URBAN TYPES IN RAPIDLY URBANISING CITIES
Analysis of Formal and Informal settlements in Dar es Salaam, Tanzania

John Modestus Lupala
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# CONTENTS

<table>
<thead>
<tr>
<th>Acknowledgement</th>
<th>ix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>x</td>
</tr>
</tbody>
</table>

## PART I: BACKGROUND AND RESEARCH DESIGN

### CHAPTER ONE: INTRODUCTION
1.1 Background
1.2 Lack of knowledge
1.3 Land under-utilisation, urban sprawl and its externality effects
1.4 Study objectives
1.5 Research questions
1.6 The relevance of this study within the field of Built Environment Analysis
1.7 Structure of the thesis

### CHAPTER TWO: THEORETICAL FRAMEWORK
2.1 Theoretical framework
2.2 Theoretical framework for the classification of urban types
2.3 Theoretical framework for the analysis of urban types
2.4 Key concepts

### CHAPTER THREE: URBANISATION AND SPATIAL GROWTH IN DAR ES SALAAM
3.1 Urbanisation trends in non-industrialised countries
3.2 Dar es Salaam: A rapidly urbanising city
3.3 Density changes and spatial growth for Dar es Salaam
3.4 Colonial legacy and ensuing urban types
3.5 Master planning and its influence on urban types
3.6 Informal housing development and its influence to urban types
3.7 Summary

### CHAPTER FOUR: DEVELOPMENT OF URBAN TYPES IN DAR ES SALAAM
3.1 General background
4.2 High-density high-rise institutional commercial city centre
4.3 Medium density, moderate height residential
4.4 Mixed density commercial-residential
4.5 Low density, low land coverage residential
4.6 Low density, low-rise residential quarters
4.7 High-density, low-rise, Swahili house residential
4.8 Consolidated high density, low-rise informal settlements
4.9 High-density high-rise residential
4.10 Medium density, low-rise sites and services residential
4.11 Low density, low-rise consolidating informal residential
4.12 Discussion
4.13 Summary
# CHAPTER FIVE: RESEARCH DESIGN AND METHODOLOGY

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Choice of research strategy and rationale</td>
<td>73</td>
</tr>
<tr>
<td>5.2</td>
<td>Research design</td>
<td>74</td>
</tr>
<tr>
<td>5.3</td>
<td>Selection of a case study areas</td>
<td>76</td>
</tr>
<tr>
<td>5.4</td>
<td>Quantitative and qualitative approaches</td>
<td>81</td>
</tr>
<tr>
<td>5.5</td>
<td>Units of analysis</td>
<td>82</td>
</tr>
<tr>
<td>5.6</td>
<td>Data collection methods</td>
<td>82</td>
</tr>
<tr>
<td>5.7</td>
<td>Reliability and internal validity</td>
<td>90</td>
</tr>
<tr>
<td>5.8</td>
<td>Generalisation</td>
<td>90</td>
</tr>
</tbody>
</table>

# PART II: EMPIRICAL INVESTIGATION FROM CASE STUDY AREAS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Settlement evolution and development</td>
<td>92</td>
</tr>
<tr>
<td>6.2</td>
<td>Influence of Master Plans on the development of Kariakoo</td>
<td>95</td>
</tr>
<tr>
<td>6.3</td>
<td>Plot characteristics</td>
<td>99</td>
</tr>
<tr>
<td>6.4</td>
<td>House forms</td>
<td>103</td>
</tr>
<tr>
<td>6.5</td>
<td>Density characteristics</td>
<td>112</td>
</tr>
<tr>
<td>6.6</td>
<td>Spaces and space uses</td>
<td>118</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Settlement evolution and growth</td>
<td>125</td>
</tr>
<tr>
<td>7.2</td>
<td>Planning intervention for Mbezi area</td>
<td>127</td>
</tr>
<tr>
<td>7.3</td>
<td>House Forms</td>
<td>133</td>
</tr>
<tr>
<td>7.4</td>
<td>Density</td>
<td>136</td>
</tr>
<tr>
<td>7.5</td>
<td>Plot characteristics</td>
<td>138</td>
</tr>
<tr>
<td>7.6</td>
<td>Spaces and space uses</td>
<td>141</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1</td>
<td>Settlement evolution and development</td>
<td>146</td>
</tr>
<tr>
<td>8.2</td>
<td>Settlement densification process</td>
<td>148</td>
</tr>
<tr>
<td>8.3</td>
<td>Planning intervention for Msasani Makangira</td>
<td>150</td>
</tr>
<tr>
<td>8.4</td>
<td>Factors influencing the development of Msasani Makangira</td>
<td>151</td>
</tr>
<tr>
<td>8.5</td>
<td>House forms</td>
<td>152</td>
</tr>
<tr>
<td>8.6</td>
<td>Density</td>
<td>156</td>
</tr>
<tr>
<td>8.7</td>
<td>Plot characteristics</td>
<td>161</td>
</tr>
<tr>
<td>8.8</td>
<td>Spaces and space uses</td>
<td>161</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1</td>
<td>Settlement evolution and growth</td>
<td>176</td>
</tr>
<tr>
<td>9.2</td>
<td>Settlement densification process</td>
<td>176</td>
</tr>
<tr>
<td>9.3</td>
<td>Planning intervention in Ubungo Kibangu</td>
<td>179</td>
</tr>
<tr>
<td>9.4</td>
<td>Regularisation of Ubungo Kibangu</td>
<td>180</td>
</tr>
<tr>
<td>9.5</td>
<td>House forms</td>
<td>183</td>
</tr>
<tr>
<td>9.6</td>
<td>Density</td>
<td>187</td>
</tr>
<tr>
<td>9.7</td>
<td>Plot characteristics</td>
<td>192</td>
</tr>
<tr>
<td>Figure 3.12</td>
<td>A land use plan for Dar es Salaam (1949)</td>
<td>45</td>
</tr>
<tr>
<td>Figure 3.13</td>
<td>Colonial government housing schemes</td>
<td>47</td>
</tr>
<tr>
<td>Figure 3.14</td>
<td>Central area zoning plan (1979)</td>
<td>50</td>
</tr>
<tr>
<td>Figure 3.15</td>
<td>Sinza sites and service scheme as planned in 1974</td>
<td>51</td>
</tr>
<tr>
<td>Figure 3.16</td>
<td>Formal and informal settlements for Dar es Salaam (1998)</td>
<td>53</td>
</tr>
<tr>
<td>Figure 3.17</td>
<td>A typical housing cluster in Keko Mwanga informal settlement in 1999</td>
<td>54</td>
</tr>
<tr>
<td>Figure 4.1</td>
<td>A typical cluster within the administrative / institutional area</td>
<td>57</td>
</tr>
<tr>
<td>Figure 4.2</td>
<td>A typical cluster within the commercial / residential area, former Indian settlement</td>
<td>58</td>
</tr>
<tr>
<td>Figure 4.3</td>
<td>A cluster within the institutional area (former European residential settlement) area</td>
<td>58</td>
</tr>
<tr>
<td>Figure 4.4</td>
<td>Typical cluster in Upanga area</td>
<td>59</td>
</tr>
<tr>
<td>Figure 4.5</td>
<td>Typical block in Kariakoo area</td>
<td>60</td>
</tr>
<tr>
<td>Figure 4.6</td>
<td>A housing block in Oysterbay</td>
<td>61</td>
</tr>
<tr>
<td>Figure 4.7</td>
<td>Low-rise low-density small detached residential quarters at Ilala</td>
<td>62</td>
</tr>
<tr>
<td>Figure 4.8</td>
<td>A semi-detached quarter type in Temekte</td>
<td>63</td>
</tr>
<tr>
<td>Figure 4.9</td>
<td>Row houses in Magomeni area</td>
<td>64</td>
</tr>
<tr>
<td>Figure 4.10</td>
<td>Typical block of Swahili type of houses in Ilala area</td>
<td>65</td>
</tr>
<tr>
<td>Figure 4.11</td>
<td>Typical cluster of a consolidated part of Msasani Makangira</td>
<td>66</td>
</tr>
<tr>
<td>Figure 4.12</td>
<td>Mwenge blocks of flats constructed by the NHC</td>
<td>67</td>
</tr>
<tr>
<td>Figure 4.13</td>
<td>Sinza sites and services area</td>
<td>68</td>
</tr>
<tr>
<td>Figure 4.14</td>
<td>One cluster of buildings in Ubungo Kibangu</td>
<td>69</td>
</tr>
<tr>
<td>Figure 4.15</td>
<td>Floor area ratios, land coverage and building heights for Dar es Salaam urban types</td>
<td>70</td>
</tr>
<tr>
<td>Figure 5.1</td>
<td>Research design and process</td>
<td>75</td>
</tr>
<tr>
<td>Figure 5.2</td>
<td>Data collection levels and targets</td>
<td>79</td>
</tr>
<tr>
<td>Figure 5.3</td>
<td>Dar es Salaam: Location of case study areas</td>
<td>80</td>
</tr>
<tr>
<td>Figure 5.4</td>
<td>Plot and house measurements in Ubungo</td>
<td>85</td>
</tr>
<tr>
<td>Figure 5.5</td>
<td>Summary of research issues and methods used</td>
<td>89</td>
</tr>
<tr>
<td>Figure 6.1</td>
<td>Layout plan for Kariakoo</td>
<td>94</td>
</tr>
<tr>
<td>Figure 6.2</td>
<td>Some of the office blocks developed in late 1960s</td>
<td>96</td>
</tr>
<tr>
<td>Figure 6.3a</td>
<td>Proposed land use for Kariakoo (1968)</td>
<td>97</td>
</tr>
<tr>
<td>Figure 6.3b</td>
<td>Proposed land use for Kariakoo (1979)</td>
<td>98</td>
</tr>
<tr>
<td>Figure 6.4</td>
<td>Plot layout for Block 76 and 77</td>
<td>100</td>
</tr>
<tr>
<td>Figure 6.5</td>
<td>Housing cluster for block 76 and 77 in Kariakoo in 1959</td>
<td>104</td>
</tr>
<tr>
<td>Figure 6.6a</td>
<td>High-rise developments with low-rise in Kariakoo bloc 76 and 77 in January 2001</td>
<td>105</td>
</tr>
<tr>
<td>Figure 6.6b</td>
<td>Transformation of houses in Kariakoo</td>
<td>105</td>
</tr>
<tr>
<td>Figure 6.7</td>
<td>Layout of houses for Kariakoo</td>
<td>106</td>
</tr>
<tr>
<td>Figure 6.8</td>
<td>Old Swahili type of house in Kariakoo</td>
<td>107</td>
</tr>
<tr>
<td>Figure 6.9</td>
<td>Variation in house sizes for Block 76 in Kariakoo between 1959 and 2001</td>
<td>108</td>
</tr>
<tr>
<td>Figure 6.10</td>
<td>Variation in house sizes for Block 77 in Kariakoo between 1959 and 2001</td>
<td>108</td>
</tr>
<tr>
<td>Figure 6.11a</td>
<td>The high-rise building amidst low-rise Swahili type of buildings along Somali Street</td>
<td>109</td>
</tr>
<tr>
<td>Figure 6.11b</td>
<td>Blockage of windows in Kariakoo</td>
<td>109</td>
</tr>
<tr>
<td>Figure 6.12</td>
<td>Extended Swahili house type</td>
<td>110</td>
</tr>
<tr>
<td>Figure 6.13</td>
<td>High rise buildings along Kiungani Street</td>
<td>111</td>
</tr>
</tbody>
</table>
Figure 6.14  Variation in plot floor area ratio for block 76 and 77 in Kariakoo area  
Figure 6.15  Floor area ratios and land coverage for block 76 and 77 in Kariakoo  
Figure 6.16  Aerial view of part of block 76 and 77 in Kariakoo  
Figure 6.17  Space use along on the central reserve of Lumumba Street  
Figure 6.18a  Commercial activities along Uhuru Street  
Figure 6.18b  Sitting on the kerbsides along Uhuru Street  
Figure 7.1   Location of Mbezi settlement within the built up area of Dar es Salaam city  
Figure 7.2   Aerial photo for Mbezi (1982)  
Figure 7.3   Conceptual plan for Mbezi Planning Scheme  
Figure 7.4a   First layout for Mbezi Block D  
Figure 7.4b   The present layout plan for Mbezi block D  
Figure 7.5   Chaotic supply of water in Mbezi  
Figure 7.6   Mbezi Block D (1992), by 1992  
Figure 7.7a  The front facade of a house on plot 295  
Figure 7.7b  The rear facade of house number 295  
Figure 7.7c  Single storey houses type on plot 271 in Mbezi  
Figure 7.7d  Typical residential house in Mbezi  
Figure 7.7e  A servant quarter on plot 266  
Figure 7.7f  Typical house types in Mbezi  
Figure 7.8  Floor area ratios and land coverage for Blocks A, B and C in Mbezi  
Figure 7.9   Categories of spaces within Mbezi  
Figure 7.10a  Use of road reserves  
Figure 7.10b  Sell of concrete along Bagamoyo Road reserve  
Figure 7.11  Sitting, cooking and gardening in Mbezi  
Figure 7.12: Sitting and talking under ‘coconut’ tree shade characterise use of spaces in Mbezi  
Figure 7.13  Poorly developed Streets in Mbezi  
Figure 8.1  Location of Msasani Makangira and its surrounding areas  
Figure 8.2a  Number of houses in Msasani (1975)  
Figure 8.2b  Number of houses in Msasani 1982  
Figure 8.2c  Number of houses 1992  
Figure 8.2d  Number of houses 2000 and analysis blocks  
Figure 8.3  Mzee Lazaro’s Farm: Farm subdivision and house densification 1974-2000  
Figure 8.4a  Upgrading proposal for Msasani (1991)  
Figure 8.4b  Plot layout and building 2000  
Figure 8.5a  Single storey house types  
Figure 8.5b  Houses overlooking the cliff  
Figure 8.5c  Three storey house type  
Figure 8.5d  A new 3-storey house type  
Figure 8.5e  Swahili house type  
Figure 8.5f  Tiled roofed house  
Figure 8.6a  Building uses along Kimweri Street  
Figure 8.6b  A restaurant along Kimweri Street  
Figure 8.7a  Block A  
Figure 8.7b  Block B
Figure 8.7c Block C
Figure 8.7d Block D
Figure 8.8 Plot shapes for Msasani Makangira
Figure 8.9 Variations in plot sizes in Msasani Makangira
Figure 8.10 Typical compact layout of buildings in Msasani
Figure 8.11 Distribution of spaces and location of case study spaces in Msasani Makangira
Figure 8.12 Layout of informal squares in Msasani (OS1, OS2 and OS3)
Figure 8.13 Space uses in OS 1
Figure 8.14 Stone crushing in OS2
Figure 8.15 Space uses in OS 3
Figure 8.16 Narrow footpaths
Figure 8.17 Lack of shade in OS1
Figure 8.18 Unused backyard spaces in the inner parts of the settlement
Figure 9.1a Ubungo Kibangu (1975)
Figure 9.1b Ubungo Kibangu 1982
Figure 9.1c Housing densification in Ubungo Kibangu 1992
Figure 9.1d Ubungo Kibangu 1995
Figure 9.2 Subdivision of farm lot and house densification process in Mzee Mwaiswaswa’s Farm, (1976-2000)
Figure 9.3 Layout proposal for part of Ubungo Kibangu (1989)
Figure 9.4 Upgrading Plan for Ubungo Kibangu (1999)
Figure 9.5: Ubungo Kibangu: Settlement layout, plot boundaries and buildings as updated in November 2000
Figure 9.6a House with clerestory roof type
Figure 9.6b One of the oldest houses in Ubungo Kibangu
Figure 9.6c Mud and pole wall house
Figure 9.6d The main house with gable roof
Figure 9.6e Incremental house construction
Figure 9.6f A cluster of houses facing the Mandela road
Figure 9.7a Block A
Figure 9.7b Block B
Figure 9.7c Block C
Figure 9.7d Block D
Figure 9.7e Block E
Figure 9.7f Block F
Figure 9.7g Block G
Figure 9.7h Block H
Figure 9.8 Plot characteristics for Ubungo Kibangu
Figure 9.9 Lack of exposure
Figure 9.10 Categories of spaces in Ubungo Kibangu (2000)
Figure 9.11 Informal square (SQ1)
Figure 9.12 Space uses within SQ1
Figure 9.13 Children playing in SQ1
Figure 9.14 The muddy road condition
Figure 9.15 Sitting and talking in SQ1
Figure 9.16 Narrow Streets
Figure 9.17 Footpath surrounded by walls
Figure 9.19 Comfortable living under shade tree
Figure 10.1 Settlements densification trends in Ubungo and Msasani for the
period between 11075 and 2000

Figure 10.2 Building heights variations of two storeys and above for Kariakoo, Mbezi, Msasani and Ubungo

Figure 10.3 Distribution of building sizes in square metres for Kariakoo, Mbezi and Msasani

Figure 10.4 Variations in plot and building sizes in Msasani

Figure 10.5 Roof types for Kariakoo, Mbezi, Msasani and Ubungo

Figure 10.6 Plot size variations in Kariakoo, Mbezi, Msasani and Ubungo

Figure 10.7 Plot exposures for Kariakoo, Msasani and Ubungo

Figure 10.8a Population density for Kariakoo, Mbezi, Msasani and Ubungo

Figure 10.8b Housing density for Kariakoo, Mbezi, Msasani and Ubungo

Figure 10.8c Occupancy rates for Kariakoo, Mbezi, Msasani and Ubungo

Figure 10.9 Plot coverage for Kariakoo, Mbezi, Msasani and Ubungo

Figure 10.10 Floor area ratio for Kariakoo, Mbezi, Msasani and Ubungo

Figure 10.11 Comparison of land coverage for Kariakoo, Mbezi, Msasani and Ubungo at block level

Figure 10.12 Variations in floor area ratios for Kariakoo, Mbezi, Msasani and Ubungo

Figure 11.1 Advantages and disadvantages of high and low density

Figure 11.2 Intercontinental comparison of net population density in selected large cities

Figure 11.3 Relationship between housing density and infrastructure costs

LIST OF TABLES

Table 3.1 Central area design guidelines

Table 4.1 Summary: Number of storeys, land coverage and floor area ratios

Table 6.1 Prevailing plots sizes for block 76 and 77

Table 6.2 Plot ratios for blocks 76 and 77 in Kariakoo

Table 6.3 Plot exposure for blocks 76 and 77

Table 6.4 Number of storeys in block 76 and 77

Table 6.5 House sizes in blocks 76 and 77

Table 6.6 Building uses in block 76 and 77

Table 6.7 Changes in plot coverage in blocks 76 and 77

Table 6.8 Assessment of housing quality by residents

Table 6.9 Residents’ assessment of the settlement quality

Table 6.10 Distribution of mobile activities along Lumumba Avenue (ST1)

Table 6.11 Distribution of mobile activities along Uhuru Street (ST2)

Table 6.12 Distribution of stationary activities along Lumumba Avenue (ST1)

Table 6.13 Distribution of stationary activities along Uhuru Street (ST2)

Table 6.14 Activity intensity of stationary activities in ST1 and ST2

Table 6.15 Activity intensity of mobile activities for ST1 and ST2

Table 7.1: Development stages of plots in Mbezi

Table 7.2 Number of storeys for Mbezi Block D

Table 7.3 House sizes for part of Mbezi Block D

Table 7.4 Residents’ assessment of settlement elements

Table 8.1 Distribution of house sizes in Msasani Makangira

Table 8.2 Room occupancy rates

Table 8.3 Plot coverage for Msasani Makangira

Table 8.4 People’s assessment of housing elements
Table 8.5 People’s assessment of settlement elements 158
Table 8.6 Activity diversity and number of users in OS1 171
Table 8.7 Activity diversity and number of users for OS2 171
Table 8.8 Activity diversity and number of users for OS3 171
Table 8.9 Activity intensity for OS1, OS2 and OS3 172
Table 9.1 Variation in house sizes in Ubungo Kibangu 186
Table 9.2 Plot coverage at plot level 188
Table 9.3 Floor area ratio and land coverage (in Blocks A-H) 192
Table 9.4 Plot sizes in Ubungo Kibangu 194
Table 9.5 Residents’ assessment of housing elements 195
Table 9.6 Residents’ assessment on quality of settlement elements 195
Table 9.7 Distribution of activities in SQ1 (10.00 to 18.00 hours) 199
Table 9.8 Activity diversity and intensity for SQ1 199
Table 10.1 Planning intervention and its effectiveness 210
Table 10.2 Building uses in Kariakoo, Msasani and Ubungo 215
Table 10.3 Space utilisation for Kariakoo, Msasani and Ubungo 223
Table 10.4 Spatial quality characteristics for Kariakoo, Mbezi, Msasani and Ubungo 225
Table 10.5 Cross case analysis: summary of main issues and planning and policy questions 227

ACRONYMS
CIS Corrugated Iron Sheets
DABCO Dar es Salaam Brewing Company
EPM Environmental Planning and Management
FAR Floor Area Ratio
HHs Households
HUDCO Housing and Development Corporation (India)
MLHSD Ministry of Lands and Human Settlements Development
NHC National Housing Corporation
OS1 Open space number 1
OS2 Open space number 2
OS3 Open space number 3
SDP Sustainable Dar es Salaam Project
SQ1 Square number 1
ST1 Street number 1
ST2 Street number 2
SUKITA Shirika la Kilimo na Mifugo Tanzania (Swahili)
TShs Tanzanian Shilling
UCLAS University College of Lands and Architectural Studies
UNCHS United Nations Centre for Human Settlements (Habitat)
URT United Republic of Tanzania
ZAR South African Rand
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John Modestus Lupala,
ABSTRACT

One of the challenges confronting cities in non-industrialised countries today is the fact that cities are growing at unprecedented rates, sizes and densities. Growth trends in these cities are largely unregulated. In these countries, cities have changed in at least four major ways: their size, spatial organisation or morphology, the quality and distribution of public services and infrastructure and their employment base. While this situation can be attributed to global urbanisation trends, the general poor knowledge on how these cities develop, densify and acquire certain physical characteristics has limited effective urban planning and management. At times, the pervasive knowledge gap has been associated with the lack of relevant theories and concepts to explain the evolution, growth and prevailing spatial qualities. However, the limited research in this field has also contributed to this problem. The other problem that confronts the rapidly urbanising city is continued sprawl that has been manifested in externalities of inadequate infrastructure provision and under-utilisation of scarce resources particularly land.

This thesis is an attempt to contribute towards addressing these two problem areas. The main field of study is on urban types within a rapidly urbanising city context. Dar es Salaam city was selected a case study area. The study explores the theoretical framework for classification and analysis of settlements. The relevance of this framework in the study context is examined. At low scale level, the study provides an analysis of house forms, density, plot characteristics, spaces and space uses in formal and informal settlements.

The analysis shows that urbanisation under poverty and low-density urban types greatly influence the sprawling character of the city. The increasing market-led housing development and ineffective planning responses are contributing factors to the observed unguided densification and deteriorating spatial qualities. It has also been shown that while theoretical frameworks developed from most industrialised countries can be adapted to analyse urban types in non-industrialised countries, these theories are limited in comprehending fully the growth and character of rapidly urbanising cities.

Key words: Urban types, house forms, density, plot characteristics, spaces and space use, spatial quality, formal and informal settlements, Dar es Salaam.
1.1 Background

Any concern for understanding changes in rapidly urbanising cities, particularly those in sub-Saharan Africa, requires the comprehension of the underlying factors for their evolution and subsequent development. Unlike in Europe and other industrialised countries, where urbanisation was triggered by industrialisation and where cities were largely organised in a regular manner, ongoing changes in many of the cities in poor countries have their roots in colonial planning influences with rapid changes taking place after independence. Urbanisation trends in many of the poor countries have been taking place under the dictates of poverty and growth of informal settlements. City growth in these countries has been largely unregulated. Informal land subdivision and housing development characterise city development processes. While many cities in these countries were established during the colonial period, their exponential growth started after the attainment of independence. The expanded post-colonial city exhibit stakes of layers of urban types reflecting the various periods of city growth or of planning intentions. In the colonial city, for example, the major ideas behind town planning are evidenced by racially segregated zones for Europeans, Asians and Africans, an ideology that pervaded town planning during the colonial era.

At the time of independence new political goals were often established. Sometimes, this induced new housing and town planning policies, but often the colonial procedures were continued or only moderately revised. The relevance of the old and more recent planning principles and existing urban types to the new economic, socio-cultural and political conditions has not often been the focus of urban planning research and practice.

Conventional planning models seem to have less effect when it comes to guiding and regulating development in these settlements. The overall cityscape that emerges from this type of city growth is a complex pattern of spatial entities comprising varying house forms, densities and spaces with differentiated spatial qualities. Yet informal settlements dominate the general city structure, providing habitat to the majority of the urban residents. This phenomenon has been observed by the United Nations Centre for Human Settlement (UNCHS) - Habitat as follows:

... from an overly regulated city which reflects the needs of the erstwhile colonial powers to control urban life in every possible way, we are witnessing the birth of a new city form which reflects the African reality. What could be called the ‘Self-help City’ in the 1970s might very well be called ‘informal city’ in the 1990s. All these changes had a major effect on the city form. (Habitat, 1996: 86)

Presently, one of the challenges confronting many post-colonial cities in these countries is the fact that cities are growing at unprecedented rates, sizes and densities besides that they are largely unregulated. The UNCHS, for example, notes that cities have grown in at least four major ways: their size, spatial organisation or morphology, the quality and distribution of public services and infrastructure and their employment base (Habitat, 1996:86). While this situation can be attributed to global urbanisation, the general poor knowledge on how urban

1Self-help initiatives in housing provision were advocated starting from the 1970s as an appropriate strategy towards housing the poor. This strategy was adopted following the public sector failure to address housing needs of the increasing population. The Self-help housing approach was viewed as an option to conventional public housing provision.
types develop, densify, or acquire certain physical characteristics and how to deal with urban growth in these countries has limited effective urban management and governance. It has been argued that the knowledge gap that pervades proper urban planning and management has tended to make city governments focus on problems rather than on the opportunities which such cities also present (Jelinek, 1992).

In view of these challenges, this study has endeavoured to explore some theoretical and methodological approaches towards addressing issues of density, house forms, plot characteristics and space uses as variables of urban types within a rapidly urbanising city context. One among other pertinent questions has been to define and analyse urban types in the so-called ‘informal settlements’. The link between density as an influential variable to infrastructure costs and utilisation of scarce resources such as land has also been discussed. The existing planning intervention and its effectiveness as a tool for guiding settlement development has also been discussed. Trends and intensity of use of spaces within urban types and inherent spatial qualities have been analysed. Operational questions that have been often raised are: Can densities (floor area ratios) be increased and functional qualities be maintained or improved? How can planners develop urban types that are more efficient in terms of density, better spatial qualities, increased productivity, community participation and sustainable urban development?

The major concern that motivated the carrying out of this study is associated with two main issues. The first is the persistent knowledge gap on the processes and the rapid changes taking place in formal and informal settlements which seem to be unguided. The second is the significant city sprawl manifested in the negative externalities of poor infrastructure provision and inadequate community facilities. While the first issue expresses the epistemological concerns of understanding built environments, the second one is ontological in nature with emphasis on practical problems confronting built environments in rapidly urbanising cities.

1.2 Lack of knowledge

Despite the fact that many of the rapidly urbanising cities are not as old as the historic stone towns, settlements in these cities constitute layers of development characterised by certain urban types and neighbourhood spaces which are yet to be systematically identified, classified and analysed. While the ‘colonial city’ reveals some kind of regulated patterns of city growth, the post-colonial city is largely unregulated as influenced by the rapid growth of informal settlements.

The rate at which such settlements have been urbanising has not been established. Systematic analyses on the growth, densification and inherent spatial qualities have been lacking. Inadequate knowledge base on house forms, prevailing densities, space usability, plot characteristics and subsequent transformations that take place in these settlements have restrained adoption of effective planning interventions.

A number of scholars have observed this knowledge gap, especially in the rapidly urbanising cities. Jelinek (1992), for example, contends that the general poor knowledge on how to deal with urban growth and particularly that of ‘megacities’ has limited city governments to optimise existing opportunities to establish effective city forms. Nnkya has related the lack of knowledge to ineffective planning and argues that:

*The lack of, or too little knowledge, on the social, economic and political processes, which shapes the physical environment has been influential to defective planning and in some instances triggered off disputes between the planning authorities and the stakeholders.* (Nnkya, 1999:19)

Habraken notes that, despite the fact that informal housing in developing countries consistently showing rapid growth and change rooted in informal local typologies, documentation and study of such informal development has been lacking. Yet preliminary
observations reveal that there is always a strong typology driven by local customs of construction and manufacturing and by the preferences of those who invest in houses and live in them (Habraken, 1998: 292-93). This argument is consistent with Anyumba’s observations when he analysed the business and residential building typologies of the Asians in colonial Kisumu, in Kenya. Anyumba observation shows that the designs aspired by the Indian community in colonial Kisumu were congruent with their lifestyles and their economic aspirations despite the stringent public health ordinances imposed on the type of house development by the colonial government (Anyumba, 1995:52). Further, Anyumba notes that the typology of built forms in Kisumu comprised of either single or two storey houses, both of which were designed to cater for the two main uses of residence and commerce. This kind of study is rare in many cities despite the fact that they provide a knowledge base for understanding the people’s potentials and preferences in the city building process.

One of the limiting factors towards the understanding of urban types has been the lack of a theoretical framework developed from empirical observations. Rådberg, for example, observes that apart from the great confusion in the field of quality and sustainability in urban planning, much of this uncertainty stems from the fact that the theories are formulated on a very general and abstract level. There is a need for empirical facts, observations and theoretical framework for understanding these empirical observations. Rådberg urges for the need of systematic descriptive classification of the urban structure on micro level in order to be able to process the accumulated information on existing urban environments (Rådberg, 1996: 385).

Jelinek relates the lacking knowledge as a cause of ineffective urban development policies when he asserts that urban management policies in these countries have been largely unsuccessful because of lack of knowledge over the densification process (Jelinek, 1992:8). Jelinek foresees that the main challenge of urban management rests on the analysis of land markets that influence residential density in rapidly urbanising cities. It is not surprising that conventional planning responses in these cities have largely failed to address contemporary planning problems due to a poor knowledge base on the processes that impel development in these cities. The aim of this study is to contribute towards addressing this knowledge gap.

1.3 Land under-utilisation, urban sprawl and its externality\(^2\) effects

Another concern for carrying out this study stems from the notable problems of sprawling cities and associated negative externality effects. Low-density sprawling cities have revealed problems related to increasing land servicing and transport costs. Although the horizontal expansion of cities particularly those in sub-Saharan Africa can be related to availability of relatively cheap buildable land in the periphery of the cities, the poor management in the utilisation of land within the confines of the built up parts of the city is a contributory factor for poor households to move to the peripheries of the cities. The effects of city sprawl have been noted by Habitat as follows:

\[\text{...more and more of the population is moving to the periphery of the larger cities, where land is cheaper and much more easily accessible, where shelter can be constructed economically using locally available materials, and where harassment from the police and restrictions of the formal planning system are rarely felt. This horizontal expansion of the African city into its rural hinterland not only attenuates major infrastructural elements such as piped water, electricity sewerage and roads to a point where their efficacy is greatly reduced: but it also adds considerably to the costs of such services as education, health and social assistance. As these peripheral settlements expand, and the}\]

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\(^2\)Quoting Rothenberg, Kironde defines externality as side effects of an activity, which are not accounted for in the budget, or utility functions of their producers or generators or their beneficiaries or sufferers (Kironde, 1994:20).
public resources to service them continue to contract, a new approach to the planning and management of African cities will have to emerge if they are going to survive as viable social and productive entities in the twenty-first century. (Habitat, 1996:86-87)

Although city sprawl is a global phenomenon, its effects in poor countries are far more reaching than in the rich countries. In Mexico City, for example, as a consequence of sprawl, people are forced to commute sometimes 3 hours in one direction on their journey to work, spending 6 hours per day travelling and 7 to 8 hours per day working. A similar commuting pattern is not uncommon in areas around London (Jelinek, 1992:10). The problem of urban sprawl is closely linked to lifestyles of people, government policies towards city planning and to housing policy. Many scholars have cited advocacy for low-rise low-density type of housing development as contributing factors to city sprawl.

Leading New Urbanism ideologists including Andres Duany, Elizabeth Plater-Zyberk and Jeff Speck have discussed externalities associated with urban sprawl in the North American context. They argue that the emerging problems of sprawl are due to the fact that those cities are not functional. They simply do not serve society or preserve the environment. Sprawled cities are characterised by unused sidewalks and lack of a ‘neighbourhood’ and sense of place. Sprawled cities reveal a misuse of public funds for infrastructure expenditure. The authors suggest that a traditional neighbourhood\(^3\) is the only alternative to sprawl. They have pioneered the New Urbanism design paradigm which, apart from other spatial qualities, seeks to address the question of city sprawl.

Discussing the American sub-urbanisation and city sprawl, Moudon notes that about 45% of the American metropolitan population live in suburban areas. This is due to the fact that the building regulations support a strong tendency towards the ownership of single-family houses and automobile transportation (Moudon, 1992:170). As a result of city sprawl, traffic congestion, threat to air quality, high petrol consumption, lack of affordable housing and increased costs of infrastructure characterise the suburban situation of many North American cities \((ibid.)\). Making a comparison with other countries, Moudon observes that while the urbanised part of Los Angeles, for example, covers 474,000 hectares and has a population of 9.5 million people, London's urbanised part spread over 120,000 hectares has a population of 6.5 million people. London's gross density of 56 persons per hectare sharply contrasts with 20 persons per hectare in Los Angeles \((ibid.)\).

Despite the fact that comparison of density based on population figures has been challenged on account of the differences in density definition, perception, and cultural variations towards dense environments, it is disputable that in most sub-Saharan cities population density is generally low (Acioly and Davidson, 1996:6). For instance, the highly populated areas of 'Kampungs' in Jakarta have a gross density of 800 persons per hectare, the Greater Bombay has a gross density of 190 persons per hectare and a net density of 3,500 persons per hectare (Jelinek, 1992:11 KTH, 1987:27). The metropolitan areas of Hong Kong have a population density of 6,160 persons per hectare, Calcutta and Medelline have 5,696 and 756 persons per hectare respectively (Jenks, 2000:343). Because of the city sprawl coupled with automobile transport, petrol consumption in America is four times the European cities and six times higher than in Asian cities (Moudon, \(op.cit.)\).

The average population density for the metropolitan area of Dar es Salaam increased from about 6 persons per hectare in 1978 to 10 persons per hectare in 1988 (Dar es Salaam\(^3\) According to Duany \textit{et al.} a neighbourhood ought to be characterised by the following qualities: the centre, a five-minute walk to ordinary or daily needs areas, presence of streets and street life, narrow versatile streets to slow down traffic, mixed uses and special sites for special buildings, all of which, they claim, have been lost in the sprawled city.
Despite the socio-cultural and climatic differences among cities, these figures show an extremely low density when compared with other cities. As a result of low-density development and higher land prices near the city centre, Dar es Salaam has expanded to about 20 kilometres in all of its radial directions. Whereas in 1941, the urbanised area had only stretched to between 3-4 kilometres, in 1969 this area had stretched to between 6-10 kilometres. In 1978 the city had expanded to about 15 kilometres. By the year 1993 the city had reached 27 kilometres to the north and between 15-30 kilometres towards the west and south-west (Dar es Salaam Statistical Abstract, 1992; Briggs and Mwamfupe, 2000:802).

With the exception of consolidated and old settlements, the dominant house types in newly established settlements are single-storey, many of which reveal a relatively low density. This is evident in the suburbs of Gongolamboto, Mbezi, Kunduchi, Mbagala and some inner city colonial neighbourhoods such as Ilala and Magomeni. Apart from the housing systems that seem to favour low-density housing development, land speculation is also contributing to the city sprawl and its associated costs. Today one observes numerous unbuilt plots in Sinza, Mikocheni and Tabata, almost 20 years after allocation due to land speculation. Serviced plots in Mikocheni area are left idle while limited resources are spent uneconomically opening new areas further in the peripheries as if the solution to the current land crisis lies in preparing layout plans and surveying more plots (Kombe, 1995:70-71). The Ministry of Lands and Human Settlement Development (MLHSD) and the Dar es Salaam City Commission (DCC) have prepared several layout plans along the major roads of the sprawling city. However, detailed studies to elaborately analyse density and housing types in the built up part and the prevailing land markets in the peripheries of the city are not part of these planning efforts. For example, the rich people who continue to buy huge tracts of land in the periphery of Dar es Salaam pose a problem of future growth of the city (Kombe, 1999:17).

The resulting effect of city sprawl has been the increase in infrastructure development costs. Transport costs have increased tremendously to and from work places. For example, experience shows that a person residing in Mbagala or Mbezi areas, some fifteen kilometres from the city centre has to spent about TShs 20,000/= (equivalent to US$ 25) per month as transport costs to and from his or her work place in the city centre. This amount is equivalent to 50% of the minimum wage of a government employee. In the 1970s, the city limit was confined within the 10-kilometre radius and subsidised public transport was available and affordable. The extremely low densities have been a major cause to under-utilisation of land resources.

The dominance of low-rise low-density house types is a factor contributing to these shortfalls. The negative externalities of urban sprawl not only augment problems related to transport costs and infrastructure services, but also point to the need for analysing existent urban types, in terms of their potentials and opportunities in relation to possibilities for infill developments or adoption of new house forms. This study also examines planning and policy issues that have played an influential role to the present city structure.

1.4 Study objectives

The objectives of this study are both knowledge seeking and normative. They are knowledge seeking in the sense that inherent changes in the case study settlements are being examined but also normative since baseline recommendations on how these settlements ought to be developed are being sought. The main objective therefore is to identify and analyse ‘urban types’ and inherent spatial qualities within a rapidly urbanising city. The study explores

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4The gross population density as referred to in the Dar es Salaam Regional Statistics Abstract is for the whole metropolitan area of Dar es Salaam that is including the rural areas. The density for the urbanised part of the city has been noted to be 52 persons per hectare.
theories of urban typological classification and analysis and examines their applicability in a non-industrialised country’s context. Policy options and possible future urban types are discussed. Specific research objectives are:

- To identify, classify and analyse urban types within a rapidly urbanising city context.
- To examine urban types with respect to house forms, density, spaces and space uses, plot characteristics and spatial qualities within formal and informal settlements.
- To develop basic recommendations as a basis for effective planning, improved spatial qualities and containment of city sprawl.

1.5 Research questions

Consistent with the research objectives, the key research questions for this study are:

- How can urban types in formal and informal settlements be systematically identified, classified and analysed?
- What potential qualities do different urban types have, in terms of house forms, density and space use with respect to optimal utilisation of land?
- How can existing urban types be adapted or improved with the view to increasing density while maintaining liveability and spatial qualities within formal and informal settlements?

1.6 The relevance of this study within the field of Built Environment Analysis

Existing mainly in Sweden, the field Built Environment Analysis evolves from the subject that was previously called Building Function Analysis. In Sweden, the social welfare state policy has been strongly linked with the emergence of the subject Building Function Analysis in the 1960s, where the government played an important role in housing research (Larsson, 1988:17). The field of Built Environment Analysis deals with relations between people, society and the built environment. It aims at developing knowledge for physical planning and building design (Thiberg, 1975). In the course of analysis, emphasis has been put on the user perspective. User perspective refers to how built space is conceived and used (Thiberg, 1982). The aim of the discipline has been to clarify the users’ demands upon their built environment.

In the 1960s, residential environment was almost the only subject of analysis. This included, for example, analysis of indoor climate, acoustics and lightning in relation to human beings, time and movement studies in dwellings, values related to residential buildings, sociological comparison of house types etc. Later on analysis of schools, hospitals, industries etc. were also subjected to building function analyses. As consciousness on the problems deepened, gradually, the activity field expanded. More conditions calling for the study of the environment than those obtainable from anthropometric studies emerged (Vestbro, 1975; Hallberg and Nyberg, 1987:1). Recent orientations clarify the field as the one, which deals with people, society and built environment with the aim to developing knowledge for physical planning and design of the built environments. This has been reflected in the current research orientations which include themes related to evaluation of the built environment in use, analysis of housing and neighbourhood typologies, information technology and accessibility in built environments and built environments in developing countries.

A triangular model has been employed to describe the relation within the field of Built Environment Analysis (Figure 1.1). In many cases, this model has been employed to explore research problems and develop explanations of the phenomena related to the built environment, people and the society.
An important perspective in all research within this field is to see the built environment as expressions of social, cultural and ecological goals. The research orientation within this discipline has been toward qualities of the built environment. The underlying assumption has been; in order to understand how the physical environment should be, an understanding on how the present environment came about and how the users wish their environment to be is of paramount importance.

This study falls well in the Built Environment Analysis tradition. It deals with the relations between society, people and the built environment. It attempts to classify urban types and analyse house forms, densities, spaces uses and spatial qualities within a non-industrialised and rapidly urbanising city context. These variables are being analysed from a user perspective. The opinions of the users obtained through interviews constitute elements of judging the spatial quality of the housing environments.

The ideology and practice that pervades physical planning in many of the non-industrialised countries seem to perpetuate borrowed concepts from industrialised countries which differ considerably in terms of prevailing peoples lifestyles and the socio-economic conditions. By this argument we note that there is gap between current planning practice and real life situation of the people whom planners and other change agents have sought to work for. It is considered that the body knowledge generated from this study will contribute towards re-orienting physical planning and the design of settlements to address contemporary needs, the same aim that underlies the field of Built Environment Analysis.

In this study, urban types have been viewed to represent the built environment. The basic assumption is that, they have a direct relationship with the people who are the producers and users of these built environments. Their evolutions and subsequent development are being influenced by among other factors, planning ideologies and policies, market forces on land and formal and informal institutionalised rules.

Of more significance in this study is the fact that a body of knowledge relating the factors for the emergence and development of urban types, space usability and housing densities and the way people utilise their built environment provide a basis for the understanding of spatial qualities in these types. Moreover, it aims at providing a basis for rational decision on design related aspects of residential neighbourhoods. Required improvements within formal and informal settlements are being discussed. This means that the analysis of urban types provide opportunities to link knowledge, design and practice which is the central concern of Built Environment Analysis. This study, therefore, strives to re-orient the thinking in planning practice as a basis for developing future urban types. The study brings to the light the discussion on the need for optimising land and usability of communal and semi-public spaces within the existing urban types. Finally, the methods employed in this study provide a basis
for analysing other built environments in other contexts that have similar socio-economic and cultural conditions to those prevailing in Dar es Salaam.

1.7 Structure of the report

This thesis has been organised into three main parts and in eleven chapters. The first part consists of five chapters namely, chapter 1 that introduces the problem area, research questions and objectives of this study. Chapter 2 discusses the theoretical framework for understanding, classifying and analysing urban types. Chapter 3 that characterises urbanisation trends and influencing factors for the growth of Dar es Salaam. Chapter 4 provides a classification of urban types in Dar es Salaam city. Chapter 5 elaborates issues of research design and the methodology.

The second part consists of four chapters of empirical investigations from the four case study settlements of Kariakoo, Mbezi, Msasani and Ubungo. These are constituted in Chapters 6, 7, 8 and 9 respectively.

The third part comprises two chapters: Chapter 10 that provides a comparative discussion in a form of cross-case analysis of issues. Finally, Chapter 11 which presents a general discussion on emerging issues from the theoretical premises and case studies. Also included in this chapter are policy and planning recommendations and conclusion.
CHAPTER TWO
THEORETICAL FRAMEWORK

In this chapter a theoretical framework for analysing urban types is reviewed. The challenge has been how to apply theories of urban types and conceptual variables developed in industrialised countries to a rapidly urbanising city in a non-industrialised country. Whereas in the former countries urban types have been largely influenced, or are a product of conventional planning approaches and principles, in most of the latter countries, the dominance of informally evolved urban types makes the direct application of these theories questionable. The second part of this chapter provides a discussion on the key concepts employed in analysing urban types.

2.1 Theoretical framework

Scientific theories are abstractions representing certain aspects of the empirical world. They are concerned with how and why of the empirical phenomena, not with what should be. They help to explain and predict about a phenomenon (Chalmers, 1999; Lundequist, 1999:29-30; Nachmias and Nachmias, 1997:35-36). A theory is a collection of concepts which together provides an understanding of how a phenomenon is built up and how it can be classified and used. Theories and concepts are tools for human thinking, in the same way as instruments are for human action. A more stringent elaboration of theory is a system in which a number of concepts and propositions have been systematically ordered. Propositions are the basis of the researchers’ attempts to understand, explain, predict and propose measures that relate the phenomenon being investigated (Lundequist, op.cit).

Concepts are abstractions of a phenomenon from which meaning or a way of seeing the world can be apprehended. Scientists begin the process of research by forming concepts as a short hand for describing the empirical world (Nachmias and Nachmias, 1997:26). Concepts provide a common language to communicate with other scientists. They give a perspective or a way of looking at a phenomenon, allow scientists to classify their experiences and generalise from them, and above all, concepts are components of theories in the sense that they define a theory’s content and attributes. Nachmias and Nachmias identify two levels of conceptual definitions, namely: conceptual definitions, which describe concepts by using other concepts and operational definitions that describe a set of procedures a researcher can follow in order to establish the existence of the phenomenon described by the concept (Nachmias and Nachmias, 1996:28-32).

Nachmias and Nachmias classify theories in four categories namely:

Ad hoc classification systems: These include the lowest level of theorising in which arbitrary categories are constructed in order to organise empirical observations. Nachmias and Nachmias exemplify that a researcher might classify responses to the questionnaire item into groups of say strongly agree, agree, disagree and strongly disagree. These categories constitute an ad hoc classificatory system because they are not derived from a more general theory of social order (Nachmias and Nachmias, 1997:41).

Taxonomies: This is the second level of theory in the categorical system. A taxonomy consists of a system of categories constructed in order to organise empirical observation in such a way that relationships among the categories can be described. The categories in taxonomy reflect the reality described (op.cit.)

Conceptual frameworks: This is the third level of theory in this categorical system. In a conceptual framework descriptive categories are systematically placed in a broad structure of explicit propositions, statements of relationships between two or more empirical properties to be rejected or accepted. Conceptual frameworks are however not established deductively. They are dependent on empirical observations in the earlier stages of theorising and research.
They are therefore limited in terms of explanatory and predictive powers (ibid.).

Theoretical systems: This one is the fourth level that combines taxonomies and conceptual frameworks by relating descriptions, explanations and predictions in a systematic manner. This is the highest level of theory and requires the most rigorous definition. It is comprised of propositions that are interrelated in a way that permits some propositions to be derived from others. Nachmias and Nachmias argue that when such theoretical systems exist, social scientists can claim to have explained and predicted the phenomena at hand.

One of the primary objectives of this study is to classify urban types and analyse their variables of density, house forms, plot characteristics and space utilisation. Since the primary aim is not to provide explanations of urban types per se, rather explore these variables within the framework of efficiency in optimisation of land and infrastructure, it seems relevant to say that taxonomies are the most important and relevant categories of a theoretical system in the classification of urban types, as they provide a basis for organising empirical results from case studies. However, in the second part of this study, where more analytic variables are demanded, conceptual frameworks become more relevant. The fact that this study is more explorative and therefore descriptive, a combination of taxonomies and conceptual frameworks seem to be of significance though not necessarily applied stringently as the theoretical systems discussed above.

Two theoretical frameworks: one on taxonomy of vernacular architecture by Amos Rapoport (1990) and that of urban morphological studies by Arne Vernez Moudon are being reviewed and their relevance for classifying and analysing urban types examined.

2.2 Theoretical framework for the classification of urban types

In an attempt to identify and classify urban types a systematic approach towards identification and categorisation of the classes ought to develop and adopt a basic system within which categories can be identified and distinguished from others. Rapoport argues that in trying to decide what something is, one is also trying to say what it is not an exercise which he refers to as a taxonomic process. The advantages of taxonomic classification are that they have heuristic value; they help order sets of complex objects and help in arriving at generalisation (Rapoport, 1990:69). Rapoport further argues that since it is impossible to talk about, or deal with, wholes, one must dismantle and decompose (before reassembling). But in trying to dismantle and assemble, one faces a problem of deciding whether particular assemblages (settlement systems, settlements, buildings and artefacts of all kinds) are similar or different and how they should be grouped (Rapoport, 1990:71). Consistent with Rapoport’s argument, Berry underscores the goal of city classification when he contends that:

…it is equally true that we would never have learned anything if we had never thought how objects resemble each other, and whether they manifest the same properties. If every object in the world were taken as distinct and unique, our perception of the world would disintegrate in complete meaninglessness. The purpose of classification is to give order to things we experience. We classify so that we may learn more about them..., the essence of the continued need is to recognise dimensions of variation, to facilitate purposive classification … (Berry, 1972:1)

Since the aim of this study is to classify and analyse urban types within an overgrown city, dismantling it into sections of similar characteristics and analysing the dismantled parts is considered important in order to grasp the variations of the city based on pre-determined classification criteria.

Amos Rapoport identifies three types of scales that are frequently used for classifications namely:

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1 Taxonomy in this study refers to the process of classification and naming up of urban types according to their similarities and differences.
• **Epistemic** (that is concerned with the properties of phenomena),
• **Genetic** (that is concerned with presumed causes of phenomena) and
• **Functional** (referring to presumed effects of phenomena).

In the case of built environments, classifications will clearly be epistemic since we are concerned with properties of the built environments (Rapoport, 1990:70). In this study the classification of urban types assumes this approach since the main ideas behind this classification focus on the properties of urban types.

In operationalising the classification, Rapoport recounts on the use of multiple descriptors so as to avoid many controversies, or at least narrow the area of disagreements. This implies that there is a need of using multiple characteristics (polythetic classification) instead of single characteristics (monothetic classification). Discussing the two types of classification Rapoport argues that:

*The distinction between them is that in monothetic classifications, the classes established differ by at least one property which is uniform among the members of the class. Polythetic taxa therefore are groups of things that share a large proportion of their properties but do not necessarily agree on any one property. This tends to negate the concept of an essence or ideal type. The corollary of polythetic classification is, therefore, the requirement that many properties on characteristics be used to classify objects. Many fields, therefore, increasingly use multiple descriptors; by using these one may avoid many controversies, or at least narrow the area of disagreement. (Rapoport, 1990:70)*

In developing urban types for Dar es Salaam, multiple descriptors are being sought. These include, for example, house forms, density, plot characteristics, spaces and space use. It has been viewed that these variables facilitate the distinction of categorisation but also adequate enough to make such categories polythetic. As Rapoport notes, it is not always possible that all categories agree on only one property, certain urban types could differ slightly on one variable such as house forms but be associated with others such as density and plot characteristics. Although some urban types can be considered as ‘ideal types’, when the whole city is subjected to this classification approach, it is assumed that these will have some slight differences in terms of their formal properties, density, plot characteristics and in some instances in terms of type of spaces. Discussing the process of classification and conflicts in dealing with ideal types, Rapoport argues that:

*... the world contains natural elements so that categorisation is not entirely arbitrary. There tend to be the central positions or ideal types. Disputes mainly occur at boundaries where things are less clear and more technical criteria (multiple descriptions and polythetic classifications) come in. The most characteristic members are the prototypes which occupy the central positions surrounded by more ambiguous members, boundaries tend to be fuzzy. In all these cases one begins with the paradigmatic example and proceeds to the more problematic cases. An important implication is that classification is essentially comparative in the sense that it is done by degree of similarity to the central position in the fuzzy set. Since one matches sets of features in the less clear-cut sets examples it follows that even the paradigmatic cases need to be decomposed into multiple descriptors. (Rapoport, 1990:71-72)*

It has been further argued that even in clear-cut cases, one needs large numbers of characteristics and tested more rigorously and if possible quantitatively instead of intuitions so as to reduce bias and facilitate comparison with more complex types. Such methods become essential when more complex or ambiguous instances or cases are encountered.

In this study, the classification of urban types has taken into account both the formal and informal settlements. While identified variables are the same for all categories of urban types, informal settlements are rather complex and present more challenges in terms of employing these variable when compared to formal settlements. Since more than one variable are being sought to characterise urban types, it has been possible to identify and classify types from informal settlements as well. Rapoport reiterates that:
No single characteristic can be sufficient for defining categories i.e. for classification. One needs a large number of characteristics and a polythetic rather than a monothetic approach. In summary this involves moving away from ‘ideal type’ definitions based on a single characteristic or a small set of characteristic deemed to be both necessary and sufficient to define the type. Rather the definition (or identification) is based on a significantly larger number of characteristics. (Rapoport, 1990:73)

Yet polythetic classification does not imply that the groups or categories fulfill all the characteristics to be a member within the groups but within a range of defined characteristics in which limits to membership of groups can be determined.

…in order to define groups, it is not necessary that every member of the group possesses all qualifying attributes. Rather, one finds a range of variations within defined limits such that each member of the type possesses a large number of the attributes or characteristics, and each attribute is shared by a large number of members of the type. (Rapoport, 1990:73.)

The process of classifying urban types involves the identification of settlements that depict similar physical characteristics within pre-defined classification criteria. The fact that the two categories of formal and informal are not totally difficult to identify, complexities emerge when variables of density, house forms and plot characteristics are brought into play as classifying variables. It seems relevant to argue that in order to benefit from the foregoing discussion, urban types should be identified using as many descriptors as possible. However, this presupposes that the scale of operation within the context is delimited to accommodate numerous descriptors. When the scale in which classification takes place extends to the whole city with numerous types (in this case the whole of Dar es Salaam city), it seems relevant to argue that a limited number of descriptors can be employed so as to facilitate classification. As Rapoport argues, the two opposing principles of classification include: first the fact that one wants each classification to be as rich in information as possible that is, one wants many categories and secondly one wants to reduce the cognitive load, therefore, one needs as few categories as possible (Rapoport, 1990:69). The fact that Dar es Salaam city is so extensive with varied urban types, the delimitation dictates the number of categories to be identified and also the details from these categories. As pointed out above, since this is an explorative study that attempts to identify and classify urban types citywide, there is a need of delimiting the number of descriptors to facilitate the carrying out of the study, especially at the city scale level.

Having developed a long list of descriptors to characterize vernacular architecture (which is not the concern in this study) Rapoport acknowledges the challenge that despite the large number of descriptors it has been difficult to analyse environments called popular suburban dwellings. Rapoport observes that:

The environments which have tended to give us most difficulty have been those called ‘popular’-suburban dwellings, roadside strips and their component elements and the like. One does not know how they fit on any continuum. (Rapoport, 1990:101)

Informal settlements that form the major part of Dar es Salaam city and many other cities in the country depict some characters that are not uniform across the settlements. In some settlements one finds consolidated patterns while in other cases sparsely built houses dominate. House forms also vary considerably. The fact that no planning guidelines have been put in place to guide housing development in these settlements indicate that house forms develop from individual’s intuitive designs and construction methods. As noted by Rapoport, unlike in formal settlements, informal settlements present a challenge in the overall exercise of identifying and classifying urban types when the exercise is pursued at city level, as is the case in this study.

Rapoport further argues that in discriminating among environments, it is not simply a matter of given characteristics being present or absent. In many cases it may be a matter of
degree, relative strength, more or less and for others some scale or, frequently, set scales would need to be developed (Rapoport, 1990:82). In this study, floor area ratio, land coverage and number of floors are being considered to characterise different categories of urban types. As shall be discussed in the subsequent sections the main variables used for classifying urban types include house forms, density and plot characteristics.

2.3 Theoretical framework for the analysis of urban types

So far a theoretical framework for identifying and classifying urban types has been discussed. However, since one of the objectives of this study is to analyse some of the identified urban types, a theoretical framework providing an account for the analysis of urban types is reviewed. The main aim being to search for relevant variables and methodological approaches that can be used in analysing urban types. One of the theoretical frameworks that is being reviewed is the field of urban forms and typo-morphological studies. Moudon provides an account of typomorphological studies as follows:

Typomorphological studies reveal the physical and spatial structure of cities. They are typological and morphological because they describe urban forms (morphology) based on detailed classification of buildings and open spaces by type (typology). Typomorphology is the study of urban form derived from studies of typical spaces and structures. Typomorphology considers all scales of built landscapes, from the small room or garden to the large urbanised area. It characterises urban form as a dynamic and continuously changing entity immersed in a dialectic relationship with its producers and inhabitants. Hence, it stipulates that the city form can only be understood as it is produced over time. (Moudon, 1994:289)

The basic premises for typomorphological studies are hinged on three main principles: The first is the understanding that urban form should be defined by three fundamental physical elements of buildings and their related open spaces, plots or lots and the streets. The second is that urban form can be understood at different scale levels namely; the building or plot, the street or block, the city and the region. The third is the question of history, that is urban form understood historically since the elements of which it is comprised undergo continuous transformation. In short, the three fundamental components that underlie typomorphological analysis are ‘form’, ‘resolution’ and ‘time’. The three variables are present in almost all studies, whether by geographers, architects and whether they focus on old or contemporary city (Moudon, 1997:7). Emerging from this description, it is apparent that the basic units of analysis of urban forms are the buildings, the plots, the blocks and at higher scale levels, the city and the region.

The limitations in this field, however, have been observed to be the segmented nature of theories for the analysis of urban forms and the lack of research application of these principles in a non-European city context (Moudon, 1994 and 1997; Rådberg, 1996). Excerpts from Moudon indicate that:

... although the concept of type is in good currency in the fields of planning and design, yet theories framing the nature, purpose and application in these fields remain vague and flawed with ambiguity. (Moudon, 1994:289)

Most urban morphological research has focused on historic European cities, despite the unprecedented expansion of cities in non-European cultures over the course of this century. This has limited the application of these studies in other countries (Moudon, 1997:9).

Rådberg observes that despite a long tradition in urban typological studies, a comprehensive theory on typology and urban quality of life is yet to be developed (Rådberg, 1996:385). In classifying urban types in Sweden, Rådberg cautions that this classification is faced with the shortfall of a comprehensive theory on typology. Rådberg contends that the great confusion in the field of quality and sustainability in urban planning stems from the fact that the theories are formulated on a very general and abstract level. He points out to the need
of empirical facts, observations, theoretical framework and systematic descriptive classification of the urban structure on the micro level in order to be able to process the accumulated information on existing urban environments (Rådberg, 1996: 385).

Three schools of thought have dominated typological and morphological studies with different philosophical and contextual approaches (Moudon, 1994). These include the Italian, the British and the French. Of interest in this study has been the search for relevant units of analysis and variables that can be adapted and employed in analysing urban types. It has been observed for example that while the main units of analysis within the Italian research tradition, have been the ‘urban fabric’ which comprises and illustrates the relationships between buildings and their surrounding spaces, the British have employed ‘plan units’, comprising of streets, buildings and lot configurations. The French have defined units of analysis depending on the scale at which typological study has been carried out, extending from buildings to cities (Moudon, 1994).

In the article ‘The Evolution of Twentieth Century Residential Forms: An American Case Study’, Moudon (1992) observes that house forms, lot sizes and street layouts define the essential elements of urban and suburban forms. Certain house forms usually correspond to particular lot sizes. Lot forms are in turn influenced by street patterns. For instance, curved streets entail non-orthogonal plots. In given areas, streets, lots and houses combine to form ‘plan units’ a term that was employed by Conzen (1960), one of the founders of the British school on morphological studies.

Of relevance from Moudon’s discussion in this study is the identified units of analysis for analysing city forms, namely: the streets, the plots and the buildings. In analysing urban types, these variables need to be considered contextually although the question that remain is the scale at which analysis can be carried out. The plan units as applied by Conzen, seem to be too large to capture variations of the interrelationships between plots, buildings and streets at lower scale level.

Based on extensive classification and analysis of urban blocks in the Swedish context, Rådberg employs land coverage, floor area ratios and building height as variables to develop a typological classification of urban types. He defines a ‘block’ as a group of buildings surrounded by the four streets and establishes Floor Area Ratio and land coverage at block level. He classifies urban types on the basis of floor area ratio, land coverage and building heights. He relates the resulting classification of urban types to different planning doctrines that pervaded town planning and which influenced the present house forms and density. In his analysis, Rådberg (1996) identifies eight urban types classified according to the variables building height, Floor Area Ratio and land coverage. The identified urban types are interrelated in a logarithmic graph that facilitates the comparison of the main variables of land coverage, floor area ratio and building heights (Figure 2.1).

The relevance of Rådberg’s analysis in this study lies in its strength to develop a typology of urban types in an analytic way. Although this analysis is typical to Swedish urban types, the method employed provides a strong basis to compare identified urban types within a single ‘model’ combining the three variables. These variables are considered useful in this study to categorise and compare urban types in Dar es Salaam. The same variables are being sought and considered to be useful in the analysis of urban types in formal and informal

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2 For detailed discussion on the philosophical aims of these schools of thought refer to Moudon (1994), Getting to Know the Built Landscape: Typomorphology, in Karen Frank and Linda Schneekloth (eds.), Ordering Space in Architecture, pp. 289-311.

3 A plan unit, according to Conzen, identifies a type comprising of types of street patterns, buildings, and lot configurations. It is similar to Caniggia’s urban fabric. Conzen and Caniggia research complement each other with Caniggia providing an approach to the definition of building types and Conzen to the type of urban fabrics (Moudon, 1994:297).
settlements.

The preceding section has provided a theoretical framework for identification, classification and analysis of urban types and variables necessary for this study. As noted above, the potential limitations in adapting these theoretical frameworks lie in the differences in context from where these theories draw their origin and the fact that generalisation across cultures with differing contexts provide a basic challenge. In this case, their applicability within the non-European city context is being tested taking cognisance of the identified limitations. In the following section, key concepts are being discussed. These include type and typology, urban type, spatial quality and informal settlements.

![Diagram](source)

**Figure 2.1: Urban density, building height and percentage of built-up area in eight Swedish urban types.** (1) High density inner city blocks, 4-6 storeys. (2) Blocks with planted inner courtyards, 4-6 storeys. (3) High rise developments, point blocks or slab blocks 6-12 storeys. (4) 3-4 storey ‘walk-ups’ (lamellas). (5) Pre-industrial low-rise traditional blocks. (6) Garden suburbs, mixed developments. (7) Small one-family houses (bungalows) on small individual plots. (8) Villas on larger plots. (Source: Rådberg, 1996:391)

### 2.4 Key concepts

#### 2.4.1 Type and typology

Type as a central concept in architecture has been discussed by many authors (see for example Lawrence, 1994; Loeckx, 1991; Moudon, 1994; Moneo, 1978; Rådberg, 1996; Franck, 1994 and Rapoport, 1990). Type as a concept refers to a kind, class, or category of people or group of objects that have certain characteristics in common, which are distinct from other groups of objects. Hence it is possible to identify objects, events and settings with specific characteristics. These characteristics underlie the general form, plan or design of each type and enable one or more to be distinguished from others (Lawrence, 1994:271). Type is not a prototype for multiplication but defined by an open set of characteristics gathered in architectural form and illustrated by different specimens. Type as a central concept in architecture is not limited to the scale of a building. Types can range from buildings to open spaces i.e. streets, squares and parks (Loeckx, 1991:72). While type refers to settings which
can be symbolised or anything with symbolic signification, the study of symbolic signification generates a typology (Lawrence, *ibid*).

Amos Rapoport has discussed type as a classificatory tool in vernacular architecture. He discusses the need and role of classification or taxonomy as a basis for distinguishing things or phenomena:

"... a category is only useful if it discriminates between A and not -A, i.e. distinguishing between A from B, C, D etc. The problem is thus one of distinguishing among things, an example of typical taxonomic process." (Rapoport, 1990: 68)

Typology has also been referred to as the logic involved in the criteria defining types (Loeckx, 1991: 72). Types are categories of places that we group together because the places are alike in some way and types are specific places that we treat as members of categories. Types organise our thinking, communicating and acting in all domains of life (Franck, 1994:345). While type has been employed in many disciplines as a classificatory tool, typology refers to the logic of information, differentiation and transformation of types. Typology as a discipline in architecture and town planning relates two or more objects both in space and time. The relational aspect of objects forms a typology. When one type is related to another, it leads to generating a typology (Moudon, 1994:305).

Rådberg discusses the usefulness of typological studies in architecture and town planning. He argues that in planning and architecture it can be useful in the following ways. As a tool for description i.e. the classification into urban types provides a basis for the description of the existing urban structure in terms of characteristic urban typologies. As a tool for analysis i.e. it can provide deeper insights into the sustainability of the different urban types when linked with environmental and socio-economic data. As a tool for planning and design, that is by providing a deeper understanding of the urban types, sustainability and quality issues, it paves way for better planning practice on both micro and macro levels of existing urban structure (Rådberg, 1996: 386).

However, the dynamic nature of rapidly urbanising cities and the relative location of urban types within cities renders urban types and typological classification tenuous. The tenuous and multiple variable nature of urban type have been discussed by Moneo when he expresses type as a concept that implies ideas of change and transformation.

"One of the frequent arguments against typology views it as a ‘frozen mechanism’ that denies change and emphasizes an almost automatic repetition. However, the very concept type, as it has been proposed here, implies the idea of change, or transformation. The architect identifies the type on or with which he is working, but that does not necessarily imply mechanical reproduction." (Moneo, 1978:23-27)

The continuous process of transformation allows the architect or artisan or builder to extrapolate from the type or changing its use. The logic of transformation of an object evokes the notions of *synchronic and diachronic* interpretation of the types. Different types can be used together to produce a new type. This indicates that categorisation has to be done taking many variables into consideration. The above discussion provides a general view as to what constitutes type. But the next question that is being raised is: What constitutes an urban type?

### 2.4.2 Urban type

Urban type as employed in this study refers to parts of settlements having a common set of physical characteristics in terms of house forms, density, spaces and plot characteristics. The conceptual and operational definitions of an urban type as applied in this study are summarised in Figure 2.2.

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4 Synchronic interpretation refers to a single moment in time –the synchronic level (syn = at the same, chronos = time). Diachronic interpretation refers to levels across time, dia = across, chronos = time (Byron, 1992).
Karen Franck discusses form in relation to places. She says that there are three attributes of place types namely form, use and meaning (Franck, 1994:346). While form attributes include all the material, spatial, structural and geometric properties, use attributes comprise all aspects of use which are sometimes referred to as function involving the performance of specific tasks that are housed by a particular type. Meaning attributes comprise the practical and symbolic messages that are conveyed by aspects of form and use or that are more loosely associated with that type (Franck, 1994:346-347).

Moudon argues that in order to characterise house forms, inventory on house forms should aim at observing and documenting house types in terms of their shapes, the major building elements and where necessary their decorative elements (Moudon, 1994:294). Formal characteristics also include whether houses are detached, semidetached, row, or high-rise buildings. The number of storeys, roof type, building materials, house sizes, and building uses are essential elements that characterise house forms. King denotes that the act of placing houses into either the same or different classes requires the selection of only those features that are seen as significant for making a distinction between them (King, 1994:130). However, the criteria used to classify and elaborate the degree of differentiation between them are obviously related to the purposes for which the categories are created. King, for example, provides a taxonomy of house types in England based on official government statistics as detached houses and bungalows, semidetached houses, terraced houses, flat and maisonettes and other accommodations (King, 1994:131).
In this study, house forms are being considered not only as exemplars in the classification of urban types but also as analytic variables of the urban types. Pertinent questions that warrant investigation are: What are the dominant house forms prevailing in formal and informal settlements? How significant are house forms in defining urban types? What socio-economic features have influenced the development of these house forms?

Density

There has been varying perceptions among scholars and authors to the concept ‘density’. These perceptions stem from the varying fields of discipline from which density draws its meaning. Density has been studied extensively from many perspectives including – physical, psychological, social and environmental (see James, 1967; Rapoport, 1975; Correa, 1985; Newman and Kenworthy, 1989; Hutchson, 1992; Burton, 1992; Breheny, 1992; Banister, 1992; Jelinek, 1992; Alexander, 1993; Delta Foundation, 1998; Churchman and Mitran, undated; Acioly and Davidson; 1996; Rådberg, 1996; Mahbubur, 2001 and Arenas-Gomez, 2002). In the field of planning, a misunderstanding arises because of the several kinds of density used such as neighbourhood density, net density, gross density etc. (James, 1967:552 and Alexander, 1993). Another ambiguity arises from the use of the concept without clearly defining it. Mitran and Churchman argue that in many studies, density has been referred to as “high” or “low”, without a definition of what is a high or a low one. As a result these studies have not built up a sufficient body of knowledge or a comprehensive theory about the meaning of residential density (Mitran and Churchman, undated). This argument has been also raised by Correa who contends that:

...the old indicators of so many square metres of open space per 1000 persons are too simplistic and crude; we have got to desegregate these numbers, both qualitatively and quantitatively in order to anticipate their real usefulness. Estimating accurately the production costs of these various spaces involves examining the relation between building heights and overall densities, since the latter is the key determinant of infrastructure costs at the city scale. (Correa, 1985:39)

High and low densities are relative measures. They differ between countries and communities, and they are dependent on which perspective density is being discussed. Comparison in density especially perceived density is complicated, since impressions and personal judgements are different. Ernest Alexander argues that there is no simple, clear definition of perceived density. Rather, it is a complex concept involving the interaction of perception with the concrete realities (Alexander, 1993:183). But the central question in this study is how density can be used as an exemplar and as an analytic tool of urban types and a measure of optimal land and infrastructure utilisation.

