

(i)

AN APPRAISAL OF PLAN IMPLEMENTATION AND DEVELOPMENT
CONTROL IN NAIROBI; A CASE STUDY OF UMOJA I ESTATE

BY

ISAAC KARANJA MWANGI, B.Sc. HONS (NAIROBI)

A THESIS SUBMITTED IN PARTIAL FULFILMENT FOR THE DEGREE
OF MASTER OF ARTS (PLANNING)

UNIVERSITY OF NAIROBI LIBRARY



0239577 0

JUNE, 1988


URBAN AND REGIONAL PLANNING
DEPARTMENT
FACULTY OF ARCHITECTURE,
DESIGN AND DEVELOPMENT,
UNIVERSITY OF NAIROBI,
NAIROBI, KENYA.

(ii)

D E C L A R A T I O N

This thesis is my original work and has not been presented for a degree in any other University.

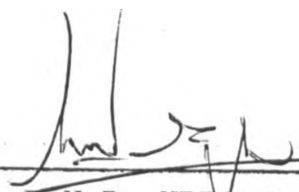
Signed



ISAAC KARANJA MWANGI
(Candidate)

This thesis has been submitted for examination with my approval as University Supervisor.

Signed



DR. E.N.D. NDEGWA
(Supervisor)

ACKNOWLEDGEMENTS

This study was carried out with a great deal of assistance and cooperation from many individuals and institutions to whom I owe much gratitude.

First I thank the Government of Kenya through Physical Planning Department for granting me a scholarship to undertake a course in Masters of Arts (Planning). Secondly I am gratefully indebted to all lecturers in the Department of Urban and Regional Planning, University of Nairobi for having assisted me to undertake and complete the course. Mr. Z. Maleche as the Chairman of the Department played an important role in encouraging me to undertake the course.

I acknowledge and sincerely thank my supervisor Dr. E.N.D. Ndegwa for the assistance and guidance he offered during the entire period when this work was done. As a sign of appreciation, I wish to express my gratitude to him for his painstaking and encouraging supervision which furnished me with immense curiosity and courage to carry out various facets of this study. This was a special and indispensable contribution on his part.

During the period when research was in progress assistance and cooperation was offered by Regional Housing and Urban Development Office (R.H.U.D.O.) as part of U.S.A.I.D. agency in general; and J.Hjelt, J. Ngari, A. Ngumbi, A. Muraya and V. De Souza as members of staff in particular.

I also wish to thank Nairobi City Commission for having facilitated collection of data and information. As a sign of appreciation I wish to mention Mr. P.M. Kibinda, Mrs. J. Manasseh, Mr. J.S. Kigera, Mr. Mwangi-Kuria and Mr. Mbithi, amongst others - all of City Planning and Architecture Department. Enthusiasm with which respondents in Umoja I Estate contributed to accomplishment of field survey was a positive contribution.

Finally I thank Mrs. Serah Luguga and Mrs. Mary Muthigo for patiently transforming my handwritten manuscript into typed work.

ISAAC KARANJA MWANGI
UNIVERSITY OF NAIROBI
MAY, 1988.

ABSTRACT

Urban physical structures are important landmarks that represents an expression of development endeavours. Residential housing structures in these urban areas are particularly important for they represent methods of ownership, amount and patterns of financial investments by man to provide himself with necessary shelter for habitation.

Since these developments are expected to take place in a certain way according to some planning policy and planning regulations, it is interesting to discover how developers undertake their development vis-a-vis the controlling planning authority.

This study is an attempt to appraise how plan implementation and development control of housing projects work in the City of Nairobi. To do so, the study focuses its attention on a relatively modern housing estate in the City - Umoja I Estate.

The main elements of the study are in relation to plan implementation process in the estate which involved construction work in two stages. The first stage which was undertaken by the local authority was completed in 1978. The construction work consisted of expandable core units with at least a wet-core, a kitchen and one room.

The second stage was expected to be accomplished by purchasers of the housing units. This stage of plan implementation which has been an on going process even at the time of this study is characterised by construction of additional structures around the core units built by former Nairobi City Council. Some of the additional structures were not authorised by the Local Planning Authority.

From discussions with City Commission Officers it was discovered that the Local Planning Authority officials were aware that unauthorised structures were being put up within the estate but it would appear that the local authority has been unable to stop this inspite of existing city planning by-laws amongst other legal documents at its disposal.

Information gathered in the field showed that construction of illegal extensions during the second stage of plan implementation do not conform with the originally planned urban environment in the estate. The purpose of this study was to find out factors which explain the inability of the local authority to enforce its own by-laws which were intended to facilitate the maintenance of a planned living environment.

Field data showed that construction which account for the unauthorised extensions include; readily available tenants who did not have a wide range of choices on where they lived, the desire for extra income by house owners as well as apparent lack of enlightenment on the part of house owners on the consequences of their actions on a planned urban environment.

On the other hand it was clear that other factors have contributed to the failure of the local authority to enforce development control legislation. These include fear on the part of City Commission officers that politicians would accuse the local authority of harassing citizens if demolition of extensions was undertaken and stringent application of planning by-laws embarked on. Another factor was the exclusion of city planners during the two main stages of plan implementation.

Due to the above factors continued construction of extensions has been taking place not only reducing the amount of planned open spaces in the estate, but also overloading planned infrastructural services such as water reticulation and sewer system. At the time of this study, 21.9% of all housing units in the estate had extensions built, some of which storey structures.

TABLE OF CONTENTS

<u>Contents</u>	<u>Page</u>
Title of Thesis -----	(i)
Declaration -----	(ii)
Acknowledgement -----	(iii)
Abstract -----	(v)
Table of Contents -----	(ix)
List of Tables -----	(xiii)
List of Figures -----	(xv)
List of Plates -----	(xvi)
List of Charts -----	(xvii)
 CHAPTER ONE: INTRODUCTION	 1
1.0 Introduction -----	1
1.1 Conceptual Background -----	1
1.2 Statement of the Problem -----	5
1.3 Objectives -----	9
1.3.1 Scope and limits of the study -----	10
1.4 Justification of the study problem -----	10
1.5 Assumptions -----	11
1.6 Hypothesis -----	12
1.7 Research Methodology -----	14
1.7.1 Data Collection -----	15
1.7.2 Field Survey -----	16
1.7.3 Sampling Frame and Sampling Techniques---	16
1.7.4 Methods of Data Analysis and Presentation.	19
1.8 Research Limitations -----	20
1.9 Operational Definitions -----	23
1.10 Conclusion -----	25

CHAPTER TWO: LITERATURE REVIEW AND PLANNING	
LEGISLATION. -----	26
2.0 Introduction -----	26
2.1 Literature Review -----	26
2.2 Evolution of Planning Regulations -----	42
2.2.1 History of Development Control -----	53
2.3 The Meaning of "Development" in Urban Planning -----	59
2.4 The Meaning of Development Control -----	65
2.5 Nairobi Planning Authority -----	66
2.6 Legal Framework of Development Control in Nairobi -----	69
2.7 Administrative Framework of Plan Implementation in Nairobi -----	74
2.8 Methodology of Development Control Enforcement in Nairobi -----	77
2.9 Conclusion -----	79
CHAPTER THREE: UMOJA I ESTATE PROJECT -----	81
3.0 Introduction -----	81
3.1 Features of the project -----	81
3.2 Location of the project -----	84
3.3 Physical Environment -----	85
3.4 Historical Background of Umoja I Project ----	86
3.5 Planning Concept of the project -----	91

	<u>Page</u>
3.6 Umoja I Estate Physical Plan -----	95
3.7 Housing Design and Plot Coverage -----	101
3.8 Implementation of the Plan -----	102
3.9 Conclusion -----	115
 CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION	 116
4.0 Introduction -----	116
4.1 Hypothesis Testing -----	116
4.1.1 Specific Hypothesis 1: Contingency Tables	116
4.1.2 Specific Hypothesis 2: Contingency Tables	121
4.2 General Hypothesis -----	130
4.3 Rate of Construction of Illegal Development	141
4.4 Additional Water Pipe Connections -----	150
4.5 Additional Sewer Connections -----	152
4.6 Solid Waste Production and Disposal .	153
4.7 The Purpose for Building Extensions -----	154
4.8 Population -----	157
4.9 Conclusion -----	160
 CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS -----	 162
5.0 Introduction -----	162
5.1 Summary of Findings -----	162
5.2 Conclusion -----	169
5.3 Recommendations -----	171

	<u>Page</u>
BIBLIOGRAPHY -----	178
APENDICES -----	186
Appendix I: Sampling areas and sampling Distribution in Umoja I Housing Estate -----	186
Appendix II: 2x2 Contingency Table model and Degree of freedom formular ----	187
Appendix III: Calculations of the rate of unauthorised structures (Extensions) -----	191
Appendix IV: Definitions of Development Control	194

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Three versions of Umoja I House Type Plans-	90
2. Principal landuses in Umoja I Housing Estate-----	91
3. General height of walls of a typical complete house -----	101
4. Original house area and plot coverage in Umoja I Estate -----	102
5. Composition of Umoja Project Unit (as the formal plan implementation agency)-----	104
6. Date and number of housing units constructed in Umoja I Estate -----	105
7. Planned and actually delivered housing units in Umoja I Estate -----	105
8. Observed frequencies -----	117
9. Calculations of expected frequencies -----	117
10. Expected frequencies -----	118
11. Observed frequencies -----	119
12. Calculations of expected frequencies -----	120
13. Expected frequencies -----	120
14. Observed frequencies -----	122
15. Calculations of expected frequencies -----	123
16. Expected frequencies -----	123
17. Observed frequencies -----	125
18. Calculations of expected frequencies -----	125
19. Expected frequencies -----	126
20. Comparison between critical and calculated chi-square values -----	128
21. Technical staff development control section	132

	<u>Page</u>
22. Mileage paid to development control officers with private vehicles -----	137
23. Approved plans that relate to housing -----	141
24. Umoja I Estate Physical Survey -----	146
25. Approximate plot coverage by extensions-----	148
26. Approximate sizes of habitable room in extensions -----	149
27. Rents paid by tenants living in extensions	155
28. Age distribution for households in main houses and extensions -----	158
29. Levels of education attained by households in main house and extensions -----	160

LIST OF FIGURES

<u>Figures</u>	<u>Page</u>
1. Umoja I Estate : Its location -----	82
2. Umoja I Estate : A sketch of its surroundings	83
3. Umoja I Estate : Distribution of sample areas	93
4. Umoja I Estate : Characteristics of hexagonal Layout Plan -----	94
5. Umoja I Estate : Architectural perspective --	97
6. Umoja I Estate : House Type ground plans:	
(a) -----	98
(b) -----	99
(c) -----	100
7. Pattern of increase of illegal development in Umoja I Estate -----	142

LIST OF PLATES

<u>Plate</u>		<u>Page</u>
Plate 1:	Complete foundation for a front extensions -----	109
Plate 2:	Completing a slab for a front extension -----	109
Plate 3:	Single story front extension -----	110
Plate 4:	Back extension -----	110
Plate 5:	A wooden back extension -----	111
Plate 6:	Back extension of a second house in a row -----	111
Plate 7(a):	A four storey structure -----	112
	(b): A two storey extension with concrete stair-case -----	112
	(c): Two adjacent double storey extensions..	112
Plate 8(a):	A building on public open space -----	113
	(b): A building on public open space used as a meat shop.-----	113
Plate 9:	A collector street in Umoja I Estate -	114

LIST OF CHARTS

Charts

Page

1(a):	Implementation of the Project and Related Consequences -----	176
(b):	Envisaged role of (Nairobi) Local Authority in plan implementation -----	177

CHAPTER ONE

INTRODUCTION

1.0 Introduction

The focus of this study is plan implementation and development control in housing estates within the City of Nairobi. Chapter One is an introduction of the study, covering conceptual background, statement of the problem and research methodology amongst others.

