirupati Region*. Indian Cartographer, MUIP-01:245-253

Arnal, I. 2010. Resurrecting Cities: Instant Urban Planning-Real-time Urbanisation and Planners role in Emergency Situations. In *Distributed Urbanism Cities after Google Earth*. Edited by G. Wilkins

Berrisford, S. 2013. Getting land governance right in Sub-saharan cities: More than land administration. In M Napier, S Berrisford, W C Kihato, R MackGaffin and L Royston (eds). Trading Places: Accesssing land in African cities. Cape Town (Somerset West): African Minds (for Urban LandMark). 73-90.

Bhatta, B. 2010. *Analysis of Urban Growth and Sprawling from Remote Sensing Data*. London: Springer

Borraine, A., Crankshaw, O., Engelbrecht, C., Gotz, G., Mbanga, S., Narsoo, M. and Parnell, S. 2006. The State of South African Cities a Decade after Democracy. *Urban Studies* 43(2): 259–284

Bowlers, A. and Evans, B.(Eds) 1997. *Town Planning into the 21st Century.* London: Routledge

Butcher, C. 1986. *Low Income Housing in Zimbabwe: A Case Study of the Epworth Squatter Upgrading Programme.* Harare: University of Zimbabwe.

Carter, J., Moscato, V., & Tindale, N. 2009. GIS as a Rapid Decision-support Tool for Raptor Conservation Planning in Urbanizing Landscapes. *Australian Geographer*, 40(4): 471-494.

Cities Alliance. 2012. *Cities without Borders: Guiding Urbanisation in Africa for Economic Development and Poverty Reduction*. [Pamphlet]

City of Harare. 1990. *Kopje Market Square Local Subject Plan Number 17*. Harare: City of Harare

City of Harare. 2000. *City Centre Local Development Plan Number 22.* Harare: City of Harare

Chatiza, K. 2010. Can local government steer socio-economic transformation in Zimbabwe? Analysing historical trends and gazing into the future. In *Local Government Reform in Zimbabwe: A policy Dialogue*. Edited by J. De Visser; N. Steytler; N. Machingauta. Cape Town: University of the Western Cape

Chanza, N., & Chirisa, I. 2011. People or Environmental Quality? Solid Waste Management Dilemma in Epworth, Harare. *United Nations Centre for Regional Development, Regional Development Studies*. 15: 42-57.

Chipungu, L. 2011. Insights into Urban Development Control Challenges: A Case Study of Operation Murambatsvina/ Restore Order in Zimbabwe: *The Built & Human Environment Review, 4(2).*

Chirisa, I. 2010. Peri-Urban Dynamics and Regional Planning in Africa: Implications for Building Healthy Cities. *Journal of African Studies and Development.* 2(2):15-26

Chirisa, I. 2012. *Contemporary Rural and Urban Issues in Zimbabwe: Implications for Policy and Planning*. London: Academica.

Chirisa, I. 2009. Prospects for the asset-based community development approach in Epworth and Ruwa, Zimbabwe: A housing and environmental perspective. *African Journal of History and Culture*. 1(2) :28-35

Chitekwe-Biti, B., Mudimu, P., Masimba Nyama, G., and Jera, T. 2012. Developing an informal settlement development protocol-the Epworth story: *Environment and Urbanization*: 12(24):131

Chitekwe-Biti, B. 2013*. Impacting the City: The Role of Social Movements in Changing the City's Spatial Form in Windhoek, Namibia*. [Unpublished Phd]. Manchester: University of Manchester.

