Urban Sprawl and Escalation of Informal Settlements in Dodoma, Tanzania.

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TO THEM ALL I SAY; "THANKS

ABSTRACT

The rapid increase in number of urban poor has caused the invasion of public and private land by low income groups devoid of planning programs depriving them of secure tenure and basic physical and social infrastructure. The deployment of GIS has been used to facilitate this study.

The deployment of Geographically Weighted Regression (GWR) analysis was used in determining informal settlements intensification in the light of hypothesized factors.

The study revealed that the escalation of informal settlements in the area is caused by; high urban migration rate, too poor per capita income to meet expensive formal development conditions, political interference in implementation of plans, poor planning and monitoring technology and insufficient financing.

Having revealing the reasons for the intensification of informal settlements, the project will be helpful to the audience as it will impart them with the knowledge of the ways for addressing this problem found in the recommendations topic.

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LIST OF ABBREVIATIONS

CBD-Central business District

CBO-Community Based Organizations

CCD-Capital City District

CCM-Chama cha Mapinduzi

CDA-Capital Development Authority

DEM- Digital Elevation Model

DUWASA –Dodoma Urban Water and Sewerage Authority

NGO-Non Governmental Organizations

SFAP- Small Format Aerial Photography

SPOT- Satellite Pour l'Observation de la Terre

TANESCO-Tanzania Electricity Supply Company

URT-United Republic of Tanzania

INTRODUCTION

The rapid increase in number of urban poor has caused the invasion of public and private land by low income groups devoid of planning programs, depriving them of secure tenure and basic physical and social infrastructure. The deployment of GIS has been used to facilitate this study.

Land is an essential component in the urbanization process. According to the recommendation in World Population Report of 2004, the increasing population in the cities all over the world requires new areas for housing, schools, recreation land, religious buildings, and so on. Where suitable, affordable and secure sites are not available; these needs are met by informal or illegal means such as informal settlements. These are known as "informal" because they are built outside the legal planning framework. They are generally characterized by high population densities, limited or non-existent urban services, and low quality housing stock (Mosha, 1989).

The pace of urbanization is such that new attitudes and approaches to land development in urban areas are necessary in almost every country. The global proportion of urban population rose dramatically from 13% (220 million) in 1900, to 29% (732 million) in 1950, to 49% (3.2 billion) in 2005. The same report projected that the figure is likely to rise to 60% (4.9 billion) by 2030 (UNWUP, 2008).

In Africa, 40% of the population currently lives in urban areas. This figure is expected to reach 54% by 2030, meaning that the urban population of the continent would likely triple over the next 40 years, from a current 340

million to some 900 million people (UNCHS Habitat, 2009). A marked phenomenon of rapid urbanization in Africa has been the proliferation and uncontrolled spread of so-called "spontaneous" or "informal settlements".

Known as "informal" because they are built outside the legal planning framework. Informal settlements are generally characterized by high population densities, limited or non-existent urban services, and low quality housing stock. As they are often built on marginal or environmentally sensitive lands such as wetlands or steep hillsides, informal settlements can have deleterious environmental impacts such as increased soil erosion or pollution of water sources by human and solid waste (Bernstein et al., 1994).

As informal settlements began to proliferate in African cities, the initial reaction of most governments to in-migration and spontaneous settlements was relatively uniform; increased regulation and enforcement. Informal settlements were seen strictly as slums – places of poverty, disease, and criminality. They were an affront to the modernization (Payne, 1989).

Since the 1960s, the approach of dealing with the growth of informal settlements in Tanzania was the common approach of slum clearance. The objective of slum clearance was to rid the cities and towns of the eyesores of squatter housing. To improve housing, to the poor, the government implemented its slum clearance and redevelopment policy by developing high-standard buildings on the cleared sites. The policy was implemented through the National Housing Corporation but proved unsustainable. By the end of the 1960s, it was abandoned due to high

economic and social costs. The net addition to the housing stock was negligible (UNCHS, 1992).

In 1972 the government adopted a softer approach to dealing with squatters. Through until the late 1980s, **sites and services** and **squatter upgrading** projects formed the national strategy for managing the growth of informal settlements. The World Bank initially supported these projects, which aimed to provide basic infrastructure and services, together with community facilities.

1.1. Informal Settlements in Tanzanian Context

Informal settlements evolve pertinent to the "utility" value of the specific location they are found in. However, the concept of "utility" in occupying land informally would be rather fuzzy as most settlers give high value to a land with relatively low expulsion risk regardless of other alternatives available (de Bruijn, 1991). Notwithstanding the threat of eviction and other pressing challenges, informal settlements often expand, densify or intensify. In the informal housing stock, specifically in Dodoma, phase construction is common phenomenon as savings are the main source of funding (Kyessi, 1990).

In Tanzania, the inadequacy of shelter delivery system to cater for the urban population has led to an extensive development of informal settlements. Studies conducted by United Nations Human Habitat for Humanity in 1995 under the Urban and Housing Programme indicated that, nationally, about 70% of the urban population live in unplanned settlements and that about 60% of the urban housing stock are found in these settlements. A more alarming situation is the rate at which these settlements have been growing. For instance, the total number of houses in the unplanned areas of Dar es Salaam was about 50,000 housing units

in 1974. The current figure is estimated to be more than 200,000 housing units (UHIP, 2008) representing 70% of city's population.

Informal settlement upgrading by virtue of its nature, is not simply the responsibility of the ministry concerned with housing and its departments, but rather the multi-sectoral responsibility of a range of stakeholders or partners. These are supposed to work collectively to address the community's development priorities through a range of complementary social and physical development initiatives that address urban livelihoods, land tenure, co-operative governance, social inclusion and environmental security.

1.2. Urban Sprawl in Dodoma

Dodoma being a new capital city of Tanzania has been experiencing a remarkable increase in informal settlements. This is due to the fact that, among other reasons, the Government shift to Dodoma that automatically embraces the shift of the public officials and allied populace.

Urban sprawl in Dodoma in two main phases as stipulated by the Capital City Master Plan of 1976; in fist phase, the area within and surrounding the Central Business District (CBD) – an old town was renewed under the Urban Renewal Program and the peripheral areas were designed, surveyed and offered to various developers. In the second phase, an area far more outside the CBD, that is, more than fifteen kilometers was considered for development and here is where the development is currently being executed.

Figure 1: Phase one Master Plan for CCD

1.3. STATEMENT OF THE PROBLEM

The supply of plots to answer for backlog of growing housing requirement in Dodoma Capital City District has been very slow since its inception in 1973. Most capital city transfer exercises in other developing countries have been timely implemented with regards to the plan.

As from the second half of 1980s, squatter or informal settlement development in Dodoma was thought to be taking the lead as the main provider of new housing stock. A housing survey conducted in 1987 indicated that areas containing squatter development had the greatest proportion of new housing stock. For example, Chang'ombe area had 15% and Kikuyu squatter area had 45%; while in planned areas of Mlimwa West neighbourhood had 11.5% and Chinangali East neighbourhood had 10.8%. But squatting proliferated in the 2000s contrary to what was expected (Master Plan review, 1988). Squatting so far hits most the following areas; Medeli East, Nkuhungu, Kisasa, Kikuyu, Ostabei, Maili Mbili, Kizota and Mlima South neighbourhoods.

This study has being conducted in order to reveal root courses of the escalation of informal settlements in the due process of Dodoma urban sprawl.

In this respect, the institutional approaches for curbing informal settlements have been put in place in order to arrest this situation. This approach entails public participation, involvement of local authorities, government organizations and civil societies. These features were expected to contribute to public acceptance, develop awareness, enhance capacity building, and other essential elements of sustainability

to curb the prevailing wave of informal settlements proliferation and upgrading the already informally settled areas.

1.4. OBJECTIVE

The general objective of the study is to examine factors contributing to the impediment of formal urban sprawl following the increase of informal settlement in sampled Chang'ombe and Medeli East communities of the Dodoma Capital City District.

Specific Objectives:

The specific objectives for undertaking the research are to:-

a. Explore the nature of the systems and main actors that regulate land tenure in informal settlements.

b. Examine how land is accessed, delivery organized and type and methods of information collection in informal settlements.

c. Analyze the role of community organizations and public administrators perception in the settlements development spatially and tenure-wise.

d. To examine the technological impetus on the urban planning processes.

1.5. SIGNIFICANCE OF THE STUDY

The expected study findings have disclosed the problems encountered regarding the urban sprawl and the existing informal settlements volume in Dodoma. The knowledge will be used to improve the urban sprawl in controlling informal settlements. The study will also be noteworthy to other scholars and researchers for their in-depth knowledge acquisition on settlement issues, literature reviews and provision of opportunities for further researches.

2. LITERATURE REVIEW

2.1. Introduction

This Chapter intends has reviewed past findings, experiences and perceptions revealed by various researches on similar topic. The Chapter entails the definitions of key terms, theoretical and empirical.

Definition of Key Terms

- **Urban Sprawl:** is the rapid growth and spread of big cities where the consumption of land is faster than the population growth.

- **Informal Settlement:** Generally, informal settlement is a dwelling put up without authority of the owner of the land, usually without a formal design and without conforming to any specification as to laid down rules and regulations, planning standards, generally accepted methods of workmanship, construction and is more often than not temporary.

2.2 Theoretical Review

Since independence the Tanganyika Government inherited the colonial laws and policy on land, the new dispensation continued to vest land in the state as the ultimate landowner, without any significant modification (except the changes in the title of ultimate owner, or the radical titles, from the Governor to the President).

Some legal reforms were introduced in 1963 when Freehold Titles were converted to Government leaseholds. These leaseholds were also converted into rights of occupancy in 1969 and land rent and development conditions, similar to those pertaining to a right of

occupancy, were attached to all leases. The effect of these changes was to reduce interest in land from being perpetual to a definite period with a maximum term of 99 years (URT, 1963).

2.3.1 Urbanization in Africa: an Empirical Review

Rates of urbanization are high and sustained throughout this period. Zambian urban areas, for instance, grew at an average rate of 6.7% in the period 1950 through 1990, with the most rapid growth (8.8%) occurring from 1950 to 1970. In Kenya, the growth rate for the 1950s and 1960s was lower (6.9%), but that country's urbanization accelerated to 8% in the 1970s, a rate sustained throughout the next decade. West African nations also experienced a similar trend, with cities in the region growing at an average rate of 5.5% from 1950 to 1990 (HABITAT, 1996).

In many places, moreover, urbanization has been geographically uneven with capital cities absorbing the greatest share of urban growth. The capital city of Dakar in Senegal, for example, was home to 29% of the urban population in 1950; by 2000 the city encompassed 46.5% of all urban residents (United Nations Population Division, 2002). The source of growth is primarily in-migration from the surrounding countryside – as of 1997 an estimated 44% of Dakar's residents were in-migrants in the age range of 25 to 34 years (World Bank, 1997). Although capital cities have experienced the most dramatic growth, smaller secondary cities have also witnessed an influx of immigrants from rural areas in recent decades. Throughout the 1980s, for instance, smaller cities in Kenya grew at rates ranging from 5 to 9% per annum (Republic of Kenya, 1994: 9).

In the last thirty years, governments of the developing world with their partners in the donor community have implemented numerous projects

and programs aimed at upgrading low quality slum housing areas, known as informal settlements. Interest and activity in informal settlement upgrading by national level governments, local government units, and the donor community has waxed and waned over this period (Angel, 2002). In the 1970s and 1980s, the World Bank, the U.S. Agency for International Development, and to a lesser extent the area development banks supported numerous project-based upgrading initiatives that attempted to improve urban service delivery, enhance tenure security and facilitate the development of low-cost housing with appropriate standards. The World Bank, for instance, supported some 116 sites and service schemes with complementary upgrading initiatives in 55 countries (Pugh, 1994). Additional experimentation with and support for informal settlement upgrading continued throughout the 1990s with assistance from subsequent donors and the United Nations Center for Human Settlements (Habitat).

Continued growth of informal settlements and the intractable problem of housing and providing services for the urban poor have sparked renewed interest in upgrading. Depending upon the definition of "informal" used, an estimated forty to seventy-percent of urban dwellers in the developing world live in extra-legal settlements (Fernandes and Varley, 1998). Habitat estimates that approximately 1.3 billion people globally live in inadequate housing – housed mostly in slums and squatter settlements in developing countries (UNCHS, 2008).

2.3.2 Urbanization and Access to Urban Land in Tanzania

2.3.2.1   Trends in Urbanization

Tanzania has been experiencing a rapid rate of urbanization of up to 8% per annum. The urban population has increased from 5% in 1967 to about 13.2% in 1978. In 1988 the urban population was 18% and in 2002 the urban population was 23% (URT, 2002).

2.3.2.2   Access to Urban land: A decade into Uhuru

Land access in urban centers is operationalized by the plot allocation and titling system. Plot numbers given in the annual reports of the Survey Division for the 1959/60 –1970/71 years were recently assembled and charted as seen hereunder.
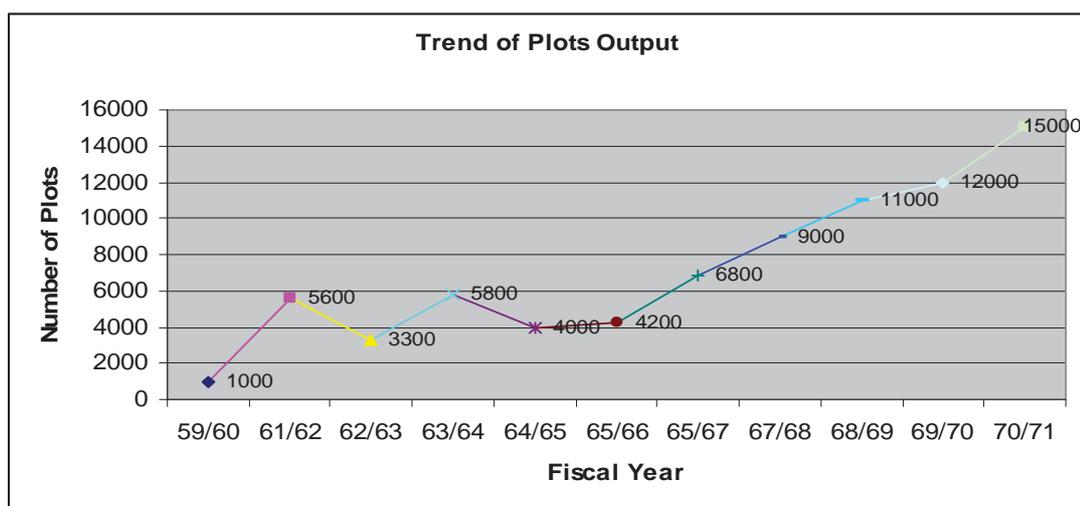

Figure 2: Trend of Output of Urban Plots in 1960s in Tanzania
Source: DILAPS, 2008

Figure 2 indicates the supply or outputs in planned and surveyed urban plots in Tanzania. The graph in the figure is seen to be rising with time from 1,000 plots in 1959 to 3,300 plots in 1963 and higher in subsequent years.