In Chapter two, literature review relevant to planning and development control is considered. Background information on Umoja I Housing Estate, the study area, is covered in Chapter three. Data analysis and discussions are taken up in Chapter four. Finally a summary of findings, conclusions and recommendations constitute Chapter five.

1.1 Conceptual Background

Development control of the urban land-use as it relates to plot size and coverage by physical structures is an indispensable component of the urban development process that give "shape" to individual structures and provides a harmonious form not only in the entire townscape but also for a given section within it.

Vagale (1970) points out that development control could be seen in better perspective as a legal tool for implementing a town development plan. Thus development

control aims to achieve through regulation, growth of a town in a planned and orderly manner.

Khamati (1976) underscores the fact that development control is an aspect of planning law. Since it operates in the context of legal control of urban land-use, it must of necessity be applied within the premisses of plan formulation, implementation and development. As such development control has temporal and spatial implication on the evolution of the entire urban landscape.

On the basis of the context discussed above, development control at a global level has been defined as legislative granting of permission to commence development and undertaking of action to remedy undesirable and illegal development (Purdue, 1977). This has however been misunderstood by developers who see development control as a constraint to realizing private initiatives and profits from development of land (McAuslan, 1973).

Evolution of development control in any given country or region has both socio-economic and political implications. It thus involves both the community (urban citizens) perception and the political machinery within which the legal system has evolved in

general and that related to development control in particular (Alder, 1979).

The rationale behind development control in urban development is to regulate development and use of land for public interest (Development Control Policy Notes, 1973)¹. This implies impartial application of instituted planning policies and guidelines to cater both for individual and the public at large. The basis of this impartiality is the acceptance that in planning and designing physical structures as well as amenity provision of a health environment in the interest of all should be maintained. A healthy environment in this case entails sufficient light, ventilation, appearance and provision of amenity spaces amongst others. However, Vagale (1970) points out that since profitable economic rent of urban land is often the motive of most real estate developers and owners of land property, more often than not, there is a strong tendency to maximise profits without conforming to planning regulations. In the case of Nairobi City, Vagale's argument has been underscored by Yahya et al (1980) in their findings within Eastleigh residential area.

1. Heap, D.(1973) Encyclopedia of Planning Law and Practice Vol. 3.

The consequences of the above notion is that development control which is a prerequisite to organizing and maintaining habitable urban environment where high densities of population work and live is a persistent problem faced by local administration (Gibberd, 1955). This problem exist inspite of development control being part of urban planning and development process that apportion land for various urban sub-systems such as residential housing, commercial, transportation, industrial and recreational.

In both the large and small urban centres where the government has stepped in to assist families acquire decent housing, the final stages of house construction are often assigned to owners of the dwelling units, Dandora in Nairobi and Pangani in Nakuru are examples (Waithaka, 1986). Since the above process involves construction of additional rooms around a core unit as stipulated in the original plan design, it is important that plot coverage is adhered to as per plan, The stipulations are catered for in plan formulation and house design stages. Since implementation is done at different stages and by different agencies, development control machinery must work closely and consistently at all stages with the implementation agencies.

In order to study the operation of development control provisions in Kenya's legislative framework, one residential estate in Nairobi, namely, Umoja I Estate was chosen for this study. The estate was started in 1975. In the design for this housing estate the owners were required to undertake certain construction works in accordance with plan of the estate.

The estate is representative of the above mode of house provision in that there is some element of public participation in plan implementation. This study sets out to discover factors which could explain why it has not been possible to implement this project as originally planned.

1.2 Statement of the problem

In Umoja I Residential Estate, the housing units were provided to occupiers at various stages of completion. Basically, the intention of the government was to provide core housing units. It was expected that full development would be attained when each household completed the construction of the remaining part of the structure according to the original plan. The original plan specified plot coverage to be achieved, leaving an open space for each plot.

The design was meant to provide and maintain a healthy environment around and within the housing units. Three levels of completion were made on the units (Figure 5). In all cases, each housing unit had at least a kitchen, a toilet and one living room.

The levels of completion of the housing units were as follows : At the first level only a kitchen, a toilet, a shower-room and living room were provided. At the second level one bedroom was provided besides those at first level. At the third level completed housing units were handed over to owners (i.e. two bedrooms, one sitting room, kitchen, toilet and a shower-room).

Any alternation or erection of a structure not catered for in the plan is regarded as unauthorised development². However, since the owners took possession of the housing units, construction has been taking place on both authorised and unauthorised private open spaces (Grootenhuis, 1983). This has resulted in plot coverage beyond the level that was stipulated in the plan design (The Standard July 24, 1987 pp. 6).

2. The term unauthorised means illegal or that which is against written law or by-law,

On the whole, the problem facing Umoja I residential estate is proferation of unauthorised development. The extensions have had no approved design since they were not catered for at planning stage (Figure 4 and Nairobi City Commission; Works and Town Planning Committee Minutes, 1977 to 1987). The trend has, however been that for those owners who have undertaken extra construction, each has done so as directed by financial ability and perception of how best to use his space, This phenomenon is reflected by numerous variety of extensions observed in the estate (plates 3 to 7 c),

The rate of construction increased over the years, From an aerial photo-mosaic (1:1000) taken in 1982, Grootenhuis counted 22 unauthorised business structures besides unrecorded number of extended rooms on private open space. The construction of extensions in the estate had risen by the end of 1986 when it was reported in a local newspaper that along New Komo Rock Road alone, 34 houses had encroached on the road reserve (Daily Nation November 7, 1986 pp 1). The report emphasised that unauthorised developed in Umoja I Estate had increased unabated,

The problem exist in three forms:

- (a) Horizontal extension of housing structures

- (b) Horizontal and vertical extension of housing structures
- (c) Modification of the original structures as provided in the plan, resulting in unauthorised development into planned open spaces.

There has also been unauthorised structures of permanent and semi-permanent structures for business purposes in public open spaces (Grootenhuis, 1983) and plates 8(a) and 8(b).

This has continued since the estate received its first residents. Whether it is due to ineffective development control on the part of city authorities or inexistence of effective planning legal system is an area that required investigation.

On the other hand Umoja I residents could have been responding to poor planning in terms of inadequate provision of dwelling space within the original plan design. This aspect also required investigation so that shortcomings in estimating space requirements may be avoided in future. The problem of unauthorised development is manifested in the following ways:

- (a) Extra sewer pipe connections which were not planned for per housing unit³.
- (b) Extra water pipe connections which were not planned for per housing unit⁴.
- (c) Increased domestic solid waste production per housing unit. In Nairobi solid waste production has been established at 1.3 Kg./person ^{per day} (Cleaving Department, 1984, Nairobi City Commission).

1.3 Objectives

Three objectives have been considered in this study; namely:

- (a) To determine whether the plot sizes provided for a complete housing structure was adequate in Umoja I Estate.. A household questionnaire and an examination of existing plans were used to get answers to this question.
- (b) To determine the factors which explain the short-coming(s) of development control in Nairobi as it relates to Umoja I residential Estate, Planning regulations and development control enforcement were analysed.

3 & 4 Author : Field observations.

- (c) To determine the rate of unauthorised development in private open spaces. The questionnaire was used. This was expected to give an indication of the trend in this phenomenon.

1.3.1 Scope and Limits of the Study

The geographical extent of the current study was limited within Umoja I Residential Estate. The entire 3073 units formed the frame of the study. The focus of the study is on the use of private open spaces for building purposes by owners of houses in Umoja I Residential Estate and enforcement of development control as exercised by Nairobi City Commission.

Within this scope the study is intended to come up with policy recommendations as regards effectiveness and enforcement of development control, user perceptions of open spaces and people's view on controlled development in urban land-use, particularly housing.

1.4 Justification of the study problem

The study is justified because of the concern with the prevalence of unauthorised development in urban areas, and in particular where housing projects are meant to be owned privately (See section 1.2).

There is also a great concern for the apparent ineffectiveness of development control measures to counter this situation. Related to these two issues is an evolving lack of harmony in some planned housing estates and associated problem of provision of some basic infrastructure. (Sunday Nation June 21, 1984 pp.4).

1.5 Assumptions

The study was carried out with a number of assumptions. The following assumptions were considered:

- (a) that the original plan for plots was such that a fully developed dwelling unit should not exceed a three-roomed house with a wet-core.
- (b) that any additional structure or alteration of structure not provided for in the original plan design imply interference with level of provision of certain services such as water supply and sewer system.
- (c) The Nairobi City Commission is aware of construction and existence of unauthorised structures in Umoja I Residential Estate, and that the City Commission is concerned and desirous to containing this problem.
- (d) that the current trend of building extensions on private open spaces will continue.

1.6 Hypothesis

One working hypothesis was formulated for the purpose of effective exposition of the study problem and in seeking the solution. Acceptance or rejection of this hypothesis is based on three conceptualized hypotheses that were derived from working hypothesis.

Two of them are specific hypotheses and were tested statistically. The other is a general hypothesis and was analysed descriptively.

(i) Working Hypothesis

- Residential estates within Nairobi could not be maintained in their original planned state if both the public and the local authority were not made aware of their responsibility to each other in implementation of development plans.

This hypothesis has been derived from the observations by Vagale (1970). Vagale observes that development control can be achieved if:-

"An informed and enlightened citizenry, a public spirited community and sagacious political leadership" are involved "in physical planning".

(ii) General Hypothesis⁵

It was hypothesised in this descriptive hypothesis that it is lack of resources to enforce development control by the City Commission rather than absence of legal powers that explain construction of extensions in Umoja I Estate.

1.7 Research Methodology

To obtain valuable information for the current research, collection of data and information was accomplished at certain specific stages. This was deemed necessary so as to enable the author obtain not only as much appropriate information as possible, but also facilitate testing of the hypotheses effectively.

First literature review was done. It provided the author with a clearer perspective of the research problem. Secondly, the methodology involved documentary research and field survey.

Reviewed literature showed that most of the past work carried out on controlled development in urban

5. Data and information on this hypothesis was analysed by use of descriptive method and discussion. This approach was considered most appropriate in making inferences related to the hypothesis because both the data and information were derived from planning legislation documents, Nairobi City Planning By-Laws and discussion with some City Commission Officers.

areas has been focused on documentary research (Khamati, 1976; Kandie, 1982 and Chebkati, 1985). Even where documentary research and field survey have been conducted, community response to planned and controlled development has not been emphatically investigated (Waithaka, 1986).

The approach to the present study went beyond the above cited cases in two major ways. First, besides its specificity in documentary research on legal basis (on development control), a field survey that was carried out aimed to unravel the relationship between development control and the community. A questionnaire was administered. Secondly, the study focused itself to a specific and relatively modern housing unit of a rapidly growing city system - Nairobi,

1.7.1 Data Collection

Two main types of data were used. They included both secondary and primary data. Secondary data included both informal discussions with relevant officials, data and information documents that relate to the study area and research problem. Documentary research involved collecting information from Town Planning Acts (legal notices and ordinances) and planning regulations. Field survey carried out enabled collection of primary data.

Primary data was derived by use of questionnaire method. One hundred (100) questionnaires were administered to cover 100 housing units. This sample size constituted 3.3% of the originally planned units. Half (50) of the plots (units) selected constituted those that had extensions, while the other half (50) were those that did not have extensions. The questionnaire was structured to cater for data and information for both.

1.7.2 Field Survey

A survey of all housing units with extensions was made. Connection of water pipes, installation of extra domestic water storage tanks and additional sewer pipes was surveyed⁶. The field survey was undertaken to reinforce information from other sources. Photographs and sketches have been used to illustrate specific aspects of the research problem.

1.7.3 Sampling Frame and Sampling Techniques

These were taken into consideration in designing data collection programme.