Chitekwe-Biti. 2014. *Transformation of Urban Planning Practices Using Geo-Spatial Technology to Manage Rapid Urbanisation in Harare: Zimbabwe*. Interviewed by D. Machakaire. Harare. Zimbabwe

Cities Alliance. 2012. Guiding Urbanisation in Africa for Economic Development and Poverty Education. ISTED

Cohen, B. 2006. Urbanisation in Developing Countries: Current Trends. Future Projections and Key challenges for Sustainability. *Technology in Society,* 28: 63-80

Collie, N. 2011. Cities of Imagination: Science, Fiction, Urban Space and Community Engangement in Urban Planning. *Futures*, 43(2011): 424-431

Colenutt, B. 1997. Environmental Planning for Sustainable Development. In *Town Planning into the 21st Century.* Edited by A. Bowlers and B. Evans. London: Routledge

Cuthbert, A.R. 2006. *The Form of Cities: Political Economy and Urban Design.* Malden: Blackwell Publishing

Cummings, S. 2011. Urban Fragility and Security in Africa: *Urban Securities Brief,* 12

Dewar, D., Todes, A. and Watson, V. 1982. *Urbanisation: Responses and Policies in Four Case Studies Kenya, Zambia,Tanzania,Zimbabwe*. Cape Town: University of Cape Town

Dialogue on Shelter for the Homeless in Zimbabwe Trust. 2010. *At Home in Epworth: Upgrading an Informal Settlement.* [Pamplet]

Di Gaetano, A. and Klemanski, J.S. 1999. *Power and City Governance: Comparative Perspectives on Urban Development*. Minneapolis: University of Minnesota

Faludi, A. 2010. *Cohesion, Coherence, Cooperation: European Spatial Planning Coming of Age*? London: Routledge

Forester, J. 1999. *The Deliberative Practitioner: Encouraging Participatory Planning Processes*. Cambridge: MIT Press

Freund, B.2007. *The African City: A History.* Cambridge: Cambridge University Press

Gandiwa, M. 2014. *Master and Local Plans in Zimbabwe*. Interviewed by D. Machakaire. Harare. Zimbabwe

Geertman, S. 2002. Participatory planning and GIS: a PSS to bridge the gap: *Environment and Planning B: Planning and Design,* 29: 21-35.

Goodchild, M. F., Harris, T.M., & Elves, G.A. 1996. The application of GIS in urban and regional planning: a review of the North American experience: *Applied Geography*, 13:9-27.

Hague, C, and Jenkins, P. 1997. *Place Identity and Participation in Planning*. London: Routledge

Hall, P. 2002. *Urban and Regional Planning* Fourth Edition. London: Routledge

Harrison, P. 1994. *Changing Economics Urban Restructuring and Planning Response*. Paper presented at SAPI conference. Cape Town

Healey, P. 1996. The Communicative Turn in Planning Theory and its Implications for Spatial Strategy Formation: *Environment and Planning* B: *Planning and Design.* 23: 217-234

Healey, P. 2006. Collaborative Planning: Shaping Places. In *Fragmented Societies*. Edited by Y. R. and A. Thornley. Basinstoke: Palgrave Macmillan.

Healey, P. 2007. On Social Nature of Planning. *Planning Theory and Practice,* 8(2): 133-136

IMF. 2005. Staff Report for the 2005 Article IV Consultation: Washington, DC: International Monetary Fund

Innes, J. and Booher, D. 2010. *Planning with Complexity: An Introduction to Collaborative Rationality for Public Policy*. London: Routledge

Kamete, A.Y. 2007. Cold-Hearted, Negligent and Spineless? Planning, Planners and the (R)Ejection of "Filth" in Urban Zimbabwe. *International Planning Studies*, 12(2): 153–171

Kamete, A.Y. 2009. In the Service of Tyranny: Debating the Role of Planning in Zimbabwe's Urban 'Clean-up' Operation. *Urban Studies,* 46(4): 897-922

Kamete, A.Y. 2012. Not exactly like the phoenix but rising all the same: reconstructing displaced livelihoods in post-clean-up Harare. *Environment and Planning D*: *Society and Space,* 30: 243-261

Kasiyamhuru, A. 2014. *Master and Local Plans in Zimbabwe*. Interviewed by D. Machakaire. Harare. Zimbabwe

Kawadza, S. & Chirisa, I. 2011. Civic Associations and Urban Governance in Harare, Zimbabwe: A Special Focus on the Post-2008 Era. *Hemispheres,* 26: 59-72.

Kay, G. 1970. Rhodesia: a human geography. London: University of London Press.