Density has often been referred to as a degree or intensity of development or of occupancy. Conventionally, urban densities have been defined from two perspectives; of population and physical density. While population density has been referred to as the number of persons per unit ground area of development, physical density (sometimes referred to as objective density) has been examined as land use ratios. In housing and urban design, density has been measured in terms of floor area ratios, plot coverage and dwelling units per specified area (Alexander, 1993). Accommodation density in housing has been expressed as the number of inhabitants per unit of habitable space. Floor Area Ratio is a unit of density referring to the floor space in relation to plot or land area. Most of the space standards used for commercial or shopping areas, residential, institutional areas etc. are based on this unit of density. James has defined physical densities in relation to urban planning and design. He discusses four categories of density, these are explained in brief as follows:

Town or overall density: that refers to population related to all urban activities and uses of the whole town.

Gross density: This is the population or built space or floor area divided by all the land
covered by dwellings and gardens, roads, local shops, primary schools and most open spaces but excluding urban uses such as secondary schools, town parks, and town centres. Gross density is an intermediate environmental measure linking dwellings with the sort of facilities one would normally be able to walk to (James, 1967:552).

**Figure 2.3: Gross Density. (Source: Gómez Arenas, 2002)**

*Net density:* This is the population or built space (in terms of houses, habitable floor areas spaces) divided by the land covered by dwellings and their gardens, any incidental open space (e.g. children’s play spaces, or parking space for visitors) and half the width of surrounding streets but excluding local shops, primary schools, open spaces and other types of development (James, 1967:552). When the total built up area is divided to the land covered by buildings, the result is a Floor Area Ratio (FAR). In a similar way land coverage at block level can be established.

**Figure 2.4: Net density. (Source: Gómez Arenas 2002)**

*Site/ plot density:* This refers to the density on a specific site excluding public roads and public open space (Units/hectare).

**Figure 2.5: Site Density (Source: Gómez Arenas 2002)**

Rapoport has criticised the simplified approach to density by arguing that density viewed as a matter of number of people per unit area is not a very useful concept (Rapoport, 1975:133). Rapoport argues that density and dense environments should be discussed and
judged from cues based on the following factors: **Perceptual** (such as whether there are or no tight or intricate spaces, large building spaces, large building height to spaces), **associational or symbolic** (for instance the presence or absence of, tall buildings or apartment buildings, absence of private gardens). **Temporal aspects** (such as fast tempos and rhythms of activities), **physical** (the presence or absence of ‘defenses’ allowing the control of interaction, levels of attractive stimuli and to places for use such as streets, meeting places etc). **Social cultural** (such as levels of social interaction and feeling of control). Based on these parameters, Rapoport notes that environments having the same number of people may therefore have different perceived densities and it may even be argued that areas with fewer people may be perceived as dense (Rapoport, 1975:133-141). Density as a perceived variable within built environments has been often employed to assess spatial and environmental qualities of places. Gewirtzman, Burt and Tzamir argue, most times people see low perceived densities as one of the characteristics of a high quality environment (Gewirtzman, Burt and Tzamir, undated pp.4). It follows from this argument that perceived higher densities characterise low quality environments.

Although Rapoport’s and Gewirtzman’s arguments on density offer a wide perspective from physical settings to perceived experiences of density, the central question is how we can operationalise density that facilitates the analysis of urban types and evaluate spatial qualities in formal and informal settlements.

Alexander argues that while individual cognitive factors provide a wider thinking on density as a concept, what determines density that is perceived by people is the physical density of that built environment (Alexander, 1993:184). Further, Alexander argues that physical density is made up of those objective and physical characteristics of the setting and its users that contribute to perceived density. Emphasising physical density and house forms, Alexander argues that:

...dwellings form is important in relation to density measures and their effect in urban form. All variables affecting residential densities are mediated by dwelling form but this does not mean that there is one-to-one relationship between densities and house forms. Rather some house forms are more closely related to specific ranges of net dwelling densities and gross residential densities and some are less so. (Alexander, 1993:196)

Commensurate with Alexander’s argument, Acioly and Davidson contend that:

The size of the plot, the amount of plot which can be built up (plot coverage) and height of the building (floor area ratio) give the dimension of the most visible aspect of density: the amount of space which is built. This is what designers determine in the design phase which officials can control in planning and building permissions and in development control but which does not necessarily guarantee success, since density is sensitive to external factors, such as land, and housing policies, real estate market development etc. (Acioly and Davidson 1996:7)

In this study, net physical density (floor area ratios and land coverage plus half the width of the surrounding streets) has been employed to identify, classify and analyse urban types for two reasons. First, this is due to the fact that although people evaluate their environments as perceived, it is the net physical density that provides a basis to objectively assess spatial and environmental quality of a place. Second is that the study theme and empirical observations put emphasis on the physically built part of urban types focusing on urban blocks, plot and building sizes. Net density is of great relevance because it shows the actual intensity of development of the settlement at a lower scale levels (block level). But the ambiguity and challenge of applying net density is how to calculate net densities where boundaries are not clear. In situations like in informal settlements, where streets are irregular and unevenly distributed, this ambiguity is further complicated because the conventional definition of net density seems to be biased to settings with well-defined streets and spaces.
Commensurate with this study, the following questions are being explored: What are the prevailing physical densities for urban types in formal and informal settlements? Which urban types in formal and informal settlements could be considered dense for optimal utilisation of land and infrastructure? Does higher density urban types construe decreasing spatial and liveability qualities?

**Spaces and space use**

Trancik defines a physical space as a bounded or purposeful void with the potential of physically linking things and it becomes a ‘place’ when it is given contextual meaning derived from cultural context, cultural meaning human use of space over time (Trancik, 1986:1129). Two spheres of urban spaces can be distinguished, namely, internal and external spaces. An external space is an open, unobstructed space for movement in the open air with public and semi-public zones (Krier, 1979:17).

Other authors discuss and classify spaces in different perspectives. Rapoport, for example, classifies spaces into groups such as designed and non-designed, symbolic, behavioural and perceived space. Other categories include experiential space or sensory space, cognitive or cultural spaces and social spaces (Rapoport, 1970:47-50). Rapoport however cautions that the above classification ought to be put into context and any meaningful evaluation on spatial qualities should be linked with the use of such spaces. While Rapoport’s categorisation seems to be abstract, Gehl categorises spaces into scale levels in relation to use aspects starting from the private residence with a private outdoor space such as a garden or a balcony. The second level comprises the public spaces in the residential group of houses that are publicly accessible but because of close connection to a limited number of residences such a space will have a semi public character. Communal spaces in the neighbourhood are somewhat more public while the city’s town hall square is totally public space (Gehl, 1987:61).

Discussing quality and use of spaces, Gehl links outdoor spaces with activities that take place therein and the quality of the physical environment. He contends that the physical environment influences the use and mix of outdoor activities. He identifies three basic types of outdoor activities, namely: necessary activities, optional activities, and social activities. While necessary activities require someone to participate under all conditions, optional activities are those pursuits that are participated in if there is a wish to do so and if time and place make it possible. Social or resultant activities are those activities that depend on the presence of others in public spaces\(^5\). Gehl’s general proposition as regards these activities is that as the outdoor spaces are improved in terms of ‘quality’ both optional and social activities increase substantially. Further, he makes an assumption that social activities are indirectly supported whenever necessary and optional activities are given better conditions in public space. Social activities occur spontaneously as a direct consequence of people moving about and people being in the same spaces.

Gehl’s propositions on the relationship between outdoor spaces and occurrences of activities has been criticised by a number of authors. Kokuleraj, for example, argues that Gehl’s study is based on cities in European context with less relevance to cities in so called ‘Third World’ countries. Further, Kokuleraj argues that the term ‘good quality’ is arguable, subjective, apart from the fact that it is context specific (Kokuleraj, 1990:85). While this

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\(^5\)Necessary activities as illustrated by Gehl include such activities as going to school, or to work, shopping, waiting for a bus, or a person, running errands and distributing mails. Optional activities include taking a walk to get a breath of fresh air, standing around to get fresh air or sitting and sun bathing. Optional activities take place only when exterior conditions are optimal and when weather and place invite them. Social or resultant activities include, for instance, children at play, greetings and conversations, communal activities of various kinds and passive contacts such as seeing and hearing other people (Gehl, 1987:13-14).
critique remains valid, the relevance of Gehl’s proposition in this study is on the preconditions for effective use of spaces or rather spatial quality requirements for a number of outdoor activities.

This study analyses the quality and use of outdoor spaces that are essentially divided into two main categories, namely, the streets and the squares. Their definition can be described by the functions that take place in these spaces. While conventionally streets harbour activities like travelling, shopping, and selling goods, squares are functional areas for recreation, leisure sporting events etc. However, variations in use will differ from one context to another. In tropical climates like Dar es Salaam, where outdoor living is very important, in this study analysis of how the outdoor living requirement influences space uses in communal and semi-public spaces is being made.

The aim has not only been to classify and define spaces, but rather to qualitatively and quantitatively assess utilisation levels and spatial qualities in these spaces. Specific variables in this analysis include: the type of space, dominant use, activity categories of space, type of users, activity diversity and activity intensity of space uses. While activity diversity refers to the number of the many different types of activities taking place in an open space, activity intensity refers to the number of users per square area (metres, hectares, etc.). Activity intensity as applied in this study implies the degree of utilisation of space.

**Plot configuration and characteristics**

The size and shapes of plots play an influential role in the definition of urban types since they finally determine the amount (size, coverage, floor space ratio and orientation) of buildings that can be built up. Acioly and Davidson argue that plot size is a culturally bound phenomenon and therefore varies from country to country. Empirical studies show increasing trends in plot size from Asian, Latin and Southern American countries with the largest plot sizes recorded in many African countries (Acioly and Davidson, 1996:16). Further to these observations, Acioly and Davidson discuss the impact of narrow plots with respect to ventilation and ensuing house types and forms. They argue that:

*The narrower the plots the more will fit in a particular cluster pattern which is often pre-defined by urban design regulations. Narrow plots impose design and usually imply very narrow houses, narrow rooms with a housing expansion towards the backyard, especially if minimal setbacks to allow circulation, ventilation, light and rainwater catchment are respected.* (Acioly and Davidson, 1996:16-17)

In informal settlements where plot dimensions and size are determined by informal transaction of the land market, formal urban design regulations might not have a significant influence on the ensuing types of plots and houses.

Carlos Barquin et al argue that the single most important planning decision in designing sites and services projects has probably been the determination of the area of the plot. They argue that plot areas vary widely from region to region, from as small as 18 square metres in India to more than 100 square metres in Africa and South America. There have been little agreements as to what constitute an optimal or even a minimal plot size. Whereas public authorities have responded to the high cost of land and infrastructure justifying the reduction in plot sizes, critics of small plots have pointed out that the larger the plot the greater the economic benefit to the owner and over time, one can improve and invest in his or her home. It has also been suggested that plots in ‘slums’ and informal settlements are frequently larger than those found in formally planned sites and services reflecting the higher priority that users themselves put on plot size (Barquin et. al. 1986:3).

In rapidly urbanising cities like Dar es Salaam where conventional planning is having limited influence over the sprawling city and of the ensuing urban types, a study on the evolutionary nature of plots and plot characteristics is much more demanding in terms of
investigating how plot subdivision evolves and in search for optimal plot sizes that will provide a basis for addressing apparent problems of city sprawl.

Characterising plot in low-income settlements in India, Carlos Barquin et al. employs the variables of plot area, plot ratio and exposure to analyse the structure and development pattern of these settlements. Plot area simply refers to the size of the plots and enables one to assess variations across settlements, while plot ratio refers to the proportion between the width and depth of the plots. Plot ratio indicates the basic shape of the plots. The underlying assumption of plot ratio has been that the more the ‘squarish’ shape, the less effective the layout in terms of infrastructure utilisation since fewer houses will have access to these infrastructure lines.

Barquin et al. analyses plot exposure in the Indian low-income context with relatively small plots sizes ranging from 15 to 37 square metres and observe:

When plots are very small (smallness will depend on market demand, user perceptions and living habits), the plot is entirely built over. This phenomenon occurs in many countries where owner builders inevitably build over space that was intended for patios and courtyards. This is certainly the case over low-income urban settlements in India. In a house that entirely covers the plot, the only possibility for door and windows will open on those sides of the plot that are adjacent to unbuilt public open space. Hence the importance of exposure as a measure of amenity. (Barquin et al., 1986:7)

Plot exposure refers to the number of sides the plot or building has that are contiguous to public open spaces or streets. In hot humid climates like Dar es Salaam and in settlements where plot coverage is so high, plot exposure facilitates cross ventilation, sunlight, view and where applicable outdoor space for outdoor activities or living. Plot exposure as employed in this analysis explores this variable as a measure of amenity.

As far as analysis of plot configuration and characteristics are concerned, a number of questions bear examination. How do plots evolve and get transformed over time? What are the variations of plot sizes in formal and informal settlements? How do these variations influence urban types and spatial qualities? Are plot sizes and plot ratios consistent with ideas of optimal land and infrastructure utilisation?

2.4.3 Spatial quality

In cities located within hot humid coastal tropical climates like Dar es Salaam, the quality of dwelling environments is mediated by the way houses have been organised to facilitate maximum cross-ventilation and comfortable use of indoor and outdoor spaces. The presence of shades from plants as protective mechanisms from extreme weather conditions is of vital importance to improve the microclimate and enhance comfort living within and outside the dwellings. Kyhn notes that:
For people in the tropics, it is normal to eat, cook, work and play outdoors and to seek shelter of a house only when the need for privacy demands it, and thus the treatment of the adjoining ground should be seen as an extension of the homes. Outdoor life in a warm humid climate is only pleasant if there is a breeze, shade and protection from rain. (Kyhn, 1984:54)

Kyhn argues further that to maximise the breeze there should be no enclosure wall at all. While perforated fencing or screens that obstruct vision may be used, fencing that obstruct air movement should not. Freely grouped houses should be encouraged to make them ‘wind transparent’. With regard to the significance of shade trees, Kyhn notes that:

*Roof overhangs, verandahs, partios and covered passages are welcome but the best is a shade from a tree. Shade tree filters the sunlight, reduce air temperatures by evaporation, protect smaller plants and on the ground reduce glare from bright overcast skies.* (Kyhn, 1984:54)

Similar conclusions have been made by Nnkya when she characterises design for comfort in the coastal tropical climate:

*A combination of high temperatures and high humidity causes permanent discomfort. However, the monsoon and local winds produce a cooling effect to some extent. Maximisation of cross-ventilation indoors and outdoors is thus important. As much as wind or air movement as possible should be directed through indoor spaces and outdoor activities located to utilise breezes.* (Nnkya, 1984:79)

With regard to in-door comfort, Kyhn observes that comfort is largely dependent on the control of air movement and radiant heat, the prevention of solar radiation from reaching the building’s occupants directly through doors or windows or indirectly by heating the structures. These requirements point to the need for light, well insulated construction of walls and roofs, reflective surfaces, correct shading and design for good breeze penetration.

It is imperative from the foregoing that spatial qualities both indoor and outdoor are primarily dictated by the degree of exposure to cross ventilation and shade from trees to buildings and outdoor spaces. However, one of the key parameters in achieving this has been how buildings have been organised and the internal design of buildings themselves. Too compactly laid down houses with double banked house types have poor qualities in terms of facilitating cross ventilation. This study endeavours to analyse spatial qualities in relation to variables of cross ventilation, views and the relative quality of in-door outdoor relationships, degree of exposure of buildings, sun lighting and generally environmental qualities related to issues of amenity and infrastructure components.

As regards spaces, Amos Rapoport discusses spatial quality and relates it with space use. He argues that owing to the multi-faceted meaning of space, any attempt to evaluate spatial quality will also have variable meanings. However, he contends that spatial quality becomes a meaningful concept when it is related to space use.

*...space as perceived is variable in many ways. It seems intuitively likely that the definition and evaluation of spatial quality would equally be variable - or more so since this involves values and ideas of the good life held by different groups. Good space in good environment is a function of a given context. For a member of a culture which evaluates space primarily as religious space, for example, criteria which we may value highly may not be relevant. Spatial quality becomes a meaningful concept only when related to definitions of space use.* (Rapoport, 1970:51)

Further, Rapoport argues that the first problem in characterising space and therefore deciding whether such a space is good or bad is the difficulty of defining it or rather deciding about the kind of space we are dealing with (Rapoport, *ibid.*). But the question to ask is: What are these requirements to characterise effective utilisation and analyse quality of spaces?

Related to this argument Gehl (1987) enumerates quality demands for effective space utilisation with regard to space use activities such as walking, standing and sitting activities as
follows:

**Quality requirements for walking.** These include quality of pavement materials and street surface conditions. In situations where the degree of crowding can be determined freely, the upper limit for an acceptable density in streets and sidewalks with two way pedestrian traffic appears to be around 10 to 15 pedestrians per minute per metre. That people tend to take direct and shortest routes - diagonal routes are more preferred. Usually pedestrians tend to walk at the edge of open spaces to enable them experience the street facades and the open spaces (Gehl, 1987:136-147).

**Quality requirements for standing.** Standing activity should be linked with the concept of staying. Standing reveals stationary activities in a public place. People will prefer to stay for residences at niches in the facades, recessed entrances, porches, verandas and planting in the front yards. Availability of standing supports such as bollards facilitates longer stays (ibid.).

**Quality requirements for sitting.** The type of seats is a determinant factor in the choice of a place to sit. Benches or chairs sometime referred to as primary seatings are essential requirements for being able to sit. A seat ought to be easy to sit on and comfortable to sit for a long time. Secondary seating in the form of stairways, pedestals, steps, low walls, boxes and so on are needed when demand for seating is particularly great.

**The question of protection.** Protection in the uses of spaces can be viewed from two perspectives, namely, protection against crime and other vices and protection against unpleasant or extreme weather conditions. It has been argued that if there are many people on the street there is considerable mutual protection (Newman, 1973:78-80; Gehl, 1987). The feeling of uncertainty and risk underlies the heavily traffic jammed streets and low-density settlements. Unpleasant weather varies from area to area and country to country but more important is the protection from negative climatic conditions such as excessive solar radiation, heat and rainfall.

Spatial quality as applied in this study refers to the basic pre-requisites for effective use of spaces. It refers to the necessary pre-conditions to evaluate utilisations of outdoor spaces and liveability qualities within identified and selected urban types. Although these variables as developed by Gehl draws their relevance to many European cities as a reaction to ‘functionalism’ and increasing car traffic that dominated city planning and development in the 1960s and 1970s, their relevance in this study lies in the pre-requisites criteria to assess quality of spaces. The argument here is that irrespective of the context, there are basic requirements within spaces that facilitate effective utilisation of such spaces. If such requirements are missing, then utilisation of spaces becomes poor or unconducive. It is from this understanding we extrapolate the applicability of these pre-requisites within Dar es Salaam city context.

### 2.4.4 Informal settlements

There has been a growing concern and debate among scholars and researchers to the concept ‘informal settlements’. The term ‘informal’ was already in academic debate since the 1970s when Sarin argued that informal implied to the existence of ‘duality’ in the socio-economic structures of urban societies but also was employed to contrast ‘traditional’ versus ‘modern’ sectors. While traditional represented the most un-organised social and economic activities ‘modern’ was considered as an indicator of development (Sarin in Huque, 1982:44). In legal terms and with reference to settlements, Sarin implied activities or settings which remained outside the institutionalised norms and regulations as well as services (ibid.). Thus, the term ‘informal’ evoked the notion of being outside of the legal procedures. Quoting the International Labour Organisation’s (ILO) report that discusses informal sector activities, Mboya and Bagachwa (1996) define the informal sector as follows:
...a set of activities that operate largely outside the system of government benefit and regulation. The informal sector is characterised by the following features: ease entry, reliance on local resources, family ownership, small scale operation, labour intensive adopted technology, skills acquisition outside the school system and unregulated and competitive labour markets. Other features include untaxed except through licensing and unprotected and unassisted by public policy. By implication, the formal sector activities, according to this view, are the opposite of informal sector activities. (Mboya and Bagachwa, 1996: 70-71)

In the field of Built Environment Analysis, informal settlements could be referred to as those housing areas developed out of official practice or procedures that govern the development of settlements, that is, the areas which have developed before the land is ‘planned’ and surveyed. Further, by implication, it refers to settlements where it is easy in terms of land acquisition and relaxed housing development conditions. It refers to settlements where stringent housing regulations are not effectively enforced.

Due to the varying contexts, the difficulty of getting a unanimously acceptable and generalisable concept of informal settlements has become manifest. Huque for example argues that different authors have used different terms in an attempt to define types of ‘slums’ and ‘squatter settlements’. Although the list can be made long, none of these terms can be used to cover all the different types of settlements at different settings (Huque, 1982:31).

One of the notable aspects under the concept informal settlements has been the conceptual shift in the thinking over time. Huque, for example, shows that:

…the perspective from which the phenomenon of slums and squatter settlements is now envisaged by the analysts departs considerably from that of the past. (Huque, 1982:33)

While in the past informal settlements received a negative view, the thinking in the 1970s changed viewing them as organic or naturally planned settlements with a basic force which tends to model them into the same system of planning. In other reports they have been described as autonomous housing areas that open new needs and opportunities, settlements conforming to needs and priorities of the population accommodated, urban bridgeheaders and consolidators (Huque, 1982:35-42). With respect to these shifts, in some countries, such settlements have tended to improve over time with tendencies towards formal settlements, a process that has been considered formalisation of informal settlements. By implication this means that the informality of settlements is a temporal aspect that changes both in space and time.

Characterising informal settlements in Tanzania, Kombe argues that although informal settlements could be considered to embrace all those settlements developed outside official urban land development process and procedures, the importance and meaning of informality should be focused on the development process of these settlements. He reiterates that:

... instead of putting emphasis on legality matters of these settlements, we need to underscore the process of development to explain informal settlements in Tanzania. Unlike the term ‘squatter

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6 Planned land in this respect denotes the physical subdivision (layout of an area) followed by cadastral surveys.

7 Huque discusses different names that have been conventionally used to depict these types of settlements. These names include: squatter settlements, autonomous settlements, spontaneous settlements, shantytowns, pirate towns, informal housing, non-European housing and slum.

8 The concepts urban bridgeheaders and consolidators were introduced by John Turner referring to informal settlements as entry points for rural migrants into the city and places where households that have stayed for a relatively longer time get consolidated in terms of housing provision, access to income generating activities or employment respectively.
settlements’ the emphasis here is not the illegality of land ownership or occupation but rather on the nature of land development process. (Kombe, 1995: 241)

Figure 2.7: A typical cluster in Manzese informal settlement. Manzese is the largest informal settlement in Dar es Salaam. Note the organic pattern of street layout that characterise many informal settlements in Dar es Salaam.

Hence informal settlements in this context reflect the character of areas emerging from informal land development processes. This means that aspects of illegality of land ownership to people, who have developed their houses over pieces of land, are less significant in this context. Further, it means that in this case generally there is no threat to evict people who have built their houses on such lands contrary to other many countries with private land ownership and repressive policies towards informal settlements.

In his seminal study, Formal and Informal Land Management in Tanzania, Kombe argues that informal settlements viewed as unorganised, unserviced and with lack of tenure rights, is misleading and rather an extreme generalisation that does not reflect the differences and realities happening in these settlements. He argues that:

...most of the literature on informal settlements disregard the heterogeneous nature of informal settlements and leads to incomplete descriptions. In other words, characterising informal settlements as areas which have insecure land tenure and are unserviced, unstructured or uncontrolled seems to be an extreme generalisation. (Kombe, 1995:185)

From case studies Kombe shows that informal settlements represent some kind of socially recognised tenure arrangements and in some cases grassroots efforts pioneered by local leaders have led to some kind of regularised settlement patterns. This suggests that there is some kind of informal planning that has been operative. Local leaders together with residents use

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9One aspect that ought to be considered in this respect is the status and legislative arrangements of land ownership in respective countries. In Tanzania, the government officially owns land. Private land ownership was abolished immediately after independence, in the early 1960s. Therefore ‘squatting’ on public land, I consider here to have lesser consequences than on private land. Coupled with ‘soft’ policies over these settlements, the resulting structures that developed in these settlements are relatively ‘permanent’ when compared to similar structures in other countries.
local rules which ensure that communal spaces and public access areas are respected and preserved. Though limited in terms of scale and capacity to operate, community efforts have made notable results in the provision of some services. Commenting on what they call ‘social regularisation’, Kombe and Kreibich reiterate that:

... even though the informal land access and development system is essentially market led and pioneered by private actors, it is not anarchic. Normally the informal sector operates with some norms and procedures which have been developed at the grassroots in order to provide a minimum of security of individual property rights. Often the sector is even co-operating with the formal institutional structures available. (Kombe and Kreibich, 2000:33)

In Tanzania, there is a resemblance in terms of physical character of building forms in formal and informal settlements. Although many of the informal settlements lack basic infrastructure services such as streets with a large number of houses having no vehicular accessibility, there is a similarity of houses in terms of building materials and the quality of houses in these settlements. The argument here is that despite some settlements being informal, good quality houses can be found in these settlements that are comparable to those in formal settlements. This illustrates the value people invest in housing irrespective of the tenure rights to land. It also illustrates the supportive government policy towards these settlements.

This study endeavours to examine the processes of informal settlement development in relation to inherent spatial qualities. Owing to the fact that housing development in these settlements is not guided by official planning procedures, it is of interest to explore how the settlements densify and acquire certain physical characteristics such as plot sizes, shapes, coverages, density and whether spatial qualities are maintained. The question of planning intervention in these settlements is also examined to assess its effectiveness as a tool for regularising and formalising informal settlements.
CHAPTER THREE

URBANISATION AND SPATIAL GROWTH IN DAR ES SALAAM

In the preceding chapter, a theoretical framework for analysing urban types has been presented. In this chapter, four main issues are being discussed, namely: urbanisation trends in non-industrialised countries and its consequences to urban management, the influence of urbanisation on spatial growth of Dar es Salaam, colonial legacy and urban master planning and their influences on the ensuing urban types and the impact of informal settlements to the urban types and the city structure of Dar es Salaam.

3.1 Urbanisation trends in non-industrialised countries

Although the concept ‘urbanisation’ has been invariably discussed from several perspectives, there seems to be an agreement on certain variables that characterise urbanisation. These variables include: demographic changes, concentration of economic activities within limited geographical space which are presumably triggered by industrialisation, spatial expansion of settlements and changes in people’s lifestyles. Unlike in industrialised countries where urbanisation was fuelled by industrialisation, the kind of urbanisation experienced in many of the non-industrialised countries portrays the character of rapid population increase and the uncontrolled expansion of cities with limited economic or productive bases. In most of these countries, cities are growing at unprecedented rates resulting from inherent demographic changes, namely, natural population growth and immigration. Thus, the main features that characterise urbanisation in these countries and more specifically the sub-Saharan Africa include: sprawling cities beyond the limits and capacity of local authorities to provide basic infrastructure and social facilities, rapid increase of unemployment and urban poverty, growth and expansion of informal settlements, deterioration of existing infrastructure and social services, proliferation of the informal sector and growth of non-urban activity sectors such as urban farming (Habitat, 1996:87-93). This kind of urbanisation is taking place amidst abject poverty, a situation that has been called by some authors, urbanisation under poverty. Accentuating this phenomenon, Lupala argues that:

Rapid urbanisation in developing countries is taking place in widespread poverty. It is currently estimated that about 50% of the urban population in sub-Saharan Africa are living below the poverty line. Nearly a third of the people in developing countries, most of who are in sub-Saharan Africa are not expected to survive beyond 40 years. (Lupala, 2001:2)

It has been noted that the rate of city expansion in these countries exceed far more than what industrialised countries went through in the 19th century when most of these countries experienced rapid urbanisation as a result of industrialisation (ibid.). Since the 1950s, the urban population in non-industrialised countries quadrupled, from about 300 million to 1.3 billion in 1990 (Kombe and Kreibich, 2000:2). By the end of this decade it is expected to rise to 2.7 billion and to 3.5 billion by the year 2020 (ibid.). Kombe and Kreibich further note that, globally, each year some 12-15 million urban households are added. In heavily urbanised parts of Latin America (Argentina, Chile and Brazil), 75% of the population already reside in urban centres. The urban growth rate in these countries is around 2% per year. In recently urbanising countries of North Africa and South East Asia (e.g. Malaysia and Philippines), 40-60% of the population is urban and the growth rate seem to have increased and are likely to slow down to 3-4% per annum (op.cit.). In mostly rural Asian countries (India and Indonesia) urban growth is
expected to be maintained at 3-4%. In South and East Asia alone, it is forecasted that by 2025, there will be 20 megacities, that is, cities with over 10 million inhabitants (Kombe and Kreibich 2000:2). Of all the continents, Africa is setting a pace of rapid urbanisation by historical standards. In rapidly urbanising countries of sub-Saharan Africa, however, urban growth rates are expected to continue in the order of 4-7% per year. Already as of 1990, nearly 30% of the African population is urban (Dillinger 1994). Many African cities will double or even triple their urban population in 10-20 years (World Bank estimates 1993). For instance, the conurbation around Lagos could boast of 24 million inhabitants by the year 2015 (Kombe and Kreibich, ibid.).

With regard to built up areas, it has been estimated that since 1970, the built up areas of the cities in these countries have been doubling every 15 to 20 years. Between 1975 and 2000, when the annual average population increase of urban areas was 56 million, about 267,000 hectares of land were transformed from peri-urban and rural lands to the urban fabric (UNCHS, 1999 in Lupala, 2001). Further, estimates show that in the 21st century, urban population is projected to increase by 86 million persons per year. About 410,000 hectares of land will be converted from peri-urban and rural lands to urban fabric (Lupala, 2001). Dowall and Clark (1996) in (Lupala, 2001) cite some specific examples on this challenge. For instance, large cities in developing countries like Cairo, Mexico City, Jakarta, Sao Paulo, Bombay and Bangkok are converting their peri-urban zones between 3,000 and 5,000 hectares to urban uses each year. In the last two decades the Indian urban areas transformed 600,000 hectares of peri-urban agricultural lands into urban uses or enough space to accommodate twenty new cities of the size of Bombay. In Bangkok, between 1984 and 1988 urban growth required 3,200 hectares of peri-urban agricultural and rural lands per year and 2,400 hectares of land per year within the same period for Karachi. Similar trends are observed in most African cities and in small and medium-sized Asian cities such as Bangalore (ibid). These rates of increase in land demands for residential, industrial, commercial and community services have few precedents in the history of countries in developing countries.

The rate at which population is growing in these countries raises a major concern on how urbanisation can be sustainably managed. Recent studies show that between 30 and 70 per cent of settlements in these countries have grown in an irregular manner (informal settlements) because the development has not been authorised or registered by the government or the development of the area had not been consented by the government (ibid.).

One of the most disturbing outcomes of rapid urbanisation in these countries is not only the declining capability of most governments to provide basic infrastructure, but their inability to manage land development in rapidly growing towns and cities (Kombe and Kreibich 2000:1). Most worrying has been the rapid urbanisation that is driven by widespread poverty and stagnating poor economies. The consequences of this type of urbanisation have been directly related to the burgeoning informal sector and proliferating informal settlements. This environment has crippled effective urban management in most of these cities. As the intensity of urbanisation processes increase in the consolidated parts of the cities, particularly housing densification, new development tends to overspill into the peri-urban zones where buildable land is available and affordable by the poor. Confronted with decreasing financial and administrative resources, institutional decadence, political instability and severe problems in the inner cities and the fact that low-rise low-density characterise housing development in these peri-urban areas, the public sector in these countries is increasingly becoming unable to manage informal housing development processes and city sprawl.
3.2 Dar es Salaam: A rapidly urbanising city

Dar es Salaam is one among many cities in the sub-Saharan Africa that are experiencing rapid urbanisation. Historically, Dar es Salaam is relatively a new city that emerged during the second half of the 19th century. It grew into an administrative and commercial centre during the German and British colonisation of Tanganyika. Therefore, it is not as old as the historic stone towns of East Africa.

Unlike the old East African coastal towns of Kilwa, Zanzibar, Mombasa, Lamu and Malindi, Dar es Salaam is a relatively new town of the 19th century. Dar es Salaam was established as a port and trading centre by Sultan Seyyid Majid in 1862. (Kironde, 1994:82)

Many other African cities that have grown as important cities or capitals emerged in the same period as Dar es Salaam.

... in the first place, a great number of cities became important during the colonial and post-colonial periods simply had not existed before the colonial rule. A city like Nairobi was established on open plain in 1899. Harare, the capital of Zimbabwe was founded in 1890, Abidjan was established in 1891 and Johannesburg in 1866. (Habitat, 1996)

When the Germans took over Tanganyika in 1891, Dar es Salaam was just a small settlement with a population of about 4,000 inhabitants (Kombe, 1995:10; Sutton, 1970). In the same year, the Germans shifted the capital from Bagamoyo to Dar es Salaam. Due to increased trade and importance, that is the establishment of port facilities and administrative activities in the city, more migrants were attracted and the population increased to 10,000 inhabitants by the year 1894. Six years later, the population had reached 20,000. Population growth slowed down over the war periods (World War I and II) and a steady increase was notable after the 1950s. A faster growth was noted after independence mainly because of the abandonment of the policies that inhibited Africans from migrating to towns. By 1948, the population had increased to 69,277. The population for Dar es Salaam had reached 782,000 by 1978 (Figure 3.1). While in 1992, estimated population for the city was pegged at 1,550,000 inhabitants, current estimates stand at 3,000,000 people (Lupala, 2001).

Whilst the city spatial expansion has been growing at an average rate of 7.2%, the annual average growth rates of population for inter censal period has been also high. For example, the average annual growth rate between 1948 and 1957 has been established to be 7.1%. This figure increased to 7.8% between 1957 and 1967 and further to 9.7% between 1967 and 1978. The growth rate slowed down to 4.8% between 1978 and 1988 but sharply rose to 9.1% as estimated between 1988 and 1995 (Strategic Plan, 1998:13-14). Recent estimates show a decreased rate to 3.1% for the period between 1995 and 2001 (Lupala 2001). These fluctuating trends in growth rates illustrate an observation by Habitat that while rural urban migration has been pointed out as one of the major factors of rapid urbanisation in sub-Saharan cities, natural population increase has also played a significant role especially in the decades 1980s and 1990s (Habitat, 1996).
3.3 Density changes and spatial growth for Dar es Salaam city

The inter-war periods (1914 –1918 and 1936-1945) were generally characterised by slow population growth trends and so was the spatial growth of the city. Trends in the spatial growth of Dar es Salaam indicate that by the year 1891, the extent of the built up area of the city was limited to only 122 hectares of land and a gross population density of 45 persons per hectare. This figure increased to 463 hectares of land in 1945 and a gross density of 130 persons per hectare. The rapid expansion of the city took place between 1945 and 1963 when the built up area extended to 3081 hectares. This resulted into a sharp decrease in density to 49 persons per hectare. The rising trends were revealed later, especially after independence whereby many Africans flocked into the city. By 1967 a gross density of 66 persons per hectare was noted (URT, 1957, 1968, 1978, 1988).

The tripling of population from 272,821 to 843,090 between 1967 and 1978 resulted into increased density to 74 persons per hectare within a built up land of 11,331 hectares. The same trends pervaded the decade of 1980s. By the year 2001, estimated population for the city of Dar es Salaam stood at 3,000,000 within a built up land of 57,211 hectares and therefore a gross density of 52 persons per hectare. Trends in density fluctuations and spatial expansion of the built up areas are summarised in Figure 3.2 and 3.3.


Figure 3.2: Trends in density (persons per hectare) changes for the built up area of Dar es Salaam (1891-2001).
From the figure 3.3 it is notable that while there has been a steady increase in population over the decades, the gross population density has been fluctuating with significant decrease after the 1990s. The fluctuating nature of population density can be attributed to the expansion (spatial extent) of the built up area. While the 1945 registered the highest gross population density for the city of 130 persons per hectare, this dropped drastically to 40 persons per hectare by 1963 with resurgent of increase in trends until 1992. One reason that can be related to high density during the 1940s could be the colonial policies that were rather prohibitive for African population migrating to the cities. The city spatial expansion was mainly confined within the ‘planned city’. The built up part of the city was until 1945 only limited to the 463 hectares of land and a total population of about 60,000 inhabitants. With the exception of a minor low-rise low-density development at Oysterbay, the rest of Dar es Salaam was largely confined to the areas of the present city centre, Kariakoo, Ilala, Upanga, Keko and Kurasini. It would appear that the city was somehow confined with a relatively high-density settlement structure.

Until 1963, the major part of Dar es Salaam was rather ‘planned’ with the exception of a few informal settlements of Keko, Buguruni, Ubungo and Temekte. The extent of the built up and consolidated parts of the city was still confined within a radius of 6 kilometres. However, the post-independence growth trends that were fuelled by rapid population influx and individuals developing their own houses resulted into rapid horizontal expansion of the city predominantly along its radial road networks. By 1978, the built up parts of the city had extended to 14 kilometres along Pugu road extending as far as Ukonga, beyond the present airport, about 12 kilometres along Morogoro and Bagamoyo roads thereby engulfing the suburbs of Kimara and Kawe respectively. The southern extension was rather limited to about 6 kilometres along Kilwa road extending to the present settlements of Temekte and Chang’ombe (Figure 3.4). Although

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1 The built up area of the city is rather complex to define since cities do not have definite boundaries as limits to the city growth. Habitat (1996:14) observes that different definitions of the built up areas of cities results in different density figure making cross comparison among cities difficult. In this study, the built up part of Dar es Salaam entails those areas with consolidated housing depicting the character of the urbanised settlements. Unlike the metropolitan Dar es Salaam that covers even the rural settlements, the urbanised part of Dar es Salaam in this respect corresponds to the built up part defined by the Sustainable Dar es Salaam Project in 1992 and subsequent revisions in the 1998 Strategic Plan. It excludes the rural part of Dar es Salaam and with no reference to administrative boundaries.
pockets of land remained undeveloped between these main roads one can generalise that the extent of the built up parts of the city was limited within the 12-kilometre radius. By 1992, the extent of the built up area predominantly remained within the 12-kilometre radius but with extended development along Bagamoyo road (settlements of Mbezi and Tegeta) up to 16 kilometres and 10 kilometres along Kilwa road (that is Mbagala and Mtoni areas). In the year 2001, the extent of the built up area show consolidation on the formerly sparsely developed areas between the major roads and a further extended growth along these roads. The northern extension along Bagamoyo road had reached about 32 kilometres, about 28 kilometres westwards along Morogoro road, about 20 kilometres south-westwards along Pugu road and 14 kilometres southwards along Kilwa road.

**Figure 3.4a:** By 1891, the extent of the built up area of Dar es Salaam was confined within 2km radius (Source: Kironde, 1994; SDP, 1998; MLHSD, 2000).

**Figure 3.4b:** The extent of city growth in 1945 was still within the 2km radius. Density had increased to 130 persons per hectare (Source: Kironde, 1994; SDP, 1998; MLHSD, 2000).

**Figure 3.4c:** In 1963, the city growth had reached 6 km distance with development taking place along the major roads (Source: Kironde, 1994; SDP, 1998; MLHSD, 2000).

**Figure 3.4d:** By the year 1978 more remarkable development had taken place with city expansion reaching 14 km (Source: Kironde, 1994; SDP, 1998; MLHSD, 2000).
The ensuing spatial structure of the city is ‘finger-like’ with land development pattern concentrating along the major Bagamoyo, Morogoro, Pugu or Nyerere and Kilwa roads (Figure 3.4). A radial structure has emerged with the city centre being the focal point of many functions of the city. Some pockets of land between these arterial roads are still in the process of consolidation though they are poorly serviced in terms of infrastructure and social services. Further densification in these areas has resulted into an amalgam of land use pattern, structured along the major roads depicting the major characteristics of the sprawled city. The sprawled city lack basic social facilities and infrastructure services. Since most of the post-independence city expansion has been taking place informally, with low-rise, single unit type of housing structures of relatively low floor area ratios, it has been difficult for the authorities to provide basic services such as water supply, road network, solid and liquid waste management and other social services. In existing settlements where further housing consolidation is taking place, the unguided pattern of houses makes it problematic to regularise using conventional upgrading approaches. Spatial and liveability qualities have also been observed to diminish over time.

The sprawled city has resulted into urban types that vary both in terms of physical character and density. Some of the urban types have their origins from the colonial periods depicting footprints of Arabs, Germans and the British colonialists. In the following section, colonial influences on urban types for Dar es Salaam are being discussed.

3.4 Colonial legacy and ensuing urban types

Although colonial domination in Dar es Salaam was pronounced during the German and the British periods, it is notable that Arabs, particularly the Sultan of Zanzibar, Seyyid Majid established commercial interest and ultimately took over control and domination of the coastal strip of the East African coast since the 1860s. In 1862 Sultan Majid conceived a design for Dar
es Salaam and from 1855 to 1866, a number of buildings were already under construction (Sutton, 1970:4). Streets were planned particularly the present City Drive or Sokoine Street and the streets behind.

Buildings that were constructed by Sultan Majid include the palace that was located at the south western of the harbour that later became a lighterage wharf (ibid.). Although this building is no longer existing today, remnants of Sultan Majid’s buildings include what was his official hotel apparently what is called the Old Boma and an adjacent buildings all of which have been recently renovated accommodating offices for the Dar es Salaam City Council and Ilala Municipality.

When Seyyid Majid died in 1870, his successor Seyyid Barghash paid little attention to what the former Sultan envisaged as a future palace. With the dawn of German colonial invasion between 1888 and 1889, the East African coast was taken over and Dar es Salaam became a capital in 1891. The construction of the road towards the inland parts of the mainland, the railway line and expansion of the port activities further contributed to the rapid growth of Dar es Salaam (Sutton, 1970; Kironde, 1994). New administrative buildings were built by the Germans beyond Barghash’s and Majid’s built areas. These buildings were constructed east of the old ‘boma’ with new office accommodation that accommodate office premises including the state houses many of which are under use until today (Figures 3.6 and 3.7).

**Figure 3.5: Dar es Salaam 1890s:** Although there seems to be no plan for the old settlement part of Dar es Salaam as was conceived by Sultan Majid, the building layout in this map illustrates some kind of organised pattern of buildings as it was in 1890s. First are the port buildings closer to the harbour and behind are streets that came to be extended in the later years by the Germans to include the main commercial streets of the present Dar es Salaam (Source: Kironde, 1994:116).
Characterising the German residential area that was developed adjacent to the administrative section of the city, Sutton describe it as follows:

Behind this administration there grew in time residential quarter for German officials. Here were sparsely erected fine villas, raised above ground level and mostly double storied with thick whitewashed stone walls airy rooms and verandahs. This whole area – along the planned streets, between the villas, as well as the empty spaces – was treated as one large botanical garden. At its eastern edge facing the ocean was the Governor’s residence (presumably the present state house) and to the north of that the equally impressive Government European (now Ocean Road) Hospital. Building in this area continued in the British and independence periods. Yet it retains much of its old character as a
Kironde notes that this area was planned with straight and wide boulevards, well lavished in verdure, large plots, with two storeyed buildings with a large proportion of land being left for experimental botanical gardens, some of the characteristic features of planning cities that were fashionable in Europe during that period\(^2\).

Following the increased demand for European residential quarters in the 1930s, a new area just north of the golf course (now the Gymkhana grounds) at Upanga or Seaview was opened up. The construction of the Selander Bridge in the late 1920s further facilitated the opening up for new European housing areas of Kinondoni, Regent Estates, Oysterbay and Msasani many of which were completed after the Second World War. The majority of these houses are being used as government quarters until today.

The main commercial and shopping centre was developed behind the old port installations and lighterage wharf at the western end of the sea front. The present Samora (formerly Acacia) Avenue was the most fashionable shopping street, a character it maintains until today. Many buildings survive until today together with a number of trees and spaces. Recently, however, blocks of offices in modern international style have been built covering many of the otherwise open spaces and others replacing old buildings. To the northwest of the administrative area was the ‘Indian bazaar’, an area that was characterised by a compact layout of buildings with small shops especially along the India Street that expands from the harbour towards Jamhuri Street. In its early years of development, buildings in this area were mixed, some being simple and small but others with permanent features. Over the years, the small huts have been replaced by tenement buildings with commercial undertakings at the ground floor and residence in the upper floors (Sutton, 1970:11-12). Some of these tenements have internal staircases, others have external staircases in the courtyards. The whole area that was, and still is actively used as a commercial centre of the city, accommodates many of the Indian traders; this area was popularly known as ‘Uhindini’, meaning an area where Indians reside.

Sutton (1970) observes further that within the Asian community there were sub-groups of Indians that identified themselves with communal activities. The main Indian communities represented Hindus and a smaller number of Sikhs, Shia Muslim Ismail, Ithnasheri and Bohora. Each community tended to have its quarter within the Uhundini with its own temple or Mosque, community centre and in some cases restaurants. But over the years, these residential divisions increasingly became blurred \(\text{ibid.}\). With the increase in commerce and population, a large number of Indian population over spilled into the new suburbs. The main overspill area was Upanga between the main commercial area and Msimbazi creek bounded by Morogoro and Bagamoyo roads. Presently, this settlement accommodates a variety of flats and individual houses originally occupied by Indians but after nationalisation in 1971, many Africans also got accommodation as tenants\(^3\).

\(^2\)The planning ideals that pervaded town planning during this period was the garden city concept where small units for the working class were developed with gardens in their plots. It might be true that development of the German area drew some insights from these ideals although in this context the building types were larger and located in larger plots than those developed in Europe. Similarly, the type of buildings that were developed in this case were meant to be occupied by European officials not the working class as was the case for the founders of this concept in Europe.

\(^3\) In 1971, the government nationalised all buildings that were valued at TShs. 100,000 or above. The Acquisition of Building Act (1971) empowered the government to acquire all building, residential or commercial that were rented and not occupied by owners. Although the ideas behind this nationalisation of buildings were politically driven, it
seems that one of the motives behind this policy was to break the persistence of a racially segregated society of Europeans, Indians and Africans. Through this move, it was possible for Africans to secure accommodation within areas that were in the past exclusively reserved for the two racial groups, such as the commercial area for Indians and Upanga and Oysterbay for Europeans.

Figure 3.8a: A compact block layout of a cluster of the commercial area. Note the courtyards at the back of these buildings. (Source: Kimaro, 1996).

Figure 3.8b: Part of the inner city block commercial cluster. Note the compact layout of buildings and character of house forms. The ground floors are used for shops and upper floors for residence (Source: Vestbro, 1968).
Whereas the above-mentioned areas were planned, the surrounding settlements especially to the west of the commercial area (and more predominantly, Kariakoo) where traditional Zaramo people lived remained fairly sparsely built compared to the others. Further west were the settlements of Keko and Keko Magurumbasi and Buguruni that remained ‘unplanned villages’. The need to plan the suburbs close to the city centre was felt in the German period. A scheme for Kariakoo was devised before the First World War. Due to increasing demand for housing and consolidation of Kariakoo, the German colonial government felt that there were increasing dangers of overcrowding, slum dwelling and inadequate sanitation. These were a result of low-income wages, underemployment and increasing city population. During the British era, in the 1920s, the gridiron pattern layout for Kariakoo was prepared (refer Chapter 6). This was later followed by similar layouts for the adjacent settlements of Ilala and Magomeni.

Based on Sutton’s description six distinct zones that characterised urban types of Dar es Salaam until the 1970s can be discerned (figure 3.11).

- First is the port facilities area with low-rise wide spanning storage warehouse type of houses mainly located on the sea front to the southwestern part of the present city centre.
- Second is the administrative area. This zone extends from the railway station northwards to Ocean Road Hospital and the State House. The Hospital and State House form a northern limit bordering the Indian Ocean. Initially, this zone was characterised by predominantly two to three storey buildings of Arabic and German Architectural influence organised as free standing blocks or sited in U-shape pattern forming enclosed courtyards within relatively larger plots. Religious and institutional buildings such as churches and schools were also built in this zone. After independence a number of new office buildings have been built some with more than ten storeys breaking the even character of the former townscape.
- Third is the commercial zone predominantly characterised by three to four storey

4The name Kariakoo traces its origin to the Carrier Corps porters who were encamped in this area during the First World War (Sutton, 1970:13).
compact tenement buildings with commercial activities on the ground floor and residences in the upper floors. The same character predominates to the present times.

- Fourth is the European residential area located adjacent to the administrative area extending towards the state house, though it occupies a relatively smaller area. Since there are only a few additional buildings that have been built, this zone has maintained its original character of one to two storey villa type of houses located within larger plots.
- Fifth is a medium density of two to three storey buildings, formerly Indian now middle class residential areas of Upanga. This zone has maintained this character until today.
- Sixth is the African residential zone predominantly Kariakoo, Ilala and Magomeni with gridiron type of layout and Swahili type of houses. However, over the two decades, Kariakoo has been transforming from typically Swahili type of houses to blocks of apartments, an overspill area to the burgeoning commercial, office and residential requirements of the city centre.

These zones have been to the greatest extent related to the zoning and planning regulations that were introduced in 1914 and later on perpetuated by the British colonialists. The Germans prepared layout plans that guided the development of the above zones. Strict development guidelines on the type of buildings to be erected were stipulated in the planning and zoning regulation (‘the Bauordnung’). The German planning and zoning regulations were based on racial discrimination and thus designated specific zones for Europeans, Asians (particularly Indians) and Africans (Figure 3.10). The present Mnazimmoja Park was deliberately laid out as a transitional zone separating the European and Indian zones from the African settlement of Kariakoo. Commenting on the influence of colonial segregation planning policy over the ensuing city structure and of urban types for Dar es Salaam, Kironde explains:

_The land use structure of Dar es Salaam was profoundly affected by the British colonial Government policy of implementing the zoning provisions left by the Germans. These provisions were basically racist. As a result Dar es Salaam was divided into the European area; a commercial/residential area (mainly inhabited by Indians); and a native area. The latter two were separated by an open space, cleared of native and other structures in the 1920s and 1930s. The planning of all these areas predated the British administration but the native town had to be regulated internally and extended from Kariakoo to Ilala. The European area was extended northwards by the ocean, to Oysterbay. For the European area, the Government inherited most of the buildings but constructed new ones at Seaview, Oysterbay and Gerezani. The Commercial/Residential area underwent fundamental transformation when the Government forced Indians to take up Rights of Occupancy, and to abide by building covenants therein._

(Kironde, 1994:206)

Further, Kironde notes that:

_...the eastern part of Dar es Salaam was seized from natives who were expelled from the area and directed westwards. Later on, building regulations entrenched this process. These regulations defined areas to be used exclusively for European settlement and areas where native buildings were not allowed. Thus racial segregation was planned for right from the start._

(Kironde, 1994:125)

Although the Bauordnung was slightly amended by the British Township Rules in the 1920s, the revised regulation still consolidated the segregation of races that was founded by the

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5 According to Kironde, Bauordnung is a German concept that can be translated as ‘Bau’ for building, and ‘Ordnung’ as order, but the word ‘Bauordnung’ also implies zoning and building regulations (Kironde 1994:130).
Germans, and the emerging urban types that were developed in the later dates were highly influenced by this planning policy.

Figure 3.10: Dar es Salaam Development Zones as stipulated in the 1914 ‘Bauordnung’ and incorporated in the 1923 Township Rules. Within zone I, residential buildings of only European type were to be built. In zone II, residential and trading buildings only were allowed. In zone III, native quarters were recommended (Source: Township Rules 1923, in Kironde, 1994:136).

The three zones and characteristic urban types derived from these zoning regulations are as indicated in Figure 3.11.
So far this discussion has dealt with the character of urban types of the city centre of Dar es Salaam that emerged from colonial influences perpetrated through segregation in planning and housing development policies. Although this factor provided a benchmark and continues to play a structuring role on the continued growth and of ensuing urban types for Dar es Salaam city, the post-independence growth trends have been influenced by a number of other factors such as urban master planning and proliferation of informal settlements. In the following section the influence of urban master planning to resulting urban types for Dar es Salaam is being examined.

**Figure: 3.11a: Colonial Development Zones and buildings for Dar es Salaam in the 1920s.**
Note that Mnazimmoja open space wasn’t developed during that time. It was still occupied by African buildings that were cleared in the 1940s by the British colonial government. (Source: Vestbro, 1975:30)

**Figure 3.11b: Aerial view of Dar es Salaam (1972): The port, administrative, commercial areas and Kariakoo.** Note that Mnazimmoja open space was later developed as a buffer zone separating Kariakoo from the rest of the other areas (Source: MLHSD, 1992).

- **European’s residence:** One to two storey villa. Located on larger plots and with spacious outdoor gardens.
- **Administrative zone:** With two to three storey office, religious buildings, larger plots, enclosed courtyards and spacious outdoor spaces.
- **Port facilities:** Wide spanning single storey warehouses located along the sea front and a few two storey office buildings.
- **Commercial area:** Two to three tenement house type with high FAR. Staircases in the houses or in the courtyards. Shops on the ground and residence in the upper floors.
- **Kariakoo:** Predominantly Swahili type of houses, single storey on relatively smaller plots with a gridiron pattern of settlement layout.
3.5 Master planning and its influence on urban types

Already in the late 1920s ideas of having a comprehensive plan for Dar es Salaam was on the agenda of the British colonial government. Following this, architect John H. Pashen was contracted to prepare a comprehensive plan for Dar es Salaam (Kironde, 1994:194). His plan was however not implemented, allegedly because of financial limitations and that in few years that followed, Pashen’s plan was seen to be conflicting with the many township establishments. It was not until 1940 that a local government engineer, Mr. Leadbeater was engaged to advise the government on matters of town planning. Accentuating government’s endeavour to get Dar es Salaam planned Kironde notes that:

In his advice, Leadbeater suggested five zones for Dar es Salaam, based on racial and functional considerations as follows: Zone I residential: to include the Government Area, Upanga, Oysterbay, Kurasini and a small part of Keko. This was meant for the use of Europeans and Asians. Zone II Commercial: being part of the city centre adjoining the government area and also parts of Oysterbay and parts of Gerezani. This too was meant for European shopping. Zone III Bazaar: being the Indian commercial / residential area in the town centre for Indian residences and general shopping. Zone IV African: i.e. Kariakoo and Ilala, as extended outwards as well as Kinondoni, Mwanayamala and Regent Estates. This was meant for African residences. Zone V Industrial: that is the Pugu Road-Temeke areas as extending westwards and the port area. In this plan, the old concepts of seeing land uses in terms of races were upheld. However, an important divergence from earlier practice was the proposal for an industrial area. (Kironde, 1994:255-256)

Once again this plan was not put into full implementation except that it played a major impact on the location of industrial establishments along Pugu road. Until 1940s, the development of Dar es Salaam was primarily being guided by the zoning plan that was prepared by the Germans in 1891(Figure 3.10). It was not until 1949 that the first Master Plan for Dar es Salaam was prepared to guide the development of the city.

3.5.1 The 1949 Dar es Salaam Master Plan

In the 1940s particularly the post-war growth trends for Dar es Salaam called for ways of managing the rapid growth of the city. The population of the town had already reached 60,000 inhabitants by 1945 and in the year 1949 Dar es Salaam reached a status of a municipality. The immediate need for preparing a comprehensive plan was already felt and the Department of Town Planning was formed. The formation of the Town Planning Department was in line with the legislative reforms that were happening in Britain but also applied in the colonised countries. The 1949 Master Plan was prepared at a time when Dar es Salaam was experiencing rapid urbanisation and rapid spatial expansion. The colonial government felt that a comprehensive plan could address the two main issues of that time, namely; land ordering that was considered to be ad hoc and provide a basis for expenditure of funds provided under the colonial development plans (ibid.). A British firm of Consulting Engineers under the leadership of Harry Ford prepared the Master Plan for Dar es Salaam in 1949 (Figure 3.12).
Kironde contends that these areas, however, were strengthening the segregation concept that sought to perpetrate the colonial segregation policy. The density zones correspond to zones for Europeans, Asians and Africans respectively (Kironde, 1994:261). Further, the Master Plan earmarked areas for future industrial development along Pugu road and commercial centres within the proposed residential areas. The Master Plan facilitated the
opening up of new areas and it played an influential role to locating areas for housing schemes implemented in the 1950s. The Master Plan paved way for the preparation of planning schemes and land acquisition to open up new areas. It also facilitated the designation of type of houses to be erected in certain areas and specification on the type of building materials.

On the basis of this plan, the following housing schemes were either implemented or opened up. The Ilala African quarters were constructed for African working class in the 1940s, the Kigamboni African settlement scheme of the 1950s. The Temeke African settlement scheme (that is Temeke quarters and the surrounding Swahili type of houses were constructed in the in 1950s). The Magomeni African housing scheme (that included the present Magomeni quarters and the surrounding sites and services scheme with Swahili type of houses). The Kinondoni African housing scheme that accommodated Africans working in the homes of Europeans in Oysterbay, (sometimes referred to as ‘village houseboy towns’). Upanga planning scheme was opened for development following a land pooling that was facilitated through payment of compensation to former African landowners. The Chang’ombe housing scheme for Asians and Railway workers and the low density housing schemes at Regent Estate and Kurasini for Europeans were also developed during this period. Extension of Oysterbay was also made possible using the 1949 Master Plan (Figure 3.13). Some of these housing schemes are discussed in the proceeding chapters.

All these schemes finally produced layers of urban types, some of which are extensions of housing clusters established by the German colonial administration, others developed during the British colonial period. Others are a result of consolidation of the former areas that were not fully developed. New pockets of housing areas especially the African quarters were further established closer to the already existing African residential areas of Kariakoo, Keko and Ilala.

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6 When land was acquired in this area, plots were demarcated and individual developers were allowed to erect houses with available building materials. Today, this area is predominantly occupied by typically Swahili type of houses that were popular until 1970s.

7 Kironde notes that the Kinondoni housing scheme was developed by demarcating and issuing plots to Africans who were employed as servants in the European housing areas of Oysterbay. This followed a rejection by some married African workers of staying in the servant quarters within Oysterbay. Europeans also got concerned over the number of Africans who were to stay within Oysterbay ostensibly the area supposedly and earmarked for Europeans (Kironde, 1994).
Figure 3.13: Colonial Government Housing Schemes. They correspond to the land use zones of the 1949 master plan. Although in some cases the colonial government implemented these schemes, the kind of urban types that emerged had their roots in the ideals of racially segregated land use zoning for the three main groups of Africans, Indians and Europeans. These schemes were implemented from the 1940s to 1960s (Source: Kironde, 1994:264).

3.5.2 The 1968 Master Plan

The 1968 Master Plan was prepared seven years after independence with the idea of seeing Dar es Salaam developed as a capital that reflects the pride of an independent nation. The master planners sought to see a planned city development and the plan was viewed as a tool to remedy
the existing slums and colonial racial segregation approach to planning. The master planners described the envisaged growth of the city as follows:

As for new areas, the districts should reflect the changing social structure of society and of breakdown of segregation of residential areas on the racial and income basis of the past. (URT, 1968:60-61)

The underlying concept of this plan was to develop a modular settlement system starting from a house level to the metropolis level. The Master Plan identifies six development levels, namely: the house, the dominant social group or neighbourhood, the community, the sub-city, sub-metro and the metropolis. At the house level, the plan recommended house organisation that is comfortable and convenient to the users. Comfortable as conceived in the plan meant adaptation to the climatic elements and convenience means functional organisation. That is, rooms should be located to allow maximum air movement and should face the courtyards, which become living spaces. The Ten-Cell Unit was recommended as the second organisational unit with several ten-cell units combined to the level of a neighbourhood of approximately 5,000 persons. A group of neighbourhoods were to be organised to form a community with a population of 25,000 to 40,000 persons. Four to six communities would form a sub-city and sub-city units combined to form a sub-metro and sub-metros combined to form a metropolis. The general city expansion was to follow the major roads of Bagamoyo and Pugu besides an extension across Magogoni towards Kigamboni that was proposed to open-up the otherwise under-utilised land closer to the city centre. Although there seems to be no specific house forms that were stipulated in the 1968 master plan, implicitly, a recommendation on higher density housing of mixed character seems to emerge from the following:

The higher density housing, perhaps in multi-storey structures should be provided when incomes and demand permit. However, some middle-income blocks might be built, for example, by the NHC to help fulfil the social aims in planning new districts by provision of sites for all sections of the community. (URT, 1968:60)

The plan recommended varying gross densities for these new areas with the highest being 70 and the lowest being 30 persons per hectare. The recommended average gross density was to be 48 persons per hectare. For the central areas the Master Plan recommended floor area ratios of 1.0 for commercial retail, private offices and banks, service commercial and hotels and a range from 0.5 to 1.0 floor area ratio to government and parastatal offices. The 1968 Master Plan further recommended a comprehensive redevelopment of Kariakoo and resettlement of almost all informal settlements existing during that time.

Radical in approach but weak in strategies for its implementation, the 1968 Master Plan could not be realised much because of limited government capacity to fund capital works projects and general resistance from people due to threats to resettlement. It was probably one of the plans that became unpopular only seven years after independence. Hence, its influence to ensuing urban types was rather limited and urban development was largely dictated by the burgeoning growth of informal settlements.

One important feature to note however during the 1960s is the establishment of the National Housing Corporation in 1962. The government had established the National Housing

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8A Ten-Cell Unit is the smallest organisational unit of the ruling Party, the former TANU, now Chama Cha Mapinduzi (CCM), with a Ten-Cell leader as a head of the unit. It refers to ten housing units although practically, often embrace more than ten housing units. In the 1970s until 1980s, ten-cell unit was employed as a planning concept in organising and designing new residential areas.
Corporation (NHC) primarily to construct houses for Africans who were ‘deprived’ during the colonial period. Backed with adequate funding from the government, the NHC constructed several housing units for Africans both for rental and tenant purchase. The NHC also implemented a number of slum clearance schemes replacing the dilapidated and slummy areas with the so-called ‘permanent houses’. The impact of the NHC on the ensuing urban types has been noted on several housing units built within Dar es Salaam ranging from Swahili type of houses for tenant purchase to two roomed quarters type of houses and apartment blocks providing accommodation to several families. Apart from actual building, NHC also provided ‘soft loans’ to owners to improve ‘temporary houses’ (mud and pole walls and thatch roofs) to cement blocks with corrugated iron sheet roofs. This programme had a considerable influence on the change of the physical character of the then Swahili house types. Commenting on the impact of the NHC’s slum clearance and housing programmes on the urban structure of Dar es Salaam, Kironde notes that:

_The impact of the NHC on the Dar es Salaam land use structure (ostensibly also to emerging urban types) especially in the first phase of ten years (1962-72), is notable by the substantial slum clearance programme as well as construction of new units for tenant purchase and for rental housing._ (Kironde, 1994:330)

Although the NHC has been influential in shaping urban types of Dar es Salaam and other upcountry regions its activities were curtailed in the 1970s following diminishing government subsidies to support its housing programmes.

**3.5.3 The 1979 Master plan**

Due to implementation failures of the 1968 Master Plan it was felt that a new Master Plan was needed to address several changes that had taken place. The 1979 Master Plan was prepared primarily to accommodate a number of policy changes that to a greater extent affected the implementation of the previous plan. Though not differing much in terms of conceptual approaches and land uses proposals, the 1979 Master Plan recommended more or less the same city structure as that of 1968. However, the 1979 Master Plan was overall, ‘less radical’ in terms of resettlement and redevelopment of slums and informal settlements. This is due to the fact that starting from 1972, advocacy to squatter upgrading and sites and services schemes was more pronounced as opposed to slum clearance. The 1979 Master Plan recommended land use extensions along the main roads of Bagamoyo, Kilwa, Morogoro and Pugu. New areas (referred to as districts) were to be developed in Mbezi, Tabata, Mbagala, Kizinga, and Kigamboni.

Planning at lower scale level was to adopt a neighbourhood unit concept. A composition of four units formed a ‘community’ and at least two communities were grouped to form a ‘district’. Recommended plot sizes were 400, 800 to 1,600 square metres for high, medium and low density plots respectively. Each plot was to accommodate one unit and recommended average gross density was 130 persons per hectare. Schemes in Mbezi and Tabata were earmarked for first phase implementation and detailed planning schemes were prepared soon after the approval of the 1979 Master Plan.

For the central area, a Conceptual Zoning Plan was proposed. In this plan, Kariakoo was recommended for redevelopment that was to be carried out incrementally on plot-by-plot basis not as radically as was recommended in the 1968 Master Plan. Eleven development zones were earmarked each with specific redevelopment conditions. The recommended floor area ratio in the city centre was to range between 0.5 and 2.0. Site coverage ranged between 30% and 70% and building height ranging from 30 to 40 metres or 100 to 120 feet (Table 3.1 and Figure 3.14).
Table 3.1: Central area design guidelines

<table>
<thead>
<tr>
<th>Zone</th>
<th>Type of use</th>
<th>Floor Area Ratio (FAR)</th>
<th>Site coverage (%)</th>
<th>Max. building height feet</th>
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<tbody>
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<td>30</td>
<td>30</td>
</tr>
<tr>
<td>R2</td>
<td>Low rise residential and corner shops</td>
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<td>50</td>
<td>10</td>
</tr>
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<td>R3</td>
<td>Medium rise residential</td>
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<td>30</td>
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<tr>
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<td>High rise residential and commercial at ground level</td>
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<td>50</td>
<td>50</td>
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</tr>
<tr>
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<td>Mixed commercial residential</td>
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<td>66-70</td>
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<td>66-70</td>
<td>120</td>
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<td>20</td>
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<tr>
<td>OS</td>
<td>Open space recreational</td>
<td>-</td>
<td>-</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: Dar es Salaam Master Plan (1979:91)

One of the influential features of urban types that emerged in the 1970s is the extensive programme of squatter upgrading and sites and services that was implemented in Dar es Salaam and other municipalities. Within Dar es Salaam, this programme was implemented in the areas of Manzese, Kijitonyama, Sinza, Tandika, Mtoni and later in Tabata and Tegeta. The housing schemes implemented under this programme introduced specific development conditions that produced another layer of urban types. Within the upgraded areas, there was little change in terms of house forms except that the provision of access roads and other basic infrastructure services such as piped water and storm water drainage opened up vehicular accessibility to these settlements. The other impact is the fact this improvement triggered further consolidation of houses including extensions and infill developments in some of the open spaces. This resulted in

Figure 3.14: Central Area Zoning Plan (1979). The master plan recommended several zones each with different redevelopment guidelines as indicated in Table 3.1 above (Source URT, 1979:89).
increased densities and plot coverage. Within sites and service areas, a relatively smaller plot size was adopted (288 square metre). It was anticipated that small housing units, self-contained would be built by the low-income people. To the contrary, higher and middle-income group acquired the plots and built larger houses resulting into compact layouts and higher plot coverage. Typical settlements include Sinza and Kijitonyama. Open spaces that were designated in the plan were appropriated and converted in building sites, a process Kironde refers to as ‘creations’.

Although criticisms have been raised against both the 1968 and 1979 Master Plans on account that the objectives of these plans were largely not achieved, it is worthy noting that these plans gave rise to the type of planned land use development patterns observable in some areas of the city. For example, the development of Tabata, Sinza, Kijitonyama and Mbezi is generally taking place within the 1979 Master Plan context. It is also notable that within the 1979 Master Plan, more comprehensive zoning and planning guidelines were developed, most of these are still useful today. However, the proliferation of informal settlements has remained a puzzle as to which planning tools should be employed to effectively manage their emergence and growth. The booming informal settlements seem not only to have surpassed the management capacity of the local authorities but stretch beyond the areas that were earmarked in the 1979 Master Plan.