6. Jackson, J.N. (1963) Survey for Town and Country Planning (pp, 108 - 129). London : Hutchinson University Library.

(a) Sampling Frame

The entire 3073 housing units were considered to constitute the sampling frame. Seven out of the fourteen identical sections of the estate formed sample areas (figure 3).

(b) Sampling Techniques

To select sample areas, every second section was determined randomly using Umoja I Housing Physical Development Plan. Except for sections "K" and "M", no two sample areas have same number of housing units (Table 24). Hence the proportionate formular shown below was used to determine number of houses with extensions and those without; out of 50 respectively, within sample areas. The proportionate formular used was adopted from Mwangi (1985) with modifications:

Proportionate Formular⁷

$$h_e \text{ or } h_w = \left[\left(\frac{H_e}{P_e} \right) \text{ or } \left(\frac{H_w}{P_w} \right) \right] \times S$$

7. P_e , P_w and S are constants (See appendix I).

where:

h_e = Number of housing units with extensions to be visited in any randomly selected sample area

h_w = Number of housing units without extensions to be visited in any randomly selected sample area

H_e = Total number of housing units with extensions in any randomly selected sample area,

H_w = Total number of housing units without extensions in any randomly selected sample area,

P_e = Total number of housing units with extensions from all selected sample areas,

P_w = Total number of housing units without extensions in all selected sample areas,

S = Sample size (of either housing units with extensions or those without) to be considered in the entire housing estate ($S = 50$),

The specific housing units in which questionnaires were administered in each sample area were determined by use of systematic random sampling. The sample areas considered were "C", "E", "G", "J", "L", "N" and "Q" (Figure 3). Sample distribution for housing units with extensions were C (7), E (5), G (6), J(12), L(7), N(10) and Q(3); while that for housing units without extensions were C(8), E(6), G(4), J(9), L(8), N(11) and Q(4) (Appendix I).

1.7.4. Method of Data Analysis and Presentation

Both quantitative and descriptive methods of data analysis were used. These facilitated in testing both specific hypotheses and the general hypothesis (Section 1.6). As such it was possible to make inferences for the working hypothesis.

The Chi-square method was applied to test the first two specific hypotheses. This is a non-parametric statistical tests designated χ^2 (Lapin, 1982). Two by two (2 x 2) contingency tables were adopted in examining degree of association for the phenomena under study within Umoja I Residential Estate,

$$\chi^2 = \sum_{i=1}^n \left(\frac{O_i - E_j}{E_j} \right)^2$$

Where O_i = Actual observed frequency of the i^{th} event

E_j = Expected frequency of the j^{th} event

$$\sum_{i=1}^n = \text{Sum of all } \left(\frac{O_i - E_j}{E_j} \right)^2 \text{ from 1}^{st} \text{ to } n^{th} \text{ variable.}$$

The rejection level was set alpha (α) = 0,05 and one degree of freedom (Appendix II),

1.8 Research Limitations

In carrying out the present research a number of problems were encountered. First the City Planning and Architecture Department of Nairobi City Commission does not keep records of housing units that are with extensions and those without.

This made it necessary for the author to undertake a complete plot by plot survey for all 3073 housing units so as to distinguish and record plots with and without extensions. This was a necessary survey because it made possible the determination of values of H_e and H_w that were used in the proportionate

of newspaper reports in late July 1987, that the City Commission had intended to demolish all illegal structures in Nairobi.

The reports had pointed out that previous intentions to demolish such structures in Umoja I Estate had always met with politicians' and residents' opposition - (Kenya Times, Friday 24, 1987 pp. 1 and pp. 7). Therefore, a great deal of time was spent in explaining to; and convincing a respondent the purpose of the research than to complete a single questionnaire.

Majority of Umoja I Estate Residents are employees or businessmen down town or at the Industrial areas of Nairobi. It was therefore intended that all questionnaires would be administered during early hours of evenings during normal working days and throughout the day at weekends.

However, it was almost impossible for all respondents to avail information at the first visits in the evening hours because they were tired and wished to relax. Hence they would give appointments most of which coincided. The estate being large, most appointments were deferred to convenient time in the evenings so as to attend to each respondent at a

time. Although deferred appointments were not convenient for most potential respondents, they were tolerated in appreciation of the researcher being able to be at one place at a time. It should therefore be appreciated that practical aspects of administering questionnaires constituted a significant limitation in collecting a bigger sample size than currently used.

Administering questionnaires to officers of City Planning and Architecture, holding discussions with them as well as with officers from Regional Housing and Urban Development Office (R.H.U.D.O.) also were accomplished by making prior appointments.

1.9 Operational Definitions

Developer: Registered agency or a private individual citizen, working on grand housing project or single private plot respectively.

Private open spaces: Spaces that are not covered by any building structure on a single plot. The spaces are designed during plan preparation stage so as to cater for amenity and maintenance of aesthetic value in urban environment(s).

Public open spaces: Open spaces that are left in urban residential and other land-use areas to cater for either amenity, recreation, large scale air circulation or maintain aesthetic value of urban environment(s).

Spirited Community: This means a community with a mood and social character that has an inclination to achieve and maintain a given level of urban environment.

Sagacious Political leadership: Leadership with wisdom of a practical kind that is necessary within an effective policy formulating framework of a local authority at both plan making and plan implementation stages.

Enlightened citizenry: This means urban citizens who have right understanding of the intensions of a planned urban environment.

public open spaces: Open spaces that are left in urban residential and other land-use areas to cater for either amenity, recreation, large scale air circulation or maintain aesthetic value of urban environment(s).

Spirited Community: This means a community with a mood and social character that has an inclination to achieve and maintain a given level of urban environment.

Sagacious Political leadership: Leadership with wisdom of a practical kind that is necessary within an effective policy formulating framework of a local authority at both plan making and plan implementation stages.

Enlightened citizenry: This means urban citizens who have right understanding of the intensions of a planned urban environment.

1.10 Conclusion

This Chapter has discussed the nature of the research problem, objectives, to be achieved, hypothesis and assumptions made amongst other elements in this study. It has also been indicated that there was knowledge of existence of unauthorised structures in the study area. However, no study has yet been conducted to establish reasons for the construction of the structures, failure of the local authority to enforce development control and the likely consequences of continued construction.

CHAPTER TWO

LITERATURE RIEVEW AND PLANNING LEGISLATION

2.0 Introduction

This chapter deals with two major aspects of this study. First it presents the literature reviewed on development control. Then, it presents the environment within which statutory planning takes place in Kenya. The latter aspect is achieved by giving a short evolutionary trend of planning regulations in Kenya as well as tracing the meaning of "development" and "development control" as derived from planning regulations.

These analyses are meant to provide a broader but distinct perspective for both frameworks of plan implementation and development control. They are also meant to unravel the methodology of development control enforcement generally in Kenya and within the City of Nairobi in particular.

2.1 Literature Review

Among the five constituents of human settlements housing is a principal component. The other four constituents of the human settlement include nature, man, society and networks. Doxiadis (1977) defined human settlement:

"as territorial arrangement made by man for himself. They result from human action and their purposes are to enhance human survival, better life, happiness and safety".

In the same context, Aristotle perceived human settlements as being the result of man's action in an endeavour to develop himself. In urban environments where the activities of man are more concentrated, a stricter control on the manner in which man arranges his environment is fundamental for his very survival. This aspect applies to the entire urban environment in general and that related to residential districts in particular (Webster, 1958).

On average man spends two thirds of each working day within the precincts of housing units. Thus two out of seven days in a week are almost always spent at home (op. cit). It is for these reasons that Gunn (1978) has emphasised the need to plan and maintain the totality of man-made environments and their physical setting in a planned state. Such environments precede the desired temporal and spatial "organic" evolution of urban environments in a country or region.

At a more specific human habitat level, Gibberd (1955) has shown that fresh air and sunlight in habitable rooms of a house as well as access to amenities of natural environment must be catered for considering

each housing unit and the entire estate in a plan. Umoja I Estate layout plan and design catered for these aspects.

In developed countries, Gibberd points out, most households prefer single housing units surrounded by an open space. This is further underscored by the fact that there is a high degree of commitment to the maintenance of these open spaces. The existing situation in Nairobi's low-income and middle - income areas regarding the use of private open spaces is the opposite of Gibberd's observation (author field observation).

This means that while development control in developed countries address itself to change of use of urban land and buildings within Nairobi development control largely address itself to unauthorised use of open spaces. Moreover, in the former case, development control regulations are used to restrict horizontal and vertical developments on plots so as to maintain aesthetic value and size of structures of planned environment(s).

Height (vertical) control in residential areas is required to maintain adequate light and air as well as to control the proportionality of height - floor

ratio. Similarly, area zoning in residential housing plans is meant to limit usable building area of land surface, front space, rear space and side space (Webster, 1958). In Umoja I Housing Estate only front and rear spaces were provided (Figures 4 and 5).

On the whole zoning at plan making stage involves provision of specification and regulation of percentage plot coverage. It is adherence to these planning provisions that development control seek to maintain in residential areas.

Development control is therefore first operationalized at initial stages of planning. During these stages the planner(s) apply the concept of planning standard. They also designate particular areas of an urban district for different uses including residential development. In Nairobi, the area of study had been designated as such.

The second stage of planning for residential areas involve the design of houses with emphasis on sizes, types and density while taking into consideration the socio-economic characteristics of the eventual occupants and landscape requirements (Mcloughlin, 1971). The size of population at occupation time and a future date are also considered. These are the planning

considerations that McLoughlin Wraps in what he calls the Law of Requisite Variety; which means that "the variety in the control device must be at least equal to that of the disturbance".

Mabogunje (1978) notes that the lasting happiness of man as relates to his shelter and its environmental components could be achieved by planners if plan design is based on interaction of man and his environment. This proposition is underscored by indicating that the best human settlement is based on reducing adverse effects on man-nature relationship. At plan design stage the policies and standards on site development are always presumed set.

Site development policy is meant to enhance environmental conditions in residential areas (op. cit). Similarly, standard policies are meant to augment development control administration and enforcement at three main stages, namely; planning stage, plan implementation stage and in the future when changes to the original plan may be proposed for further physical development. This policy is therefore formulated to cater for all factors related to the control of environmental problems.

The above analyses underscores the first dimension of earlier stages in planning a residential estate. The second dimension is incorporation of specific standard types. Specificity implies integrating the two notions during the planning stage - man standards and expected planned state by residents who would be directly affected by the plan.

The first set of standards are official. Official standards as indicated by Mabogunje, are the operational rules and regulations formulated on legal basis and administered by a local authority. They serve the purpose of providing the control of type and character of housing units within a given section of a town. Although they form the basis of development control enforcement at the early planning stages their use is more practical at controlling development at post planning and plan implementation stages.

Official planning standards are therefore incorporated into blue prints and plan design documents of a comprehensive plan. Finally, incorporation of cultural standards into official planning standards and adaptation of culture to society's modernization process are also a prerequisite.

Standards play an indispensable role in influencing the character of environment in urban residential areas. Gibberd (1955), Webster (1958) and Mabogunje (1978) have shown that space standards define levels of comprehensive planning.

Space standard are expressed in five principle units. Minimum plot sizes indicate the sizes of individual housing units within an area. The number of housing units per unit area specify the housing density while number of persons per room specify occupancy ratio. Finally, the number of persons per acre is a standard for population density.

Another aspect of this dimension at planning stage is that related to technological and performance standards. These define the quality of environment to be maintained within a residential area. They include quality of services to be offered, quality of construction and type of materials to be used; etc.

The final aspects of the planning stage dimension are range and threshold standards. They are considered and incorporated into the plan as a single entity. Range standard establish limits of lower and upper population considered in the plan. Threshold standard on the other hand delimit the areas or distance to be

considered as part of physical size requiring development in a comprehensive plan. McLoughlin (1971) has stressed that these should be included in plan proposals for they reflect socio-economic level of occupants as well as density assumptions for both, the population and dwelling units respectively.