Assessment of the annual divisional reports shows that the country witnessed an exponential growth in plot production, from 12,000 plots in 1969 to 15,000 in 1971 when it reached a three-decade super mom. The figure of 15,000 urban plots output, attained in 1970/71, remained the highest output in nearly thirty years in spite of technological backwardness, inferior skills and lower capacity levels of that era.

2.3.3 Supply of Urban Plots under Decentralization Policy

The production of urban plots grew in late 1960s and early 1970s alongside demarcations of plots in Ujamaa villages, as can be seen in Figure below.
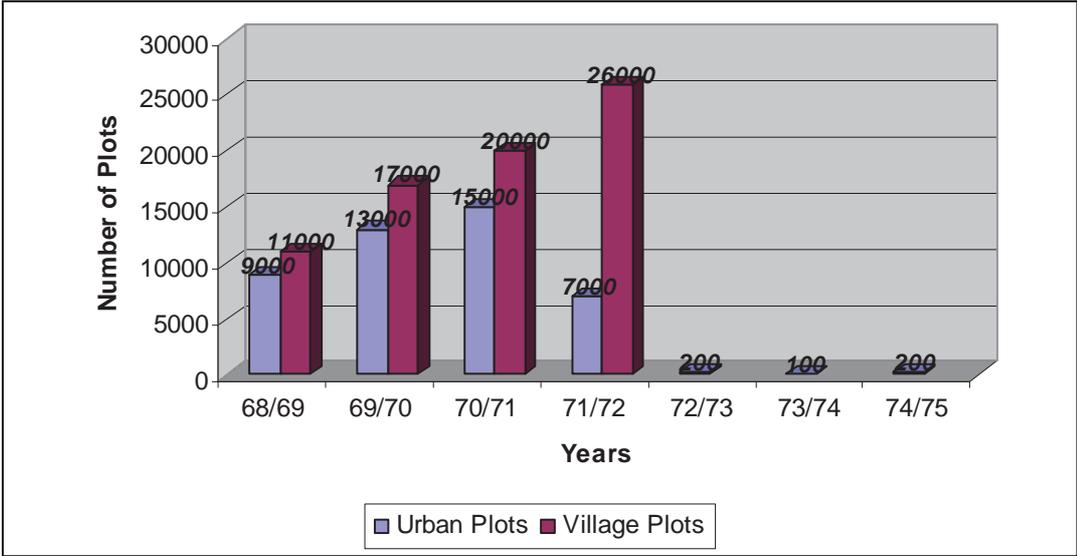
Figure 3: Growth in Urban and Village Plots (1968 onwards)
Source: DILAPS, 2008

However, the number of urban plots produced during the time decreased sharply, perhaps pointing to shifted emphasis in favour of more demarcations in Ujamaa villages and at the expense of urban plots. The production of urban plots nearly came to a halt starting 1972/73, with a national average annual output of 2,000 plots only for the over 100 towns of Tanzania.

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The gloomy scenario with urban plot production in the late 1970s continued into the 1980s as is provided in Figure 4. The figure reflects an average annual production of 4,480 plots equivalent with the 1965/66 output – about two decades earlier.

With the problem getting worse in townships, Government sought assistance from the World Bank assistance and embarked on the Sites and Services Schemes (SSS) as a remedy. But even these remedial programmes could not turn the tide under a policy that seriously affected budgeting (DILAPS, 2008).
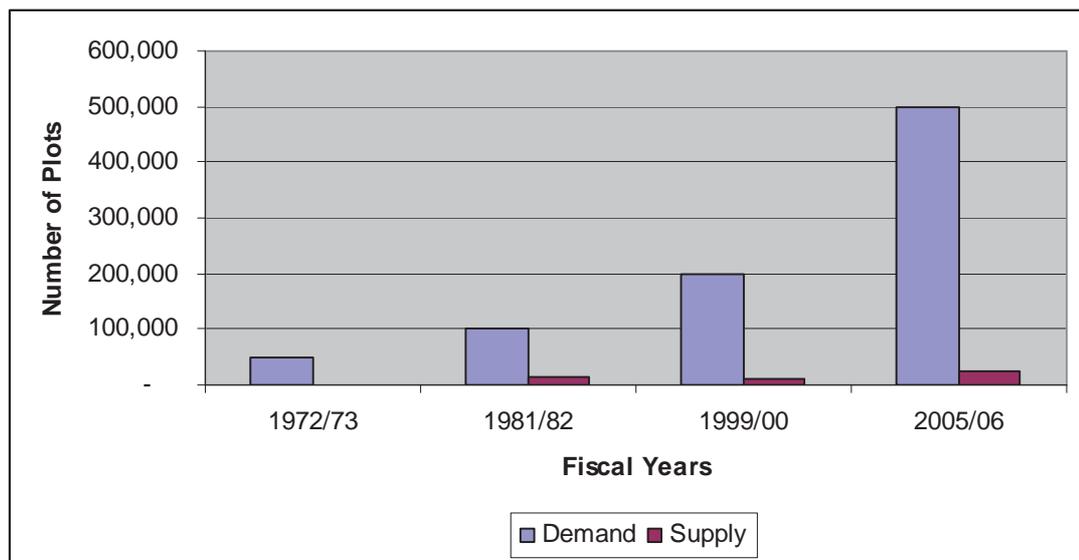
Figure 4: Supply and Accumulated Demand of Plots at Different Epochs Compared
Source: DILAPS, 2008

As history would have it the Ministry of Lands, Housing and Human Settlements and SMD in particular in recent years, would be forced to suspend most of its activities and its products would not be made available for physical planning and land delivery in towns for many years to come for lack of a development budget. Suspending other activities

meant adding insult to injury as production of urban plots had already stalled.

The problem of urbanization overwhelmed Government efforts at coping with the housing situation as early as mid 1970s and squatters started growing in most urban areas. Government's response was to initiating the squatter clearance programs and later squatter upgrading as a means of introducing services sites and services scheme (SSS) was also launched under financial assistance of the World Bank, and the National Housing Corporation (NHC) was established. These were seen as moves aimed at addressing land and housing availability for those living in squatters. Furthermore, the housing finance approach was also attempted by establishing the Tanzania Housing Bank (THB) to provide cheap loans to the low-income earners.

Urbanization continued unabated as life in the villages became harder with people seeking employment in the towns but with the supply of urban plots and housing remaining far below demand. Further Government efforts included the launching of the Growth Centre Policy was launched during the Second Five Year Development Plan (1970 to 1975) that included nine major urban centers. The aim was to reduce the pressure on towns and cities by setting up Growth Centers. In 1978, the government launched the policy by initiating the planning and survey of more residential plots in Tabata, Mbagala, Kinyerezi and Mbezi areas of Dar es Salaam City. There were no thorough studies on the demand for plots for particular land use in a given location. For example, industrial sites at Kitunda, also in Dar es Salaam, were never developed as was intended.

The literature on informal housing land development has grown considerably in the last decade. The research on the economic, social, and political forces that generate and sustain the formation of informal settlements is abundant. This includes work by Payne (1989), Arche (1992), Kombe (1995), Durand– Lasserve (1996), Habitat (1996), Kombe and Kreibich (2000), Cheema and Shabir (1993), and Zaghalonl (1994), among others.

In many Third World cities, the information available on informal urbanization remains inadequate. The deficit is about our understanding of the internal organization including institutional arrangements and the process of the informal self-regularization. There is also lack of consensus regarding the status of informal settlements, especially the nature of their legality or illegality. The often cloudy statutory nature of the settlements is further complicated by a muddled policy environment and an often lukewarm stance by most Third World governments (Kombe, 1995). The fact that the majority of settlers in informal housing belong to the economically and socially marginalized (poorer) groups as seen in previous sections seems to have worsened the reputation and increased the alienation of the informal housing subsystem (Baross and van der Linden, 1990).

Government responses have ranged from passing tough and stringent regulations to excluding informal settlements from infrastructure extension plans to barring their integration in urban or municipal services (Zaghalonl, 1994) to outright demolition. Although bias of public policy towards the formally planned and developed areas persists, hostile attitudes against informal settlements are gradually weakening. More governments are now shifting from hostility towards viewing informal

house builders as 'real builders and designer of large parts of cities" (Cheema and Shabir 1993). On the other hand, the difference in infrastructure provision which in the past distinguished formal from informal housing neighbourhoods is gradually giving way in the wake of the poor economic performance and the subsequent deficits of the public sector. A large section of formal housing in many Third World countries including Tanzania is already lacking basic institutional intrusion.

Irrespective of their status (legal or illegal) the following are common characteristics of most informal settlements (Angel, 1983):

o They are built by the inhabitants themselves and their proportion continues in spite of frequent eviction threats from public authorities. The houses are built with the intent of owner-occupation, renting or both.

o They are built, for the larger part, by low-income urban dwellers for whom the existing formal housing systems or markets are hardly realistic options.

o The houses are built primarily with informal financing methods, i.e. family savings, capital from inheritance, sales of inherited land or savings from informal credit associations.

o The builders employ local building materials, skills, designs and indigenous technology.

o Often builders do not adhere to formal/legal building codes and planning standards.

o The informally built houses exhibit high variations in types and quality of construction, ranging from traditional construction materials (e.g. mud and pole or thatch) to modern quality components (concrete blocks, corrugated iron, aluminium, zinc, or tin roofs).

o   They are built and serviced incrementally, ensuring flexibility on the part of builders and owners.

o   They can exhibit unique urban designs with significant variations in lay-outs and spatial arrangements.

o   Their densities are normally increasing rapidly up to a saturation or over-densification stage.

o   The land use patterns are highly mixed, including small industries and urban agriculture.

2.4 Factors Impeding Development Control in Tanzania

Development control measures which have been applied in Tanzania so far are well intended, and indeed reflect the seriousness and determination of the government in trying to solve land related urban problems. Among the explanations which have been put forward in this direction include those in the studies by Kimaryo (1983b, 1984), Hayuma (1984), Stren et al (1989), Mosha (1989), etc.

Lack of finance, skilled manpower, materials, equipment and other resources has been cited as the main cause of the failure by many public agencies involved in land development in meeting their development targets (Kimaryo, 1983b, 1984; Hayuma, 1984). This problem of resources has also been associated with the poor implementation of Master Plans and inability of most local authorities to enforce adopted control measures (Mosha, 1989).

 In addressing the question of resources (Stren et al 1989), point out that lack of resources for the implementation of Master Plans in particular has nothing to do with the national economic problems. Instead, the deliberate attitude of the government towards urban development especially after the Arusha Declaration, led to urban areas being practically ignored. The declaration which is the backbone of the socialist

policy in Tanzania, declared the primacy of rural development over urban development. The intentional neglect of urban areas is clearly illustrated in Table 1 which shows the percentages of the total national development budget allocated to urban areas over the years.

3.1 METHODOLOGY

This section details the methodology used to collect both primary and secondary data. It will briefly present the criteria that were used to select study settlements and the population sampling process. The model for spatial analysis will also be explained in this chapter.

The study Area

Located in the heartland of Tanzania, Dodoma is the nation's new official political capital and the seat of government in the country. Comparatively, much smaller and less developed than the country's commercial centre, Dar es Salaam, Dodoma remains a National Capital for Tanzania. Dodoma is surrounded by a rich agricultural area and pleasant scenery. Dodoma has many places and items of interest to recommend it to the passing visitor. The reasons given for picking Dodoma as the prospective Capital City for Tanzania were primarily economic benefits to the people in the central region, favorable climate, security centrality and unique natural landscape.
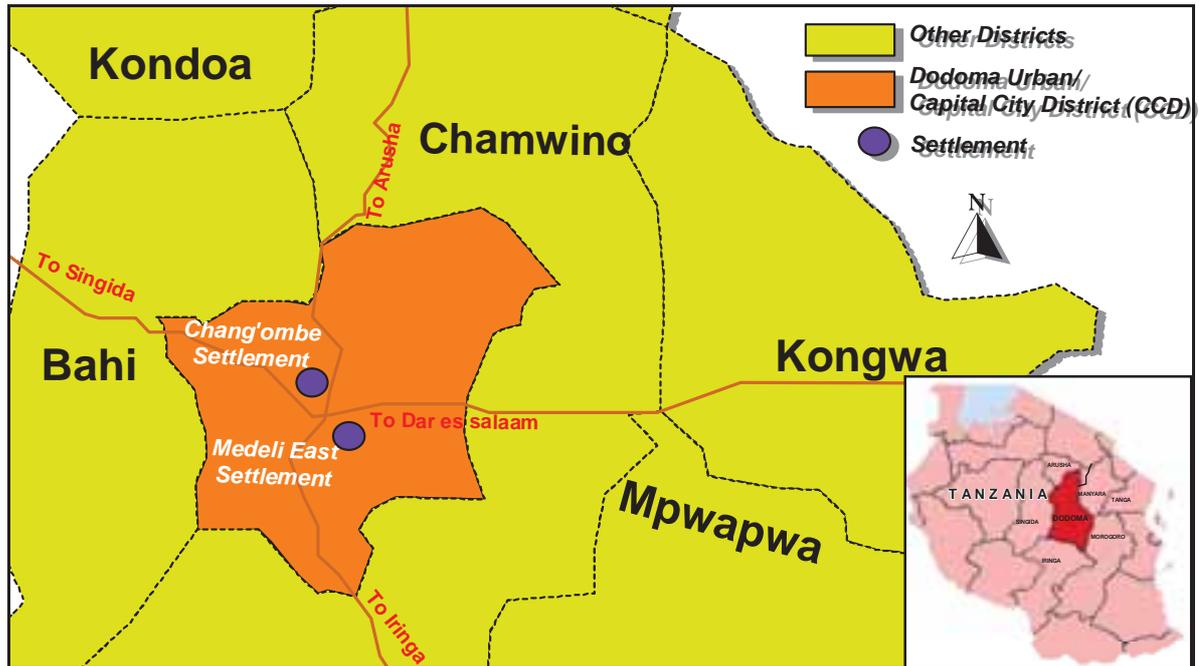
Figure 5: Districts layout of Dodoma Region showing the CCD and study areas. The insert is a map of Tanzania showing the location of Dodoma.
Source: URT Country report, 2008

Chang'ombe Settlement

Chang'ombe settlement is located in the Tanzanian Capital Dodoma alongside the road to Arusha. It accommodates about 38,500 inhabitants living in 5,234 houses and hence about 7.3 people per household. According to the 1976 Capital City Master Plan, the land on which this settlement has developed was part of the Capital City Afforestation (landscape) Plan. Before this area was designated a green belt in 1976, it was a smallholder agro-pastoralist village in the periphery of the town cultivating seasonal crops such as maize, beans and millet.