‘Creations’ is a process whereby areas designated as open spaces within a planned neighbourhood are dubiously converted into other uses predominantly building plot. Often, this process is motivated by corrupt land officers in collaboration with prospective developers. The ‘created’ plots are sold to developers at a relatively higher price.
Upgrading schemes that were popular in the 1970s and early 1980s seem to have been abandoned in the 1990s. In recent years (starting from early 1990s), participatory planning approaches\(^\text{10}\) advocated by the city council and the three established municipalities seem to be far from addressing the pace at which these settlements are growing and consolidating. Informal settlements have and still are playing a leading role in shaping the ensuing urban types and the city structure of Dar es Salaam.

3.6 Informal housing development and its influence on urban types

Up to the 1940s there were only a few informal settlements in the city. However, after independence in 1961, the number and character of these settlements changed rapidly. One of the oldest informal settlements is Keko. This settlement was spared from demolition during the colonial period primarily because it was earmarked for African working at the port. Other old informal settlements included Chang’ombe, Buguruni, Kigogo and Msasani. Included in this category also are settlements of Mbulahati, Magogoni and Msasani that developed in the early 1950s. Attempts to control informal housing development have proved to be difficult since the colonial era. It became more difficult after independence when the growth of informal settlements got out of control of the planning authorities. Despite detailed and general planning schemes preparation as instruments to guide systematic housing development, this tool has proved to be inadequate to cope with the pace of growth of informal settlements. Kironde notes:

> ....planning schemes have continued to be hatched for various parts of Dar es salaam, and in this process, the struggle by the authorities to control land through planning schemes has become manifest. However, unplanned development, popularly known as squatting was growing fast, so that by 1979, over 60% of Dar es Salaam population was living in such areas. Therefore the Dar es Salaam of 1970s onwards can rightly be called the city of squatters and planning schemes. (Kironde, 1994: 350)

By 1979, some 2,349 hectares (or nearly 40% of the city’s residential land) was occupied by some 25 squatter settlements. This figure had increased to 40 settlements in 1990 covering some 5,000 hectares. Recent estimates (2000) indicate that this number has increased to 50 settlements (Figure 3.16). By 1992, it was estimated that out of the total 170,000 dwelling units of Dar es Salaam, approximately 127,500 units representing 75% of the total dwelling units were located in informal settlements (Hoek-Smit, 1990; Environmental Profile for Dar es Salaam, 1992.). These units occupy more or less the same land coverage as those in the formal settlements implying that densities in these areas are relatively higher in terms of land coverage when compared to those in the formally developed areas.

After independence, Dar es Salaam experienced a high population growth rate. The resulting impact has been a huge deficit in housing particularly for low-income urbanites. Due to limited formal housing provision mechanisms and resource constraints, the rapid population increase has had fundamental impacts on the emergence, growth and proliferation of informal settlements. Kombe and Kreibich observe that:

> The sustained high population growth rate amidst low public capacities has crested a huge backlog of housing over the last three decades particularly among low-income urbanites. The deficit has been

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\(^{10}\) In 1992, the Dar es Salaam City Council in collaboration with the UNCHS-Habitat started to institute the Environmental Planning and Management (EPM) approaches that aims at involving stakeholders in the planning process. The EPM advocates participatory approaches in planning whereby different interest groups get involved in the planning and decision making process. The EPM draws its premises from communicative planning theories with the prime goals in sustainable development of cities. In Dar es Salaam, this process is being implemented under the Sustainable Dar es Salaam Project (SDP).
estimated anywhere beyond 600,000 units. The severity of the housing problem in the city is at least partly expressed by the increasing number of housing units in overcrowded and ill-serviced neighbourhoods. In 1960, the number of squatter houses in the city was estimated to be 5000 units. In 1963, a study by the Town Planning Division based on aerial photography survey revealed that there were 7,000 units in unplanned areas. By 1972, a report by the Ministry of Lands and Housing Development indicated that the number had more than tripled to about 28,000 units. In 1992, planned residential areas accounted for 30% of the housing stock but constituted 50% of the residential land in the city. The rest of the population was accommodated in over 40 unplanned settlements scattered all over the city. (Kombe and Kreibich, 2000:40-41)

![Figure 3.16: Formal and informal settlements in Dar es Salaam (1998). The extent and number of informal settlements has increased rapidly especially at the periphery of the formal settlements. This indicates that the peri-urban settlements of Dar es Salaam are to the greater extent informal and the city expansion is taking place with little influence from conventional planning schemes. (Source: Kombe and Kreibich, 2000:42).](image-url)
These settlements are characterised by single storey house types with compact layouts especially and with organic patterns of settlements structure and streets. Characterising housing density and structure of Keko Mwanga informal settlement, Kombe and Kreibich observe that:

*Housing densities range between 40 and 50 houses per hectare. This suggests that Keko Mwanga is one of the most densely built informal areas in the city. House sizes vary between 80 and 100 square metres, a few measure more than 100 square metres. There are also small houses measuring 40 square metres or less, many of these being found mainly along the surrounding slopes and in the river valleys.* (Kombe and Kreibich, 2000:80)

As regards settlement structure, Kombe and Kreibich further note as follows:

*>The overall spatial feature exhibits a characteristic of a highly densified settlement. Except for the houses which are along the main access road most of the dwelling units are located haphazardly, rarely in conformity with ventilation and physical harmony with the immediately surrounding buildings and only sometimes oriented towards access roads. Sometimes one sees a pit latrine or a shower room facing an entrance or a footpath. A number of toilets, bathrooms, or business kiosks have protruded into walkways, thus sometimes blocking them. Apart from the 2-5 metre wide road which traverses the settlement from north to south, most of the paths in the area are non-motorable. In fact some of the paths are less than one metre wide. Moreover, some of the footpaths and narrow spaces between houses have become dumping areas for domestic waste.* (Kombe and Kreibich, 2000:86)

![Figure 3.17: A typical housing cluster in Keko Mwanga informal settlement in 1999. Keko is one of the oldest informal settlements in Dar es Salaam with observed horizontal densities of up to 40 to 50 houses per hectare. (Source: Sliuzas, ITC, 1999).](image)

In newly emerging settlements, there are wide variations but with generally low-density patterns. Since the development of these settlements takes place outside the formal land use planning and management procedures, informal land subdivision has contributed to the sprawling city structure explained above. Moreover, it has been difficult to manage development in informal settlements mainly because of lack of information. Data on land ownership, subdivision and transfer procedures, plot characteristics, number of inhabitants in these
settlements are unknown.

... in these settlements the number of people living in such areas and the number of structures therein is unknown and this has negative connotation for urban management. (Kironde, 1994:375)

3. 7 Summary

Although it is difficult to relate the characters of the emerging urban types with only a few factors, it seems however, that rapid urbanisation trends play a major influencing role especially on the proliferation of informal settlements in Dar es Salaam. This factor is in turn linked with the limited capacity of the local authorities to supply buildable land for housing and to facilitate formal provision of housing for the migrating population. However, as noted in the preceding sections, one of the compelling factors for the present urban types of Dar es Salaam has been the colonial city planning influence especially the town planning practices and zoning regulations that advocated segregated zones for Africans, Asians and European. Each of these zones had specific development conditions that finally shaped the ensuing urban types. The housing schemes implemented under the colonial regime also resulted in new urban types some of which have maintained special characteristics in the city. Overall, Master Plans as tools for guiding city development seem to have limited impact to the present urban types of Dar es Salaam even though, development guidelines for certain housing areas in the city draw their origins from these plans. The proliferation of informal settlements and its outward expansion and on-going consolidation within the old settlements play a major role in shaping the city structure and the emerging urban types of Dar es Salaam city. Having outlined some factors that influence the growth and of the ensuing urban types of Dar es Salaam, in the following chapter an attempt to identify and classify urban types on the basis of the foregoing discussion is being made. The main variables in this classification are house forms, density that is floor area ratios and land coverage.
CHAPTER FOUR

DEVELOPMENT OF URBAN TYPES IN DAR ES SALAAM

In the preceding chapter, the urbanisation trends and spatial growth of Dar es Salaam have been discussed. The influence of Master Plans and the growth of informal settlements to the urban types have been unveiled. In this chapter, urban types in Dar es Salaam are being developed. Ten categories of urban types have been identified and classified. These include: the high-density high-rise institutional commercial city centre, medium density moderate height residential, mixed density commercial-residential, low density-low-land coverage residential, low-density-low-rise residential quarters, high-density-low-rise Swahili house residential, consolidated high-density-low-rise informal settlements, high-density-high-rise residential, medium-density-low-rise sites and services residential and the low-density-low-rise consolidating informal residential.

4.1 General background

Any attempt to identify and classify urban types in a city such as Dar es Salaam ought to take into consideration a number of factors some of which have been discussed in the preceding chapter. However, before this attempt is made, already by 1970, Sutton (1970:12-15) had provided a descriptive account of building types in Dar es Salaam city (Refer Chapter 3). Another classification was made by Kironde who identified four development areas within Dar es Salaam as follows:

The old ‘planned’ areas: These are areas developed mainly before 1970 including the city centre, Kariakoo, Oysterbay, Chang’ombe, Pugu road Industrial area, Upanga, Kinondoni, Magomeni, Ilala and Temeke. Some of these areas need redevelopment or refurbishing to cope with current needs and opportunities. In some areas like Kariakoo, run-down houses are being bought, demolished and rebuilt into multi storey buildings. These redevelopment schemes are however not co-ordinated so that development is isolated and the existing infrastructure is not expanding in tune with the intensity of use to which land is being put. Kironde notes that the general policy to deal with these areas seems to be lacking (Kironde, 1994:96).

The new ‘planned’ areas: These are areas developed since 1970 including the sites and services areas of Kijitonyama, Sinza, Mikocheni, pockets of Mbezi beach, Tegeta and Tabata. These are areas characterised by poor land servicing. In some instances even rough roads are non-existent. Basic infrastructure services such as water supply are also lacking. They are characterised by slow consolidation of plots with relatively high standards in housing. The paradox that is observable in these areas is the contrast between the high standard of buildings that cannot be easily accessed because of lack of services such as access roads.

The old informal settlements: These are settlements developed before 1980. They include settlements of Keko, Buguruni, Msasani, Mwanayamala, Hanna Nassif, Manzese, Mtoni and Tandika. The main character of these settlements is the high density to which land is put and the irregular pattern to which houses have been organised.

The new ‘unplanned’ areas: These have developed during the past three decades and include outer areas of Kimara, Mabibo, Bunju, Mbagala and Ukonga. The major characteristics of these settlements is that they have been, and still are being developed to fairly low densities and include a sizeable population of people who could be categorised as high income or have influential positions in the society. Land in these areas is partly put to agricultural uses.

Although Sutton (1970) and Kironde (1994) classifications are considered useful entry point to identification and classification of urban types, their analyses lack specificities at that
can address issues of physical density and house forms in a systematic manner. Their classification therefore lack the quantification and qualification of variables that are crucial in the analysis of both environmental and spatial qualities within settlements. In the following sections, urban types in Dar es Salaam are identified and classified.

4.2 High-density high-rise institutional commercial city centre

Although the city centre of Dar es Salaam can be categorised as one urban type at city level, that is predominantly high-density with high-rise type of buildings, three distinct characters appear when the administrative, commercial and former European settlements are closely examined. These are outlined below.

4.2.1 The administrative and institutional area (1a)

This includes the former colonial administrative area with relatively higher densities and land coverage. The floor area ratio from a typical block in this area is 1.8, land coverage of 35%. Until early 1960s, this area was characterised by predominantly low-rise office blocks of two to three storeys. After independence new office blocks have been constructed breaking the skyline with tower blocks of up to fourteen storeys (Figure 4.1).

![Figure 4.1: A typical cluster within the administrative/institutional area i.e. the City Hall and the PPF Tower). Others buildings are office buildings.](image)

Number of storeys: 3-12  
Lot (Land) coverage: 35%  
Floor area ratio (FAR): 1.8

Both floor area ratios and land coverage in this block correspond to the 1979 Master Plan recommendation of 1.5 and 35% respectively (Table 3.1). The recommended building height was 36 metres or approximately 12 storeys. The Master Plan further recommended plot coverage in this part of the city centre to range between 66% and 70% the latter being for buildings at corner plots. It can be concluded that to a greatest extent development in this block is in accordance with the conditions stipulated in the 1979 Master Plan especially for the new buildings.

4.2.2 The commercial residential area (1b)

The second is the commercial area (the former Indian’s residential and commercial area) with compact layout characterised by three to five storey commercial-cum-residential apartment blocks (Figure 4.2). The ground floors are used for commercial purposes. It is characterised by relatively smaller plots and high floor area ratios. The floor area ratio from typical block is
2.2 and land coverage is 44%. The majority of these blocks have staircases located in courtyards of the buildings. These density figures tally with the 1979 Master Plan recommendation of floor area ratio of 2.0, site coverage of between 66% and 70% and maximum building height of 5 storeys.

4.2.3 The institutional - former European residential area (1c)

This zone is characterised by one to two storey villa type of houses located on larger plots with low density and land coverage (Figure 4.3).

Figure 4.2: A typical cluster within the commercial / residential area, former Indian settlement.

Number of storeys: 3-5  
Lot (Land) coverage: 44 %  
Floor area ratio (FAR): 2.2

Figure 4.3: A cluster within the institutional area (former European residential settlement) area. Houses in this area are sited on large plots with big gardens and smaller buildings at the back as car parks. Presently, these building are being used for office accommodation.

Number of storeys: 1-2  
Lot (Land) coverage: 10.2 %  
Floor area ratio (FAR): 0.19
Established floor area ratio from this block is 0.19 and site coverage of 10.9%. The low-density character is a result of larger plot size of 3,500 square metres but more specifically is the fact that this was the first European residential area designed and developed purposely for colonial officers adjacent to the administrative area. Although the 1979 Master Plan recommended a maximum lot coverage of 30%, floor area ratio of 0.5 and building height of about 10 metres or three storey buildings, this part of the city centre has maintained its original character until today.

4.3 Medium density, moderate height residential (2)

Essentially, this refers to the settlements of Upanga and Mikocheni. While Upanga was developed during the colonial period, Mikocheni was planned in the 1970s as part of the sites and services with remarkable development taking place in the 1980s. The two settlements are predominantly characterised by two to three storeys detached residential type of houses on relatively larger plots sizes (approximately 1,000 square metres). In few and isolated cases, buildings of four storeys have been observed. At times, in some cases, two to three storey row type of houses are found in these areas. The average land coverage is approximately 20%. Estimated floor area ratio for a typical block in Upanga is 0.44. Unlike the city centre blocks, Upanga was designed and developed mainly in favour of the Asian community after the commercial part of the city centre was fully developed.

![Figure 4.4: Typical cluster in Upanga area. It is characterised by two to three storey type of houses sited on relatively larger plots.](image)

- Number of storeys: 2-4
- Lot (Land) coverage: 20%
- Floor area ratio (FAR): 0.44

Although Upanga is considered one of the old settlements in Dar es Salaam, its full
development was accomplished in the 1950s following a successful land pooling and regularisation of the otherwise African occupied land with traditional building types. Africans who lived in this area resisted colonial eviction attempts until such a time when they were fairly compensated (Kironde, 1994:277-8). According to Kironde, Indians who bought off Africans in this area were required to register their land after land pooling and scheme preparation. It is not yet established as to what specific conditions for the development of Upanga were required during the 1950s. However, it seems that the requirement for land registration was also accompanied with conditions to erect two to three storeys buildings, as was the case for other non-African settlements of Oysterbay and Kurasini. In the latter, building covenants stipulating the required value of buildings were put in place resulting into the present house forms.

4.4 Mixed density commercial-residential (3)

Although all settlements are transforming both vertically and horizontally this phenomenon is more pronounced in Kariakoo. Kariakoo that borders the city centre and a former ‘African Settlement’ under colonial regimes is presently an overspill area for the expanding city centre functions (office, commercial and residential space). The 1979 Master Plan designated Kariakoo as part of the city centre with new development conditions.

![Figure 4.5: Typical block in Kariakoo area.](image)

Number of storeys: 1-7  
Lot (Land) coverage: 40%  
Floor area ratio (FAR): 1.5

The settlement that was predominantly characterised by Swahili type single storey houses is now being transformed into multi-storey apartments for commercial, residential and office accommodation. The mixture of Swahili and new high-rise house types has resulted into a mixed character of an urban type in terms of building heights and their relationships to the surrounding spaces. Since the area was planned during the colonial period, with a standard plot size of 225 square metres, the ongoing plot-by-plot reconstruction of high rise buildings is to a greater extent uncoordinated, rendering spatial qualities for this part of the city
problematic (for detailed discussion on this aspect, see Chapter Six). Established floor area ratio from a typical block in Kariakoo is as high as 1.5 and land coverage of 40%. The recommended redevelopment conditions for this part of Kariakoo as stipulated in the 1979 Master Plan included a 0.5 floor area ratio, 50% plot coverage and a maximum building height of 10 feet or single storey buildings. These conditions were however revised in the 1989 Kariakoo Redevelopment Plan (Chapter Six). The pattern of street network for Kariakoo is the gridiron pattern, illustrating a ‘regularist’ layout planning typical of several neighbourhoods that were planned during the colonial period. A Similar street pattern exists in areas that were planned during the same period such as Ilala and Magomeni.

4.5 Low density, low land coverage residential (4)

This category includes settlements of Msasani Peninsular, Oysterbay, Kawe, a small segment of housing area at Kurasini, Gerezani and Mbezi. While development in Mbezi started in the 1980s, the former were essentially colonial housing areas that were developed as extensions for European housing schemes of the 1940s. Gerezani was built before 1940 as a housing scheme for European workers of the Railways Corporation and Kurasini for European officials in the port. Oysterbay was an extension of the European government officials after Seaview. Mbezi and Mikocheni are post-independence low-density areas designed and developed as a residential area for high class or high-ranking government employees and business people after the sites and services project were undertaken presumably to cater the needs of the low-income group. Within these areas, a variety of house types is notable. They vary from bungalows that were originally built in Oysterbay for European government officials, detached two to three storey villa types of houses that were developed as part of the extension area of Oysterbay for the high-income people. Houses are located on larger plots of approximately 2,000 square metres (Figure 4.6).

Discussing the development and the character of the government quarters (bungalow type) of Oysterbay, Kironde observes that:

*By 1947, Oysterbay was ready for development. Construction started in 1947 on a number of houses meant for European officials. Plots were, each, one acre in size. Each plot had besides a huge bungalow with a large sitting room but with only one or two bedrooms, a garage and a servant quarter. The latter was to house servants and the figure was based on the assumption that the government quarters would have each a boy’s quarter with two rooms and that in each of the rooms would be a boy and his wife, that is there would be four Africans per one plot. (Kironde, 1994:282)*

![Figure 4.6: A housing block in Oysterbay. Note the large plot sizes and low land coverage.](image-url)
The general character of this type, especially in Oysterbay has to be linked with building covenants that determined the type of buildings supposedly to be erected in this area. The fact that Oysterbay was designated as a European residential area, covenants required that buildings erected should be no less than £2000 equivalent to TShs. 40,0000 in value of that time. This condition was to be applied in the extension areas outside the government quarter type of buildings. That was why in some parts of Msasani and Oysterbay, high-rise free-standing villa type of buildings and later two to four storey apartment blocks and isolated cases of two to three storey row houses were developed. The resulting character is a segment of government quarters with predominantly bungalow type of houses surrounded with these other types of houses. The established density characteristics from one block in this area are relatively low with plot coverage of 7.9 % and floor area ratio of 0.16. Being located along the ocean with spacious plots and a lot of tree plantings, Oysterbay is one of the urban types with better qualities than many other types within the city.

4.6 Low density, low-rise residential quarters

Three distinct categories of low-density, low-rise residential quarters can be discerned from this type. First are the small detached residential quarters, second are the semi-detached and third, the row housing quarters developed during the colonial era as part of African housing schemes but others developed by the National Housing Corporation (NHC) starting from the 1960 to the 1970s. The three sub-categories are elaborated as follows:

4.6.1 Small detached quarters (5a)

This category of residential quarters include those at Ilala and Kilwa road Police quarters. These quarters consist of small-detached two roomed with external pit latrines, constructed between 1946 and 1950. The construction materials for the walls are cement blocks and tiles for roofing. They are sited on relatively larger plot sizes resulting into very low plot coverage and floor area ratios. The floor area ratio as calculated from a typical block in this category is 0.07 and land coverage of 6.9 %.

Figure 4.7: Low-rise low-density small detached residential quarters at Ilala. Houses are characterised by small two roomed houses and toilets and baths outside the building. The houses have small windows that limit cross ventilation.
While this type was developed as the first housing scheme for African employees of the colonial government, Temeke quarters were developed as a second phase and experimental housing of the same scheme for African employees employed in the Pugu industrial area. The experimentation was described as an attempt to develop a better housing design for the Africans (Kironde, 1994).

These houses have been criticised from many views. One of the criticisms arises from the low land coverage and extremely low floor area ratio. Being located on a prime land a few kilometres from the city centre, land is extremely under-utilised. Alternative types could optimise existing potential and probably accommodate more housing units of better quality than the existing ones. They have also been criticised on grounds that they were built with colonial aims of providing accommodation to Africans who were considered as temporary residents working in the city and would finally go back to their rural areas. From architectural point of view, they have been criticised on over-emphasis on the roof with steep sloping tiled ‘roofs’, that implicitly has been viewed as a mere shelter for the intended occupiers of the houses (Africans) not necessary housing. They lack adequate provisions for windows and openings to allow cross ventilation that is essential for the hot and humid coastal tropical climate (Figure 4.7). It would seem interesting however, to study this type so as to explore what has been changing in terms of uses when compared to the original design intentions and how residents in these houses cope with the changing lifestyles.

4.6.2 Semi-detached residential quarters (5b)

The semi-detached residential quarters type were developed in Temeke as part of the colonial government experimental housing projects for Africans in early 1950s (Kironde, 1994:267). This scheme was developed to provide accommodation to African workers employed in the nearby industrial areas of Pugu and Chang’ombe. It was also a colonial response to repeated African’s strife and workers’ movement to pressurise for better housing conditions during this period.

![Figure 4.8: A semi-detached quarter type in Temeke. These houses were built in the 1950s for African employees in Pugu and Chang’ombe industrial areas. Houses are characterised by two roomed units each with toilet and baths outside in the back yard of the main building.](image-url)
The Railways Corporation also built similar type of houses for its workers at Chang’ombe during the same period. Since they were developed concurrent with the colonial sites and service programme in Temeke\(^1\), they are therefore located in the middle of settlement characterised by Swahili type of houses. The Swahili houses were developed by individuals who were issued serviced sites to develop their houses with flexible building materials. Established floor area ratio and land coverage from a typical block are relatively low, that is 0.19 and 18.7\% respectively (Figure 4.8).

4.6.3 Row housing residential quarters (5c)

A third sub-category within this urban type is a group of row house residential quarters all of which are single storey. These houses together with the small detached were developed in the 1950s as part of the African housing schemes. Buildings in this category are grouped around an open space with undefined pattern of paths within the housing clusters. Two roomed units with shared toilet and kitchen facilities outside the main building characterise the row house type in this group. As regards building materials, concrete blocks were used for walls and tiles for roofing. In the 1970s, the NHC constructed this type of houses but with kitchen and toilet facilities provided within the main building and additional room for sitting and dinning. Typical clusters developed by the NHC in the 1970s can be found in the areas of Ubungo, Kinondoni, Temeke and Tandika. Floor area ratios and land coverage established for a typical block in Magomeni reveal low quantities of 0.22 and 22.1\% respectively. The typical layout of streets in these areas is closely related with the planning of the surrounding areas that were designed together with this type. The street pattern is gridiron that seems to have been applied in the surrounding areas of Magomeni. For all the three sub-categories in this type, the 1979 Master Plan did not make any specific recommendations with regard to its development.

![Figure 4.9: Row houses in Magomeni area. Note that two units of the row house share the toilet and kitchen facilities at the back of the main building (Source: Vestbro, 1975).](image)

\[^1\] During this period, the ‘Sites and Services Programme’ entailed the demarcation of plots and provision of basic services such as streets, water supply and drainages. Individual developers were allowed to erect houses using locally available building materials. Many of the developers constructed Swahili type of houses that was; apart from providing accommodation for the owners, it was also possible to rent some rooms to others thereby providing a revenue source for the house owners. This type of housing development is notable in many parts of Dar es Salaam city.
4.7 High-density, low-rise, Swahili house residential (6)

This category of urban type occupies the major part of Dar es Salaam city. In 1990, the housing stock of Dar es Salaam was estimated to be 170,000 units out of which 43% or 73,100 units comprised of Swahili type of houses (Hoek-Smit, 1990). Some of the housing areas constituting this type were primarily designated for Africans during the colonial period.

Further extension was made after independence by the NHC through soft loans that were provided to Africans to improve their houses. Specific areas that characterise this type include Magomeni, Kinondoni, Ilala, Part of Temeke, formal areas of Keko, Mabibo, Mwananyamala and a small segment in Oysterbay area. The latter was planned for African workers ('houseboys') to the former European areas of Oysterbay, following a refusal to stay in the servant quarters. Although land coverage in this type is slightly higher when compared to other types, due to low rise character of the buildings the floor area ratios is rather low. Floor area ratio established from a typical block in Ilala has been revealed to be 0.37 and lot coverage of 36.6% (Figure 4.10).

The Swahili house type has been criticised from various ends. From traditional building materials point of view and as a security for loans during the British colonial era, Kironde notes comments from one district officer who commented as follows:

Africans built only in mud and wattle and thatch, houses that could not be insured against, so there would therefore be no security against advances of public funds. The Swahili house type required frequent repairs, it was in-sanitary and was difficult to be rid of pests. (Kironde, 1994:217)

With regard to comfort characteristics versus layout of the Swahili house type, the 1968 Master Plan observed:

The traditional Swahili house with its central corridor sealed off from private spaces allows for no movement of air. Windows in rooms face to the side and toward the unit next to it. No cross-circulation is therefore possible. The outdoor courts are completely solid and wind movement within courtyards is almost non-existent. The metal roofing, though fire resistant, is heat accumulating. (URT, 1968:41)
However, the understanding on the dominance of the urban Swahili type of house ought to be underscored in relation to peoples’ urge to generate income through renting income versus colonial housing policy for Africans. Vestbro (1975) had already put the argument on the dominance of the urban Swahili type of houses when he noted that:

*The colonial market economy existing in urban areas obviously led to the breaking down of familial and tribal loyalties so that the profit motive became the driving force for the construction of urban Swahili type of houses. House owners could get a return of 25% per annum of their invested capital with little or no risk involved.* (Vestbro, 1975:32)

It seems logical to conclude that the motive for renting of rooms to migrating population to the city during the colonial period and the decades that followed after independence played a significant impetus to developers to build Swahili type of houses for both owner and rental occupation. Even though the house type could not, and still does not provide comfortable living in terms of cross ventilation, the layout maximises the number of rooms for owner and rental occupation within the prescribed plot development conditions of that period.

The dominant street pattern in these settlements is the gridiron type with street widths ranging between 10 to 15 metres wide. This type of street layout dominated planning in the 1960s and 1970s during a time when town planning ideas of regularising African settlements seemed to have been dominating. One reason behind the gridiron pattern has been the fact that most of these areas are located in flat terrain hence it was easy to adopt the grid pattern. But the other factor that has been advanced in favour of grid layout has been the need for the colonial powers to make streets regular for easy control in case of riots. These are typical intentions that were politically motivated in regulating streets in Europe following the chaotic development of cities as a consequence of the industrial revolution.

4.8 Consolidated high density, low-rise informal settlements (7)

Several old informal settlements fall within this category. These include Manzese, Hanna Nassif, Msasani, Kigogo, Mabibo, Vingunguti, Buguruni, Kurasini Shimo la Udongo, Keko, Temece, Part of Tandika and Mtoni and Kinondoni Shamba. Detailed field observations and measurement studies in Msasani Makangira revealed that density in this settlement was 43 houses per hectare. This figure corresponds to an average plot density of 43 plots per hectare. These figures are twice those in newly emerging informal settlements (e.g. Ubungo Kibangu), which have 22 houses per hectare. Generally, single storey house types dominate in these settlements.

![Figure 4.11: Typical cluster of a consolidated part of Msasani Makangira. There are no regular streets in these settlements except for a few that serve a cluster of houses but not necessarily each housing unit.](image)

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<thead>
<tr>
<th>Number of storeys: 1</th>
<th>Lot (Land) coverage: 41.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor area ratio (FAR): 0.41</td>
<td></td>
</tr>
</tbody>
</table>
In settlements where informal land markets and consolidation of houses have intensified, isolated cases of two to three storey house types could be observed. Due to variations in plot size, house size also varies considerably with subsequent variations in terms of plot coverage, exposure and floor area ratios. Established floor area ratio from a typical cluster in Msasani Makangira has been observed to be 0.41 and land coverage of 41.5% (Figure 4.11).

Within this urban type, streets are narrow mainly because house construction has encroached these accesses and in some instances blocked by informal sector activities located along these streets. Large sections of the housing areas within these settlements are only accessible by footpaths.

4.9 High-density high-rise residential (8)

These settlements are unevenly distributed within the city. In some cases they exist as isolated groups of buildings amidst low-rise urban types and mainly developed by the NHC and other parastatal organisations in the 1960s and 1970s. Dominant areas that characterise this category are Ilala, Mwenge, Ubungo, Tandika, Keko, Buguruni, Chang’ombe and Tazara. These are high-rise residential apartments ranging from three to six storeys. Where such blocks are clustered closer to each other they have resulted into relatively higher floor area ratios and land coverage. Established floor area and lot coverage for typical apartment blocks in Mwenge area with five storeys on a lot area covering 20,510 square metres has been established to be 0.54 and land coverage of 10.8% (Figure 4.12).

4.10 Medium density, low-rise sites and services residential (9)

Kironde (1994) notes that the concept of sites and services started during the colonial era when plots at Magomeni, Kigamboni, Temneke, Kinondoni and Msasani were demarcated and serviced. However, the sites and services urban types referred in this category are those developed starting from the 1970s. Four main areas are included under this category, namely: Sinza, Kijitonyama, Tabata and Mwenge Housing Co-operative areas. Although the last was developed as a co-operative housing scheme in the 1970s, the other three settlements were
planned as sites and services areas under the World Bank support projects also developed in the 1970s. While Sinza and Kijitonyama were earmarked for low-income ‘working class’, Tabata was understandably for middle class or middle-income category of people.

The settlements of Kijitonyama and Sinza are distinguished by the character of uniform plot size of 288 square metres (Figure 4.13). Land coverage in this category is high but since the majority of the houses are single storeyed, floor area ratio is small. Established figures for floor area and land coverage from a typical block in Sinza are 0.36 and 36.2% respectively (Figure 4.13). Typical streets are narrow (6 to 10 metres right of way), unpaved curvilinear and in some cases radial in pattern (Sinza, Block A). In Sinza and Kijitonyama, the common house types are single unit (detached) type of houses. In some instances, two plots have been combined to form one larger plot, yet with higher plot coverage.

The dominant roof type is clerestorey locally called ‘Maputo style’ or ‘Sinza type’. This roof type became popular in the 1980s since developers claimed that it was economical in terms of number of roofing sheets required to cover the same built up area when compared to other roof types such as hipped or gable. Whether the roof style has been adopted from Maputo it is yet to be known.

4.11 Low density, low-rise consolidating informal residential (10)

The larger part of the newly emerging residential settlements in Dar es Salaam city falls in this category. These are settlements located in the immediate surroundings of the consolidated settlements of the city. This category includes settlements of Ubungo Kibangu, Msewe, Part of Kimara, Yombo, Vituka, Mbagala, Savei, Ukonga, Segerea and a number of outlying settlements along the major roads of Morogoro, Bagamoyo, Pugu and Kilwa. These settlements are dominated by single storey detached type of houses but in some instances more than one house have been observed to be on one plot.

Observation from Ubungo Kibangu revealed a gross population density of 234 persons per hectare that was established to be 50% lower than that in consolidated informal settlements. The land coverage in these settlements vary as intensification of building activities is still in progress. Floor area ratios and land coverage established from a typical block in Ubungo Kibangu has been revealed to be 0.25 and coverage of 25.5% (Figure 4.14).
Beyond this type are the outlying low-rise residential settlements with extremely low density. In these areas plots are large enough to facilitate activities like cattle and poultry keeping and urban farming. They form part of the rural setting of Dar es Salaam city. They include settlements like part of Kigamboni beyond Mbwamaji, Kinyerezi, Goba, Boko and Bunju. For the purpose and scope of this study, they have not been included in this classification.

4.12 Discussion

Established floor area and land coverage from the above-identified urban types is summarised in the following table.

Table 4.1: Summary; Number of storeys, land coverage and floor area ratios

<table>
<thead>
<tr>
<th>Urban Type</th>
<th>Number of storeys</th>
<th>Lot (Land) Coverage (%)</th>
<th>Floor Area Ratio (FAR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>The Administrative / Institutional area</td>
<td>3-12</td>
<td>35.2</td>
</tr>
<tr>
<td>1b</td>
<td>The Commercial residential area</td>
<td>3-5</td>
<td>44.1</td>
</tr>
<tr>
<td>1c</td>
<td>The Institutional (former European residential) area</td>
<td>1-2</td>
<td>10.2</td>
</tr>
<tr>
<td>2</td>
<td>Medium density, moderate height residential</td>
<td>2-4</td>
<td>19.9</td>
</tr>
<tr>
<td>3</td>
<td>Mixed density commercial / residential</td>
<td>1-7</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>Low density, low coverage residential</td>
<td>1-4</td>
<td>7.9</td>
</tr>
<tr>
<td>5a</td>
<td>Small detached quarters</td>
<td>1</td>
<td>6.9</td>
</tr>
<tr>
<td>5b</td>
<td>Semi-detached residential quarters</td>
<td>1</td>
<td>18.7</td>
</tr>
<tr>
<td>5c</td>
<td>Row housing residential quarters</td>
<td>1</td>
<td>22.1</td>
</tr>
<tr>
<td>6</td>
<td>High density, low-rise, Swahili house residential</td>
<td>1</td>
<td>36.6</td>
</tr>
<tr>
<td>7</td>
<td>Consolidated high density, low-rise informal settlements</td>
<td>1</td>
<td>41.5</td>
</tr>
<tr>
<td>8</td>
<td>High density high-rise residential</td>
<td>5</td>
<td>10.8</td>
</tr>
<tr>
<td>9</td>
<td>Medium density, low-rise sites and services residential</td>
<td>1</td>
<td>36.2</td>
</tr>
<tr>
<td>10</td>
<td>Low density, low-rise consolidating informal residential</td>
<td>1</td>
<td>25.5</td>
</tr>
</tbody>
</table>

Figure 4.14: One cluster of buildings within Ubungo Kbangu. There is still ample land that is yet to be developed. Floor area ratios and land coverage is generally low.

Number of storeys: 1
Lot (Land) coverage: 25.5%
Floor area ratio (FAR): 0.26
Figure 4.15: Floor area ratios, land coverage and building heights for Dar es Salaam urban types (Source: Adapted from Rådberg, 1996:391)
A close examination of these urban types in terms of land coverage, floor area ratio and house forms reveal variations some of which have high land coverage as well as floor area ratio. These could be considered as types with tendency towards optimal land utilisation. However, the majority of these types reveal low-density characteristics. If floor area ratios and land coverage are taken into consideration six main categories emerge. The first category is the higher land coverage and floor area ratio urban types. These are types 1a and 1b located in the city centre. The floor area ratio from these urban types range from 1.5 to 2.2 and land coverage of between 35% and 45%. The second category is the mixed density urban types in Kariakoo (type 3). This is rather a unique category in the sense that, it has the highest variations in terms of floor area ratio, land coverage and building heights. The observed floor area ratio is relatively high that is 1.5 and land coverage of 40%. The building height varies from single storey to seven storeys. The reason for this variation is the on-going redevelopment of single storey Swahili type of houses into high-rise apartment houses. The third category is the high-density high-rise residential with a relatively higher floor area ratio. This is type 8 characterised by the five-storey flats. The calculated floor area ratio is 0.54 but with low land coverage of 10.8%. Although this urban type could be considered together with the second category (type 3), its contrast between low land coverage and high floor area ratio indicates that buildings are spaced at larger distance with high-rise type of houses that result into increased floor area ratio. The fourth category is the medium density two to four storey urban type of Upanga area (type 2). This category has unique features in the sense that, despite having larger plots, established floor area ratios and land coverage are rather moderate that is 0.44 and 20% respectively. The building heights that vary between two to four storeys make this urban type unique when compared with the rest of the others. The fifth category is the medium density category characterised by moderate floor area ratios ranging between 0.2 to 0.5 and a relatively higher land coverage ranging between 22% and 41%. This category includes urban types with low-rise house types but with compact layouts such as: the Swahili house dominated urban types, the consolidated and emerging informal settlements, the row housing and a quarter urban types (types 5c, 6, 7, 9 and 10). The sixth category is the low-land coverage and low floor area ratio urban types. This category include urban types with land coverage ranging between 7% and 19% and floor area ratio ranging between 0.07 and 0.19 (types 1c, 4, 5a and 5b). This category is characterised by low-rise residential quarters or two to three storey urban types and with buildings sited on larger plots. They are in fact the low-density urban types of Dar es Salaam.

4.13 Summary

It has been observed that about half of the land coverage of Dar es Salaam city is presently occupied by informal settlements. When land coverage and floor area ratios from these settlements are taken into consideration, it can be concluded that about 50% of the city of Dar es Salaam is characterised by urban types with land coverage of less than 42% and floor area ratios of 0.41. These are the main features that characterise the consolidated informal settlements. With the exception of urban types in the city centre, Kariakoo, Upanga and isolated cases of the high-rise apartment block types, the rest of Dar es Salaam is primarily dominated by the low-rise, low-density urban types, which, understandably, bear the disadvantages in terms of under-utilisation of land and infrastructure.

If the assumption that low-land coverage urban types promote adequate spacing of buildings and therefore adequate cross-ventilation, sun lighting, views, adequate space for outdoor activities such variables that presumably illustrate good liveability and spatial quality of the urban type, the low floor area ratios observed from Dar es Salaam urban types undermine the whole question of optimising land and infrastructure services. Unless effective
measures are established to address these shortfalls, the rapid growth and sprawling city with low-rise urban types will continue to augment the negative externalities which include the lack of infrastructure and other basic services and poor accessibility to the city centre where most of the city functions are located.

So far we have identified and classified urban types on the basis of the prevailing density characteristics such as land coverage and floor area ratios. However, an examination of what has been happening in terms of their evolution, density changes, type and use of spaces is lacking. The link between these variables and liveability and spatial qualities from these urban types is yet to be established. These are subjects of discussion in the subsequent chapters, case studies of selected urban types.
CHAPTER FIVE

RESEARCH DESIGN AND METHODOLOGY

This chapter presents the bases and processes within which this study was conceived and executed. It points out the instruments employed for selecting, classifying and analysing urban types and how conclusions were derived. It outlines how the research was designed and the overall study strategy.

5.1 Choice of research strategy and rationale

The nature of the research problem, namely, the need for understanding and classifying urban types indicate that the approach in carrying out this study is both exploratory and causational. This points to the need for selecting cases for detailed empirical investigations.

A question related to understanding, often demand descriptive accounts of a phenomenon. For instance in this study, the starting point was to define what constitute an urban type and employing this definition in real life context. The notion of type implies the question of a class or classes distinct from other class or classes. The typing process therefore requires systematic approaches in identifying and assigning references to different classes based on pre-determined criteria. A case study approach was considered and selected as an appropriate research strategy.

Yin defines a case study as:

... an empirical enquiry that investigates a contemporary phenomenon within its real - life context, especially when the boundaries between a phenomenon and context are not clearly evident (Yin, 1994:13).

Indeed, attempts to identify, classify, analyse and draw inferences from empirical investigation ought to start from a case. The evolution of urban types often involves long, complicated and multiple chains of actions, events, actors and reactions without clear distinction of how each event has contributed to specific output in the specific situation. The classification and subsequent analysis of the dynamics of urban types in relation to efficient land utilisation and inherent spatial qualities ought to be studied in a real life context.

Commensurate with this argument, it is worth realising one example of a visitor from Europe who was asked to distinguish between formal and informal settlements in Dar es Salaam. His response was that he could not distinguish between the two since they generally depicted similar physical characteristics in terms of visual appearance of house forms, physical density and spaces between buildings. This implies that the boundaries between formal and informal are rather fuzzy and often times obscured. This observation shows one major issue which Yin discusses under the case study strategy, that the boundaries between the phenomena are obscured. In rapidly urbanising cities like Dar es Salaam attempts to distinguish urban types in formal and informal settlements is not quite an obvious phenomenon. Apart from the difficulties of distinguishing urban types physically, the complex social relations, lifestyles, the meaning and use attached to urban spaces, conception of planning among residents and planners which influence the components of this research make the separation between the context of the study and phenomena under the study not explicit. Therefore, the phenomena being investigated are context bound or have obscured boundaries. It is from this nature of these characteristics of the research problem and focus that the case study strategy is considered a relevant approach in exploring and describing relations of these phenomena.
5.2 Research design

Decisions regarding what, where, when, how much, by what means constitute central issues of research design (Konthari, 1992: 39). A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedures. Further, Konthari argues that the explicitness of research design strives to provide answers to the following questions: What is the study about? Why is the study being made? Where will the study be carried out? What type of data is required? Where can the data be found? What periods of time will the study include? What techniques of data collection will be used? How will the data be analysed? And in what style will the report be prepared? (ibid.). The research design therefore concerns the logical sequence for collection and analysis of data and its ultimate conclusions in relation to the research questions.

This research employs a multiple case design. One of the advantages of multiple case designs is the fact that they are more compelling and considered robust than single case designs (Yin, 1994:45). Yin points out further that multiple case studies have been considered when a comparative study among cases is envisaged. However, Yin cautions that multiple cases need more time and resources to be manageable. Since one of the aims of this study is to explore and compare variables of urban types from the two major categories of formal and informal settlements within the context of Dar es Salaam, a multiple case study design has been considered an appropriate strategy to explore in great detail variations among urban types. Dar es Salaam city was selected as a case within which identification and classification of urban types would be made. For detailed investigation on of components and spatial qualities on urban types, four case study settlements were selected, two from each formal and informal settlement (Figure 5.1). Data collection was designed to commence from one case to the other. This was deliberately done to familiarise with the respondents, local leaders, sub-ward leaders and key informants. Data collection from case study settlements was systematically administered from one case to another. Lessons learnt including shortcomings were applied to improve performance in the other cases. This proved useful especially in the first phase where detailed measurement studies were done in the informal settlements. The same procedure was applied in writing case study reports. After discussing the individual cases (Chapters 6, 7, 8 and 9), a cross case analysis was designed so as to establish patterns and variations emerging from individual cases and their implications to theory, planning and policies issues and as a basis towards working out recommendations and conclusions (Figure 5.1). As shall be discussed in the forthcoming sections, the challenges related with generalisation in a case study approach were also experienced. The idea behind this research is to have analytic generalisation as opposed to statistical generalisation whereby observed issues from these case study areas could be related to other contexts with similar conditions.
Figure 5.1: Research design and process.
5.3 Selection of case study areas

Both Flyvbjerg (1999) and Patton (1987) discuss the basic criteria for the selection of case study areas. They argue that in selecting cases, one should consider information rich cases. According to Patton, information rich cases are those from which one can learn a great deal about issues of central importance to the purpose of evaluation. Unlike in representative cases whereby the power of statistical sampling is dependent on selecting truly random and representative sample to a large proportion, the power of purposeful sampling lies in selecting information rich cases (Patton, 1987: 51-52). Consideration should focus on cases that are interesting, which answer what one wants to study, which fit the purpose, accessibility to case location and accessibility to case data (Patton, 1987:51-52; Flyvbjerg, 1999:120). Both Patton and Flyvbjerg further suggest that in selecting cases one may consider extreme or deviant cases that are particularly successful or problematic, maximum variant cases that are as different as possible, typical cases that are representative, critical cases with the logic that, if it holds (does not hold) for this case then it holds for all (for no) cases and paradigmatic cases that define a paradigm (Flyvbjerg and Patton, ibid.). Patton, however, adds more to these criteria when he discusses snowball or chain sampling that facilitates the identification of "key informants" or cases of special importance. Criterion sampling whereby cases that fulfil certain predetermined criterion characteristics are identified for in-depth study. Others include confirmatory and disconfirming cases whereby cases that fit into already emergent patterns add richness, depth and creditability to confirm or dis-confirm preliminary findings of the research. Of less significance in these criteria though may contribute towards case selection include politically important cases and convenience sampling. The last two as described by Patton are least desirable in selecting cases.

In this study a combination of criteria motivated the choice of cases as well as the case study city. These include the attempt to select an urban area which is inter alia, information rich, that is with urban types that reveal great variations (deviant cases), a great mix of formal and informal neighbourhoods and with dynamics that show rapid growth and transformation of urban types. The main target was to capture, assess and interpret urban types both synchronically and diachronically.

5.3.1 Dar es Salaam City: A case study area

Before selecting Dar es Salaam as a case study area, other towns and cities like Dodoma, Iringa, Mbeya, Morogoro, Arusha, and Mwanza were considered. The choice of Dar es Salaam was motivated by the fact that the city is one among the rapidly urbanising centres in the country as well as in the sub-Saharan region. Dar es Salaam is the largest sea port, industrial, commercial and administrative centre in Tanzania with a fairly long history of urban planning and settlement development. Because of the underlying socio-economic and historical factors, it attracts more people and exhibits a variety in urban types, high rate of settlements development and transformation. Being a primate city, Dar es Salaam is seven times larger than the second city (Mwanza) in terms of population size\(^1\). Besides, the growth rate for Dar es Salaam has been more remarkable than the rest of other cities. The 1968-1978 inter-censal city population recorded a growth of 9.9% per annum. Although this figure dropped to 7.7% during the period 1978 – 1988, population estimates in the 1990s suggest increased population growth rates (Kombe, 1995; Lupala, 2001:27). The city, therefore, represents an interesting case with

\(^1\) While average urban growth rate for Dar es Salaam between 1978 and 1988 stood at 7.7%, growth rates for other cities were recorded to be for example Mbeya (7.2%), Mwanza (7.3%).
challenging exposition of the study phenomena. Both the German and British colonial administrations had their footprints on the present urban types which are traceable today within available data sources.

Apart from the above qualities, the selection of Dar es Salaam city as a case study area was motivated by the growing number of studies that relate to this study. These include, for example, the study of the evolution of the city structure of Dar es Salaam (Kironde, 1994), formal and informal land management in Dar es Salaam (Kombe, 1995 and Kombe and Kreibich, 2000). A recent study on peri-urban land management in rapidly growing cities (Lupala, 2001) also contributes to the available literature. There exist data sources which have been established by the Dar es Salaam Sustainable Project (SDP, 1992) and the Urban Sector Engineering Project (USEP, 1992). Others include the availability of time series aerial photographs (1975, 1982, 1992 and 1995). These materials make Dar es Salaam information rich in terms of basic data sources when compared to other cities within the country.

5.3.2 Selection of urban blocks for detailed studies

At the city level, urban types have been identified, classified and discussed within the conceptual framework involving the variables of house forms, plot characteristics, density and streets. However, since we are dealing with cases within a rapidly urbanising city, and in order to operationalise studies at lower scale level, ‘urban blocks’ have been employed as the major units of analysis within which variables of house forms, density, and space uses and their relation to spatial qualities are assessed. In selecting urban blocks, the following selection criteria were taken into consideration. First, it was considered important to draw a distinction between formal and informal urban types. The two are the predominant forms of settlements in the city of Dar es Salaam as well as in many other urbanising cities in non-industrialised countries. Second, is the level of consolidation. The argument here is that both formal and informal urban types, exhibit different levels of housing consolidation that reflect the dominance of either formal or informal nature of settlement development dynamics of which this study aspires to explore.

The level of consolidation is related to the age and location of the settlements. Therefore, in each (formal and informal) case, an assessment on whether the settlement is old and consolidated or newly developing (unconsolidated) has been carried out (Figure 5.2). Consolidation as used here refers to extent of housing development within the specified area of study as measured by the physical density. The third criterion was related to variations in terms of urban type components. Urban types that showed greater variations in terms of house types, for example detached, single storey houses, detached multi-storey, apartment blocks, row-houses and semi-detached types of houses or in terms of planning and housing development process were considered for selection. The approach used to select urban blocks for detailed studies was by identifying clusters which were large enough to facilitate the comprehension of key study variables namely; density, house forms, plot characteristics and spaces and space use.

Commensurate with these criteria Kariakoo area was selected as an old formally consolidated case study area. Mbezi Block D was selected a newly emerging formal residential area. Msasani Makangira consolidates a consolidated informal settlement and Ubungo Kibangu a newly developing informal settlement.
Selection of consolidated formal urban blocks in Kariakoo

Within Kariakoo two urban namely, blocks 76 and 77 comprising 50 houses and 78 households were selected. In these, the ‘gentrification’\(^2\) dynamics that presently characterise redevelopment of houses for the whole settlement of Kariakoo can be noted. The two blocks also exhibit variations in terms of house forms whereby a mixed character of old Swahili type of houses with newly emerging high-rise apartments is notable. It was also considered that results from this settlements would provide a basis for rival explanation from formal settlements within this study.

Selection of newly developing formal Mbezi Block D area

The Mbezi sub-district area is a large planned residential area covering more than 5,500 hectares of land. Although the primary idea of planning this area was to provide low-density residential plots for ‘high income’ people, in designing the neighbourhoods a mixed development approach was adopted. This meant that all the three categories of plots namely: low, medium and high density were adopted.

The choice of Mbezi, more specifically Mbezi block D was motivated by the fact that this area portrays some characters of low density that is density housing located on large plots. The area is mainly occupied by high and middle class people, with some kind of sub-urban lifestyles. It is also characterised by housing development that has not been fully guided resulting into land use conflicts that necessitated the revision of layout plans to accommodate changes in land development. Besides being a planned area, housing development in this area has preceded infrastructure provision. Often, individual efforts to provide infrastructure have not been coordinated. Despite high quality house forms that are being constructed in this area, poor infrastructure provision has rendered spatial and liveability qualities in this settlement to be poor. Because Mbezi Block D is located along Bagamoyo Road with better accessibility, its development dynamics are faster when compared to several other Blocks within the sub-district planning area. Besides the fact that the area is yet to be fully developed, the present development portrays variations in terms of house form especially the visual and physical qualities. These are distinct from many planned neighbourhoods in the city. The case is therefore considered information rich and fulfils the criteria set as a basis for case study area selection.

\(^2\) The gentrification process as noted from Kariakoo is the transformation of the old low-rise Swahili type of houses to multi-storey apartments. House owners of the old Swahili type of houses are being bought-off by rich investors who develop housing for both rental accommodation and for commercial and office use. It evokes all the notions of replacing the original poor occupiers of this area who cannot afford new development conditions by the high-income people.
Figure 5.2: Data collection levels and targets.
Selection of consolidated informal urban blocks in Msasani Makangira

Although Msasani Makangira is considered one of the older informal settlements in the city its development emerged prominently in the 1960s with significant rapid house consolidation taking place in the 1970s. The relatively dense character and its ‘strategic’ location as a residential-cum-commercial centre lead to the selection of this settlement for detailed analysis. Despite the variations in house forms, horizontal housing densification in this settlement seems to have reached a saturation point. This has prompted a few house owners to start changing their houses from residential single storey to multi-storey residential-commercial buildings. Besides the foregoing, recent studies conducted by UCLAS and Milano Polytechnic Institute of Architecture (1998-2000) provided an entry point for detailed studies in Msasani Makangira. Further, a

Figure 5.3: Dar es Salaam: Location of case study areas

Selection of consolidated informal urban blocks in Msasani Makangira

Although Msasani Makangira is considered one of the older informal settlements in the city its development emerged prominently in the 1960s with significant rapid house consolidation taking place in the 1970s. The relatively dense character and its ‘strategic’ location as a residential-cum-commercial centre lead to the selection of this settlement for detailed analysis. Despite the variations in house forms, horizontal housing densification in this settlement seems to have reached a saturation point. This has prompted a few house owners to start changing their houses from residential single storey to multi-storey residential-commercial buildings. Besides the foregoing, recent studies conducted by UCLAS and Milano Polytechnic Institute of Architecture (1998-2000) provided an entry point for detailed studies in Msasani Makangira. Further, a

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3 This work that has been edited by Eleonora Bersani and Barbara Bogoni culminated into a book titled: Living in
study by Kironde (1994) on the historical development of the settlement was another source of evidence that proved to be useful in this study. As was the case for other settlements, aerial photographs for Msasani Makangira for the years 1975, 1982 and 1992 were also available. An upgrading plan prepared by the Ministry of Lands and Human Settlement Development (1991) also provided an information base for the selection of this settlement.

**Selection of newly developing informal urban blocks in Ubungo Kibangu**

Although Ubungo Kibangu is located away from the city centre, it has been rapidly urbanising especially after the completion of the Mandela Road in 1980. Its proximity to employment opportunity areas namely, the Ubungo industrial area has also influenced rapid development. It portrays varied characters in terms of house forms, plot sizes, density and space uses. Since it is relatively sparsely developed, if guided, it could provide potentials for future orderly densification that maintains liveability and spatial qualities. During the preliminary study period in this area, the local government office (Mtaa Leader) was running a census study to register all houses for the purposes of assigning each house a property tax collection number. This survey was also a source of information for this study. Unlike many informal settlements, Ubungo Kibangu also has aerial photographs that were taken in 1995 under the Songosongo Gas Pipeline Project. Further, Ubungo is one of the case studies by Kironde in 1994. As is the case for Msasani Makangira, there also upgrading proposals prepared by the City Council in 1989 and 1999. These attributes qualified the settlement for selection in this study.

**5.4 Quantitative and qualitative approaches**

The case study approach advocates the use of multiple sources of data and data collection methods, (Yin, 1981 in Kombe, 1995:55). The approach to data collection employed in this study included both quantitative and qualitative sources. The latter includes open-ended interviews, discussions, observations, measurements and analysis of documents and aerial photographs. Although some social scientists such as Lincoln and Guba construe the two approaches to be incompatible, other researchers such as Patton, Reinchartd and Cook argue that skilled researchers can successfully combine the two (Lincoln and Guba 1985, and Mill and Huberman 1994, in Lupala, 2001:92). Although the positivists support the quantitative approaches on grounds that the world is composed of observable and measurable facts, the interpretivists in contrast, support the qualitative methods on grounds that the world is in reality socially constructed, complex, and always in the process of change. Each approach emphasises the strength of its paradigm, but does not explain vividly its weakness (ibid.). In this study the divide between quantitative and qualitative is considered superficial because quantitative research approach is strong to establish answers to 'how many' and 'how much' questions. The understanding of 'why' things happen is better investigated with qualitative approaches that provide data about perceptions, attitudes, and behaviour (Blackman 1995, in Lupala, 2001).

Hence, both approaches share the same epistemological basis and are therefore considered as complementary to one another. This argument has been also noted and complemented by Ceccato when she argues that:

*Although the differences between quantitative - qualitative approach are accepted by a researcher, the dichotomy between these two types of information often melts away in practice. This happens since the relationship of quantitative to qualitative involves an overlapping set of paired opposites such as*

*Developing Countries; Dar es Salaam (2001).*
objective versus subjective, individual versus aggregated, tangible versus less tangible, formal versus informal, analytical versus narrative. (Ceccato, 2001:28)

It is from this understanding that this study deploys both qualitative and quantitative approaches in analysing urban types and spatial qualities inherent in the housing areas.

5.5 Units of analysis

According to Patton, the units of analysis depend on prior decision on the focus of the study. Units of analysis may comprise individual persons, small groups, families, subcultures, formal organisations, agencies or communities, neighbourhoods, cities, states even nations if the focus is on international programmes (Patton, 1987:50). Further, Patton argues that in qualitative evaluations, units of analysis may also be particular kinds of events, occurrences or incidences (Patton, 1987:51). In identifying the units of analysis Patton argues as follows:

_The key factor in selecting and making decisions about the appropriate unit of analysis is to decide what unit is that you want to be able to say something about at the end of the evaluation._ (Patton, 1987:51)

Based on the research questions, the primary units of analysis for this study are the urban blocks that have been selected after a comprehensive attempt of classifying the urban types city-wise. Within these major units, sub-units of analysis have been established to facilitate a detailed descriptive account of the urban blocks. For example, since one of the main interests of this study is to analyse density, both the plot and a block have been employed as sub-units of analysis.

5.6 Data collection methods

Sources of empirical evidence may be documents, archival records, interviews, direct observations, participant observation and physical artifacts (Yin, 1994:78). The list may however go beyond the six mentioned sources to include others such as films, photographs videotapes, street ethnography and life histories (_ibid._). The data collection in this study was gathered from various sources encompassing two main phases. The first phase entailed a citywide identification and classification of settlements by type. Included also in this phase were detailed measurements of houses, plots and spaces within the four-selected case study areas. Identification, classification and space use studies were also carried out during this phase. The second phase entailed interviews with heads of households to explore and document patterns in their household and occupancy characteristics and their views with respect to quality of their settlements. In both phases, interview with key informants, officials from the municipalities were carried out either as an entry point to the case study areas or a way of triangulating information gathered from the household, documentary sources and observations.

5.6.1 Observation and photographic registration

Observation was employed as a primary method to study house forms, building uses, plot measurements, configuration and plot characteristics and space uses. Observed house forms variables included house type, number of storeys, roof type, building materials and size and entrances to buildings. These variables were recorded in a _house form characteristics form_ (Appendix 1). It was also during this phase of study that house use and occupancy characteristics were probed and recorded. In each house, information on the number of households living, persons per household, number of rooms for the whole house, ownership status of the house, year the house was completed and occupied were gathered. Also observed and recorded included
house vehicular accessibility and use of outdoor space. The latter were recorded in *house use and occupancy characteristics form* (Appendix 2). Plot configuration and characteristics such as frontages, exposure, and plot setbacks or simply distance between buildings were also measured and recorded. Observation on house forms and plot configuration and characteristics was supplemented by photographic registration of the features examined. For example, each house within a detailed study area was photographed, this included registering of the front, side and the rear elevations and activities taking place within the plot. Street façade capturing two or more houses was also documented.

Observation study was further used to facilitate identification, classification and quantification of spaces and space utilisation. The identification, classification and selection of spaces for detailed observation study were facilitated by a number of criteria\(^4\). These criteria included the configuration of spaces, diversity of activities that take place within the space and the general impression on the intensity of activities. Commensurate with these criteria, two spaces within Kariakoo area (ST1 and ST2) were selected for this study. In Msasani area three spaces were selected, namely, OS1, OS2 and OS3. In Ubungo settlement, an open space SQ1 was selected for the study. Observation in the use of spaces involved counting the number of users at a specified time interval of three hours. In order to identify and categorise users of spaces, the count was designed to take into account the age and sex of users. Users between the age zero to seven years (that is children) were recorded by male or female sex category. The same applied for the seven to eighteen year olds (that is youths) and above eighteen (that is adults). Both mobile and stationary activities were recorded. Mobile activities included walking, walking and talking, walking and selling items, pushed or pulled carts, and moving bicycles. Stationary activities included sitting, sitting and eating, sitting and talking, sitting and selling items, standing, standing and talking, parked carts, bicycles. These activities were recorded within *space use registration form* (Appendix 3). By quantifying the number of users for both stationary and mobile activities it was possible to establish variations in activity diversity and intensity for the various time intervals the observation exercise was carried out. There were no detailed observation studies in Mbezi Block D because the area is still sparsely built. Unlike in other settlements, the dominant activities found in this settlement were mostly related to gardening.

5.6.2 Analysis of plans and drawings

Plans and drawings provided essential inputs in the analysis of house types, forms, plot layout and configurations, floor area ratios and setbacks. Existing plans were gathered either from the Ministry of Lands and Human Settlement Development or from respective Municipal Authorities (Ilala and Kinondoni)\(^5\). Calculation of plots sizes, plot ratios, houses sizes, plot coverage, floor area ratio was made possible through analysis of maps and plans. A comparison of variables such as trends in changing sizes of houses was also explored by comparing maps of the same area for two or more periods for the same area. Standard basemaps of scale 1:2500 were acquired and enlarged to working scales of 1:1000 and, where necessary, to the scale of 1:500.

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\(^4\) Spaces as used here refer to streets, informal squares that were noted to harbour activities such as walking, sitting, children at play, and a number of roadside informal petty trading activities ranging from shoe shining, stone crushing, selling of cooked food stuffs etc.

\(^5\) From January 2000, the former City Council of Dar es Salaam was split into three municipalities of Ilala, Temeke and Kinondoni. Kariakoo as a case study area is located in Ilala Municipality and Msasani, Ubungo and Mbezi in Kinondoni municipality.
5.6.3 Analysis of aerial photographs

Before detailed measurements were carried out in the case study areas, aerial photographs covering the whole of the built-up part of the city of Dar es Salaam were compiled into a ‘photo mosaic’. Time series photo mosaics for the years 1975, 1982 and 1992 were prepared to provide an overview on the spatial growth trends for the whole city of Dar es Salaam (scale 1:12,500). Analysis of these mosaics also provided a basis for the development of urban types for Dar es Salaam. Aerial photographs provided a basis for establishing trends in housing densification processes. Houses were counted from aerial photos for different periods - particularly those found of 1975, 1982, 1992 and 1995 (for Ubungo Kibangu). Aerial photographs of scale 1:2,500 were used for this purpose. In informal settlements where plans or maps are in many cases not easily available, aerial photos facilitated the updating of existing maps and as a basis for comparing changes in housing densification. Although analysis within case study areas centred on the present situation that is synchronic interpretation, time series aerial photographs provided a ground to analyse settlement diachronically on spatial growth trends and on time-space development or changes.

5.6.4 Measurements

House and plot measurements were conducted for 178 houses and 182 plots in Msasani Makangira and 126 houses and 133 plots in Ubungo Kibangu. This exercise was necessary in these two settlements because they fall within the category of informal settlements. Therefore, there were no readily available source of information to illustrate plots sizes and configuration characteristics. Measured quantities included plot width, depth and setbacks. Plot exposure and boundary definition were observed and recorded in ‘plot configuration form’ (Appendix 4). Results from house and plot measurements provided a basis for the analysis of house and plot sizes, plot dimensions, plot ratio, plot coverage and usability of spaces at plot level. In formal settlements (Kariakoo and Mbezi), the exercise was simplified by either updating information from available maps or ascertaining measurements recorded from maps against prevailing situations on the site. A total of 59 plots and 50 houses were measured in Kariakoo and 56 plots and 42 houses were measured in Mbezi block D.

6 A photo mosaic as applied in this study is the composite pieces of aerial photographs of the same area and the same scale forming a large photograph. Traditionally, photo mosaics were manually processed though with the introduction of digital processing procedures, it is now possible to prepare such mosaics using a computer. In this study, photo mosaics for 1975, 1982 and 1992 were manually processed and analysed.
5.6.5 Interviews

Kvale (1996) defines an interview as a conversation that has a structure and purpose. He further points out that interviews go beyond the spontaneous exchange of views as in everyday conversation and becomes a careful questioning and listening approach with the purposes of obtaining thoroughly tested knowledge (Kvale, 1996:6). Further more, Kvale notes that an interview is not a conversation between equal partners because the researcher dictates terms to the interviews by defining, introducing questions that aim at achieving certain information. This argument supports Moser’s and Kalton’s (in Lupala, 2001:93) views who define an interview as a conversation between interviewer and respondents with the purpose of eliciting certain information from respondents. Although Kvale acknowledges that interviews as a research method can be employed in both fact finding employing the metaphor of a ‘minor’, and as a way of understanding the complexities embedded within humanities employing the metaphor the ‘traveller’, he suggests that interviews are more useful in qualitative research. He argues that interview methodology has the strength of capturing a multitude of subjective views that underlies the quality of qualitative research (Kvale, 1996:7).

Yin identifies three forms of interviews. First, is the open-ended interview in which respondents are asked the facts of a matter and their opinions about events or their proposal on
such events. Second, is focused interview whereby a respondent is interviewed for a short period of time, say one hour. Third, is a more structured interview along the lines of formal survey (Yin, 1994: 84-85).

The interview method was preferred to other data collection methods such as distance administered questionnaire surveys because the aim of this study was to explore variations in views of residents and their expressions of their environment. The interview method offered an opportunity to record individual wishes, views, expressions and visions including evaluation of their settlements. Although household interviews were facilitated by a questionnaire, most of the questions were open-ended. Most of the questions were directed to the heads of household. The questionnaire that was administered to explore household characteristics was divided into four main parts. These included household dwellings related activities, income and work related activities, recreation and relaxation activities and participation in religious, organisational and socialising activities (Appendix 5).

Selection of households for interviews

Before commencement of household interviews the first phase of field study established the total number of households and persons in each house at the same time measurement of houses and plots were taken. This facilitated the preparation of an enumeration list in each study area. Since urban blocks in formal settlements were of fairly manageable size, the target was to cover 100% of all houses and households. The procedure adopted was to interview all households within a house with the primary objective of documenting views of residents with respect to their daily life activities. This endeavour was however not fulfilled as planned because some heads of households were not available despite several attempts to reach them, particularly in Kariakoo and Mbezi areas. Therefore, out of 78 households, 48 households were interviewed in Kariakoo. In Mbezi area, the same approach was used. However, since in this settlement there are a lot of unfinished buildings and servant quarters, only households residing in finished buildings were interviewed. Thus, out of 48 listed households, 17 households were interviewed.

The situation was a bit different in informal settlements. From large numbers of households, that is 437 households in Msasani Makangira and 376 households in Ubungo Kibangu, 56 households were interviewed in Msasani and 47 households in Ubungo (Figure 5.2). The criteria for selecting the households were based on a the number of factors. These factors included houses that accommodated nuclear families, houses located along the streets and those in the inner parts of the settlements. Others are houses that accommodated home-based activities such as animal keeping, poultry keeping and gardening. Further, a consideration on whether such houses were larger or smaller, with plots surveyed or un-surveyed were taken into consideration. Houses were selected from an already prepared enumeration list and updated maps. As the case was for Kariakoo and Mbezi, once a house was selected for interview, all households in the house were interviewed. The primary aim of using multi-criteria in house selection was to capture as much variations as possible. The selection of houses was therefore purposeful rather than random sampling approaches. As Patton (1987) argues, the power of statistical sampling depends on selecting a truly random and representative sample that permits generalisation, the power of purposeful sampling lies on selecting information-rich cases for in-depth studies. The aim of studying peoples’ views and their activities was not to draw some generalisations to the whole population, rather to reveal variations, opportunities and impressions of individual households and underscore their relationship with the built environment. It is from this understanding that a systematic statistical sampling approach was not used in this study.
Interview with key informants

Key informants are respondents who are particularly knowledgeable and with deep insights that are useful in helping the researcher understand what happens (Patton, 1982:95). Key informant interviews were carried out particularly in informal settlements primarily to establish the historical evolution of the settlements. These included the elderly settlers in these settlements, community leaders, Ten-Cell Leaders, Sub-ward Leaders and Land ‘Subdividers’. The latter are people who initially held large tracks of land and have subdivided and sold pieces of land (plots) to developers. Key informants provided information about original settlers in the settlements, land use changes, processes on how people settled in the area, plot allocation processes, local norms and rules that guided the construction of houses, effectiveness of these local rules in guiding housing development. Key informant interviews sought to unveil how people define public and semi-public spaces, their uses, how people protect these spaces for communal interest. Further, conflicts in the use of spaces, existing and level of infrastructure and recreational facilities were documented. Interviews with key informants, where allowed, were tape-recorded. Information gathered provided a basis to corroborate with information from documentary sources and observation studies (Appendix 6).

Interview with officials

Respondents for this sector included professionals such as Town Planners, Engineers and Architects. Information gathered from this group focused on the relationship between identified urban types and planning ideology, prevailing planning practice, planning considerations of urban types with respect to density, city transformation and sprawl, usability of spaces and formalisation processes of informal settlements. As was the case for key informants, interviews with officials provided a basis to triangulate information gathered from other sources including documentary analysis. Interviews with officials also provided a ground to make inferences on policy issues, perceptions of the institutions they represent with respect to planning and management of changes occurring in urban types. A tape recorder was also used to record interviews to supplement notes taken during the interview. Interviewed officials included Municipal Planners and Engineers from Ilala and Kinondoni municipalities as well as the Head of Urban Planning, Environment and Utilities of the Dar es Salaam City Council.