The above review brings into perspective, the three main controls of a physical development plan, namely; legislative, administrative and judicial (Webster, 1958). In catering for harmonious development in residential areas, these become part of formulation stage in comprehensive planning. They function as legal devices of executing development control at all stages mentioned earlier.

Vagale (1970), Purdue (1977) and McAuslan (1980) however note that to observe and maintain planning standard as well as planned urban environments respectively, stricter, rigorous and persistent enforcement of development control should be a continuous process. Where the nature of a housing programme has profit implications the above phenomenon require even greater emphasis.

However McAuslan (1975) underscore the fact that the framework within which planning process take place, the

relationship between law and informal process and the interaction between actors - PLANNERS, DEVELOPERS, LAWYERS and POLITICIANS, make enforcement of development control encounter judicial setbacks. While central government, judiciary and local authorities are levels within which post planning development control is supposed to take place, it is the latter that has the prerogative to enforce.

Within local authorities, development control takes place under the influence of organization, structure and powers of planning departments. In this context, post-plan implementation and development control is enforced by either, a planning officer with specifically delagated powers or by a committee in which a planning officer exercises development control advisory powers rather than executive powers.

Whichever is the case for a particular planning authority the role of development control is vital in plan implementation and therefore all techniques should be applied when considering the future prospects of implementation of a development (Chebkati, 1985). The nature of development and its control is given its legal status in Kenya in Land Planning Act CAP 303.

At both planning stage, plan implementation stage and post-plan implementation stage, the planning system is faced with serious problems of persistent disjointedness in institutional arrangement governing plan-making and development control (Alder, 1979). This phenomenon is a set-back to achieving the intensions of the planning and planned systems.

By invoking the Law of Requisite Variety Mcloughlin puts the plan implementation notion in perspective. It is the process by which thoughts on some anticipated social order are articulated into physical objects (structures); which if not satisfactory to the society, may set social mechanisms tending to remedy the shortcoming(s). This is why he further points out that plan implementation is a control activity which operationalize the designed enviornment and maintain positive intensions.

Heap (1973 , pp. 4512 - 4536) agrees with the above notion when he emphasises that implementation of physical development plans in comformity with plan design is the premise within which development control activity take place. For the same reason, the author of this thesis considers Umoja I Housing Physical Development Plan as the basis of implementing it and enforcing

development control. Hence, as Mcloughlin points out development control is a consistent measure of difference between actual and intended planned state. Moreover, the essence of a plan being the intended physical environment, development control becomes the premise for conformance of the said state albeit with variation of plan objectives within acceptable limits.

In Nairobi's low-income housing development areas the interest and intensions of private developers to maximise use of space is that of gaining monetary profits (Yahya, 1980). The Local Planning Authority is therefore faced with two planning problems at both pre-plan and post-plan implementation stages. These are, first, the manner in which piecemeal development take place, and secondly; the problem of tandem development.⁸

Where tandem development could be allowed by law as in the case of construction both a master's house and a servant-quarter, adequate planning precautions are often taken into consideration so as to ensure acceptable amenity and environmental standards. In

8. Peacemeal Development: This is carry out additional development or redevelopment on one or a few plots within an existing large scheme already developed.

Tandem Development: This is development of a housing unit (on rear open space) behind an existing house such that both housing units share accessibility. Normally the house at the back experience accessibility difficulties (Encyclopedia of Planning Law and Practice Vol. 3).

both piecemeal and tandem development, development control aims at achieving explicit order, desire for clear-cut relationships and maintenance (McLoughlin, 1973). According to Heap (1973) and Hagwood (1978) the above imply that development control is further meant to prevent bad design. Design in this case mean delimitation of "environments" within which people inhabit and work, enhancement of scale for harmonious relationship between physical structures and within the entire residential neighbourhoods.

Vickery (1978) agrees with McLoughlin and Heap, and emphasises that development control is the most powerful tool with the greatest effect on ordinary man. Hence efficiency of participation by general public in general development is enhanced by appropriate plans and implementation as regards land use and physical development of built environment (Ray, 1978).

Since non-enforcement of control result in land owners and property developers carrying out development disorderly, the aim of planned urban environment is thwarted (Vagale, 1970, Ola 1977, and Caddy, 1978). It follows therefore, that the aim of preparing physical plans and efforts to implement them being a positive transformation of society as well as its economy through development objectives in man-made

environments, become self-defeating (Finney, 1978; Caddy, op. cit. and Davies, 1980).

So far the foregoing analysis of development control has shown that urban physical organization, growth characteristics and spatio-temporal development patterns of the entire urban environment is a result of a number of more than one force (Kandie, 1982 and Chebkati, 1985). In fact McAuslan (1980) underscore this observation by delineating three principal planning ideologies that compete to influence and control physical development of urban environment as a base for human and financial resource utilization.

McAuslan (op. cit) has itemised the three ideologies as public interest ideology, private interest ideology and public participation ideology. The public interest ideology is advocated by the planner. Professional ethics of a planner are obligations to exercise impartial planning and plan implementation notions - favouring the public at the expense of an individual's pursuit and vice versa.

Private interest ideology is advocated by the law in the context of private law and prevalent socio-economic system. Where private interest ideology is dominant, the planning system is weakened in that

it is the individual private property owner who is at a higher esteem in relation to public interest. Within this ideology the character of evolving urban physical structures, dominant activities and eventual townscape reflect prevalent real estate development tendency.

Public participation ideology holds that policy formulation, plan preparation and plan implementation processes be the constituents of operationalization of all development plans. This planning ideology underscore the necessity of democratization of planning process. A direct involvement of the public in decision making and actual implementation is the theme of this ideology. This involvement should be at all levels of planning, namely; national, regional and at highly localized level. This ideology converges with Vagale's view that "enlightened and spirited community together with prudential political will" constitute a prerequisite to the success of plan implementation.

However there is a conflict between the private interest ideology on one hand, and public interest ideology and public participation ideology on the other. This conflict has been exposed by Chebkati(1985) who has stated that "planning should not have any business in asking the ignorant citizens on what he should do". He points out that planning should be left to professional

planners who are conversant with theories of planning and techniques which are not amenable to understanding by ordinary citizen or ignorant politician.

While the above planning ideologies exist in theory; at practical planning and plan implementation level, the first two ideologies, namely; private and public interest ideologies dominate contemporary operational planning policies (Garner, 1975). Where public interest ideology prevails, it is expected to be complemented by public participation ideology in principle and practice. However this is rarely achieved because more often than not the planning decisions have political implications.

The prevalent planning ideology within which development control take place in any single urban centre is reflected by functional efficiency, relationship and harmony of planned physical environment. A general consideration of dominant characteristics of planned urban environments, planning regulations and socio-economic characteristics will facilitate elucidation of dominant planning ideology in operation. vis-a-vis institutionalized physical planning policy.

Alder (1979) has shown that failure of public participation interest ideology in planning stage and plan implementation stage; and therefore the entire development control is due to persistent limited participation of civic leaders. Alder points out that this limitation is attributed by civic leaders' part time roles and lack of professional background. For this reason, public participation through representative democracy is not an effective method of supervising development control.

The above planning facets as they relate to development control explain the intricate factors that account for the difficulties encountered in development control enforcement, either through issues of enforcement notices, punishment by civic courts or physical intervention (demolitions) by the planning authority (Telling, 1986). To accomplish comprehensive development control; administrative machinery, the seemingly disjointed process of planning, implementation and management of urban environments require a co-ordinated as well as clear-cut policy.

Alder (1979), Mcloughlin (1973) and Garner (1975) show that development control as a phase in the planning process was evolved and developed in Britain. The aim of development control in the British context is to

empower central government and local authorities to prohibit undesirable use of land by private land owners, ensure use of land for projects desirable in the public interest as well as ensure that immediate and future use of planned physical environment is maintained. Any development therein should be approved (Heap 1978).

Development control definitions enumerated on Appendix IV from various authors have same meaning as that given by Vagale 1970 (Section 1.1 in this thesis) thus; development control is a legal tool for implementing a town development plan. This definition, and those on Appendix IV convey the same meaning as that in Kenya's legislative documents (Section 2.4 of this thesis).

2.2 Evolution of Planning Regulations

In Kenya town planning statutes were never been enacted on the basis of local urban development problems. The existing town planning statutes were from British Town Planning Ideas during protectorate (1895 to 1920) period, colonial (1920 to 1963) period and immediately after independence.

Initially planning statutes adopted for application in Kenya were principally meant to influence use of urban land in Nairobi, and other smaller centres of the

time such as Mombasa and Kisumu. The 1903 Ordinance was the first landuse statute in Kenya and was instituted two years after completion of Uganda Railways. This Ordinance was proclaimed in favour of the railway authority whose administrators were the most powerful in matters pertaining to land development in Nairobi as well as other centres. The Ordinance was enacted in order to delimit the size and locational characteristics of land under the railway possession.

In Nairobi, the 1903 Ordinance allocated land between the then principal commercial site and factory site to the railway offices, marshalling yards, workshops and warehouses. Today the commercial site marks the eastern zone of Nairobi Central Business District while the factory site mark the western zone of the main industrial area. On matters pertaining to the Railway, the Ordinance deemed all strip of land 5380 ft. wide on either side of the centre line to be Railway zone, whereas all land within one mile radius of any Railway Station could not be acquired for any other purpose.⁹

Another land use proclamation that was made by Uganda Railway Authorities is that of 1911. This made

9. East Africa Protectorate No. 16 of 1903 Ordinance.

Nyeri, Embu and Meru Townships to be delimited within 1 mile radius from the administrative offices flag post.¹⁰ The 1911 proclamation coincided with Simpson Committee Report of 1911 - 12 which recommended zoning of Nairobi residential areas on the basis of racial segregation.

The Government Notice No. 911 of 1914 is considered as the first planning legislation to control development.¹¹ The notice gave a definition of a plot in urban areas. It also specified desired types of building materials, relationship between buildings, occupancy, accessibility and other provisions related to sizes of structures as well as sanitation. This operated until 1918.

In 1919, another Town Planning Ordinance was enacted. The Town Planning Ordinance 1919 did not have much influence on major physical developments in Nairobi because existing patterns of landuse had been pre-determined by the 1903 Ordinance and Simpson Report. However, after Nairobi was elevated to a Municipal Status in 1920, the Town Planning Ordinance 1919 remained the only Town Planning legislation for twelve years until Town Planning Ordinance 1931 was enacted.

10. East Africa Protectorate, Official Gazzete Vol. XIII 1911 pp. 82.

11. East African Protectorate, Official Gazzete Vol. XVI of 1914 pp. 1001-1002.

Under Town Planning Ordinance 1919 control of development in other urban centres in Kenya was exercised by smaller Local Authorities during the initial stages of plan formulation (Laws of Kenya, 1926 Vol. I CAP 84). Section 4 paragraphs (1) and (2) gave power to Local Authorities to be in charge of authorizing planning schemes. Such schemes were prepared to guide development patterns of particular sections of a town.

The aim of planning schemes in Town Planning Ordinance 1919 as shown in Section 3 was to ensure.

"proper sanitary conditions, amenity and convenience in connection with layout and use of the land,"

On enforcement of development control in built up areas Section 9 paragraph (1(c)) states as the following quotation shows:

"--- erection, character, occupation and use of buildings and other structures --- the space about them, the percentage of any plot to be covered by "new or reconstructed buildings "the number of separate dwelling houses --- allowed per acre (and) the class of buildings" were to be controlled by Local Authorities so as to regulate the density of buildings for the purpose of securing amenity and or proper hygiene.

An importance of the Town Planning Ordinance 1919 in evolution of planning regulations was the provision in Section 9(2) which gave every local

authority power to formulate a set of by-laws for initiation, control and/or execution of Town Planning work related to it. Such planning by-laws received approval by the Governor-in-council.¹² Any breach of a planning by-law called for a penalty of Sterling £500. On development control, Section 12 of the Ordinance empowered a local authority to "pull down, alter any buildings or other works in an area included" in town planning scheme. Any expenses incurred were to be paid by the offender.