Khanda, C. 2014. *Master and Local Plans in Zimbabwe*. Interviewed by D. Machakaire. Harare. Zimbabwe

Klosterman, R.E. 1995. The Appropriateness of Geographic Information Systems for Regional Planning in the Developing World. *Computer Environ. and Urban Systems*, 19(1): l-13.

Knox, P.L. and McCarthy, L. 2005. *Urbanization: An Introduction to Urban Geography.* Second edition. London: Pearson Prentice Hall.

Madanipour, A. 2003. *Public and Private Spaces of the City*. London. Routledge

Marx, K. and Engels, F. 1 959: *Basic Writings on Politics and Philosophy*. London, Collins Fontana

Mattingly, M. 1998. *Changing Urban Planning Practice*. An open lecture delivered to professionals and government officers as part of LasConferencias Sobre Planificacion

Estrategica de Ciudades conducted by the Facultad de Arquitectura y Urbanismo, Universidad Nacional de Tucumán, San Miguel de Tucumán, Argentina

Mouton, J. 2009. *Understanding Social Research.* Pretoria. Van Schaik Publishers.

Mudimu. 2014. *Transformation of Urban Planning Practices Using Geo-Spatial Technology to Manage Rapid Urbanisation in Harare: Zimbabwe*. Interviewed by D. Machakaire. Harare. Zimbabwe

Mukoto, S. 2014. *Master and Local Plans in Zimbabwe*. Interviewed by D. Machakaire. Harare. Zimbabwe

Munzwa, K. & Wellington J. 2010. Urban Development in Zimbabwe: A Human Settlement Perspective, *Theoretical and Empirical Researches in Urban Management,* 5(14):120-146

Musakwa, W. and Van Niekerk, A. 2013. Implications of land use change for the sustainability of urban areas: A case study of Stellenbosch, South Africa. *Cities*

Muzamindo. 2014. *Transformation of Urban Planning Practices Using Geo-Spatial Technology to Manage Rapid Urbanisation in Harare: Zimbabwe*. Interviewed by D. Machakaire. Epworth. Zimbabwe

Myers, G. 2011. *African cities alternative visions of urban theory and practice*. London: Zed Books

Ngau, P. 2013. *For Rural and Urban a New Approach to Urban Planning in Kenya*. London: Africa Research Institute

Njoh, A.J. 2009. Urban Planning as a Tool for Power and Social Control in Colonial Africa. *Africa Planning Perspectives,* 24(3): 301-317

Owusu, F. 2011. Urban Planning: The Way Forward for Africa's Cities? *Think Africa Press*. [Online]. http://thinkafricapress.com/population-matters/impact-demographic-change-resources-and-urban-planning-africa [11 October 2012]

Pal, A. 2008. *Planning from the Bottom-up: Democratic Decentralisation in Action*. Delf: IOS Press

Parnell, S. & Walawege, R. 2011. Sub-Saharan African Urbanisation and Global Environmental Change. *Elsevier: Global Environmental Change*. 944:1-9

Patel, S., Baptist, C., and D'Cruz, C. 2012. Knowledge is Power-Informal Communities Assert their right to the city through SDI and Community-led Enumerations. *Environment and Urbanisation:* 24: 13

Potts, D. 2006. 'Restoring Order'? Operation Murambatsvina and the Urban Crisis in Zimbabwe. *Southern African Journal* 32(2): 273 – 291

Potts, D. 2012. *Whatever Happened to Africa's Rapid Urbanisation*: Africa Research Institute

Rakodi, C. 1995. *Harare: Inheriting a colonial city, change or continuity?.* Chichester and New York: J. Whiley

Rakodi, C. 2006 The Urban Challenge in Africa. In *Managing Urban Futures: Sustainability and Urban Growth in Developing Countries.* Edited by M. Keinner; M. Koll-Schretzenmayr; W. Schmid. UK: Ashgate

Robi, W. 2011. *Rapid Urbanization and Housing Shortage in Africa: The Opportunity within the Problem for Ethiopia*.[Unpublished MSc] Stockholm: KTH Royal Institute of Technology

Ryan, R. 2011. The social landscape of planning: Integrating social and perceptual research with spatial planning information. *Landscape and Urban Planning,* 100: 361–363

Sager, T. 2013. *Reviving Critical Planning theory: Dealing with pressure, neo-liberalism, and responsibilities in communicative planning*: New York: Routledge.