5.6.6 Documentary sources

Yin enumerates documentary sources of evidence for case studies to include letters, memoranda and other communiqués. Documentation also include agendas, announcements and minutes of meetings and written reports. Further, he includes administrative documents as part of documentary evidence. Included also are formal studies or evaluation of the same site under study, newspaper clippings and other articles appearing in the mass media (Yin, 1994:81). Concerning the usefulness of documents, Yin argues that they should be used to corroborate and augment evidence from other sources. He cautions that if the documentary evidence is contradictory rather than corroborative, then the case study investigator should inquire further into the topic (ibid.).

Documentary sources of evidence on urban types in rapidly urbanising cities like Dar es Salaam and within non-industrialised countries like Tanzania are scanty. Although there are arguments in favour over a long tradition in urbanity tradition in sub-Saharan Africa, a clear and systematic documentation in their spatial patterns, transformation, quality and form have been scanty. Cities that developed after colonial occupation have some kind of documentation existing
as plans and historical biographies written by historians, and other social scientists.

The study by Kironde (1994) was used to elucidate the evolution and growth of settlements both in case study areas and in the development of urban types for Dar es Salaam. Studies by Kombe (1995), Kombe and Kreibich (2000) and Lupala (2001) on Informal Land Management in Tanzania enriched this study particularly on empirical issues. Similar studies such as Vestbro (1975), Sutton (1970) also provided a grounding basis especially in the identification and development of urban types. Besides, the Master Plans for Dar es Salaam (1968 and 1979), Planning Standards and Redevelopment Plans for Kariakoo provided a significant input to empirical evidences of detailed case study areas.
<table>
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<tr>
<th>Research Issues</th>
<th>Literature Review</th>
<th>Analysis of documents</th>
<th>Key persons interview</th>
<th>Observation with observers</th>
<th>Interviews</th>
<th>Analysis of photographs and map</th>
<th>Measurements</th>
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*Figure 5.5: Summary of research issues and methods used.*

**Key:**

- **V** signifies that the method was important.
- **●** signifies that the method was used to supplement other methods.
5.7 Reliability and internal validity

Reliability aims at demonstrating that if the operations are repeated such as data collections processes under similar conditions similar results will emerge. Validity establishes causal relationships whereby certain conditions are shown to lead to other conditions. In order to minimise threats to internal validity complementary strategies were adopted. First, was the use of complementary data, information and other cases to rule out rival explanations. For example, the selection of two categories of formal and informal and further re-categorisation of old and newly consolidating settlements targeted at elucidating competing explanations over study phenomena of house forms, density, plot characteristics and spaces and space uses. Second, was the corroboration of the multiple sources of evidence. However, it is important to mention that due to the nature of this study (exploratory and descriptive) at times it was not possible to corroborate such data due to lack of alternative sources of information. For example, the plot boundaries in informal settlements could only be measured during the fieldwork studies in informal settlements. There were no official documents, maps that depicted prevailing conditions on the disposition of plots in these settlements. Hence, the calculations of plot coverage and floor area ratios are a result of these exploratory studies. In situations where boundary definition was problematic key informants were asked to confirm and verify physically. However, in formal settlements both measured quantities were cross-checked with dimensions measured from maps and if there were discrepancies, field visits to the site were made to check and rectify the anomaly.

For the purpose of ensuring reliability of results from this study three strategies were deployed. Firstly, a database was established for each case study area whereby information gathered from each settlement was stored and built up. Each case study area (Kariakoo, Mbezi, Msasani and Ubungo) had its own database where information was systematically ordered and stored. The first phase of fieldwork studies in these settlements that involved registration of all houses within case study areas provided a concrete base from which purposefully sampled house and households were selected for interviews in the second phase. Information gathered from interviews was also systematically documented. Secondly, in order to ensure quality of data collected, only graduate field assistants were recruited. A two days seminar was conducted to explain among other things, the research objectives, the methods of data collection, introduction to local leaders, translation of questionnaire forms from English to Kiswahili\(^7\). The main purpose of the seminar was to develop a common understanding on the questions and the translation. Answer sheets were scrutinised on daily basis so as to check the consistence in the type of responses, adequacy of the data collected and relevance of the questions. The third strategy was the adoption of a coherent data collection method in all cases. For instance in analysing urban types, the same variables namely, house forms, density, plot characteristics and spaces and space uses have been used. The application of the same variables for all cases facilitated cross-case analysis and pooling up results from these cases.

5.8 Generalisation

One of the main challenges of a case study research has been how to generalise results from one case to a wider context. A number of authors have discussed how generalisation from a case can be made. An agreement that seems to emerge from these authors is that results from

\(^7\) Although the questions in questionnaire forms were drafted in English, actual interviews were conducted in Kiswahili, the language that is understandable to almost all Tanzanians. This then necessitated the translation of the questions from English to Kiswahili so as to develop a common understanding among the research team. The main target was to ensure that the collected information was consistent from all the field assistants who were involved in the data collection exercise.
case studies research are not generaliseable as the case is for statistical samples. Case study findings can be related or transformed to another context provided that conditions in latter context are similar (Yin, 1994:38; Patton, 1987:167; Nnkya, 1996: 258 – 59; Flyvbjerg, 1999:15). Quoting Bassey, Nnkya argues:

*An important criteria for judging the merit of a case study is the extent to which the details are sufficient and appropriate for a (practitioner) working in a similar situation to relate his decision - making to that described in a case study. The relatability of a case study is more important than its generalisability.* (Nnkya, 1996: 259)

This argument is considered valid for the Dar es Salaam case and that practitioners within and outside Dar es Salaam will get the opportunity of relating results from Dar es Salaam and reflect upon their contexts. Complementing this argument, Flyvbjerg (1999:15) advocates ‘transferability’ of case study research. He argues that the text in case writing must contain enough details and context for the reader to be able to judge whether the results hold true for other cases that the reader knows about. Yin argues for analytic generalisation and the logic of ‘replication’. He recounts that instead of generalising a correctly selected sample to a larger universe or statistical generalisation, case studies have to rely on analytical generalisation. In analytical generalisation, the investigator strives to generalise particular a set of results to some broader theory or a set of propositions (Yin, 1994:36). Yin notes that instead of statistical generalisation, the ideas of analytic generalisation can be related to the logic of ‘replication’.

Patton seems to concur with Yin when he discusses the logic of generalisation in case study research with the logic of ‘extrapolation’. He argues that:

*Unlike the usual meaning of the term “generalisation” an extrapolation connotes that one goes beyond the narrow confines of the data to think about other applications of the findings. Extrapolations are modest speculations on the likely applicability of findings to other situations under similar, but not identical conditions. Extrapolations are logical, thoughtful and problem-oriented rather than statistical and probabilistic. Extrapolations can be particularly useful when based on information - rich samples and designs. (Patton, 1987: 168)*

In this study, results from case studies have not been used as representative of other cases. As such, results from case studies have been presented towards serving mostly as bases for relatability with specific contexts where prevailing conditions are more or less the same as those found in these cases. Since no statistically representative samples were taken, results from the case study areas (Kariakoo, Mbezi, Msasani and Ubungo) are therefore context specific whose generalisability does not take into account representativity of the cases. The fact that stringent theories towards explaining dynamics within cities with informal settlement developments are still vague, the question of theoretical generalisation is less significant in this study. The central idea is that analytical results established from this study can be related with other cases with similar conditions as those prevailing in Dar es Salaam.
CHAPTER SIX

KARIAKOO-THE RAPIDLY TRANSFORMING INNER CITY
SETTLEMENT

This chapter presents part of the results from the case study areas. Kariakoo being one of the oldest settlements in Dar es Salaam evolved from a typical African settlement with its gridiron layout designed in the 1920s. Presently, this urban type is rapidly changing with houses being transformed from typically low-rise Swahili type of houses to multi-storey buildings. This transformation has resulted in a mixed character of low-rise Swahili type and multi-storey buildings. Despite the increase in density, the new character has also resulted into numerous design and development problems rendering liveability and spatial qualities problematic. Kariakoo has been selected as one of the old formal settlements to explore in detail variables that characterise urban types.

6.1 Settlement evolution and development

Kariakoo had its beginning in the 1920s although the buildings in this area were existing as small huts within a coconut plantation before this period. Within Dar es Salaam, it is considered one of the oldest settlements. It developed on a former Sultan’s coconut plantation in early 1880s and later planned by the German and British colonial administration. At that time the area of Dar es Salaam was limited to the city core bordered by the present Samora Avenue, and ocean road. The nearby villages included Kisingo, Mzizima, Upanga, Kisutu and Magogoni (Kironde, 1994:134-5). Africans in these villages were farmers, fishermen and small-scale traders. Others were labourers engaged in the extensive coconut plantations. These plantations belonging to the Sultan of Zanzibar were situated at Kariakoo, Kisutu, Kitchwele, Gerezani and Upanga (ibid.). Under the guidance of the German zoning and building regulations (the Bauordnung) of 1891, Kariakoo was earmarked in Zone III together with Gerezani where ‘native buildings’ with flexible standards were allowed (Figure 3.10). In decades to follow, land use planning aimed at defining street layouts, land subdivisions and building regulations, but also with an intention of implementing a racial segregation policy as designated in land use plans. Since the area in the periphery of the town including Kariakoo was left with no specified building regulations, and the fact that the majority of the occupiers of this part of the city were Africans, this resulted into construction of simple traditional houses.

A German called Scholler purchased about 213 hectares from the Sultan’s plantation during the early days of German rule and formed what was called the Sultan Plantation Company (ibid.). Scholler allowed Africans including those who were working in the plantations to settle on that land but charged them land rent. With the commencement of railway construction, many Africans came to Dar es Salaam and settled on Scholler’s plantation. This is because it was easy for Africans to occupy land on that coconut plantation, paying rent to the owner and the fact that the farm owner and building regulations of that time allowed to construct houses in temporary structures. By 1905 Africans had occupied the

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1Buildings regulations in this zone allowed all types of materials to be used. Unlike in Zone II and I where only ‘European type of houses’ were allowed, Africans developed small huts that came to be improved in the future decades. The building and zoning regulations implicitly refer to European houses as those houses built of stone for walls and corrugated iron sheets or tiles for roofing. These are some of the requirements that guided development in Zone I and II.
northern and western parts of the town (ibid.). They put up simple structures, organised in clusters unrelated to colonial set up. Therefore, Kariakoo was already occupied by mainly Africans and a few Indians. Indians were buying plots before the German administration prepared a plan for this area.

The German colonial government, in 1914 bought Scholler’s plantation so that it could make a proper settling plan for Africans. This land transfer to the government was based on the fact that about 63% (i.e. 15,000 Africans out of 24,000) of the total African population had settled in that plantation, (ibid.). It was therefore logical that the development of such a big area could not be left to a private company with lots of houses within the plantation. But it can also be argued that the land acquisition from the private company meant to facilitate the segregation policy as provided in the ‘Bauordnung’.

The construction of the central railway line starting from Dar es Salaam to Kigoma in 1905 raised demands for new land uses such the railway station, the railways reserve, the marshalling yards and residential quarters for the workers. This demands forced Africans to be removed from some of the old African areas to Kariakoo. Others were resettled at Ilala, a settlement adjacent to Kariakoo. Even though these developments shaped the structure of Kariakoo and its surroundings, it is indeed the British who gave the present form of Kariakoo an urban structure. A gridiron plan typical of European 19th century working class quarters was prepared for the African area. It could also be argued that the grid layout illustrate a ‘regularist’ planning approach, typical of neighbourhoods that were planned during this period in other cities within the country (Figure 6.1). The regularist approach can also be associated with political motives of easing control of riots, a situation considered to be difficult if the settlements are irregular.

In regularising Kariakoo, the first layout prepared was of gridiron pattern with blocks of approximately 150 metres and plot size of average 12 by 15 metres (180 square metres). But because it was the only area where simple temporary structures were allowed, the majority of the migrants from other parts of Tanzania were accommodated in Kariakoo. As job opportunities increased in Dar es Salaam, in-migration too increased and densification increased in Kariakoo. By the 1930s Kariakoo had already raised redevelopment thinking among policy makers since this area was developed primarily into traditional Swahili type of houses with the so called temporary building materials. In 1943, the Dar es Salaam Municipal Secretary E.H. Helps proposed that Kariakoo should be redeveloped piece-meal wise into a garden city,(ibid.). These intentions might have had arisen as a way to upgrade the ‘temporary’ character of houses in terms of materials used in constructing the Swahili type of houses, that is thatch for the roof and mud and pole for the walls.

One of the problems arising from rapid growth of Dar es Salaam was insufficient housing provision to cope with the increasing population. Subsequently, by 1947, informal housing development was already becoming a difficult task to control by the city authorities. Undeveloped lands were being built rapidly. As the need for accommodation increased, many landlords added more rooms for renting wherever space permitted. In doing so, they encroached, albeit illegally on the reserve service corridors which were provided at the rear

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2 Spiro Kostof discusses the logic behind the grid. He argues that orthogonality should be viewed not only as a manner of creating urban order or a simple formula of urban design but on flat terrain it is a sensible method of land subdivision. But the grid may also be fostering a calculated political and social structure. Further, the grid may have intentions to group blocks into wards, stretch into strips of burgage plots maximising street frontage. Citing advantages of the grid, Kostof argues for its unending flexibility in extending designs when he says: ‘it can extend almost indefinitely to make greater Chicago or the conurbations of Lima or Buenos Aires’. (Kostof, 1991:116)
side of the courtyards. Population in Kariakoo increased rapidly surpassing requirements for services such as water supply, drainage and sanitary facilities (Kaitila, 1990:214).

Although the 1949 plan for Dar es Salaam is said to have proposed redevelopment of Kariakoo to increase open spaces and reduce densities, existing literature does not indicate how this was to be achieved. This plan was not implemented. Development in Kariakoo continued unguided. It was not until 1968 and 1979 when comprehensive Master Plans for Dar es

Figure 6.1: Layout plan for Kariakoo. Note the gridiron pattern that was adopted to regularise the settlement. Between Kariakoo and the east is the buffer zone, the Mnazimmoja that was developed purposely to separate Kariakoo from the city centre areas that were designated for Europeans and Asians (Source: Kironde, 1994: 196).

Although the 1949 plan for Dar es Salaam is said to have proposed redevelopment of Kariakoo to increase open spaces and reduce densities, existing literature does not indicate how this was to be achieved. This plan was not implemented. Development in Kariakoo continued unguided. It was not until 1968 and 1979 when comprehensive Master Plans for Dar es

Unlike the Asian and European residential areas, Kariakoo and other African areas had no sewage system or improved on-site sanitation system. Kariakoo lacked kerbsides and storm water drains were openly connected (Kaitila, 1990:214).
Salaam (that is the 1968 and 1979 Master Plans) were prepared therein stipulating redevelopment guidelines for Kariakoo.

6.2 Influence of Master Plans on the development of Kariakoo

The first general planning scheme for Dar es Salaam, and indeed the first in the country was prepared in 1949\(^4\). The influence of this plan with respect to the development and transformation of Kariakoo is relatively small (Chapter 3). The second Master Plan was prepared in 1968. This was the first comprehensive plan under the Towns and Country Planning Ordinance of 1956\(^5\). Under this Master Plan, Kariakoo was designated part of the city centre. About 30\% of the built up land was to be converted to office and commercial development (*ibid.*). Besides, a few institutional and commercial land uses were recommended along the present Lumumba and Mafia Streets. Although this plan was not fully implemented the planning ideas envisaged redeveloping Kariakoo into a ‘modern city’. The excerpt below depicts the Mater Planners’ vision of future Kariakoo:

> The central area (which Kariakoo was part of) should be an expression of the personality, image and vitality of the capital city and its region. It must express through good planning and in human terms, a structure and physical form appropriate to its unusually advantageous setting and also to the dignity and importance of the government. At the western side of the Mnazimmoja Park, the proposed open space forms a focus of concentration of government offices. Its edges would be sharply defined as they provide a foil to buildings to a maximum height of 15 storeys in character with the recent Cooperative building. (URT, 1968:61-63)

This is an expression of modernistic planning that prevailed during the 1960s that sought to transform Kariakoo from single storey residential Swahili type of houses to multi-storey office and commercial buildings. Other specific proposals included: concentration of future government and parastatal offices along both edges of Mnazimmoja, the commercial high-density link extending from the Mnazimmoja to Kariakoo market, high-density redevelopment pattern in a manner that could utilise the grid pattern streets and services (Figure 6.3a). It was also recommended that every second street running parallel to Lumumba Street was to be converted into pedestrian mall that would lead to the inner commercial link (URT, 1968:64-65).

The implementation of comprehensive redevelopment proposals of the 1968 Master Plan was faced with people’s resistance particularly on the aspect of resettlement of several households. It was only seven years after independence and the argument advanced by residents of Kariakoo was that the government wanted to push them out of their area on the pretext of redevelopment, a policy that was perpetrated during the colonial period to replace Africans from their land to facilitate racial segregation. Residents argued that while they supported the government to fight for independence, it was the same government that was then turning back against them. It was from these arguments backed with local leadership support from the area that the government postponed indefinitely the redevelopment programmes as proposed in this Master Plan. Only a few institutions and commercial buildings were implemented or extended, such as the Kariakoo market, and few office blocks along Lumumba Street (Figure 6.2).

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\(^4\)British Civil Engineers Sir Alexander Gibb and Partners prepared this plan when the population of Dar es Salaam was about 70,000 people.

\(^5\) The Town and Country Planning Ordinance is the principle legislation governing town planning in Tanzania. It was enacted in 1958, with minor amendments in 1960 and 1999. It was adopted from the British Town and Country Planning Act enacted in Britain during the same period and was applicable to many of the countries that were colonised by Britain.
While the 1968 Master Plan recommended substantial reconstruction in Kariakoo, the 1979 Master Plan focussed on land use and building height controls. The plan recommended the maximum allowable building height in Kariakoo to be eight storeys. The recommended floor area ratio for Kariakoo area was broadly divided into four main zones. Zone I comprised the area west of Msimbazi Street that was recommended for single storeys with floor area ratio of 0.5 and a maximum plot coverage of 50%. Ideally, this area was recommended to retain a single storey character with improvements being made to services and roadways. The second zone is the area bordered with Msimbazi, Morogoro, Mafia and Lumumba Streets. In this zone, floor area ratio of 1.0, plot coverage of 50% was recommended and a maximum height of 3 storey houses was recommended. In Zone III that is a stretch along Mkunguni Street in which Kariakoo market is located was recommended for 8 storey buildings, floor area ratio of 1.5 and site or plot coverage of between 60 and 70%. The fourth zone (Zone IV), the area bordered by Msimbazi, Uhuru and Livingstone Streets including two blocks east of Livingstone and a linear stretch facing Uhuru Street was recommended for a maximum of 5 storey houses and floor area ratio of 1.0. Recommended plot coverage was 50%. The fifth zone (Zone V) covers the southern strip, which borders the railway sidings of Msimbazi presently accommodating the small-scale industrial activities of Gerezani. Recommended site development conditions for this area include two storey buildings with maximum site coverage of up to 60% and floor area ratio of 1.0 (Figure 6.3b).
When actual development is examined for the whole part of Kariakoo, one observes a number of discrepancies with the Master Plan proposals. The fact that developers of high-rise buildings in this area are individuals buying off old occupiers of this area, they tend to maximise use of plots both in terms of plot coverage and building height. Despite the fact that several houses have been redeveloped into high-rise buildings, the development process is rather uncoordinated with what happens in the next plot resulting into some of the housing elements in these new buildings to be poorly sited and used. For example, while developers locate side balconies as spaces for sitting, drying clothes and view, adjacent development that takes place often blocks these balconies from view and cross ventilation. The juxtaposition of high-rise buildings with small setbacks has resulted into narrow alleys separating the buildings that are not adequate for fire safety. Although the question of privacy has not been the central issue in this study, one can note that the small setbacks also tend to limit privacy of the closely located buildings facing each other.

Further, the mixing of low-rise Swahili type of houses and high-rise buildings has resulted into blocked ventilation especially to the low-rise buildings. One study that was conducted in Kariakoo by the author in 1996 indicated that residents in the high-rise buildings were throwing garbage on the roofs of the low-rise houses a situation that led to complaints from the low-rise housing residents. With infrastructure facilities like water supply being old, it has been difficult for water to reach the upper floors of the high-rise buildings. Developers of high-rise houses have to construct underground water storage tanks and then pump water to the upper floors. On-site sanitation such as cesspits has also proved problematic to the ongoing redevelopments in Kariakoo.

Figure 6.3a: Proposed land use for Kariakoo (1968). Mixed commercial and offices uses were recommended mainly along Lumumba Street (Source: URT, 1968).
Although this situation can be related to general laxity in enforcing development control from the city authorities, the weak government machinery to guide market-led redevelopment trends in Kariakoo contributes to observed problems in this area. While for example the 1989 redevelopment plan recommended developers to combine at least two plots for high-rise development to facilitate flexible design, the plot-by-plot redevelopment is due to the land transactions between present house owners and new developers. However, it seems unlikely for developers to combine plots since not all owners are willing to sell their plots at the same time. It was noted in some parts of Kariakoo that although developers were willing to buy more than one plot adjacent to each other, they had to buy across the street since owners of adjacent plots were not ready to sell their houses. Unless issues of land market and planning approaches are harmonised such as land pooling to facilitate flexible design, the plot-by-plot redevelopment will continue to augment design and house development problems to the dismay of spatial qualities that are pre-requisite for comfort living.

In 1989, a Redevelopment Plan for Kariakoo was prepared. This plan has been refined by the 2001 plan that is in the final stages of preparation. This plan makes recommendations on land uses dividing Kariakoo into three zones on assumption of combined plots, public utilities, transport network including parking demands and implementation strategies. The general concept is to have building height increasing from Lumumba Avenue, reaching its maximum at Kariakoo Market and decreasing westwards to facilitate cross ventilation for the whole settlement (URT, 2001). However, the plan recommends height development on the assumption that the idea of combined plot development will be possible to facilitate flexible design and proper siting and development of buildings. As pointed above, if the question of combined plot is not well guided by the government itself, it is unlikely that a harmonious
development will be achieved by these plans. In this regard, both private developers and present house owners have to be part of the development process with government facilitating smooth and fair market operations within the redevelopment process.

The on-going housing transformations in Kariakoo are related to the changes in the country's policy in house investment i.e. the waiving of the 1971 Building Acquisition Act and the adoption of trade liberalisation policy in the 1980s that encourages private sector investment on housing. These policy changes have been responsible for the kind of house redevelopments taking place in Kariakoo today. Kombe for example argues that:

*Economic Development Policy changes of the 1980s including liberalisation of trade and enactment of the investment code, might have significantly improved the private sector investment environment which had been severely affected by the state capitalism ideologies of the late 1960s and 1970s. These policy developments, coupled with a number of assurances against arbitrary nationalisation which have been frequently uttered by the government starting from the late 1980s, may have had cumulatively assisted in restoring confidence among the private sector investors. Thus, the mushrooming of multi-storey buildings in Kariakoo in the late 1980s and 1990s might be one but an important indicator of the effect of the policy changes.* (Kombe, 1995)

An analysis of building height from aerial photographs and fieldwork observations in Kariakoo conducted in 1996 indicates that while by 1975 there were 106 buildings representing 5% of all buildings of two or more storeys, this figure has increased to 206 (9%) by 1992 and further to 369 (17%) by 1996 (Lupala, 1996). These transformations are largely a response to increasing demand for residential, office and commercial spaces, that can no longer be provided in the old city centre but also a result of the changes on investment policy.

### 6.3 Plot characteristics

Plot characteristics play an influential role to the form of houses that are built on it and density of settlements. Many authors have pointed this relationship (see for example Acioly and Davidson 1996 and Barquin et al.:1986). In this study, the frames of reference for the analysis of a plot include plot sizes, plot ratio, plot exposure and boundary definitions. Plot characteristics is an important variable that influences house forms and density. In Kariakoo for instance, plot characteristics have been to some extent a defining factor of the house forms in terms of size, coverage and height. Since the area was planned and developed from 1920s as an African settlement it has been difficult to adopt a comprehensive redevelopment for the area because of isolated ownership of plots. The plot-by- plot redevelopment process that is taking places in Kariakoo is an indication of plot size layout structure and rights on the land to the redevelopment process. Only in few cases developers have pooled up two or more plots to facilitate flexibility in terms of house design and forms. These include, for example, the Co-operative building plot that combined 14 smaller plots to the present plot covering 4,992 square metres. The SUKITA combined 4 plots, the present Fuel Station and residential apartment block along Uhuru Street that combined six plots. Keys Hotel that combines 2 plots. Recently, two old houses on plot numbers 29 and 31 along Somali Street have been bought by one developer awaiting demolition and reconstruction of a new building.

#### 6.3.1 Plot sizes

Analysis of plot sizes in block 76 and 77 indicates little variations in terms of plot areas. Before redevelopment of houses in the area plot sizes for the two blocks ranged between 250 and 300 square metres (Figure 6.4).
Figure 6.4: Plot layout for Block 76 and 77. Left: The layout of 1920s as implemented until 1940s. The layout made provisions for walkways in the back of the houses. These walkways provided more exposure of buildings than the present situation. Right: Old layout superimposed on present developments. Extension and reconstruction of buildings with high plot coverage have blocked most of these walkways. Note that in this layout, new office buildings along Lumumba Street have been constructed by combining two or more plots.

Although there is no clear evidence on the ideas behind the plot sizes it can be argued that design of plots for Kariakoo is related to the ideas of planning the overall area of Kariakoo as a settlement for “Native Africans”. The idea was to plan and develop Kariakoo as a “high density” low-income settlement area. It has to be related with the type of house Africans were developing that time, that is the Swahili type of house. The Swahili type of house accommodated requirements for owner occupation as well as renting, thereby generating income to the landlords. Arguments raised by Vestbro with regard to similar plot sizes in Magomeni area point to the same reasons (Vestbro, 1975:32). It would seem logical to argue that the size of plots designed for Kariakoo was aimed at accommodating this requirement (Chapter 4). Therefore, variation in terms of plot sizes is not an outcome of rational planning but of the type of house and intended occupants who were regarded weak in their social status. Plots were designed predominantly to accommodate the Swahili house and outer buildings in the courtyard. It was considered that progressive extension and improvement would be made to improve the houses and some utility services such as sanitation and water supply. Prevailing plot sizes for Blocks 76 and 77 are as indicated in Table 6.1.

**Table 6.1 Prevailing plot sizes for block 76 and 77**

<table>
<thead>
<tr>
<th>Plot size (m²)</th>
<th>Number of plots</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Block 76</td>
<td>Block 77</td>
</tr>
<tr>
<td>150 – 200</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>200 – 250</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>250 – 300</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>300 – 350</td>
<td>7</td>
<td>-</td>
</tr>
<tr>
<td>350 – 400</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>400+</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>27</td>
<td>28</td>
</tr>
</tbody>
</table>

Although plot sizes in Kariakoo have been considered small and comparable to those of the sites and services programmes of the 1970s (i.e. 288m²) these sizes are relatively on the higher side when compared to plot sizes in other countries’ cities such as in Asia and South America. For example, the smallest plot size in high-density settlements in India has been observed to have an average of 35 square metres, in Ismailia (Egypt), 100 square metres (Acioly and Davidson, 1996). With climatic conditions that is almost similar to that of Dar es Salaam, one can conclude that plot sizes in Dar es Salaam that are considered small are in actual fact ten times larger than the same category of plots in the Indian context.

6.3.2 Plot ratio analysis

Plot ratio refers to the proportion of plot width to plot depth. Plot ratio defines the shape of the plot and can be expressed as a numerical ratio that is depth divided by the width. In some reports it has been referred to the ratio of depth divided by width. In design, it has been frequently used to rationalise shape of plots and ensure that the ratio applied ensures optional use of line infrastructure for the neighbourhood. The basic assumption in this case is that the smaller the ratio (that is long and narrow plots) the more efficient is the layout in terms of streets and layout. When the ratio approaches one to one or beyond (that is squarish or even shallow wide plots) the length of line infrastructure increases. Similarly, the adoption of larger plot ratio implies that plot shapes will be too elongated and limit flexibility in terms of siting building on such plots. Consistent with this argument, Acioly and Davidson note that:

The narrower the plots the more will fit in a particular cluster pattern which is often predefined by urban design regulations. However, narrower plots impose limitations to housing design and usually imply very narrow houses, narrow rooms with housing expansion pattern towards the backyard, especially if minimal setbacks to allow circulation, ventilation, light and rain water catchment are to be respected. It also encourages implementation of row houses to optimise use. However, in terms of land market, narrower plots may be unattractive for potential buyers due to difficulties in developing the land. (Acioly and Davidson, 1996:17)

Plot ratio is practically applied when plots are four sided with orthogonal angles. In situations where plots have more than four sides, the analysis of plot ratio is rather complicated. However, this consideration has to be made to strike a balance between houses form that can be accommodated within narrow plots and it uses. Analysis of field measurements from two blocks in Kariakoo area indicates that because the majority of the plots are similar in size, and in plots widths and depths, variations in plot ratio is correspondingly small. This situation is as summarised in Table 6.2.

<table>
<thead>
<tr>
<th>Plot ratio</th>
<th>Number of plots</th>
<th>Block 76</th>
<th>Block 77</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:1 – 1:1.2</td>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>1:1.2 – 1:1.3</td>
<td></td>
<td>1</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>1:1.3 – 1:1.4</td>
<td></td>
<td>10</td>
<td>18</td>
<td>28</td>
</tr>
<tr>
<td>1:1.40 – 1:1.5</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1:1.5 – 1:1.6</td>
<td></td>
<td>5</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>1:1.6 – 1:1.7</td>
<td></td>
<td>4</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Above 1:1.7</td>
<td></td>
<td>6</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>27</strong></td>
<td><strong>28</strong></td>
<td><strong>55</strong></td>
</tr>
</tbody>
</table>

*Source: Calculation from plot measurements done in February 2001.*
Carlos Barquin et al. argue that the high-density urban housing plots typically demonstrate high plot ratio. Plot ratio of 6-8\(^6\) is not unusual and may even be higher in exceptional cases such as Amsterdam. Further, they observe that the low-density Canadian suburb plots typically have ratio of 1.7 and there also exist examples of squarish plots (Barquin et al., 1986:5). One may wish to raise the following questions: Does the plot ratios in Kariakoo indicate the required trends in design? What were the ideas behind planning for these ratios? It is possible to link these observations with the intentions of planning for Kariakoo. It would also be relevant to reflect these figures in relation to the space standards for planning of residential areas in Tanzania. The Tanzania Space and Planning Standards (1978) recommends the minimum and maximum plot ratios of 1:1.5 and 1:3 respectively. The majority of the plots in Kariakoo indicate ratio in the category of 1:1.4. This is leading towards the recommended minimum standards tending towards squarish shapes of plots. This type of plot shape as indicated above is not desirable if line infrastructure is to be optimised. However, it has to be linked with the design intentions of Kariakoo, which, as noted above sought to regularise the already inhabited African settlement and probably with little considerations for the provision of line infrastructure such as sewerage, piped water supply and drainage channels.

**6.3.3 Plot exposure**

In this study exposure refers to the number of sides of the building or plot that are contiguous to open spaces or street. The significance of plot exposure underlies two basic requirements. First, the requirement that in highly covered plots like Kariakoo plot exposure provides an opportunity for the building to have main openings to an open area. Second, is the requirement that in hot humid climates like Dar es Salaam, plot exposure increases human comfort by providing cross-ventilation and adequate lighting. Plot exposure, in this context can be viewed as a measure of amenity and quality. As Barquin et al note single exposure plots that are fully built upon will be characterised by poorly lit and badly ventilated interiors (ibid.).

Empirical observations from Block 76 and block 77 show that the majority of the plots (66%) of all plots have one exposure, 17 plots have two exposures, and only 2 plots have three exposures (Table 6.3).

**Table 6.3: Plot exposure for blocks 76 and 77**

<table>
<thead>
<tr>
<th>Number of exposures</th>
<th>Number of plots</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Block 76</td>
<td>Block 77</td>
</tr>
<tr>
<td>1</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>27</strong></td>
<td><strong>28</strong></td>
</tr>
</tbody>
</table>

*Source: Fieldwork Observation in Kariakoo, February 2001.*

One remarkable feature in Kariakoo with respect to plot exposure is the fact that the original design of plot layout took into consideration the need of adequate exposure of plots. This is revealed by the provision of the rear alleyway as pedestrian access to the plots (Figure 6.4). With the low-rise single storey Swahili house type the level of amenity in terms of exposure was considerably higher compared to the present high-rise development that has

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\(^{6}\) Note that Barquin et al. refer to plot ratio as the depth to width. This means that the larger the number the more the depth of the plot is. In this study we employ the opposite that is the ratio of width to depth. Therefore, the smaller the ratio, the more the depth of the plot.
blocked rear alleyways and lack courtyard spaces. Characterising the importance of exposure for cross ventilation, Barquin et al further note that:

... two or more exposures, even if to an alley increases the possibility of cross-ventilation and assures access to natural light for more of the rooms. Two or more exposures may also allow multiple entries to different parts of the house from the street... Multiple plot exposure becomes more important when many people share a single house or when part of the house is rented to another family or is dedicated to commercial use. Single exposure plots with only one entry reduce privacy and increase the amount of interior space devoted to circulation. (Barquin et al., 1986:7)

This argument is quite relevant when the previous layout with Swahili type of houses is contrasted with the present developments in Kariakoo. Observations from Kariakoo indicate that the majority of the houses have been either extended or redeveloped into high-rise buildings blocking exposure. In old Swahili type of houses, more rooms have been added for commercial or residential purposes. Where such extension or modification to the houses has been made, rear alleyways have been blocked. For multi-storey houses side rooms have been blocked from light and natural ventilation due to high plot coverage and blockage of the rear side walkways. Although the Swahili type of house has been criticised as poor in terms of cross-ventilation, the high-rise buildings seems to be more problematic because they lack outdoor spaces like courtyards that provided outdoor living for the old type of houses. The too narrow side and rear setbacks of the present high-rise building are presently not being effectively used and in many a case they have turned to spaces where garbage is dumped.

6.4 House forms

Karen Franck (1994:346) discusses the concept form in relation to spaces. She denotes that discussion on forms should embrace elements of material, spatial, geometric properties and functions of spaces. Further, Karen Franck argues that form should also, where possible, point out to the meaning i.e. the symbolic messages conveyed by those elements’ functions and use. Besides Franck’s characterisation, other variables include shapes, major building elements and their decorative aspects. It would seem relevant therefore to argue that variables in house forms analysis should embrace material, spatial, geometric properties and functions or uses of houses. The general formal structure of houses in Kariakoo depicts two major features, namely, the still dominant single storey Swahili type of houses and the emerging multi-storey apartment blocks. These multi-storey or high-rise forms are emerging amidst loose enforcement of development control guidelines and standards by the city authorities.

Many of the plots in Kariakoo are 14 x 18 metres and have two or more freestanding structures especially those with Swahili type of houses. The main houses face the street with 4 to 6 rooms or more and smaller outer building at the rear with auxiliary service rooms. Plot coverage is unusually high, in the order of 80% up to 154%. Since Kariakoo was developed during the 1920s and 1940s with the initial buildings constructed in mud and poles, the present visual evidence indicates that many of this type of houses are structurally in poor conditions. Due to lack of repair, some of the houses have deteriorated to the state of disrepair. The only structural change made to almost all houses has been the replacement of palm roofs with corrugated iron sheets. For many of the houses, walls remained more or less the same i.e. with wattle and mud.

7 A number of houses in Kariakoo were observed to have been abandoned mainly because they were structurally too poor for human habitation. For this reason, some have been changed from typically commercial/residential use to storage or warehousing such as storage of groceries and home appliances as a transitional use before they are demolished to pave way for the construction of high-rise buildings. This was noted for houses located on plots 29 and 31 in block 77 and plot 14 in block 76.
6.4.1 Number of storeys – building heights

Studies in blocks 76 and 77 indicate that out of 56 houses that were investigated, 24 comprised single storey, detached Swahili type of houses. The remaining comprised between two to twelve storeys as summarised in Table 6.4. Four plots are vacant after old Swahili type of houses were demolished as part of the redevelopment processes taking place in Kariakoo.

Table 6.4: Number of storeys in block 76 and 77

<table>
<thead>
<tr>
<th>Number of storeys</th>
<th>Number of houses</th>
<th>Total</th>
<th>Percentage of Total houses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Block 76</td>
<td>Block 77</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>11</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
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<td>1</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>24</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: Field observations in Kariakoo, February 2001

It is apparent from the above table that the majority of the houses in Kariakoo are predominantly single storey constituting 46% of all observed houses. An examination of building height in 1959 for Kariakoo indicates that almost all buildings were single storey with Swahili type of a house as illustrated in Figure 6.5

Figure 6.5: Housing cluster for block 76 and 77 in Kariakoo in 1959. All houses were typically single storey Swahili with the main buildings facing the street and secondary buildings at the backyards. Note also the dominance of hipped roof type for the main buildings and monopitch for the back yard buildings. Due to low-rise character of the houses a considerable cross-ventilation was to some extent promoted across the settlement (Source: Standard maps 1959 at scale 1:2,500 and interviews with house owners in Kariakoo, November 2001).
6.4.2 Layout of houses

At least each house in Kariakoo has been transformed in one way or another in terms of layout. For low-rise Swahili type of houses, one notable change has been the extension of the houses covering more spaces particularly the side of the houses thereby introducing new uses or creating more space for residential use. Others have been altered in terms of main entrances opening up doors to the sides of the houses creating new independent units primarily to promote privacy that has been considered low for the Swahili type of houses. For the new buildings, the internal layouts have been quite influenced by the smaller plot.
sizes particularly the widths thereby resulting into elongated house forms covering the whole plot (Figure 6.7).

![Figure 6.7](image_url)

Figure 6.7: Layout of houses for Kariakoo. 6.7(a): Extended and modified entrances of a Swahili type of house. The left setback is presently being used as a restaurant. Entrances have been opened to the right to create more privacy. 6.7 (b): First floor plan of the five-storey office block along Kiungani street. The effect of the narrow plot has resulted into narrow layout of a building. 6.7 (c): The ground floor plan of the five storey building along Uhuru street that accommodate shops at ground floor and rooms in the upper floors. 6.7(d): The first floor plan of the hotel building along Somali street that is in the final stages of construction. Due to inadequate light, the central corridors were observed to be dark (Source: Plot and house measurements in Kariakoo, January 2001). NB: All drawings are not to scale.

Observed layout of houses in Kariakoo have to be linked with new demands for office, commercial and residential uses, operating land markets and the shape of plots that influences the layout of buildings. While the land markets inhibit comprehensive design and redevelopment of the whole of Kariakoo due to the plot-by-plot sale and redevelopment processes, the narrow plots have further limited design of building that is responsive to the hot and humid climatic conditions of Dar es Salaam. Coupled with developers’ desire to maximise plot use, emerging building layouts such as narrow and double-banked buildings have resulted into poor ventilation and inadequate lighting necessitating the installation of mechanical cooling systems such as air conditioners and constant use of electricity light in the corridors.

### 6.4.3 Building materials and roof types

In many a case, the materials of major elements such as walls, windows, doors and roofs have influenced house forms. Within block 76 and 77 the majority of the high-rise buildings have sand cement blocks for the walls and corrugated iron sheets for roofs. The old low-rise houses, mud and pole walls and corrugated iron sheets characterise the main building materials for walls. Only a few single storey houses had concrete blocks for the walls apparently because of the restrictions that were imposed on house owners to reconstruct their houses in such ‘permanent’ materials if the development was not high-rise. Corrugated iron sheets have been widely used for roofing. Virtually, there were no houses roofed with tiles. The hipped roof type is more dominant than other roof types.
The dominance of mud and pole walls as building materials for the low-rise Swahili type of houses has to be related to attempts to enforce and implement proposals of the 1979 Master Plan. The city authorities imposed restrictions on the repair of houses in Kariakoo with ‘permanent’ building materials since early 1980s as a way to implement the height zoning proposals of 1979 Master Plan. The kind of repair that was allowed during that decade was replacement of building elements similar to those deteriorating. Although the Master Plan does not categorically state this rule, it seems that the aim was to see houses deteriorating to the state of disrepair to facilitate replacement and redevelopment. Kironde confirms this argument:

The government policy towards Kariakoo has been ambivalent. While on the one hand it has favoured the redevelopment of the area, it has shied away from demolition and building, partly because of the financial constraints, but more significantly because redevelopment has always been politically too unpopular to be undertaken. The government however has never come out clearly in support of the African ‘land owners’ of Kariakoo. Until relatively recently, it upheld the colonial policy of refusing to give long-term titles to owners of houses constructed in traditional materials, the most prevalent of whom were Africans. It upheld the colonial policy of denying the owners of traditional houses permission to repair, or improve their houses unless these houses were to be rebuilt into multi-storey buildings. (Kironde, 1994:455-6)

It is not surprising therefore to see until today that many of the old Swahili type of houses maintain mud and pole wall structures, a phenomenon that has been rapidly changing in many of the settlements in Dar es Salaam city.

6.4.4 House sizes

Another variable of house form is the size in terms of spatial coverage. Although house size can be viewed from both spatial extent and floor area ratio, that is the height of buildings, the focus here has been the spatial coverage. Field observations and measurements from blocks

Figure 6.8: Old Swahili type of house in Kariakoo. It was constructed with mud and pole that has deteriorated beyond repair. Presently, it is being used as accommodation to one of the poor families and a ‘genge’ by some youths who sell cooked foodstuff to people in Kariakoo.
76 and 77 indicate that many of the houses are relatively large. The majority of these houses had house size ranging between 150 and 250 square metres (Table 6.5).

**Table 6.5: House sizes in blocks 76 and 77**

<table>
<thead>
<tr>
<th>House size (square metres)</th>
<th>Number of houses</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 – 99</td>
<td>-</td>
</tr>
<tr>
<td>100 – 149</td>
<td>1</td>
</tr>
<tr>
<td>150 – 199</td>
<td>13</td>
</tr>
<tr>
<td>200 – 249</td>
<td>20</td>
</tr>
<tr>
<td>250 – 299</td>
<td>9</td>
</tr>
<tr>
<td>300 – 349</td>
<td>2</td>
</tr>
<tr>
<td>350 – 399</td>
<td>2</td>
</tr>
<tr>
<td>Above 400</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>49</strong></td>
</tr>
</tbody>
</table>

*Source: Field measurements in Kariakoo, February 2001.*

From a spatial point of view most of the newly reconstructed houses are bigger than the original structures. This is further illustrated in Figure 6.9.

![Figure 6.9: Variation in house sizes for Block 76 in Kariakoo between 1959 and 2001. This figure excludes extreme values of house size of office buildings of Co-operatives and SUKITA (Source: Field measurements in Kariakoo, February 2001).](image)

The change in size of the houses in block 76 and 77 has been part of the redevelopment dynamics taking place in the whole area of Kariakoo. As noted above, even those houses,
which have not been redeveloped, have been extended covering more area than the situation was in late 1950s (see Figure 6.7a).

Although the shape of the houses has remained more or less the same (i.e. rectangular shaped) formal properties i.e. size, volume and appearance of houses has changed considerably. For instance in block 76, there is no house that has maintained its original size. Eleven (11) houses had their sizes increased by more than 50% from their original size. Six houses were demolished on plots numbers 17, 19, 21, 31, 33 and 35 to pave way for the present petrol station. Seven (7) plots together with six houses in block 77 (1,2,5,7,35 and 37) were pooled up to pave way for the construction of the present twelve storey co-operative building (Figure 6.4). Land pooling (combining several plots) was applied to acquire the land for the Co-operative (4992m$^2$) along Lumumba Avenue.

Because the implementation of the 1968 and 1979 Master Plans have largely failed, the kind of redevelopment that has been taking place in Kariakoo today is piecemeal, that is plot-by-plot reconstruction of houses with no relation to adjacent plots. Although there are no reports on structural problems of building foundations constructed close to each other, the general observation indicates that building facades are designed and constructed without taking into consideration of the type of construction that will take place on the next plot, the results of which have been the negative spatial consequences highlighted above.

![Figure 6.11(a): The high-rise building amidst low-rise Swahili type of buildings along Somali street. Presently, the side windows are functional both in terms of view and cross-ventilation. These qualities will be lost once a high-rise building is constructed next to this building. This is a typical plot-by-plot redevelopment that characterise current redevelopment processes in Kariakoo.](image1)

![Figure 6.11(b): Blockage of windows in Kariakoo. Windows on the sides of the buildings can hardly be opened due to narrow spaces between buildings. The back yard spaces are frequently used as dumping spaces. This has resulted in deteriorating environmental quality of these spaces.](image2)

Owing to the relatively smaller size of plots (i.e. between 234 and 500 square metres) the emerging house forms are also narrow though in some instances it was observed that developers built houses beyond the plot lines. Unless two or more plots are combined to provide flexibility in terms of design (as indicated for office building in Figure 6.4), the fitting in of buildings within plots of 13 metres by 18 metres and 20 metres by 25 metres will continue to augment redevelopment problems in Kariakoo with the consequences of poor
spatial qualities. Given the high land value and land market operations in Kariakoo\textsuperscript{8} amidst relaxed enforcement of redevelopment guidelines from the authorities, developers continue to maximise the use of plots by developing houses with the maximum number of storeys and high plot coverage irrespective of some pre-requisites for spatial qualities as stipulated in the zoning and development standards for this area. For example, many of the high-rise houses developed within block 76 and 77, have their side balconies blocked from side view and ventilation. Side setbacks between buildings are too small to ensure adequate sunlight and cross ventilation for the side rooms. This is important aspect especially in the hot and humid climate of Dar es Salaam. Rear setbacks suffer from the same quality problem. The horizontal extension of the Swahili type of houses and further construction in the courtyards has resulted into closing the side and rear alleys and reduced amount of air movement necessary for cross-ventilation (Figure 6.12).

![Figure 6.12: Extended Swahili house type. Note that after extension to the right the passage between the two buildings has been blocked.](image)

It was further observed that the side and rear setbacks often were changed into small kiosks and shops but sometimes rooms for commercial or residential use. The lack of enforcement of development control measures in Kariakoo warrants a number of issues worth questioning. Are trends in housing transformations that are taking place with little or no guidance in Kariakoo be paralled or considered to typify informal developments? Are the emerging functions and forms therefore a depiction of informal sector demands and therefore a failure or displacement of the formal sector? Is Kariakoo informalising when formal urban types are taken into consideration?

\textsuperscript{8} According to a land market survey that was conducted by Kombe in Kariakoo area in early 1990s a plot of 14 x 18 square metres occupied by an old Swahili type of houses was being sold between Tshs.13.2 million and TShs 27.0 million or equivalent to Tshs.52, 380 to Tshs.107, 142 per square metre. The prices of land were and still vary depending on the location of the site with respect to potential locations to business or level of services available (Kombe, 1995:92).
Quite often informal settlements have been linked with low-income people, irregular settlement patterns and with simple built forms of houses. Although land transaction and development processes have been guided informally with local institutions, the same have been limited to oversee the general quality requirements for settlement needs such as adequate spaces for streets, open spaces for communal use and land reserves for line infrastructure in these settlements. In consolidated informal settlements these limitations have resulted in negative externalities of vehicular inaccessibility, inadequate exposure due to congested houses, narrow footpaths and difficulties in collecting liquid and solid wastes. If redevelopment trends noted in Kariakoo will not be closely monitored, it is likely that the future quality of Kariakoo will be characterised by externalities similar to those of consolidated informal urban types.

6.4.5 Use of buildings

Analysis of building uses indicates a changing pattern from typical residential houses in the 1950s and 1960s to predominantly commercial, commercial-residential and office accommodations. Out of 48 buildings, 5 buildings were exclusively being used for office accommodation. These comprise the Co-operative building, which accommodate mainly the offices for the Ministry of Industries and Trade, the Co-operative Unions of Tanzania and several other rented offices, and SUKITA, which was formally harbouring the Adult Education College. Both the Co-operative and SUKITA buildings are located along Lumumba Avenue, a corridor that was earmarked for office development in the 1968 redevelopment proposal for Kariakoo. As such, the use is a partial compliance with the 1968 Master Plan. Other offices include the Tanzania Revenue Authority along Kipata Street and ZAOMA Enterprises along Kiungani Street. Almost all buildings along Livingstone and Uhuru Streets accommodate both commercial activities at ground floors and residences in the upper floors. Items sold in these shops include spare parts for machines and vehicles, mattresses, electronic goods, garments, electrical equipment, bicycles and shoes. Three hotels (Keys, Rick Hill and Kibodya) are located within block 76, along Uhuru Street. Another hotel is under construction on plot No.36, block 77.

Buildings facing Kidongo Chekundu open space, i.e. along Kiungani Street are predominantly used for wholesale of goods such as bottled water, used clothes (Mitumba), salt, sugar, canned food and other groceries. These activities also take place along Somali

Figure 6.13: High rise buildings along Kiungani Street. The juxtaposition of these buildings close to each other has resulted in dark unused spaces between buildings and blocked ventilation. View from the balconies and windows facing the sides of the buildings have been also blocked.
Street in two old houses that have been abandoned awaiting redevelopment. These are being used as storage of packed salt, sugar and water. Other building uses include a filling (fuel and service) station along Uhuru Street which also accommodate residential apartments in the upper floors, an office building for the Moslem Society, restaurants and a recently completed building on plot number 32 intended to function as a hospital. Temporary office accommodation was noted on plots No. 26 and 28 in Block 77 but the houses were awaiting demolition and reconstruction. An inventory on building uses has been summarised in Table 6.6.

Table 6.6: Building uses in block 76 and 77

<table>
<thead>
<tr>
<th>Use of buildings</th>
<th>Number of buildings</th>
<th>Percentage of total buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential and shops</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>Residential/restaurants</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Warehouse/storage</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Hotels</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Residential only</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Residential-cum-hospital</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Offices</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Fieldwork Observation in Kariakoo, February 2001

All these functions have attracted a large proportion of both vehicular and pedestrian traffic into this part of Kariakoo. Owing to limited space for parking, and the fact that piecemeal plot-by-plot redevelopment processes do not take into account these requirements, in many cases this area is overcrowded and congested with vehicles. It is difficult to secure a parking space in this area and on-street parking further hinders smooth traffic flow. The Streets of Kiungani, Livingstone and Somali for example often get blocked because of several light trucks parked nearby wholesale shops awaiting clients to hire these vehicles. Pedestrian movement is also constrained by parked cars along side walkways and because of high population in the area, pick-pocketing was reported to be widespread. One has to be quite conscious and careful of these incidences while walking in Kariakoo.

The concentration of these functions together with vehicular traffic congestion has made this part of Kariakoo one of the extremely noisy areas. Noises from cars, vendors and porters undermine the quality of this area as it is no longer a peaceful living environment. Besides noise, the area is also dusty and affected by fumes from vehicles. This is partly due to the poor road condition, especially along the Streets of Somali, Livingstone Kiungani, Kipata and Lindi which are gravel surfaced. Similarly, due to limited spaces between buildings, trees for shade are rarely planted. This has subjected almost the whole area of Kariakoo to extensive sun and dust.

6.5 Density characteristics

Although density can be studied from various perspectives, the focus in this study has been on physical density. The variables employed in characterising physical density include population and housing density, land coverage and floor area ratio at plots and block level.

6.5.1 Population density and occupancy characteristics

A study that was conducted by the Ministry of Lands, Housing and Urban Development in Kariakoo in 1989 shows that the population of Kariakoo was 44,527 with a gross population density of 300 persons per hectare. Estimates from the same study indicate a housing density
to be 20 houses per hectare. It was further reported that Kariakoo had the highest occupancy rate in the city of up to 6 persons per room. Studies in Blocks 76 and 77 covering a total area of 3.7 hectares reveal a gross density of 140 persons per hectare. Out of 49 households that were interviewed 24 were tenant households who were accommodated in a total of 68 rooms. There were 25 owners accommodated in 122 rooms. Results from these interviews indicate that many of the owners have a fairly adequate number of rooms that is 5 rooms per household. Tenant households have an average of 3 rooms per household. Given these figures, and an average household size of 5.3 persons per household, room occupancy has been established to be 1.1 persons per room for owners and 1.9 for tenants. In many respects, these occupancy levels cannot be considered to portray overcrowding; overcrowding in its simplest sense referring to the number of persons per room. Although the external environment of Kariakoo depicts a characteristic density which has been perceived to be high, implicitly including the internal environment, the actual established room occupancy seems to be within acceptable limits as recommended by the space standards for housing and residential areas. This situation can be attributed to the larger size of high-rise type of buildings with many rooms that are being built to replace the old Swahili type of houses. Although room occupancy and population density provide a dimension of crowding within a given context, the two variables are too dynamic and difficult to manage through planning and other regulatory mechanisms. This is noted in Acioly and Davidson as follows:

_Since dwelling occupancy is very dynamic it becomes very hard to stipulate or control population density once a plan is executed. For the purpose of planning and subdivision, it is much more pertinent to work with housing and building densities. These are more controllable figures and give more possibilities to assess the trade-off in relation to land occupation and the costs of infrastructure and services. (Acioly and Davidson, 1996:12)_

It is from this understanding that the physical density variables such as plot coverage and floor area ratios become more important not only in planning but also in the analysis of both formal and informal built environments.

### 6.5.2 Plot coverage

Plot coverage has been used as a measure of spatial coverage of buildings. It provides a sound basis for analysing “mass” of built spaces in relation to size of plots. The preceding section, (i.e. building sizes and changes over time) reveals that the majority of the plots had relatively lower plot coverage in the 1950s until 1970s. During this period, plot coverage ranged between 44 and 90%. Due to the rapid rate of the on-going redevelopment processes coupled with laxity in development control many buildings have been built beyond recommended plot coverage. Plot coverage of up to 154% has been observed. This means that buildings in these plots have been built beyond plot boundaries therefore blocking partly or wholly some side and rear setbacks. By 1959, in Block 76 and 77, nine plots had coverage not exceeding 50%, twenty three plots had coverage ranging between 51 and 60%, twenty eight plots had coverage range of between 61 and 70%. Fourteen plots had coverage

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9 Studies in Block 76 and 77 revealed the highest occupancy rates to be 2.8 persons per room. The rate of 6 persons per room is associated with the low-rise, single storey Swahili type of houses when room tenancy is common. In high-rises buildings, observed housing tenancy is on the basis of apartment units rather than rooms.

10 The concept ‘overcrowding’ is rather wide, complex and context bound and has been studied from various disciplines. In built environments it has been related to variables of degree of use of dwelling spaces, private open spaces, protection, privacy and use of community facilities (Vestbro, 1975:109-11). Overcrowding as assessed in this discussion refers to recommendations made by the space standards for planning and housing of residential areas in Tanzania that considers occupancy rates of up to two persons per room as within acceptable limits beyond which a situation of crowding can be considered to prevail.
of between 71 and 80% and only two plots had plot coverage of between 81 – 90%. Measurements and observation studies in the same blocks for the year 2001 reveals increasing trends in coverage as indicated in Table 6.7 below.

Table 6.7: Changes in plot coverage in blocks 76 and 77

<table>
<thead>
<tr>
<th>Plot coverage (%)</th>
<th>Number of plots</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1959</td>
</tr>
<tr>
<td>50 or less</td>
<td>9</td>
</tr>
<tr>
<td>51 – 60</td>
<td>23</td>
</tr>
<tr>
<td>61 – 70</td>
<td>28</td>
</tr>
<tr>
<td>71 – 80</td>
<td>14</td>
</tr>
<tr>
<td>81 – 90</td>
<td>2</td>
</tr>
<tr>
<td>91 – 100</td>
<td>-</td>
</tr>
<tr>
<td>101 – 110</td>
<td>-</td>
</tr>
<tr>
<td>Above 110</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>76</strong></td>
</tr>
</tbody>
</table>


The 1959 building coverage indicates that only 9 out of 76 buildings in Kariakoo conformed to the building requirements of 50% plot coverage. The situation further changed in 2001 whereby only 3 buildings out of 50 had coverage not exceeding 50%. Although it is understandable that there is need of maximising the use of land especially in prime areas like Kariakoo, excessive plot coverage caused by building extensions and reconstruction of buildings often compromise liveability attributes discussed in the preceding sections. Since many houses have exceeded the 50% recommended coverage, in case of fire accident in one building it is likely to spread to the adjacent ones.

However, it is important to underline here that although liveability qualities may be viewed to deteriorate as a consequence of excessive plot coverage in Kariakoo, the same commands a high potential in terms of commercial functions and office use. This then raises another discussion as to whether the settlement can be managed to serve the two functions with different requirements. It also points out to the discussion on trade-off between high density and optimal use of land and infrastructure.

In hot humid tropical climatic areas like Dar es Salaam, the idea of 50% plot coverage was in response to the requirement for enough space between buildings that would allow adequate ventilation and lighting. Although the Courtyard Swahili type of house has been criticised on its double-banked design as blocking cross ventilation, the same house type provided adequate spaces for outdoor living and shared outdoor space for the households in the house compared to the new high-rise houses. Besides the fact that the newly developed multi-storey houses in Kariakoo provide ample spaces for residential, commercial and institutional functions with increased density and therefore optimising use of prime land, their quality in terms of comfortable living have been relatively reduced. Comfortable living refers to the fact that due to the hot and humid climatic conditions rooms have to be provided with mechanical cooling devices so as to ensure comfort.

Interviews with residents of Kariakoo indicate varying opinion with respect to quality of house elements, the results of which are summarised in Table 6.8.

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11 Liveability qualities as used here refer to the comfort living requirements. In hot and humid climatic conditions like Dar es Salaam, aspects of cross ventilation, adequate natural lighting into houses, shading from hot sun, functional spaces between buildings, aspects of effective infrastructure provision, solid and liquid waste management will characterise liveability qualities in the area.
Table 6.8: Assessment of housing quality by residents

<table>
<thead>
<tr>
<th>House element</th>
<th>Like</th>
<th>Dislike</th>
<th>Total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plot size</td>
<td>31</td>
<td>7</td>
<td>38</td>
</tr>
<tr>
<td>Outdoor space</td>
<td>14</td>
<td>26</td>
<td>40</td>
</tr>
<tr>
<td>Plot exposure</td>
<td>36</td>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td>Cross ventilation</td>
<td>35</td>
<td>12</td>
<td>47</td>
</tr>
<tr>
<td>Room size</td>
<td>40</td>
<td>5</td>
<td>45</td>
</tr>
<tr>
<td>Degree of privacy</td>
<td>23</td>
<td>18</td>
<td>41</td>
</tr>
<tr>
<td>Social contacts</td>
<td>31</td>
<td>4</td>
<td>35</td>
</tr>
<tr>
<td>Accessibility</td>
<td>45</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>Noise</td>
<td>5</td>
<td>37</td>
<td>42</td>
</tr>
<tr>
<td>Dust</td>
<td>8</td>
<td>31</td>
<td>39</td>
</tr>
<tr>
<td>Others (sewerage, electricity and solid waste collection)</td>
<td></td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>


Although the above results can be considered subjective owing to the varying value systems different respondents attach to the different elements of a house, yet it provides some insights worth commenting upon. People seem to be most concerned and dissatisfied with the issues of privacy, noise, dust, inadequate outdoor space, and to some extent cross ventilation. Most residents in high-rise buildings expressed dissatisfaction with lack of outdoor space for their children to play. This is due to the fact that the new high-rise buildings lack courtyards and where available such courtyards have not been designed to function as outdoor spaces for living and for children play. The question of lack of cross ventilation is rather related to the observed high plot coverages that lead to blocked ventilation. As commented earlier, the issues of noise and dust are a result of poor road surface conditions in this part of Kariakoo and the many street activities that take place outside the housing environment. It is indicative therefore that high plot coverage has partly contributed to dissatisfaction among residents as far as liveability qualities are concerned.

6.5.3 Floor area ratio (FAR)

Since floor area ratio takes into consideration the height of buildings, it has been frequently used as a tool to regulate physical density and townscapes or skylines. It has also been used as a tool for formulating space standards for central functions of cities such as commercial / shopping and institutional areas.

Two levels have been examined in terms of floor area ratio. The first is at plot and second is the at block level. Detailed measurements of floor area ratios at plot level in Blocks 76 and 77 show some kind of pattern that is evenly distributed. The majority of the buildings have floor area ratio ranging between 0.5 and 1.0. The distribution in floor area ratios for blocks 76 and 77 is as summarised in Figure 6.14.
Figure 6.14: Variation in plot floor area ratio for block 76 and 77 in Kariakoo area (Source: House and Plot Measurement February 2002 and analysis of maps for Kariakoo (1:500)).

The highest frequency in ratio of 0.5 to 1.0 is related to the many single storey houses that are still dominant in this area. This floor area ratio is high especially when single storey houses are considered. The high frequency within this range is associated with high plot coverage as noted in the preceding discussion. The kind of even distribution in floor area ratio indicates that buildings have differing heights since plot size in this area does not vary considerably. With the exception of the Cooperative Building that has 12 storeys, many of the buildings have a heights varying from two to eight storeys. When floor area ratio was considered at a block level thereby including half the width of the surrounding streets, the result is as summarised in the Figure 6.15 below.

Figure 6.15: Floor area ratios and land coverage for block 76 and 77 in Kariakoo. Except for undeveloped plots within blocks, the layout of buildings is too compact to guarantee adequate ventilation.

- **Block 76**
  - Land coverage: 40%
  - Floor area ratio: 1.3

- **Block 77**
  - Land coverage: 41%
  - Floor area ratio: 1.4
When floor area ratio at block level is taken into consideration, the overall result is as high as 1.4 for block 77 and 1.3 for block 76 (Figure 6.15). The high floor area ratio is a result of high-rise buildings constructed within the two blocks but also the high plot coverage from the low-rise buildings. Apart from the few undeveloped plots in the two blocks and an open space along Kiungani Street space there are no spaces between buildings that can act as ‘lungs’ to the compact layout with high-rise buildings further blocking ventilation and lighting.

Some of the arguments that have been advanced in support for higher densities include, for example, optimal utilisation of land and infrastructure, transportation, social services, increased social interactions and increased security. However, poorly managed dense environments have been associated with negative externalities of overloaded infrastructure, lack of spaces for playing and socialising, poor liveability qualities and problems of resettlement when introducing infrastructure especially in consolidated informal settlements. It is the trade-off of these two aspects that will result into densities that addresses positive and negative aspects and the fact that the results of this trade-off have to be socially acceptable by people. When residents of Kariakoo were asked to assess their settlement, the majority expressed discontent with issues of security, drainage and water and a few pointed out the aspect of density (Table 6.9).

Figure 6.16: Aerial view of part of block 76 and 77 in Kariakoo. Note the mixed character of low-rise and high-rise and the compact layout. The two variables make Kariakoo one of the densely built settlements in Dar es Salaam with high floor area ratios and relatively high plot coverage (Source: EISCAP, UCLAS-ITC Project, July 2001).
Table 6.9: Residents’ assessment of the settlement quality

<table>
<thead>
<tr>
<th>Element</th>
<th>Like</th>
<th>Dislike</th>
<th>Total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>22</td>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td>Accessibility (streets)</td>
<td>37</td>
<td></td>
<td>37</td>
</tr>
<tr>
<td>Security</td>
<td>2</td>
<td>42</td>
<td>44</td>
</tr>
<tr>
<td>Shopping facilities</td>
<td>44</td>
<td></td>
<td>44</td>
</tr>
<tr>
<td>Drainage</td>
<td>10</td>
<td>26</td>
<td>36</td>
</tr>
<tr>
<td>Water</td>
<td>17</td>
<td>24</td>
<td>41</td>
</tr>
<tr>
<td>Distance to services</td>
<td>33</td>
<td>2</td>
<td>35</td>
</tr>
<tr>
<td>Others (Police post, Political demonstrations solid and Liquid waste disposal)</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Household interview with residents of Block 76 and 77 Kariakoo area, September 2001.*

Dissatisfaction with security in this case has to be related with the kind of activities that take place in Kariakoo. The congested streets with street vendors and hawkers have resulted into pick-pocketing and other vices. Poor drainage is a result of increased land coverage with a poor drainage system resulting in storm water stagnation along the streets. The water supply issue is related to an overloaded system that is old and can no longer suffice the present requirements. Water rationing is frequent in Kariakoo and water does not reach the upper floors of the high-rise buildings due to low pressure. Despite the fact that dense environments are desirable in terms of optimal uses of land and services, residents in Kariakoo point to some problems of increasing density when these built environments are not properly managed.

It was also noted despite these shortfalls, the majority of the residents indicated unwillingness to leave Kariakoo to other settlements. Out of 48 households, 44 had no plans of shifting from Kariakoo to other places. Even tenant households indicated unwillingness to shift to other settlements. They attributed this to the factors of being closer to the city centre functions, having their economic and livelihood activities such as restaurants and shops within or closer to their residential premises. Another reason is that some of the respondents are house owners and do not have any alternative for accommodation. It was further noted that many of the residents have stayed in the area for quite a long time and have developed socio-cultural ties with neighbours.

Apparently, Kariakoo has high preferences by its residents even by tenants or renters. The fact that most buildings accommodate both residential and commercial uses within the house has attracted many people not only those currently residing in this area but also potential investors in commercial activities.

6.6 Spaces and space uses

Due to high plot coverage and floor area ratios, spaces in Kariakoo are limited to courtyards (especially for the old Swahili type of houses), pavements and sidewalks, road reserves, undeveloped plots and streets. With increasing commercial functions, these spaces have attracted intensive activities of various kinds some of which are mobile in character and others stationary. Since these activities are largely informal they have been located in some spaces that are not suitable for their operations with respect to spatial qualities. Most of these activities are taking place along road reserves causing problems of traffic congestion and conflicts, blockage of pavements and generally increased population density during the day.

The two main variables employed to characterise spaces and space uses are activity diversity referring to the number of various activities taking place in a particular space and activity intensity referring to the degree of utilisation of space.
Activity diversity and intensity within Kariakoo have been assessed in two spaces, namely, the road reserves of the Lumumba Street (STI) within a stretch covering 1,820 square metres and the pavement space along Uhuru Street (ST2) covering 695 square metres. Results from observation in these spaces show that about two thirds of all mobile activities along Lumumba Avenue included walking, walking and selling items (that is street hawking) pushed or pulled carts and bicycles (Table 6.10).

Figure 6.17: Space use along the central reserve of the Lumumba Street. Due to lack of spaces within the built up parts of the settlements, mobile vending kiosks, shoe shining, selling of fruits and other activities are confined in this reserve which is dangerous due to high vehicular traffic surrounding this space.

Figure 6.18a: Commercial activities along Uhuru Street. Some activities overspill along the pavements thereby blocking smooth walking along the street.

Figure 6.18b: Sitting on the kerbsides. Due to lack of sitting and standing supports, people sit along the kerbstones along Uhuru Street.

6.6.1 Activity diversity

Activity diversity and intensity within Kariakoo have been assessed in two spaces, namely, the road reserves of the Lumumba Street (STI) within a stretch covering 1,820 square metres and the pavement space along Uhuru Street (ST2) covering 695 square metres. Results from observation in these spaces show that about two thirds of all mobile activities along Lumumba Avenue included walking, walking and selling items (that is street hawking) pushed or pulled carts and bicycles (Table 6.10).
Table 6.10: Distribution of mobile activities along Lumumba Avenue (ST1)

<table>
<thead>
<tr>
<th>Activity type/ time interval</th>
<th>7.30-10.30</th>
<th>10.30-13.30</th>
<th>14.30-18.30</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>417</td>
<td>602</td>
<td>653</td>
<td>1672</td>
</tr>
<tr>
<td>Walking and Talking</td>
<td>92</td>
<td>234</td>
<td>317</td>
<td>643</td>
</tr>
<tr>
<td>Walking and selling items</td>
<td>47</td>
<td>188</td>
<td>164</td>
<td>399</td>
</tr>
<tr>
<td>Pushed/Pulled carts</td>
<td>25</td>
<td>87</td>
<td>138</td>
<td>250</td>
</tr>
<tr>
<td>Moving Bicycles</td>
<td>29</td>
<td>62</td>
<td>81</td>
<td>172</td>
</tr>
<tr>
<td>Moving Motorcycles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>610</strong></td>
<td><strong>1173</strong></td>
<td><strong>1353</strong></td>
<td><strong>3136</strong></td>
</tr>
</tbody>
</table>

Source: Space utilisation study in Kariakoo Block 76 and 77, October 2001.