Moreover where building or works contravened a town planning scheme, legal disputes which arose were to be settled by the Governor-in-council. Under the provisions of this Ordinance Nairobi Municipality was able to establish its own court.

The Town Planning Ordinance of 1931 was enacted to amend the law relating to town planning in Kenya. A town planning office under a Town Planning Adviser was established under the office of Commissioner of Local Government. By then, Nairobi Municipality's planning functions were discharged by the municipality town planner due to its status as a local planning authority.

12. The Laws of Kenya 1926 Vol. II: Governor in Council was the head of a local authority in Kenya under the Town Planning Ordinance 1919.

According to the ordinance the Commissioner of Local Government had to be consulted on all planning matters as a custodian of land. This applied to Nairobi in cases of sub-division of land and acquisition of land for urban development. Under the ordinance planning authorities had their responsibility of enforcing observance and adherence to a planning scheme. The legislative powers of Nairobi Municipality to order or carry out demolition of buildings or structures erected or altered without legal sanctions; was strengthened. All legal problems arising from plan implementation were arbitrated by Commissioner of Local Government and not as provided in the 1919 Ordinance when the Governor-in-council exercised these powers.

Kenya's Planning Legislation in general and that operated in Nairobi in particular entered a new phase when Nairobi was chartered as a colonial city in 1950. The period 1931 to 1950 (about 19 years) when Town Planning Ordinance 1931 was in operation Nairobi continued to maintain physical development patterns that had been set in motion during the establishment of railway headquarters.

Nairobi Master Plan prepared by White et al (1948), is an important plan document that represented planning notions which were to guide future development

of the city. The Master Plan for Nairobi was meant to achieve a desire for a British Colonial City in Eastern Africa. In terms of spatial organization of land use and envisaged development in Nairobi, the Master Plan revivlized previous town planning ordinances and Simpson Report which had introduced racial segregation as part of Development Control measures by introducing further segregation in landuses, particularly in residential and commercial areas.

The 1948 Nairobi Master Plan was accompanied by formal institutionalization of development control legislation(Laws of Kenya 1948 CAP 133). Development control was entirely under District Commissioner. This indicates a direct involvement of central government in urban physical development. Rules and regulations were enacted in CAP 133 and in section 29 it states as follows:

"Any person who may intend

(a) to erect a building

(b) to make any alteration or repair to a building involving the removal or re-erection of any external wall which supports the roof --- shall give the District Commissioner notice of his said intensions so to do on a form --- obtained for this purpose specifying the position --- description --- the purpose and its dimensions."

On open space, it was provided that an area equal to, not less than, that approved in the draft of planning scheme and signed by District Commissioner should be maintained. An important aspect of planning legislation during mid-colonial period was that emphasised on the manner of implementation of planning schemes and procedures in development control.

Laws of Kenya 1948 CAP 133 sections 59, 60 and 61 emphasise the above aspects. Section 59 points out that:

"All buildings within the towns shall be constructed in accordance with the general plan of the town"

Penalties to those who constructed unauthorised buildings is stated in Section 60 as follows:

"Any person who shall erect or begin to erect any building or shall execute any such work as is described in rule 59 before he has given notice of his intension to erect such building or to execute such works as prescribed by these rules relating to building or before the District Commissioner has either intimated his approval of such building or works or has failed to intimate his disapproval thereof within stipulated time or after the District Commissioner has disapproval of any such buildings or works shall be guilty of an offence and shall be liable to a fine of not exceeding Ksh. 400 and -- whether proceedings have been taken or not the District Commissioner may serve either upon the person causing the buildings to be erected or other work to be executed or upon the persons who have been served a notice in writing requiring such person to remove or demolish such building or work within a time stipulated by such notice."

Finally on penalty for buildings erected contrary to provisions of the approved plans, section 61 show that:

"Any person who having obtained the approval of the District Commissioner for a proposed building or work shall erect such building or work otherwise than in accordance with plans, drawings, description or terms approved or prescribed by the District Commissioner shall be guilty of an offence and shall be liable to a fine not exceeding Ksh. 400 and -- the District Commissioner may serve --- a notice requiring removal or demolish such building or any part of such building or works within a time to be stipulated by such notice."

A difference exists between the period after 1931 and the period after 1948. In the former case, the Commissioner of Local Government had the most significant influence on Urban Planning and Development matters. In the latter case, the District Commissioner had most influence on these matters.

In 1950s, Development control was extended and applied in planning of rural villages. This approach to physical planning of rural villages was however limited in that it was meant to provide suitable emergency villages for colonial administrative purposes in Central Province. However the planning for rural village physical structures, related plan implementation and subsequent control of further development were non-statutory (Dyer, 1958).

Emergency villages were specifically planned to control man-man activities. The layout plan and design of roads, schools, administrative offices and other communication facilities were aimed at producing a pattern of African dwelling units that were easily accessible when carrying out security surveillance.

By 1960 landuse planning had become more of a central government issue than local government. The legal powers on landuse planning were in the office of Commissioner of Lands. Where an urban centre was not a planning authority, subdivision of land and implementation of planning schemes in accordance with a town plan, approval by the Commissioner of Lands was inescapable.

After 1963, planning legislation that has been in application for over 25 years (now, 1988) is based on four principal pieces of legislation. First the Local Government Regulations, 1963 and Local Government Adoptive By-laws (Building) Order, 1968 are used by local authorities in controlling planning and development activities related to construction work. Local authorities that have the status of planning authorities formulate planning by-laws on the basis of these documents.

Secondly, Development and Use of Land (Planning) Regulations 1961, and Land Planning Act CAP 303 encompass

all legislative provisions for landuse planning in Kenya. Both form a single document, the Land Planning Act CAP 303.

On development control the Land Planning Act CAP 303, section 10(1) states:

"Subject to the regulation, no person shall carry out development in an interim planning area except with the consent of the planning authority under these regulations empowered to grant consent".

On non-compliance with planning regulations section 10(2) emphasise that:

"Any person who carries out development without consent shall be guilty of an offence against these regulations and shall be liable to a fine not exceeding five thousand shillings or to imprisonment".

Sections 15 and 17 of the act explain the manner of applying for planning permission while section 27(1), 27(2) and 27(3) deal with the manner of development control enforcement. According to this act landuse planning is under a Central (Land) Planning Authority constituted by:

- (a) The Commissioner of Lands as the Chairman
- (b) Public Officer from Ministry of Agriculture
- (c) Public Officer from Ministry of Local Government
- (d) Public Officer from Ministry of Economic Planning

- (e) Public Officer from Ministry of Works
- (f) Public Officer from Ministry of Health
- (g) The Town Planning Adviser.

The above analysis indicate that development control at local authority level is action oriented. It determines types, the use and relationship of building structures as well as their location in an urban centre. This way development control guide evolution of urban spatial organization. On the other hand development control at national level is enforced by the Central (Land) Authority. The Authority's role is mainly regulation of the use of land which is converted from agricultural to urban uses.

2.2.1. History of Development Control

The concern for the form and layout of towns back to the era of Greek Empire during the reign of Alexander the Great at about 323 B.C. (Burke, 1971). The purpose of development control in these earlier days was to maintain military order and related landuses. The concern for the town plan focused on the layout which could facilitate military survaillance for potential attacks while catering for instant and effective mobilization of soldiers in case of an invasion.

In the latter stages of classical period during the period of Roman Empire development control was exercised by use of grid-iron road network as well as a concern for locational relationship between all types of building structures. This type of development control within towns entered a period of insignificant application when Roman Empire collapsed from 5th to 6th centuries.

In Britain for example when the medieval period set after invasion by Saxons, Celts and Normans later, there was extensive destruction of building structures and roads that had been constructed in Roman Towns. An inclination to feudal way of life based in rural areas rather than towns by the conquiring races had a devastating effect on further development of towns. This was accentuated by a low level of interaction between social groups.

However, during renaissance period stretching from 14th to 18th century, there was a wave of awakening by different human societies in Europe. There was a social awakening in conscience that aroused a need to travel, make adventures and explore near and far in search of knowledge. This social phenomenon was associated with growth of trade, commerce and a need to exchange ideas as well as innovations. Consequently,

towns such Venice and Constantinople in Southern Europe grew and developed where these activities took place. Building structures to accommodate merchants, travellers, loyal families and people who worked in the towns were also growing in number.

Renaissance period experienced an increasing enterprising wealthy communities and ruling families who had great influence on the manner in which towns grew and took form. Development control was an important element of town planning although it was exercised by the above social groups so as to enhance grandeur and nobility rather than achieve predetermined quality of urban environment for the benefit of all citizens (Burke, *ibid*).

Control of development was accomplished at planning stage so that the needs for aristocracy and other aspects of magnificence in renaissance architecture and garden designs preoccupied town planner-designer. Khamati (1976) has shown that planning was an art exercised by reknown individuals from higher social groups. It was for that reason that planning and plan implementation were carefully articulated to meet the demands of nobles and middle class for landuse allocation for physical structures and provision for amenities. Peripheral areas where poor social groups lived,

received minimal planning services at early stages of renaissance period.

During classical and renaissance periods development control was exercised in a non-legislative form. Planned urban environments were therefore viewed as symbols of social achievement and status rather than a basic requirement for man in his habitats characterised by high density of built-up settlements - towns.

The above trends in development control prevailed during the first quarter of 19th century when industrial revolution was about to peak momentum. The earlier concern for establishment of largescale planned and controlled urban environments for the benefit of poorer social groups was shown by philanthropic industrialists in Britain who planned model industrial villages such as Lanark by Robert Owen, Akryoden by Edward Akryod, Portsunlight by William H. Lever and Bourniville by George Cadbury. Construction of dwelling, industrial and amenity building structures was done applying great control based on the perceptions of the philanthropist industrialists.

During the latter years of 19th century and the first half of 20th Century, the concern for controlling development in towns became a concern for planners who

based their planning views on pure environmental and socio-economic considerations. In the period between 1889 and 1928, development control was viewed by Ebenezer Howard as one of the solutions to social evils in urban areas as it would bring good attributes of town and country side together. Howard expressed concern in controlled density of people, buildings, amenity spaces and travel ways (Mcfayden, 1933).

On the other hand Clarence Perry (1872-1944) and Clarence Stein (1882 - 1975) advocated the control of development by evolving and applying the concept of neighbourhood unit. While Ebenezer Howard introduced the Garden City Concept; for Clarence Perry and Clarence Stein, the concept of neighbourhood unit was advocated as the dominant planning tool, as the planners sought to resolve environmental and socio-economic problems related to housing, commercial and industrial land use activities.

The above historical perspective underscore earlier philanthropic industrialists and planning philosophers such as Ebenezer Howard as having contributed greatest in the replacement of non-legislative development control with legislative control. Howard in particular advocated adoption of three salient planning principles in the Garden City Concept. The principles were building

to a preconceived plan, restriction of growth and public/trustee ownership.

The first two principles have been used as the main themes in planning law (Heap, 1972), (Telling, 1986) and Nairobi City (Planning By-Laws 1981). The third principle is the basis on which local authorities are bestowed with the responsibility of a planning authority. The emphasis of this principle being that of public ownership complements McAuslan's (1980) public participation ideology since it would involve direct or indirect representation in urban planning and development.

Practicable legislative development control based on these principles did not become operational until enactment of Town and Country Planning 1947 Act in Britain. Garner (1975) Ed.) has indicated that development control instituted in other countries does not differ in context and intent from that in Britain. Hence Universal target of development control is to ensure a health environment against an urge for economic gains by developers in urban human habitats (Collins, 1969), (Kanyaihamba , 1975) and (Ola, 1977).