Saungweme, T., Matsvai, S. and Sakuhuni, R. 2014. Economic Analysis of Unemployment, Output and Growth of Informal Sector in Zimbabwe (1985-1993). *International Journal of Economics*, 5i2: 01-09

Shen, Z. 2012. *Geo-Spatial Techniques in Urban Planning*. London: Springer

Silva, C.N. 2010. *Handbook of Research on E-Planning: ICTs for Urban Development and Monitoring*. Hershely: Information Science Reference

South African Cities Network, 2007. State of the Cities Report 2006. Inclusive African Cities Conference. Wits University, Johannesburg, South Africa. 06-07 March 2007**.**

Tapela, N**.** and Tonkin, A**.** 2012. Urbanity, design and inclusion: Mediating the physical and social bases of urban planning through density and diversity lenses and sensibilities. Design, Development and Research Conference. Cape Town, South Africa. 04-05 September 2012.

Taylor, N. 1998. *Urban Planning Theory Since 1945*. London: Sage Publications Limited.

The Economist. 2010. The Urbanisation of Africa: Africa's cities are set to swell in size*. Urbanisation_Africa* [Online]. http://www.economist.com/blogs/dailychart/2010/12/ [October 11, 2012].

Tibaijuka, A. 2005. *Report of the Fact-Finding Mission to Zimbabwe to assess the Scope and Impact of Operation Murambatsvina by the UN Special Envoy on Human Settlements Issues in Zimbabwe*. New York: United Nations.

Todes, A. 2011. Reinventing Planning: Critical Reflections. *Urban Forum,* 22: 115-133

Todes, A. 2012. New Directions in Spatial Planning: linking Strategic Spatial Planning with Infrastructure Development: *Journal of Planning Education,* 32 (4): 400-414

Toriro, P. 2008. Town Planning in Zimbabwe: History, Challenges and the Urban Renewal Operation Murambatsvina. In *Zimbabwe's Development Experiences since 1980: Challenges and Prospects for the Future*. Edited by Maphosa., France., Kraposy., Kujinga., &, D.C. Sunungurai. Addis Ababa: OSSREA.

Toriro, P. 2009. The Impact of the Economic Meltdown on Urban Agriculture in Harare, *Urban Agriculture Magazine*. 21:26-27

Turok, I. 2012. Urbanisation and Development in South Africa: Economic Imperatives, Spatial Distortions and Strategic Responses. [Online] Available: http://pubs.iied.org/10621IIED.html. [12 March 2014].

UNECE. 2008. Spatial Planning: Key Instrument for Development and Effective Governance with Special Reference to Countries in Transition

UN-HABITAT. 2008. *The State of African Cities 2008.*Nairobi: United Nations Human Settlements Programme.

UN-HABITAT. 2009. *Planning Sustainable Cities***.** London: Earth scan

UN-Habitat. 2010. The state of African cities 2010: Governance, Inequality and Urban Land Markets. Nairobi Kenya.

UN-Habitat. 2012. *Where Are We?- Where We Need to Go: Advancing a New Pact Towards Habitat III*. African Ministerial Conference on Housing.

UN-Habitat. 2013. Urban Planning for City Leaders. Nairobi Kenya.

Van den Brink, A., Van Lammeren, R., Van de Velde, R. and Däne, S. 2007. *Imaging the future: Geo-visualisation for participatory spatial planning in Europe*. Wageningen: Wageningen Academic Publishers

Van Niekerk, A. 2008*. CLUES: A web-based Land Expert System for the Western Cape*: Phd. Thesis. University of Stellenbosch.

Vhutuza, W. 2014. *Master and Local Plans in Zimbabwe*. Interviewed by D. Machakaire. Harare. Zimbabwe

Watson, V. 2009. Seeing from the South: Refocusing Urban Planning on the Globe's Central Urban Issues, *Urban Studies Journal*, 46(11): 2259–2275.