Along the Uhuru Street (ST2) more mobile activities were noted because the street is one of the main shopping Streets in Kariakoo. Walking activities are more dominant accounting for about 80% of all observed mobile activities in this space (Table 6.11).

Table 6.11: Distribution of mobile activities along Uhuru Street (ST2)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Time interval and number of activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.30-10.30</td>
</tr>
<tr>
<td>Walking</td>
<td>936</td>
</tr>
<tr>
<td>Walking and talking</td>
<td>472</td>
</tr>
<tr>
<td>Walking and selling items</td>
<td>137</td>
</tr>
<tr>
<td>Pushed/pulled carts</td>
<td>88</td>
</tr>
<tr>
<td>Moving bicycles</td>
<td>81</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1714</strong></td>
</tr>
</tbody>
</table>

Source: Space utilisation study in Kariakoo block 76 and 77, October 2001.

When stationary activities are closely examined they show more diversity than mobile activities. Yet the proportion on the occurrence of stationary activities does not vary much when the two spaces are compared. While standing and standing and talking accounts for about 30% of all stationary activities in ST1, the same activities account for about 40% in ST2. Sitting and sitting and talking which account for 28% and 34% in ST1 and ST2 respectively, is the second largest in occurrence after standing and talking activities (Table 6.12).

Table 6.12: Distribution of stationary activities along Lumumba Avenue (ST1)

<table>
<thead>
<tr>
<th>Activity Type</th>
<th>Time interval/Number of activities</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>07.30-10.30</td>
<td>10.30-13.30</td>
</tr>
<tr>
<td>Sitting</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Sitting and talking</td>
<td>79</td>
<td>122</td>
</tr>
<tr>
<td>Sitting and drinking/eating</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>Sitting and selling items</td>
<td>28</td>
<td>54</td>
</tr>
<tr>
<td>Shoe shining</td>
<td>19</td>
<td>27</td>
</tr>
<tr>
<td>Standing</td>
<td>39</td>
<td>60</td>
</tr>
<tr>
<td>Standing and talking</td>
<td>82</td>
<td>121</td>
</tr>
<tr>
<td>Standing and eating/drinking</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Parked carts</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>Parked cars and washing</td>
<td>68</td>
<td>107</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>375</strong></td>
<td><strong>589</strong></td>
</tr>
</tbody>
</table>

Source: Space utilisation study in Kariakoo Block 76 and 77, October 2001.

12 Refers to total of average daily activity types
Table 6.13: Distribution of stationary activities along Uhuru Street (ST2)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Frequency and time interval</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>07.30-10.30</td>
<td>10.30-13.30</td>
</tr>
<tr>
<td>Sitting</td>
<td>53</td>
<td>57</td>
</tr>
<tr>
<td>Sitting and talking</td>
<td>62</td>
<td>69</td>
</tr>
<tr>
<td>Selling items</td>
<td>16</td>
<td>35</td>
</tr>
<tr>
<td>Standing</td>
<td>64</td>
<td>52</td>
</tr>
<tr>
<td>Standing and Talking</td>
<td>77</td>
<td>118</td>
</tr>
<tr>
<td>Parked carts</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Parked cars</td>
<td>48</td>
<td>62</td>
</tr>
<tr>
<td>Parked Bicycles</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>312</strong></td>
<td><strong>398</strong></td>
</tr>
</tbody>
</table>

Source: Observation and space utilisation study in Kariakoo, October 2001.

6.6.2 Activity intensity

If the intensity of utilisation of these spaces is taken into consideration, it is notable that given the relatively smaller size of ST2 and high volume of activities, activity intensity in ST2 is higher than in ST1. Results from calculation of activity intensity for both mobile and stationary activities in ST1 and ST2 are summarised in Tables 6.14 and 6.15

Table 6.14: Activity intensity of stationary activities in ST1 and ST2

<table>
<thead>
<tr>
<th>Time interval (Hours)</th>
<th>Activity intensity</th>
<th>ST2 (Area = 695m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.30 - 10.30</td>
<td>0.2060</td>
<td>0.4489</td>
</tr>
<tr>
<td>10.30 - 13.30</td>
<td>0.3236</td>
<td>0.5727</td>
</tr>
<tr>
<td>14.00 - 18.30</td>
<td>0.2675</td>
<td>0.5353</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>0.2665</strong></td>
<td><strong>0.5353</strong></td>
</tr>
</tbody>
</table>

Source: Derived from total activity distribution tables.

Table 6.15: Activity intensity of mobile activities for ST1 and ST2

<table>
<thead>
<tr>
<th>Time interval</th>
<th>Activity intensity</th>
<th>ST2 (Area = 695m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.30 - 10.30</td>
<td>0.3352</td>
<td>2.4662</td>
</tr>
<tr>
<td>10.30 - 13.30</td>
<td>0.6445</td>
<td>4.8144</td>
</tr>
<tr>
<td>14.00 - 18.30</td>
<td>0.7434</td>
<td>4.600</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>0.5744</strong></td>
<td><strong>3.9602</strong></td>
</tr>
</tbody>
</table>

Source: Derived from total activity distribution tables.

It is notable from the above tables that there is higher activity intensity both for stationary and mobile activities. Two reasons can be advanced to explain higher intensity of mobile activities along Uhuru Street (ST2). First, is due to the smaller size of the ST2 (695m²) despite the fact that it has the majority of the mobile activities when compared to ST1 (1820m²). The second reason is that many shops are located along this Street, and many people visit the Street for shopping purposes. The actual volumes of mobile traffic also illustrate this observation whereby a total of 8,257 mobile activities were recorded from ST2 against 3,136 recorded in ST1.

The high volume of activities in spaces in Kariakoo has made this part of the city centre hectic with many activities especially during the day. These activities are however conducted in poor quality spaces due to the small size, lack of supporting facilities, building congestion

13 Refers to total average of daily activity types.
as a result of high plot coverage and floor area ratios. In hot and humid climatic conditions like Dar es Salaam, where these spaces are necessary for the daily life of people, they are poorly maintained resulting into problems in terms of use and in terms of their spatial quality.

6.6.3 Spatial qualities

Jan Gehl (1987) has discussed the components of quality assessment in the use of space. These include quality requirements related to walking, standing, sitting, seeing, hearing or noise, talking and protection. I find these criteria relevant to assess spatial qualities of spaces within Kariakoo based on the above categorisation and utilisation study. The variables employed include quality requirements for walking, standing, sitting, and protection.

Walking

Spatial quality requirement for walking as noted by Gehl includes elements of pavement or surface conditions, level of crowding, desirable walking distance, configuration of walking routes related to how such routes provide the shortest distance to destination (diagonally) or simply spatial direction and levels through which such pavements pass through. The pavements along the Lumumba and Uhuru Streets are well surfaced with cement slabs. These pavements are relatively in good condition for convenient walking. The only problem that arises in the use of these pavements is the glare that comes from the sun due to reflection. The soaring mid-day sun and glare make walking in these spaces uncomfortable. Due to high land coverage, there are hardly spaces left for tree planting and for other soft landscape elements such as grass lawns or trees to absorb glare. This situation compounds further the state of poor comfort while walking along the Uhuru and Lumumba Streets. The Streets of Kiungani, Somali, Lindi and Kipata are characterised by poor surface conditions with numerous potholes. During the dry season, the streets are dusty and muddy with stagnant water pools during the rainy season. The quality of these Streets in terms of walking is rather poor despite the fact that they are not intensively used as the case is for the Uhuru (ST2) and Lumumba Streets (ST1).

If overcrowding in terms of walking activity is reflected in Gehl's proposition, the result is an average of 0.03 pedestrians per metre per minute for ST1 and 4.7 pedestrians per metre per minute for ST2. Gehl's proposition is 10 to 15 persons per metre per minute as the upper limit with two-way pedestrian traffic. Despite ST1 having a relatively low level of overcrowding in this context, parked vehicles hinder walking in this space. Similarly, the two-way walking movement makes walking along this Street uncomfortable. The mixing up with bicycle and car traffic also makes walking along this space unsafe for pedestrians the consequences of which are poor quality of the space to function as a walkway. With regard to ST2, there is a considerable volume of traffic and the overcrowding level is more pronounced than in ST1. Since the space is narrow, with varying widths and also accommodating two-way traffic of pedestrians, it is more uncomfortable walking along ST2 than in ST1. At times cars are parked within this space. This diminishes further the amount of space available for walking. Pedestrians have to overspill to pavements used by cars. It is therefore risky in terms of traffic safety and accidents and creates a sense of insecurity while walking along this space.

Standing

Some of the spatial quality requirements for standing as proposed by Gehl include availability of standing supports, recessed entrances, porches or verandahs and niches. Within ST1, for example, there are standing supports such as trees and columns under the ground floor of the Co-operative Building. The central reserve of the Lumumba Avenue is planted with trees that provide a better standing environment. However, the disadvantage
with this space is its location surrounded by moving traffic on both sides. It is narrow (about three metres) and unprotected from traffic. It is therefore not safe standing at this part of ST1.

Virtually there are no standing supports along ST2 apart from the short iron poles that prevent vehicular traffic to infringe pedestrian flow in few sections of this space. Some sections that are recessed from the street are being used by street and kiosk vendors selling items like clothes and shoes. Therefore, they are not frequently used as standing supports. Although some sections of ST2 are covered with arcades, again these arcades are either used as display areas for goods or blocked by parked cars of the shop owners facing the street. Spatial qualities to support standing both in ST1 and ST2 are generally poor and those available have been either infringed with other activities or not designed to provide for good standing environment.

**Sitting**

Spatial quality requirements for sitting include orientation to view (unobstructed view), availability of seating supports such as benches or chairs, comfortable seats and for stretching spaces, convenient interval of placement of seats.

Both ST1 and ST2 are part of the Streets of Lumumba and Uhuru and therefore have a primary function of supporting travelling or mobile activities. However, a substantial amount of stationary activities particularly sitting and sitting and eating were noted in these spaces. Sitting and its associated activities of drinking or eating, talking, selling items and shoe shining accounted for 46% of all observed stationary activities in ST1 and 40% in ST2. Observations in ST1 show that some people sat on benches especially those who went for shoe shining along the central reserve. Movable benches and chairs were frequently used as the type of business itself was mobile, informal and temporarily located in such spaces. Other people used kerbstones to sit on where alternative seats were not available. In a situation where mobile and stationary activities were mixed as the case was for ST1, provision for seats had been rare. Therefore, the qualities for sitting in both ST1 and ST2 seems to be poor and the ones available were too temporary to promote significant and comfortable sitting in these spaces.

**Protection**

Protection as a variable for spatial quality assessment refers to protection against crime, robbery, vandalism and more specifically protection against negative climatic conditions (*ibid.*). Considering spaces in Kariakoo area, vehicles and pedestrians intensively use both ST1 and ST2 and the rest of other streets all the day long and even during weekends. As such, one may consider that these spaces are well protected against daytime vandalism and crime due to the presence of many people. With the exception of the central reserve in ST1, the two spaces do not have tree shades that protect mobile and stationary activities from the hot and humid weather. It is totally uncomfortable to walk along the sides of ST1 and ST2 due to lack of shade. When it rains, almost all activities have to close down due to lack of covered roofs or arcades. The arcades along ST1 are disconnected hence inhibit continuous movement for shopping.

Another variable of protection is the availability of light especially during the night. Almost all Streets in Kariakoo lack streetlights. Streetlights along the Lumumba Avenue are not functioning. Others have been knocked down by vehicles and are yet to be repaired or replaced. Only security lights from houses facing the street provide some light to the street but this is not adequate for street lighting purposes. Although crime events during the night from Kariakoo has not been researched in this study, the absence of streetlights scares people to walk in the streets during night times. One can generally argue that due to high building
density in Kariakoo, spaces are somehow protected in terms of crime and other vices. However, they lack the physical elements of protection against negative climatic conditions such as extreme solar radiation and humid weather, rainfall as well as protection against vehicular traffic in terms of traffic separation and night security.
CHAPTER SEVEN

MBEZI-A NEWLY DEVELOPING FORMAL SETTLEMENT

This chapter presents empirical results from one of the newly emerging formal settlements of Mbezi\(^1\). This settlement was planned for low-density development with relatively larger plot sizes and has been mostly occupied by the middle and high-income group of people. Initial development in this area was not well guided resulting into re-designing of the layout to accommodate unregulated developments. Due to larger plot sizes and the fact that it is still in the process of development it exhibits an extremely low-density character both in terms of land coverage and floor area ratios. Infrastructure services have been lacking and individual efforts towards provision of these services have been uncoordinated. Despite spectacular house forms that emerge from this settlement, environmental and liveability qualities have been undermined by the lack of these basic services.

7.1 Settlement evolution and growth

Mbezi is one of the newly developing settlements that emerged in the 1980s. It is located about 12 kilometres from the city centre. Mbezi planning scheme was designed in 1980s and occupies 5,500 hectares with Bagamoyo Road traversing through the settlement. The settlement shares borders with Mbezi River to the south, the Indian Ocean to the east, Tegeta River to the north and a hilly area making a border with Goba and Kimara settlements to the west (Figure 7.1). Towards the east the land falls gently to the sea, with extensive white sand beaches. Due to absence of reliable storm water drainage channels, some housing areas experience seasonal floods particularly during rainy seasons.

\[\text{Figure 7.1: Location of Mbezi settlement within the built up area of Dar es Salaam city (Source: Kironde, 1994:86).}\]

\(^1\) There are two settlements bearing the same name ‘Mbezi’ within Dar es Salaam. The settlement in focus in this study is Mbezi along Bagamoyo road and not the one located along Morogoro road.
Figure 7.2: Aerial photo of Mbezi (1982). Until 1982, the larger part of Mbezi was undeveloped with only small scale farming activities taking place throughout the central part of the area. A few developments were already along the Indian Ocean. It was not until after 1985 that the pace of development of this area gained momentum with increased housing development occurring in the 1990s. Note that the southern border of the settlement is River Mbezi and the North-South Bagamoyo Road traversing this area as seen in this photo (Source: Surveys and Mapping Division, Ministry of Lands, Dar es Salaam).
The history of Mbezi dates back to the 1950s when part of this area along the Indian ocean was already occupied by Europeans settlers. Then the area was considered to be agricultural land (Kironde, 1994: 393-399). In 1955, some settlers and farm owners attempted to raise a fund for road servicing in the area but the target could not be met because most of the farm owners did not contribute (ibid.). During this time, the area was well outside the city boundaries of Dar es Salaam and was put free for general farming activities. Until 1974, a large part of Mbezi was part of two private Sisal Estates, the Mbezi and Kunduchi Sisal Estates. Indigenous people were using some of the areas. Since the estates were not well managed by the owners the government nationalised and subdivided them into small-scale farms. These farms were allocated to small-scale farmers (natives) for agricultural purposes (ibid.). Small-scale farming activities continued in the area until 1976 when land use planning in the area commenced.

7.2 Planning intervention for Mbezi area

The overall idea of planning for Mbezi arose from the need to provide residential plots to middle and higher income category of social groups whose needs were not considered in the 1970s and 1980s Sites and Services programmes. Kironde observes that:

*The Mbezi planning scheme came up as a means of the government to accommodate other social groups which could not be accommodated by the sites and services project. It happened that not only the quantity of plots was inadequate to meet the needs, but also the plot sizes and locations did not meet some specific needs of other social groups. It was therefore found important to launch a major planning scheme in Mbezi area whose location and size could offer low-density plot sizes. (Kironde, 1994: 393-394).*

Recent observations and interviews with residents in Mbezi Block D support the foregoing observation. Site development characteristics in Mbezi also confirm this, most of the already developed plots having ‘grandiose’ house types, maisonette two to three storeys with flat concrete roof slabs while the majority have red tiled roofs.

Both the 1968 and 1979 Master Plans have had an influence on the present settlement structure and house forms of Mbezi. The 1968 Master Plan recommended that Mbezi area be developed for land uses such as industrial, residential, institutional, district centre and agricultural as well as open spaces. The residential area was designated to be developed in residential districts divided in the so called ‘Village Units’ with each unit providing housing areas for between 5,000 and 8,000 persons. Each unit was grouped around a primary school, religious site and open spaces. These units were to be separated by major collector roads and central functions in which markets, commercial areas, secondary school sites and future high density housing areas would be located (URT, 1968:58). The Master Planners recommended each ‘village unit’ to be surrounded by local collector roads with cul-de-sacs leading toward the open space core. Larger plots earmarked for car owning families were designated along the perimeters of the ‘village units’ with easy access to the encircling collector roads (Figure 7.3).

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2 It is important to note that in 1974, the country was hit by severe drought that caused famine. This necessitated the government to embark on “Nguvu Kazi” operation. In this operation, people living in urban areas were urged to cultivate small farms in the periphery areas of the city. Mbezi might be one of the areas. However, the quasi-official allocation of farm plots created problems in land acquisitions when this area was needed for planning purposes later on.
Although the 1968 Master Plan and scheme proposals were not fully realised in the implementation of this plan, its planning concepts did influence the design of several detailed planning schemes for Mbezi that were prepared in the 1980s. In 1978, a planning scheme for Mbezi covering some 5,500 hectares was prepared. This scheme designated various land uses, namely: residential area covering 3,184 hectares, an industrial area covering 558 hectares, an institutional area of 145 hectares and a district centre covering 55 hectares (Kironde, 1994). Even though the 1979 Master Plan came into effect and replaced the 1968 plan, the general planning scheme and detailed conceptual plan for Mbezi remained more or less the same as that of 1968.

The ‘Village Units’ were synonymous to neighbourhood units borrowing several ideas from Clarence Perry’s neighbourhood unit concept and principles\(^3\). The neighbourhood units designated in the detailed planning schemes have been referred to as ‘Blocks’ and not ‘village units’. The actual situation is that they both refer to neighbourhood units. A typical example is

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\(^3\) According to Perry, the six principles for a place planned for social living should embrace the following: a population of about 5,000 inhabitants, enough to support an elementary school, its boundaries are thoroughfare roads, its open spaces spread within the area, the school, church and other institutions are placed at the centre of the area, district shops located at the periphery to serve nearby neighbourhoods and internal traffic system intended for local residents only (Perry, 1929).
‘Mbezi Block D’ of relatively low-density with plot sizes ranging between 800 and 1200 square metres. The neighbourhood unit also provides for central facilities such as primary school, religious sites, police station, health centre, library, petrol stations and retail shops. The street layout has been organised in such a way to discourage transit traffic with loop networks and cul-de-sacs providing vehicular access to the peripheral plots (Figure 7.3). Only few open spaces were provided. Easements that provide pedestrian access within and to neighbouring areas were also provided. The cul-de-sacs – easement concepts seem to have borrowed from urban design ideas that were developed and implemented in Radburn primarily to promote safe pedestrian movement within residential areas. Although these concepts seem logical in terms of planning and design, they have not been widely adopted in the real context of Mbezi. For instance, the lack of basic (planned) services such as footpaths, paved streets and access roads obliges settlers to re-open cul-de-sacs to transit traffic to join the main Bagamoyo road. Furthermore, the encroachment of central facilities areas such as primary schools, health centres, road reserves and shopping centres by residential uses limits the application of the neighbourhood concept in Mbezi. Since land development has not reached a consolidation stage, unguided housing developments have made Mbezi planning scheme a source of conflicts of various land uses and among developers. To remedy this situation the Ministry of Lands revised the schemes so as to accommodate existing development especially changes to the neighbourhood centre (Figure 7.4).

![Figure 7.4a: First layout for Mbezi Block D. It incorporated central area functions such as commercial plots and sites for primary school. This layout was later revised to accommodate changes happening on the ground. (Source: Ministry of Lands, 2000).](image1)

![Figure 7.4b: The present layout plan for Mbezi Block D. The layout does not include the central function. This follows amendments made later to accommodate changes on the ground (Source: Ministry of Lands, 2000).](image2)
These conflicts in land development emerge from disputes between new allocatees and the former land owners who were cultivating crops in small farms during operation ‘Nguvu Kazi’ in the mid 1970s. The land disputes in Mbezi have adversely affected smooth development of plots. Some plots are yet to be developed due to cases awaiting hearing by the court or city authorities. Land disputes in Mbezi area have been discussed by Kironde (1994) when he attributes disputes to low compensation rates paid to former farm owners and displacement of the poor by the rich supported by the government land administrative machinery. Besides, some of the disputes arose from surveying, allegedly because land surveyors further subdivided the layout plan in order to produce more plots – similar to ‘plot creations’ practised in Sinza and other Sites and Services projects in the 1970s. Other causes include weaknesses in land development control particularly the poor record keeping by the lands offices. Kironde narrates one of the land disputes as follows:

One Jane Josephat was allocated plot 110 block D Mbezi in 1980. In January 1988 she requested the Land Office to transfer the plot (which was yet to be developed) to her brother Gilbert working with the Army, and who was economically able to develop it. This plot 110 (together with plots 109, 111 and 120) fell in shamba land belonging to one Selemani Kondo, who was therefore entitled to compensation, alternative land, or ‘naturalisation’ on his land. As government policy has always inclined to replacing existing users, Valuers inspected Kondo’s shamba in June 1988, at the request of Gilbert. The ‘unexhausted improvements’ found on Kondo’s land were; one banana tree which was valued at TShs. 225/=, and six cassava trees which were valued at TShs. 4.75/= each. Thus the total compensation due to Kondo was assessed to be only TShs. 245.45/=. In February 1989 Kondo was made to take the compensation, paid by Gilbert, through the City Council. Kondo was apparently illiterate since he could only thumb-sign the voluminous compensation documents. He continued tilling the land. In June 1989, Gilbert obtained a building permit and was poised to develop that plot. Kondo must have found out that he had been dragged into a bad deal dispossessing him of his land for peanuts. Taking cue from other shamba owners in Mbezi, he complained to the Land Office that the land allocated to Gilbert was his (Kondo’s). The Land Office revoked Gilbert’s offer for a right of occupancy. But on getting evidence that Gilbert had paid compensation, the Land Office restored Gilbert’s offer for a right of occupancy. Thus Kondo lost his land for just TShs. 245.45/=. (Kironde, 1994:470-471)

This example represents typical land disputes and take-over processes that characterise settlement development in Mbezi area. The area was surveyed without involvement of the small-scale farmers although it was initially agreed that they would be paid compensation for their unexhausted improvements and be allocated plots within the land. Failure to honour this aspect led to the scheme’s unsystematic implementation. One of the reasons for the failure to pay compensation was the poor governments economic condition experienced in the late 1970’s and in the early 1980s. The government not only lacked resources to pay compensation but also failed to provide the necessary infrastructure before plot allocation. Plots were therefore demarcated, surveyed and allocated in Mbezi bush. Lorries delivering building materials to construction sites spontaneously formed tracks. The alignment of these tracks kept changing whenever owners fenced their plots.

The lack of co-ordinated line infrastructure service delivery has forced residents to take individual initiatives to own plots leading into chaotic and uneconomic supply of services particularly water pipes.
Kironde (ibid.) observes that individual efforts in water laying in Mbezi have resulted into unnecessary expenses for repetitive actions and in some occasions, people found themselves laying down pipes in ditches dug earlier by another developer due to lack of co-ordination (Figure 7.5).

Although Mbezi has been officially planned and is a formal settlement, its development process raises a number of issues that will need immediate attention by the authorities. For instance, the unguided housing development, uncoordinated individual efforts in water supply provision, unpaved roads and lack of drainage systems altogether have resulted into poor spatial and environmental qualities amidst high quality housing that are being put up by developers in this area. For the case of infrastructure, it seems that residents are capable of paying for these services only that their efforts are not coordinated. This aspect needs attention if quality and the type of houses erected in this settlement are to be harmonised. Otherwise the once planned and high status settlement may as well be undergoing the ‘informalisation process’ of the formal settlements.

To date, Mbezi is characterised by a landscape with some sites fully developed and habited, some are half way completed for example with superstructure completed but not the roofing and finishing. There is also a good number of plots which are still vacant. Results from an observation study on stages of house development from 57 plots are as summarised in Table 7.1.
Table 7.1: Development stages of plots in Mbezi

<table>
<thead>
<tr>
<th>Stage of plot development</th>
<th>Number of plots</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacant plots</td>
<td>5</td>
<td>One plot is severely damaged by erosions, two are low-lying and flooded</td>
</tr>
<tr>
<td>Servant quarters only</td>
<td>7</td>
<td>Usually these quarters are used as storage houses during construction of main house</td>
</tr>
<tr>
<td>Foundation to roofing stage</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>Completed not occupied</td>
<td>6</td>
<td>These are either awaiting to be rented or occupied by owners</td>
</tr>
<tr>
<td>Completed and occupied</td>
<td>33</td>
<td>Including a plot exclusively used for the Church, Nursery School, Bird’s shed and a purely commercial plot along Bagamoyo road</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td></td>
</tr>
</tbody>
</table>

Source: Plot measurement and observation studies of a part of Mbezi Block D, January 2001.

Figure 7.6: Mbezi Block D by 1992. Many buildings were still under construction whereas other plots were unbuilt. Note the character of plot boundaries as defined by fences. Besides, the road network is yet to be constructed. Only locally defined tracks provide access to the completed and occupied buildings. (Source: MLHSD, 1992).
7.3 House Forms

7.3.1 Number of storeys, roof types and building materials

Though the planning concepts for Mbezi scheme envisaged mixed kind of densities and of social groups, the present pattern of house development in Mbezi depicts more features of higher income category of people. This is illustrated by the house forms in this area. Generally, the whole residential section of Mbezi is characterised by large detached types of houses some of which are two to three storeys (Table 7.2).

Table 7.2: Number of storeys for Mbezi Block D

<table>
<thead>
<tr>
<th>Number of storeys</th>
<th>Number of houses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
</tr>
</tbody>
</table>

Source: Field observations in Mbezi Block D, January 2001.

Unlike Kariakoo and other consolidated inner city settlements where plot coverage is high, the single unit type of houses in this case have been sited centrally on the plot with ample setbacks and with low plot coverage. This provides room for outdoor activities as gardening and animal keeping. In some plots, a servant quarter is provided at the rear side of the plot and the main building in the front side. The servant quarters are used as storage units during construction of main buildings or dwelling units for people employed by house owners as guards or gardeners.

According to the field observation and the plot measurement studies conducted in the settlement, 42 houses were detached occupied by only one household. The 5 detached houses had more than two households. This means that the later category comprised house types that could be shared with more than one household. Typical Swahili house types are non-existent in Mbezi Block D.

Another important character of house forms is the roof type. Out of 54 houses that were observed during fieldwork studies, 27 houses had gable roofs, 7 houses had hipped roofs, 5 had clerestory, 6 had flat roofs and 9 had mono-pitch roofs.

A more significant variable that characterises house forms in Mbezi is the building materials. The fieldwork results indicated that out of the 42 main houses almost all had walls constructed of concrete blocks. As regards materials for windows and doors, 30 houses had timber and glass whereas 12 had timber only. Roofing materials that pre-dominate in the area are tiles and Corrugated Iron Sheets (CIS). Field observations further indicated that 20 houses were roofed with CIS and 20 with tiles and 2 with concrete. One dominant feature in Mbezi is the extensive use of roofing tiles. This is probably due to the fact that tiles are available from a number of factories, one of which is located within Mbezi. Though tiles are not cheap roofing materials many affluent developers have widened its use. It is also climatically appreciated in hot humid

4 This indicates that the majority of the houses in Mbezi are meant for single household occupation be it for owner or rental accommodation. In many cases the Swahili house type has been associated with multi-occupational character i.e. accommodating several households, either all occupants being tenant or tenants with owners.

5 Note that this figure includes some secondary buildings and servant quarters. The actual number of main buildings is 42.
climates such as Dar es Salaam. Tiles were not easily available until mid 1980s when private investors established a tile factory in the city.

Another variable that characterises house forms is the number of storeys. Unlike many residential areas of Dar es Salaam where single storey housing is a dominant house form, in Mbezi house forms comprise both single storey and two to three storey houses. Within 57 plots that were visited, there were 38 single storey houses, 7 two storeys and 4 houses with three storeys.

The decorative nature of the facades, fences and varying styles in forms of windows and doors is another variable that characterises house forms in this settlement. Many houses have facades decorated with coral stones (Figure 7.7). Fences comprise perforated walls with white paint and aligned together with monumental trees such as ‘ashock’; In other instances aligned or planted with *bougnaivillea* flowers. Balconies are well shielded with balustrades of sand cement material in many a case, painted in white colour. Windows and doors are usually with arches at the top or at the corners deviating from the usual right-angled forms of windows and doors that dominate many settlements of Dar es Salaam. When a houses is roofed with tiles and located on a well landscaped larger plot size like the one described above, it symbolically portray a high status residence and or simply a resident with higher social and economic status.

![Figure 7.7a: The front facade of a house on plot 295. Note the use of coral stones as decorative elements and arches for windows and doors, hipped roof type with tile roofing. Tiles have been used extensively in Mbezi area.](image)

![Figure 7.7b: The rear facade of house number 295. Note that due to larger plot size the rear side is also being used to keep animals such as goats.](image)

![Figure 7.7c: Single storey house type on plot 271. Note the use of outdoor spaces of tree planting and gardening.](image)

![Figure 7.7d: Typical residential house in Mbezi. Houses are usually fenced and the courtyards are well treated to facilitate use of outdoor space for various activities.](image)
7.3.2 House sizes

Although not all plots in Mbezi have been fully developed as per planning requirements (i.e. some of the plots have a foundation only, others have servant quarters only), overall the completed houses are relatively bigger than houses found in many other settlements of Dar es Salaam city. With the exception of few plots currently with servant quarters, the majority of other plots have house sizes ranging between 200 to 250 square metres (Table 7.3).

Table 7.3: House sizes for part of Mbezi Block D

<table>
<thead>
<tr>
<th>House size in square metres</th>
<th>Number of houses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-49</td>
<td>5</td>
</tr>
<tr>
<td>50 - 99</td>
<td>3</td>
</tr>
<tr>
<td>100-149</td>
<td>1</td>
</tr>
<tr>
<td>150-199</td>
<td>2</td>
</tr>
<tr>
<td>200-249</td>
<td>10</td>
</tr>
<tr>
<td>250-299</td>
<td>7</td>
</tr>
<tr>
<td>300-349</td>
<td>6</td>
</tr>
<tr>
<td>350-399</td>
<td>4</td>
</tr>
<tr>
<td>Above 400</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>


The larger houses for this settlement have to be related to the larger plot size and the social status of the developers of this area. While the smallest plot size in this part of the settlement was observed to be 1,080 square metres, the largest is 1,869 square metres. Residents of this area have relatively high incomes which give rise to larger house sizes. Unlike in informal...
settlements where house sizes show considerable variations, house sizes in this area do not seem to vary significantly. In informal settlements such as Ubungo and Msasani this variation is directly related to the informal nature of plot subdivision processes which influence plot sizes and ultimately the house sizes.

7.3.3 Use of buildings

Since most parts of the Mbezi planning scheme was designated primarily for residential use, general trends in building uses also show the dominance of residential houses. A few non-residential uses such as offices, shops and a religious building were noted being attached to residential houses. However, as plot development and population density increase and given the fact that the area designated for commercial and retail centres has been ‘appropriated’ by some people and built up residential houses, some of the house owners have altered part of their houses to accommodate other non-residential activities including commercial activities. These activities include retail shops, offices and a church (for example a temporary Seventh Day Adventist Church on plot numbers 280). Other commercial uses were noted in houses located on plot 292 in which sale of building materials such as cement blocks, pipes and cement were taking place, whereas retail shops and tailoring activities were being undertaken on plot 252. Part of plot 289 was being used for wholesale of soft drinks.

Although retail commercial centres are still few in the area, it is unlikely that such uses will increase given the pattern of the life styles of the people in this part of the settlement. The majority of the residents are generally people with a reliable income and means of transport (i.e. many own cars). Therefore, they usually do their shopping in the city or nearby supermarkets. Further development of retail shops in the low-density plots seems unlikely. For less affluent households the lack of services like retail facilities and schools has made Mbezi not a conducive area to live in since they have to walk longer distances to these facilities.

7.4 Density

7.4.1 Housing and population density

The perception of low-density for Mbezi is also supported by measured or physical density. With a total population of 241 people and a total area coverage of about 9 hectares the gross population density has been established to be as low as 27 persons per hectare. If only the completed houses were taken into account, the resulting housing density would be approximately 4 houses per hectare. But if the servant quarters and other houses under construction are taken into consideration, a gross density of 6 houses per hectare is achieved. These figures reveal an extremely low housing density compared to the recommended densities of 12 to 15 dwelling units per hectare and net densities of 15 to 20 units per hectare for low-density settlements (URT, 1978). Apart from prohibitive costs, the deficiencies in infrastructure provision experienced by this settlement are attributed to low-density character of housing development and the fact that individual or group efforts are yet to be mobilised and co-ordinated. Low-density as a variable augmenting infrastructure provision has been pointed out by Acioly and Davidson when they observe that:

...scattered settlements with large plots and individual free standing houses surrounding many African towns means that many people live without municipal services or are obliged to cover long distance to reach them. (Acioly and Davidson, 1996:9).
Further analysis show that room occupancy is also low implying that there is no overcrowding. There are a total of 226 habitable rooms within the area, hence an occupancy rate of approximately 1 person per room. This is a half the recommended rate of 2 persons per room by the Space and Planning Standards in Tanzania (URT, 1978). As noted above, this figure indicates that Mbezi is still a low-density settlement. The main factors contributing to the observed state of low-density and occupancy characteristics include the relatively larger plot sizes, fewer people and incomplete development state of the area.

7.4.2 Plot coverage

Even though this part of Mbezi comprises large size of houses, the plot coverage is generally low. It was noted that out of total 57 plots, 33 had coverage ranging between 11% and 30%, 8 had less than 10%. The last category were primarily servant quarters. There was no plot coverage exceeding 60%.

7.4.3 Floor area ratio (FAR)

Floor area ratio as a function of plot area and house forms has been revealed to be generally low in Mbezi area. Out of 42 observed houses 34 houses had single storey, 6 or had two storey and 2 houses had 3 storeys. These houses are sited in 1,200 square metres plots yielding low floor area ratios. Since plot size is almost the same, variation in terms of floor area ratio has been also small. Fieldwork observations indicate that the majority of the plots have floor area ratios ranging from 0.1 to 0.29. These are extremely low floor area ratios if issues of infrastructure and community facilities are taken into consideration.

7.4.4 Floor area ratios and coverage at block level

Even though plots play an influential role in resulting physical densities of settlements, that is plot floor area ratio and coverage, density analysis at plot level becomes limited when concern over spatial qualities and amenities are taken into consideration. The amount of spaces, road network and other services such as incidental open spaces that are part of the daily residential areas are not considered in density analyses at the plot level. The physical density as established from the blocks in Mbezi is summarised in Figure 7.8.

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7Overcrowding in this situation is being used in its simplest sense of number of people accommodated in habitable rooms as compared to recommended accommodation density of 2 persons per room.
When the case study area was further subdivided into smaller blocks (A, B, and C) and floor area ratio and land coverage analysed, despite the slight variations, the general results is low land coverage and floor area ratio (Figure 7.8). The slight variations should however be related to the different development levels observed in each block whereby block C had more fully developed houses than the other two blocks.

### 7.5 Plot characteristics

Unlike in informal settlements where informal plot subdivision processes determine the character and shape of plots, in formal settlements, this process is to a greater extent constrained by predetermined plot sizes by the planning authorities and as provided in the space standards for planning residential areas.

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8 The Tanzanian Space Standards for Residential Areas recommend five basic principles in the design of plots. First, is that residential plots should be regular. Second, is rectangular plots should be preferred to squarish or other shapes of plots. Squarish plots are uneconomical and entail waste of land. Third, is that the ratio of the width and depth of plots should not be less than 1:1.5 and not more than 1:3. Fourth, is that irregular plots should be avoided and if allowed, such plots should have a minimum of 6 metres in one of its sides. Fifth, is that triangular plots should be avoided (Source: Mittal, 1978:12).
7.5.1 Area analysis

The smallest plot size was observed to be 1,080 square metres and the largest is 1,869 square metres. Out of 52 plots, 35 plots had sizes ranging between 1200 and 1400 square metres. The standard plot size that seems to have been adopted is 1200 square metres, while the largest plot size covers 2,400 square metres. The latter comprise plots that have been informally extended to include the adjacent cul-de-sacs.

Within the framework of the 1978 Space and Planning Standards, these plots were recognised as low density. However, under the revised standards, that increased plot size per category, most of these plot sizes fall under the ‘medium density’ category. It is surprising therefore that despite the problems of infrastructure provision in such low-density urban types and in many other newly developing settlements, revised standards have increased plot sizes. Even developers will be motivated and coordinated to make provisions for infrastructure in their settlements, effective realisation of these efforts are likely to have little success due to extremely larger plot sizes. The adoption of these new standards will augment further continued city sprawl that extends without infrastructure and community facilities. Plot size as an important parameter for density and land utilisation calls for close re-examination and redefinition within the framework of planning standards if sustainable city development is to be assured in the future.

7.5.2 Plot ratio

Notwithstanding the larger plot sizes, the majority of the plots have plot ratios tending towards squarish shapes that is plot ratio of 1:1.33. With plot ratio tending towards 1:1 it implies that only a limited number of houses will be connected to line infrastructure such as water, drainage, streets and sewerage. This kind of layout poses more disadvantages in terms of economic provision, operation and maintenance of infrastructure. Apparently, one of the basic principles in layout of settlements for optimal infrastructure provision has been the trade-off of narrower frontages so as to maximise the number of houses that could be connected to infrastructure networks but also maintain flexibility in design. In this case, some of the plots were noted to have longer widths than depths facing the streets. This augments further future possibilities of servicing the area with this type of settlement layout.

7.5.3 Plot exposure

Plot exposure as a measure of amenity refers to the number of sides of the plot exposed to contiguous open space or street. This variable is more important in analysing exposure of buildings in congested or consolidated settlements in relation to comfort requirements such as cross-ventilation, adequate sun lighting, site vistas and at times, privacy. In settlements like Mbezi where plot sizes are relatively larger with extremely low density, exposure analysis is of little relevance, as almost all buildings are exposed and therefore facilitates both cross ventilation and adequate sun lighting. Even if the settlement is fully developed, it is not anticipated that plot

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9 The 1996 Town Planning Space Standards recommend larger sizes of plots than those in the 1978 report for the three groups of residential plot categories. The new and old standards (in brackets) are as follows: high density to range between 400 – 800 (in place of 288-450) square metres, medium density ranging between 801 to 1600 (in place of 450-800) square metres and, low density with plots sizes ranging between 1601-4000 in place of 800-1200) square metres.
exposure will be limited, mainly because of ample open spaces surrounding houses in almost all plots.

7.5.4 Plot boundary definition

Both block walling and soft hedges have been extensively used to define plot boundaries in Mbezi Block D (Figure 6.7). Unlike in informal settlements and the densely inner city areas such as Kariakoo where plot boundaries are not often physically marked on the ground, in Mbezi most of the occupied buildings have plots which are fenced. Fenced plot boundaries have increased individuality and privacy as well as perception of low density. Contacts with other people have been inhibited and due to lack of communal and neighbourhood spaces, casual contacts among residents has been further curtailed. Although fences and hedges enhance security against burglary and theft, fences have in turn blocked social and visual contacts with neighbours. Vania Ceccato for example, argues that:

… the quality of a residential area or a city is not merely dependent on its physical environment only but also on the interplay between space (including local resources) and residents and also between residents themselves. It also depends on how people have access to services, quality of outdoor environment, security and the social links among themselves. It also embraces aspects of degree of attachment to the settlement and participation on local organisations, yet its evaluation depends on how, when and for whom the area was planned and how the same area has developed over the years. (Ceccato, 2000:8)

Results from empirical studies in Msasani, for example, where plots are not fenced indicate that about 34 respondents out of 56 admitted to have daily casual contacts with their neighbours, only 4 residents out of 17 responded to have contacts with their neighbours in Mbezi.

As regards security, although fencing has been applied as a measure to curb burglary, there seems to be more problems related to security issues in this settlement. Oscar Newman argues that besides other protective mechanisms increased surveillance in residential areas has to be related with the layout of the settlements and how spaces have been organised within residential environments when he contends that:

Improved surveillance operates most effectively when linked with territorial subdivision of residential areas, allowing the resident to observe those public areas which he considers to be part of their realm of ownership and hence responsibility… An ability to distinguish strangers has been found to be closely related to the number of families sharing a particular defined area at a level of development subdivision. (Newman, 1973:79-80)

Acioly and Davidson however, related security with density when they argue that:

… concerns about security are tending to promote higher densities. Large gardens in low-density neighbourhoods may be seen as a danger rather than advantage. New middle class development in cities such as Nairobi and Johannesburg promote compact ‘town houses’ crouching behind barbed wire topped walls. (Acioly and Davidson 1996:11)

These arguments indicate that even though plot fencing can be employed as a means to prevent crime, density of the settlement plays a significant role for assured surveillance within home environments. The observed low-density character of Mbezi is contributory to the low security condition of the settlement. Even though the undeveloped plots will be fully developed later, the too large plot sizes will continue to augment security problems in this settlement. When residents of Mbezi were asked to evaluate their settlement on various aspects, security emerged as one of the problems, as summarised in Table 7.4
Table 7.4: Residents’ assessment of settlement elements

<table>
<thead>
<tr>
<th>Settlement element</th>
<th>Like</th>
<th>Dislike</th>
<th>Total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>16</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Accessibility</td>
<td>15</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Security</td>
<td>10</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>Shopping</td>
<td>13</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>Storm water drainage</td>
<td>-</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Water supply</td>
<td>15</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Distance to services</td>
<td>7</td>
<td>6</td>
<td>13</td>
</tr>
</tbody>
</table>


Many respondents indicated that it was unsafe to stay in the house which was not fenced. Apart from putting up fenced plots many households employ watchmen especially during the night. Although this phenomenon is characteristic to Mbezi, it is not experienced in the same magnitude in consolidated informal settlements such as Msasani. Because houses are isolated and sparsely located chances of robbery and burglary have been more in low-density areas than in settlements where houses are closely or densely developed.

7.6 Spaces and space uses

The categories of spaces that were observed in Mbezi included road reserves, vacant or undeveloped plots, courtyards, streets, cul-de-sacs and footpaths (Figure 7.9). Road reserves include that of Bagamoyo Road that is wide enough (50 metres wide). Although the pavement is good, that is bituminous in surface, the reserves are yet to be developed to accommodate allied functions such as walking, sitting, cycling etc. The only use that was observed to take place in these spaces was tendering of tree nurseries of ornamental plants. Another activity was the making of concrete block noted at the junction of Bagamoyo Road and Tembo Street. Although blocks are made within the courtyard of the house located at this corner plot, display, storage, and sale of blocks were being carried out along the reserve of Bagamoyo Road.

Five plots that are yet to be developed and several other plots that are in the process of development (such as those built of servant quarters or foundations) have the larger parts of their areas used for gardening. Crops grown include bananas and coconut trees, maize, green vegetables and grass. Due to larger plot sizes, several outdoor activities were noted to take place in the open-to-sky spaces. These activities included washing and drying of clothes, food preparation, sitting and resting, eating and talking.

Cul-de-sacs have been uncared for as part of the spaces. In some instances, they have been ‘appropriated’ by house developers as part of their plots. Where existing, no specific use has been taking place apart from the natural grass that grows in these spaces. The fact that cul-de-sacs are yet to be developed, and others informally opened towards Bagamoyo Road, the remaining reserves depict a ‘non-man’s land’ character with no specific use upon them.
Figure 7.9: Categories of spaces within Mbezi. While there are a number of undeveloped plots within the area, there are also larger spaces between buildings due to large plot sizes of this settlement. Note that some of the access streets have been blocked with dead ends or with connection by footpath to the main road of Bagamoyo (Source: Field study, November 2000).

Figure 7.10a: Use of road reserves. One of the uses of the road reserves is tree nursery as this one along Bagamoyo Road. Most of the road reserve is unpaved and therefore not effectively used.

Figure 7.10b: Sell of concrete blocks along Bagamoyo Road reserve. Since it is facing the major road, big trucks can easily access this space for loading of blocks and delivery of materials.
Figure 7.11: Sitting, cooking and gardening in Mbezi. When outdoor spaces are well shaded with trees, several activities take place such as cooking, washing of utensils and clothes, drying of clothes etc. Due to large plot size residents also engage in gardening activities as indicated by the surrounding gardens in this figure.

Figure 7.12: Sitting and talking under a coconut tree shade characterises the use of spaces in Mbezi. Guests are welcome outside and people can comfortably converse with a high degree of comfort than inside the house. Note also that the space is also used for drying of clothes with an immediate surrounding of gardens.
Courtyards (enclosed by walls) within housing compounds accommodate activities such as washing and drying of clothes, food preparation, sitting and resting, eating and talking, car parks, animal sheds, flower gardens and animal feeding.

Almost all streets are yet to be developed to an acceptable level. Although all streets have been given names that seem to be consistent both in terms of the logic and hierarchy, the surface and drainage conditions of these streets are still poor. Tembo, which is the major Street on the eastern part of the settlement, is poorly developed. Due to lack drainage, it is flooded during rainy seasons. The seasonal floods inhibit smooth pedestrian and vehicular movement along this street. Houses developed on cul-de-sac spaces have blocked Kanga and Njiwa Streets.

7.6.1 Spatial qualities

Walking

Although walking along the streets is convenient due to low levels of vehicular traffic and good shade from trees, the dusty and muddy conditions during dry and rainy seasons respectively, render walking in these streets unattractive. The blockage of the streets and footpaths has forced people to walk longer distances around fenced plots of the settlement. Short cuts are limited or blocked therefore it takes longer to walk from one side of the settlement to the other. The absence of developed walkway along the Bagamoyo Road makes both pedestrian and cyclists to share the same carriageway with vehicular traffic. It is therefore unsafe to walk along this highway with heavy traffic and fast moving vehicles.

Figure 7.13: Poorly developed streets in Mbezi. They lack good surface material and side drains. During rainy seasons, the streets are flooded and become muddy. Walking in these streets is very difficult.
Sitting

Sitting predominantly takes place within courtyards of individual houses. The majority of the developed and occupied houses have either front verandahs and backyard gardens that have been well planted with grass lawns and shaded with trees. Although there are no permanent and comfortable seats within these spaces, the general sitting environment was observed to be quite good. These spaces have been conducive for activities such as sitting and talking, eating and resting. A number of household members were observed to cook and eat under the shades of trees where such spaces have been well kept (Figure 7.11).

Other activities

Other activities include washing, drying of clothes, utensils, food preparation and cooking, car parking, gardening and animal keeping. For households with cars, such cars were parked in spaces in front of their houses during the day and in carports or garages during the night. Gardening activities such as banana plants, flower gardens and flowerbeds were done in a manner that enhanced the microclimate of the house environment. Apart from providing food, the surrounding greenery environment reduces glare from the hot sun. Shade from trees provides a cooling effect from the extreme hot and humid climate.

Animal keeping was observed in few plots. Animals kept included goats, cattle and poultry. Although animal sheds have been constructed within plots, some animals were found loitering within and outside the plot. However, bad smell from these sheds undermine environmental and liveability qualities in this area. Although plots are large enough to facilitate varied home-based activities as itemised above, strict management of animals needs to be enforced so as to maintain spatial qualities within individual plots and the surrounding environments.
CHAPTER EIGHT
MSASANI MAKANGIRA-A CONSOLIDATED INFORMAL SETTLEMENT

This chapter presents part of the empirical results from one of the old informal settlements of Dar es Salaam, that is Msasani Makangira. Until the 1930s this area was used as a Sisal Estate. In the later years it was designed as a quarry site until late 1950s when it was closed down. People started to settle in this area in late 1960s with rapid densification of houses taking place in the 1980s. Presently, Msasani portrays a character of a ‘saturated’ settlement in terms of horizontal densification. The settlement has attracted many commercial activities assuming the role as one of the small commercial centres in Dar es Salaam. The high land coverage ensuing from informal land subdivision and subsequent housing densification processes has resulted into poor spatial and environmental qualities. Despite the spaces being intensively utilised, due to lack of proper care, spatial qualities in these spaces have been equally poor.

8.1 Settlement evolution and development

Msasani Makangira is one of the oldest informal settlements in Dar es Salaam. It is located about five kilometres from the city centre towards the north along the Bagamoyo Road. The name ‘Msasani’ originated from a slave trader known as Mussa Hassan who lived in one of the oldest fishing villages that grew up near the beach. The area was therefore named after his name. In 1932 when several sisal estates were established in various areas in the city by Europeans, many people including the Makonde came in to supply labour in the plantations (Kironde, 1994). The Makondes failed to pronounce ‘Mussa Hassan’ and called it ‘Msasani’. As time passed by the name of the area changed to Msasani (ibid.). The same applies to the part of the settlement that came to be named after one of its first settlers by the name of Mzee Makangira, who was employed as a ‘houseboy’ in a nearby European settlement area of Msasani.

Figure 8.1: Location of Msasani Makangira and its surrounding areas. The settlement is surrounded by the low-density areas of Oysterbay and Msasani (Source: Bersami and Boogoni, 2001:38).
Msasani Makangira therefore comprises a strip of land that stretches linearly between Kimweri and Juhudi Streets (Figure 8.1). It is bordered with Kimweri Street to the west, the old Bagamoyo Road to the southwestern side and Juhudi Street to the east. It is surrounded by the low-density former European settlements of Oysterbay and Msasani. To the south the new Bagamoyo Road traverses joining the old Bagamoyo Road forming a Y-junction. The settlement which seems to be sandwiched between these low-density, high-status residential areas is characterised by a low-lying rocky land marked by water ponds at its lowest points and escarpments on its edges with Juhudi Road. These features are remnants of the original excavation of coral stones from this area. Houses that have been built in this low-lying area often experience flooding during the rainy season. Compounded with lack of proper drainage, access roads and poor waste collection, the environmental quality in this part of the settlement is generally poor.

Its origin dates back to 1930s when it used to be a sisal plantation. Following failure by the farmers to maintain the sisal farm, the area became a stone quarry that was run by an Arab until the 1950s. The quarrying activities were supplying building stones to the first developers (Europeans) along Msasani and Oysterbay beach areas. Interviews with original settlers and elderly people who have lived for several decades in this areas reveal that stone quarrying activities were later taken over by the Prisons Department until early 1960s when it was closed. After the closure of stone quarrying, people started to settle in this area. People who were supplying labour in the sisal and cashewnuts plantations and those who were working as domestic servants for Europeans, were the first settlers in this area.

According to one of the first occupiers of this settlement, Mzee John Lazaro, the first three persons who occupied the largest part of this land included the late Mzee Miraji Masikini, Mzee Makangira and he himself, John Lazaro Kababera. Together, they occupied most of the central parts of Makangira, first as a farming area before establishing permanent residences. According to Mzee Lazaro the process followed in land acquisition was by clearing bush and occupying the land. He himself occupied a piece of land on which he cultivated maize, cowpeas, cassava, and bananas. He decided to settle in this area because his crops were often stolen. He therefore decided to erect a small shack and settled in the area in 1974. Since the area was isolated and far from other settlements, he decided to sell part of his land to other people so as to get neighbours. He started by selling the most remote sections of the farm until such a time he could not subdivide further the farm. In the later years the selling of plots came to be motivated by the relatively higher land prices people were willing to pay when the informal land market intensified especially starting from the 1980s.

Rapid settlement growth started in the 1980s when many people immigrated into this area. The fact that Msasani Makangira is closer to the city centre and surrounded with the low-density high-income areas of Msasani, coupled with good vehicular access through Bagamoyo Road has attracted many developers to construct houses for both residential and commercial uses. By the 1980s the settlement had grown into a shopping centre with wholesale and retail trading. Locally, the southern commercial area later acquired the name “Namanga” owing to its vibrant and full stocked retail businesses of all sorts of consumer items similar to the booming Kenya-Tanzania border town of Namanga that was famous for both formal and informal trading activities especially in the 1980s. Presently, Msasani Makangira is one of the minor commercial centres in Dar es Salaam city with numerous groceries and shops specialising on sale of canned foodstuffs, bottled drinks, milk, packed foods like tea, fruits, and fresh vegetables. The settlement therefore has been a centre of attraction for customers from many parts of the city for
retail and wholesale shopping daily. Since commercial activities are concentrated at the junction between the old and new Bagamoyo Roads, at certain periods of the day traffic congestion is experienced. The inner part of the settlement is congested with some houses totally blocked from vehicular accessibility.

8.2 Settlement densification process

Until 1975, only a few houses existed at the junction between the old and new Bagamoyo Roads. Trends in house densification increased between 1975 and 1982 and more rapidly between 1982 and 1992. The house count and analysis of aerial photographs from the larger part of this settlement¹ show that by 1975, there were 48 houses. The number of houses increased to 120 houses in 1982. By the year 1992, the number of houses had reached 193. The gradual densification of the settlement as depicted by the aerial photographs is as shown in Figure 8.2.

¹ The detailed study area covered only 4.82 hectares but the whole settlement of Msasani Makangira extends beyond this area.
The densification of the settlement commenced with the subdivision of larger farm plots owned by original settlers into smaller building plots for building purposes. Interviews with Mzee Lazaro showed that he subdivided and sold pieces of plots to Mugisha (plot No.1), then to Mr. Kisalu (plot No.2), to Cheka (plot No.3), one developer (plot No. 4), Moshi (plot No.5) and finally to Anthony (plot No.6). The last further subdivided his plot and sold a part to another person. This trend of plot subdivision and subletting to other persons has been typical to many of the first settlers of Makangira area and also typical to many informal settlements in Dar es Salaam. Subsequent trends in house densification for the whole settlement followed this process of plot subdivision and house construction (Figure 8.3).
Planning intervention in Msasani Makangira

Owing to increased housing developments and government’s intentions to regularise informal settlements, an upgrading plan for Msasani Makangira was prepared and approved by the Ministry of Lands in 1991 (see Figure 8.4a). This was in line with the government Technical Directive Number 1 of June 1989. According to this plan the layout of plots was designed to accommodate houses in regular plots of rectangular shapes and where not achieved, trapezoidal or four sided. Access roads were designed to ensure that at least almost all houses had vehicular access despite that they could be in irregular shapes and sizes. This was an attempt to regularise the plot shapes through design that was considered to facilitate the regularisation of tenure of plot ownership through surveying and registration. However, one of the major drawbacks of this plan was that it neglected plotting the existing land or property boundaries. When updated plot boundaries are overlapped over the layout plan, there is a considerable discrepancy between the two maps. This indicates that planners did not consider existing plot boundaries during layout design. Experience shows that quite often the process of preparing layout plans for informal settlements like that of Msasani is being done with little fieldwork knowledge and minimal consultation with people. Such plans, at times, have been a source of conflict and misunderstanding between authorities and residents.

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2 The Technical Directive Number 1 of 1989 provided by the Ministry of Lands, Housing and Human Settlement Development requires that all informal settlements within cities in the country are regularised by preparing comprehensive layout plans to facilitate formal procedures of surveying and issuance of titles to land. The directive restricts planners to prepare one or a few plots as infilling, subdivision, change of use or squatter incorporation in favour of comprehensively laid out plans covering a wider or the whole planning area (URT, 1989:92).
The overall regularisation processes and land use planning approaches by layout design have been criticised by many scholars and increasingly becoming unpopular. This has been criticised on account of being product oriented (that is focusing on plan making rather than addressing critical issues including the issue of for example resolution of property boundary conflicts in informal settlements). Also the approach in plan making has been viewed as top-down and technical that excludes stakeholders in the planning process. Hence plans prepared under these procedures have been rarely used as effective tools for guiding development in these settlements (Nguluma and Lupala, 2000).

Another drawback associated with this plan is the over-emphasis on regularisation of plots or land uses instead of addressing pressing issues facing people. Issues like storm water drainage, liquid and solid waste management, space availability and usability that undermine liveability qualities of Msasani Makangira have not constituted the planning agenda in these plans.

8.4 Factors influencing the development of Msasani Makangira

One of the factors that contribute to the rapid growth and consolidation of Msasani Makangira settlements is its strategic location, i.e. closer to the city centre and surrounded with the low-density, high-income settlements of Oysterbay, Msasani, and Mikocheni. Because it was centrally located, a number of traders, particularly those originating from Pemba Island in Zanzibar started to open up groceries and business units that catered for the social category of
people residing in these surrounding settlements (i.e. Europeans, top-government officials and business people). When the business units flourished, more traders opened shops in the area in the 1980’s but further increase happened in the 1990’s. It was also during this period that a number of original settlers started subdividing further their small plots and sold the plots to the new investors. More than 55% of the interviewed households moved into this area between 1990 and the year 2000. To date, there are varieties of business units within Makangira mainly along the Old Bagamoyo Road with more concentration at the junction between the old and new Bagamoyo Roads. These commercial units include; bureau-de-change, Internet cafes, restaurants, groceries selling canned and packed food, many of which are uncommon in other informal settlements. Besides the settlement’s potentiality to business undertaking, it is also closer to the city centre and therefore attractive to many households which need rental accommodation. It is not surprising therefore that, out of 56 interviewed households, 33 were revealed to be tenants and 23 owners. Further, due to its proximity to the high-income residential areas of Msasani, Oysterbay and Mikocheni, the settlement enjoys fairly reliable services of uninterrupted water supply and reliable electricity. These qualities attract developers to build houses within this area.

8.5 House forms

Unlike in Kariakoo settlement, the majority of the houses in Msasani Makangira consist a single-unit, detached single storey, rectangular shaped houses, with variations in the internal layout. While in Kariakoo the old houses are typically Swahili type with a corridor and veranda in the main building and courtyards and outer buildings on the rear sides, many houses observed in Msasani are single unit houses at times without corridors and courtyards. In some cases, these houses do not have outer buildings. According to studies that were conducted in November 2000, out of 194 houses located in 178 plots, 93 comprised detached houses of single household type, 96 houses were detached with multiple households occupation and five (5) semi-detached houses. Only 2 houses were two storeys, 2 had three storeys and the rest were single storey (Figure 8.5)

![Figure 8.5a: Single storey house types. The roof is gable, single-pitch and clerestory pitched. They characterise the majority of house forms of the inner section of the settlement.](image)

![Figure 8.5b: Houses overlooking the cliff. It indicates the effects of stone excavation to house builders who utilise the slope to construct a basement floor but at the same time making the main living house levelled.](image)
The identification of roof types revealed considerable variations. A total of 60 houses were observed to be single pitched, 4 houses flat roofed, 88 houses clere story or broken pitch, 30 houses hipped roofed and 53 gable roofed.

As regards building materials, about 88% of the houses are built of concrete blocks and the remaining 12% comprise houses built up of mud and pole walls. Field observations show increased house improvement activities, namely, the change from mud and pole wall constructions to concrete blocks in pursuit of better housing conditions. A number of mud and pole houses were being demolished and rebuilt with cement blocks. Although the mud and pole could provide for a fairly good house lasting for a number of years, many people consider mud and pole houses as inferior housing (i.e. for the poor).

Observations on roofing materials indicate that almost all, that is 95% of the houses are roofed with corrugated iron sheets and the remaining 5% were either roofed with tiles or concrete slabs. One reason for the dominance of corrugated iron sheets, as a dominant form of roofing material is the fact that they are relatively cheaper. Despite being not climatic responsive especially for the hot humid coastal climate, the affordability aspect has affected the wide use of corrugated iron sheets for roofing. About 50% of all studied houses had their doors and windows made of timber materials, the remaining proportion were a combination of timber and glass.
8.5.1 House sizes

There is a considerable variation in house size within Msasani Makangira compared to many formal settlements in Dar es Salaam. The house measurement study reveals that the smallest house size range between 21 and 30 square meters and the largest being more than 300 square metres. Many houses have the size ranging between 71 and 80 square metres. The distribution of house sizes in Msasani is as summarised in Table 8.1.

Table 8.1 Distribution of house sizes in Msasani Makangira

<table>
<thead>
<tr>
<th>House size in square metres</th>
<th>Number of houses</th>
<th>Percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-49</td>
<td>27</td>
<td>15</td>
</tr>
<tr>
<td>50-99</td>
<td>62</td>
<td>35</td>
</tr>
<tr>
<td>100-149</td>
<td>43</td>
<td>24</td>
</tr>
<tr>
<td>150-199</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>200-249</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>250-299</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>300+</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>178</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: House and plot measurements in Msasani Makangira, November 2000.

Unlike in Kariakoo area, where sizes of the majority of houses ranged between 150 to 200 square metres, in Msasani Makangira smaller house sizes of up to 21 square metres are common. About 50% of all houses are less than 100 square metres. These figures suggest that unlike in formal settlements, informal settlements reveal some kind of flexibility in terms of house size. This is partly due to financial inability of most developers but a more compelling reason is attributable to variation in plot sizes. While in formal areas like Kariakoo plots are standardised as provided in the subdivision plan, in Msasani and in many other informal settlements, plot sizes have been determined by the pressure on land requirement for housing and by informal subdivision processes of farm plots. Plots are not necessarily regular or rectangular in shape with plot ratios related to infrastructure requirements. The field observations from this settlement indicate that plots are in many cases irregular, and with many sides hence influencing the size and shape of the houses that have been built upon.

House sizes in terms of spatial extent seem to have a correlation with plot sizes. That is, as the plot size increases the house size also increases. This implies that big plot owners tend to build larger houses. This has led into higher plot coverage that is comparable to, or more than the inner city settlements such as Kariakoo. While house size in formal settlements has been largely influenced by the plot, sizes in informal settlements and individual capacity to buy and develop larger plots seems to have been key factors. The remarkable variation in terms of house sizes reflects the differentiated people’s ability to buy and develop land.

8.5.2 Use of buildings

Despite the fact that Msasani is one of the commercial centres in Dar es Salaam most of the houses in the settlement are residential. Commercial and residential-commercial uses are concentrated along the Old Bagamoyo and Kimweri Roads. The buildings in these sectors of the settlement accommodate commercial functions such as shops, groceries, butcheries, restaurants, internet café, bureau de change, photo labs, hair salons, garment shops, pharmaceutical shops and bars.
Figure 8.6a: Building uses along the Kimweri Street. Almost all buildings along Kimweri Street accommodate commercial activities such as retail shops, groceries, bars, butcheries, internet cafes, bureau de change, restaurants etc. This has makes Msasani one of the minor commercial centres in Dar es Salaam.

Figure 8.6b: A restaurant along Kimweri Street. It is part of the commercial activities along Kimweri Street.
Observations on use of buildings reveal that out of 197 houses, 142 houses (or 73%) were exclusively used for residential purposes, 10 houses (5%) for commercial purposes and 40 houses (or 21%) for both commercial and residential purpose. Only 2 houses were being used for office purposes. A few houses along Karume Street were also being used for commercial purposes. Due to poor vehicular accessibility in the settlement commercial activities in the central sections of the settlement are limited to petty trading, stalls for vegetables and charcoal selling. The inner part of this settlement is rather congested, characterised by narrow footpaths and few links with the surrounding roads. Although it can be said that the inner parts of this settlement represents a typical residential character that is blocked from the noisy and busy commercial streets, the lack of vehicular accessibility coupled with seasonal floods particularly during rainy seasons make liveability and spatial qualities for this part of the settlement poor. This was elucidated by one resident who reported that:

*Increased building activities in the settlement have left no space for storm water to flow. When it rains we experience flooding but the problem is more serious for those who have constructed their houses in the low-lying areas. As you know this area was a stone quarry site therefore it has some depressions within which people have built their houses.*

8.6 Density

8.6.1 Housing, population density and occupancy characteristics

The total area covered by Msasani Makangira is 6.4 hectares accommodating a total of 178 houses and 1,650 people. This gives a relatively high housing density of 38 houses per hectare. Comparing housing density to formal settlements like Kariakoo (20 houses per hectare), these figures are on the higher side suggesting that in most of the informal settlements, even in those considered to have reached high levels of densification there is a continuous process of plot subdivision and housing development. When density reaches a level that cannot be supported by horizontal growth, vertical development options have been sought. Therefore, housing densities established from these settlements should be considered as temporary due to the dynamic growth taking place in these settlements.

Estimated gross population density has been also high, that is 258 persons per hectare, or a net residential density of 350 persons per hectare. Average occupancy rate has been estimated to be 1.6 persons per room. Although physically, Msasani has been perceived as one of the densely developed and overcrowded settlements, the figures do not support this contention. The average room occupancy rate of 1.6 persons per room is in fact lower than the maximum room occupancy of 2 persons as recommended by the Tanzanian Space Standards for residential areas. However, this does not mean that all houses have lower rates since in some of the houses, room occupancy of up to 6.8 persons per room was revealed (Table 8.2).

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3 This figure included the outer buildings for plots that accommodated more than one house.

4 Interview with Andrew Tulilagwa Sanga, resident of Msasani who settled in the area in 1975. Presently, Mr. Sanga is redeveloping his house into a three-storey building. His house is located along Kimweri Street. (8th February 2001).
Table 8.2: Room occupancy rates

<table>
<thead>
<tr>
<th>Occupancy rate (persons per room)</th>
<th>Number of houses</th>
<th>Percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 1.0</td>
<td>42</td>
<td>25</td>
</tr>
<tr>
<td>1.1 – 15</td>
<td>35</td>
<td>21</td>
</tr>
<tr>
<td>1.6 – 2.0</td>
<td>46</td>
<td>27</td>
</tr>
<tr>
<td>2.1 – 2.5</td>
<td>26</td>
<td>15</td>
</tr>
<tr>
<td>2.6 – 3.0</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>3.1 – 3.5</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Above 3.6</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>170</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Interviews with residents of Msasani Makangira, November 2000.

More than 70% of the houses have room occupancy ranging between 1 and 2 persons. This is understandably lower room occupancy rate when international comparisons are made. However, the argument here is that room congestion in this context is to the general extent not problematic despite the perceptions that Msasani is one of the congested settlements in Dar es Salaam city.

8.6.2 Plot coverage

Although occupancy rate provides a dimension of crowding and therefore of density, the same variable is limited in terms of elucidating the physical coverage of land. It has been argued that occupancy rates are rather influenced by the coverage of the built spaces (Acioly and Davidson, 1996). One influential parameter to density is the plot coverage. As noted above, there seems to be a correlation between building size and plot size and therefore the plot coverage. The tendency towards high plot coverage has resulted into the general congestion of buildings in Msasani. Plot coverage ranging between 30% and 70% characterise Msasani settlement. This implies that although house development in this area is not guided by planning guidelines and official development control procedures, housing development in these settlements seem to abide to some kind of locally institutionalised and locally enforced procedures. Analysis of plot coverage from Msasani Makangira is summarised in Table 8.3.

Table 8.3: Plot coverage for Msasani Makangira

<table>
<thead>
<tr>
<th>Plot coverage range (%)</th>
<th>Number of plots</th>
<th>Percentage of all plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 10</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>11 - 20</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>21 - 30</td>
<td>18</td>
<td>11</td>
</tr>
<tr>
<td>31 - 40</td>
<td>33</td>
<td>20</td>
</tr>
<tr>
<td>41 - 50</td>
<td>30</td>
<td>19</td>
</tr>
<tr>
<td>51 - 60</td>
<td>31</td>
<td>19</td>
</tr>
<tr>
<td>61 - 70</td>
<td>21</td>
<td>13</td>
</tr>
<tr>
<td>71 - 80</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>81 - 90</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>91 - 100</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>163(^5)</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Plot and house measurement studies in Msasani Makangira, November 2000.

\(^5\) This figure excludes 15 plots whose ownership status was not confirmed during fieldwork studies and plots that were unbuilt i.e.-vacant plots.
Although visual observation of the most congested parts of the settlement indicate a feeling of higher plot coverage, the majority of the plots in the inner parts of the resettlement either had adequate courtyard spaces left for outdoor activities. As indicated in the above table some houses have relatively high plot coverage of up to 90% suggesting that outdoor spaces are very limited in such cases. It is however likely that the general moderate plot coverage in this settlement (with a gross average of 48%) facilitates cross ventilation in several parts of the settlements, hence a comfortable living environment. But the fact that the major sectors of the inner part of the settlement is low-lying (due to stone excavation that was being conducted before building construction started in this area), air movement and local breeze necessary to provide comfortable living is not adequate. Outdoor living space is therefore considered necessary and very important in this respect. When residents were asked to assess their housing quality in which cross ventilation was one of the variables taken into consideration they responded as indicated in Table 8.4 below.