2.3 The Meaning of "Development" in Urban Planning

The meaning of "development" was first exhaustively defined and explained in Town and Country Planning Act 1947 of Britain. Garner (1975) (Ed) has summarised the definition thus: development means carrying out of building, engineering, mining or other operations in, on, over or under the land. This summary also incorporated aspects of buildings as they relate to material change and the use of buildings or land.

Heap (1978) elaborated the meaning by explaining the physical development and legal attributes of development. According to the explanation development include buildings, other structures and the process of erecting them. In this context, development includes the buildings themselves and the activity of constructing them.

McLoughlin (1973) points out that the above explanation has been used in planning legislation as enacted in Town and Country Planning Act 1947, Section 12(2) of the act define development as follows:

- (a) Carrying out of building operations, engineering operations, mining and other operations in, on over or under the land.

- (b) Making any material change in the use of building or other land.
- (c) The use of a single dwelling unit for the purpose of two or more dwelling units.
- (d) The deposit of refuse or waste on existing dump if:
 - (i) either, the superficial area of the dump is extended or,
 - (ii) height of the dump is extended and exceeds the level of land adjoining the dump.
- (e) Display of advertisement on the external part of a building not normally used for such display.

The Town and Country Planning Act 1971 excluded the following in the meaning of development.

- (a) internal or external improvements, alterations or maintenance works (not constituting the making of war damage in Britain) none of which materially affects external appearance of the building so treated.
- (b) Maintenance or improvement works carried out by the local highway authority to, and within boundaries of a road.

- (c) The making open of streets, etc. for the inspection, repair or removal of sewers, main pipes, cables, etc. of local authority.
- (d) Use of the building or other land within the precincts of the dwelling house for any purpose incidental to enjoyment of the dwelling unit.
- (e) The use of land for agricultural or forestry and the use of such purpose of any building occupied within land so used.
- (f) In the case of buildings or other land used for a purpose, such purposes of any class specified in the order made by the secretary of state the use thereof for any purpose in the same class and Town and Country Planning.

In Kenya development has been defined in The Land Planning Act CAP 303. Part I section 3(a) and (b) show that:

- 3(a) The making of any material change in the use of or density of any building or land or the subdivision of any land which for the purpose of the regulations shall be termed class A development.

- (b) The erection of such building or works and carrying out of such building operations as the Minister may from time to time determine, which for the Regulations shall be termed class B development.

It is noted that the reference to density, erection of buildings or work are meant for maintenance of planned urban environment as far as building structures for both residential and other activities are concerned. The Land Planning Act CAP 303 also point out that the following do not constitute development:

- (a) the subdivision of agricultural land into plots of twenty acres or more where no change of use is involved;
- (b) the use of land for the purposes of agriculture or forestry or use of buildings occupied within land so used;
- (c) the carrying out of works for the maintenance or improvement or other attraction of, or addition.
- (d) the carrying out by any competent authority of any works required for the construction,

maintenance or improvement of a road, if the works are carried out on land within the road reserve.

- (e) the carrying out of any local authority or statutory undertaker of any works for the purpose of inspecting, repairing or renewing any sewers, water mains cables or other apparatus including the breaking open of any street for that purpose and the installation of services by local authority.
- (f) the use of any building or land within the curtilage of the dwelling for any purpose incidental to enjoyment of the dwelling.

While the above activities do not constitute development within statutory provisions of Planning Law in Kenya, the Land Planning Act CAP 303 show clearly that the following four activities constitute development:-

- (a) the deposit of refuse, scrap or waste material on land;
- (b) the use as two or more of a building previously used as one dwelling constitute class A development;
- (c) the erection of more than one dwelling and/or shop on one plot constitutes class A development;
- (d) the display of any advertisement constitutes class A development.

Since a dwelling means a building or part or portion of a building used for human habitation in separate tenancy by one family, the factors (b) and (c) above imply that the value of a building and/or plot is enhanced by additional buildings, the erection of additional dwelling units on urban residential plots previously used as one dwelling unit; and this constitutes class "A" development.

Two terms "Operations" and "Uses" as used in Town and Country Planning Act 1947 are important in the meaning of development. "Operations" refer to activities resulting in physical alterations of land. These activities have some degree of permanence in relation to the land itself.

The term "Uses" include activities carried alongside or on the land but do not interfere with actual physical characteristics of the land. In Kenya, the Land Planning Act CAP 303 omit the terms "engineering" and "mining" but includes with emphasis the effects of increased "density of buildings" and "the erection of such buildings and works". In essence, however the carrying out of engineering operations is implied where interference with existing sewer lines, water mains, etc, occur; when carrying out construction.

The above analysis indicate that when application for planning permission is made the granting of permission depend amongst other considerations on density of building structures and their use. Legally, then any type of development in either new planning scheme or in already existing such scheme, that is not catered for in planning policies of a planning authority contravenes the planning process and plan implementation regulations.

2.4 The Meaning of Development Control

The meaning of development control in Kenya is similar to that given by Vagale (1970), Heap (1973), Garner (1975) Ed.), Khamati (1976) Purdue (1977), Ola (1977) and Alder (1979). Essentially development control is the process by which legal permission is granted to a person or groups of persons to carryout development, ensuring that such development has been undertaken according to authentic plan, and legal action for those who implement development(s) contrary to the provisions of such a plan.

This meaning upholds the implicit objective of Town Planning Ordinance 1919 (Laws of Kenya 1926 II CAP 84) and Town Planning Ordinance 1931 (Laws of Kenya 1948 CAP 133 - 134). Essentially therefore the

concept of development is the basis of the meaning of development control as discussed earlier (2.3). Its meaning is functional in relation to urban physical development objectives. The functional characteristics of development control are delimited by relevant legislative statutes discussed in part 2.3, as well as such planning by-laws as may be enacted by a specific local authority.

Essentially the meaning of development control in Kenya involves applying for permission from a planning authority. Hence any development should only take place after consent has been granted. Consequently carrying out of any development without consent is an offence against the written law. These aspects underscore one of the basic objectives of development control; that of ensuring development activities are carried out in accordance with planning policies as provided for in development plans.

2.5 Nairobi Planning Authority

Nairobi City Commission is a fully fledged planning authority by an Act of Parliament; Local Government Act 1963. The Act gave Nairobi Local Authority some autonomy in policy and management matters. Consequently the city authority operates as a corporate organization. The Local Authority is therefore seen

as a group of individuals united in one body under special and perpetual obligation invested by legal power to act in a number of ways; as an individual, to make and grant property, and by contracting obligations, being amenable to sue and being sued.

The range of operations, nature and scope of activities accomplished by Nairobi City Commission as a local planning authority are provided for in statutes of law. As a planning authority the commission is expected to remain as a system that operates within an urban society so as to provide planning services as well as determine extent of spaces within which human habitation and activities take place. Its operation is of necessity expected to reciprocate national urban policies and programmes (Standard Friday, August 28th 1987).

Since Nairobi City as a Local Authority is organized on the basis of national legal framework it operates as a micropolitical unit within a geographical space. Kandie (1982) has shown that in such framework all ranges of decisive policies on development control of land use for urban physical development are not independent of wider political implications.

All matters related to planning in Nairobi must reflect governmental approaches to development planning. Planning policies and decisions are to a large extent democratised through political and technical representation on Council/Commission Committee System. This analysis indicates that Nairobi as a planning authority does not function as a private corporate organization. In spite of the obligation to function as a corporate organization, political influences have a bearing on planning decisions and practice.

Responsibility for planning policies in Nairobi is vested in elected civic leaders who at the time when this study was conducted had been replaced by Commissioners appointed by the Central Government. Professionary qualified planners play the role of technical advisors. Usually, unless the planner is able to convince the civic politicians or commissioners in the Works and Town Planning Committee the Local Authority is bound to formulate irrational and therefore wrong planning policies.

The Works and Town Planning Committee and the planners represents public participation interests, democratic representation and professional interests. To articulate their roles in urban development matters both groups should theoretically and practically pursue

matters related to the control of the physical environment so as to enhance the enjoyment of resultant environment by citizens. The totality of this role is fundamentally administrative as well as executive. Efficiency with which these two are accomplished is an effective tool of determining the deviation from the legal framework of planning.

Planning tasks by the authority are expected to be accomplished through existing quasi-judicial control based on the legally bestowed power to make planning by-laws, enforce them and take remedial action wherever non-compliance by a citizen or a group of citizens has occurred. Non-enforcement of the by-laws on all types of development that result from non-compliance with the planning by-laws is interpreted as administrative weakness of the planning authority. Ultimately this trend would result in the prevalence of unplanned urban environment.

2.6 Legal Framework of Development Control in Nairobi

Nairobi City as a planning authority has sources of planning legislation from which to make planning by-laws so as to achieve desired physical development and appropriate governance of its citizens. The first source for its legal power exist in form of planning by-laws currently in force. The second is Local Government

Adoptive By-Laws (Building) Order 1968. Finally Local Government Act 1963 provide for legal framework within which not only is the Local Authority expected to work but also to make such by-laws as it may deem necessary.

In Legal Notice No. 256, Local Government Act 1963, Part XIV deals with the premises around which Nairobi Planning Authority could institute by-laws so as to overcome both policy and administrative bottlenecks which would be a constraint to planning (Kenya Subsidiary Legislation Part I, JAN - MAY). On powers to make by-laws section 20(1) of the legal notice states that:

"Subject to regulation 202 of these regulations, Local Authority may from time to time make by-laws in respect of all such matters as are necessary or desirable for the maintenance of the health, safety and well being of the inhabitants of its area or any part thereof --- and for prevention and suppression of nuisances therein and more particularly --- "

- (a) for controlling any of the things which it is empowered to do, establish, maintain or carry on, and
- (b) for controlling or regulating any of the things which and any of the persons whom it is empowered by or under these regulations to control or regulate, and
- (c) for prohibiting or preventing by prohibiting any of the things which it is empowered to prohibit, and

- (d) for requiring or compelling the doing of any of these things which it is empowered by or under these Regulations to require or compel.

On penalty on contravention of by-laws section 201(2) of the Legal Notice point out that:

"A local authority may by by-laws, prescribe all or any of the following penalties which may be imposed for breach of any by-law made by it ---"

Such by-laws made by a local authority have a full force of the law and are operationalized thus; as shown in section 201(3) (a) and (b): Section 201(3)(a)

"Any by-law made by a local authority under these regulations may ---

- (a) require acts to or things to be performed or done to the satisfaction of a specified person, and may empower any person to issue order to any person requiring acts or things to be performed or done, imposing conditions and prescribing periods and dates upon, within or before which acts or things shall be fulfilled and --- "

The above statute indicate that the planning by-laws made by Nairobi City Commission empower officers to carry out enforcement of such by-laws within the legal framework. Moreover, section 201(3)(b)

"confers on the officers of such local authority such powers of inspection, inquiry and execution of works as may be necessary for the proper carrying out or enforcement thereof"

City of Nairobi Planning By-Laws 1981 section IV
reinforce the above statute by showing that:

"Notices, orders and any other documents required or authorised to be served under these by-laws, may be served by delivering the same to or at the residence or place of business of the person to whom they are addressed or if addressed to the owner or some person on the premises or person on the premises who can be served by fixing them on some conspicuous part of the premises ---"

The above legal powers on enforcement of development control are further reinforced by Local Government Adoptive By-Law (Building) Order 1968 which broadens the legal scope within which development control take place in Nairobi. The adoptive by-laws deals with specific and detailed aspects of the built environment. Section 5 of the adoptive by-laws illustrate this as follows:

"Any person who intends to erect a building or materially change the use of a building or part of a building shall furnish the council--- with such of the following particulars as are possible

5(c) if the building is alteration or extension to the existing building ---

5(d) if the building constitutes a change of use or uses ---"

Application of by-laws, notices, fee, etc. will be such that;

3(1) a person who erects a building or develops land or changes the use of a building or land shall comply with requirements of these by-laws.