Following the incorporation of the village in the Capital City, the few indigenous landowners who were occupying the land were compensated for unexhausted development including their houses which consisted predominantly of temporary structures.

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Even though the Capital Development Authority (CDA) embarked on an extensive tree planting programme which included the area of Chang'ombe and even established a horticultural nursery along the southern boundary of the settlement, most indigenous settlers continued occupying the land. Many argued that they were dissatisfied with the amount of compensation paid and decided not to vacate the area.

Following the demolition of an unplanned neighbourhood in the central business area in the late 1970s, most evacuees migrated to Chang'ombe where they easily managed to access housing land and putting up houses of affordable low quality. Intensified land subdivision and influx of new settlers from the central area and other parts of Dodoma to Chang'ombe started in the early 1980s. According to the elderly settlers, the main motivation for the indigenous landowners to subdivide and allocate land to the immigrants was to attract and marshal the support necessary to withstand the CDA eviction order.

Like in other informal settlements studied, 'social-recognition' of an individual's rights on land by other settlers, especially the adjoining landowners, local leaders and relatives or friends is the key factor guaranteeing security of tenure. This was enhanced by the security of tenure exercise which was initiated by CDA on behalf of the government. This was done by designing and applying land transfer agreement forms with attributes similar to the ones which were used elsewhere such as Kihonda in Morogoro town. Some forms even show the selling price and the mode and date of payment. Chang'ombe is, however, not divided into housing blocks. The plot area is, therefore,

often defined with reference to the adjoining land owners or to permanent land marks or dominant features in the area.
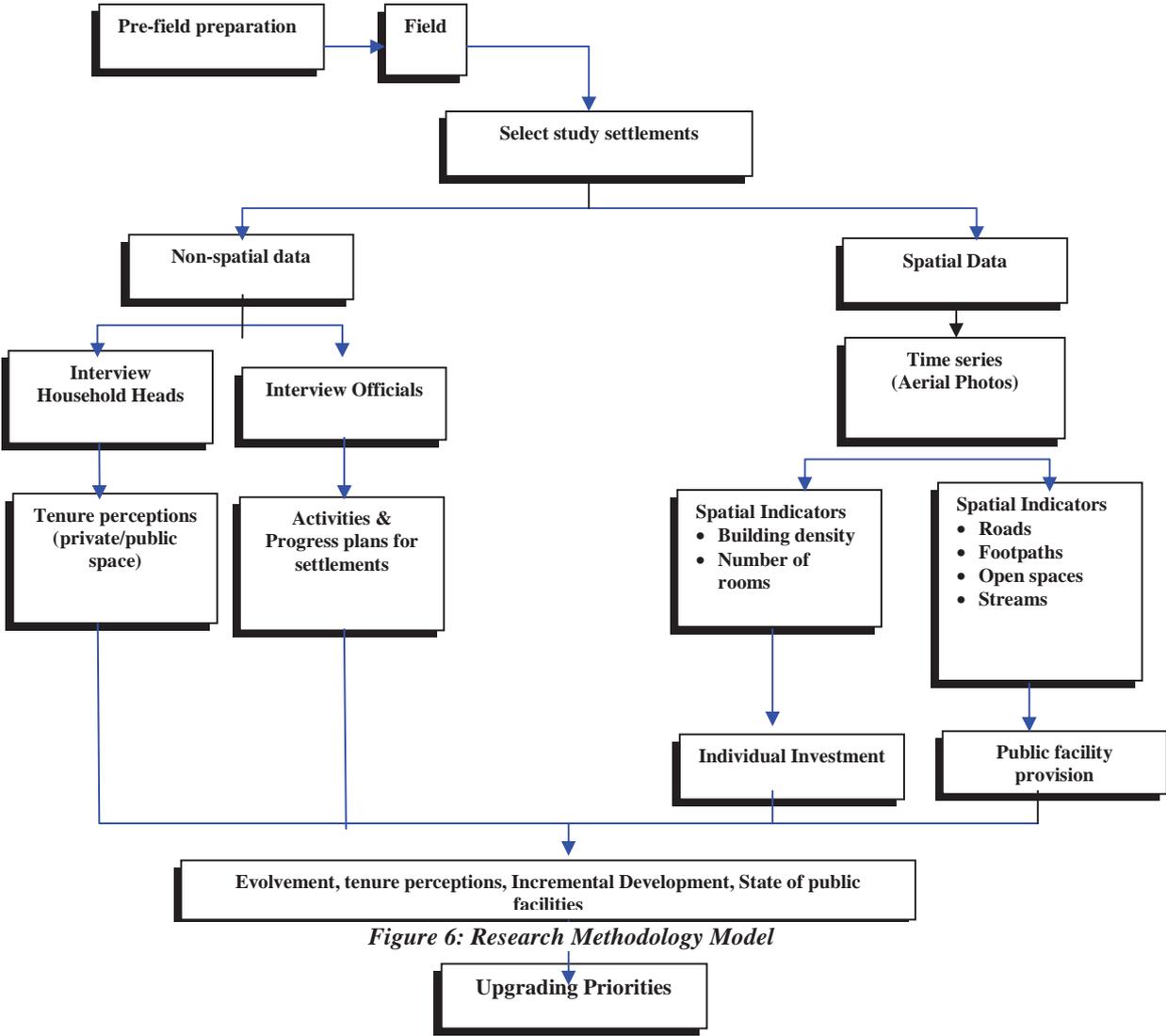
RESEARCH METHODOLOGY MODEL

Figure 6: Research Methodology Model

Source: Own Construction

This is the framework that guided the solicit of information that was relevant and used in the research. This involved the collection of both spatial and non-spatial data from the selected settlements. Non spatial data were collected through interviews which mainly focused on tenure

perception and progress plans. Both ended up in uncovering status of evolvement of settlements, tenure perception and pertaining public facility.

In a study carried out by the Institute of Resource Assessment of the University of Dar es Salaam in 1986 for Capital Development Authority, revealed that the most immigrants (75%), into the city, are persons moving from rural areas from within the region seeking employment for improvement of livelihood. In that case, most immigrants moving into Dodoma are still struggling to improve their socio-economic lot and are not financially secure.

Medeli East Settlement

Medeli East settlement is located alongside the road to Dar es salaam. It accommodates about 2,500 households living in sub standard houses. According to the 1976 Capital City Master Plan, the land on which this settlement is developed was allotted for the diplomatic reasons. This involved the plots for embassies and consulates. Following the incorporation of the urban village in the Capital City, the few indigenous land owners who were occupying land were displaced for formal development reasons. But as the time went on, while on the process of facilitating the shift of the intended use to the area, and the slow pace emanating from various reasons, the area was encroached by the informal settlers.

The Research Strategy

The research strategy gives the insights in the choice of the research strategy (Lupala, 2002.) Research strategy is a logical sequence that connects the empirical data with hypotheses. It is the plan that guides

the whole process of collecting, analyzing and interpreting data for decision making. It is well referred to as the arrangement of conditions and organization of collection of relevant data, identification of sources of data and analysis techniques to fulfill the purpose of providing information which is sought to derive explanation to respond to the research questions (Kothari, 2004).

Choice of research strategy

There are five major research strategies in the social sciences research. These include; experiment, surveys, archival analysis, histories and case studies. The nature of research issue dictates the approach to be followed (Malele, 2004). The nature of this research requires investigation on how the urban sprawl trends relates to the growth of unplanned settlers.

Selection of Study Settlements

In selection of the study areas was made in the light of the availability time and other resources. This was done by outlining informal settlements available within the Capital City District with the emphasis on the ones closest to the urban center. These settlements were; Chang'ombe, Kikuyu, Mlimwa South, Nkuhungu West, Medeli East, Bwawani, Chinyoyo, Maili Mbili and Ostabei.

The two purposively selected settlements among many existing informal settlements within the CCD were Chang'ombe and Medeli East.

3.2 Research Design

In order to manipulate the variables portrayed in the conceptual framework, both primary and secondary data were collected.

Secondary data were solicited from various publications included maps, planning reports, journals, progressive reports and newsletters. The primary data were collected through, interviews, focus group discussion and observation.

The study was made in three stages namely; non-spatial data, spatial data and literature review. The first stage was the use of qualitative data to establish the informal settlers perceptions on tenure and utility provision and how these perceptions influence the development of the individual's house on the own plot. This was accomplished by the use of non-spatial data collected through interviews on households' heads, local leaders, utility providers, CBOs and government agents.

The second stage involved spatial data analysis using aerial photos of 1976, 2002 and 2007 to establish the spatial growth of the settlements overtime and the state of informal settlements. The third stage involved the use of secondary data in form of maps, physical plan reports, available relevant literature on informal settlements and other research data were used to complement the findings of stage one and two.

However, the design and process was guided by the model portrayed in Figure 8 by trying to uncover the emerged institutional conflicts in managing informal settlements through research problem and objectives formulation, preparation of proposal and ultimate report preparation.

3.3 Sources of data

Most of spatial data were accessed from CDA data archive. The original available data are produced with different methods across significant years liable for interpretation.

Land cover vector map of Chang'ombe and Medeli were produced based on aerial photographs with scales of 1:2,500 and 1:5,000. The land cover map, focusing on CCD, is derived from SPOT and SFAP taken in the same year. The SPAF is colour, 35mm, high oblique taken at 500-800m. The land cover map is also available extracted from orthophoto, though it is not mentioned explicitly in the metadata.

Shape files were made available for population for years 1976, 2002 and 2010. The 2010 census results could be joined with sub-wards to create homogeneous distribution.

DEM, 20mX20m cell size, processed from topographical data and topographical map was available. Roads treated as exogenous variables derived from 1976, 2002 and 2010 topographical maps and detailed plans.

3.4 Data Collection Methods

In this study, six data collection methods were employed namely; documentary review, interviews, observation, focus group discussion, maps review and aerial photo reviews.

The research questions were answered through the collection of both secondary and primary data. Primary data was solicited using semi-structured interview with close-ended questions to the household, *Mtaa* leaders and different officials.

3.5 Sampling

The actual interviews were made to 250 heads of households in each settlement. The time available and the mapping that was later deployed in the analysis stage determined the size of the settlement and the

number of the interviewees. The sampling points from the entire settlement were selected through stratified followed by random sampling. The stratified sampling was employed in selecting the settlements followed by random sampling so as to determine the number of households. The strata which were considered were the locations of the settlements, within each strata random sampling was employed in soliciting the respondents. Other units of enquiry such as *Mtaa* leaders, engineers, planners, land officers and community development officers were determined purposively.

Spatial Data

The development of the settlement overtime was analyzed from aerial photographs of 1976, 2002, and 2007 for the selected settlements.
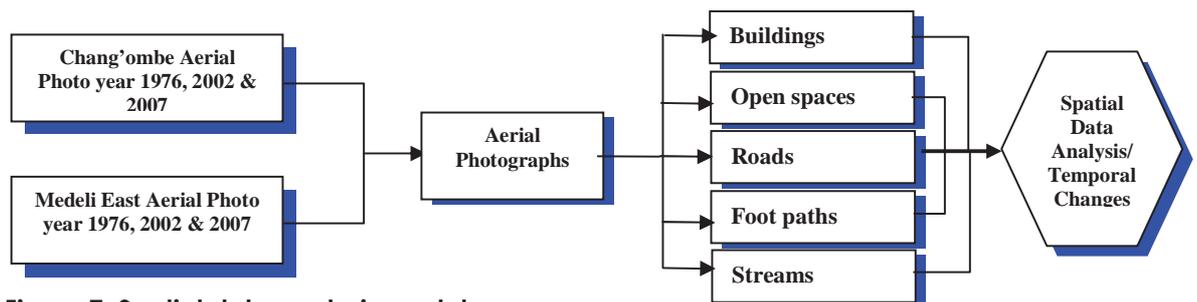
Figure 7: Spatial data analysis model

The indicators considered for the perception of tenure included the increase in the number of informal development over time. Incremental developments were determined by the size of the house, quality, improvements done at specific periods and any additional investments in formal rental units.

3.6 Data Analysis and Presentation

One of the main objectives in spatial analysis is to identify the nature of relationships that exist between variables. Typically this is undertaken by calculating statistics or estimating parameters with observations taken

from different spatial units across a study area. The resulting statistics or parameter estimates are assumed to be constant across space although this might be a very questionable assumption to make in many circumstances. It is found reasonable to assume that there might be intrinsic differences in relationships over space or that there might be some problem with the specification of the model from which the relationships are being measured and which manifests itself.

The most common statistical modeling technique used in the social sciences is that of regression. In standard applications of regression, a dependent variable is linked to a set of independent variables with one of the main outputs of regression being the estimation of a parameter that links each independent variable to the dependent variable.

In this research, Geographically Weighted Regression was deployed to allow the modeling of processes that vary over space which resulted into a set of local parameter estimates for each relationship which were mapped to produce a parameter surface across the study region. A dependent variable in this case, 'informal settlements' is linked to a set of independent variables stipulated in the hypotheses sub-topic being the estimation of a parameter that links each independent variable to the dependent variable.

Three reasons to suspect that relationships would vary over space are as follows; firstly, there will inevitably be spatial variations in observed relationships caused by random sampling variations, secondly, the relationships might be intrinsically different across space for example; there are spatial variations in people's attitudes or preferences or there are different administrative, political or other contextual issues that

produce different responses to the same stimuli over space, and thirdly, the model from which the relationships are measured in a gross misspecification of reality and that one or more relevant variables are either omitted from the model or are represented by an incorrect functional form.