Table 8.4: People’s assessment of housing and settlement elements

<table>
<thead>
<tr>
<th>Housing element</th>
<th>Like</th>
<th>Dislike</th>
<th>Total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plot size</td>
<td>43</td>
<td>12</td>
<td>55</td>
</tr>
<tr>
<td>Outdoor space</td>
<td>43</td>
<td>12</td>
<td>55</td>
</tr>
<tr>
<td>Plot exposure</td>
<td>40</td>
<td>15</td>
<td>55</td>
</tr>
<tr>
<td>Cross ventilation</td>
<td>38</td>
<td>16</td>
<td>54</td>
</tr>
<tr>
<td>Room size</td>
<td>35</td>
<td>19</td>
<td>54</td>
</tr>
<tr>
<td>Degree of privacy</td>
<td>45</td>
<td>9</td>
<td>54</td>
</tr>
<tr>
<td>Social contacts</td>
<td>53</td>
<td></td>
<td>53</td>
</tr>
<tr>
<td>Accessibility</td>
<td>36</td>
<td>17</td>
<td>53</td>
</tr>
<tr>
<td>Noise</td>
<td>40</td>
<td>13</td>
<td>53</td>
</tr>
<tr>
<td>Dust</td>
<td>40</td>
<td>14</td>
<td>54</td>
</tr>
<tr>
<td>Toilet</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Tap water availability</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Roof</td>
<td></td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>


When the residents were requested to evaluate their settlement against the variables of density, accessibility, security, shopping facilities, drainage, water supply, distances to services and solid waste disposal services, their answers are summarised in Table 8.5.

Table 8.5: People’s assessment of settlement elements

<table>
<thead>
<tr>
<th>Settlement element</th>
<th>Like</th>
<th>Dislike</th>
<th>Total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>26</td>
<td>28</td>
<td>54</td>
</tr>
<tr>
<td>Accessibility</td>
<td>31</td>
<td>23</td>
<td>54</td>
</tr>
<tr>
<td>Security</td>
<td>53</td>
<td>1</td>
<td>54</td>
</tr>
<tr>
<td>Shopping</td>
<td>51</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>Drainage</td>
<td>30</td>
<td>23</td>
<td>53</td>
</tr>
<tr>
<td>Water</td>
<td>52</td>
<td>2</td>
<td>54</td>
</tr>
<tr>
<td>Distance to Services</td>
<td>51</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>Waste Disposal</td>
<td>1</td>
<td>17</td>
<td>18</td>
</tr>
</tbody>
</table>


Despite the fact that the above assessments might be considered subjective due to differing value judgements towards housing elements, corroborating information from observations study indicate some patterns that can be linked with congested houses due to relatively higher plot coverage. Usually, plots with more than 50% coverage have little outdoor spaces left for outdoor
activities. In situations like Msasani, several buildings with less than one metre setbacks were observed. Such conditions limit cross ventilation and comfort living within the houses.

As regards liveability and environmental qualities, residents disliked the dense settlement pattern, lack of accessibility and poor drainage system in the settlement. As noted earlier, houses located in the low-lying parts of the settlement have been experiencing seasonal floods during the rainy season due to poor drainage. Residents are also discontented by the state of solid waste management because the inner parts of the settlement are not accessible by solid waste collection vehicles. Solid waste has been dumped haphazardly and due to limited space for dumpsites, it has sometimes spread to many parts of the settlement.

### 8.6.3 Floor area ratios (FAR)

As said earlier, because most of the houses in Msasani Makangira are single storeyed, floor area ratios are more or less in the same magnitude as the coverage. However, in recent years commercial development has propelled developers to construct houses of up to 4 storeys. These include a house on plot J7 with three storeys, a house on plot 77 with three storeys and a house under construction on plot 146c with two storeys.

Floor area ratio as a variable of density provides more insight when assessed at block or settlement level (Acioly and Davidson, 1996). When floor area ratio is viewed at plot level, the actual dimension of settlement density cannot be vividly expressed. When the settlement is divided into blocks and floor area ratio examined at a block level, variation between blocks is noted indicating that not all sectors within the settlement are equally dense (Figure 8.6). For example, the floor area ratio for block C shows a relatively higher floor area ratio than other blocks (A, B and D) because houses in this area are more congested than in other blocks and that the proportion of the surrounding road to this block is highly limited. It is one of the blocks with limited vehicular accessibility due to house congestion and limited space to pave way for vehicular accesses.

**Figure 8.7a: Block A**
- Land coverage: 33.4%
- Floor area ratio (FAR): 0.33
Figure 8.7b: Block B  
Land coverage: 49%  
Floor area ratio (FAR): 0.49

Figure 8.7c: Block C  
Land coverage: 60.9%  
Floor area ratio (FAR): 0.61

Figure 8.7d: Block D  
Land coverage: 50.7%  
Floor area ratio (FAR): 0.51

Figure 8.7: Land coverage and floor area ratio for blocks A-D. (Source: Plot and house measurements in Msasani, November 2000).
Some of the house owners fronting the main access road of Kimweri have redeveloped their houses into two to three storey houses. The owner of house number J7 for example which is under construction decided to redevelop the outer building so as to maximise use of the plot and rent out the apartments when construction of the house is completed. He plans to demolish the front houses to provide space for parking.

From the physical character the redevelopment of the houses taking place in this area indicate that horizontal densifications are reaching a stage of higher level that can no longer be accommodated within low-rise single storey houses. As is the case for Kariakoo, though not comparable in terms of scale, increasing demands for new building uses such as commercial, residential and office accommodation are the driving forces for the increased plot coverage and new house forms of three storey buildings that are emerging. Despite the high potentials to commercial development of settlement, the informal character and unregulated pattern of housing development have been the limiting factors for further development. If land and housing development will be regularised to facilitate improved accessibility and possibilities for developing new house forms, Msasani is likely to be one of the important commercial centres in the city.

8.7 Plot characteristics

Unlike many formal settlements where plots have more or less the same size thus limiting the choice and variations in house types, there is a considerable variation both in terms of size, shape and ratios of plots in informal settlements. There are small plots of 43 square metres but also larger ones measuring up to 2,010 square metres. The majority of the plots in Msasani Makangira have irregular shapes reflecting the unregulated or informal nature of the subdivision process through which the settlement layout has evolved (Figure 8.8).

Within the formal settlements, the smallest plot size so far measures 12 x 24 = 288 square metres. This size was widely applied in the sites and services projects of Sinza, Kijitonyama and in other cities within the country. This size was considered not only the smallest but also optimal to the envisaged infrastructure services that were to be provided by the project. Fieldwork results from the study areas indicates that nearly half (47%) of all plots are less than 200 square meters, suggesting that if the official planning procedures were sensitive enough to land issues, consideration of lowering the current 450 square metres to lower sizes is still possible. However, this ought to take into consideration climatic and socio-cultural requirements in order to maintain spatial qualities that are acceptable such as comfort, outdoor space and air circulation.

8.7.1 Area analysis

There is a considerable variation in plot sizes. The plot sizes range from as small as 47 square metres to as large as 2,010 square metres. Plot variation has influenced variation in house sizes since developers’ tendency has been to build larger houses as far as plot sizes accommodate the intended uses. As was observed in Kariakoo, the tendency towards building larger houses has to be linked with developers’ urge to maximise coverage and accommodate more rooms for renting. This tendency is more visible in houses developed along the main access roads where larger houses have been developed and rented for commercial uses. Variation in plot sizes within the study area is as summarised in Figure 8.9.
The consequences of smaller plot sizes, especially in informal settlements where housing development guidance is limited is the observed higher coverage that limits possibilities of future upgrading. Future upgrading becomes costly as it involves demolition of houses and displacement of people. Due to high plot coverage, spatial qualities and comfort living have been negatively affected. Higher plot coverage has led to blocking cross-ventilation and difficulties in draining off storm water.

Figure 8.8: Plot shapes for Msasani Makangira. Note the irregular pattern of plot that reflects the informal subdivision process of land. Some of the plots have been surveyed and owners of these plots have, or are processing long time titles using locally recognised plot boundaries (Source: Plot and house measurement studies in Msasani, November 2000).
8.7.2 Plot ratio or plot dimensions

As discussed in the previous chapter, plot ratio refers to the width-depth ratio that ultimately dictates the type of house to be built and efficiency in terms of infrastructure provision. Too narrow plots provide limitation in terms of flexibility of houses and such plot shapes have been associated with row-type houses. Squarish plot limits the number of houses that can be provided with line infrastructure particularly, water mains, access roads, drainage and sewerage systems. Results from this case study area indicate that many plots have a ratio ranging between 1:0.5 and 1:1.99. Further it has been noted that 40 plots or (53% of all plots) have ratios which are more than 1:1.5. This implies that they are inclined towards squarish than rectangular shapes. It was not easy to establish plot ratios of the rest 94 plots due to irregular pattern of the plots. Generally, it is indicative that if regularisation of this settlement is to be carried out effectively, the question of regularising plot ratios has to be taken into consideration. The tendency towards squarish plot ratio bears the disadvantage of having a limited number of houses with access to infrastructure services. Yet, too elongated plots have that disadvantage in terms of limitations for adopting flexible designs.

8.7.3 Plot exposure

In hot humid coastal climates, plot exposure is a necessary factor to enhance ventilation. The more the plot is exposed to adjacent public spaces and to the prevailing winds the more the comfortability in the indoor and outdoor environments. A study in Msasani Makangira shows that more than half (54%) of the plots (buildings) do not have exposure, 43% have single exposure and plots with two exposures were limited to only 3%.

Plot exposure as an indicator of amenity was also commented by residents during household interviews. Out of 55 respondents, 15 residents disliked the way the plots were not exposed to any public space. This evaluation also is closely related to issues of density whereby 28 out of 54 respondents disliked the dense character of the settlement. Plot exposure and density are two variables that residents in Msasani Makangira ranked highly in terms of dissatisfaction when evaluated by residents themselves. This is illustrated by the following response from a tenant interviewee:
I don’t like this house because it is so squeezed with other houses. There is no space for even sitting around the house. Besides, the house has no vehicular access. Houses are overcrowded, not planned that is why some of the houses do not have vehicular accessibility.

Another respondent commented that:

The plot size for this house is too small and squeezed with other plots. Rooms are facing each other. The only one window for my room does not provide adequate cross ventilation because too many houses surround it. Although the compact settlement facilitates to meet neighbours, vehicular accessibility in this settlement is very poor with streets traversing only a few metres into the settlement.

These remarks indicate that since the majority of the plots do not have exposures, comfort characteristics in this area is rather problematic. Both indoor and outdoor environments are not conducive for good living. Given the fact that the area also has limited internal streets, cross-ventilation within and between buildings was also observed to be low. As an indicator of amenity more exposure enhances view where people inside rooms facing an exposed side of the plot can view the outside environment without necessarily being seen.

Figure 8.10: Typical compact layout of buildings in Msasani. When houses are too close with minimum setbacks, cross ventilation, lighting within the side rooms and view are blocked from the sides of the buildings as indicated in this figure. The Swahili type of a house with a corridor in the middle of the house further limit possibilities of cross ventilation and view.
8.7.4 Plot boundary definition

One of the key characteristics in many consolidated settlements like Msasani Makangira is the absence of individual boundary defining elements such as hard and soft fences or hedges. Due to small setbacks (majority of the plots have site setbacks between 0.5 to 1.0 metre) and loose demarcation between private and semi-public and private property spaces it is difficult to establish plot boundaries. Another factor that contributes to non-existence of physical plot boundaries is the loose system of footpaths which provide access and link houses located in the inner and outer areas of the settlement. Many residents in Msasani use these footpaths as property boundaries. Because they often run between plots/buildings, people have tended to reserve them. Mutual understanding and at times socially enforced norms have been used to prohibit encroachment. These observations correspond to Kombe’s discussion on recognition of socially accepted boundaries.

In relation to security of tenure it also ought to be noted that those who have managed to overcome the formal wearisome land surveying and title acquisition were mainly among the affluent. Corollary to this, social recognition seems to be a popular means for guaranteeing security of tenure among the less well-to-do. Without this the rights of the less well-to-do would be difficult to secure. Many residents have confidence in social recognition as manifested by the similarity in quality and quantity of investments observable on both titled and untitled plots. (Kombe, 1995:189-190)

An interview with the sub-Ward Chairman indicate that while footpaths provide demarcations of plots on the ground, the community has also maintained their importance as arteries of communication. If a developer blocks footpaths normally neighbours and users would complain to the sub-Ward Chairman. Thereafter the responsible person is summoned before the sub-ward leader who in turn directs such a person to un-block the footpath. Although such regulations are at times not enforceable, they have been effective, and sometimes they have been used as a basis for arguments when such cases reach higher order legal authorities.

As a result of the open system of the settlement, social contacts among residents are high and several respondents expressed their involvement in several socialising activities. Many respondents indicated that they frequently participated in weddings, religious parties, ngoma dancing, kitchen parties and funeral ceremonies. Many of these activities take place within the settlement. About 60% of the interviewed respondents conceded that they meet with their neighbours daily during the time when they are at home for those sharing the same house and with others in the neighbouring houses. About 10% acknowledged that they meet their neighbours twice or thrice a week. The remaining proportion (30%) revealed that they rarely meet with their neighbours. There are two main reasons that can be attributed to these encounters. First, is the reason related to the house forms that are single storey houses with shared facilities and with a limited number of fenced plots. Because a significant proportion of the household members are engaged in home-based informal income generating activities, the home as a working place necessitates them to meet with each other. In Kariakoo area where shared service facilities (in new multi-storey houses) are uncommon, there are few or no encounters experienced. Second, is the organic pattern of the settlement layout linked with footpaths meandering within the settlement. The fact that most of the plots within Msasani are

6 Interviews with the residents on their engagement in economic and income generating activities indicate that out of 34 interviewees, 3 were carpenters, 4 vendors selling items in kiosks, 7 included shopkeepers, restaurant attendants, hair salon attendants, 3 were selling cooked foodstuffs from their homes and 5 selling food cooked from homes elsewhere within the settlement.
not fenced, these plots can be reached from different parts of settlement using footpaths culminating into increased number of casual encounters.

8.8 Spaces and space uses

Due to increased building activities in Msasani with tendencies towards higher plot coverage, the remaining spaces between buildings are rather small in size, some of which have not been well utilised. While some of these spaces have been turned into dumpsites for garbage, others have remained as voids where wastewater stagnates. Most of the spaces along the streets had uses that were not well defined. The main categories of spaces within the study area include therefore unused voids surrounded by buildings, informal squares in which several uses were taking place, gardens, streets and footpaths.

Of interest in this study has been the assessment of usability levels of spaces and spatial qualities within informal squares that were used or accommodated several activities. Three informal squares were selected for detailed assessment. The first is a square at the junction of the Bagamoyo and Juhudi Streets (OS1) covering a total area of 1,375 square metres. The second square is an undeveloped plot area presently being used by a number of people crushing stones (OS2) covering 326 square metres. The third is an informal square (OS 3) covering 300 square metres located within the inner part of the settlement. This square accommodates cooking, selling of food and relaxation activities. Although these spaces reveal a rather communal use in character, they are essentially part of the individual plots or plots that are yet to be developed into housing.
Figure 8.11: Distribution of spaces and location of case study spaces in Msasani Makangira (Source: Field measurement in Msasani Makangira, November 2000).
Figure 8.12: Layout of informal squares OS1, OS2 and OS3 (Source: Field measurement in Msasani Makangira, November 2000).
Figure 8.13: Space uses in OS1. It includes parking for carts, fetching water from a public stand pipe, cooking of food by some of the cart pushers, sitting and eating by a number of people who come to eat food from the nearby working areas.

Figure 8.14: Stone crushing in OS2: Note that the users of this space are predominantly women who crush stones as building materials. Pushcarts parked nearby at OS1 facilitate the ferrying of crushed stones. The square is intensively used for income generation activities than relaxation.
8.8.1 Activity diversity and intensity

Observed dominant uses for spaces OS1 included parking of cars and carts; cooking and selling of food; selling of used clothes, shoes, fruits, sand; and pedestrians and cyclists movement. Other uses included relaxing and eating. This space is surrounded by a number of business units such as a wholesale shop of soft drinks, a restaurant, a chicken meat shop, an animal food shop and a charcoal selling kiosk. Along Juhudi Street there is a strip of kiosks selling animal food, photocopying services, fast food and take away, milk and bread and a hair dressing saloon. It is therefore a space that is surrounded by small business units and it attracts many people.

Activities noted within OS2 included walking and talking, selling of food, eating, and cars and bicycles passing through. Throughout the period of observation, there were 15 people engaged in crushing of stones. The dominant uses in OS3 were observed to include sitting and talking, preparation and selling of food (frying chips for eating within the space or take away). Within OS3 observed activities included passers-by who came to fetch water from a water stand pipe, food preparation, sitting, standing, children playing and people walking through. The type of activities and number of users in OS1, OS2 and OS3 spaces are as summarised in Tables 8.6, 8.7 and 8.8 respectively.

Figure 8.15: Space uses in OS 3: Due to its location i.e. in the inner part of the settlement, this space is less noisy and used for relaxation activities such as sitting and selling food. Children also play in this area. Since the space is well shaded by a tree, sitting and standing activities have been comfortably accommodated in this space.
Table 8.6: Activity diversity and number of users in OS1

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Time interval / Total number of users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>09.00-11.00</td>
</tr>
<tr>
<td>Sitting and talking, relaxing</td>
<td>15</td>
</tr>
<tr>
<td>Walking through</td>
<td>56</td>
</tr>
<tr>
<td>Sitting and eating</td>
<td>8</td>
</tr>
<tr>
<td>Fetching water</td>
<td>7</td>
</tr>
<tr>
<td>Buying items</td>
<td>4</td>
</tr>
<tr>
<td>Washing at the tap</td>
<td>1</td>
</tr>
<tr>
<td>Parked carts</td>
<td>5</td>
</tr>
<tr>
<td>Parked cars</td>
<td>23</td>
</tr>
<tr>
<td>Cars crossing through</td>
<td>14</td>
</tr>
<tr>
<td>Cycles crossing through</td>
<td>12</td>
</tr>
<tr>
<td>Carts crossing through</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>145</strong></td>
</tr>
</tbody>
</table>

Source: Space use observation study in OS1, February 2001.

Table 8.7: Activity diversity and number of users for OS2

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Time interval / Total number of users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>09.00-11.00</td>
</tr>
<tr>
<td>Sitting and talking</td>
<td>5</td>
</tr>
<tr>
<td>Walking and talking</td>
<td>178</td>
</tr>
<tr>
<td>Crushing stones</td>
<td>19</td>
</tr>
<tr>
<td>Feeding a baby</td>
<td>5</td>
</tr>
<tr>
<td>Selling of cooked food</td>
<td>5</td>
</tr>
<tr>
<td>Cars passing through</td>
<td>37</td>
</tr>
<tr>
<td>Bicycles crossing through</td>
<td>34</td>
</tr>
<tr>
<td>Parked cars</td>
<td>5</td>
</tr>
<tr>
<td>Carts loading crushed stones</td>
<td>9</td>
</tr>
<tr>
<td>Children playing</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>297</strong></td>
</tr>
</tbody>
</table>

Source: Space use observation study in OS2, February 2001.

Table 8.8: Activity diversity and number of users for OS3

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Time interval / Total number of users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>09.00-11.00</td>
</tr>
<tr>
<td>Sitting and talking</td>
<td>9</td>
</tr>
<tr>
<td>Sitting</td>
<td>2</td>
</tr>
<tr>
<td>Sitting and eating</td>
<td>3</td>
</tr>
<tr>
<td>Sitting and reading (newspapers)</td>
<td>3</td>
</tr>
<tr>
<td>Standing and talking</td>
<td>5</td>
</tr>
<tr>
<td>Fetching water</td>
<td>19</td>
</tr>
<tr>
<td>Preparing food (frying chips)</td>
<td>2</td>
</tr>
<tr>
<td>Buying food (chips)</td>
<td></td>
</tr>
<tr>
<td>Children playing</td>
<td>8</td>
</tr>
<tr>
<td>Walking and talking</td>
<td>43</td>
</tr>
<tr>
<td>Walking through</td>
<td>74</td>
</tr>
<tr>
<td>Walking and selling items (hawkers)</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>165</strong></td>
</tr>
</tbody>
</table>

Source: Space use observation study in OS3, February 2001.
In all the observed spaces, and as indicated in the above tables, there are varied types of activities that were taking place from morning until evening. However, these activities diminished with time and there were no such activities during the night. When activity intensity from the three spaces is closely examined the results are as summarised in Table 8.9.

**Table 8.9: Activity intensity for OS1, OS2 and OS3**

<table>
<thead>
<tr>
<th>Time interval (Hours)</th>
<th>Activity Diversity</th>
<th>Activity intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OS1 (1375 m²)</td>
<td>OS2 (326 m²)</td>
</tr>
<tr>
<td>0900 – 11.00</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>11.00 - 13.00</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>13.00 – 15.00</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>15.00 – 17.00</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>17.00 – 18.00</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>10</strong></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>

Source: Observation study on space uses for OS1, OS2 and OS3, February 2001.

Apparently, these established figures compares well with space utilisation intensity in some spaces that were studied in the city centre. This implies that resident are in dire need of spaces regardless of their location. Once such spaces are made available, a variety of activities are immediately attached to them, the majority of which are related to income generation. Therefore, they are important nodes for a wide range of outdoor activities mainly those related to livelihood and also as meeting places. However, these activities have been taking place within spaces that have not been well organised and are largely deficient of many basic requirements for effective and comfortable use.

**8.8.2 Spatial qualities**

Employing Gehl’s (1987) determinants on spatial quality requirements, the following are discernible from this case study settlement.

**Walking**

Walking is a primary mode people use to traverse through and move alongside the settlement. However, the poor quality of the pavements (i.e. earth surface with no clear definition of pavements for pedestrians and cyclists) makes walking in these spaces rather uncomfortable. With the exception of a small section running on the edges of OS1 which is well paved with cement slabs and exclusively reserved for pedestrian movement, the rest of the walkways/footpaths within Msasani settlement are generally poor. Almost all footpaths are dusty during the dry season and muddy during rainy season. Some footpaths are too narrow to comfortable walking (in some instances less than one metre in width), irregular and not easily identifiable when joining the streets. The escarpment on the eastern side of the settlements inhibits pedestrian movement for the east-west direction.

**Standing**

Standing as an activity within squares is not well promoted due to lack of ‘standing supports’ to facilitate standing apart from a few trees observed in these spaces. Standing has been also limited because these spaces are primarily being used for income generating activities which are
informal in character. The intensity of activities does not favour convenient standing to take place in these spaces.

Figure 8.16: Narrow footpaths. Too narrow footpaths make walking uncomfortable and at times unsafe. When two buildings enclose these narrow spaces as side setbacks, they are not utilised for any meaningful use.

Sitting

Quality requirements for sitting include orientation to view, availability of seating supports for instance benches and chairs and comfortable seats (Gehl, 1987). Although OS1 is oriented towards an open area, that is opening towards Bagamoyo Road and enclosed with kiosks and shops, the absence of seats in this space has rendered sitting activity to be influenced by the location of trees that provide protection against the hot sun. Since sitting is done on the ground or on chairs borrowed from nearby shops and kiosks, the sitting arrangement has been rather sporadic depending on where a group of people decided to sit together. Both sitting on the ground and on chairs was chosen strategically to avoid passing by cars and bicycles through the space and from the soaring mid-day sun. However, a few vendors have erected temporary shelters on the edge with Bagamoyo Road with temporary sitting arrangement to facilitate sitting while selling their items (Figure 8.17).
Figure 8.17: Lack of shade in OS1. Due to lack of shade from trees, vendors usually erect temporary sheds to cover themselves from the soaring mid day sun. Sitting as an activity is not well supported in some parts of OS1.

Figure 8.18: Unused backyard spaces in the inner parts of the settlement. Spaces that are at the backside of the houses are not used effectively and for meaningful activities apart from waste dumping. Despite providing exposure to buildings, they are poorly kept and are a potential threat to environmental hazards.
Protection

Protection against such variables as crime, robbery or vandalism and negative climatic conditions characterise quality assessment of spaces (ibid.). When this variable is examined across the spaces observed, it is notable that both OS1 and OS3 were well protected from the sun by the wide canopy trees providing shade against solar radiation. OS2 lacked proper shade apart from trees. Lighting in these spaces has been lacking therefore no activities have been taking place during the night. However, the higher density character of the settlement and the higher activity intensity within spaces have provided a sense of self-protection against vandalism, crime and other vices.
CHAPTER NINE

UBUNGO KIBANGU-A RAPIDLY DENSIFYING INFORMAL SETTLEMENT

This chapter presents part of the empirical results from one of the newly developing informal settlements of Ubungo Kibangu. The settlement that evolved from a paddy farm started to develop gradually into residential area in the 1980s with rapid development taking place in the 1990s. The completion of Mandela Road contributed further to the rapid development in terms of housing densification that is still taking place until the present times. Presently, the settlement portrays a relatively low-density character with a few blocks that have densified to about thirty percent of land coverage. The larger part of the settlement is however still characterised by larger plots some of which are yet to be developed.

9.1 Settlement evolution and growth

Ubungo Kibangu is one of the newly urbanising informal settlements. It is located about 10 kilometres from the city centre on an elevated land overlooking Morogoro and Port access (or Mandela) Road. The area that started as a paddy farm had its first settlers of Ndengereko and Nyakyusa tribe who settled in this area in the late 1940s. The original settlers of this area were paddy cultivators who owned large parcels of farm lots but there were also cattle keepers. Due to its relatively far location from the city centre it was not until late in the 1970s that remarkable housing development started to take place. The rapid urbanisation trends and the completions of Port Access Road are the major factors for the increased rate of housing development in Ubungo Kibangu. Further, the rapid population increase to this area was facilitated by the establishment of the nearby industries at Ubungo, for example the Urafiki Textile Mill, The Ubungo Farm Implements (UFI), the brewing company-DarBrew and the power plant of the Tanzania Electricity Supply Company (TANESCO). Others include the Milk Processing Industry (Maziwa) and the establishment of institutions such as the University of Dar es Salaam and the Water Resources Department at Ubungo (Kironde, 1994:423). These industries and institutions provided employment to several people who developed their houses at Ubungo Kibangu. The completion of the Port Access Road in 1980 triggered further the rapid housing and population increase in Kibangu.

9.2 Settlement densification process

A house count from aerial photographs of 1975, 1982, 1992 and 1995 indicates a gradual house densification rate picking up in the 1980s and more rapidly in the 1990s. For example, by 1975, there were only 8 houses. This number increased to 48 houses in 1982, i.e. immediately after the completion of the Port Access or Mandela Road. By 1992 there were 160 houses and this figure increased to 176 in 1995. The house and plot measurement study conducted in November 2000 registered a total of 267 houses (See Figure 9.1).

1 Interview with Mzee Mwaiswaswa, a ten-cell leader and one of the original settlers of Ubungo, on 29th October 2001.
2 House count from aerial photographs gives the total number of houses regardless whether one or more than one house (say a compound) are accommodated in one plot. If a ‘compound’ that is one or more houses being accommodated in one plot is taken into consideration the total figure for the number of houses will be considerably reduced than if counted from aerial photos. House count from aerial photos is a method to establish...
the total number of buildings on the ground without consideration of plot boundaries and the houses contained therein. This figure does not also take into consideration the 'compound' so as to facilitate comparison.

Figure 9.1a: Ubungo Kibangu (1975). Until 1975, Ubungo Kibangu was still a farmland dominated by paddy cultivation and mango trees as indicated in the above photograph. (Source: MLHSD).

Figure 9.1b: Ubungo Kibangu (1982). A number of houses started to emerge during the 1980s. This was promoted by the completion of Mandela Road as indicated in the above photograph. (Source: MLHSD).

Figure 9.1c: Housing densification in Ubungo Kibangu (1992). To the west is the DABCO site that has been recently developed into a student hostel. (Source: MLHSD, 1992).

Figure 9.1d: Ubungo Kibangu (1995). By this period the settlement had its pattern defined with more concentration of housing development on the south eastern side bordering Radio Tanzania site (Source: MLHSD, 1995).
The total population recorded from the same study was 1,493 people in a study area of approximately 9 hectares. This gives a gross population density of 167 persons per hectare. As was the case for Msasani, for example, the densification process in this area started with large farm owners subdividing into smaller building plots and selling to new developers. A typical case is Mzee Mwaiswaswa who subdivided his farm and sold smaller plots to new developers as indicated in Figure 9.2.

Housing development and further densification followed the process of plot subdivision and development. Further subdivision that is being done by the second generation of people who got relatively larger plots from the original settlers of this settlement perpetrates housing densification in this settlement. Due to its proximity to the industrial areas and institutions, and the fact that the settlement borders Mandela highway, it provides residential accommodation to mixed groups of people including University lecturers, various higher-ranking officials, businessmen, as well as ordinary citizens.
9.3 Planning interventions in Ubungo Kibangu

Within the 1979 Dar es Salaam Master Plan, Ubungo Kibangu was designated for development of light industries. The Dar es Salaam City Council was keen to see that light industries were established, especially after the completion of the Mandela Road. Despite the fact that by 1979 there were several people who had settled within and beyond this area (Kironde estimates it to be 240 in 1979 and increased to 1530 people in 1989), the city authorities prepared a layout plan primarily as a light industrial area. The layout plan recommended plot sizes of approximately 1,500 square metres (25 x 60 metres. This plan was approved in 1989 (Figure 9.3).

Figure 9.3: Layout proposal for part of Ubungo Kibangu (1989). The layout portrays larger plot sizes understandably because it was envisaged for the development of light industries. This layout was later changed following protests from residents of Ubungo (Source: MLHSD, 1989).
Although the intention of the city authority was to designate this area for industrial use, this proposal was overtaken by events that people had already settled in this area. As a result, the plan caused conflict between residents and the city authorities. Residents resisted the idea of being resettled elsewhere to pave way for light industries. The aim of relocating residents of Ubungo Kibangu started as early as in 1980 when the City Council issued a stop order notice against further development in the area pending the assessment of compensation and demolition so that the area could be put to the planned use (Kironde, 1994). Kironde reports that residents rose in arms, appealing to the ruling political party and the Central Government who in turn decided in favour of the residents. The stop order notice issued by the City Council was repealed (ibid.). Yet another attempt to relocate Ubungo Kibangu residents was made in May 1986 by the City Council but this time the residents had even stronger arguments against removal. According to Kironde, they cited inter alia, the earlier attempts to remove them, after the failure of which, they had been given a go ahead to continue development on their land. They also cited the Tanzania Housing Bank which had been issuing loans to some of them for house construction, and which had been sanctioned by the Ward, District and City Authorities, thus condoning development in the area. They also cited the two primary schools in the area that had been constructed by the city council itself. Finally, they argued that the proposed industrial establishments would pollute nearby residences, and that some of their houses were new, and very expensive, compared to the earmarked compensation. In view of these arguments the attempt of relocating residents from this area was stopped again by the Government (ibid.).

This case demonstrates a problem of policy conflicts that existed and still persisting within the city and in many other municipal and town councils. The conflict is between local authorities, the central government and residents who continue to develop informally many parts of the city. It is not surprising therefore that the peri-urban zones of Dar es Salaam are rapidly urbanising informally without the planning authorities taking appropriate measures to guide such developments. When consolidation emerges, planners usually come in with upgrading plans which in many cases create ambiguities in terms of regularising the informally built settlements.

9.4 Regularisation of Ubungo Kibangu

Following this hegemony of managing the growth and development of Ubungo Kibangu, the failure of the city authorities to evict residents from this area and the fact that densification was rapidly taking place, an attempt to upgrade the settlement was made in 1999. An upgrading plan was prepared and approved in the same year. The aim was to regularise the settlement and facilitate the provision of basic services such as motorable tracks and walkways within the settlement (Figure 9.4).
Figure 9.4: Upgrading Plan for Ubungo Kibangu (1999). One of the prominent features of this plan is an attempt to provide access streets to all houses and regularise plot shapes. However, the plan fails to take into consideration the existing locally recognised plot boundaries that have been admittedly used even by the land surveyors (Source: MLHSD, 1999).
Although the 1999 upgrading plan seems to have been carefully prepared thereby accommodating all houses into plots, it does not differ from many typical plans that have been prepared for upgrading informal settlements. The plan lacks an up-to-date base map and on which subdivision of plots would have been based. These types of plans have in many cases failed to guide development in informal settlements. Although one of the main purposes of preparing upgrading plans has been to facilitate cadastral surveys and issuance of long-term titles to land, the actual practice indicates that land surveyors use locally recognised plot boundaries to demarcate plots. This discrepancy raises the whole debate on the need for search of appropriate planning approaches towards upgrading rapidly urbanising informal settlements. The fact that residents have established plot boundaries which are respected by themselves and also by the surveying teams any subdivision that does not respect locally recognised boundaries will have little chances of being implemented. As observed during the fieldwork studies in this area, several people had their plots surveyed and with title deeds of up to 33 years, the basis of the surveys being the plot boundaries locally recognised by the people themselves.

Figure 9.5: Ubungo Kibangu. Settlement layout, plot boundaries and buildings as updated in November 2000. Despite the difference in terms of time for the two plans, there is a substantial difference between the upgrading proposal and layout of plots as recognised by residents (Source: House and plot measurements in Ubungo Kibangu, November 2000).
9.5 House forms

The predominant house types for Ubungo Kibangu are the single-storey, rectangular shaped but variations in terms of size and layout. Unlike in old formal settlements such as Kariakoo where the old Swahili type of houses are still dominant, varied house forms are typical in many of the newly emerging and rapidly urbanising informal settlements. Most of the main houses are single units comprising a sitting room, dining and bedrooms with outer buildings. The outer buildings are predominantly subdivided into rooms for rental purposes. According to field observations conducted in Ubungo Kibangu in November 2000, there were 63 detached houses with single household occupation and 71 detached houses with more than one household. There were virtually no houses with more than one storey apart from the warehouse-cum-commercial building along Mandela Road and two residential units at Ubungo Marian Faith Centre, one of which is still under construction.

Figure 9.6a: House with clere-story roof type. House forms with this type of roof are so common in Ubungo Kibangu.

Figure 9.6b: One of the oldest houses in Ubungo Kibangu. It is a Swahili house type with a hipped roof. Note the kind of outdoor activities taking place in front of the house that is people sitting and talking, washing a baby etc.
Figure 9.6c: Mud and pole house. There are very few mud and pole houses that are remaining in Ubungo Kibangu. Most of these types of houses have been phased out with cement blocks. Note the small size of windows that makes cross-ventilation limited. Note also the use of old tyres to prevent the house from being knocked by vehicles. The house is located at the corner plot.

Figure 9.6d: The main house with gable roof. Another house form is like this one gable roofed but having the outer building at the backyard. Note the small setbacks to the right (where the young girl can stretch her arms) which limits cross-ventilation for rooms with no exposure or facing this side. This situation is typical in many parts of the settlement whereby consolidation has reached advanced stages.
Figure 9.6e: Incremental house construction: Usually construction is done in stages starting with a ‘core house’ like this one and gradually extending as resources allow. The house forms also change as residents continue to change their houses with time. Note the use of the outdoor space (sale of charcoal) as one of the livelihood activity by residents of this house.

Figure 9.6f: A cluster of houses facing the Mandela Road. The main buildings facing the road are being used for small-scale industrial activities and the back yard houses either as stores or residential. Note although the walled fences are used to define the plot boundary they block cross ventilation especially to buildings on low-lying areas.
With regard to roof types there is a considerable variation from this settlement. Out of 142 houses, 40 houses had gable roof, 21 had hipped roof, 84 were had clere-story and 34 had mono pitch type of roof.

When building materials are closely examined, concrete blocks were noted to be the dominant wall construction materials accounting for almost 98% of all houses in this study area. The remaining 2% had walls constructed in mud and pole. For doors and windows, 65 houses had windows made of timber and 75 with timber and glass. The majority of the houses are roofed with corrugated iron sheets and only 2 houses were roofed with tiles.

The significant usage of concrete blocks for foundation and wall construction and corrugated iron sheets for roofing is because they are produced locally from factories located within Dar es Salaam or within the country. It is increasingly becoming difficult to use mud and pole due to their shortage and increasing prices. Also, mud and pole wall houses have been increasingly viewed as inferior constructions that need to be replaced over time. Further, it is difficult to get good soils to make mud for cladding the pole structure. On the contrary, it has been easy to make concrete blocks on site once cement has been acquired since the major sections of Dar es Salaam city are constituted of sand. Usually sand is mixed with cement to make concrete blocks. The availability of corrugated iron sheets also explains its extensive usage. Although tiles are being introduced slowly and they are also available from industries located within Dar es Salaam, they are prohibitive in terms of cost when compared to iron sheets and in terms of technology required for roofing with tiles.

9.5.1 House sizes

There is a considerable variation in house size in this case study area. Since Ubungo is one of the recently densifying settlements, the variation in house size can be related to the varying plot size, which is a result of informal plot subdivision and subsequent house development. House size varies from as small as 10 to 20 square metre houses to as large as more than 300 square metres. The distribution in house sizes as measured from Ubungo is summarised to Table 9.1

<table>
<thead>
<tr>
<th>House size in square metres</th>
<th>Number of houses</th>
<th>Percentage of total houses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 50</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>51-100</td>
<td>35</td>
<td>27</td>
</tr>
<tr>
<td>101-150</td>
<td>26</td>
<td>20</td>
</tr>
<tr>
<td>151-200</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>201-250</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>251-300</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Above 300</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>126</strong>*</td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>


NB  * 6 buildings were note included because they were exclusively non-residential such as light industries.

From the above table, many of the houses have a size ranging between 51 and 100 square metres. But also several houses fall into the category of house size between 101 and 150 square metres and also many building within the category of 151 and 200 square metres. This variation can be related to variations in plot size especially in this settlement where horizontal densification process is still taking place.
9.5.2 Use of buildings

Although the majority of the buildings are used for residential purposes, buildings uses along Mandela Road include commercial and light industries. Out of 133 Plots surveyed within the area, 11 plots accommodate light industrial activities such as metal works dealing with the preparation of door and window grills, carpentry works and timber selling, warehouse, shop for sale of building materials and spare parts for vehicles. Other uses include repair of electrical and electronic devices. There is a grinding mill for wheat that is located along the main road on a relatively larger plot. The grinding mill has a special physical character providing a landmark to this part of the settlement by its tall storage building located on this site. Overall a total of 110 buildings were exclusively being used for residential purpose while 27 were used for both commercial and residential purposes. Only 2 buildings were used for commercial purposes. Other building uses included religious buildings such as the Marian Faith Healing Centre and one building was used as a post office. One building was used both as a nursery school and a residence to the owner.

Although Ubungo Kibangu is located on an elevated part of the city sloping downwards to Mandela Road, it is yet to attract significant commercial undertakings. This is because the settlement is still in the process of consolidation. However, the completion of the student hostels on the formerly Dar Brew Company (DABCO) site to the south of this settlement will increased both traffic and commercial activities in this area. Already some houses that were predominantly residential are being changed into commercial-residential to accommodate functions such as stationery and photocopier services, internet cafes, bars and restaurants, retail shops, hair salons, kiosks for soft drinks, tailoring marts, shoe shining and shoes repairs, etc. The problem that arises, however, is the fact that these new demands are taking place in an unguided way that poses threat to crowding or lack of facilities for their effective and efficient operation. There is an apparent need to regulate these activities so as to ensure both environmental and spatial qualities for this part of the settlement.

9.6 Density

9.6.1 Population density and occupancy characteristics

The total area in which detailed studies were conducted covers an area of approximately 9 hectares accommodating 133 plots of residential houses. The total population was established to be 1,437 people accommodated in 955 habitable rooms. This gives a gross population density of about 167 persons per hectare and average room occupancy of 1.5 persons per room. The room occupancy rate is within acceptable limits of 2 persons per room as recommended in the space standards for planning residential and housing areas.

With regard to housing tenure characteristics, out of 129 houses, 43 were owner occupied, 34 rented and 52 were both rented and owner occupied. If average room occupancy is taken into consideration, the results from this case indicate that overcrowding, as applied in its simple terms is very low. Even when individual buildings are assessed, occupancy rates are still low. Out of 133 houses, 107 had occupancy ranging between 1 and 2 persons per room and the remaining had more than 2 persons per room. Only five houses had occupancy rates of more than 3 persons per room. This is extremely low occupancy rate when compared to such rates in for example Indian cities that have reportedly been as high as 16 persons per room (KTH, 1997). One reason for the low level of room occupancy can be related to the larger size of houses that provides for many rooms.
Household interviews indicate increased proportion of tenant households. It was revealed that out of 48 interviewed households, 29 households comprised tenants and 19 owners. The implication here is that although many owners construct their houses to meet owner occupation needs, they also use these houses as sources of income through renting. The high rate of tenancy can also be related to the locational advantages of the settlement. Ubungo Kibangu is located on an elevated site and closer to the Mandela Road where people can easily get access to public transport and travel to different destinations within the city. It is also served with reliable electricity and some basic community facilities such as nursery school, primary school, retail shops, a post office and at least motorable access roads to many of the buildings. All these qualities render Ubungo Kibangu one of the attractive places to rent or own a house. However, the settlement lacks reliable piped water supply. Due to this problem, the owner of house number 583 for example, constructed a shallow well in front of his house that provides water to the rest of the residents in this settlement. However, the quality of this underground water is questionable since it is not treated.

9.6.2 Plot and land coverage at block level

The fact that Ubungo Kibangu is one of the newly developing informal settlements, the plot coverage as well as land coverage is relatively low. The majority of the plots have coverage ranging between 20 and 40% (Table 9.2). The lowest plot coverage was observed to be 10%. If land coverage at block level is taken into consideration, a slight variation emerges among blocks indicating that some of the blocks are consolidating faster than other blocks (Figure 9.7 and Table 9.2).

<table>
<thead>
<tr>
<th>Plot coverage (%)</th>
<th>Number of plots</th>
<th>Percentage of total plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 10</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>11-20</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>21-30</td>
<td>32</td>
<td>24</td>
</tr>
<tr>
<td>31-40</td>
<td>32</td>
<td>24</td>
</tr>
<tr>
<td>41-50</td>
<td>25</td>
<td>19</td>
</tr>
<tr>
<td>51-60</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>61-70</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>71-80</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>133</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Plot and house measurements studies in Ubungo, November 2000.

The relatively low land coverage in this settlement has facilitated possibilities for planting trees for shade to the outdoor spaces and promotes cross-ventilation within the settlement. Due to low plot and land coverage, it has been possible for residents of this settlement to cultivate gardens, erect shades for cows and poultry keeping, a phenomenon that is not common in highly covered land like that of Msasani and Kariakoo.

Since almost all houses are low-rise single storey houses, floor area ratios correspond to plot coverage. Since plot coverage has been observed to be low, recurring floor area ratios are correspondingly low. The majority of the houses have floor area ratios ranging between 0.2 and 0.29. This implies that due to low land coverage and floor area ratios, there is still a potential for further densification both horizontally and vertically in terms of number of storeys.

One of the bottlenecks for vertical extensions of many houses is the lack of strong foundations to support additional floors. Since the majority of the houses were constructed with foundations only to support single storeys, it will be difficult to support additional floors on the present
foundations. Thus in case of vertical extension, one has to pull down the existing structures and start reconstruction from the ground. Making special provision for the support of the upper floors could be an alternative to total reconstruction. The relatively low density would have been an advantage to increase density while maintaining spatial qualities. This would have amounted to better quality living environment while allowing increase in density within the settlement. Another variable that limits and increased number of floors is the whole economic capacity of the house owners to develop more than one storey house. Limited household financial capacity is likely to augment present difficulties for vertical densification within a foreseeable future.

Figure 9.7a: Block A:
Land coverage: 27.8%
Floor area ratio (FAR): 0.28

Figure 9.7b: Block B
Land coverage: 32.4%
Floor area ratio (FAR): 0.32
Figure 9.7c: Block C
Land coverage: 26.0%
Floor area ratio (FAR): 0.26

Figure 9.7d: Block D
Land coverage: 32.2%
Floor area ratio (FAR): 0.32

Figure 9.7e: Block E
Land coverage: 30.2%
Floor area ratio (FAR): 0.32
Figure 9.7f: Block F:
Land coverage: 20.0%
Floor area ratio (FAR): 0.20

Figure 9.7g: Block G:
Land coverage: 26.7%
Floor area ratio (FAR): 0.27

Figure 9.7h: Block H
Land coverage: 29.3%
Floor area ratio (FAR): 0.29

Figure 9.7: Analysis blocks, land coverage and floor area ratios (Source: house and plot measurement studies in Ubungo Kibangu, November 2000).
Table 9.3: Floor area ratio and land coverage (in Blocks A-H)

<table>
<thead>
<tr>
<th>Block</th>
<th>Land area (m²)</th>
<th>Total floor area (m²)</th>
<th>Floor area ratio (FAR)</th>
<th>Land coverage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>14207</td>
<td>3994</td>
<td>0.28</td>
<td>27.8</td>
</tr>
<tr>
<td>B</td>
<td>7400</td>
<td>2399</td>
<td>0.32</td>
<td>32.4</td>
</tr>
<tr>
<td>C</td>
<td>15449</td>
<td>4017</td>
<td>0.26</td>
<td>26.0</td>
</tr>
<tr>
<td>D</td>
<td>12407</td>
<td>4000</td>
<td>0.32</td>
<td>32.2</td>
</tr>
<tr>
<td>E</td>
<td>15001</td>
<td>4551</td>
<td>0.30</td>
<td>30.3</td>
</tr>
<tr>
<td>F</td>
<td>6884</td>
<td>1376</td>
<td>0.20</td>
<td>20.0</td>
</tr>
<tr>
<td>G</td>
<td>7133</td>
<td>1902</td>
<td>0.27</td>
<td>26.7</td>
</tr>
<tr>
<td>H</td>
<td>10446</td>
<td>3059</td>
<td>0.29</td>
<td>29.3</td>
</tr>
<tr>
<td>Total/average*</td>
<td>88927</td>
<td>25258*</td>
<td>0.28*</td>
<td>28.4*</td>
</tr>
</tbody>
</table>

Source: Plot and house measurements studies in Ubungo, November 2000.

9.7 Plot characteristics

Plot variables that are being assessed include plot sizes, plot ratios or plot shapes, exposure and boundary definition.

9.7.1 Plot sizes

Plot sizes show a considerable variation ranging from as small as 63 square metres to as large as 3,897 square metres. The majority of the plot sizes fall within the range of 300 and 400 square metres. Also many plots fall within the range between 200 and 300 square metres (Table 9.4).

Table 9.4: Plot sizes in Ubungo Kibangu

<table>
<thead>
<tr>
<th>Plot size in square metres</th>
<th>Number of plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-100</td>
<td>3</td>
</tr>
<tr>
<td>101-200</td>
<td>19</td>
</tr>
<tr>
<td>201-300</td>
<td>24</td>
</tr>
<tr>
<td>301-400</td>
<td>24</td>
</tr>
<tr>
<td>401-500</td>
<td>19</td>
</tr>
<tr>
<td>501-600</td>
<td>11</td>
</tr>
<tr>
<td>601-700</td>
<td>9</td>
</tr>
<tr>
<td>701-800</td>
<td>5</td>
</tr>
<tr>
<td>801-900</td>
<td>5</td>
</tr>
<tr>
<td>901-1000</td>
<td></td>
</tr>
<tr>
<td>1001-1100</td>
<td>1</td>
</tr>
<tr>
<td>1101-1200</td>
<td></td>
</tr>
<tr>
<td>1201-1300</td>
<td>2</td>
</tr>
<tr>
<td>1301-1400</td>
<td>1</td>
</tr>
<tr>
<td>Above 1400</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>133</td>
</tr>
</tbody>
</table>

Source: Plot measurement studies in Ubungo Kibangu, November 2000.

The net residential area covered by the 133 plots amounts to 7.3 hectares. This gives an average plot size of 549 square metres. The relatively larger plot size is related to the fact that Ubungo Kibangu is still undergoing informal plot subdivision and housing development. The average plot size for this settlement is essentially larger than in consolidated informal settlements such as Msasani where the average plot size was revealed to be 264 square metres. Although
larger plots are somehow geographically spread throughout the settlement, smaller plot sizes
tend to concentrate towards the central parts of this settlement with gradual increase in plot
coverage and floor area ratio (Figure 9.8).

![Figure 9.8: Plot characteristics for Ubungo Kibangu. Note that despite of irregular shapes of the plots a considerable number of plots have been surveyed using locally recognised plot boundaries. Some of the plots are fenced to define space and for security reasons. Also note that larger plots are located at the borders of the settlement with smaller plots concentrated along Mandela Road towards the southeast (Source: Plot and house measurement studies, November 2000).]

9.7.2 Plot ratio

One of the variables that characterises plot shapes is plot ratio. This refers to the proportion of
width to depth of the plot. Since there are no formal procedures governing the subdivision of
plots in informal settlements, plot shapes vary considerably. The majority of the remaining plots
have plot ratios ranging between 1:1.0 and 1:1.5 and between 1:1.5 and 1:1.99. This implies
that there is a good number of plots which approaches a squarish shape but also many have plots
that are rectangular in shape. Plot ratio could not be established from 46 plots due to irregular
shapes.

9.7.3 Plot exposure

Plot exposure has been employed in this study as a measure of amenity. It has been applied as a
basis for characterising possibilities for comfort living in hot humid climates like Dar es Salaam.
The assumption here is that the more the number of exposures, the more likely the comfort living
within and outside the building. Physical observations in Ubungo Kibangu revealed that more
than half of all the plots (52%) of all plots had at least one exposure. In many cases the type of
exposure was towards the adjacent street. Only 15% of all plots had two exposures and a few had three exposures. About 30% of all plots, that is 40 plots, had no exposure. This implies that further consolidation of houses in the settlement results into blocked cross ventilation. It is also anticipated that if further plot subdivision and subsequent house construction continues, these trends will change the character of plot exposure for many houses making the majority of these houses blocked from cross ventilation and adequate lighting and view.

Figure 9.9: Lack of exposure. The lack of exposure to building sides makes indoor living uncomfortable. Besides, such narrow alleyways are always dark as a result of the shadow casted by bordering houses. These narrow spaces have not been used for any meaningful outdoor activity. This situation is typical in many of the consolidated settlements.

When residents were asked to evaluate their houses and the settlement within predefined variables and on limited criteria of like or dislike, results from responses are as summarised in Tables 9.5 and 9.6 respectively.
Table 9.5: Residents’ assessment of housing elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Liked</th>
<th>Disliked</th>
<th>Total response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plot size</td>
<td>30</td>
<td>13</td>
<td>43</td>
</tr>
<tr>
<td>Outdoor space</td>
<td>32</td>
<td>15</td>
<td>47</td>
</tr>
<tr>
<td>Plot exposure</td>
<td>27</td>
<td>17</td>
<td>44</td>
</tr>
<tr>
<td>Cross-ventilation</td>
<td>31</td>
<td>9</td>
<td>40</td>
</tr>
<tr>
<td>Room size</td>
<td>34</td>
<td>12</td>
<td>46</td>
</tr>
<tr>
<td>Degree of privacy</td>
<td>34</td>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td>Social contacts</td>
<td>40</td>
<td>6</td>
<td>46</td>
</tr>
<tr>
<td>Accessibility</td>
<td>31</td>
<td>16</td>
<td>47</td>
</tr>
<tr>
<td>Noise</td>
<td>8</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Dust</td>
<td>7</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Condition of Toilet</td>
<td>6</td>
<td>6</td>
<td>13</td>
</tr>
</tbody>
</table>


Many residents seem to be satisfied with social contacts, accessibility, room sizes, plots sizes and outdoor spaces and degree of privacy within their housing areas. However, issues that registered larger proportions in terms of dislikes or dissatisfaction include noise, cross ventilation, plot exposure, and outdoor spaces. The degree of satisfaction and dissatisfaction however differs from one element to another but the general assessment can be considered that people assess their housing characteristics more liked than disliked.

Table 9.6: Residents’ assessment on quality of settlement elements

<table>
<thead>
<tr>
<th>Elements</th>
<th>Liked</th>
<th>Disliked</th>
<th>Total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>10</td>
<td>36</td>
<td>46</td>
</tr>
<tr>
<td>Accessibility</td>
<td>27</td>
<td>19</td>
<td>46</td>
</tr>
<tr>
<td>Security</td>
<td>43</td>
<td>3</td>
<td>46</td>
</tr>
<tr>
<td>Shopping</td>
<td>32</td>
<td>13</td>
<td>45</td>
</tr>
<tr>
<td>Drainage</td>
<td>22</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Water</td>
<td>2</td>
<td>45</td>
<td>47</td>
</tr>
<tr>
<td>Distance to Services</td>
<td>25</td>
<td>15</td>
<td>40</td>
</tr>
</tbody>
</table>


One of the characteristics respondents disliked most is the issue of inadequate water supply. This was followed by density, drainage, accessibility and lack of shopping facilities. With regard to plot exposure, some of the respondents associated it with the lack of places to rest. Therefore, household members are obliged to stay indoors. Another respondent argued that since the windows of the house were too small, it was uncomfortable staying indoors for a long period of time. Also another respondent reiterated that there was no breathing space for the house.

People’s assessment of settlement elements indicated dissatisfaction with issues related to density. They argued that the houses within the settlement were too much congested to be well organised. Others related the unorganised pattern to the ‘squatter characteristics’. Another respondent argued that because of house congestion, they are disorganised, haphazardly built and spaces between buildings are not effectively used for children play and by adults. Due to congestion, cross-ventilation is blocked and other houses have been blocked from vehicular accessibility. Other respondents contemplated the dense environment with risks of fire accidents; they argued that due to close positioning of houses, if one house catch fire, it is very likely that nearby houses would also catch fire (Figure 9.9).
In formal settlements, it is unlikely to find plots with no exposure, a situation that was revealed in Kariakoo. This is due to the fact that in such settlements, at least streets provide open areas to which plots can be exposed. However, the number of exposures does not necessarily mean that the plot provides comfortable living. It has to be linked with the house forms (especially the layout and height of buildings) and the space between buildings. This situation is evidenced in Kariakoo where all plot have at least one exposure but the compact layout of buildings and the high rise nature of the houses block many of the buildings from cross ventilation and lighting. As densification intensifies in this settlement, this situation is likely to be experienced in the near future.

9.7.4 Plot boundary definition

One remarkable feature of settlements that are in the process of densification such as Ubungo Kibangu is the mixture of well-defined and undefined plot boundaries. Since the majority of the plots are yet to be surveyed, a number of plot owners have decided to erect block walls and soft hedges to define plot boundaries. Wall boundaries are common for many industrial plots facing Mandela Road and a few plots in the central parts of the settlement. Demarcating plot boundaries with walls and fences have served two purposes; first, is the avoidance of conflicts with surrounding neighbours and secondly, for security reasons. Boundary definition has also served the purpose of delineating clearly semi-public spaces that are to be used by household members living within the plot. However, unlike in consolidated settlements like Msasani where wall boundaries are not frequent, walking through the settlement is not as easy due to blocked footpaths. Out of 133 residential plots, 36 plots were observed to have boundaries defined by cement blocks and others with soft hedges of predominantly Tanganyika thorns. Other plots had part of their boundaries defined by walls such as those bordering DABCO site (now accommodating a student hostel) and those sharing a border with small industrial plots facing Mandela Road. Although Ubungo Kibangu is yet to be ‘saturated’ in terms of horizontal densification of houses, the few plots that have been fenced do not totally inhibit walking through the settlement. This is facilitated by the motorable tracks traversing in the east-west direction and via footpaths that meander through the settlement.

The fact that many plots are yet to be fenced, the present pattern of free movement within the settlement facilitates casual contacts among residents. Interviews with a total of 48 residents in this area indicate that 24 residents meet their neighbours daily and 13 meet their neighbours once or twice per week. Only a few i.e. 3 responded that they rarely meet their neighbours. The larger proportion of these contacts happens with households sharing the same house though other encounters were reported to involved households in the neighbouring houses.

9.8 Spaces and space use

9.8.1 Categories of spaces

Five dominant types of spaces could be identified in Ubungo. These include spaces used as gardens within housing compounds, court yards used as household outdoor activity areas (for washing and drying of clothes, cooking, flower and vegetables gardens, garaging and animal

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3During the period when this study was being conducted in this settlement, there was a conflict that raised complaints of neighbours following a blockage of an access path that crosses through plots number 500 and 501. The case was already in the Primary Court and Ten-Cell and Sub-Ward leaders were trying to resolve the conflict locally but with little success.
keeping), informal squares used mainly for children playing, pedestrian walkways and streets (Figure 9.10).

Gardens include spaces surrounding the housing compounds whereby green vegetables, flowers, lawns and trees such as banana are planted. Courtyards have been the centre of many households’ outdoor activities such as cooking, washing and drying of both clothes and household appliances. Courtyards also harbour activities like sitting and talking, place for flower beds, car parking, garaging and carpentry workshops and animal keeping (such as poultry and cattle). In Ubungo Kibangu, particularly the stretch facing Mandela Road has many of the courtyards being used for industrial oriented type of activities.

As was the case for Msasani, there was a limited number of informal squares within Ubungo Kibangu which were actively used. These included square 1 and 2 (SQ1 and SQ2) (Figure 9.11). SQ2 was rather non-active with a limited number of activities due to the fact that it was entirely located in the private plot and disturbed by lorries, that were ferrying construction materials to DABCO construction site. SQ2 though small, has a recessed section that provides a relatively ample space for activities such as children play, talking, walking and sitting.

![Figure 9.10: Categories of spaces in Ubungo Kibangu (2000)](image_url)
Streets are limited and many houses lack vehicular accessibility. The major streets for Ubungo Kibangu include the central street, which traverses through the settlement running from south northwestwards. This street provides vehicular accessibility to the majority of the southern part of the settlement. Another street is a service road running parallel with the Mandela Road that provides both vehicular and pedestrian accessibility to buildings and plots facing this main road. Apart from streets, walking is also facilitated by a number of footpaths that traverses through settlement providing linkage between housing compounds and individual dwellings. These footpaths are in many cases narrow and irregular in size. In some instances, footpaths have been blocked by some developers who have fenced their plots.

9.8.2 Activity diversity and intensity

While activity diversity refers to the number of activity types, intensity refers to the number of activities per unit area. This implies that diversity indicates the variety of activities taking place in a given space and intensity refers to the density of such activities. Intensity shows the degree...
of utilisation of space. The established activity diversity and activity intensity from space SQ1 is summarised in Tables 9.6 and 9.7 respectively.

Table 9.7: Distribution of activities in SQ1 (10.00 to 18.00 hours)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Total number of users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time interval</td>
</tr>
<tr>
<td></td>
<td>10.00-12.00</td>
</tr>
<tr>
<td>Buying items</td>
<td>4</td>
</tr>
<tr>
<td>Playing</td>
<td>19</td>
</tr>
<tr>
<td>Selling items</td>
<td>24</td>
</tr>
<tr>
<td>Sitting and talking</td>
<td>8</td>
</tr>
<tr>
<td>Fetching water and taking</td>
<td>13</td>
</tr>
<tr>
<td>Vending kiosk</td>
<td>3</td>
</tr>
<tr>
<td>Sitting and resting</td>
<td></td>
</tr>
<tr>
<td>Car parking</td>
<td>4</td>
</tr>
<tr>
<td>Riding bicycle</td>
<td>20</td>
</tr>
<tr>
<td>Carts passing through</td>
<td>11</td>
</tr>
<tr>
<td>Motorcycle passing through</td>
<td>2</td>
</tr>
<tr>
<td>Cars passing through</td>
<td>19</td>
</tr>
<tr>
<td>Walking through</td>
<td>363</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>490</strong></td>
</tr>
</tbody>
</table>

Source: Space use observation study in SQ1, February 2001.

Table 9.8: Activity diversity and intensity for SQ1

<table>
<thead>
<tr>
<th>Time Interval (hours)</th>
<th>Activity diversity</th>
<th>Activity intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.00 – 12.00</td>
<td>13</td>
<td>1.3352</td>
</tr>
<tr>
<td>12.00 – 14.00</td>
<td>13</td>
<td>1.2605</td>
</tr>
<tr>
<td>14.00 – 16.00</td>
<td>12</td>
<td>1.0224</td>
</tr>
<tr>
<td>16.00 – 18.00</td>
<td>10</td>
<td>0.0356</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>12</strong></td>
<td><strong>0.9134</strong></td>
</tr>
</tbody>
</table>

Source: Space use observation study in SQ1, February 2001.

From Table 9.6, it is notable that the number of activities decreases with time. This implies that in the evening and during the night, the square is not utilised for many of the observed daytime activities. Further observation in this space indicates that the square was being used as a parking space for cars. Walking through activity has higher frequencies than others. During daytime the same space was being used for children playing while adults used it for sitting and talking. Activities such as selling of food such as bananas, chapati, fish and bread were predominantly noted in the morning hours and diminished in the afternoon and emerged up in the evening. Since this square is also a meeting point of three streets, it has revealed high utilisation intensity and diversity of activities.
Figure 9.12: Space uses within SQ1. The space is used for a variety of activities ranging from children play to people walking through and also as a junction point of the main streets within the settlement.

Figure 9.13: Children playing in SQ1: In this square, children play during the day. During the night, the space is used for car parking.
9.8.3 Spatial qualities

The assessment of spatial qualities is based on the type of observed activities taking place in these spaces. Spatial qualities evaluated include quality requirements for walking, standing, sitting and protection.

Walking

The majority of the walking routes in Ubungo area have poor surface material (earth material) which becomes muddy during the rainy season and dusty during the dry season. The service road along Mandela Road that was once well surfaced with tarmac, has deteriorated with many potholes.

The whole stretch of the service road along the Mandela Road is not well linked with housing compounds behind this road. This is because almost all plots facing Mandela Road have been fenced limiting pedestrian linkage between houses in the inner parts of the settlement and this main road. Residents have to walk along the streets and get access to the main road through the three main vehicular entrance points. This creates inconvenience, as residents have to walk a relatively longer distance to the bus terminal and other facilities located along the Mandela Road. Unlike Msasani where pedestrian linkage is rather even, Ubungo Kibangu can be considered as ‘land-locked’ in terms of pedestrian linkage with the main road.

Roadside informal sector activities such as carpentry works, kiosks and car parking have encroached parts of this street limiting its effective use. The streets in the settlements are also poor with pools of water stagnating during the rainy season. The general narrow size of streets limits any attempt to separate pedestrian and vehicular traffic. Under such conditions, walking through such spaces is inconvenient rendering the whole issue of quality for walking poor.

Standing

Standing as an activity predominantly takes place at squares and occasionally along the streets. Observations within SQ1 showed that standing activity was less frequent in this space. This was attributed to lack of standing supports and the fact that the facades facing SQ1, though irregular in shape, are semi-private in character whereby unknown people might not be welcome. It is
therefore important to note that standing as an activity is limited not only due to lack of supports but also due to the semi-private nature of the space facing this square.

_Sitting_

Sitting requirements include the provision for seating supports such as benches and chairs which should be arranged in such a way to facilitate encounter or interaction. For stretching spaces such as streets, a reasonable interval of distance (100 metres) has been considered as a quality requirement aspect for placing seats to facilitate the sitting activity. Observations from SQ1 show that putting a bench under a mango tree facilitated sitting but sometimes people sat on the ground. Although this square has not been well provided for with these facilities, a considerable number of people were observed using this square for sitting and talking activities. Despite the fact that SQ1 is semi-private in terms of land ownership, its use portrays a communal character as revealed by the number of activities taking place in this space. However, quality requirements with respect to sitting are generally poor.

![Figure 9.15: Sitting and talking in SQ1. Due to lack of sitting facilities, sitting as an activity is less promoted to take place in this square. Temporary seats such as benches put in front of the house are used for sitting activity.](image)

Streets within Ubungo Kibangu are relatively narrow (3-5 metres wide) to the extent that two way vehicular traffic is sometimes limited. Although these narrow streets provide a harmonious feeling of residential character within the settlement, in some sections, the too narrow streets are limited in terms of facilitating nice views and visibility to the surrounding environment. In some areas where plots have been fenced by walls, such narrow streets have limited vehicular flow and create a sense of insecurity for pedestrians.
Protection

Protection as a quality requirement for spaces is related to two aspects, namely, that is the presence of many people that guarantee mutual protection security-wise and the protection from negative climatic conditions. With the exception of a few sections with fenced walls and with few people passing through, generally there were many people passing through such footpaths providing a guarantee for mutual protection against daytime crimes and robbery.

Since SQ1 is communal in character and in terms of use, it is well protected by shade from a big canopy mango tree. The mango tree that is evergreen throughout the year provides shade under which numerous activities take place. The presence of the mango tree has attracted people to sit and talk, sale items, park cars, walk through and children to play under this tree. The protective aspect of this tree has enhanced the quality of SQ1 to be used as an informal square for these varied types of activities. Trees as protective means against the hot and humid climatic conditions have been also used in other spaces particularly in private courtyards and front gardens (Figure 9.18).
Figure 9.17: Footpath surrounded by walls. Only a few people pass through this footpath. The fact that it has been surrounded by walled fences and without streetlight it creates a sense of insecurity and fear for users. During the night the problem is more complicated. Waste dumping further deters effective use of this footpath that links Kibangu with the other settlement of Kisukulu.

Figure 9.18: Comfortable living under a tree shade. Children sitting, cloth drying and food preparation takes place under a well-protected shaded courtyard. Trees as protective means against the hot humid weather attract users of space to sit comfortably.
Many walkways traversing through the settlement lack shade from trees. Walking in hot and humid and narrow footpaths has been uncomfortable. Similar conditions prevail along the Mandela Road. The lack of shade from trees along this walkway renders walking also uncomfortable.
CHAPTER TEN
CROSS CASE ANALYSIS

In this chapter, emerging issues from the case study urban types are compared. While the aim is not to draw generalised conclusions, the results from these case studies are re-interpreted so as to establish whether patterns of the issues discussed can be related to each other for all the cases. For the purposes of consistency, the major themes used to analyse the four case study urban types are maintained in this chapter. These include trends in settlement evolution and subsequent development processes, planning intervention and its effects onto the present settlement patterns, house forms, density, plot characteristics, spaces and space uses. Across the themes, the issue of spatial quality is discussed.

10.1 Settlements development trends

While Kariakoo is as old as the city of Dar es Salaam with its plan laid down in the 1920s, Msasani, Mbezi and Ubungo are post-independent settlements evolving in the 1960s with remarkable development taking place in the 1980s. When the rate of densification process is taken into consideration within this period, a higher rate of densification is more pronounced in Ubungo than Msasani. This is illustrated in Figure 10.1. Trends in the growth in number of houses in Ubungo has been faster reaching to more or less the same level as that of Msasani by the year 2000 despite the fact that Msasani is much older than Ubungo.

Figure 10.1: Settlements densification trends in Ubungo and Msasani in the period between 1975 and 2000

Although the two settlements are informal and characterised by informal housing development processes, the differing rate of settlement development particularly that of Ubungo can be explained by two factors. The first is the decade 1980-1990 that observed a rapid population influx in Dar es Salaam (Figure 3.1) and it was during this period a sharp decrease in the supply of surveyed plots was experienced. While the demand for plots in the decade of the 1980s was estimated to be 6,000 plots per year, the total supply stood at 1,635 plots per year. This represented only 27% of the whole city requirements (Kombe, 1995:67). Msasani being a relatively old settlement with some kind of saturation in terms of horizontal densification, due to the low density character and availability of buildable land, Ubungo
became a target of informal housing development for many of the land seekers of that time. The second reason for the rapid growth of Ubungo was the completion of the Mandela Road in 1980 that facilitated the opening up of Ubungo settlement to vehicular accessibility. This triggered further development in this settlement with the rapid development in housing taking place in the decade of the 1990s. Corroborating this observation with a study on the period of completion and occupation of houses in Ubungo, it has been observed that 7 houses out of 143 houses were completed by the year 1979. Between 1980 and 1990, 67 houses were built representing 47% of all the houses. A total of 51 buildings representing 36% of all houses were completed and occupied between 1990 and the year 2000. It is apparent therefore that nearly half of the observed buildings in Ubungo have been developed during the decade 1990-2000, the period that characterised the rapid growth of Ubungo.