It is on the basis of the above legal framework that development control as it relates to the maintenance of open spaces around buildings, walls and other structures have been catered for in Nairobi City Planning By-Laws 1981. The by-laws specify that there should be no more than one building and its appurtenances on any plot or sub-plot.

For the purpose of controlling development in residential areas, Nairobi City By-Laws 1981 define the dwelling house and a habitable room as a "building designed for use exclusively as one self-contained residence, together with such out buildings as are an ancillary there to." A habitable room is defined as that which is intended to be used for the purpose of working, living as well as sleeping. In defining a dwelling unit, the term ancillary includes open spaces around such house, while in defining a habitable room, kitchen and laundry rooms are not included.

The city planning by-laws have set standards to control density of housing structures and ground coverage. Ground coverage is that portion of horizontal area of the site covered by the building as permitted under legal provisions in the by-laws. All building structures for the purpose of dwelling houses and associated appurtenances are required to maintain a maximum of 50% ground coverage.

With regard to specific plots the following are subject to development control according to Nairobi City Planning By-Laws 1981 part V.

- (i) the roofing over any open space;
- (ii) the erection or extension of a building;
- (iii) the erection, alteration or extension of chimney shaft;
- (iv) the changing of the use or uses to which land or building is put;
- (v) increasing or reducing the number of dwellings in a building;
- (vi) the carrying out of a drainage work;
- (vii) laying out of an access from a street to a plot;
- (viii) the re-erection of any building or part --- as the case may be, that part of such building has been pulled down, burnt or damaged.

2.7 Administrative Framework of Plan Implementation in Nairobi

The City Planning and Architecture Development is responsible for all physical planning matters in the City of Nairobi. The Department is divided into three sections, namely; Forward Planning, Research and Development Control.

Forward Planning Section deal with routine land planning matters such as leases, custody of plan documents such as structure plans, detailed physical plans, part development plans and master plans. Planners in this section work very closely with City Planning Director in order to put in context issues discussed by Works and Town Planning Committee. Besides, the section works closely with the office of Commissioner of Lands on lease matters, change of use and land subdivision.

Research section deals with plan design, preparation and research. At the same time, the section perform all architectural design of plans for single building structures or entire planning schemes. The section is also responsible for collecting and storing planning data and information.

Finally the Development Control Section is responsible for processing planning applications. Officers in the section scrutinize plan proposals submitted by developers to determine the nature of development envisaged by applicant - developer. They also assess all technical details of the plan design, The proposed structures are examined in relation to location of other developments in the city.

The above analysis has illustrated two principal roles of the City Planning and Architecture Department. First the planners in the department advice, guide the growth of the city and ensure that development plan proposals and implementation comform to the city's physical planning policies. In this context the department prepares planning schemes. Implementation of such schemes is accomplished by the planning authority or working jointly with private or public planning agencies.

Secondly, any permanent building structure that is proposed for construction must undergo development planning approval. This applies to both large scale development schemes or single buildings structures by either public or private developers. The role is accomplished by ensuring that all building designs and plans are approved before actual construction work begins. All approved plans are therefore deemed to have achieved planning and architectural technical requirements.

Professionally qualified planners working in City Planning and Architecture Department are expected to approve all structural details, architectural plans and aspects related to accessibility and environmental health. Building foundations and their relationship to one another are constantly appraised at various

stages of construction to ascertain compliance with the expectations of the planning authority on built environment.

Plot coverage, open spaces around buildings and other amenity services are planning attributes that are also considered in supervisory work during plan implementation process. At the time of this study, City Planning and Architecture Department had twelve qualified planners, two of whom worked in Development Control Section (Field Survey 1987).

2.8 Methodology of Development Control Enforcement in Nairobi

Area zoning is one of the initial stages undertaken by Nairobi City Planning and Architecture Department. Preparation and designation of different types of planning schemes is done on the basis of area zones. Such planning schemes include high, medium and low density housing and industrial schemes as well as commercial and recreational areas. This type of zonation entails preparation of master plan proposals for the entire city.

On the other hand planning schemes are of necessity detailed plans prepared to reflect policy formulations. It is for this reason that development control is not

only project specific but is also a factor of both broad and minute aspects of the built up urban environment. Hence the methodology of development control enforcement entail both macro and micro facets of plan implementation.

Development control enforcement at planning scheme level is expected to be based on broader legal system and planning policy level of the country and Nairobi City Commission as explained elsewhere in this chapter. Development control in specific planning schemes in Nairobi entails actual supervision and inspection of erection of structures in the city by respective city planning officers. Development control enforcement at this level takes place after approval of plans and construction of building structures commenced.

Planners are supposed to consistently visit the site so as to carry out inspection of the structures at various stages of completion. Discussion with planning officers indicated that the following stages require inspection:

- (i) depth of foundation to reach bedrock
- (ii) after gravel fillings before slab is cemented
- (iii) height of wall at window level
- (iv) complete structure before roofing
- (v) after roofing.

These stages of inspection are supposed to ensure that appropriate construction material are used while space standards, height standards, plot coverage standard, infrastructural and air circulation standards are maintained in accordance with plan proposal. The inspections are also meant to ensure that new development maintain or increase rather than reduce aesthetic value of the surrounding environment.

The objective of the entire methodology of development control is essentially meant to enhance harmony in planned urban environment.

2.9 Conclusion

In this chapter it has been established that the concern for maintenance of a healthy planned urban environment is a universal desire. Attempts to achieve this social objective have always been made through preparation of preconceived organization of space in the form of plans and their implementation.

In order to prepare physical development plans, carry out implementation and maintain a planned environment it is necessary to evolve legislative statutes as a means of enforcing planning procedure

as well as plan requirements. While these statutes empower the planning authority to control development, they have provisions which developers can use to undertake development proposals which are implementable as long as they conform to planning requirements. Finally, it has been established that Nairobi City Commission as a planning authority has adequate legal provisions and administrative framework to control development within the city.

CHAPTER THREE

UMOJA I ESTATE PROJECT

3.0 Introduction



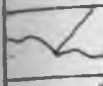

This Chapter presents the study area focusing on Umoja I Housing Estate (project) in particular. The main features of this Chapter are the history of the project, its planning concept, design and implementation process.

3.1 Features of the Project

Umoja I Housing Estate is a low-income housing project which was externally funded. The project was conceived in October 1971. Planning and implementation of the project involved the United States Agency for International Development (U.S.A.I.D.), local authority (the then Nairobi City Council) and the purchasers of the housing units.

Implementation process began in September 1975 after loan negotiations, formulation of project objectives, signing of purchaser-seller contractual agreement and other similar matters related to the project were resolved. Due to the large size of the project an autonomous project management unit was formed, to act as the policy making body for the project. Members of Umoja Project Committee represented the project management unit in all relevant City Council meetings.

LEGEND

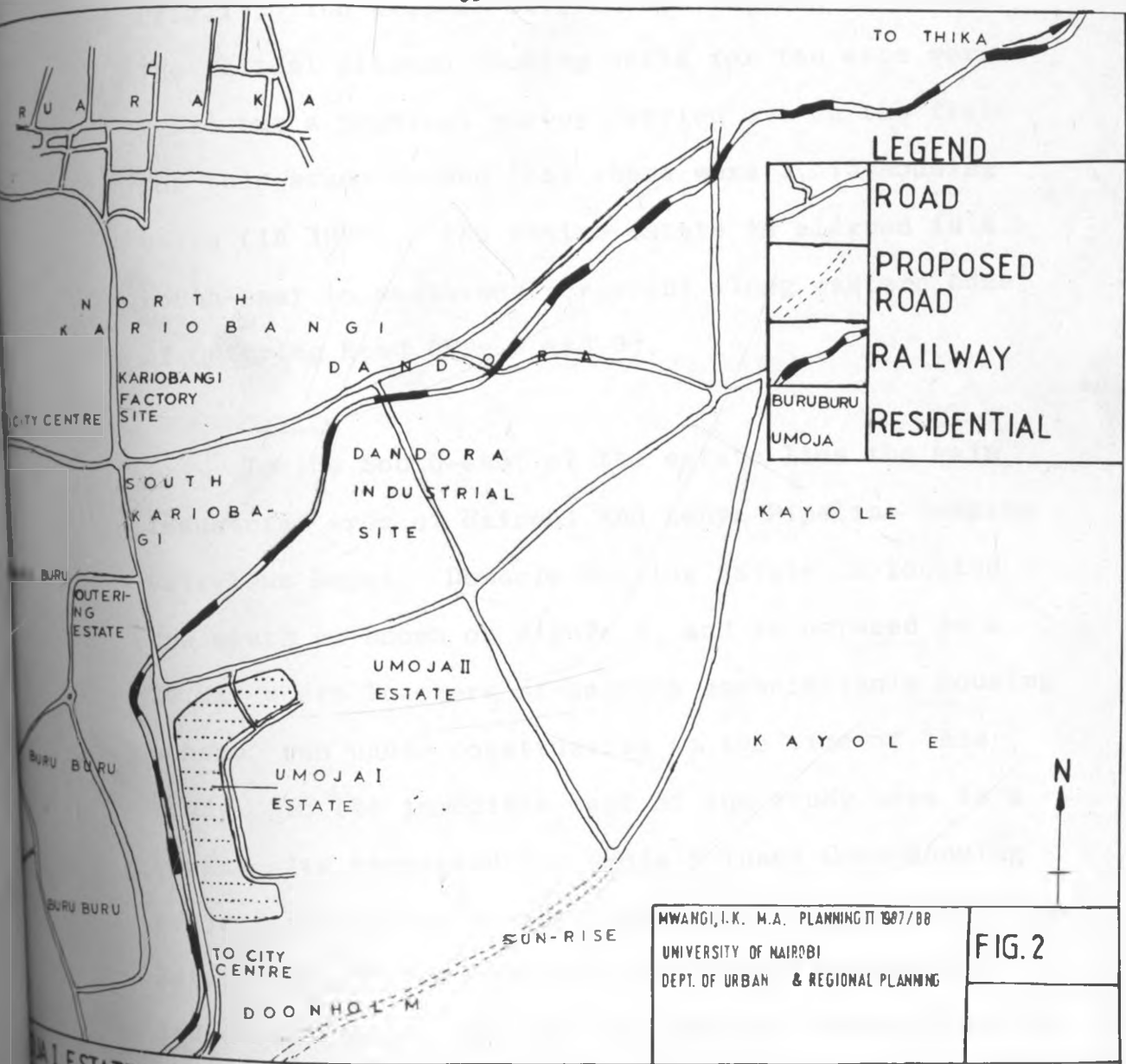
	RESIDENTIAL AREA
	GREAT NORTH ROAD
	NAIROBI CITY MAIN ROADS
	RAILWAY



MWANGI, I.K. M.A. (PLANNING) II 1987/88
 UNIVERSITY OF NAIROBI
 DEPT OF URBAN & REGIONAL PLANNING

FIG. 1

UMOJA I ESTATE: ITS LOCATION



UMOJA I ESTATE: A SKETCH OF ITS SURROUNDINGS

3.2 Location of the Project

Umoja I Housing Estate is located about 7 kilometres east of Nairobi Central Business District (Fig.1). The project site covers an area of 125 Ha. The initial planned housing units for the site were 2,924 but a physical survey carried out in the field for this study showed that there were 3,073 housing units (in 1987). The entire estate is aligned in a north-east to south-west crescent along eastern edge of Outer Ring Road (Fig.2 and 3).

To the South-east of the estate lies the main industrial area of Nairobi and Kenya Pipeline Company Petroleum Depot. Donholm Housing Estate is located due south as shown on figure 2, and in between is a 20 Ha. where Teachers of Nairobi Association's housing scheme was under construction at the time of this study. To the immediate east of the study area is a vacant site earmarked for Umoja I Inner Core Housing Project and beyond is the newly built Umoja II Housing Estate (Fig,2). Finally to the north is Dandora I Industrial Estate and BuruBuru Housing Estate Phase V.