Wekwete, K.H. 1987. *Development of Urban Planning in Zimbabwe-An Overview*. Harare: Department of Rural and Urban Planning Occasional Paper. University of Zimbabwe.

Wekwete, K. & Rambanapasi, C. 1994. *Planning Urban Economies in Southern and Eastern Africa*. Hants: Ashgate Publishing Limited.

Wong, C. 2006. *Indicators for Urban and Regional Planning.* Oxon: Routledge.

Wu, H., He, Z., and Gong, J. 2010. A Virtual Globe-based 3D Visualisation and Interactive Framework of Participation in Urban Planning Processes. *Computer, Environment and Urban Systems,* 34: 291-298

WUP, 2009. *World Population Prospects: The 2008 Revision Comprehensive Tables,*1. New York. United Nations Population Division Department of Economic and Social Affairs

Zimbabwe. 1996. Regional Town and Country Planning Act no. 22 of 1996. Harare: Government Printers

Zimbabwe. 2013. *Zimbabwe Agenda for Sustainable Socio-Economic Transformation*. Harare: Government Printers

Zvareva. 2014. *Transformation of Urban Planning Practices Using Geo-Spatial Technology to Manage Rapid Urbanisation in Harare: Zimbabwe*. Interviewed by D. Machakaire. Epworth. Zimbabwe

APPENDICES

APPENDIX 1

QUESTIONNAIRE FOR CITY OF HARARE AND GOVERNMENT PLANNERS

(Master and Local Plans in Zimbabwe)

PART 1: GENERAL

1. Name _____
2. Employer _____
3. Position/ Area of Responsibility _____
4. Qualifications and Experience _____

PART 2:

5. Have you ever been participated in preparing a Master plan or a Local Plan?
Yes/No
If yes which one? _____

6. What do you consider to be the main problems in the MP/LP preparation process?
_____
_____
_____
_____
_____
_____

7. Do you have any comments on the contents of the MPs/LPs that you use in terms of the following areas?
   a) Comprehensiveness
   _____
   b) Detail & Accuracy
   _____
   c) Time frame /plan period_____
   d) Approval process
   _____
   e) Any other
   _____

8. Are there any shortcomings in MPs and LPs as tools for urban development management? Yes/ No

If yes what are they?

_____
_____
_____

10. Do you think the current MPs and LPs have enough provisions to adequately deal with the following trendy concepts in planning? Give reasons for your answers.

a) Informality _____
b) Inclusivity _____
c) Equality

_____

d) Sustainable development _____
e) Globalisation/ competiveness

_____

11. How do you rate the participatory process in Zimbabwe? Is it:

a) **Consultative** Yes/no

Reasons for your answer

_____
_____
_____

b) **Informative** Yes/no

Reasons for your answer

_____
_____
_____

c) **Formulative** Yes/No

Reasons for your answer

_____
_____
_____

12. Do you think that the application of Geo-Spatial technology will aid the efficacy of your planning practices in any way? Yes/No

If yes how?

_____
_____
_____

12. Has the application of technology impacted on your planning in your planning activities in any way? Yes/ No

If yes how?

_____
_____
_____

Thank you.

APPENDIX 2

STRUCTURED INTERVIEW ON EVALUATION OF LOCAL PLAN 17

(Kopje Market Square Local Subject Plan)

Name of interviewee:

_____

Occupation:

_____

–

1. How do you rate the level of success or failure in the achievement of the following goals stated in Local Plan 17?
   a) Land use zoning

      _____
      _____
      _____
      _____
      _____
      _____

   b) Provision of safe and efficient vehicular and pedestrian traffic circulation

      _____
      _____
      _____
      _____
      _____

   c) The provision of adequate parking, and public commuter interchange

      _____
      _____
      _____
      _____
      _____
      _____

   d) Designation of and use of areas for bus station and parking garage

      _____
      _____
      _____
      _____

e) Redevelopment of Municipal Site, design and implement multi-purpose office and commercial centre at former municipal workshop site.