On the other hand, the growth of Msasani and its consolidation is linked with its proximity to the formal higher-income residential areas of Msasani and Oysterbay. Its proximity to the city centre and location at a junction of the Old and New Bagamoyo Roads promoted establishment of commercial activities in this settlement. It is these potentialities that triggered land subdivision and rapid housing development in Msasani. To date, Msasani has developed as one of the minor commercial centres of Dar es Salaam. The development and subsequent densification in informal urban types of Msasani and Ubungo have to be discussed in relation to informal subdivision and selling and buying of land. The process that started by the then owners of farm land subletting pieces of land to relatives and friends, later, after land prices and demand for buildable land, selling and buying plots started to be effective especially in the 1980s. Discussing informal transaction processes of land in informal settlements, Kombe observes that although this process has been taking place over the years, presently, land transactions have been transformed to some kind of quasi-formalised procedures involving paper documentation, witnesses, community leaders and special demarcation of plot boundaries by actual measurements or pacing on the ground (Kombe, 1995:177).

Continued plot subdivisions and house construction amidst informal land market transactions and less consciousness to the ultimate density have resulted into unregulated horizontal densification especially in Msasani. Although informal land markets have helped developers to acquire land with eased procedures, lack of technical guidance and limited technical capabilities of the grassroots institutions and actors have resulted into congested housing environment. In turn, this has inhibited economic provision of basic infrastructure services and amenities. Despite the role of the local institutions and actors in making land easily available for housing development are playing, the unguided and limited capacities of these institutions and actors have rendered development in informal settlements rather sporadic. This observation has been underscored by Kombe as follows:

... however, generally, land parcelling and development has been sporadic. Therefore, individuals acted on their own without co-ordination or a comprehensive overview regarding future public requirements such as circulation, recreational areas and the like. (Kombe, 1995:177)

The fact that still a number of open lands in Ubungo are yet to be developed, rapid densification continues unguided as the situation was for Msasani. The rate of densification seems to increase after the completion of the student hostels adjacent to this area. The student hostels have created new demands for allied uses such as groceries, photocopier and stationary services, restaurants, retail shops and hair salons. These functions emerge closer to the hostel but it is anticipated that more similar uses or functions will emerge as a result of increase in student population. However, if guidance to these new uses will not be timely executed, the sporadic establishment of these functions is likely to result into crowded houses...
and activities without the basic facilities, a situation that will have adverse effects to public health.

10.2 Planning interventions

Due to the fact that the case study areas differ in terms of formal and informal contexts, planning intervention into these settlements has also been different. Within Kariakoo and Mbezi, for example, planning intervention has been through plot subdivision and zoning plans such as height zoning. In informal urban types, planning intervention has been through upgrading plans that have been prepared primarily to open up crowded housing clusters lacking vehicular accessibility. Besides opening up inaccessible clusters, the plans have been sought to facilitate the provision of line infrastructure services such as piped water supply, sewerage, drainage channels and designate areas for community facilities such as schools, clinics and open spaces. Planning intervention in informal settlements has also attempted to subdivide plots as a basis for regularising, but also for issuance of survey instructions and survey permits for house owners willing to survey their plots. However, the fallacy in these upgrading plans has been the overemphasis of just subdividing plots with little or no regard to the existing plot boundaries as recognised by the inhabitants. Both the upgrading or subdivision plans for Msasani and Ubungo are quite different when compared to the existing plot layout as mapped from field measurements conducted under this study (Figures 8.4a and 8.4b and Figures 9.4 and 9.5). Another discrepancy in this process is the fact that while these plans are supposed to be used as tools to guide plot surveying, in practice surveyors have adopted locally recognised plot boundaries to demarcate plots in Ubungo and Msasani settlements.

One wonders why planners prepare plans that do not reflect reality and which are not used by surveyors for plot surveys. One explanation to these discrepancies has to be related to planners’ attitude towards planning. It seems that planners prepare plans for the sake of producing a drawing despite the fact that such plans do not reflect reality. The upgrading plans are often prepared with little or no efforts in terms to update basemaps or incorporate individual property boundaries. While Planners spend little time to update the existing base maps of the site, they spend more time in preparing the plan. In this regard, planning activity seems to emphasise the plan as a ‘product’ rather than a ‘process’ through which the plan has to be produced and used. Arguing in favour of supporting local institutions that have been trying to guide informal land subdivision in some of the informal settlements in Dar es Salaam and contrasted with planners’ practice, Kombe notes that:

The praxis approach applied in the case study areas (referring to land sub-dividers and community leaders in informal settlements) shows the ability of the land sub-dividers and local leaders to devise innovative approaches which are compatible with the socio-cultural background and technical capability of clients. In other words unlike most urban planners, they have in terms of planning gone beyond what is ‘acceptable practice’ by illustrating how it should be done otherwise. In so doing the gap between the drawing table concepts and reality (implementation) that often persists in physical planning has been bridged. These experiences challenge prevailing naive notions among planners that the land use (layout) plan is an end in itself. (Kombe, 1995: 176)

Kironde made similar observations when he argues that:

The current land use schemes being prepared unilaterally for these squatter areas are, in our opinion, retrograde and possibly illegal. In any case they are impractical and are likely to work in favour of the rich against the poor. What is required is a set of schemes prepared in collaboration with the people themselves. (Kironde, 1994:528)

Since informal land transactions have been the driving forces for housing development in
these urban types, the fact that often planners do not attempt to explore the functioning of these forces have resulted into preparing upgrading plans that are not frequently used. Increasingly, planners are becoming unpopular and their role marginalised.

Enforcement of plot coverage and building height as per development guidelines in Kariakoo are generally problematic. Both violation in building height and plot coverage were observed in Kariakoo. It was noted, for example, while the approved number of storeys of two houses in blocks 76 and 77 was 2 and 6 storeys, actual development on the site was observed to be 4 and 8 storeys respectively. The latter has been developed into a hotel. Whether additional floors were approved as extensions could not verified from records. The same applies for plot coverage. It was observed that 8 houses had plot coverage exceeding 100% as compared to the recommended coverage of 50%. Further, it was noted that more than 40 plots out of 50 had plot coverage exceeding this recommended standard.

These observations can be related to two factors. The first is the question of laxity in the enforcement of guidelines and the second, is the plot-by-plot redevelopment with developers’ tendency towards maximising gains from land utilisation with little regard to spatial qualities. The fact that the layout for Kariakoo was prepared in the 1920s primarily to cater for the low-rise, Swahili type of houses meant that the new demands to redevelopment houses into high-rise apartment blocks would necessarily require readjustments commensurate with these new demands. The first problem that arises in this process is the fact that the uncoordinated plot-by-plot redevelopments have resulted into some house elements of the emerging high-rise structures to be less useful. For example, the side balconies that have been built quite often have been blocked from view and cross-ventilation. The juxtaposition of high-rise buildings too close to each other with narrow building sides or simply the high plot coverage has resulted into dark and unused alleys. At ground level these alleys have been turned into waste dumping spaces resulting into dirty and poor living environment.

The negative consequences of unguided high-rise buildings should also be related to market forces that perpetrate private developers to maximise profit and thus compromise spatial and environmental qualities. The fact that the number of tenants is almost the same as that of owners in high-rise buildings points to these intentions. For example, out of 12 developed high-rise buildings with apartments presently being used for residential purposes, eight buildings had tenants ranging between 2 to 12 households. One apartment had 12 tenant households. A study that was conducted by the author in 1996 revealed that monthly rental charges for apartment buildings in Kariakoo ranged between TShs. 250,000 to 300,000, equivalent to $ 455-545 at that time (Lupala, 1996). This is more or less equivalent to prevailing market rates of housing in Dar es Salaam. Also it has been observed that developers of these apartments own more than one building within Kariakoo. Due to increased demand for commercial and residential uses, it follows that private investors develop houses typically for investments purpose and maximising profit returns from rented apartments for residential and commercial uses. Profit maximisation irrespective of deteriorating spatial qualities has been accentuated by Verma when discussing redevelopment processes taking place in New Delhi. Verma argues that:

*Adverse impacts that soon follow are by way of infrastructural stress as services designed for few came to be used by many. As apartment buildings proliferate, several middle and high-income plotted developments have reached a state where the quality of residential amenity can hardly be considered acceptable and the need for neighbourhood improvement is becoming increasingly evident. The perpetuating stakes behind this phenomenon, however, are entirely profit-driven and blatantly disregard this dimension. (Verma, 1995:9)*

In Dar es Salaam, where enforcement of guidelines has been rather slack, it is not
surprising, therefore that private developer have enjoyed much freedom in their quest to maximise profit through land over-utilisation. This in turn has become detrimental to liveability and spatial qualities.

Even though Mbezi had a formally prepared and approved layout plan (Figure 7.4a) actual development has been rather haphazard and in some instances mixed-up. The haphazard development in Mbezi necessitated the revision and redrawing of the new plan to supersede the former layout as a corrective measure (Figure 7.4b). The idea was to accommodate developments that were uncontrolled to the extent that in some neighbourhoods, developers encroached upon important areas that were earmarked for community services such as schools, markets and open spaces. In some cases, the railway reserve was also encroached upon. Observations in Mbezi Block D indicated that some cul-de-sacs that are yet to be developed have been converted and built up with houses. Besides, some cul-de-sacs have been opened up and directly join the major road of Bagamoyo. The increased number of openings to this road increases possibilities of traffic accidents. Since most of the streets in Mbezi are yet to be paved, the opening of these cul-de-sacs may be considered a temporary solution. However, the blocking of cul-de-sacs by some developers by constructing houses will augment more problems when all plots have been developed in this settlement. On the other hand, some houses have been built too close to the streets. These are some of the features that characterise unguided housing development in Mbezi, especially in the 1980s and 1990s when the pace of housing development showed a rapid growth. Generally, it has been noted from Mbezi that the layout plans that were supposed to guide smooth development of this area were also a source of land disputes especially between new developers and old landholders, some of the disputes that are yet to be resolved in the courts of law.

Table 10.1: Planning intervention and its effectiveness

<table>
<thead>
<tr>
<th>Type of planning intervention</th>
<th>Kariakoo</th>
<th>Mbezi</th>
<th>Msasani</th>
<th>Ubungo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redevelopment plan, zoning for building heights, plot coverage and floor area ratios</td>
<td>A tool to guide redevelopment of houses and infrastructure improvement</td>
<td>A tool to guide survey and issuance of plots, building permits and control of housing development</td>
<td>To guide provision of line infrastructure, plot subdivision, issuance of survey permit and opening up inaccessible housing clusters to vehicular accessibility</td>
<td>To guide provision of line infrastructure, plot subdivision, issuance of survey permit and opening up inaccessible housing clusters to vehicular accessibility</td>
</tr>
<tr>
<td>Plot layout subdivision plans</td>
<td>Upgrading plans (plot subdivision plan)</td>
<td>Not effectively used because of the discrepancy between plans and property boundaries. Surveying of plots follows locally recognised boundaries.</td>
<td>Not effectively used because of the discrepancy between plans and property boundaries. Surveying of plots follows locally recognised boundaries.</td>
<td></td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Not consistently followed due to laxity in enforcing guidelines, overshadowed by private developers’ motives.</td>
<td>Not systematically followed. Streets have been blocked, encroached and public service areas appropriated by private developers.</td>
<td>Not effectively used because of the discrepancy between plans and property boundaries. Surveying of plots follows locally recognised boundaries.</td>
<td>Not effectively used because of the discrepancy between plans and property boundaries. Surveying of plots follows locally recognised boundaries.</td>
</tr>
</tbody>
</table>

Some of the factors limiting effective implementation of urban development controls have been poor record keeping by the authorities, lack of frequent site inspection, dubious and
informal deals in land transfers and transactions. For example, it was quite difficult to trace building permits for completed and on-going developments in Kariakoo and Mbezi from the Lands and Planning Offices. Registers were unsorted and files piled without order. Building permit records was unsystematic, uncoordinated and land use and planning data for the whole city was lumped together. The registers did not indicate issued permits by area or zone. This made the whole permit search exercise quite tedious. Under such conditions, it is unlikely that development control of sites can be effectively exercised unless deliberate efforts are made to improve the management and retrieval of information. The type of planning intervention and its effectiveness to the four case study urban types is summarised in table 10.1

10.3 House forms

Four main variables have been used to characterise house forms. These variables include building height, sizes, materials and roof types and uses.

10.3.1 Building height

With the exception of Kariakoo, the majority of the houses in Msasani, Mbezi and Ubungo are single storey houses. Yet, even within Kariakoo where redevelopment into multi-storey houses is more pronounced, single storey houses are more dominant than multi-storey houses. Out of 50 houses that were studied in Kariakoo, 23 were single storey and the remaining 27 had 2 to 8 storeys. The Co-operative Building is rather unique with its 12 storeys providing office accommodation to the Ministry of Industries, the Co-operatives and a number of other offices rented to private and public institutions. Within Mbezi, out of a total of 46 houses, 34 houses were single storey, 6 two storeys and 2 three storeys. Msasani and Ubungo are predominantly low-rise housing area. Out of 178 houses in Msasani, only 2 were two storeys and 2 were three storeys. In Ubungo, only three were multi-storey houses. Variations in building heights for the four case study settlements has been summarised in Figure 10.2.

![Figure 10.2: Building height variations of two storeys and above for Kariakoo, Mbezi, Msasani and Ubungo.](image)

The development of high-rise buildings in Kariakoo has to be linked with the building uses and new demands that arise in the settlement. Since Karachi is part of the city centre, new demands for commercial, office and residential spaces have prompted property developers to buy and redevelop single storey Swahili type of houses into high rise blocks of apartments. The fact that former owners of the old Swahili houses in Kariakoo do not have the financial capacity to redevelop their houses, the market forces are replacing these owners through ‘gentrification’ process. Kombe has observed the replacement of old house owners by the rich people as follows:
Starting from the 1970s, shrewd land seekers had been ingenious enough using ‘carrot and stick’ (such as offers of alternative accommodation in addition to the cash which was paid to the land and building) to pressurise the indigenous land occupiers in Kariakoo to sell land. (Kombe, 1995:96)

The emerging high-rise buildings in Kariakoo are largely a result of the gentrification process and initiatives by private property developers who want to maximise profit by responding to these new demands. However, the question that remains is how to balance market forces on land and housing development and ensure acceptable spatial and environmental qualities. Perhaps it is difficult to argue given marginal role local authorities are playing to co-ordinate housing in Kariakoo. This is however a thorny issue that ought to be resolved before extreme negative consequences are experienced in Kariakoo.

10.3.2 Building sizes

There is a considerable variation in building sizes in the four case study areas. These variations are summarised in Figure 10.3.

Building sizes vary from small houses of 49 square metres to as large as 400 square metres. The reason for this variation is that plots in Mbezi are relatively larger when compared to plots in other urban types. The larger plot size provides flexibility in design and in terms of construction of larger houses. The variation is also due to some plots in Mbezi, for instance, where servant quarters have been constructed first before constructing the main houses. The fact that building sizes of up to 400 square metres were observed in Kariakoo, an area with relatively smaller plot sizes, explains why in some of the plots, the coverage of beyond 100% was observed. In Ubungo and Msasani, a similar trend in building size variation prevails.

However, in informal urban types where building regulations are not applicable, it has been noted that building sizes vary according to plot sizes, that is, the larger the plot the larger the house constructed on the plot. Understandably, since the motive behind house construction in these settlements has been both owner and rental occupation, and the fact that land acquisition has been through informal land markets, as the case was for Kariakoo, it is natural that house developers maximises plot coverage so as to secure adequate number of rooms for owner and rental accommodation. In Msasani, for example, out of 56 households that were interviewed, 33 households were tenants and 23 households were owners. In Ubungo, out of 48 interviewed households, 29 households were tenants and the remaining 19 households were owners.
Although the magnitude of profit returns from rental income in these settlements is by far not comparable to those in Kariakoo, it is still reasonable to argue that building sizes have to be viewed as a function of developers’ intentions to maximise returns through renting.

![Figure 10.4: Variations in plot and building sizes in Msasani.](image)

**10.3.3 Building materials and roof types**

Building materials as a variable of house forms do not seem to show a sharp contrast across cases. The dominance of concrete blocks as a walling material and corrugated iron sheets for roofing appear in all the four studied cases. However, houses with traditional building materials such as mud and pole walls characterise the old Swahili type of houses in Kariakoo and a few houses in Msasani. Due to old age and the ongoing redevelopment dynamics taking place in Kariakoo, most of these houses have dilapidated to the extent that some of them are unfit for human habitation. Some of these houses have been bought awaiting demolition and reconstruction into high-rise buildings. Some of the buildings have changed use from typical residential to storage of goods such as hardware and grocery goods. Out of 70 houses that were studied in Kariakoo, 12 houses have mud and pole walls representing only 17% of all houses. In Mbezi, there were no mud ad pole houses. In Msasani, out of 178 houses, 24 houses were mud and pole and 3 houses out of 143 in Ubungo. It was noted that even in these informal areas where demands and regulations requiring for adherence to conventional construction materials are not as binding as in formal areas, developers have been changing their houses from mud and pole to concrete blocks. The dominance of sand cement blocks has to be linked with the availability of cement from factories within the country and generally, developers’ attitude that sand cement blocks are considered ‘more permanent’ material than mud and pole. During the period of fieldwork studies in Msasani, a number of mud and pole houses were being reconstructed with sand cement (concrete) blocks.

The dominance of mud and pole wall houses in Kariakoo, as noted earlier is attributed to restrictions imposed by the city authority in pursuance of Master Plan recommendations of encouraging high-rise type of houses. It was a deliberate move to discourage low-rise development in an area earmarked for high-rise development.

As far as roofing materials are concerned, corrugated iron sheets are more dominant than other materials. Observations from the four cases indicate that within Kariakoo 35 houses out of 70 were roofed with corrugated iron sheets, 24 of 58 houses in Mbezi, 173 out of 178 houses in Msasani and 141 out of 144 houses in Ubungo. The remaining are either roofed with tiles or concrete slabs. If the type of roofs is considered as a variable for house forms across cases, the majority of houses in Kariakoo have hipped roofs and a few houses with
monopitch type of roof. The ‘clere-story’ or ‘Sinza type’ and gable roof types that are popular in Msasani and Ubungo seems to be limited in Kariakoo. Within Mbezi, all types of roofs were noted although the gable roof type was more dominant than the others.

![Figure 10.5: Roof types for Kariakoo, Mbezi, Msasani and Ubungo.](image)

The dominance of specific roof types in specific settlements can be related to specific periods of development of urban types. Until the 1970s, the hipped roofs were popular in many of the settlements and closely associated with the Swahili house type. In the later decades, a gradual rejection of the hipped roof has been noted. More preference has been on either gable or clerey-story roof types. House developers consider a hipped roof a costly option because more roofing sheets are required to cover the same floor space. Besides, there is more wastage in terms of the number of pieces of roofing sheets cut from the gables some of which are too small and therefore cannot used. The hipped roofed-Swahili house type has been often seen as an old model type of house. This is a characteristic feature notable in several housing areas developed after the 1970s not only in Dar es Salaam but also in other towns in the country.

Discussing the shifting preferences from Swahili type of houses and the hipped roof to other house forms and roof types, a Planner from Ilala municipality commented that:

> Although the Swahili type of house is still allowed and qualifies for building permits, many of the developers do not prefer this type of house because it is seen as an old fashioned design. The other reason however, is the fact that nowadays people prefer to have self-contained type of houses to the Swahili house type. This is because of the growing tendency towards owner occupation first before ideas of rental accommodation or multi-occupation as was in Swahili type of houses are taken into consideration¹.

Although this comment cannot be taken to imply that owner occupation is more dominant than rental, the observation that there is a changing preference in roof types and therefore of the house forms is manifest. Moreover, it indicates the shifting trends to new demands for increased ‘privacy’ at household level. Experience shows that even middle class tenants prefer to rent the whole housing unit rather than sharing with other tenants or house owners. This has influenced house developers to construct houses that reflect these current demands. In some houses, while developers maintain the layout of the Swahili type, the roof type has been changed to gable or ‘monopitch’.

¹ Interview with a planner of Ilala Municipality, 02nd May 2002.
10.3.4 Building uses

One general observation from the four cases study areas is the gradual change in building uses from typical residential to commercial uses when settlements reach consolidation stages. When Kariakoo was laid out in the 1920s, almost all buildings were primarily used for residential purposes with only a handful of buildings accommodating corner shops (‘dukas’). Presently, as the city centre functions expand, building uses have changed from residential to commercial, warehouses, offices, hotels, residential-cum-hospital, fuel filling stations and the like. These new uses have impelled housing transformation in Kariakoo to accommodate increasing demands for new uses.

Emerging as an informal settlement in the 1960s, Msasani has grown to a commercial centre with building uses changing from typical residential to residential-cum-commercial. Buildings along Kimweri Road have been extended to accommodate increased space demand for groceries, restaurants, photo printing shops, bureau de change, boutique and hair dressing salons. A few buildings are being redeveloped into three storeys for office accommodation and restaurants. Building uses in Mbezi settlement are predominantly residential with shops being opened to provide the daily necessities within a few residential houses. The dominance of residential use in Mbezi is because this settlement is still in its intermediate stage of development with several plots that are yet to be developed. New building uses play a significant influence to the changing house forms that result from extensions, redevelopment and modifications.

Table 10.2: Building uses in Kariakoo, Msasani and Ubungo

<table>
<thead>
<tr>
<th>Building use</th>
<th>Kariakoo</th>
<th>Msasani</th>
<th>Ubungo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>9</td>
<td>132</td>
<td>110</td>
</tr>
<tr>
<td>Residential / Commercial</td>
<td>32</td>
<td>40</td>
<td>27</td>
</tr>
<tr>
<td>Commercial only</td>
<td>-</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Offices</td>
<td>5</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Ware houses/small scale industries</td>
<td>-</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46</strong></td>
<td><strong>178</strong></td>
<td><strong>148</strong></td>
</tr>
</tbody>
</table>

*Source: Fieldwork studies in Kariakoo, Msasani and Ubungo, November 2000.*

Building uses have to be viewed in relation to basic necessities required to cope with the new uses. Whereas commercial uses for example call for services such as parking, spaces for shopping, loading and unloading of goods, conditions in Kariakoo do not seem to support this requirement. Petty traders quite often block pedestrian and shopping arcades. In some sections of the streets shopping arcades are simply lacking, parking spaces are overcrowded and the narrow arcades are not adequate enough for comfortable and safe window-shopping. Increased floor area ratios in Kariakoo have not matched with infrastructure improvement like water supply and sewerage system. The water reticulation system in Kariakoo that was installed back in the 1940s can no longer support present requirements of high-rise buildings. The system is too old and the pressure is too low for water to flow to the upper floors. Many developers have constructed water tanks at ground level and pump water to the upper floors. Similar problems characterise the existing sewerage system. The majority of the houses still rely on on-site sanitation that is septic tanks and cesspits. With increased building uses and water consumption, these cesspits have to be frequently emptied, a situation that is too costly and not sustainable in the long run. Parking spaces are congested and simply lacking. In Msasani for example, though there are adequate spaces for parking, the spaces are not properly organised. This has resulted into haphazard parking, and under-utilisation of the available parking space.
Discussing redevelopment of neighbourhood in New Delhi, Verma notes:

...sewers are overflowing as the volume of the sewage has increased. While earlier drinking water was supplied for four hours, now it is available only for two hours. ... as water requirements are being met by boring tube wells, the ground water seems to be falling. Also with several units per floor, the electricity consumption has increased, especially on account of excessive air conditioners, and as the power lines cannot take too much load, there are frequent disruptions in supply. (Verma, 1995:10)

These are infrastructure problems that characterise unregulated redevelopment and changing building uses in Kariakoo. While it was noted that solid waste was better managed in Kariakoo area, the situation in Msasani and Ubungo was poor. The lack of vehicular accessibility to some parts of these settlements and the lack of effective solid waste collection mechanisms from the inner parts of the settlements have resulted into some areas having piles of rotting garbage. Apart from being an eye sore, uncollected wastes are breeding places for disease vectors such as flies and mosquitoes.

10.4 Plot characteristics

Plot configuration, that is the size and the shape, influence the form of houses as well as the density of the settlement. Four main variables are being discussed to characterise plot configuration from the four case study urban types. These variables are plot size, plot ratio or plot dimension, plot exposure and plot boundary definition.

10.4.1 Plot sizes

There is a considerable variation in plot sizes when the four cases are compared. These variations have to be related to whether the settlement has been developing informally or planned with specific planning intentions. In Msasani and Ubungo, plot sizes show a wider range of variations than in Kariakoo and Mbezi. This is due to the fact that land subdivision in these cases was, and still is not regulated, that is it has been undertaken through informal land subdivision processes. In this process, plot sizes are largely determined by the willingness of the seller to dispose of land and willingness of the buyer to pay. It was generally observed that poor families with low financial capacities end up having smaller plots. Even original settlers of these settlements are increasingly remaining with smaller plot as they continue subdivide and sell parts of their original farm plots.
It is apparent from Figure 10.6 that while plot sizes in Msasani are smaller with diminishing trends towards 701-800 square metre category, the opposite prevails for Mbezi. Plot sizes in Mbezi range from 1,101 to as large as 1,400 square metres. In Kariakoo the plot sizes vary between 201 and 600 square metres. On the other hand, Ubungo has plot sizes that vary across the ranges from as small as 100 square metres to over 1,400 square metres.

While plot sizes in Kariakoo have been linked with the Swahili type of houses, the larger plots in Mbezi are related to lavish standards for middle and high income people who could not, or were not allowed to acquire plots from the Sites and Services projects of the 1980s. Since small plot sizes influence higher densities, it is not surprising that Msasani has relatively higher horizontal density than the other three cases. It is important also to note that the smaller plot sizes observed in Msasani probably indicate the size that is affordable by the poor and which can be adapted in land use planning so as to optimise land use and address the problems associated with city sprawl. The extremely larger plot sizes in Mbezi are on the contrary a constraint to economic provision of infrastructure and optimal utilisation of land.

10.4.2 Plot ratio or plot dimension

Plot ratio refers to the proportion of plot width to depth. This variable indicates the shape of the plot. The underlying assumption under plot ratio analysis has been mainly linked with the effects different plot ratios have on the layout of a block or a settlement. It has also been related to the cost of, and the need for optimising line infrastructure such as roads, water mains, sewer lines and drainage channels. It has been stated, for example, that plots with ratios approaching 1:1 are not desirable on account that square shapes have the disadvantage of having fewer houses along the line infrastructure than for instance rectangular plots. On the other hand, plots with low ratios of less than 1:3 result into elongated shapes whereby flexibility in terms of siting buildings becomes problematic (Acioly and Davidson, 1996; and URT, 1976).

While most plots in Kariakoo were rectangular thus considered desirable, the majority of plots in Mbezi are rather squarish in shape with ratios approaching 1:1. The fact that plot sizes in Mbezi are also large (1,200 to 1,400 square metres), plot ratios that tend towards
squirish shapes imply unnecessarily higher and uneconomical costs for line infrastructure as compared to the other cases.

In Msasani and Ubungo it was difficult to establish plot ratios because some of the plots were rather irregular, that is neither rectangular nor squirish in shape. In Msasani for example, 94 plots out of 170 had irregular shapes whose plot ratio could not be established. However, the remaining plots show varying ratios with the majority having a ratio ranging between 1:0.5 and 1:2.5. A few extreme values of as low as 1:0.5 (implying that widths are longer than depths) and as high or more than 1: 3.5 were also noted. A similar pattern prevails in Ubungo. These variations are a result of the informal land markets that characterise land subdivision and development.

10.4.3 Plot exposure

As discussed earlier, the underlying assumption in the analysis of exposure is that the more the number of exposures, the more likely that comfort living characteristics are ensured. Empirical observations from the four cases show that in informal urban types, many plots have no exposure or have limited exposure to only one side. In Msasani, for example, out of 170 plots, 91 plots had no exposure, 73 had one exposure, 5 had two exposures and only one had three exposures. In Ubungo, out of a total 133 plots, 40 plots had no exposure, 69 plots had one exposure and 20 had two exposures. Despite the compact layout of Kariakoo, at least each plot has one exposure. The number of exposures in Kariakoo is due to the fact that at least each house is facing an access road.

Two views can be discussed with regard to plot exposure. First, since Msasani is too consolidated with compact layout of buildings, the limited exposures for more than half of the plots has made living in this settlement uncomfortable due to the lack of cross ventilation and to some extent inadequate light into the rooms. Second, often views have been blocked due to congested buildings. The overall situation is that amenity within Msasani settlement is rather poor when plot exposure is compared across cases.

This situation is mainly attributed to extensive development of houses and with buildings covering almost the entire plots that have barely left space for alleyways or streets. Since development in this settlement takes place informally, individual tendencies towards high plot coverage does not take into consideration the need for plot exposure. Apart from narrow footpaths that cannot provide adequate space for exposure, the remaining unbuilt spaces within the settlement are too few to guarantee adequate cross ventilation to many of the blocked houses. The lack of streets in the inner parts of the settlements further limits the number of exposure in this settlement. For example, more than half of all houses in Msasani, that is 92 out of 178 houses, do not have vehicular accessibility. Coupled with congested
houses, liveability qualities within Msasani are relatively poor when compared to other case study areas.

10.4.4 Plot boundary definition

One of the main features observed in informal urban types is the absence or limited use of plot boundary defining elements such as walls and hedges. In Msasani for example, due to minimal site setbacks, plot boundaries are not marked on the ground despite the fact that house owners know and respect these boundaries. It has been undesirable to erect boundaries because this would block footpaths that provide pedestrian linkage between Kimweri and Juhudi Streets. Generally, residents respect the footpaths because they provide reliable linkages within housing clusters that cannot be reached by cars. In the case of Ubungo plot fencing was noted only on relatively larger plots. In certain blocks where densification has reached higher levels, there were no fencing or hedged boundaries. The high plot coverage in Kariakoo seems to have restrained plot boundary definition by physical fixtures. Shopping activities at ground floors of many buildings further limit boundary definition, as shoppers want to move freely from one shop to another.

Plot fencing and hedging has to be discussed in relation to low-density characteristics of settlements and the social status of residents. Often plot fencing is common among high-income housing areas. The objective being two fold, first is enhancement of security and second is limiting unwanted contacts with other people. Acioly and Davidson for example, note that:

Socially, low densities are connected with high incomes and a low degree of casual social contact. High densities are associated often with low income, with liveliness and social contact, but also with conflicts. (Acioly and Davidson, 1996)

Interviews with residents in Mbezi support this correlation whereby the majority of the residents have a relatively high social status in terms of employment, expenditure patterns and ownership of properties. Among the interviewed residents included university professors, medical doctors, directors of privately run companies, accountants and employees in government institutions.

In the same vein, Gehl (1987) reiterates the relationship between socialising activities and the built environments when he points out that the increase of socialising activities is dependent on whether built environments have been designed to promote both necessary and optional activities. Mbezi was primarily designated low-density, a design that promotes privacy. Contacts among residents are minimal. Therefore, plot boundaries such as hedges and fences should be viewed as a phenomenon of low-density plots and high social status by which developers want to define the limit of their plots, shield their houses from burglary and other crimes but also limit unwanted contacts with other people. In other words, Mbezi does not seem to have been designed to promote optional activities.

10.5 Density characteristics

Four main variables have been used to characterise density across cases. These include population density and occupancy characteristics, housing density, floor area ratio and coverage at plot and block level.

10.5.1 Population, housing and occupancy density

Although Kariakoo has been perceived as one of the high-density settlements both in terms of housing and population, the actual population density was noted to be lower compared with Msasani and Ubungo. For instance, while the population density for Kariakoo was 140 persons per hectare, population density for Msasani and Ubungo was 258 and 167 persons per
hectare respectively. Mbezi had the lowest density of 20 persons per hectare. When housing density is considered across cases, Msasani had the highest density of 38 houses per hectare followed by Ubungo with 17 houses per hectare. Kariakoo had 16 houses per hectare and Mbezi had 5 houses per hectare.

When occupancy characteristics are examined across cases, Msasani has the highest occupancy of 1.6 persons per room followed by Ubungo with 1.5 persons per room, 1.1 persons per room in Kariakoo and lastly is Mbezi with 1.1 persons per room. If room occupancy is employed as a measure of overcrowding, overcrowding being interpreted as the number of persons per room, it is indicative that overcrowding is more pronounced in Msasani and Ubungo than Kariakoo and Mbezi. When these figures are compared with recommended room occupancies from the Space Standards (1978) of 2 persons per room, it can be concluded that room occupancy in all the four case studies is within acceptable limits despite the general perceptions that Kariakoo and Msasani are overcrowded settlements.

The room occupancy rates observed in the case study areas can be related to prevailing house forms in each case and the proportion between owner and rental accommodation. For example, out of 178 buildings in Msasani, 76 were occupied by owners, 35 were rented and 68 occupied by both tenants and owners. Rental accommodation for owner and tenant occupied houses is in this respect refers to a few rooms (usually 1-3 rooms) being rented while the remaining rooms are occupied by the house owner. Ultimately, this results in higher occupancy rates. In new buildings in Kariakoo, apartments have been rented rather than rooms. In Mbezi, there are no multi-family houses. Almost every house is occupied by one household, regardless of whether it has been rented or owner occupied. The fact that houses in Mbezi are relatively larger in size and occupied by one household has resulted into lower room occupancy rate.

![Figure 10.8a: Population density for Kariakoo, Mbezi, Msasani and Ubungo.](image1)

![Figure 10.8b: Housing density for Kariakoo, Mbezi, Msasani and Ubungo.](image2)

![Figure 10.8c: Occupancy rates for Kariakoo, Mbezi, Msasani and Ubungo.](image3)
10.5.2 Plot coverage and floor area ratio

When plot or site coverage was calculated across the cases, Kariakoo reveals a relatively higher coverage ranging from 41% to about 120%. Plot coverage for Mbezi is very low. Plot coverage in Msasani spreads across the range, that is between 11% and 90%. Low plot coverage is also notable in Ubungo (Figure 10.9). While Mbezi was designed as a low-density area, higher plot coverage in Kariakoo and Msasani are a result of market forces to maximise profit from rental accommodation.

![Figure 10.9: Plot coverage for Kariakoo, Mbezi, Msasani and Ubungo.](image)

When floor area ratios at plot level is considered, the result is generally low ratios ranging between 0.5 and 1.0. Only Kariakoo has ratios ranging from 0.5 to 5.0 (Figure 10.10).

![Figure 10.10: Floor area ratio for Kariakoo, Mbezi, Msasani and Ubungo.](image)

It is indicative that the general pattern in floor area ratios at plot level across the cases is generally low and with little variations. This observation can attributed to the single storey character of buildings particularly in the two informal settlements of Msasani and Ubungo and the relatively larger plot sizes in Mbezi, even though there are houses with two to three storeys in Mbezi.
10.5.3 Floor area ratio and land coverage at block level

Density expressed as number of houses per hectare, occupancy characteristics, plot coverage and plot floor area ratio do not provide an explicit magnitude of intensity of development of urban types especially where there are houses with more than one storey as the case is for Kariakoo. The number of houses per hectare is therefore misleading if parameters of house forms are not defined and vividly identified. For example, there are buildings with more than seven storeys in Kariakoo, but when a housing unit per hectare is used to calculate density, and a house with several floors is counted as one, this will be misleading. It is the floor area ratio at a block level that provides the dimension of intensity of development of an urban type. To unveil density variation in the case study areas, two variables of land coverage and floor area ratios at block level are examined. Density at block level includes those facilities that are usually part of the daily requirements of urban types. Together with developments on plots, it includes half the width of the surrounding roads and services such as shops, incidental open spaces at cluster or block level (refer respective sections in case study areas). When blocks are employed as units of analysis, land coverage and floor area ratios in the four case study areas show variations within and between cases as illustrated in Figures 10.11 and 10.12.

![Figure 10.11: Comparison of land coverage for Kariakoo, Mbezi, Msasani and Ubungo at block level.](image1)

![Figure 10.12: Variations in floor area ratios for Kariakoo, Mbezi, Msasani and Ubungo.](image2)
It is apparent that while Msasani reveals higher land coverage than the other three cases but also with variations within the case, it has low floor area ratios compared to Kariakoo. Variation in coverage is related to the amount of open land that is either yet to be built or presently existing as informal squares or un-built courtyards, and streets within the settlement. Little variations in terms of land coverage and floor area ratio can be noted in Kariakoo and Mbezi. Ubungo shows negligible variation in land coverage and floor area ratio. If horizontal extension and land coverage are taken into consideration, then Msasani and Kariakoo portray rather horizontally densified urban types whose negative consequences have been more apparent than in Mbezi and Ubungo. When vertical densification and increase in floor area ratio is considered, Kariakoo prominently depicts a vertically densified urban type that optimises land but also depicting negative externalities associated with unregulated vertical densification.

10.6 Spaces and space use

Across cases, inventory on the types of spaces does not seem to vary considerably. Variation is observed when levels of development, ownership, use and usability levels are examined. In Kariakoo, for example, the observed types of spaces included courtyards, paved sidewalks, streets and road reserves. Most of the spaces in Mbezi are yet to be paved. These include spaces within plots, streets and road reserve, cul-de-sacs and un-built plots within the settlement. In Msasani, space types range from courtyards in individual dwellings, voids surrounded by buildings, ‘informal squares’, streets and footpaths. In Ubungo, observed spaces included courtyards, informal squares, streets and footpaths.

When the two main variables of activity diversity and activity intensity are used to examine levels in space use, Kariakoo, Msasani and Ubungo reveal similarities in activity diversity but with variations in activity intensity. While activity diversity for spaces in Kariakoo and Msasani was observed to be 10 and 8, diversity in Ubungo was observed to be a bit higher, that is 12 (Table 10.3).

Table 10.3: Space utilisation for Kariakoo, Msasani and Ubungo

<table>
<thead>
<tr>
<th>Type of activity</th>
<th>Kariakoo</th>
<th>Msasani</th>
<th>Ubungo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile activities</td>
<td>ST1</td>
<td>ST2</td>
<td>OS1</td>
</tr>
<tr>
<td></td>
<td>3136</td>
<td>8257</td>
<td>151</td>
</tr>
<tr>
<td>Stationary activities</td>
<td>485</td>
<td>372</td>
<td>0.5744</td>
</tr>
<tr>
<td>Activity intensity (Mobile)</td>
<td>0.2665</td>
<td>0.5353</td>
<td>10</td>
</tr>
</tbody>
</table>


Higher activity intensity is notable in Kariakoo especially when mobile activities are analysed separately. High level of space utilisation was also recorded in Ubungo with moderate level in Msasani. Variations in level of utilisation of spaces (particularly activity intensity) has to be linked with the type of spaces and its location, the type of major functions and building uses in each urban type and the size and functions supported by each space within which such uses were observed to take place. Within Kariakoo, for example, it was observed that substantial volume of mobile activities was taking place along Uhuru Avenue (ST2) which is one of the major shopping streets in Kariakoo. This resulted into higher utilisation intensity (3.96) of mobile activities but low stationary activities (0.53). The higher intensity was also due to the fact that the space under which such activities have been taking place was rather smaller that is 695 square metres. Space utilisation intensity was noted to be
even higher than in the city centre. The highest utilisation level of spaces within the city centre was noted to be 0.7538 (Kimaryo, 1996). Although the general assumptions have been that within the city centre, spaces are more intensively utilised than in its peripheral settlements, the observation made in the present study show that spaces in many other settlements especially where income-generating activities are attached to these spaces, have equally higher utilisation intensities.

Within Ubungo, an informal square (SQ1) with an area of 357 square metres accommodated varied functions of mobile and stationary nature such as children play, sitting and talking, walking, selling of cooked food and car parking with space utilisation intensity of 0.9143. In Msasani an informal square (OS2) covering 326 square metres was a centre of stone crushing to about 18 stone crushers apart from the buyers who visit the area to purchase crushed stones. Established utilisation intensity from this space was 0.9546. Due to increased building activities in these settlements with increasing tendencies for maximising plot coverage, only smaller size spaces are remaining that which are in many case intensively utilised.

One important observation worth discussing is the type of activities in these spaces. Space uses are primarily related to income generating activities apart from walking activity that was dominant across the cases. Stone crushing, selling of cooked foodstuffs, parked carts for hire, shoes shining, food preparation, selling of used clothes are some of the observed uses in these spaces. Even in spaces located in the inner parts of the settlements, such as SQ3 in Msasani, income-generating activities such as food preparation, frying and selling of chips characterised uses observed in this space. Space uses attached with income-generating activities have to be related to the general poor economic conditions of many households within the city and in relation to the context of proliferating informal sector activities. These spaces are more of focal points for petty trading than recreation and relaxation.

However, spatial qualities in these spaces are rather poor to support the observed type of activities. This is due to increased building densities in the study settlements. The lack of furnishing and proper management of the type of activities taking place have lead into poor quality of spaces in terms of use. The semi-public and private character of some of the spaces has had the consequence of what was observed to be as no-body’s space resulting into uncared for spaces. Moreover, the informal character of these spaces was manifested in some spaces being too small to be put into effective use.

10.7 Spatial qualities

Across the four cases, it was observed that walking, standing and sitting activities were poorly promoted due to the lack of standing and sitting facilities such as benches, standing supports and the poor pavement materials of the walkways, footpaths and streets. It was also noted that the absence of limited number of shade devices such as trees and covered street arcades have rendered sitting, walking and standing activities to be poorly supported. Unlike Kariakoo, Msasani and Ubungo, the low-density character of Mbezi has not guaranteed mutual protection in terms of walking along the streets when the issue of security is closely examined. The lack of streetlights in all cases makes protection against crime and the sense of insecurity more pervasive especially during the night. This has rendered the quality of spaces to be poor. The very narrow footpaths, in some cases being less than one metre in Msasani are uncomfortable and unsafe for walking through. In all the four cases, the dusty and muddy conditions of spaces during the dry and wet seasons have rendered walking in these spaces uncomfortable. In some spaces, garbage was haphazardly dumped or burnt creating polluted and smoky environments. An assessment of observed spatial qualities for spaces within the four case study urban types is summarised in the following table.
Table 10.4 Spatial quality characteristics for Kariakoo, Mbezi, Msasani and Ubungo

<table>
<thead>
<tr>
<th>Variable</th>
<th>Kariakoo</th>
<th>Mbezi</th>
<th>Msasani</th>
<th>Ubungo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>(i) Paved roads and paved slabs for pedestrian along major streets.</td>
<td>(i) Poor surface conditions, unpaved roads, water logged soil render use of footpaths un conducive.</td>
<td>(i) Poor pavement materials for streets, walkways and footpaths.</td>
<td>(i) Narrow, muddy and dusty streets and footpaths that are in poor condition and are uncomfortable for walking.</td>
</tr>
<tr>
<td></td>
<td>(ii) Minor streets are poorly surfaced.</td>
<td>(ii) Too narrow streets and footpaths. Streets encroached upon by vending activities. Footpaths have been squeezed by higher plot coverage.</td>
<td></td>
<td>(ii) Blocked footpaths outlets to Mandela Road necessitate people to walk longer distances.</td>
</tr>
<tr>
<td></td>
<td>(iii) Streets lack shade and soft landscape elements such as lawns.</td>
<td>(iii) Lack of walkways along Bagamoyo Road makes walking unsafe.</td>
<td>(iii) Distribution of footpaths is uneven thus making walking unconducive.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>It is uncomfortable walking during the day because of dust and glare.</td>
<td>(iv) Walking is generally poorly promoted in terms of quality requirements for walking.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(iv) Accommodate higher volumes of activities but not overcrowded (4.7 pedestrians per minute).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(v) Activities along the Lumumba Road reserve are liable to traffic accidents.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(vi) Walkways are being infringed by parked cars, carts, informal business and street vending activities.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standing</td>
<td>(i) Planted trees along Lumumba Street provide shade for standing activity.</td>
<td>(i) Sitting is done on individual plots with good quality grass lawns.</td>
<td>(i) There are few trees as supports for standing activities.</td>
<td>(i) Limited standing activities due to lack of standing supports.</td>
</tr>
<tr>
<td></td>
<td>(ii) There are no standing supports along Uhuru street.</td>
<td>(ii) Planted trees provide shade and promote sitting in outdoor areas.</td>
<td>(ii) Private ownership of informal squares limits standing activity in such spaces.</td>
<td>(ii) Semi-private nature of fronting houses limits standing activity.</td>
</tr>
<tr>
<td></td>
<td>(iii) Standing supports are hardly available limiting the number of standing activities. Quality for standing is generally poor.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sitting</td>
<td>(i) Sitting is done on movable benches, stools, and kerbsides. No sitting facilities are available.</td>
<td>(i) Well developed courtyards and outdoor spaces. Ground treatment including grass lawns and provision of trees for shading makes on-plot outdoor spaces conducive for many outdoor activities.</td>
<td>(i) No permanent seats are provided.</td>
<td>(i) No permanent seats are provided.</td>
</tr>
<tr>
<td></td>
<td>(ii) Parked cars obscure view for seated people.</td>
<td>(ii) A few trees in few squares are available.</td>
<td>(ii) A few trees within squares and courtyards provide shade for sitting activity.</td>
<td>(ii) A few trees within squares and courtyards provide shade for sitting activity.</td>
</tr>
<tr>
<td></td>
<td>(iii) Mobile activities also disturb seated people.</td>
<td>(iii) Shading is poor, thus sitting activities are poorly promoted.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(iv) Sitting along Lumumba that has heavy vehicular traffic is unsafe.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection</td>
<td>(i) The presence of many people enhances mutual protection against crime and vandalism.</td>
<td>(i) The low-density character of the settlement does not enhance security against crime and burglary.</td>
<td>(i) The presence of many activities and people provide a feeling of mutual protection and security.</td>
<td>(i) The presence of many people during daytime provides a feeling of mutual protection.</td>
</tr>
<tr>
<td></td>
<td>(ii) Except for Lumumba, other streets are not provided with shade for protection from the hot and humid climatic elements of hot sun and rainfall.</td>
<td>(ii) Security is not guaranteed along streets. Due to unpaved condition of streets, activities along the streets are limited.</td>
<td>(ii) Inadequate shading makes protection against scorching sun poor.</td>
<td>(ii) Lack of trees along footpaths makes walking unprotected from the scorching sun.</td>
</tr>
<tr>
<td></td>
<td>(iii) Lack of streetlights reduces natural surveillance within the spaces.</td>
<td>(iii) Lack of streetlights makes walking during night times unsafe.</td>
<td>(iii) The lack of streetlights create a sense of insecurity.</td>
<td></td>
</tr>
</tbody>
</table>
10.8 Summary

It has been shown that there are variations in terms of rate and pattern of development of urban types. Due to the availability of buildable land in Ubungo, rapid horizontal densification has been taking place as contrasted to that of Msasani where horizontal densification has more or less reached ‘saturation’. The transformation of the low rise Swahili type of houses into multi-storey apartment buildings characterise housing development in Kariakoo. Despite the fact that land is increasingly being put into intensive use by this type of houses, unguided high-rise constructions have resulted into poor spatial and environmental qualities. It has been argued that the intensive utilisation of land in Kariakoo as manifested in high land coverage and floor area ratio is linked with the operating land market forces whereby developers are vying for profit maximisation through renting of apartments. This has been a private sector’s response to new demands for commercial and residential spaces in Kariakoo. However, the type of redevelopments perpetrated by market forces has resulted into externalities of both spatial and environmental quality. The observed poor qualities in terms of blocked ventilation, view, un-cared for spaces between buildings and water and sanitation problems are also linked with the piecemeal, plot-by-plot redevelopments that limit adoption of flexible designs of high-rise buildings and generally, a comprehensive plan for the area. Presently, high-rise buildings are being constructed on plots that were designed for low-rise Swahili type of houses. Further, the poor development control in terms of monitoring redevelopment of buildings by local authorities contributes to the present state of affairs in Kariakoo. Ineffective development control is attributed to poor record keeping and generally, poor information management system by these authorities.

Generally, planning intervention across cases has been less effective. The zoning plan for Kariakoo is not heeded to. Upgrading plans for Msasani and Ubungo do not reflect individual plot and property boundaries as recognised by the residents. They depict ‘drawing board plans’ rather than plans based on actual conditions in these settlements. Unguided housing development in Mbezi has resulted into blockage of streets and cul-de-sacs and encroachment of sites earmarked for public services.

Although Msasani has been viewed as high-density settlement, results from floor area ratios reveal low-density characteristics. The horizontal densification of this settlement with high plot coverage constitute a hindrance to effective provision of infrastructure. Besides, it does not optimise land and amenity aspects of the built environment such as plot exposure, cross-ventilation, view, lighting and effective management of solid and liquid wastes.

Extensive plot coverage (in Msasani and Kariakoo) has resulted into smaller spaces with high activity utilisation intensities and diversities. Due to poor management, furnishing and informal character of the type of activities that are taking place in these spaces, spatial qualities have been noted to be poor. Unless effective urban planning policies and guidelines are instituted and implemented, the poor quality of built and unbuilt spaces will continue to undermine desirable urban development and redevelopment processes in Dar es Salaam. The question that is worthy raising here is, what urban types should be considered for the future development of the city of Dar es Salaam that will ensure optimal use of land and infrastructure without compromising spatial and liveability qualities? This question together with the key issues raised in the previous chapters are the subjects of discussion in the subsequent chapter.
Table 10.5: Cross case analysis: Summary of main issues and planning and policy questions

<table>
<thead>
<tr>
<th>Issue</th>
<th>Kariakoo</th>
<th>Mbezi</th>
<th>Msasani</th>
<th>Ubungo</th>
<th>Planning and policy questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settlement development process</td>
<td>Market driven plot-by-plot redevelopment of single storey Swahili type of houses into high-rise apartment buildings with minimal guidance from the authorities.</td>
<td>Low density designed settlement to cater for middle and high-income group who could not get access to the sites and services projects of the 1970s and 1980s.</td>
<td>Informal land subdivision and house development as triggered by informal land markets and developers urge to maximise plot coverage.</td>
<td>Informal land markets for subdivision and subletting of plots with rapid densification trends.</td>
<td>How can market led redevelopment and informal settlement subdivisions be guided so as to ensure optimal use of land, infrastructure provision / improvement and sustained spatial qualities in formal and informal urban types?</td>
</tr>
<tr>
<td>Planning intervention and its effectiveness</td>
<td>Redevelopment plans stipulating height zoning, plot coverage, floor area ratio and building uses. To the larger extent these plans have not been implemented.</td>
<td>Plot subdivision plan. Original layout plan was revised due to haphazard housing development.</td>
<td>The prepared upgrading plans did not take into consideration the existing property boundaries. Plans have not been effectively used.</td>
<td>Upgrading plan did not take cognisance of existing plot boundaries. They have not been effectively used.</td>
<td>What planning approach and development control mechanisms should be instituted to address both development and redevelopment processes of houses in formal and informal urban types? How can plots be designed to flexibly accommodate different house forms in formal and informal settlements?</td>
</tr>
<tr>
<td>House forms</td>
<td>Mixed character of low-rise Swahili type of houses with high-rise apartment buildings. This has resulted into loss of spatial qualities.</td>
<td>Predominantly large detached, one to three storey house types on larger plots.</td>
<td>Predominantly low-rise, single storey, varying sizes in a compact layout.</td>
<td>Low-rise single storey, variable sizes on relatively larger plots with rapid house densification.</td>
<td>What house forms should be adopted so as to ensure optimal use of land and changing building uses in formal and informal settlements? What are the pre-requisites for the introduction of these new house forms?</td>
</tr>
<tr>
<td>Plot characteristics</td>
<td>With the exception of institutional buildings and other re-adjusted plots, the dominant plot size is 13 x 20 (260m²).</td>
<td>Dominant plot size is 30 x 40 (1200m²).</td>
<td>Variable but the majority of the plots are within the range of 100 to 300 m².</td>
<td>Variable but the majority of the plots are within the range of 200 to 500 m².</td>
<td>What plot sizes should be adopted to accommodate flexibility in terms of house forms while maintaining optimal use of land, minimal infrastructure costs and liveability and spatial qualities?</td>
</tr>
<tr>
<td>Density characteristics</td>
<td>High land coverage and floor area ratio both at plot and block level.</td>
<td>Low land coverage and floor area ratio</td>
<td>High plot and land coverage but low floor area ratio.</td>
<td>Relatively low coverage and low floor area ratio.</td>
<td>At what density should urban types be developed to optimise land while maintaining spatial qualities? How can this fit within prevailing socio-cultural, economic and physical conditions of the society?</td>
</tr>
<tr>
<td>Spaces and space use</td>
<td>Road reserves and street pavements have been intensively used but poorly maintained / furnished to support activities taking place in these spaces.</td>
<td>Streets, cul-de-sacs and road reserves are yet to be paved. Due to low density these spaces have not been frequently used.</td>
<td>Intensively used spaces but poorly managed with poor spatial qualities. They lack furnishing, shading and lighting.</td>
<td>Intensively used streets, footpaths and squares. They lack shading, furnishing and lighting.</td>
<td>How can spaces and space use be organised to promote observed livelihood activities and social contacts among residents within formal and informal urban types?</td>
</tr>
</tbody>
</table>
CHAPTER ELEVEN

EMERGING ISSUES, RECOMMENDATIONS AND CONCLUSION

In this study it has been shown that rapid urbanisation and low-density urban types have greatly influenced the sprawled city structure of Dar es Salaam. The disadvantages of this pattern of development have been manifested in terms of difficulties in infrastructure provision and underutilisation of scarce resources, particularly land. Further, it has been shown that the market-led settlement development and ineffective planning are contributory factors to unguided densifications in informal and formal settlements. Unguided densification has led to poor spatial qualities. Due to ineffective planning and management, spatial qualities in observed spaces have equally been poor, despite being intensively utilised. In this chapter, the relevance of the theoretical premises for this study is being discussed and key variables discussed in the preceding chapters reflected upon. A comparison with situations in other countries is also made as a springboard towards working out some general planning and policy recommendations.

11.1 The relevance of the theoretical premises to the context of this study

11.1.1 The relevance of classification theory in the study of urban types

One of the theoretical premises that has been reviewed in this study is Rapoport’s account on the identification and classification of vernacular architecture. The main argument that has been put forward by Rapoport is the concern over the use of multiple descriptors (polythetic as opposed to monothetic) in the classification process. Further, Rapoport discusses the need for clarity in describing the scales in the classification process, namely, whether the study focuses on properties or on causes and effects of the phenomena. As a general framework, it provides a base on which various fields of study can apply with respect to their focus of study. It is interesting to note that in the present study the basic classificatory variables of house forms, density, spaces and plot characteristics played a significant role in classifying urban types within the context of Dar es Salaam. It is clear that the application of these variables was rather, polythetic. However, one of the arguments that is being raised out of this discussion is the question of scale in which the study is being carried out. The question to ask is that: How many descriptors should be considered adequate to guarantee the ensuing classification as an adequate and valid one? Although Rapoport recommends many descriptors, our argument has been based on the reasoning of the scope, purpose and level of generalisation required to characterise the object of the study. That is, depending on the scope of the study, the number of descriptors will vary from one study to the other and presumably, the more the descriptors, the more complicated the classification will be. In this study, for example, the geographical scope of the study has been the whole city of Dar es Salaam. Given this wider scale of operation, the number of descriptors was limited to facilitate the classification and characterisation of urban types for the whole city area.

11.1.2 Rapidly urbanising cities in the context of typomorphological theories

Another theoretical premise that has been reviewed is that related to typomorphological research. Although the theoretical account in this field remains segmented, that is drawing its origin from various fields of architecture, geography and planning, Moudon (1997) discusses the convergence from these fields especially on agreements towards understanding the city. Moudon recounts three major points. The First is that urban form is defined by the three fundamental elements of namely: the buildings, their related open spaces, and the streets. The second is that urban form can be understood at different levels of resolution. Commonly,
four levels have been recognised namely: the building or plot, the street or block, the city and the region. The third is that urban form can only be understood historically since the elements of which it is composed undergo continuous transformation and replacement. Thus, form, resolution and time constitute the three major converging points of urban typomorphological research (Moudon, 1997:7).

It is important to note however that Moudon’s account on these common grounds from various disciplines is still new and is yet to combine the various fields to come out with a coherent theoretical framework. As Whitehand, the editor of the recently established Journal of the International Seminar on Urban Forms (ISUF) notes:

*Perhaps the greatest challenge of all that faces researchers striving to build intellectual bridges, and hence central to the purpose of this journal is to reconcile or at least clarify the distinctions between different conceptual frameworks.* (Whitehand, 1997:2)

The argument here is that although urban morphology and typological studies have been in debate since the 1960s, a coherent theory combining the various filed is yet to be developed. The idea here is not to discount the focuses and richness in each field but to discern the complexity that arises when a particular study in question combines variables cutting across these fields. For example while the Italian typomorphologists have insistently analysed urban tissues and architectural artefacts for the purpose of cultural, collective memory and for the development of design theory, the British morphologists have endeavoured to understand city building process employing plan units in what has been referred to as urban landscape management (Moudon 1994). The Italian morphologists have used morphological studies as a basis for 'reading the city' (Bandini, 1992, 1993). The French school of thought focuses on critical theory, in search for authentic architecture, the city understood as a socio-physical phenomenon. The question to ask is: How relevant is this theoretical framework in the analysis of urban types within a city context that is different from where it draws it origin? One argument that is being put forward is the fact that at least the three notions of form, resolution and time have been relevant in the analysis of urban types because they guided the identification of the units of analysis at both city and settlement level. On the question of resolution namely; the buildings and plots, the blocks and the city have been employed both to classify urban types at city level and the analysis of these types at block level. The notion of time was reflected in the analysis of evolution and subsequent development of the city and settlements employing the time series aerial photographs.

However, one of the limitations of the morphological and typological approaches to urban analysis in this context is the segmented nature of these theoretical bases as outlined above but more specifically, is their lack on qualitative account of the built and non-built spaces. The emphasis on architectural, morphology and the socio-physical study as advocated by the three schools of thoughts sidelines the focus in quality of the built spaces to everyday life of the residents. In poor countries’ cities like Dar es Salaam, it is difficult to figure out how the question of collective memory can be employed in designing future housing areas of the city. While not denying the fact that there are artefacts that draws their architectural relevance since the colonial period, the question of informal settlement processes being the major forces of city development limits the applicability of typological designs emulated from collective memory. The fact that use and spatial quality of the built environments are not pronounced in this theoretical framework, and in cities where poverty and poor living environments characterises city development and growth, the total adoption of this theoretical premise becomes limited.
11.1.3 The rationale of normative planning theories for planning interventions

In all levels presented in this study, planning has been operative. At city level, Master Plans have been prepared primarily as tools for guiding development at the city scale. At lower levels, planning has been exercised in the form of neighbourhood plans for newly emerging formal settlements and upgrading plans for informal settlements. Having analysed these plans, there is one common observation that emerges across the cases and at all levels. This is the conflict between the residents and the planners in the course of making or implementing the plan (refer case study chapters). The 1968 master plan recommendations for Kariakoo, for example, were not implemented because of protests from the people against involuntary resettlement. In Ubungo Kibangu, residents resisted resettlement to pave way for the development of the light industries. Similar conflicts have been reported from Mbezi and Msasani. In view of these failures, the question is: Does planning matter? In other words, how should planning be conceptualised to address the prevailing city dynamics therein accommodating the needs of the people without compromising public goods and amenity?

One of the major observations in this study is the fact that informal settlements are largely influencing the spatial structures of rapidly urbanising cities, and further, that market-led housing development seem to overshadow public planning interventions. Although it is acknowledgeable that land markets are *prime facie* indicators of probably the best use of land, experience shows that they tend to ignore the demand of non-profit making uses such as land for recreation and spatial qualities within and around built environments. It is from these deficiencies planning derives its justification as a regulatory instrument in the form of state intervention in the urban land market. Kombe and Kreibich argue that:

*The market cannot be trusted to produce a rational and efficient land-use system which would be able to allow for a long-term accommodation of future growth. S a scarce resource, urban land requires stewardship by legitimised public bodies who are able to balance short term against long term needs and the claims of one interest group against another. Governments must set rules regarding the use of land to avoid economic, social and physical chaos.* (Kombe and Kreibich, 2000: 29)

The question raised above is how planning intervention should be conceptualised? One of the recent theoretical accounts on conceptualising planning intervention has been discussed by Watson (2002) in an article titled, the *Usefulness of Normative Planning Theories in the Context of sub-Saharan Cities*. Watson brings in focus three theoretical accounts, namely; Forester’s and Healey’s communicative planning, Sandercock’s theory of planning in multicultural societies and Fainstein’s political economy or ‘just city’. The premises for communicative planning underscores the need for interaction among stakeholders and interest groups in communicating ideas, forming arguments, debating differences in understanding and finally reaching consensus on a course of action replacing detached, expert-driven plan-making as the primary activity of planners. Sandercock’s radical planning model has its roots in advocacy planning happening most often outside the formal structures of the state and economy. Fainstein’s argument of the just city points to the decision making process and the impacts of the decision. She argues that the impacts of the decisions have to be judged for their impact on equity and democracy. Further, Fainstein argue that in poor countries, where poverty and survival are the central issues for the vast majority of the inhabitants, the question of distributive effects of planning decisions and more specifically on urban spatial forms is very crucial (Watson, 2002). The role of the planner within this framework and according to Watson is, to link knowledge to action, to empower the oppressed and marginalised groups (Watson, 2002:32). Further Watson underscores the significance of this theoretical account especially in sub-Saharan African cities where poverty and survival are
the central issues for the vast majority of the inhabitants and whose voices have been suppressed:

*The recognition that there are ‘different voices’ within civil society which represent what may be valid and valuable points of view is vitally important in Africa where societies are anything but homogeneous and where some voices are often repressed by violence of tradition.* (Watson, 2002:42)

Further, Watson emphasises the significance of planning at the level of the city as whole as opposed to a focus on local groups or project initiatives and how this wider level set parameters for more local actions. However, some of the limitations within the normative planning theoretical framework has been cited as the difficulties in achieving consensus, movement of population delimiting permanency in decisions made and actions being implemented, and the mono-functional spatial forms of many African cities that promote sprawl. While this theoretical base plays an important role in redressing the forms of planning intervention required, it will be difficult to realise if the process of democratisation will not go hand in hand with the planning intentions. It points to the need for effective participation of people in their everyday life. Further, it points to the redefinition of the planning activity and new roles planners have to play. Planning being a ‘process’ rather than a ‘product’ and the centre of planning being the stakeholders.

### 11.1.4 The contradictions between formal and informal

Over more than three decades, the concept ‘informal settlements’ have drawn a wider acceptance among scholars as opposed to synonymous concepts such as unplanned, squatter, slum, spontaneous and illegal settlements. In the past, these concepts were unilaterally employed to depict settlements that evolved outside the official planning procedures. The view towards these settlements has changed considerably from typically viewed as, for example, ‘fungus’, colonies of misery and more generally ‘problems’ of cities to notions of ‘potential’ housing areas for the urban poor. Further, there has been a growing consensus that instead of viewing informal settlements from an illegality point of view, the focus has to be paid to the development processes that characterise their evolution. By this argument, it can be said that formal settlements largely evolve from formally instituted development guidelines.

Having gone through the empirical studies in Kariakoo, Mbezi, Msasani and Ubungo a number of contradictions emerge between formal and informal. The defiance in building height, extensive plot coverage and uncontrolled land transactions, characterise the development process of the inner city ‘formal’ settlement of Kariakoo. The question that has been raised in relation to this development character has been: Is Kariakoo informalising when in relation to these development trends? In Msasani and Ubungo informal settlements it was noted that residents have established plot boundaries that were adopted by Land officials when surveying the plots. Several plots have been surveyed and registered with long-term titles. While in non-surveyed plots house development has been unguided, in surveyed plots residents have developed houses, some with building permits from the authorities. This contradicts the notion that informal settlements are chaotic, illegal, spontaneous etc. The question that ought to be raised is: Are informal settlements formalising when related to the development processes?

The main argument is that, the question of formality or informality of settlements is increasingly becoming less important in so far as all settlements continue to transform and densify in what can be viewed as the *formalisation* of the informal and *informalisation* of the formal settlements. What emerge are new forms of settlements that would require redefinition based on variables such as density, liveability and spatial qualities offered to the residents. This observation points to the need of rethinking and developing new concepts that are
consistent with the on-going settlement development dynamics and resulting forms in place of the conventional concepts of what have been frequently depicted as formal or informal settlements.

11.2 Planning and policy issues

The planning and policy issues that are being raised for discussion include the observed rapid urbanisation and city sprawl, limited impact of conventional planning interventions, density as an influential parameter in planning and infrastructure provision, house forms as a variable of density and optimal use of land and infrastructure, plot characteristics and its influence on urban types and outdoor spaces as living and working spaces in tropical countries.

11.2.1 Rapid urbanisation and city sprawl

It has been shown that the rapid urbanisation trends that characterise the growth of Dar es Salaam have resulted into a sprawled city with low-density urban types. Only urban types within the city centre reveal relatively higher density characterised by floor area ratios ranging between 0.4 and 2.0 and land coverage of up to 50%. The overall pattern of city growth is considered one of the most disadvantages especially for the rapidly urbanising cities like Dar es Salaam where neither conventional planning intervention nor financial capacities of the local authorities are in a position to cope with the negative externalities of the sprawling city. Kombe has made the same observation when he notes that:

The sprawling extent of housing development including development of housing on derelict or marginal lands in Dar es Salaam and among the rapidly growing municipalities, are some but important indicators suggesting that current urbanisation trends have outpaced the existing public institutional, administrative and financial capacities. (Kombe, 1995:193)

Dar es Salaam can be considered one of the inefficient cities with regard to laxity in enforcing development guidelines. As noted in Chapter 3, the horizontal expansion of Dar es Salaam has reached an extent where disadvantages in terms of transport costs and the problems of servicing the extended city are increasingly becoming unsustainable and beyond the limit of acceptable thresholds of city growth. Policies and planning actions addressing city sprawl are now more calling than ever before. In terms of policies, the control of city expansion and sprawl have been recognised and attempt to address this issue has been made under section 4.3 of the Tanzania Human Settlement Policy (2000). Which states:

... control over physical growth of urban areas is necessary in order to reduce urban sprawl; to facilitate economy in the use of land and in provision of infrastructure services; to protect the urban environment; and to ensure a functional and efficient urban system. The uncontrolled expansion of towns is undesirable because in certain areas it encroaches on productive rural agricultural and pastureland, and increases the costs of the provision of infrastructure. The government shall ensure that land is used efficiently and effectively. The future trend will be vertical growth rather than horizontal. The planning machinery shall put a limit to municipal physical growth after which development shall be directed to satellite towns. (Human Settlement Policy, 2000:44-45)

Further to vertical growth as a strategy in achieving compact city development and establishment of satellite towns, the policy recommends that:

All urban land use plans shall aim at more intensive use of land compared to the existing situation. Space and planning standards shall be revised so as to promote more compact form of building in all urban areas. Vertical development in towns shall be encouraged as it has the following advantages: The reduction of physical extent will reduce the cost of installing, operating and maintaining infrastructure facilities, maximisation of use of land and intra-urban distances will be shorter. Research shall have to be regularly conducted so as to know the capacity of the towns in
implementing this concept. Moreover, research shall be undertaken to determine the form and pattern of development suitable for each specific urban area. (Human Settlement Policy, 2000:94)

A close examination of these policy recommendations in relation to the revised Space Standards for Residential Development reveals some contradictions that warrant discussion. For example, while the 1978 Space Standards for planning and housing development recommended the minimum plot size of 240, 350 and 480 square metres for what was referred to as ‘slum areas’, low cost housing and normal housing development respectively, the 1999 Space Standards provide for larger plot sizes ranging between 480 and 800 square metres as high density, between 801 and 1,600 square metres as medium density and between 1,601 and 4,000 square metres as low density. If high density in 1,999 standards is synonymous to plot provisions for the 1976 ‘slums’, low cost and normal development standards, it is apparent that the present standards do not seem to take cognisance of the fact that larger plot sizes will have cumulative effects on the sprawl of the city, a phenomenon that the policy envisages to address. It is surprising therefore that while the policy advocates compact development and containment of city sprawl, the ensuing planning standards are on the contrary, promoting city sprawl.

The 1978 Space Standards conceived high, medium and low density plots in relation to type of dwelling and the number of dwelling units per hectare and not in terms of plot size. The provision was made for detached, semi-detached, row or group of houses and what was described as multiple family dwelling. In the case of detached high-density housing category, recommended net density was between 25 and 30 dwelling units per hectare and gross density of 15 to 18 units per hectare. This implied that the plot sizes for net densities would have ranged between 333 and 400 square metres. It seems that the revised Space Standards for the residential areas do not complement the Human Settlement Policy objectives that envisage compact layout and containment of city sprawl. Besides, the fact that the 1999 Space Standards do not stipulate the type of buildings to be developed in the three density categories they pose more difficulties to implement and achieve the policy objective especially vertical development as stipulated in the Human Settlement Policy. The argument here is not to favour stringent development guidelines but rather to address the question of city sprawl through compact development.