Identifying probable causes of informal settlements

The probable causes of informal settlement growth in the study areas were subjected to preliminary assessment. The assessment based on literature review and opinions from key informants[1].

Modeling using GIS and logistic regression technique

Anthology of likely causes of informal settlement

A list of causes for informal settlements identified from literature review and provided by key informants are grouped according to their nature which falls in sight specific characteristics, proximity extent, and neighbourhoods characteristics Dubovyk, 2010; Huang, et al., 2009).

Input data for logistic regression known as factor maps were prepared for years 1976, 2002 and 2010 in ArcGIS environment. These data represent independent variables which can be dichotomous or continuous while the output is informal settlement growth as a dependent multinomial variable.

The dependent variables are represented by binary maps for informal settlements expansion; and by categorical map for densification. Both dependent and independent data are represented in a raster format,

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[1] A key informant is an individual knowledgeable about informal settlements in Dodoma

20mx20m cell size that is determined by the required spatial resolution in the light of the available data, such as, slope, etc (Hu & Lo, 2007).

3.7 Site Characteristics

Population

The data on populations were available in hexagon cell of 5.4ha. size with attributed population data of year 2002 and 2010 population census which are to be joined with sub-ward boundaries of settlements at 2010. While the former data is spatially explicit to 5.4 ha resolution in built up areas (planned and informal), the latter is only an aggregate population figure at sub-ward level. The population data available at sub-ward level were updated by subjecting it to GWR with different weigh factors assigned for different land uses. These weights are considered as Dodoma housed 35% of its population in informal settlements at or around 2010. Accordingly, land uses; informal settlements, planned residential, commercial, residential-commercial, institutional and industrial were given weights considering what they reportedly share. For instance, the share of settlement population of the total population at the 2012 census (URT, 2010). The same way, it is assumed the commercial 5%, institutional 10%, residential 60%, open space 15% and circulation10% and thus reducing a share from informal and planned residential population proportions. Assuming the same administrative sub-boundary existed in year 2002, the population is found to be using 2.4% annual growth rate between years 2002 and 2010 according to census report (URT, 2010) was distributed to sub-wards with assumption that each sub-ward experienced identical population growth of 3% a figure calculated considering 2.45 annual average population growth between 2002 and 2010 (URT, 2010). After each sub-ward has been assigned its estimated population, GWR has been

conducted with weight factors of the population that informal settlements hosted at that time. Similar procedure has been followed to produce grid population of the area.

Year	Informal Settl.	Planned residential	Commercial	Institutional	GWR_r^2	GWR_r^2 (adjusted)
1976	0.45	0.52	0.1	0.05		
2002	0.55	0.65	0.1	0.05		
2010	0.55	0.63	0.1	0.05		

Neighbourhood characteristics

Proportion of CCD land, proportion of informal settlements and proportion of undeveloped land around the study areas (a cell of 20mx20m) is calculated using 21 cell(420m) circular neigbourhood (Dubovyk, 2010). Input data a provided in a raster format. The raster data are either dichotomous (0 or 1) or continuous type. The continuous data has been normalized to a range of (0,1), by minimum-maximum linear transformation of the input raster, as it requires multivariate statistical analysis all continous variables should have the same scale (Cheng & Masser, 2003; Huang, et al, 2010; Nefeslioglu, et al, 2008).

Logistic regression model of Informal Settlement in CCD

This section brings to mind the dependent and independent variables of informal settlements including modeling results for increase of informal settlements and ultimate interpretation. This is used to identify the key causes of the urban dynamics involved in the change of spatial pattern. As an empirical estimation method, it has been used widely to model the relationship between land use changes and the causes based on the historic data. This was used to identify the influence of independent

variables and also to provide a degree of confidence about their contribution (Hu & Lo, 2007).

The statistical model for logistic regression is expressed by:-

$$P(Y) = \frac{1}{1+e^{-(b_o+b_1x_{1i}b_2x_{2i}+...+b_nx_{ni})}}$$

Probable areas of informal settlements expansion patterns were mapped by extrapolating past trends of informal settlements. Areas (cells) with high probability to host informal settlements were allocated to accommodate the study area at the specific year in the future.

Dependent Variables

There are two dependent variables deployed to explain informal settlements growth. There are of two categories, the presence of informal settlements denoted by '$_1$' and absence of informal settlements denoted by '$_0$' to cater for binary logistic regression.

Independent variables

A number of probable causes of the growth of informal settlements have been incorporated in the model based on its perceived impact from the review of literature, key informants opinions and available data at disposal.

Type of factor	Variable	Description	Nature of variable
Dependent	Z (Expansion)	1-Informal settl. 2-No informal settl.	Dichotomous
Independent			
Site specific characteristics	X_1	Population density (people/km^2)	Continuous
Neighbourhood characteristics	X_2	Proportion of informal settl. In surrounding area	Continuous

4.1 ANALYSIS AND DISCUSSION OF FINDINGS

Introduction

This chapter presents the findings of the research conducted in Chang'ombe and Medeli East settlements. So long as similar data was collected from both settlements, the data analysis was identical. The non-spatial data analysis shows how land is accessed and gradually developed, tenure security with necessary infrastructure being connected to the households. The spatial data analysis presents the escalation of buildings for residential purposes over time, spaces available for public purposes and subsequent developments.

The Chapter is subdivided into four sections reflecting the following subtopics; the nature of the system with subsequent main actors, land accessibility and delivery mechanism including relevant settlement information management, the managerial aspect of informal settlements relative to basic services and the role of community organizations and public administration perception.

Nature of the systems and main actors that regulate land tenure in informal settlements

CDA's Settlement Regularization schemes

CDA has undertaken a number of informal settlement regularization schemes including those of two settlements in the study. The Chang'ombe scheme spanned past the Greenbelt one of land uses stipulated in CCD Master Plan. Trees for green belt were planted by the CDA's Department of Horticulture and Conservation, now the Department of Environment Management in an orderly pattern which

was carefully conserved but of late invaded by indigenous informal landowners.

After the regularization exercise, CDA directed and guided land allottees homebuilders not to uproot the trees. It was also reported that in order to ensure that no trees were affected during the construction of houses, adjoining home owners often assisted newcomers to site their houses so as to ensure compliance with the set-backs which were generally respected by their predecessors as road reserves.

The pattern of access roads which emerged from this self-imposed planning norm followed the existing rows of trees. It provided the initial spatial structure for the settlement and the housing lay-out during regularization under the Outreach and Community Facilitation Division in the Department of Planning.

The number of houses in Chang'ombe had increased from merely 12 houses with less than 100 inhabitants in 1980 to 751 units accommodating more than 9,000 inhabitants by 1988. However, in 2004, during the regularization survey, the houses rose to 1,200. Starting from the mid 1980s, the community leaders, particularly the Ten Cell (TCLS) and ruling party (CCM) leaders, had joined the landowners in monitoring and assisting home builders to adhere to the linear pattern and avoid uprooting of the trees.

In order to ensure an orderly development, the community leaders used sisal ropes and bush poles to measure, demarcate and site houses. The main motivation for maintaining an orderly arrangement of houses and avoiding displacement of the trees which had been planted by the CDA

was to try to appease the CDA. The spirit of co-operation that evolved among the local leaders and residents to guide land development and maintain a united front against the CDA eviction pressures continued until 1986/87 when the central and regional governments intervened so as to ease the tension between the CDA and the Chang'ombe residents.

Following the government decision to declare Chang'ombe settlers lawful occupants, the role of the local leaders in guiding the siting of houses and monitoring land development suddenly came to and end. The legalisation of ownership thus marked the beginning of 'unguided' housing land development. The demise of the institutions and grass-root actors which had played active roles in laying-out the houses in an orderly pattern is depicted by the sporadic nature of the housing clusters which ensued the government intervention. The DMC response after the regularization included the development of markets, schools, cemetery and related services in the subsequent areas designated by CDA regularization scheme. Therefore, the main actors that regulate land tenure in informal settlements are responsible government organizations and local leadership. The most powerful actor is the government organizations due to statutory powers they have

Land accessibility, delivery mechanism and type and methods of information collection in informal settlements.

Land accessibility and Evolution of Unplanned settlements
The government through the Ministry of Lands, Housing and Human Settlements Development owns all land in Tanzania. It is the government that decides who owns what, size, purpose, where and how that

particular land is developed (Tanzania Land Policy, 1999). In its decision on how to allocate land to different individuals, companies, organizations and institutions, the government has agents such as planners, land officers and surveyors. Allocations therefore ought to be systematic by planning prior to any development. This in-turn gives two categories of ownership; private land registered to individuals and public land solely under government.

The government is supposed to ensure that urban dwellers are located and housed in decent serviced houses. This is normally done through organizations or agencies mandated to plan, survey and allocate land for housing purposes as well as creating conducive environment to individual housing developments. In Dodoma, unlike other towns and cities, the government has delegated the land planning and allocation responsibilities to the CDA.

CDA however, over the years has not been able to supply plots to all residents and especially the low-income groups. Its inability is so much that 52% of the population is housed outside the formal areas. This situation has brought about the occupation of unplanned and subserviced land (CDA, 2008).

As seen in earlier chapters, Dodoma town has been growing past the neigbourhoods of the existing traditional villages. These villages are headed by traditional leaders with headmen in every cluster of settlement relying on their customs on land distribution. This customary way of leadership has been conflicting with statutory government land management for so long; a live case is that of Medeli East settlement. This settlement area has been statutorily planned and allocated to

various individuals and organizations by the government through its agency, the CDA, but the traditional ruler's off springs do not recognize the contemporary management by insisting on the customary/freehold ownership.

Settlements attraction

This research established that, the people moving into unplanned settlements are mostly immigrants from other places including rural areas. For example, out of 25 respondents in Chang'ombe 16% had migrated from the rural areas and other places due to a number of factors. When asked what attracted the respondents to Chang'ombe settlement, 40% indicated proximity to work place as the reason with, 24% considered availability of affordable land, 4% for water, electricity, security, good roads and health facility each and 16% availability of schools (see Figure 10). In Medeli East, contrast to Chang'ombe, 24% considered the availability of affordable land while 22% considered proximity to work place followed by 14% for security, 12% water, 10% schools, 8% good roads, 6% health facilities and 4% electricity. In Medeli East, it is the opposite of Chang'ombe and could be explained by the fact that there is still more land for sale in Medeli East than Chang'ombe.
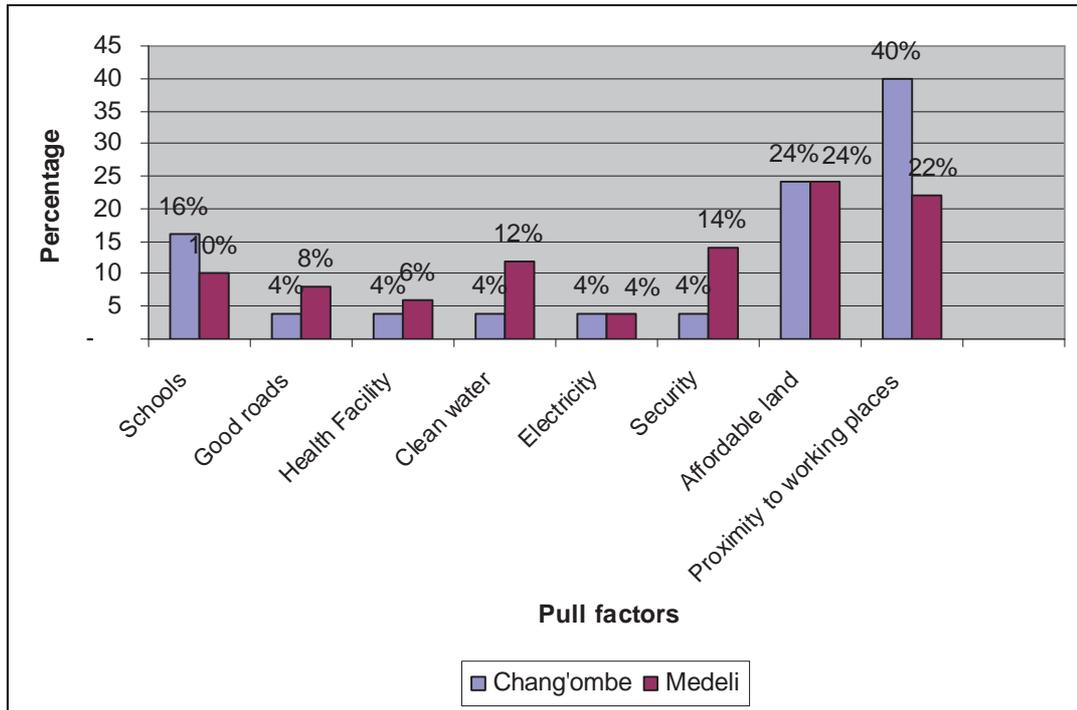
Pull factors

Figure 8: Factors Considered in Settlement Choice
Source: Field data, Figure 9: Property Occupancy Status
Source: Field data, January 2013.

The Property Occupancy

Percentage wise in occupancy status between the two settlements of study, Chang'ombe has 36% of tenants while the remaining 64% are real owners of the houses. On the other hand, Medeli East is 48% of occupants were tenants while 52% were owners. This implies that the majority of houses in Medeli East are tenancy-occupied compared to Chang'ombe as invaders are business oriented as the study revealed as Figure 11 portrays.
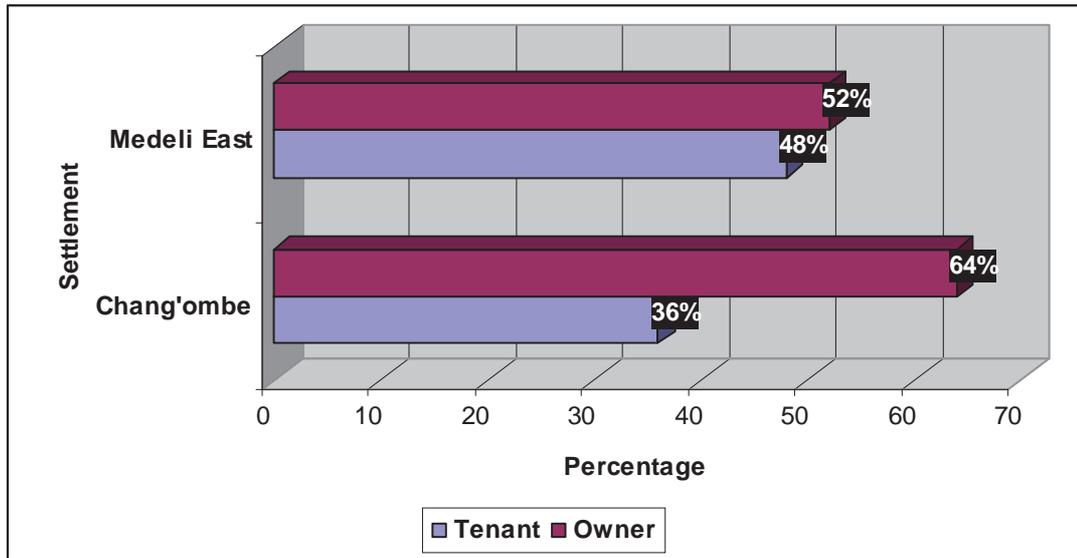
Figure 10: Property Occupancy Status
Source: Field data, January 2013.