_____
_____
_____
_____
_____

2. Do you think the above stated goals adequately represented and addressed the problems of the affected area? Yes/ No
   If no what else would you have suggested?

_____
_____
_____
_____
_____
_____

3. In your opinion what at were the shortcomings and failures of LP 17?

_____
_____
_____
_____
_____
_____
_____

4. In your opinion what at were the successes and strengths of LP 17?

_____
_____
_____
_____
_____
_____

Thank you.

APPENDIX 3

STRUCTURED INTERVIEW ON EVALUATION OF LOCAL PLAN 22

(City Centre Local Development Plan)

Name of interviewee:

_____

Occupation:

_____

1. How do you rate the level of success or failure in the achievement of the following aims and objectives of Local Plan 22?

a) **Commercial development** –enhancement of economic base of city, attracting more investment and utilisation of individual stands.
Tools/ objectives- Higher floor area factors, Increase in areas of higher intensity, maintenance and enhancement of supportive commercial zones

_____
_____
_____
_____
_____
_____

b) **Integrated Residential and Social Development-**ensuring existence of lively residential, social and economic environment in the vicinity of city centre.
Tools/objectives- more intensive residential land use, encouraging more investment and mixed land uses. Encouraging growth of commercial centres

_____
_____
_____
_____
_____
_____

c) **Community and Health** –Provision of adequate community, medical and recreational facilities in the area.
Tools/Objectives – create a viable public assembly zone protected from the threat of more economically powerful uses, designating enlarged area for medical facilities and educational uses

_____
_____
_____

_____
_____

d) **Traffic and Transportation-**ensuring high accessibility and efficient circulation of transport.
Tools/objectives-road hierarchy which allows choice of routes by road users according to destinations, encourage private sector participation in parking garage development through changing them from being reservations to zones and also creating new parking garages-safety and convenience of pedestrians through shopping malls and pedestrianisation of some areas.

_____
_____
_____
_____
_____

e) **Environment and Amenity-**Retain and add features that enhance the environment and amenity of planning area.
Tools/ objectives- Physical development of buildings and infrastructure that conforms to human scale. High quality of designs and finishes to all mass structures and street furniture , Maintenance of passive and active open spaces to benefit the public, Creation and protection of areas of high scenic beauty and historic interest

_____
_____
_____
_____
_____

2. Do you think the above stated aims and objectives adequately addressed the problems of the affected area? Yes/ No
If no what else would you have suggested?

_____
_____
_____
_____
_____
_____

3. In your opinion what at are the shortcomings and failures of LP 22?

_____
_____

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_____
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4. In your opinion what at are the strengths and successes of LP 22?

_____
_____
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_____
_____

Thank you.

APPENDIX 4

DEPARTMENT: TOWN AND REGIONAL PLANNING

FACULTY: INFORMATICS AND DESIGN

MASTER OF TECHNOLOGY IN TOWN AND REGIONAL PLANNING THESIS

RESEARCH TOPIC:

Transformation of Urban Planning Practices Using Geo-Spatial Technology in Managing Rapid Urbanization in Harare: Zimbabwe

Property Managers Questionnaire

This information is going to be used for academic purposes by the undersigned student.

Name …….. Designation……..

Company……..

1.

a) Does your company own or manage any buildings within the central business district of Harare?

…….

b) If yes How many?

……
……
……

2.

a) What average monthly rentals do you charge for buildings within the CBD?

……
……

3. Do the following factors affect your business and if yes how?

a) Land use zoning Yes/ No

……

b) Parking Yes/ No

……

c) Traffic Yes/ No

……

d) Quality and condition of buildings Yes/ No

……

e) Street vending Yes/ No

……

4, On a scale of one to ten (where one is the lowest and ten is the highest) can you rate the quality and reliability of the following services in your area?

Service	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Water supply										
Electricity										
Parking										
Solid waste management										
Public transport										
Sewerage										

5. What is the average percentage occupancy on your buildings?

……

6. Which types of tenants or activities occupy most of your buildings? Estimate the percentages.

Type of Tenants/ Activities	**Percentage**
Retail Shops	
Hair salons	
Offices	
Service industries	
Flea markets	
Churches	
Others (specify)	

7. Have you ever been consulted, Informed or contributed towards the preparation or review of town planning projects in the CBD?