Within the United States, the New Urbanism movement is being experimented to address the question of sprawled American cities. The New Urbanism is a design paradigm that envisages promoting the creation and restoration of diverse, walkable, compact, vibrant and mixed-use communities. The paradigm advocates the containment of housing, work places, shops, entertainment, schools, parks, and civic facilities essential to the daily lives of the residents, all within easy walking distance of each other. It aims at increased use of trains and light rail, instead of more highways and roads. It has been estimated that there are over 500 New Urbanist projects planned or under construction in the United States alone, half of which are in historic urban centres (http://www.newurbanism.org/page416429.htm).

Proponents of the New Urbanism have developed ten principles of design paradigm. These principles that can be applied to projects at full range of scale from a single building to an entire community include: walkability, connectivity, mixed-use and diversity, mixed housing, quality architecture and urban design, traditional neighbourhood structure,

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1 It is important to note that while the human settlement policy came out of print in the year 2000, the 1999 space standards were prepared concurrently with the policy, the latter trying to address the objectives of the policy.

2 Leaders in this design trend came together in 1993 to form the Congress for the New Urbanism (CNU), based in San Francisco. The founders are Andres Duany, Elizabeth Plater-Zyberk, Peter Calthorpe, Daniel Solomon, Stefanos Polyzoides, and Elizabeth Moule, all practicing architects and town planners.
increased density, smart transportation, sustainability and quality of life\textsuperscript{3} (http://www.newurbanism.org/page416429.htm). The central design tool within this paradigm is a revised neighbourhood concept characterising the above-mentioned features.

Despite the big differences between Dar es Salaam and the American cities, there are a number of features from this paradigm that can be borrowed and adapted in the Dar es Salaam context, for instance increased density, walkability, and spatial quality features, the design for walking to services, connectivity, mixed land uses and mixed housing appear relevant design features for Dar es Salaam as well. However, the adaptation of these features ought to take into consideration the differing character in city sprawl of the US and that of Tanzania. While in the US city sprawl was rather ‘government supported’ through subsidy policies on housing and vehicles and by way of construction of highways linking the suburbs and city centres, the Dar es Salaam sprawl is taking place under the dictates of poverty without housing subsidies, highways and with limited ownership of motor vehicles. Houses in the peri-urban settlements of Dar es Salaam are being built in the ‘bushes’ or agricultural lands where roads and water mains are non-existent. Poor households suffer most since they have to walk longer distances to catch the bus and have to pay high prices in terms of bus fare to their work places and other destinations. The fact that Dar es Salaam represents a ‘mono-centric’ city structure and with major commercial, recreational and employment activities concentrated at the centre, city sprawl exacerbate further the problems related to transport and traffic to poor households residing in peri-urban settlements.

Of more significant impact to Dar es Salaam city sprawl is the economies of scale in terms of costs on utilities, efficient utilisation of communal services and facilities and per capita expenditure on infrastructure. Habitat for example observes that:

In Dar es Salaam, there was a decline in expenditure in services and infrastructure of 8.5% a year from 1978/9 through 1986/7 measured in constant currency units. If Dar es Salaam’s population growth is taken into account, the per capita decline in expenditure comes to 11% per year over the period studied. While the Tanzania’s economy as a whole was stagnating during much of this period, the decline of urban infrastructure fabric was occurring at a much more faster rate. (Habitat 1996:91)

The New Urbanism ideas focusing on optimal use of land and infrastructure will therefore be of more relevance in contemplating on how to manage the sprawling city of Dar es Salaam.

Some of the planning responses addressing the problems of city sprawl have been put forward by a number of scholars. Dennis Rondinelli (1983) in Kombe (1995) for example

\textsuperscript{3} The New Urbanism advocates the following design principles: \textbf{Walkability}: Most things within a 10-minute walk of home and work, Pedestrian friendly street design, pedestrian streets free of cars in special cases. \textbf{Connectivity}: Interconnected street grid network disperses traffic & eases walking and high quality pedestrian network. \textbf{Mixed-use & diversity}: A mix of shops, offices, apartments, and homes on site. Diversity of people, of ages, classes, cultures, and races. \textbf{Mixed housing}: A range of types, sizes and prices in closer proximity. \textbf{Quality architecture & urban design}: Emphasis on beauty, aesthetics, human comfort, and creating a sense of place. \textbf{Traditional neighbourhood structure}: Discernable centre and edge, public space at centre, contains a range of uses and densities within 10-minute walk, transect planning; highest densities at town centre; progressively less dense towards the edge. \textbf{Increased density}: More buildings, residences, shops, and services closer together for ease of walking. \textbf{Smart transportation}: A network of high-quality trains connecting cities, towns, and neighbourhoods together, pedestrian-friendly design and greater use of bicycles, rollerblades, scooters. \textbf{Sustainability}: Minimal environmental impact of development and its operations, eco-friendly technologies, respect for ecology and value of natural systems, less use of finite fuels more local production, more walking, less driving. \textbf{Quality of life}: Taken together these add up to a high quality of life well worth living, and create places that enrich, uplift, and inspire the human spirit (http://www.newurbanism.org/page416429.htm).
suggested the strengthening of secondary towns. Richardson (1993) also in Kombe (1995) recommended the adoption of polycentric spatial structures. While the later sound plausible for the sprawling character and city structure of Dar es Salaam, its applicability in terms of developing decentralised concentrations will need special impetus and commitment from the government to develop such centres as poles of economic growth. This can be realised if incentives on investment and efficient infrastructure systems are developed linking the main city centre and these new centres. It is important also to note that efforts to develop high-density urban types have to be addressed concurrently with these planning intentions that aim at addressing rapid urbanisation trends and city sprawl. More commitment and practical solutions need to be worked out towards addressing the Human Settlement Policy objectives in a consistent way.

### 11.2.2 Limited impacts of conventional planning interventions

One of the impediments of planning intervention as observed in the case study areas has been the tendency of planners to stick to conventional approaches while realities have changed quite dramatically. One of the reasons that can be advanced in relation to this tendency is the adoration of Master Planning approach and as a derivative of colonial planning periods. Habitat (1996) for example asserts that master plans in many African cities have failed to capture the speed and direction of growth in the peripheral areas of these cities because these plans are direct descendants of numerous plans produced during the colonial periods.

> While these plans often had an important influence on the overall approach to land-use planning in the central areas of the larger African cities, they failed to capture the speed and direction of growth in the peripheral areas, and in any case were almost never supported by the level of capital expenditure necessary to implement their infrastructural projections. (Habitat, 1996:88)

While the master planning approach was also tied with government involvement in providing housing, infrastructure services, current trends show that the private developers under the market forces are spearheading housing development processes in many ways. The fact that land development processes are currently being influenced by markets whereby buying and selling of land characterise land acquisition and subsequent housing development processes, such as the plot-by-plot redevelopments observed in Kariakoo, planners are still stuck to conventional approaches that presuppose that the government will acquire land and pay compensations and effect development as recommended in the master plans or detailed planning schemes. Conventional planning responses are further curtailed from being effective when it comes to upgrading of informal settlements. The limited planning interventions in Msasani and Ubungo informal settlements are linked to these factors. Little attention has been paid in comprehending the socio-economic context and on-going land market transactions before planning intervention. Besides, these plans have been prepared largely on technical grounding with no or limited participation of the residents. Characterising the limited responses of conventional planning interventions in Tanzania Kombe notes that:

> One of the most apparent criticisms of urban land use planning in Tanzania has been that planners have often prepared town or city land use plans (master plans) giving little attention to the social and economic factors which interact in the urban development process. Moreover, land use plans have been prepared without active participation of the people for whom the plans are being made. Where participation has been adopted, it has often been in the form of placation, that is such attempts have been devoid of substantive contribution from the beneficiaries. In many ways, current land use management problems in Tanzania may be closely associated with the weaknesses inherent in urban land use planning. (Kombe, 1995:215)
The emphasis in this case has been on technical aspects of planning downplaying the
social and economic dimensions of planning that underlie settlement development. While, on
the one hand this tendency could be related to the legislative bases of Town Planning
Ordinance, Cap 378 and government circulars and directives that seem to be overtaken by
events, the general laxity in searching for, and implementing practical solutions to changing
planning problems seem to augment ineffective planning responses as observed across the
cases. Amidst informal land subdivisions and market transactions, conventional planning
responses are increasingly becoming less effective. Reacting to technocratic approach in
planning that over the years is losing touch with reality, Kombe reiterates that:

_In spite of the widening gap between what is envisaged or prescribed in land use plans and what
is happening on the ground, land managers seem to be unaware that they have lost control of the
main housing land development process. Worse still, technocrats do not seem to be concerned with
the fact that sooner or later they will be redundant, if the marginal contribution they are making at
the moment continues… Often time technocrats (particularly planners) may be aware that ‘the old
prescriptions are no longer potent to the new problems’ but are still reluctant to change because of
either personal (vested) interests or restrictive administrative systems. In situations where most land
management activities are centralised as the case is in Tanzania today, innovative capacities may be
further inhibited by orders, directives and circulars which are issued from the centre._ (Kombe,
1995:202)

In the same vein, Nnkya observes that:

_… the hitherto official disregard of exchange value of land and the ambivalence of the land law
about the customary land tenure systems have contributed to a non-participatory, unlawful and unjust
land use planning practice which has been insensitive to land holders’ rights and other interests in
land. It is this insensitive planning practice, it is argued, which underpins the protests that have
culminated in far reaching disputes and conflicts pervasive in land development, undermining the
efficacy of the planning system in the management of urban land use change._ (Nnkya, 1999a: 136)

Understandably, one of the reasons for ineffective planning interventions could be
attributed to the low capacity of the local authorities in terms of manpower, financial
resources and equipment to deal with the sprawled city and the large number of informal
settlements. However, the tendency towards making plans that do not reflect reality such as
those observed in Msasani and Ubungo is counterproductive when such plans are to be put
into actual implementation. Interviews with planners revealed that they hardly spent more
than two days in base map updating before making an upgrading plan. Less number of days
are spent for planning of new areas such as neighbourhood plans. Two days is too short a
time to articulate actual developments in informal settlements especially in situations where
aerial photographs and base maps outdated, which is the case for many settlements in Dar es Salaam. There is a need therefore, to revisit the whole planning in practice and evolve
alternative approaches that are consistent with realities on the ground.

What emerges from the preceding discussion is perhaps the need to sensitise professionals
to acknowledge that ineffective planning has far reaching negative impacts on land
management in the long run. Change in attitudes (particularly value judgement) towards the
quality of desirable urban environments and evolving new and innovative approaches
towards addressing prevailing urban planning problems should constitute major themes in
urban planning agendas. For instance, urban planners should move from the drawing board
(office) to the field to conceptualise and generate plans in collaboration with those who are
being affected or have a stake in the implementation of the plans. It requires both change of
the established norms and procedures of planning so as to address the dynamics spearheading
development and densification in urban types. It points to the redefinition of roles and
position of planners shifting from technocratic prescriptive top-down to participatory bottom-
up planning approaches. These efforts are being slowly instituted by the Sustainable Dar es Salaam Project within the Environmental Planning and Management (EPM) framework. However, these efforts are yet to be reflected in many parts of the city where individual developers effectively participate in formulating and implementing plans.

11.2.3 Density as an influential parameter in planning and infrastructure provision

One of the main factors influencing city sprawl and consumption of land is density. Density is one of the most important indicators and design parameters in the field of housing and human settlement planning. However, there is no such thing as the ‘perfect density’ that is acceptable across cultures and countries. What people see and feel depend on their own background, and to some extent on the layout, building, form and use, and spatial use in an area. Even within a country different social and ethnic groups perceive densities differently. One group might sometimes see a layout that satisfies certain specific group as totally inappropriate. It has been argued for instance that environments having the same number of people may as well be perceived to have different densities depending on the variables employed to evaluate density (Rapoport, 1975:133-141). However, there is a general agreement that higher densities have advantages of efficiency in terms of infrastructure provision and maintenance, economies of scale, efficient utilisation of land, lively neighbourhood life, high levels of access to business for both employees and to markets and increased surveillance in the use of spaces (Acioly and Davidson, 1996; Correa, 1985; Newman, 1973). Yet higher densities (and especially when not well guided) may also be associated with problems of congestion, overloaded infrastructure, poor spatial qualities and urban inefficiencies. Transport, water, drainage and sanitation systems are usually the most affected (Figure 11.1)

![Figure 11.1: Advantages and disadvantages of high and low density (Source: Acioly and Davidson, 1996:7)](image)

But the question which is relevant here is: What urban types can provide for higher densities and still facilitate good spatial qualities? In other words, this is to question what should be considered too high or too low as far as density is concerned? Discussing this question, Acioly and Davidson argue that:

*Densities are too low or too high when they frustrate city diversity instead of abetting it. We ought to look at densities in as much the same way as we look at calories and vitamins. Right amounts are*
right amounts because of how they perform.... and what is right differs in specific instances. (Acioly and Davidson, 1996:4)

But what are these right amounts and limits to density issue when it comes to built environments? Charles Correa discusses the limits of densities especially with reference to the Indian context when he argues that densities could be kept within an optimal range of 250 to 1,000 persons per hectare. Going beyond these densities puts the third world city into deep trouble (Correa, 1985). However, in order to highlight the aspect of density from different contexts, let us consider the inter-continental variations as illustrated in Figure 11.2.

Figure 11.2: Intercontinental comparison of net population density in selected large cities (Source: Acioly and Davidson, 1996:6)

The highest urban densities are notable in the Asian cites with a population density of up to above 900 persons per hectare, followed by the Middle East, Latin America, Europe and Africa and the lowest densities in North America and Oceania with less than 100 persons per hectare. The low population density in North America has to be linked with the planned sprawled character of the cities within the North American context. Whether the higher population densities in Asian countries imply higher floor area ratios is not reflected in this figure. But at least one feature that becomes evident is that population per hectare is observably high which may lead to intensive land utilisation.

Population densities as revealed from case studies and for the whole city of Dar es Salaam are generally low, that is gross population of 52 persons per hectare and at city level, and in what is considered highly dense urban types (Msasani) being 287 persons per hectare. It is much lower in many other parts of the city for instance in Mbezi, that is 20 persons per hectare. It is not surprising therefore, that with such low-density figures and with low-rise character of urban types, Dar es Salaam has sprawled to the extent that infrastructure provision has become an almost impossible mission.

In Indonesia, for example, the housing density of 80 and 150 persons per hectare, net, characterise densities in Jakarta as was observed by Jelinek (1992:11). He argues that this type of horizontal city requires a lot of roads and infrastructure, together with their necessary operation and maintenance services, to keep it running. Some sections of the city have plots of 1,000 square metres and sometimes going down to 500 square metres with single dwellings. This has resulted into densities which vary between 50 and 80 persons to a hectare or a gross density of 30-50 persons per hectare. Jelinek recounts that:
No doubt almost every one would like to live in such accommodation. However, for the city of the future this approach would appear to be inappropriate if only for the reason that if everyone were to be accommodated in this way Jakarta's residential area alone would need to occupy 125,000 hectares. As the whole of Jakarta at present covers 65,000 hectares this is obviously impractical, quite apart from the cost of infrastructure that would need to be provided and its operation and maintenance. (Jelinek, 1992:11)

The urbanised part of Dar es Salaam city by 2001 covered a total area of 54,211 hectares and a gross population density of 52 persons per hectare. In informal settlements where 75% of the city inhabitants live, gross densities have been ranging between 250 and 350 persons per hectare. Densities in recently established informal settlements are as low as 167 persons per hectare (Ubungo). Although these figures may be comparable to some extent with other African countries, when compared with figure from other countries, they are rather low. For instance population densities in highly occupied settlements from different countries have been noted to be as follows; Katchi Abadi, Karachi (650 persons per hectare), high-rise apartments in Hong Kong (5000 persons per hectare), high-rise apartments in Bombay (3500 persons per hectare), Mexico (1442 persons per hectare), Jakarta (800 persons per hectare), Rocas and Santos Reis informal settlements in Brazil (350 persons per hectare) (Acioly and Davidson, 1996).

When the number of housing units is taken into consideration, which implicitly influences occupancy and population density, still Dar es Salaam reveals lower densities despite the fact that in some instances it compares well with other countries. Observed housing density in the consolidated informal settlement of Msasani was 38 houses per hectare. Housing density in Missionvale in Port Elizabeth (recommended and being developed) is 48 units per hectare, The Housing Development Corporation (HUDCO) project with high-rise apartments in India is 600 units per hectare, in Itamaraca project in Brazil is 40 units per hectare and Jamaican sites and services project 44 units per hectare (Acioly and Davidson, 1996; Arenas Gomez, 2002).

The fact that the growth of Dar es Salaam is largely characterised by low-rise detached house types with density values as that of Ubungo or even less in the outlying settlements, the city has expanded horizontally limiting effective provision of line infrastructure and social facilities. As a consequence to this pattern of growth, water supply is lacking in many parts of its suburban neighbourhoods. For the serviced neighbourhoods the supply has been unreliable and irregular due to pirating of water mains by the suburban population. New areas lack paved roads, storm water channels and proper solid and liquid waste management. Community facilities such as schools and health centres are also lacking. Residents from peri-urban settlements have to walk longer distances to these services.

11.2.4 Relationship between housing density and infrastructure costs

Density is an important factor when analysing the provision of infrastructure and public services delivery in a residential areas. One of the main arguments for encouraging higher densities is the efficient provision and maintenance of infrastructure. Low density means long infrastructure runs and thus higher costs per consumer both for installation and for operation. Since the provision of public services such as health and education are based on the number of people to be served within a specific radial distance, low-density areas also impose longer journeys to these services. It should be borne in mind however that extreme high and unguided densities create problems of congestion, overloaded in infrastructure and urban inefficiencies. The relationship between increased density and infrastructure costs has been the reduction in cost per dwelling unit as illustrated in Figure 11.3.
There is an inverse relationship between density and infrastructure costs. As indicated in the above Figure, at 14.7 dwelling units per hectare, established costs per dwelling unit was approximately TShs 70,000. When density was doubled to 31.6 units per hectare, the costs on infrastructure per dwelling were reduced by 50%. Arenas has established similar results from a study in Port Elizabeth. Based on an analysis of density and infrastructure costs from two project areas of Missionvalle and Bloemendal, Arenas notes that in Missionvalle project with gross density of 48 units per hectare, the project costs on service installation was ZAR 3587. This represented 21% of the total housing costs. In Bloemendal project with gross densities of 25 units per hectare the service costs were as high as ZAR 7858, which is 46% of the total housing project cost (Arenas, 2002: 47). It is apparent from the two examples therefore that the denser the settlement, the less the infrastructure costs.

Studies in design and implementation of low income settlements in Brandao, Brasilia, have further revealed that per capita costs of infrastructure decreases spectacularly when the population density is increased from 50 to 200 inhabitants per hectare. From 200 to 300 inhabitants per hectare, per capita cost decreases but not significantly and tends to remain at the lowest values for 300 to 600 inhabitants per hectare. The pavement of roads seems to be the most costly component followed by sewage and drainage. The overall cost of the network decreases drastically from US$ 2,500 per dwelling for a density of 75 inhabitants per hectare to US$ 750 per dwelling for a density of 300 inhabitants per hectare (Acioly and Davidson, 1996:15-16).

As regards transport, it has been shown that public transport becomes viable at net densities of between 90 and 120 persons per hectare (gross densities of 30-40 plots/hectare) and walking becomes viable at a net density of 300 persons per hectare (Newman & Kenworthy, 1989 in Vestbro, 2001).

Due to low-rise, low-density type of houses and the sprawled character of Dar es Salaam city and with as low as 52 persons per hectare, it is not surprising that infrastructure services in many parts of the city are totally lacking. Until 1992, road provision for the whole city was only 2.3% of the total land uses as compared to 15-20% as is usually provided in cities. Only 26% of the population had supply of water on their plots, 5% had connection to the sewerage system and the majority (about 70%) used on-site sanitation, primarily pit latrines.
Only 33% of the households were connected to electricity supply (Dar es Salaam Statistical Abstract, 1993; Kironde, 1994). Street lighting is restricted to only a few sections of the city, even though the functioning of this service is very poor. Some neighbourhoods go without schools despite the fact that they were planned (for example Mbezi). Students have to travel 5 to 10 kilometres for such a service. The finger-like sprawled city structure has made the unserviced parcels of lands to be landlocked lacking access roads for public bus transport. Residents from the peri-urban zones have to change buses three times to and from the city centre spending about 45% of their gross monthly incomes (Kombe, Lupala and Kyessi, 2002).

11.2.5 House forms as a variable of density

One of the limitations for increased density in many of the urban types is the low-rise, single storey character of the houses that dominate the city of Dar es Salaam. Some of the reasons that can be attributed to this character can range from poor economic conditions of developers to construct houses of more than one storey, limited technological capabilities of the local masons (fundis) who are the builders of the present housing stock in the city and the lack of persuasive efforts from the concerned authorities on house forms that can be built incrementally to two and four storeys within limited resources of the residents. If some residents have been able to construct as large as 400 square metre single storey houses covering almost the whole plot in informal settlements, it is likely that if well guided, such a horizontal extension would have been accommodated better in a two to four storey housing unit built incrementally.

However, as land value increases, the need for new house forms is becoming evident especially in urban types closer to the city centre and in consolidated informal settlements. This has been manifested by some isolated two to four storey house types emerging from these areas such as Ilala, Magomeni, Kinondoni, Msasani and Hanna Nassif. The question that is being raised is: What house forms should be favoured so as to optimise land and infrastructure provision?

A study that was conducted in Mexico involving 12 low-income settlements provided comprehensive and detailed information about the performance of the sites in relation to densities and utilisation of land and infrastructure. In this study it was recommended that acceptable and desirable densities should range between 300 and 600 persons per hectare and that the housing typology should vary between 1 and 3 storeys with an average residential floor area per person of 10-20 square metres and plot coverage of 30-40%. It was on this basis that efficiency in terms of land uses, layout and housing typologies was assessed in Mexico (Acioly and Davidson, 1996:17).

Within the Indian city context Correa contemplates on the low-rise 2-4 storey houses as the type of house form that ensures equity across all sectors of the society. He attributes his recommendation to such variables as incremental, that is they can be developed with owners’ requirements and earning capacity, variety that is it preserves the owners’ wishes, sensitivity to social/cultural/religious determinants that is the lifestyles of the people, speedier housing that is it needs shorter construction period, building materials that is does not need to use high-priority materials such as steel and cement that are scarce and renewability that is with lifespan of 15-20 years building materials can be removed and rebuilt again (Correa, 1985:51-53).

Correa’s argument is consistent with Jelinek’s observations on house forms within the Indonesian city context. Jelinek argues that in trying to decide on which forms of housing are an appropriate option for increasing the housing stock and optimising land and services, the guiding criteria should be equity, efficiency, flexibility, appropriateness and affordability. (Jelinek, 1992:12). On house form options, Jelinek further observes that one of the efficient
and effective housing systems in Indonesia is the Kampung\(^4\). Kampungs provide the main source of housing opportunities for the low-income group. As Kampungs are removed, those that remain are constantly densifying. They are one of the main forms of housing and shelter facilities provided by the informal private sector (roughly 80\%) of all provisions. It is likely that net densities of up to 800 persons per hectare could be achieved by using this form of housing while still maintaining a healthy and pleasant, safe secure environment. If an assumption of 5 persons per dwelling unit is made, the total housing density of 160 dwelling units per hectare is realised. However, this presupposes careful planning and willingness of landowners to participate in such a venture (Jelinek, 1992:12).

Despite the cultural differences between the Tanzanian, Indian, Mexican and the Indonesian contexts, what is coming out of this discussion are some similarities on desirable house forms that provide a basis towards addressing optimal densities while maintaining acceptable spatial qualities. The examples point towards 3-4 storey building height whose design and building materials may vary according to the specific context. It has been shown that within this framework of house forms optimal densities can be achieved while spatial qualities are maintained and equity among society assured. It seems plausible to consider the applicability of this house form within the context of Dar es Salaam.

11.2.6 Plot characteristics as an influential variable of urban types

One of the limitations towards increasing densities within the built up parts and in newly ‘planned’ urban types of Dar es Salaam has been the larger plot size. As observed in the case studies, the majority of the plots in Kariakoo are 260 square metres. In consolidated informal settlement of Msasani plot sizes range between 100 and 300 square metres. In the unconsolidated informal settlement of Ubungo plot sizes range between 200 and 500 square metres. In the low density ‘planned’ settlement of Mbezi plot size is 1200 square metres. Current Planning Standards for Residential Areas (1999) recommend ‘generous’ plot sizes that favour horizontal growth and city sprawl. These plots are generally on the higher side when it comes to infrastructure costs. Commenting on the larger plot sizes and the need to reduce plot sizes, Kombe reiterates that:

… concerted efforts ought to be undertaken particularly to avoid underutilisation of land and to optimise use of limited infrastructure services and facilities. Immediate areas for intervention include, for instance, the redefinition of urban land parcelling standards, to do away with the ‘generous’ (uneconomical) plot sizes. (Kombe, 1995:193)

A question worth examining is: At what optimal plot size should land parcelling standards adopt so to address issues of land underutilisation and infrastructure provision? Acioly and Davidson argue that the size, width, depth and shapes of plots, coverage and dimension of roads will significantly affect ultimate density (Acioly and Davidson, 1996:16). The process of development of design usually involves a lot of discussion with trade-off between smaller plots giving greater affordability or larger plots with greater flexibility over time. A project in Ismailia for example, where the idea was to develop an urban development model for low income groups, responses from people revealed that plots with widths of 7.5 or 9 metres

\(^4\) A Kampung is not a squatter nor a slum; its is a continuous and incrementally developed self-help developed housing, mostly on traditional owned land in traditional way it is an indigenous concept of housing and community of various sizes, shapes and densities. Kampungs are strategically located in all parts of the city providing easy access to different employment opportunities and services. Kampungs house about two thirds of the urban population, offering different standards of housing at different price levels, mostly for low and medium income families. Kampung houses may have 2-4 storey houses depending on where they are located (Source: Municipal Government of Surabaya 1993, Annual Report on Housing, pp. 45).
Could be developed with two flats on each floor sharing the same stair and thus be more efficient (Acioly and Davidson, 1996:15).

The fact that plot size is a culturally bound phenomenon, great variations are notable across countries. Acioly and Davidson notes that in Delhi, the Rohini Sites and Services project, plot sizes that ranged between 26 and 90 square metres in which two-storey buildings could be constructed were adopted. In this project plot coverage of up to 75% was permitted allowing two dwelling units for plots of 48, 60 and 90 square metres to be constructed. In Brasilia, the Candangolandia and Itamaraca projects were based on plot sizes of 120 and 126 square metres. In Katchi Abadi, Pakistan, a plot size of 90 square metres was adopted. In Guinea Bissau urban plots are conventionally 20 by 25, covering an area of 500 square metres. In Dodoma, Tanzania, recommended plot sizes in the 1976 Master Plan for detached houses was 325 square metres, 225 square metres for row and semi-detached houses and 1000 square metres for 2-3 storey apartment blocks accommodating 6 dwelling units.

The trade-off in terms of infrastructure costs offered by narrow plots is high because it means a greater number of dwellings and thus more households can be served per length of networks. There is indeed an optimisation of the infrastructure network (Acioly and Davidson, 1996:17). Dowall and Clarke (in Acioly and Davidson) note that although plot frontages of 4-4.25 metres and plot areas of 35 square metres have been considered profitable for residential areas in Asia, this may be true from an economic point of view, but will certainly fail to be culturally acceptable in many other contexts. This is because it forces the design of row houses and induces the condition for vertical housing extensions. The urban densities derived from these plot areas and housing typology will bring residential densities to very high levels which may not suit all countries.

The fact that plots in many African countries exceed 250 square metres, a factor that differs greatly from other parts of the world and influences density outcomes, this tendency has to be related with certain traditions that affect these outcomes such as the need for private open spaces in the vicinity of the houses, large houses and plots and traditional use of these spaces. However, assumptions that these traditions and standards are unchangeable are questioned by examination of what is happening in African cities. Densification of plots in Harare, for example, has been taking place through informal occupation of gardens of formal subdivisions. In Nairobi, the transformation of single storey houses into multi-storey buildings has changed density patterns of the original layout (Acioly and Davidson, 1996:18).

As to what constitutes an optimal plot size, Correa discusses plot sizes that can accommodate the demand of the rich and the poor, implicitly within the Indian city context. He argues that the range from 50 to 100 square metres is the plot size that can accommodate a house for the well-off as well as the poor. He refers to this plot an equity plot and reiterates:

Plot size of 50-100 would be viable both for the poorest section of the society (furnished perhaps with a couple of trees, tied up goat and a lean-to roof) as well as an affluent (as witness the very elegant town houses in Amsterdam, San Francisco, Udaipur and other cities). In fact, this kind of optimal size plots – or shall we call them equity plots - could be viable for more than 95% of our urban population. This is indeed a concept with profound socio-economic implications; one which could constitute a crucial step towards defining a truly egalitarian urban society, totally different from the prevailing in vast majority of the Third World Cities. (Correa, 1985:54)

In many countries, plot sizes are smaller when compared to those recorded in Dar es Salaam. Even in what has been regarded as consolidated urban types, plot sizes are larger than in these countries. In many of these countries plot sizes range between 50 and 200 square metres. It is worth taking into consideration this range when trying to develop responsive space and planning standards but also relating this type of plot size with the kind
of house forms envisaged to be developed within specific sections of the city of Dar es Salaam.

11.2.7 Outdoor spaces as living and working spaces in tropical countries

The significance of outdoors spaces as living and working spaces in tropical countries cannot to be overemphasised. A number of essential activities for example cooking, sleeping and children play take place outdoors. These activities have been observed to take place in open courtyards, in formal and informal squares, street reserves and pavements. In Bombay, Correa estimates that at least 75% of essential functions of living (sleeping, cooking, entertaining friends etc.) can occur in an open-to-sky space; and, since the monsoons are limited to three months, this holds true for about 70% of the year. Thus open-to-sky space has a usability coefficient of about half (i.e. .75x70) that of built up room (Correa, 1985: 37).

The observed high levels in activity diversity and space utilisation intensity in Dar es Salaam points to the need of making adequate provisions of such spaces at cluster, neighbourhood and city level. Apart from being used as centres of informal livelihood activities, they have been used for activities like children play and for socialising activities.

A similar study that was conducted in Hanna Nassif informal settlement in Dar es Salaam revealed the usefulness of spaces at cluster levels. Out of eight spaces that were studied, six were found to be highly utilised with activities such as communication\(^5\), laundry and body hygiene, housework and crafts, food stalls, water kiosks, leisure and relaxation activities and children play (Jessen et al., 1999). Further it has been reported that during the week most of the children start to play in these spaces in the afternoons when they come back from school. People relax in some of these spaces when the temperature are higher, especially in situations where the spaces were shaded with trees. Every open space has some attraction that invites people.

Jessen et al. conclude that even though life in Hanna Nassif as it is today, may be at a lower standard than in many planned settlements, it is still of very high quality especially when one considers social interaction and life among people. Though some open appear to be of little significance, overall they all have an important function for the settlement. Not every space is lively but the small squares used by neighbours offer the possibilities of staying and doing housework in the public or semi-public open spaces that favour communication. At times celebrations, family and social activities take place in these open spaces (Jessen et al., 1999).

As noted in our observations on space uses in the case study areas, apart from providing outdoor living activities, spaces in these settlements are centres of livelihood activities and also, voids that enhance cross ventilation. Preparing and selling of cooked food stuffs, selling of soft drinks, shoe shining, selling of newspapers etc. characterise some of the observed spaces uses.

However, along the chapters it has been noted that activities taking place in these spaces are in many cases informal, they are therefore not guided. Further, due to high land coverage by buildings some of these activities have been relegated into marginal spaces (such as road reserves) that have poor qualities and not safe in terms of possible conflict with motor traffic. They lack proper surfacing, shade and streetlights to effectively promote interaction among people. It is imperative, therefore, while advocating for increased densities, optimal plot sizes and appropriate house forms, efforts should also be made towards promoting effective use and management of these spaces as centres for interaction among people and places for livelihood activities.

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\(^5\) Communication as applied in this study refers to interaction of at least two persons who are involved in conversation, discussion, playing with each other, interaction with mutual activities, through gestures or speech.
11.3 Recommendations

11.3.1 Containment of city sprawl

In view of the overgrown spatial structure of Dar es Salaam city, the containment of city sprawl will need to be addressed by a number of flexible and genuine approaches that span from planning to actual implementation. It embraces change in attitudes towards acknowledging that high-density residential urban types are a necessity towards addressing city sprawl. It calls for the government’s commitment to revisit the policies consistent with the plans and soliciting for practical mechanisms towards realising the policy objectives. In view of these prerequisites, the following are recommended:

- There is a need to revisit the structure plan for the city of Dar es Salaam and thereby identify segments of the city that require more densification or optimisation of land use.
- There is a need to redefine the limit of the city growth designating future growth centres that will be self-sustaining in terms of employment and other services. These centres will need some kind of promotion in terms of investment by providing basic infrastructure services such as roads, educational facilities that will ultimately attract private commercial investors. The aim is to establish decentralised concentrations instead of the present mono-centre city growth pattern that spans from the main centre outwards.
- Development in the peri-urban zones of the city should be guided, by taking the present stock of land and its tenure status. The management of these peri-urban lands has to be done in collaboration with grass root and local institutions currently involved in the processes of informal market-led land transactions, hoarding and development.
- New house forms that optimise land have to be encouraged as discusses in section (10.2.5).

11.3.2 The need for land pooling to facilitate effective planning intervention

Along the chapters a discussion on planning intervention at city level where master plans have been widely used has been made. At settlement level, redevelopment plans for the inner city urban types such as Kariakoo and upgrading plans for informal urban types such as Msasani and Ubungo have been used. It has also been argued that the market forces on land and developers’ intentions to invest and maximise profit through apartment and room renting have largely influenced on-going redevelopment dynamics in Kariakoo and horizontal densification in informal settlements. In order to reconcile needs for amenity (spatial and liveability qualities) while accommodating investors interests and those of present low-rise house owners, there is a need for land pooling to facilitate planning intervention.

Land pooling or replotting is an instrument for consolidating private land holdings so that they can be planned, serviced and subdivided, with the cost shared among the landholders and recouped from overall increase in land values. This has been also noted by Kombe (1995) when he argues that land pooling aims at providing land ownership with usable plot forms (shape) which are more economical and convenient to develop. Land pooling can be applied to re-organise existing plots which are too small or too narrow for building purposes. This mechanism can be practically applied in urban types such as Kariakoo where the plot-by-plot redevelopment has proved to be problematic in terms of flexibility in houses design and of more significance in acquisition of larger plots to facilitate design. The conventional compulsory acquisition (as provided by the planning law, CAP 378) is inappropriate since the
government does not seem to have adequate capacity to pay for market prices on land as the private sector does.

Land pooling may be implemented in a form of partnership arrangement between landowners, private investors and local government who pays for the land servicing costs. The approach may also be organised by landowners with any other corporate body or themselves. Land pooling however, as a policy instrument requires efficient and perhaps knowledgeable technical personnel and commitment from the government with planning decentralised from the centre to the stakeholders in the redevelopment processes.

It is further recommended that in order to facilitate effective planning intervention thereby involving stakeholders, land and housing registration studies to document the state of the art in terms of levels in housing development that has taken place and adapting current developments into a new zoning plan be undertaken. The present redevelopment plans that recommend combined plot development without land pooling is facing some difficulties in its implementation as individual developers cannot pool land (as was shown in Kariakoo). Land pooling has to be facilitated by government intervention, but has to be carefully carried out so as to safeguard the interests of the present property owners, investors wider societal needs. Since developers of houses are expected to be the private investors as the situation is today, present house owners (of old houses) should preferably be encouraged and supported to go into ‘joint ventures’ with new developers so as to facilitate their continued stay especially in Kariakoo. Unlike paying them some kind of compensation and resettling outside Kariakoo, agreements can be made where they can own apartments in the new building(s). This condition was acceptable by some developers as was revealed in one of the studies conducted in Kariakoo in 1996 (Lupala, 1996).

Land pooling or land sharing is an instrument that has been successfully used in some Asian countries to redistribute land and prepare rational plans in a unified form. Within Dar es Salaam, land pooling was executed in Upanga in the 1950s by the British colonial government to regularise land ownership that culminated in a planning scheme. Presently, Upanga exhibits a well organised urban type with moderate density and good spatial qualities (Chapter 4).

11.3.3 Land regularisation of informal urban types

In horizontally densified urban types such as Msasani, it is difficult to implement regularisation without substantial demolition of houses and resettlement of households. This approach was unpopular and has had some social and economic costs to the affected households in the implementation of upgrading schemes of the 1970s. It is further anticipated that developers in these settlements will be private investors and individuals as the case is at present. What is required is guidance and monitoring of private sector

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6 In this study, it was established that due to smaller plot sizes, some developers of high-rise houses in Kariakoo were willing to go into joint venture with present house owners so as to facilitate flexible design of buildings. But it was reported that present owners were hesitating on grounds of uncertainties especially the long procedures involved in contractual agreements. The inherited character of many houses in Kariakoo with many heirs sharing the same house also provided a bottleneck towards reaching agreements on the sale of houses or going into these kind of arrangements.

7 The concept ‘regularisation’ has been used to refer to the processes of legalisation together with any necessary physical restructuring of houses and land use. The main concerns in regularisation in many cases have been the improvement of safety for residents by reducing the risks of fire, flooding and natural hazards and natural disasters. It has involved the improvement of road network for better accessibility and public transportation. Further regularisation refers to reservation of land for community services such as schools and clinics and generally, the improvement in infrastructure services (Mercado and Uzin, 1996:7).
operations so as to achieve balanced development of high density without undermining spatial qualities. It is therefore recommended that:

- First, before any design activity takes place identification of present property (plot boundaries) as recognised and respected by the residents and the mapping of these boundaries on cadastral plans be done. Extensive field studies should be carried out to record the ownership of plots and houses and occupancy characteristics.
- The second is land pooling that should be introduced as discussed in the preceding section so as facilitate zoning and regularisation. This is subject to the contextual factors which will no doubt vary from one case to another.
- Third, is preparing a regularisation plan. In regularising these settlements, improvement of access to all clusters within the settlements should be given the highest priority. The idea here is not to resettle households outside the settlement, rather, within the settlement in houses that will be reconstructed by potential investors as enunciated for the case of redevelopment processes in Kariakoo. The assumption here is that since in many of the consolidated urban types there is high potential for commercial undertakings, potential investors will be willing to develop houses to a moderate height of two to four storeys to accommodate commercial uses in ground floors and residential and other uses in the upper floors. This was evidenced by a few houses in Msasani whereby developers along the main commercial streets have started redeveloping their houses from single storey to two to three storey houses, to accommodate new demands such as supermarkets, internet cafes, bureau-de-change, office accommodation and groceries. The idea of zoning is to guide this redevelopment so as to optimise use of land while maintaining spatial qualities.
- Fourth is, on the basis of the property boundary identified, zoning plans should also be prepared indicating recommended ranges in land coverage and floor area ratios. It is recommended that development in these settlements be incremental with active participation of residents from all stages of property boundary identification, zoning, discussion with developers, development and use of the newly built houses.
- In newly emerging informal urban settlements, more effort should be directed towards guiding housing development before such development reaches ‘saturation’ stage as observed in Msasani. Timely land registration by mapping property boundaries and preparing regularisation plans in collaboration with residents seem to be appropriate for this type of settlements. However, this will be feasible if land coverage has not reached alarming levels. In situations where urban types have reaching densities of more than 50% land coverage, such areas should be treated separately identifying the proper type of intervention in relation to the potential uses that can be put to the houses.

11.3.4 Instituting planning interventions at local level and improving information management systems

Current developments in formal and informal settlements require close guidance and continuous monitoring if effective planning and coherent land use are to be achieved. It requires a decentralised type of planning approach where planners work with people in the sites. It is therefore recommended that further decentralisation of planning activities be effected to make sure that planning is done at project (settlement) level. The present situation where planners operate from municipal and city offices create a situation where often they are not aware of what is happening on the ground. Establishment of site offices in identified urban types where the dynamics of development are rapid is quite important. This was
achieved in Hanna Nassif project where the technical team operated from a site office within the settlement in collaboration with residents. The site office in Hanna Nassif was and still is a centre for planning, negotiations, information dissemination, conflict resolution and where projects are formulated and implemented. The day-to-day monitoring of site development will only work if planners and other technocrats leave their offices and work from site offices.

The changing role of planners from plot ‘sub-dividers’ to facilitators of new urban types development is rather crucial and requires change in attitudes, commitment, frequent sensitisation and training towards innovative approaches in planning to respond to current problems. The preparation of property boundaries for the current situation in informal urban types requires planners to leave their offices and work more in the field. This is one of the several roles planners have to play in the market-led housing redevelopment and construction processes.

Consistent with efforts of decentralising planning to local levels, the question of improving information management system seems to be crucial. The establishment of systematic ways of keeping records, maps, plans, building permits, reports and other documentation need not to be emphasised. The Geographic Information System (GIS) is a strong tool that can used to link social and spatial data and for storage, retrieval and analysis of data. This tool is yet to be used in all the recently established three municipalities. The adoption of this tool will have far reaching advantages and to some extent minimise the problems associated with information management.

11.3.5 What house forms are appropriate for the future city?

In trying to project and anticipate on future house forms we encounter the dilemma on how the present urban lifestyles will be accommodated within the anticipated house forms that aim at increased densities: Shall it be low-rise, medium-rise or high-rise? In view of the low-density urban types observed in Dar es Salaam and on the basis of experiences from other countries, it seems logical to argue that future urban types should be of high-density high-rise type near the city centre and moderate height of between two to four storey house types in the immediate surrounding of the city centre, with mixed uses of residential commercial and institutions. This may include for example all areas within the six-kilometre radius from the city centre such as Kurasini, Ilala, Magomeni, Chang’ombe, Msasani, part of Kinondoni, Gerezani and Keko. It is also recommended that such urban types be developed in already established sub-centres such as Ubungo, Msasani, Mwenge, Buguruni, and Temeke where commercial undertakings are predominant. However, this will have to be decided on the basis of thresholds and demands for new uses of non-residential character. It is most likely that the high land prices in the central areas like Kariakoo and new demands on commercial and residential apartments will tend to maximise use of land, but these developments will have to be guided as outlined in section 11.2.2 above.

It is further recommended that infill development be encouraged especially in urban types where low land coverage and floor area ratios are pervasive. Infill house forms should preferably be more than two storeys with mixed uses such as commercial in the ground floors and residential in the upper floors. This means that the state of the art of land ownership in all ten identified urban types will have to be ascertained before infilling or redevelopment commences.

In planning for new areas, great care should be taken first by encouraging house forms that can be extended vertically and where possible some form of row-houses. In areas that will be designated for detached house forms, then houses should be developed in relatively smaller plot sizes as elucidated under section 11.2.6.
The adoption of these house forms, however, presupposes that development will be on an incremental basis and that private sector investors on housing will be promoted consistent with the current government policies that encourage investors to venture into many economic sectors. It also presupposes that residential lifestyles of residents will gradually change towards appreciating living in these types of house forms and also individual households developing such houses gradually as household economy improves. Besides, the recommendation presupposes that technical guidance in terms of appropriate foundations will be extended to developers so as to guarantee future vertical extensions of these house forms.

11.3.6 Reduction in plot sizes

In Tanzania, and Dar es Salaam in particular, about 75% of the shelter is being provided by the informal private sector in the low-rise single storey house types. Government and parastatal organisations are providing the remainder. Therefore, it is anticipated that within the short term, the situation will not change drastically. However, of more importance here is the question of reducing the plot size to levels where possibilities for infrastructure provision will be feasible and future vertical densification can be undertaken. On the basis of experience from other countries, between 100 and 200 square metre plot would be appropriate for many kinds of residential forms and within acceptable ranges if aspects of infrastructure provision such as water supply, drainage and sewerage are to be addressed. Presently, the minimum plot size is that which was adopted during the Sites and Services project of the 1970s of 288 square metres. Due to the low-rise character of houses in these plots and the tendency towards maximising plot coverage, they have been viewed as smaller to the actual needs of the residents. However, if residents were encouraged and guided to build vertically, this settlement would have been one of the well planned and implemented in line with the arguments of optimal land and infrastructure utilisation.

As reiterated in the preceding sections, there lies the whole question of revisiting and revising the 1999 Space and Planning Standards. The aim should be to lower the plot sizes to levels that will facilitate the private sector, city authorities and land servicing agents to provide the basic infrastructure and optimise the use of existing services. It should be viewed as a strategy to address the question of city sprawl as envisaged in the Human Settlement Policy.

11.3.7 Open spaces and space uses

It seems obvious to argue that while encouraging development of new house forms on smaller plot sizes, if careful planning is not observed, there is a possibility that spaces that have been part of the daily living activities by residents will be occupied by buildings. There is an urgent need to design functional squares within clusters of houses both in informal and formal settlements concurrently with the implementation of new house forms. In urban types such as Kariakoo, the plot-by-plot redevelopment process is likely to result into an overgrown mass of built environment lacking spaces to mediate spatial and visual qualities and also provide outdoor uses. If the concept of land pooling is successfully deployed, in this case it should be possible to designate clusters of open spaces within the zoning plan. The idea is that, with land pooling it should be possible to provide for ample open spaces after resettling the affected residents.

In informal settlements the existing informal squares should be improved both in terms of regularising private ownership and tenure status from typically private to communal status. Efforts towards furnishing these spaces should be encouraged particularly by the primary users and by the local communities to function better as centres of income generating activities and for social interactions. This may as well be accomplished within a regularisation plan as recommended under section 10.2.3 above.
11.4 Potential limitations and areas for further research

It will be naive to believe that these recommendations will materialise within a short term especially considering that we are dealing with the already built parts of the city. Adopting these recommendations involve a multitude of complex web of social, economic, cultural, political, technical and government policy factors and the general attitudes of people towards new ways of building and living. These recommendations should therefore be considered as general benchmarks towards positive approaches in addressing the problems emanating from the city sprawl and low-density urban types that dominate the present city development of Dar es Salaam. As noted in the case studies, one of the factors that impel high land coverage development has been to maximise profit through renting, as development in these settlement is typically market-led via land subdivision and selling process. Obviously, other factors come into play with this factor when trying to implement the envisaged urban types. These include: acceptability by people, trends in household economic conditions, political will to support new urban types, planning attitudes towards increased density, willingness of the private sector to invest in new urban types, and tenure arrangements between present house owners and new investors altogether are potential limitations which will need further investigations to facilitate operationalisation of these recommendations. Future research should therefore be directed towards addressing the following pertinent issues:

(i) Identification of infill development areas within the built up area of the city where new house forms can be developed and experimental projects implemented. Strategic locations that attract private investors should be carefully selected and a continuous mechanisms for evaluating efficiency of the developed projects be instituted.

(ii) The present patterns of urban lifestyles with respect to new forms of dwellings are crucial determinants of the envisaged house forms.

(iii) Inventory on the state of the art in land ownership within the confines of the built up part is more demanding than ever before. Which land is owned by whom and under what tenure arrangement is of paramount importance for the recommended land pooling processes prior to planning intervention.

(iv) The identification and classification of informal settlements that are potential areas for commercial investment development should be examined and prioritised for regularisation. Investment potentials for such settlements should be examined as a basis for land sharing approaches in the upgrading process of these settlements.

(v) The question of land pooling to facilitate flexible design in prime areas such as Kariakoo demands that the legislative bases provide an enabling environment for new developers and present house owners to have equitable share in the new investments. Further investigation on the possibilities of sharing apartment both in practice and within the legal provision needs to be carried out.

11.5 Conclusion

This study has empirically demonstrated that low-density low-rise urban types characterise the rapidly urbanising city of Dar es Salaam with major consequences in city sprawl and land underutilisation. Infrastructure provision has proved to be difficult both in the old and in newly developing settlements. It has also been shown that housing development in formal and informal settlements has been taking place with minimal guidance from the concerned authorities and conventional planning intervention has proved to be largely ineffective. This has resulted into poor spatial and liveability qualities.

One of the main factors contributing to these consequences is the rapid urbanisation that takes place under the dictates of poverty. Unlike in industrialised countries where industrialisation was the basic factor for urbanisation, in poor countries, Tanzania include, the
rapid urbanisation experienced is a result of high birth rate and population migration from rural to urban areas in search for livelihood opportunities. In to acquire houses in urban areas, other poor migrants seek cheap land in the peri-urban settlements where land is relatively cheap and development conditions are not applicable. This has resulted into horizontal expansion of the city that is unmanageable both in terms of planning and service provision.

The city-wide classification of urban types and detailed case study areas provided a basis for recommendations on re-orienting policy and planning approaches to effectively optimise land and infrastructure. In resource-starved countries such as Tanzania the adoptions of new urban types is considered a step forward towards addressing the problems of city sprawl. With excessive urban growth and limited capacities to manage city expansion, the strategies for the containment of city sprawl is considered as the key strategy towards improvement of the quality of urban life and enhancement of institutional and managerial capabilities of the local authorities to effectively spearhead settlement development processes.

As policy and planning issues, this study recommends the adoption of decentralised concentration city structure and adaptation of the New Urbanism ideas to the local condition of Tanzania’s city context. Good practice concepts which have proved effective from within and outside the country have been recommended. Specific recommendations on land pooling, informal settlements regularisation, revision of plot sizes, infill development and the adoption of new house forms to increase density have been put forward. For example if the floor area ratio in present urbanised part of Dar es Salaam will be doubled (that is from 0.4 to 0.8) the extended coverage of 57,211 hectares will be reduced by 50% to approximately 28,500 hectares. If further infill in the low land coverage urban types is carefully implemented, a compact city structure can be achieved. This corresponds slightly to the 1978 spatial extent of the city, that is within 18-kilometre radius (Figure 3.4d). This extent is considered manageable with respect to provision of basic infrastructure services, public transport and community facilities.

As regards theoretical premises of this study, one of the taxonomic and typomorphological approaches to urban analysis have been revisited. In the latter, one of the theoretical gaps from these premises has been how to link the analysed physical elements of the built environment with spatial or liveability qualities. Despite the strength of typomorphological approach in analysing city forms, both diachronically and synchronically, from lower to larger scale levels, its total applicability in situations where informal processes influence city development required some adaptations to suit the context. For example while the concept of an urban block can easily be applied in formal settlements and characterise urban types from this category, it is difficult to delineate urban blocks in informal settlements because of the lack of features defining blocks such as the streets. In such cases, redefinition using footpaths or identifiable features such as continuous spaces was used. In the same vein and for the purpose of operationalising this study, key concepts such as ‘urban type’ were developed.

The fact that informal land subdivision and market-led land transactions are spearheading city development process provides some limitations in the total application of theories established from other countries. It was observed that at times some of the formal urban types were juxtaposed with informal types making a clear distinction of the two not apparent. In some cases, mixed house forms and plot characteristics further provided a challenge to identify or develop a clear-cut distinction of urban types. Some kind of generalisation had to be made so as to make a category evident. Apart from challenges in making generalisation, the adoption of polythetic classification using as ‘many’ descriptors as recommended by Rapoport requires that the object of the study is limited in scope. In situations where the whole city is taken as an object as the case is in this study, the application of too many
descriptors makes the whole exercise complicated if not impractical. It has been argued that depending on the object and scope of the study, the number of descriptors will vary accordingly, with results that are within the limits of the established scope of the study.

On the methodological frontier, it has been noted that while the methods employed in this study were time-consuming and at times challenging, they have the advantage of making the results more practical and user-oriented. The plot and house measurement studies, for example, provided a basis for developing and mapping of plot boundaries that reflect prevailing plot characteristics especially in informal settlements. This exercise was time consuming and in some instances complicated with due to for instance uncertainties on the correctness of plot boundaries. The interpretation of aerial photographs provided a basis for classifying urban types and also, for studying settlement development processes. However, due to the larger time span between periods of taking photographs (some times more than ten years), consistent pattern in the analysis of these photographs became limited and sometimes the quality of the photographs was poor. Observation and photographic registration proved to be crucial in this kind of space utilisation study.

This study has identified, classified and analysed urban types within the city context of Dar es Salaam. Policy-based and planning recommendations have been made. It has also been highlighted that in order to operationalise these recommendations, potential limitations that are likely to hinder effective implementation of these recommendations have to be addressed.

As contribution to knowledge, this work has generated several examples to discuss the concepts of urban type and their constituent variables of house forms, density, plot characteristics and spaces and space use. The contradiction that surrounds the concepts of formal and informal settlements has been raised. This work provides a grounding base for further investigations towards addressing the two itemised problem areas of lack of knowledge and of city sprawl and its associated externality effects.
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[http://www.newurbanism.org/page416429.htm](http://www.newurbanism.org/page416429.htm)
APPENDIX 1: REGISTRATION OF HOUSE FORM CHARACTERISTICS

Guidelines:
- Make a sketch of each observed house and show: house layout, roof types and dimensions on a site layout plan.
- Take a photograph of each house that has been observed and sketched.

Location ……………………… Name of settlement………………………….. Name of Urban Block ………………………………………………………………………..
Names of observer(s) ………………………………………………………………… Day and date………………………………………………………………………..

<table>
<thead>
<tr>
<th>House type¹</th>
<th>No of storeys</th>
<th>Roof type²</th>
<th>Building materials³</th>
<th>House size (m²)</th>
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<tbody>
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<td>Det (MO)</td>
<td>Sem Det</td>
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</tr>
</tbody>
</table>

1 House type: Detached single household (De 1HH), Detached Multi-Occupational (Det MO), Semidetached (Sem Det), Row Houses (Row), Block of Flats (Bl Fl)
2 Roof type: Gabble (gb), Hipped (hp), Cleret storey (cs), Flat roof (fl)
3 Construction materials: Walls: Mud and pole(md), cement blocks (cb), ; Windows and doors (W&D): Timber (t), Timber and Glass (tg); Roof: Corrugated iron sheets (cis), tiles (tl), Concrete (cn)
APPENDIX 2: HOUSE USE AND OCCUPANCY CHARACTERISTICS

Guidelines:
- Respondent to many questions can be a tenant or adult residents of the houses.
- It is preferable to fill this table from house owners’ responses.
- Observe and register use of spaces surrounding the building.

<table>
<thead>
<tr>
<th>Location</th>
<th>Name of settlement</th>
<th>Name of Urban Block</th>
<th>Names of observer(s)</th>
<th>Day and date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>No of HH</th>
<th>Persons /HH</th>
<th>No of Rooms</th>
<th>Use of building</th>
<th>House ownership</th>
<th>Tenure Status</th>
<th>Access</th>
<th>Const. Year</th>
<th>Use of outdoor plot area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 Re s Com m Res/Comm</td>
<td>PV PB OO R OR</td>
<td>yes no</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>House No.</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td></td>
</tr>
</tbody>
</table>

1 Use of building: Residential (Res.), Commercial (Comm.), Commercial Residential (Res/Comm.)
2 House ownership: Private(PV), Public (PB)
3 Tenure status: Owner occupied (OO), Rented (R), Owner and Rental (OR)
APPENDIX 3: USE OF SEMI - PUBLIC SPACES

Guidelines:

- Record the number of people engaged in the listed number of activities for the whole period of observation
- The type of public and semi-public spaces for observation include
- Categories of users broadly distinguished into male/female and grouped into three, children (under 7 years) Youths (8-18 years) and adults (above 18 years).
- The observation time is divided morning, noon and evening (7am -6pm).
- Take a photograph of all dominant activities in these spaces.
- Indicate the location and size of the space under study in a map covering that area.

<table>
<thead>
<tr>
<th>Name of space</th>
<th>Ownership status</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (m²)</td>
<td>Furniture</td>
<td>Type of open space</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Children (0-7 yeras)</th>
<th>(7-18 yeras)</th>
<th>Above 18 years</th>
<th>TOTAL</th>
<th>Activity Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Activity</td>
<td></td>
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<td></td>
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<tr>
<td>playing</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>meeting</td>
<td></td>
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<tr>
<td>selling items</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sitting and talking</td>
<td></td>
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<tr>
<td>Walking and talking</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Fetching water</td>
<td></td>
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<tr>
<td>vending kiosk</td>
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<tr>
<td>sitting</td>
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<tr>
<td>Sitting and eating</td>
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<tr>
<td>garaging</td>
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<tr>
<td>Car parking</td>
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<tr>
<td>Others uses….</td>
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</tr>
<tr>
<td>TOTAL</td>
<td></td>
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</tbody>
</table>
APPENDIX 4: PLOT MEASUREMENTS AND CONFIGURATION CHARACTERISTICS

Guidelines:
- Enquire from residents and make a sketch of all plots boundaries especially in informal settlements.
- In formal settlements, use a survey plan at a scale 1:1000 or 1:500.
- Take plot and building dimension and register as indicated in the following table.

<table>
<thead>
<tr>
<th>Location</th>
<th>Name of settlement</th>
<th>Name of Urban Block</th>
<th>Names of observer(s)</th>
<th>Day and date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Plot No.</th>
<th>Width</th>
<th>Depth</th>
<th>Plot Area</th>
<th>Plot ratio</th>
<th>Plot frontage</th>
<th>Plot exposure</th>
<th>Built up area</th>
<th>Plot coverage</th>
<th>Plot setbacks</th>
<th>Floor area Ratio</th>
<th>Boundary definition</th>
<th>Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

1. Plot ratio is determined by dividing plot depth by its frontage. This defines the shape of the plot.
2. Plot frontage is determined by measuring side that fronts the main access street.
3. Plot exposure is determined by counting the number of sides of the built plot that are contiguous to public open space.
4. Built up area is the area covered by the building determined by multiplying the width and depth of the building.
5. Plot coverage is the percentage expression of built up area to plot area.
6. Plot setbacks are determined by measuring the front (F), sides (S1 & S2) and back (B) distances of the building line to plot line.
7. Floor area ratio is determined by dividing the total floor by the plot area.
8. Boundary definition: Hedging (Hedg), No Hedging (No Hedg).
9. Surveyed in this respect refers to plot with long term leases. in Tanzania long term leases are in the order of 33, 66 and 99 years.
APPENDIX 5: HOUSEHOLD INTERVIEW FORM

PART I: FAMILY RELATED ACTIVITIES (households and dwellings)

Instructions:
• These questions should be directed to the head of households of the selected (sampled) household
• All households in a selected house should be interviewed

1. How many members are you in this household? .................................................................
2. What is the age structure? (fill in the table below)

<table>
<thead>
<tr>
<th>HH Member</th>
<th>Status¹</th>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>Education</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

3. How many rooms do you occupy? ...................................................................................
4. Are you a tenant or owner? ............................................................................................
5. Is the accommodation available adequate to your household needs? Yes/ No
6. If not how do you solve this problem? ...........................................................................
7. How do you arrange for accommodation for different sexes? .......................................
8. When did you move to this area? ....................................................................................
9. Where did you come from (within Dsm-specify, outside Dsm-specify)? .......................
10. Why did you leave your former area of residence? ......................................................
11. Do you have contacts / attachment with your rural origins (if relevant specify how)? ..........................................................
12. What type of contacts / Attachment? ............................................................................
13. What elements of this house do you like and dislike most? ........................................

<table>
<thead>
<tr>
<th>Element</th>
<th>like</th>
<th>dislike</th>
<th>Reason for like or dislike</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plot size</td>
<td></td>
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<td></td>
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<tr>
<td>outdoor space</td>
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<td></td>
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<tr>
<td>exposure</td>
<td></td>
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<td></td>
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<tr>
<td>cross ventilation</td>
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<tr>
<td>room size</td>
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<tr>
<td>privacy</td>
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<tr>
<td>social contacts</td>
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<td></td>
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<tr>
<td>accessibility</td>
<td></td>
<td></td>
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<tr>
<td>Others.........</td>
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</tr>
</tbody>
</table>

14. What elements of this settlement do you like or dislike most?

<table>
<thead>
<tr>
<th>Element</th>
<th>like</th>
<th>dislike</th>
<th>Reason for like or dislike</th>
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</thead>
<tbody>
<tr>
<td>Density</td>
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<td></td>
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<tr>
<td>accessibility</td>
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<tr>
<td>security</td>
<td></td>
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<tr>
<td>shopping</td>
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<tr>
<td>drainage</td>
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<tr>
<td>water</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>distance to services (schools and health services), shopping, recreation and working centres</td>
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<td></td>
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<tr>
<td>Others.........</td>
<td></td>
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</tbody>
</table>

¹ Status here refers to where is father, mother, child or relative.
15. Do you have plans to move to another settlement? (if yes or no explain why)?
……………………………………………………………………………………………………………………………………

16. Which settlement in Dar es Salaam you would prefer to live? Explain why?…………………..

PART: II INCOME RELATED ACTIVITIES

17. In what sector are you employed/engaged?…………………………………………………………………

18. What is your routine of daily work from wake in the morning to sleeping in the night?
……………………………………………………………………………………………………………………………………

19. What is your weekly, monthly income?……………………………………………………………………

20. How many other members of this household are engaged in productive activities? (fill in the following table).

<table>
<thead>
<tr>
<th>HH member</th>
<th>Activity</th>
<th>Weekly income</th>
<th>Monthly income</th>
<th>remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

which home based activities do you conduct? (narrate the storey as in above question)
……………………………………………………………………………………………………………………………………

21. What is your daily, monthly and seasonal household expenditure on the following basic items (state the quantity either as daily, weekly or monthly).

<table>
<thead>
<tr>
<th>Sr no.</th>
<th>Item</th>
<th>quantity</th>
<th>Price per item</th>
<th>Total expenditure</th>
<th>remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Food</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• maize</td>
<td></td>
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<tr>
<td>• rice</td>
<td></td>
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<tr>
<td>• sugar</td>
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<tr>
<td>• meat</td>
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<tr>
<td>• beans and greens</td>
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<td></td>
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<tr>
<td>• milk</td>
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<tr>
<td>• oil</td>
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<td>• other supplementary</td>
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<tr>
<td>2</td>
<td>Fuel / energy</td>
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<tr>
<td>• electricity</td>
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<tr>
<td>• charcoal</td>
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<tr>
<td>• fuel wood</td>
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<tr>
<td>• kerosene</td>
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<tr>
<td>3</td>
<td>Home necessities</td>
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<tr>
<td>• water</td>
<td></td>
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<tr>
<td>• soaps</td>
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<tr>
<td>4</td>
<td>House rent</td>
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<tr>
<td>5</td>
<td>Clothing</td>
<td></td>
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<tr>
<td>6</td>
<td>School fees</td>
<td></td>
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<td></td>
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<tr>
<td>7</td>
<td>Medical expenses</td>
<td></td>
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<tr>
<td>8</td>
<td>Development levy</td>
<td></td>
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<td>9</td>
<td>Land rent</td>
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<td>10</td>
<td>Property tax</td>
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<td>11</td>
<td>Transport</td>
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<td>12</td>
<td>Others e.g.</td>
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<tr>
<td>• contributions</td>
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<tr>
<td>• support parents</td>
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</tbody>
</table>

Total

……………………………………………………………………………………………………………………………………

2 In this narration, include time, place, and means of getting to and from work place (e.g. means of transport used), type and nature of activities done at work places and facilities available at work place.
PART III: RECREATION AND RELAXATION
22. In which recreational activities do you engage after your sessions of productive work?…
……………………………………………………………………………………………………………………………. 
23. Where do you go for these activities?…………………………………………………………………………
24. How often do you go for these activities? ………………………………………………………………………
25. Where do other members of the household go for recreational facilities?

<table>
<thead>
<tr>
<th>HH member</th>
<th>Status</th>
<th>Sex</th>
<th>Age</th>
<th>Recreational activity</th>
<th>Frequency/ day/week/ month</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

PART IV: PARTICIPATION IN RELIGIOUS, ORGANISATIONAL AND SOCIALISING ACTIVITIES
26. In which religious activities do you participate? ……………………………………………………………
…………………………………………………………………………………………………………………………
27. How many members of your household participate in these activities?
…………………………………………………………………………………………………………………………
28. How frequent do you participate and in what capacity?
…………………………………………………………………………………………………………………………
29. In which social organisation do you participate or a member of?
…………………………………………………………………………………………………………………………
30. How frequent do you meet?
…………………………………………………………………………………………………………………………
31. What is the nature and functions of this organisation?
…………………………………………………………………………………………………………………………
32. In which socialising activities do you attend? (weddings, music, ngomas, bao, ?
…………………………………………………………………………………………………………………………
33. How frequent do you meet your neighbours? (mention and locate them) …………………..
………………………………………………………………………………………………….……………………
34. What do you discuss when you meet your neighbours?
………………………………………………………………………………………………….……………………
Are you and your neighbours helping each other? (if yes mention the neighbours and the type of help)?
………………………………………………………………………………………………….………………….
APPENDIX 6: INTERVIEW FORM FOR OFFICIALS

Guidelines:
• The interview should preferably be done having a map showing the urban types of Dar es Salaam
• The respondent should preferably be a senior town planner or architect with considerable planning experience or practice in the office.
• If allowed use a tape recorder

Interviewee:  ………………………………  Title (Designation) …………………………...
Day and Date ……………………………… Organisation …………………………………..

I: On planning ideology
1. Town planning underwent through distinct planning ideologies (regularism, garden city and functionalism)
   1. What planning ideology dominated the planning of settlements in Dar es Salaam city?

2. Which urban types would you associate with the above mentioned ideological viewpoints?

3. What would you consider as the present ideology in planning for residential areas?

4. Why do you considered the mentioned considerations as relevant to the present context?

II On Planning and Practice
5. How do you plan for new residential areas? (probe on the approach used, land acquisition issues and methodology used)

6. For whom or which target group?

7. What is the current planning and development control guidelines / standards for residential areas? (enquire for these guidelines, building codes, regulations, use classes)

8. How do you enforce them?

9. Would you point out some successes in applying these guidelines? Give examples?

10. What problems do you face in enforcing these guidelines?

11. How do you solve these problems? (if no probe: does planning really matter)?

III On Urban Types and Residential Density
12. Do you have some specific consideration on urban types when designing residential areas? (clarify this question so that the response is geared towards explaining the following variables)

   House forms…
   Housing density …
   Spatial pattern and street network ...
   Public open spaces ...
   Functional aspects of buildings ...

13. What are the guiding principles for residential density and open spaces in residential areas?

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1 Planning ideology as applied in this research refers to the main three variables

• Regularism: having the sub-variables of emphasis on new sanitary conditions and higher standards in layout and construction.

• Garden city movement: Having emphasis on working class housing, reduced housing densities, mixed developments of detached, semidetached, row houses and apartments

• Functionalism: Having emphasis on high rise apartment blocks, provide high residential density, sunny & healthy dwellings, no separation of private and public spaces.
14. Some of the urban types within the vicinity of the city centre reveal a relatively low density, low rise character. What approaches are being done to address this issue?

15. What housing development guidelines do you use for the type of development taking place in the areas like Kariakoo?

16. Some house types developed in Kariakoo area for example lack ventilation, lighting, lack of open spaces, parking facilities and design considerations against fire. Why does this happen and how do you address these issues?

17. What are the peoples' preferences with regard to house types in so called 'planned' areas?

IV On City Transformation and Sprawl

18. Dar es Salaam has grown (sprawled) to over 20km with new housing areas having no water supply, access roads and communal facilities. What efforts are being made to address this planning problem?

19. What planning guidelines do you use for peri-urban settlements like Mbezi, Mbagala, Kimara, etc?

20. What problems do you face and how do you solve them?

V On Usability of Public and Semi-Public Spaces

21. There has been complaints that many public and semi-public spaces that were planned for public use have been taken away for other uses like housing. Why does this happen and how do you address this issue?

22. What is your experience with regard to peoples' attitudes towards public spaces?

23. What planning ideas do you have as regards with provision of public spaces in areas like Kariakoo?

24. Who are responsible for managing public spaces in residential areas?

25. What conflicts do you experience with regard to use or change of use of public spaces?

VI On Formalisation of Informal Settlements

26. It has been said that there are more than 50 informal settlements in Dar es Salaam city. Do you consider this as threat or a potential to city development?

27. What approaches do you use to regulate development in informal settlements?

28. How effective is this approach? (give examples)?

29. Residents in informal settlements have a kind of informal planning guided with some kind of local rules and regulations. How effective is this locally based planning?