Access to Land for Housing in Unplanned Settlements

The accessibility to land in the study settlements was through the following means as shown in Figure 12; 25% of respondents in Chang'ombe got land through local leaders, 43.75% bought from individuals who owned land while 31.25% inherited from relatives.

Chang'ombe is older than Medeli East. The number of respondents that got land from the local leaders is lower than that of buyers indicating the decrease of available land for free allocations. The settlement has a high number of second and third generations as reflected by the percentage of those who have inherited land (Figure 12).

In Medeli East, 15% of respondents got lands through ordinary local leaders' allocations, 40% bought from other land owners, 20% inherited while 25% bought land at market value from the local leader (Figure 12). Land buying from individuals is common in Medeli East. Unlike Chang'ombe, some respondents have bought from the local leader

against the tradition of free allocation. This could be an indication of erosion of the customary norms and creeping in of corruption with the increase of land value. During the interviews with heads of households. It is evident that local leaders had played a significant role in selling public land that was supposed to be under CDA for development of schools, market, hospital, police post, etc.
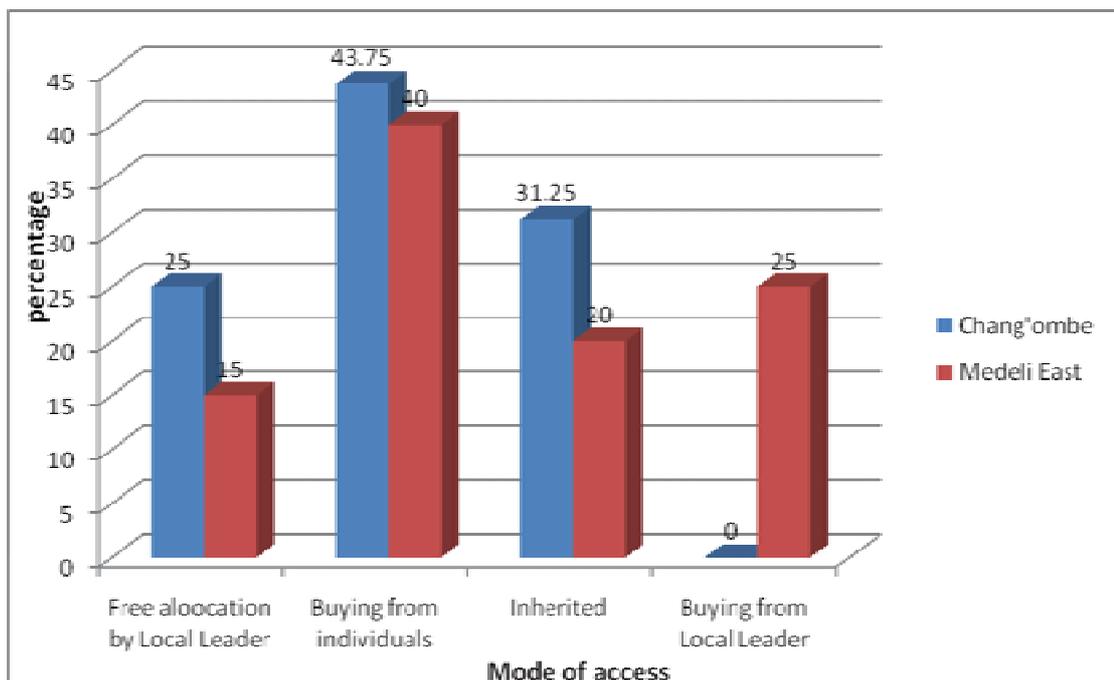
Figure 11: Percentage of respondents by mode of access to land for housing
Source: Field data, January 2013.

On their part, the local leaders argue that, "the growth of the town and demand for land for housing has led to commercialization of land in Medeli East with children of the first residents sub-dividing land and selling it to improve their houses. Local leaders from both settlements indicated that they now witness more land sales, and there is no more land to be allocated. They however pointed out that the majority of occupants are buyers than the original allottees. Figure 8 shows the means of getting

land in both Chang'ombe and Medeli East presented as percentage of the total respondents in each settlement.

4.1.1 Interest on Land for Housing

From the research findings it was clear that most people go to the settlements with the intention to own land for development. Table 4 shows the percentage and number of the respondents who are owners of their dwelling against those respondents who are tenants. Few respondents indicated the wish of ever moving out of the settlements. The tenants are therefore living in the hope of consolidating their resources to buy land and build own homes. A settlement like Medeli East, which is still more spacious, may attract those willing to buy for own housing.

Table 1: Interest on Land

Occupancy status	Chang'ombe Settlement		Medeli East Settlement	
	No. of respondents	% of respondents	No. of respondents	% of respondents
Owner	16	64	20	80
Tenant	9	36	5	20
Total	**25**	**100**	**25**	**100**

Source: Field data, September 2013

After regularization buyers came in and put up some of the best residential houses and commercial enterprises. Medeli East viewed from the main road resembles any medium and high density formal area due to the quality of developments. The roads among other infrastructural services also led to an increase in land prices and to more land sub-divisions.

4.1.2 Status of land at acquisition

Further insight on how people acquire land and how the settlements have continued to grow is provided by information collected on the

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status of land at acquisition. Of the respondents who own their houses, 62.5 % of Chang'ombe respondents and 80% of Medeli East got their land as vacant plots given to them by local leadership. A number of those who acquired land and developments reported having demolished the old structures they bought to put up new and better houses.

All respondents in both settlements have had a land relationship with the local leader. This is during the allocation period or when buying the land. Though in Chang'ombe, developments from 1995, when multiparty politics came into being had been reported to political party officials, it is optional. Local leaders have to record all developments in the settlement register for only they hold the right to burial sites (Chome, 2002). Figure 13 shows how informal settlements evolve from existing settlements with the local leader allocating land or monitoring new developments through sales or inheritance that ensures security of ownership to new home developers.
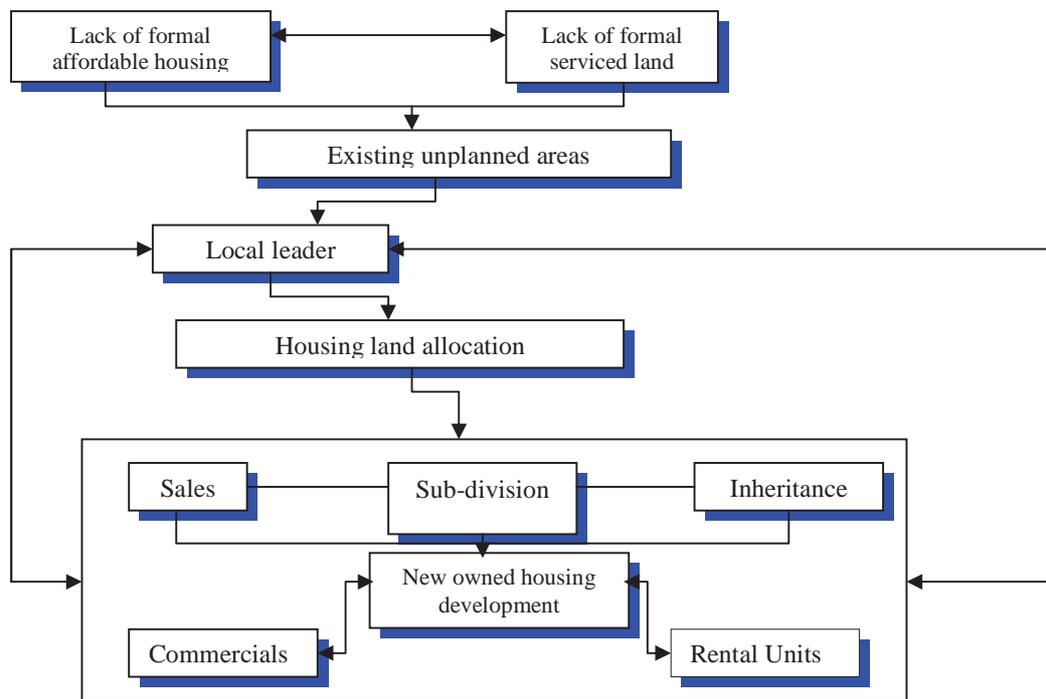
Figure 12: Evolution of Informal Settlement and Relationship that Exists
Source: Own Construction

4.1.3 Perceptions of tenure security

Respondents in the two settlements did not express insecurity in the form of ownership they have on land. The reasons they cite for the confidence is the procedures they followed when acquiring land. The village head awareness and one's neighbours are sufficient proof of ownership. They simply could not imagine any government removing them from the settlements nor did they indicate ever wishing the development authority controlling them.

In a later interview with the physical planner, it was reported that officials of CDA are received with either open hostility or suspicion. Residents are not interested in official intervention in land ownership and development.

The lower number of people reporting development to the local leaders in Chang'ombe does not mean that the local leader did not know the respondents as property holders. Having gone through the local leader to acquire land respondents saw no reason to further report developments. On the other hand, Medeli East shows a higher number of local leaders' involvement because of the vibrant land sales.

When questioned on intentions to ever move out of the current settlements the results were as shown on Figure 11 and 12. Some 79% of the respondents in Medeli East indicated no intentions of moving out. The 21% who were uncertain said their stay in Medeli East depended on their jobs. Investments in permanent homes were given as an indicator of die wish to remain in the settlement. In Chang'ombe, 3% of the respondents were certain to move while 23% were uncertain with 74% declaring Chang'ombe their permanent home.
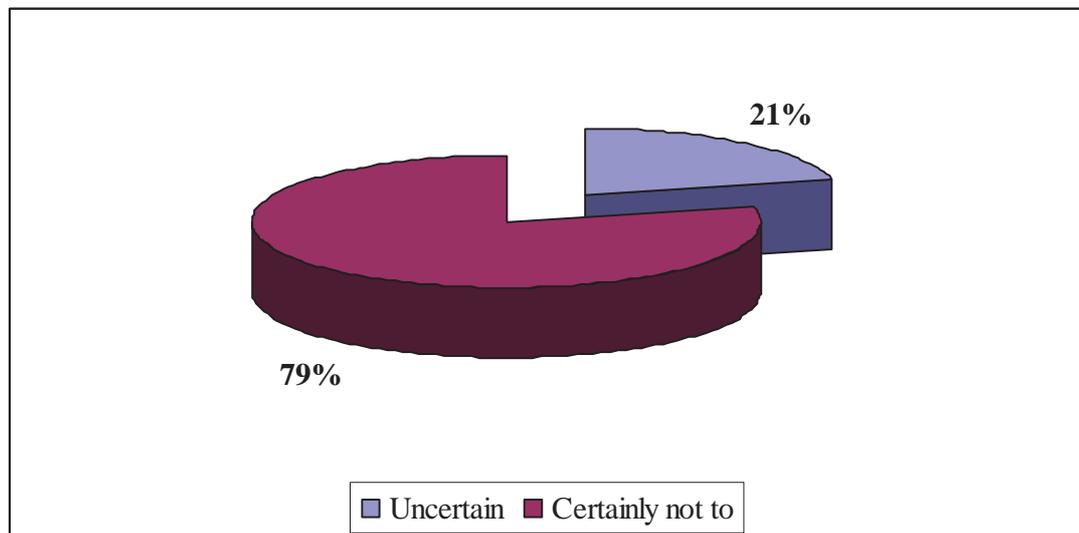

Figure 13: Chang'ombe households' Intensions
Source: Field data, January 2013.
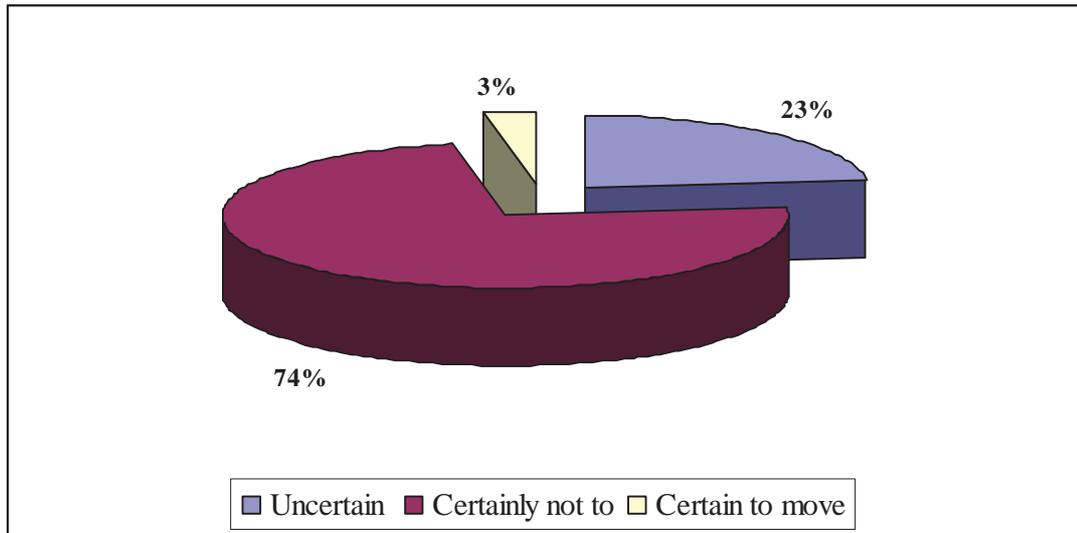
Figure 14: Medeli East households' Intensions
Source: Field data, January 2013.