If yes how?

9, Have you experienced any significant changes in your business with regards to the following areas in the past 10 years?

	Remarks	**Coping strategy**
Occupancy levels		
Value of rentals		
Type/ nature of tenants businesses		
Period of occupancy		
Payment of rentals		
Service provision		
New investment prospects		
Technology application		
Any other		

10. Do you have any suggestions regarding the improvement of urban development management and planning in the city of Harare?

……
……
……
……
……
……

Declaration

I the undersigned student declare that I am going to use this information for academic purposes only. Thank you.

Name……Student Number 210043512.

D. Machakaire

APPENDIX 5

DEPARTMENT: TOWN AND REGIONAL PLANNING

FACULTY: INFORMATICS AND DESIGN

MASTER OF TECHNOLOGY IN TOWN AND REGIONAL PLANNING THESIS

RESEARCH TOPIC:

Transformation of Urban Planning Practices Using Geo-Spatial Technology in Managing Rapid Urbanization in Harare: Zimbabwe

Epworth Development Stakeholders Interview

Name of Respondent …….. ……..

Occupation ……..

1. Which are the main development management problems in Epworth?
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2. How are you responding to these problems?
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   ……
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   ……..

3. What tools and planning frameworks do you use to manage development in your area?
   ……
   ……
   ……
   ……
   ……
   ……..

4. Are the above stated tools and frameworks adequate? Yes/No Motivate your answer:
   ……
   ……
   ……
   ……
   ……
   ……
   ……
   ……..

5. Have you ever participated in the preparation of spatial plans for your area? Yes/ No

6. What do you consider to be the main problems in the plan preparation process?
7. What is your view on the role of public participation in planning? In terms of:

a) Consultations
   ……
   ……
   …….....
   .....

b) Information

……
……
……
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……..

c) Plan formulation

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8.What is your view on the role of technology in planning and urban development management?

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Declaration

I the undersigned student declare that I am going to use this information for academic purposes only. Thank you.

Name……Student Number 210043512.

D. Machakaire

APPENDIX 6

DEPARTMENT: TOWN AND REGIONAL PLANNING
FACULTY: INFORMATICS AND DESIGN
MASTER OF TECHNOLOGY IN TOWN AND REGIONAL PLANNING THESIS

RESEARCH TOPIC:

Transformation of Urban Planning Practices Using Geo-Spatial Technology in Managing Rapid Urbanization in Harare: Zimbabwe

Epworth Household Questionnaire

Name of Respondent …….. Age ……..

Plot Number ……..

1
a) What is the size of your family/ household?

…….

2
What does the head of your household do for a living?

☐ Formally employed

☐ Informally employed

☐ Other

Specify the nature and place of employment

……
……

3. Are there any other members of your household involved in income generating activities? Yes/ No ……..

If yes which ones and where?

……

…….

4. Have you ever participated or contributed anything towards the planning or development of your area? Yes/ No …….. If yes how?

……

……

5. What do you consider to be the most pressing developmental issues in your area?

……

……

……

……

6. Are you aware of the existence of an approved layout plan for Ward 7? Yes / No

……..

7. Do you think the plan will be of any benefit to you and your community? Yes/ No

……

If yes how?

.....

.....

.....

.....

.....

Declaration

I the undersigned student declare that I am going to use this information for academic purposes only. Thank you.

Name……Student Number 210043512.

D. Machakaire

APPENDIX 7

DEPARTMENT: TOWN AND REGIONAL PLANNING
FACULTY: INFORMATICS AND DESIGN
MASTER OF TECHNOLOGY IN TOWN AND REGIONAL PLANNING THESIS

RESEARCH TOPIC:

Transformation of Urban Planning Practices Using Geo-Spatial Technology in Managing Rapid Urbanization in Harare: Zimbabwe

Land use Survey 1

Stand Number……..……
Name of Building……..……
Block Reference……..……
Number of Floors……..……
Condition of Building……..……
Number of Off-Site Parking Bays……
Number of On-Site Parking Bays……

Floor	Uses

Declaration
I the undersigned student declare that I am going to use this information for academic purposes only. Thank you.