Most settlers in the two settlements were of the opinion that titling is a luxury of the rich and not a concern of the majority of residents. Chome (2002) reports that though residents in informal settlements do not feel insecure without formal titles, those who have invested a lot often seemed to want additional formal tenure security through titling. None of the local leaders indicated having residents neither questions the non-existence of titles nor do people discuss how to get titles. According to the local leaders the properties are owned in a bidding manner and the government should spend money on provision of basic services rather than in a titling programme.

4.2   The managerial aspect of informal settlements development in the light of the availability of basic service and tenure.

4.2.1 Incremental development

This research found out that household development is a continuous exercise. In most cases, a dwelling house is put up and inhabited sometimes unfinished. Building materials could be semi-permanent but

later improvements that include getting connected to basic infrastructure such as water and electricity are done. This is supported by findings elsewhere (Angel, 1983) that if poor people are left on their own with their own resources, without any threat of eviction, they improve their dwellings overtime. Photograph 1 and 2 show houses that are occupied while improvement and extension are done gradually. Table 5 indicates the physical and socio-economic characteristics for Medeli East and Chang'ombe respondents.

Photograph 1: A Chang'ombe woman preparing to modernize her traditional dwelling in response to upgrading exercise.
Field data, January 2013

4.2.2 Improvements on the physical housing structure

From Table 5, it seems that most houses have their roofs done by iron sheets from the very beginning. This could be so because in an urban set-up thatching grass may be difficult to get. However, there are still houses that were thatch roofed but later got iron shed roofs. Those without have the owners intending to do so in future.

Table 2: Physical and socio-economic characteristics for Medeli East and Chang'ombe

Item	Number of respondents per aspect	Chang'ombe	Medeli East
1	Male household heads	15	22
2	Female household heads	10	3
3	Household owner occupiers	16	20
4	Household tenants	9	5
5	Income above Tshs 100,000/=	3	15
6	Income below Tshs 100,000/=	22	9
7	Formal employment	14	13
8	Informal employment	4	4
9	Self-employment	5	6
10	Temporary employment	2	2
11	Corrugated roof	25	23
12	Grass roof	0	2
13	Burnt bricks wall	7	10
14	Unbumt bricks wall	18	15
15	Cement floor	20	20
16	Earth floor	5	5
18	Own tap water connection	3	9
20	Pit latrines	25	23

Source: Field data January, 2013.

The material for permanent house construction in Tanzania is cement and burned bricks for construction of walls and corrugated iron sheets for roofing. A building with unburnt bricks that later gets its walls plastered is also considered to be a permanent (Chilowa, 2000). In the two settlements, a large number of houses are made of unburnt bricks, which explains the big number of respondents intending to improve the houses especially walling in the future.

The research found out that 76% and 80% of the houses in Medeli East and Chang'ombe, respectively have cemented floors. Improving the floor of the houses was also mentioned as one of the intentions by a number of those whose floors were not yet cemented as indica

Table 3: House Improvements and intentions

House Characteristics	No. of houses improved in last 10 years		Houses intended for improvement next 10 years	
	Chang'ombe	Medeli East	Chang'ombe	Medeli East
Roof	3	1	2	1
Wall	2	2	y	6
Floor	4	3	9	5
Additional rooms	3	4	16	9
Electricity connection	6	2	11	4
Water connection	5	1	11	2
Telephone connection	1	0	2	0
Toilets.	2	1	2	1

Source: Field data January, 2013.

By having a look at the data on roof, walls and floor, the settlements can be said to be more permanent than one would expect where the poor reside. Viewed from the main Dodoma-Dar es Salaam trunk road, Medeli East does not look like the conventional picture of informal settlement besides having buildings of different sizes, type, finishing and varying in connection to infrastructure. It is all "on site" incremental development like the local leaders previously said, older residents sell their land to improve their houses while new ones start by small houses that are extended with time.

4.2.3 Connection to basic infrastructure

In the last 10 years, a number of households have had electricity and water connection. In the next 10 years, a large number of them intend to have water and electricity especially in Medeli East as Table 6 shows.

The assumption has always been that basic infrastructure like water and electricity may not be in the informal settlement due to existing policy by central Government of no such utilities delivery before planning.

However, water and electricity were found in a number of households. Out of 25 interviewed, 12 used electricity for lighting in Medeli East with 48% of the sample population while in Chang'ombe was 28%.

What came out of the interview with Tanzania Electricity Supply Company (TANESCO) was that electricity is supplied to all residents no matter where they are as long as they can afford it. TANESCO is not obliged to follow existing policies of non-supply to unplanned areas possibly because they feel those policies are outdated. Most of their potential clients are increasingly in the unplanned settlements. Besides, the composition of the residents in unplanned settlements is such that some of the senior government officers and citizens reside there and cannot be denied of services. Furthermore, the residents use political influence to push their requests when denied as reported by TANESCO official in Dodoma.

Photograph 2: One of the Chang'ombe dweller in preparation for modifying the house following regularization exercise.
Field Data January, 2013

Photograph 3 shows a mixture of house quality in the settlements. Section of Chang'ombe in Photograph 3 shows electricity lines in the background and modern houses next to poor traditional ones while in Medeli East modern houses that will later be connected with electricity and water are being put up.

Photograph 3: Modest house being erected in Medeli East in response to the upgrading exercise

Field Data January, 2013

Development control officers from CDA Planning Department however, do not view this kind of development favourably. An officer interviewed sees this as a violation of building standards where to him security of the households is compromised in case of a fire while informality is being encouraged,

The Dodoma Urban Water and Sewerage Supply Authority (DUWASA) operates on the basis of the level of income of its clients. Like TANESCO, DUWASA supplies water on the basis of affordability. But to make sure that they reach all their clients in the unplanned settlements and considering different levels of income, they apply a group 'pooling' policy. In this policy, DUWASA takes water to strategic points in the settlements. Besides, those who can afford private direct lines to their compounds are encouraged to do so.

The field interviews show a wide disparity in the improvements done on water supply and the intended ones between Medeli East and Chang'ombe. In Medeli East, of the 25 interviewed household, 5 had water connected in the last 10 years, 11 expect to connect water in future; while in Chang'ombe only 1 had water connected and 2 intend to do so. These differences are well shown in Table 3 and 4.

In these two settlements developments towards one dwelling unit is continuous and it extends to commercialization of housing by building rental units. Thus, we have tenants and landlords all who have various common needs besides housing. These are the basic social facilities that can hardly be availed by an individual. They include education, health, sewerage, waste collection, security, and access roads among others.

4.2.4   Public Space perceptions

The informal settlements are being developed and improved overtime. However, living standards are still poor especially viewed at a higher level than the household. It is in the availability and development of the most basic public facilities that this poverty is more prominent. Every settlement requires motorable roads, schools, health centers, security

through law enforcement, trading centers, play grounds, worship places, burial spaces among others. Basic social services and facilities supplement and compliment individual household's efforts.

Table 4: Perceptions of Public spaces/Facilities

Type of facility	Medeli East Settlement			Chang'ombe Settlement		
	Fair state	Poor state	Total	Fair state	Poor state	Total
Public School	3	22	25	12	13	25
Public hospitals	0	25	25	5	20	25
Cemetery	25	0	25	25	0	25
Roads (motorable)	2	23	25	4	21	25
Markets	0	25	25	25	0	25
Religious places	25	0	25	25	0	25
Public play grounds	0	25	25	0	25	25
Public water points	8	17	25	25	0	25

Source: *Field data, January, 2013.*

Respondents in the settlements were quick in declaring public spaces as important or very important. In Medeli East 16 out of 25 people find public spaces very important while 9 say they are important. Perception on public spaces being very important in Chang'ombe was by 7 and important by l8 respondents, Medeli East local leader reported hospital as the place where life in the settlements is taken care of while schools are the future of the settlement. The respondents were requested to give a general view on the condition of facilities, the availability or the quality of service in Public Space. Table 7 summarizes the results of the interview with households on public facilities. Religious places and cemetery were satisfying but the problem was in the availability and state of hospitals, schools market, roads and play grounds.

4.2.5 Health facilities

From Table 7the difference in public facilities investments comes out clearly for the two settlements. In Medeli East there is no single public hospital. The nearest treatment is about 3 kilometres away. In Chang'ombe, most respondents have low opinion of public health because of the congestion and shortage of drugs (reported in the field). Lack of small health facilities within the settlement, rather than a central hospital that caters for all the informal settlements was reported as a problem to health.

4.2.6 Public schools

The state of public schools was reported as poor due to congestion in all the primary schools. The shortage is in both settlements and it is for under kindergarten, primary, secondary and technical institutions. Students in primary schools learn sitting on the floor and using their laps to place writing material. This was observed in both Medeli East and Chang'ombe in the course of the interviews.

This is so even though there is a public space big enough for developing both primary and secondary streams. Instead, very little development has been done over the years and some are selling the land. In Chang'ombe, students go to class in shifts (reported by respondents).

4.2.7 Public Markets

Both settlements have a public market. Chang'ombe market is bigger and well constructed with sheds though there are plans to relocate the market soon while in Medeli East every respondent was negative about the state of the market. They remarked that there are small genges around that are scattered with no sheds. A number of businesses are

done outside the market on the roadsides extending into the school compound even when the learning is on session.

4.2.8 Roads of access

The state of the roads was reported as poor in the two settlements despite the regularization exercise. This is more with the access roads in the settlements. The CDA that is in charge of roads maintenance was of the opinion that under the given circumstances of wide spread of informal settlements it has been doing its best. Grading and other services are given on an annual schedule that should cover all the areas in the settlement. Respondents maintained that they are not graded as required and only during top government officials visits and campaigns of which service under constrained resources and political pressure. Chang'ombe respondents complained of buildings on the road.

4.2.9 Waste management

The interview revealed several ways of managing household waste and the minimal role the DMC plays. In Medeli East the council has one solid waste skip at the market stalls, which no household reported to have used. Most residents in Medeli East use random disposal as indicated in Figure 16, the same as that of Chang'ombe which shows a number of the respondents burn their solid waste as others dump in the rivers and by roadside with slight number with garbage pits.

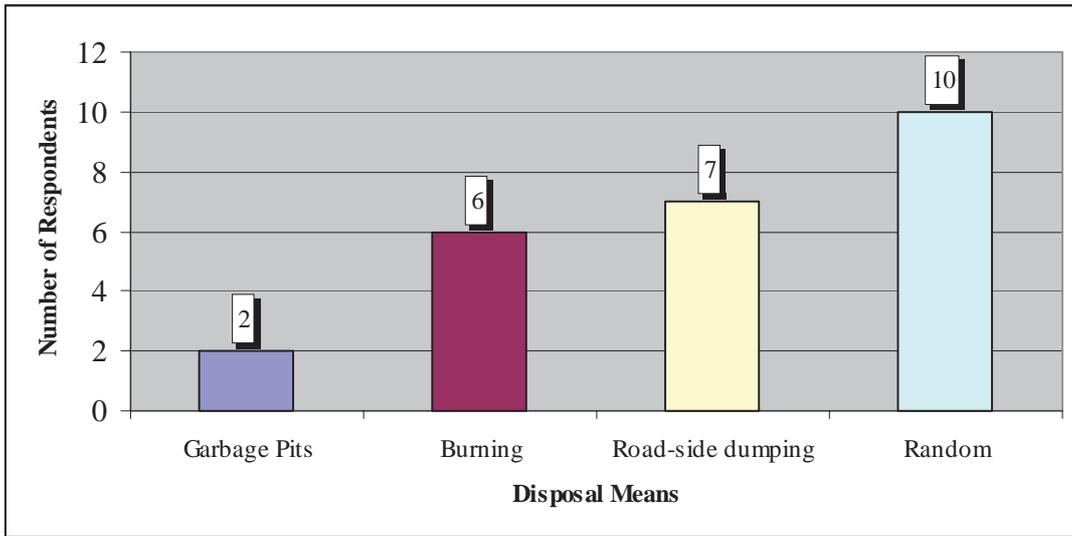**Figure 15: Medeli East Solid waste Disposal means**
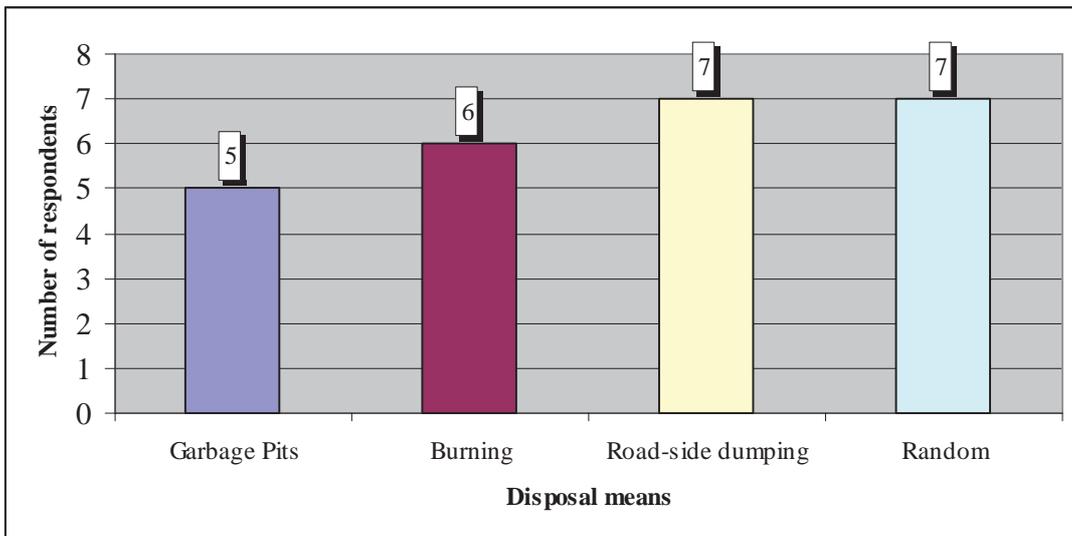*Source: Field data, January, 2013.*

Figure 16: Chang'ombe Disposal Solid Waste means
Source: Field data, January, 2013.

Chang'ombe residents on the other hand, have been disposing haphazardly and by the roadside as shown in Photograph 4. The use of garbage pits burning are however practices which are more conducive. While residents have tried to

manage household waste the DMC has failed them at settlement level by not emptying the skips giving rise to heaps of waste by the roadside.

The community officer in the DMC office reported the annual occurrence of cholera in Chang'ombe even though water supply is no longer seen as the main problem. Lack of waste management at settlement level where all residents use pit latrines and where flooding occurs frequently was mentioned as the reason why the fight against cholera is low by both residents of Chang'ombe and Medeli East have no sewerage connections.

Photograph 4: The roadside dump cleared following the regularization exercise
Source: Field data, January, 2013.

Residents perceived shortage of open spaces and under development as settlement problems that need to be addressed by public or local authorities. Open spaces tenure security was perceived as insecured for future settlements needs. The respondents were requested to indicate their development priorities

if something were to be done at community level. Figure 18 below show the respondent's priorities choice in the two settlements.

In Medeli East, most respondents would prefer to have a hospital first as there is none at the present. They would wish the DMC to consolidate the current mini-markets into one big market and to construct well-roofed stands for traders. The improvement of schools came third.

In Chang'ombe most respondents would wish to have the health facility improved by having smaller clinics set in the settlement. Development by expansion of the current schools and setting up of new ones was indicated as a second priority while grading and maintenance of roads came third.

The availability of Open spaces and the type of development done was further indicated through spatial temporal analysis of the settlements under study.
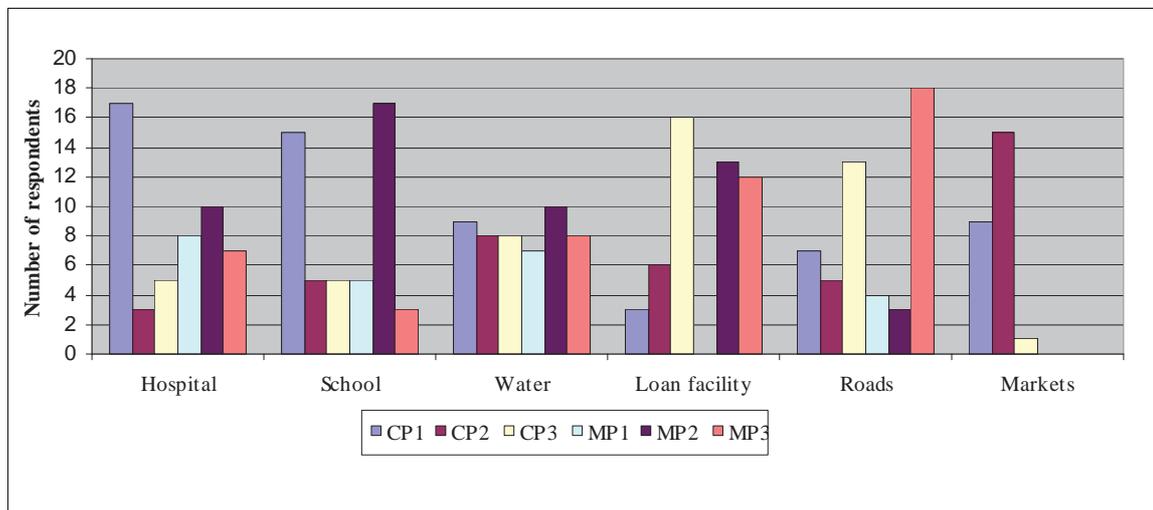

Figure 17: Development Priorities in the Settlements
(NB: CP & **CM** stands for **Priority for** *Chang'ombe* and **Priority for Medeli East** respectively**)**
Source: Field data, January, 2013.

4.2.10 Spatial temporal changes in the settlement

The spatial growth and pattern both at household and settlement level were viewed from a macro level by use of aerial photographs as described in Chapter Three. The increase in number of buildings for residential use was noted and the negative and positive changes that have taken place on existing open spaces. Spatial changes are supported by household interviews and information from settlement leaders.

The two-time series analysis done for Chang'ombe revealed that by 2002 the settlement was densely populated as shown in Photograph 5. In an area where over 3,000 households are, the development of Public Space is shown to be very minimal with only one public primary school and the rest of the services being found in the neighbouring sections of the settlement. Chang'ombe has public land reserved for institutional purpose but due to under development and lack of protection residential houses and commercial buildings are slowly being put up.

Photograph 5: Buildings in Chang'ombe in 2002
Source: CCD aerial photograph, January, 2013.

Table 5: Building Intensification in Chang'ombe

Year	Total no. of buildings	Residential buildings	Commercial buildings	School buildings	Church buildings
2002	4000	3950	35	7	8
2007	5637	5585	36	11	5

Source: Planning report, CDA-2007

Chang'ombe population has continued to increase as indicated by the increase in number of buildings captured from aerial Photograph for 2002. Of the total structures 5,585 are residential yet the school buildings have not increased substantially nor have other basic services been put up on the Public Space available. Table 8 shows a break down of the developments as analysed for year 2002 and 2007 while Photograph 6 shows the spatial pattern for 2002.

The increase in population has led to congestion in Chang'ombe and although infill through sub-divisions and construction of rental facilities may have contributed, residents claimed there are numerous buildings on road reserves. Analysis for years 2002 and 2007 indicate that although developments on institutional public land has not been explosive with 52 residential structures in 2002 to 70 in 2007, constructions on road reserve is on the increase.

Photograph 6: One of the demolished houses to give room for Circulation in Chang'ombe
Source: Field data, January, 2013.

By 2002, 52 structures were on road reserve but by 2007, there were over 70 structures on road reserve resulting to closure of some road segments as shown on Map 3. The protection of open spaces is the responsibility of the local citizens. In Chang'ombe, the people blamed the erosion of authority by various political regimes as the contributor to the illegal developments now coming up more so with the introduction multi party system in 1995 where authority on who was in

charge of what was not clear. Some respondents in this settlement claimed to have reported development to the political party head.

Medeli East had for so long remained a sparsely populated settlement until the trunk Dodoma-Dar es Salaam tarmac road was constructed. According to the village head, Medeli East was mainly bush with gullies that discouraged development. This was a sight for diplomatic plots. The passing of the road nearby the place however, changed everything at around the time the town was growing tremendously. Many people came in after 1987 when the road was officially opened. Between 1987 and 1990, residential buildings increased by about 60%, which could be credited to the opening of the tarmac road. The increase has continued as indicated by Table 9.

Photograph 7: Buildings in Medeli in 2002
Source: CCD aerial photograph, 2002.

Table 9: Informal dwellings trend in Medeli East

Year	Total no. of buildings	Residential	Commercial buildings	School buildings	religious	Residential on Public Space
2002	954	933	8	9	1	38
2003	1562	1532	12	9	1	60
2004	2259	2226	16	10	4	123

Source: Planning report, CDA-2004

CDA officials admitted to have not enforced development control in the area. The leaders while claiming that the allocations were by predecessor, however, they said the government is to blame for not releasing timely enough resources for developing the land for the purpose it was for.

In 1987, 38 structures were residential. Medeli East is one of the settlements that were acquired by the government and set aside for development without prior compensation to the locals who never moved out. The 38 dwellings may have been for the original resident. The 1990 aerial photo showed an increase to 60 residential structures while that of 1998 gives 123 structures. The increase of residential buildings by 1998 is supported by the claim made by residents on sale of public land by the local leader.

Descriptive and spatial analysis done in the previous sections have identified several main variables. The variables explain evolvement, development of informal settlements and land tenure security perceptions. These variables include means of acquiring land, interest on land, settlement attraction and incremental informal development perceptions. The conclusions made have not

been compared to results that could arise from further statistical analysis in a detailed manner.

Bi-variate analysis was applied to test some of the variables relationships. For example, a correlation between *means of acquiring land* and *status of land during acquisition* period had a strong positive relationship of r = 0.599 in Chang'ombe. This relationship is not there in Medeli East. In the two settlements, means of acquiring land, though weak, correlates positively with income (r = 0.281 for Chang'ombe and 0.201 for Medeli East). This may explain the number of respondents that reported having acquired land by buying from individuals.

Tenure security in Medeli East was found to have a strong positive relationship (r = 0.622) with reasons for moving into a settlement from previous resident, in the same settlement development control had a moderate positive relationship with tenure security (r = .421). This could explain the role of the local leader in development control, land transactions and allocations. However, these same variables had no significant relationship in Chang'ombe.

Further trial in inferential statistics did not yield satisfying results. Assumptions based on descriptive analysis may be misleading but it requires a research methodology designed for wide statistical analysis to make inferential relationships and further data explanations.

Besides having the household views on *tenure security* and *growth of Informal Settlements*, government officials and utility providers had their own perceptions that may reflect on the development of that has taken place in the informal settlements.

4.3 The role of community organizations and public administrators' perception in the settlements development spatially and tenure-wise.

4.3.1 Institutional perception of Informal Settlements
4.3.1.1 Capital Development Authority

This research was fortunate to interview a senior officer from the Department of Planning in the Capital Development Authority. The conclusion made from the interview is that central government still views Informal Settlements as undesirable developments. The Authority being in charge of building control was reported as not doing much. The office was of the opinion that political interference makes officers work in fear and policy implementation difficulty.

The solution to informal settlement is seen in having to re-locate some of the settlements outside the town. In some cases, planning and titling could be done. Central government would wish the Authority to control the supply of services in oncoming new settlements to reduce their spread. The utility providers were reported as working against development control policies by supplying the settlements with utilities. All the development and protection in them should start from the lowest level of local governance which is closest to the people. This may include *Mtaa* Executive Officers, Ward executive Officers, etc.

The mandate to plan and control development in the city is on Capital development Authority. The Authority's officers from Planning Department reported remarkable involvement in the informal settlements. This was blamed on the dual responsibilities where the Authority controls allocations in the formal areas while traditional leaders control customary lands which are recognized by the Land Policy section 5 and the Village Land Policy Section 5 of 1999. Until informal settlements are planned they are not officially in the Authority's records of development control. There is no clear way of dealing with the spread of

informal settlements in terms of policy besides that legal tenure and service provision may be implemented. Nevertheless, the Authority embarked on regularization exercises for both settlements during different periods of time.

4.3.1.2 Utility providers

The utility providers concern themselves with services to all on the basis of individuals' affordability. They view the Capital Development Authority and central government as organizations, which have failed to plan the city and yet keep on applying retrogressive regulations. Though they do attend Authority's planning meetings, they only seek authority for development on new projects and not on individual connections. For example, where lack of planning would have hindered lying down of water pipes due to lack of access, the offices advise applicants to acquire right of way from neighbours with local leaders having to endorse agreements.

The TANESCO prefers people to group together to cut down on the costs of installation.

Normally, the office does not refer to the Authority or any other organization while providing services in the informal settlements. The office views Informal Settlements as places where majority of their clients reside. To utility such providers informal settlements are there to stay and the only way is to give the services that would make living in them comfortable. None of the officers interviewed saw regularization as a solution. They however would wish pre-planning was done in the settlements before development. The advice is to have the Authority plan all other vacant land and protect unauthorized growth.

4.3.1.3   Community Organizations in the settlements

In areas where people have to get together to pull resources for development, community groups are normally established. However, this research did not encounter any community group in the settlements of study. For example, in Medeli East none of the respondents had ever been involved in any community group. The reasons were given as lack of awareness, poor leadership in the known groups, residents' lack of cooperation and the financial involvements in the groups. Though in Chang'ombe 2 of the respondents had been involved in community work, it was for pay by World Vision. The residents were non-committal on the usefulness of groups and the areas local leaders did not emphasize on them.

The community officer from the DMC associated low establishment of groups to individualism nature of the residents, the culture of provision by the government and the wish not to be involved in any financial committing activity. This could be the cause of low development of community facilities like schools and hospitals.

In the proceeding discussions it has become evident that informal settlements have grown side by side with the formal residential areas. In time, they have become the housing areas for the majority of residents of Dodoma who include all categories if income earners. This is due to the shortage of housing from the formal sector and lack of planned land in the market. As of the year 2000, CDA reported a backlog of many plots. Traditional ways of accessing land have given a sense of tenure security that has led to gradual incremental development. Public utilities have continued to tap the clientele in these areas and hence, the problem is not really lack of services that can be sold out at household level but lack of funds. This reflected by the incremental development witnessed in the study areas.

The research has followed an exploratory approach from a historical perspective of informal settlements growth. This is because informal settlement have grown and spread over time taking into account events and different circumstances of Dodoma. Ways of controlling informality also have a time span that follows a historical trend.

4.3.2 Informal Settlements

In Chapter Two Informal Settlements are described as residential areas where a group of housing units has been constructed on land to which the occupants have no legal claim, or which they occupy illegally; and/or unplanned settlements and areas where housing is not in compliance with current planning and building regulations.

They therefore have no legal tenure security, do not always adhere to planning and development control, the housing condition is poor and they lack basic services and infrastructure. While this is true in many regards, recent studies have disapproved some of these long standing views as will be brought out in this discussion.

Conventional ways of dealing with Informal Settlements have ranged from eviction, mass house developments, site and service schemes, planning and titling to present upgrading schemes. These methods have not reduced the growth of Informal Settlements in any significant form due to increased urbanization in Dodoma.

The phenomenon of urban growth rate was introduced to many developing countries during the colonial period. After independence these countries inherited the western models of city planning, development control and

registration (Payne, 2001). What is significant is that the colonial governments had been able to restrict "unnecessary" migrants to cities through coercion means. After independence there were flows of migrants to cities greater than the capacity to house and provide employment. To date, rural migrants still contribute the highest number of residents in the Informal Settlements.

Laws inherited during the colonial period defined land in urban areas as public, private or customary owned. Unauthorized settlements in the first two categories lead to informality in the context of law. But considering that the settlers do not displace anyone or any public project, and then the legal tools that justify public and private land and therefore define informality are not appropriate.

Medeli East is public land according to government officials through extension of city boundaries and land acquisition procedures. However locals were not re-located elsewhere as required by law.

Chang'ombe was previously a customary land before the advent of 20,000 hectares Green Belt in 1976. The settlement is however covered by the planning Act that demands development control. The traditional practices of managing land have continued in these settlements and were considered secure by residents while government officials still claim the land is informal. These traditional means are not considered as invasion of public and private land nor informal or insecure by the migrants in urban centers. They support the concept of perceived tenure security (Fourie, 1999) against formal tenure.

It would then be right to argue that from a historical perspective on how Dodoma urban developed, the adoption of western legal instruments of land use, development and registration led to the problem of informality as seen today. These instruments have been applied so rigidly that they have failed to appreciate the culture and traditions of the people they are supposed to manage land for, thus informality lies in the acts of the lawmaker (G.Baross et al,

1990). These legal instruments and procedures are however, the ones applied country-wide and globally by international organizations in the provision of housing, secure tenure and Informal Settlements upgrading.