Name……Student Number 210043512.

D. Machakaire

APPENDIX 8

Cape Peninsula University of Technology

DEPARTMENT: TOWN AND REGIONAL PLANNING
FACULTY: INFORMATICS AND DESIGN

MASTER OF TECHNOLOGY IN TOWN AND REGIONAL PLANNING THESIS
RESEARCH TOPIC:

Transformation of Urban Planning Practices Using Geo-Spatial Technology in Managing Rapid Urbanization in Harare: Zimbabwe

Land use Survey 2

SAMPLE NUMBER……

BLOCK NO	Residential detached	Flats	Medical	Guest Houses	Shops	Restaurant	Office	Funeral palour	church	educational	Others (specify)	Block Classification

Declaration

I the undersigned student declare that I am going to use this information for academic purposes only. Thank you.

Name……Student Number 210043512.
D. Machakaire

APPENDIX 9: Calculating floor area factors using ArcGIS

FAF which is calculated by dividing the total floor area per stand by the plot size was calculated using ArcGIS in the following manner:

Step 1: Calculate the areas of individual plots in the block by opening the attribute table for the shape file for Block 19 , add field named area, and then click calculate geometry to get the areas for all the stands in block 19.

Step 2: Add the geo-referenced Google Earth satellite image and digitise the building features for the stands in Block 19. Calculate the areas for the digitised building features using same method as in step 1. The results were the multiplied by the number of floors per stand to give the total floor areas per building.

Step 3: The total floor areas were then divided by the areas of individual plots to come up with the existing floor area factors.

The results of the FAF calculations as tabulated in column 5 of the attribute table of Map 4.2 indicate that the FAFs on rows 1;2;3;4;7 and 11 are above the value 5 which is the FAF stipulated for zone 1A(i) in the local plan. These violations of the FAFs represent a non-compliance factor of six out of eleven stands in Block 19 which translate into 55% non-compliance. This method demonstrated the speed and the ease with compliance with FAFs can be calculated. The method is however susceptible to errors due when one assumes that all the floors on a storey building identical floor areas and use. The researcher tried to reduce this error by verifying the assumptions with some of the physical observations obtained from the manual land use survey.

APPENDIX 10: MAPS

Figure 4.13: Land use change maps for sample 1

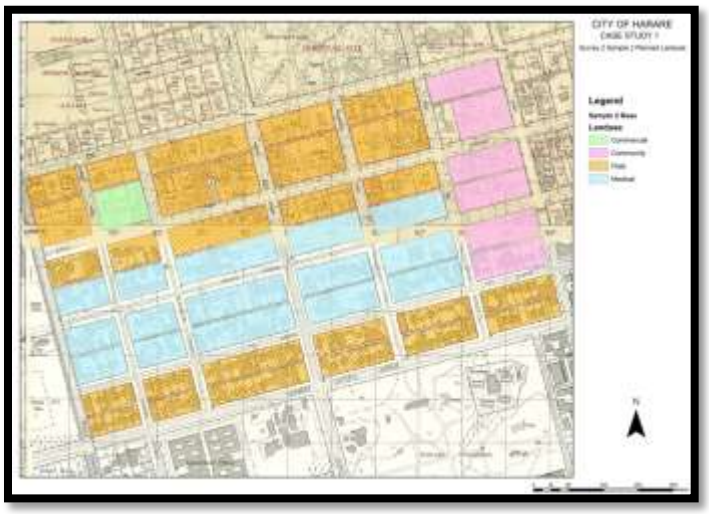
1. Zoned Land Use Map

2. Existing Land use map

3. Land use change map

Source: Author, 2014.

Figure 4.14: Land use change maps for sample 2



1. Land Use Survey 2 Sample 2 Zoning Map

2. Existing land use map for sample 2

Source: Author, 2014. **3. Land use change for sample 2**