Global campaigns

Housing programs, site and service schemes, titling programs and upgrading schemes are all introduced and wholly or partially supported by donor agents. The World Bank and UNCHS (Habitat) are the major supporters.

Habitat global campaign on "shelter for all" led to the initial formation of housing departments in the developing countries to address the housing problems. The required finances for house projects came mainly from World Bank. However some the projects were beyond sustainability as seen through Tanzania Housing Bank (THB) and had to be abandoned, if the standards and cost in housing projects were a hindrance, even the less demanding site and service schemes have not provided shelter to all because they are too expensive for the target group.

One would then imagine that the on-site upgrading would be easier to implement especially if services and infrastructures are all that is required. However, tied to housing, the donors have always put secure legal tenure as an important factor. Access to land and security of tenure as a condition for sustainable shelter and urban development is supported by donor countries (Habitat 11, 1996). The access to housing through security of tenure is favored by the World Bank under its current shift from specific project funding in the developing world to institutional reform where broader issues of accountability, transparency, revenue generation and good governance are addressed.

Of the global approach to housing through provision of basic services and secure formal tenure, which are the main packages in upgrading methods, and site and service schemes have had a lengthy application in Dodoma. These methods have been attempts to reduce the growth and spread of Informal Settlements by providing ready to occupy serviced plots for individual's house construction.

Applied upgrading packages in Informal Settlements in Dodoma

Tanzanian government has applied several methods dealing with informal settlement control. Chapter three detailed the formation of communities for the provision of plots to all categories of income groups. Plots allocation having not met the increasingly needs, alternative scheme was introduced under what is referred in Dodoma as Settlement regularization Programme.

This programme is the responsibility of CDA and the success is very minimal as aforesaid. Information from other institutional officials during the research indicated that CDA had undertaken only few projects between 1992 and 2007 with less than 4,000 plots.

Upgrading incorporates the regularization of tenure and in Dodoma this has been applied in some Informal Settlements named Chang'ombe and Medeli East as aforesaid. Unfortunately this was not widely extended to many other informal settlements. By the time this research was carried out the CDA Land officials implied issuance of formal titles as one of the intended formalization mechanisms.

From the above issues on housing and serviced land it is evident that formal housing with legal security is a far-fetched goal of the authorities if it is to be through the present laid down procedures. CDA is incapacitated by lack of

funds to meet the backlog of plots required for ever fast growing town of Dodoma. Development in low unplanned areas has shifted to the local authority yet residents cited no contact with the local authorities officials.

Residents contribution

Residents have shown their capacity to meet their housing needs on their own and even to take advantage of the shortfall in the housing sector by extending their buildings with rooms for rental purposes. 36% of Chang'ombe's respondents were tenants and 36% of plot owners intend to construct rental rooms depicting the continual need for investing in cheap houses.

In Medeli East, the contribution to housing shortage and does not call for projects or privatization. In Dodoma, because the formal sector is not providing enough serviced land, middle and high-income groups seek alternatives in the informal sector- Medeli East has middle class inhabitants as indicated by the income category in previous chapters and the type of buildings that are being built.

When it comes to self-development, residents under enabling environment will always improve their conditions. Chang'ombe and Medeli East have shown progressive improvements on dwellings, leading to connections with basic infrastructures whenever possible. This type of incremental development is determined by the amount of income in each household and the level of provision of services and infrastructure by the government or other agents such as World Bank. Though there is no correlation in the two settlements between connection to electricity and income, those who were not connected to electricity cited lack of funds as the reason.

The limiting factor to incremental development is income and type and amount of service/infrastructure that are availed in the settlements. The initiative by the DUWASA and TANESCO where "pooling of resources" type of policy has enabled clean running water and electricity supply at a level not expected in Informal Settlements should be encouraged.

Informal Settlements are basically for the poor and lack in basic infrastructure and services is disapproved to some extent. However the poor are in the settlements and the access, supply and amounts of services differs from household to household and settlement to settlement.

It is a working relationship that would leave the informal settlers to continue with their own means of accessing land and utilities for as long as the responsible authority takes charge of public facilities where services and utilities are located for continued supply, maintenance and accountability. It is in this regard that this research proposes an Informal Settlements upgrading mechanism by way of institutional reforms through the local authorities based on the fact that:

- The formal sector has failed to provide adequate housing,
- That solutions through tenure security and low housing schemes not worked, but;
- That people left to their own social means, are secure and improve incrementally,
- That basic services and infrastructure should be given in a continuous progressive way guided by enabling policies, and
- That the search for solution to poverty reduction and informality is still on, this research proposes upgrading Informal Settlements through institutional reforms by the local authorities as a likely sustainable method.

This should be done disregarding the official standards of planning. The local leaders reported lack of interest on the side of the government on the development of the facilities. The Authority should take this desire to have public facilities developed as an excuse to penetrate the Informal Settlements as development partner.

For Authorities like CDA this offers the chance of marketing itself in the settlements and other peri-urban areas where land sub-divisions are likely to continue. Information on the actual development needs will enable the Authority to negotiate strongly for funding and capacity building in the decentralization process and donor funding. This research finds this upgrading approach applicable in Dodoma.

5.0   CONCLUSION AND RECOMMENDATIONS

5.1   CONCLUSION

This research has explored the evolution and development of informal settlement through case studies of Chang'ombe and Medeli East informal settlements in the town of Dodoma. Structured questionnaires were used to interview heads of household heads. Semi-structured interviews were employed to the government officials, government agencies and local leaders. With these two types of interviews, it was hoped that; nature of the systems and main actors that regulate land tenure, land accessibility, delivery mechanism, type and methods of information collection in informal settlements, managerial aspect of informal settlements development and the role of community organizations and public administrators perception in the settlements development spatially and tenure-wise would have in-depth analysis.

This chapter draws conclusions based on the research questions in Chapter One. It will also make recommendations based on the conclusion.

5.1.1   The nature of the systems and main actors that regulate land tenure in informal settlements

Formal land delivery in Dodoma is inadequate. CDA officials during the interviews reported having released less than one third of serviced plots in demand in a period of 10 years. In this period of 10 years the population of Dodoma increases by about four hundred thousand people. The informal settlements accommodate this large increase not only by invasion of private or public land but also through socially unaccepted traditional means. These traditional means are perceived so secure that none of the respondents

reported having had any official legal land dealings with the government. They were involved in direct land allocations by local leaders as one of the main actors and consent to various land transactions that involve subdivisions, buying and selling- majority of new developments are reported to the local leaders with just a rare cases where in Chang'ombe political leaders were informed.

Local leaders in the study areas reported to have residents enquire on how to get land titles. This is so even though some households have invested heavily in permanent houses, rental and commercial facilities. This means that residents do not consider their settlements informal nor do they see any threat to their properties in the future. However at a settlement level, respondents did not seem to appreciate the allocation of what they commonly understand as public land to individuals. The local leaders in Medeli East have allocated land reserved for school and other public purposes where in Chang'ombe, political party leaders had intervened the orderly spatial development against the intended use.

Respondents were willing to discuss the dissatisfaction they had on the quality and quantity of public facilities and services. They seem to perceive the protection and development of open spaces as a responsibility of the government. In the choice of their immediate needs none of the household heads desired roofing material, school fees, transport or those aspects of life that are associated with one's household. Instead they complained about congestion in schools and in hospitals, poor roads, dirty and small market facilities and poor sanitation all of which the CDA and/or other government agents are expected to take care of.

In Medeli East, some respondents felt that it is the duty of CDA to intervene on public land allocations since it took over settlements responsibility. In

Chang'ombe, the respondents felt that the government and CDA in particular have failed to control politicians from interfering with land in the settlements. On the other hand, government officials did not want to acknowledge responsibility for public facilities in informal settlements because they are unplanned, unregistered and illegal according to them. It is a scenario in which informal settlers know what they should do for themselves given time and resources, but they feel helpless in other areas that they expect the government to help, while the government ignores total responsibility to them because it does not recognize their land tenure status.

It can then be concluded that at the household level, land tenure is perceived as secured individual investments that continue without undue fear. Institutional interventions face the danger of continuous encroachment and inadequate services and facilities in these settlements make the future at a settlement level very insecure.

House owner-occupation is popular in the settlements of study. Most respondents got their plots vacant through allocations by the local leaders' involvements, through buying or inheritance from families. Construction starts with the basics with one improving and extending while in occupation. Improvements are in terms of roof, walls, floor, additional rooms, and connection to utilities like water and electricity. The improvements observed and reported differ in the two settlements with the highest common wish to improve being on additional rooms. Differences in already reported and intended improvements could be attributed to:

a. *Location of settlement.* Medeli East is close to the town center. It is attractive to job seekers for residence purpose. This could explain the investments in additional rooms by plot owners- 48% of respondents were

tenants out of which 52% intend to add rooms. Addition of rooms was reported to be limited by lack of space.

b. *Income related limitations.* Medeli East has a larger number of respondents wishing to be connected to utilities like electricity, water and telephone than Chang'ombe. The income levels of Chang'ombe are lower than those of Medeli East and though the wish to have utilities is there, respondents showed financial constraints as a factor. Generally, telephone connection is low in both settlements.

c. *Government/NGOs facilitation.* Where utility facility has been supplied in the settlements, the wish to invest in that facility is low. Since water supply is well covering in Chang'ombe, respondents reported a low priority for improvement in water connections contrary to Medeli East. Though the intensity is low, they is an indication of progressive household developments.

d. Thus, development in the settlement; is incremental and it ranges from basic immediate improvements on physical aspect of the house to the connection of utilities. The limiting factor to connection is the financial capacity of each household and the extent of supply of basic utilities by the government.

5.1.2 Land accessibility, delivery organization and type and methods of information collection in informal settlements.

Findings from the research indicate that Informal Settlements have evolved and developed over time. The growth and spatial sprawl is attributed to several factors which include:

- *Migration from rural areas in search for employment.* Majority of informal settlers found to have migrated from rural areas in search of employment.

Once in the city, lack of adequate housing and serviced land forces migrants to seek housing facilities in any available bare land within and outside the urban boundaries, Chang'ombe being the oldest is more populated,

- *Inability to supply housing and serviced land by government.* The government has not met the housing demands and not just for the low-income groups but generally for all categories of income. This has made the middle and high-income groups to seek for land for home development in the informal settlements, with improved transport network, spacious settlements like Medeli East have recently been developed by well earning residents and most of buildings are not different from those in the formal high-income class areas.

- *Traditional means of land delivery.* Local leaders allocate customary land for use in the peri-urban areas of Dodoma; this practice is experienced in many areas and because of incorporating rural villages into cities and towns boundaries without replacing traditional practices with statutory procedures immediately (URT, 2002).

5.1.3 The managerial aspect of informal settlements development in the light of the availability of basic service and tenure.

The fact that public managerial aspect, that informal settlements are illegal does not mean there are should no utility connections, the utilities companies like DUWASA and TANESCO who do not concern themselves with tenure issues, have delivered services in such settlements on the basis of affordability to any needy applicant and irrational profit maximization. The continued spread of informal settlements means that a large number of clients are in there. Building in these areas by the elites has also increased political push for facilities against the non-provision policies of the central government.

TANESCO advices households to team-up to qualify for power supply even in poor mud houses albeit government ban in informal settlements. From the interviews it was clear that public administrators do not appreciate the non-adherence of policy by utility providers or the political backing they use at times to provide services in informal settlements. To public administrators, service provision encourages informal settlements sprawl. To utility providers, public administrators have failed in their role to plan the city and to come up with proactive implementable policies. Respondents reported having no direct dealings with public administrators but since a number are connected with electricity and water, it means there are interactions with utility providers. This questions the public administrators approach in upgrading through legal procedures against the engineering approach for delivery of services.

The central government, CDA and the local authorities seem to be stuck with the standard formal planning and registration approach to upgrading. Even though the central government was unable to control informal growth through the lowered traditional houses of site and service schemes that were being done by CDA proceeds with the same approach to date. The output is too low and slow to have an impact on serviced land provision. To add to this, CDA is experimenting on titling programs even though some of the residents in the informal settlements do not consider legal tenure as an important factor to development. Although the new land policy mandates the local authority to control development, the rooted traditional practices and the shortage of funds and personnel would not allow CDA to implement the policies as they are today.

In summary, the informal settlements are on the increase in Dodoma spatially and by densification in each settlement. The expected insecurity of tenure is not

there due to traditional practices that are trusted by people enabling incremental upgrading of households on their private properties. What is lacking is adequate governments support in provision of basic services and infrastructure.

Physical changes in the settlements

GIS and Remote Sensing Technology was useful in detecting and mapping the densification of household buildings. Using aerial photographs, it was possible to estimate the number of buildings that have been put up over a period of time. GIS was also used to show the location of open spaces and the physical developments that have taken place on them. GIS analysis enabled the visualization of the extent of illegal developments in the study settlement to support the household interviews. For this research, remote sensing helped in random sampling of the study population through stratification of settlement orthophotos and in faster location and accessing of households by entering coordinates of sampled points into a GPS.

5.1.4 The role of community organizations and public administration perceptions

One would expect strong rooted community groups in informal settlements mainly to act as a link between residents and government authorities administrations in the quest for social services and basic utilities. This was found not to be the case in both settlements of the study. Majority of residents reported unawareness of any existing groups and to some extent poor leadership by group leaders. Group formation facilitation is the role of the central government and the local authority in Tanzania.

The problem in Dodoma is that government officials have distanced themselves from the activities of the informal settlers because by law, they do not exist.

Religious developments and cemetery facilities that are the responsibility of the community are adequate but those services that require more funding and are expected to come from the government are poorly supplied, under-developed or unprotected. These include the construction of schools, hospitals, roads, and solid waste collection among others.

These are the facilities that community groups could request for from the government. They are all "public goods" that go beyond the capacity of individuals or groups to provide for themselves. They require government budget planning and continuous maintenance.

It can be concluded that there is official negligence in the provision of services under the pretext of informality even though the settlements house big population. There is no strong official wish to bring people together through community participation in the study settlements.

In summary, continuous rural urban migration, natural urban population growth, the inability of the formal sector to provide housing and serviced land has resulted in uncontrolled, unauthorized land delivery and constructions leading to the development of informal settlements.

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