The above analysis and that shown on figure 1 and 2 emphasise two underlying locational characteristics, the first of which is that the estate

is located within a zone of numerous housing schemes in the Eastlands. Secondly, that the project is within the neighbourhood of the main industrial area and other smaller industrial sites such as Dandora and Kariobangi.

3.3 Physical Environment

The Eastlands zone of the City of Nairobi within which Umoja I Housing Estate is located has minimal diversity in geomorphological characteristics of the land. The project site is located at an altitude of 1584 M to 1590M. The site's lowest and highest points on the ground being at 6M apart underscore the flat nature of the land,

Annual average temperature is 20°C while annual minimum temperatures are 15°C and 25°C respectively (Bureau of Education and Research, 1978), Hence the annual temperature range is 10°C.

On the other hand precipitation of the area within which the project site is located averages 900 mm per annum. The geology of the site is such that the bedrock is intermittently interrupted by durable volcanic rocks. Over the bedrock, soft ash deposits of volcanic rocks form a layer of black

cotton soil (vertisols) that is 1m. thick on average. When dry the soil forms cracks of upto 50cm. in depth. When wet the soil expands by as much as 50%.

The original vegetation at the site has been cleared but the vegetation on the land immediately surrounding the estate indicates that the area was dominantly covered with Acacia scrub and Hyperrhena rufa types of grasses and scattered bushes. The general physical environment is monotonous and fragile requiring special attention in landscape design when developing urban structures for human settlement.

3.4 Historical Background of Umoja I Project

Umoja I project was part of the second large housing project to be implemented under the assistance of Housing Guaranty Programme of the United States of America, through Agency for International Development (A.I.D.). The first successfully implemented housing project was Kimathi Housing Estate which was completed in 1970. Kimathi Housing Estate is located 4 km, east of Nairobi Central Business District and has 343 medium income housing units (R.H.U.D.O, 1983). The second Housing Guaranty Project but which was never implemented was a Kenya Caners Housing Guaranty Project.

cotton soil (vertisols) that is 1m. thick on average. When dry the soil forms cracks of upto 50cm. in depth. When wet the soil expands by as much as 50%.

The original vegetation at the site has been cleared but the vegetation on the land immediately surrounding the estate indicates that the area was dominantly covered with Acacia scrub and Hyperrhena rufa types of grasses and scattered bushes. The general physical environment is monotonous and fragile requiring special attention in landscape design when developing urban structures for human settlement.

3.4 Historical Background of Umoja I Project

Umoja I project was part of the second large housing project to be implemented under the assistance of Housing Guaranty Programme of the United States of America, through Agency for International Development (A.I.D.). The first successfully implemented housing project was Kimathi Housing Estate which was completed in 1970. Kimathi Housing Estate is located 4 km. east of Nairobi Central Business District and has 343 medium income housing units (R.H.U.D.O, 1983). The second Housing Guaranty Project but which was never implemented was a Kenya Caners Housing Guaranty Project.

The aim of Housing Guaranty Projects in Kenya has been to encourage home ownership in urban areas as opposed to rental housing schemes (R.H.U.D.O., 1979). Rental housing in Nairobi began in 1929. By the early 1960s when the Housing Guaranty Programme was incorporated in the United States of America to assist in solving housing problems in third world urban centres, rental housing in Nairobi had become inadequate in that they were not affordable to majority of the citizens. On the other hand the types of houses which were built did not assure a majority of Nairobi citizens of home ownership.

The development of Umoja I project was preceded by two events. First in October 1971, the Town clerk to Nairobi City Council as the executive officer of the local authority requested the United States Agency for International Development (U.S.A.I.D.) to finance the project. The request was followed by a pre-investment survey by the agency for International Development. On the basis of the survey report, the project was approved by Housing Guaranty Programme in 1972.

The general goal of the Agency for International Development was to re-direct Nairobi City Council in favour of low-income groups. In January 1973 a 10

million dollar loan was signed between Nairobi City Council under the guarantee of Central Government and the United States Agency for International Development. The loan was made available by Federal Home Loan Bank of New York (Auditor General, 1980). The following objectives were expected to be achieved through Umoja I Housing Guaranty Project:-

- (a) To help Nairobi City Council (local authority) implement a housing policy with emphasis on housing the poor in order to demonstrate that low cost houses could be build inspite of rises in building materials and other construction costs.
- (b) To influence Nairobi City Council adopt a housing policy that would focus on shelter and related needs of low-income families.
- (c) To provide shelter (not income through sub-letting) to eligible low-income families.
- (d) To increase housing stock while demonstrating the feasibility of low-income housing construction.

- (e) To improve institutional capacity of the local authority in administering low-income housing projects; including, their planning, design, construction and development, allocation and sale, financial management and post-occupancy maintainance.

Although all elements embraced in the above objectives contribute effectively in various facets of the current study, objective (f) is of special importance as it relates directly to the major hypothesis of the study which is discussed in chapter four.

Between January and February of 1974 initial house designs were altered so as to achieve reduction of costs per housing unit. The changes were made on floor and roof details. These changes also incorporated an increased amount of self-help construction work. Consequently the final house designs were based on controlled expandable structure.

One house type plan was used during the implementation of the project based on three versions in the levels of completion (3,7 and Table 1).

Table 1 : The three versions of Umoja I House Type Plan

Levels of House Completion	Code of Type Plan
One Room Version	.01 Type Plan
Two Rooms Version	.02 Type Plan
Three Rooms Version	.03 Type Plan

Source: R.H.U.D.O (1983), Final Evaluation Report :
Umoja I Estate.

Post-implementation and development control were catered for in the contractual agreement between the local authority and individual purchasers on one hand, and the funding agency on the other (UMOJA ESTATE TENANT PURCHASE AGREEMENT, Clause 6 (f) and (g). Section (g) of the clause is basically a reflection of the requirements of The Land Planning Act Cap. 303 Section 10 (1) which was discussed in Chapter 2.

The relevant section of the agreement clause states:

"Not without the previous consent in writing of the council to erect or permit to or suffer to be erected on or about the premises or any part thereof any new buildings, fences or erections of any nature whatsoever and not to make nor allow to be made any alterations or additions to the premises or to any buildings, fences or creations erected unless such consent as aforesaid has been obtained"

13. See Figures 6 (a), (b) and (c) for each version of type plan.

Table 1 : The three versions of Umoja I House Type Plan

Levels of House Completion	Code of Type Plan
One Room Version	01 Type Plan
Two Rooms Version	02 Type Plan
Three Rooms Version	03 Type Plan

Source: R.H.U.D.O (1983), Final Evaluation Report :
Umoja I Estate.

Post-implementation and development control were catered for in the contractual agreement between the local authority and individual purchasers on one hand, and the funding agency on the other (UMOJA ESTATE TENANT PURCHASE AGREEMENT, Clause 6 (f) and (g)). Section (g) of the clause is basically a reflection of the requirements of The Land Planning Act Cap. 303 Section 10 (1) which was discussed in Chapter 2,

The relevant section of the agreement clause states:

"Not without the previous consent in writing of the council to erect or permit to or suffer to be erected on or about the premises or any part thereof any new buildings, fences or erections of any nature whatsoever and not to make nor allow to be made any alterations or additions to the premises or to any buildings, fences or creations erected unless such consent as aforesaid has been obtained"

13. See Figures 6 (a), (b) and (c) for each version of type plan.

Implementation of Umoja I Housing Guaranty Project took place between 1975 and 1979.

3.5 Planning Concept of the Project

Allocation of land gave priority to land for house plots and circulation within the estate. Housing occupies 62.5% of the land; while circulation occupies 37.5%, of all the land on project site. Circulation includes one main primary local distributor, a network of secondary and plot access roads; as well as estate paths and private open spaces on individual plots (Figures 3, 4 and Plates 7 (c) and 9).

Table 2 below shows the principal land uses in Umoja I Housing Estate.

Table 2 : Principal Land Uses in Umoja I Housing Estate.

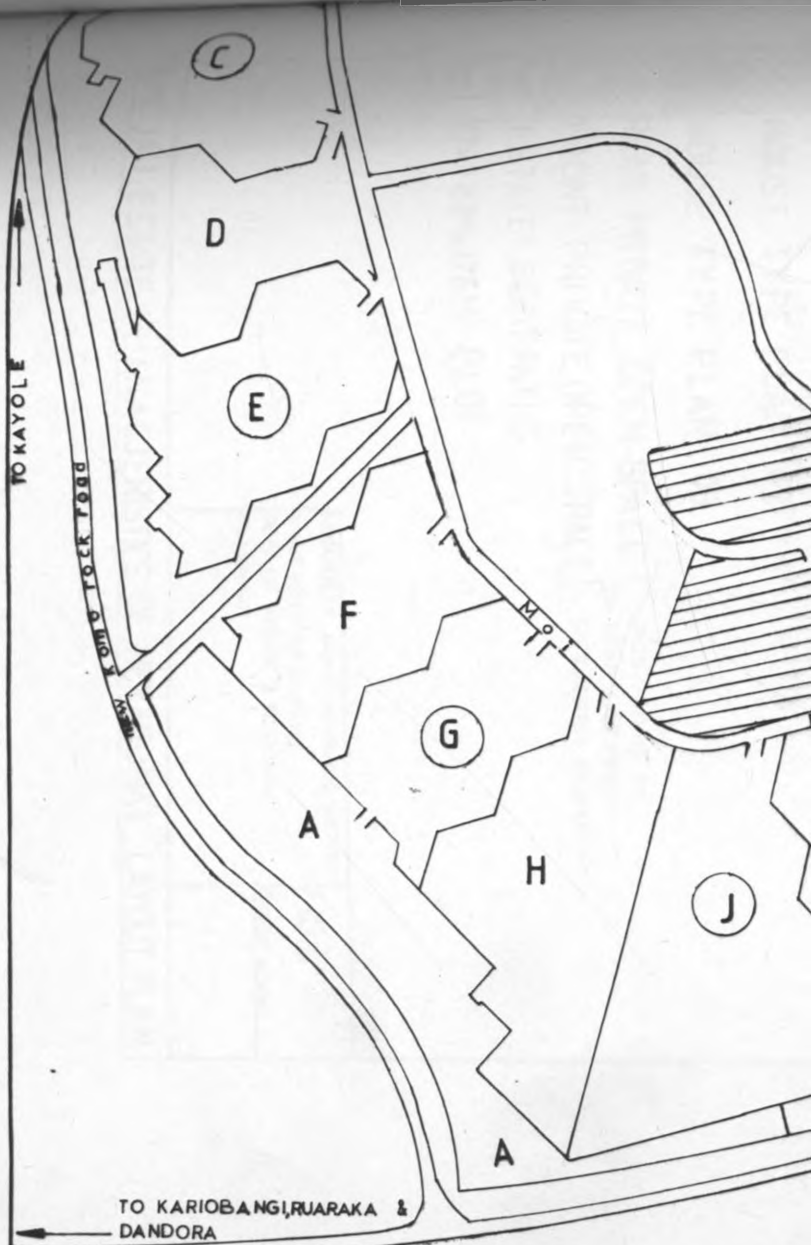
Type of Land uses	Area (Ha.)	Percentage
Housing	78.1	62.5
Circulation	46.9	37.5
	125.0	100%

Source: Warner and Hicks (1983), Water and Sewerage Design Criteria for Umoja II Housing Project in Nairobi.

The expected density of development was 25 units per ha., while the population planned for was expected to maintain a household size of four. Hence population density was planned at 100 persons per Ha. Since the housing units that were originally planned were about 3,000, initial population for the estate was estimated at about 12,000 persons.

Umoja I Housing Estate was planned to be self-sufficient in most public, community and social infrastructural facilities. These were catered for in the structure plan and located around a public open space between the estate and the site earmarked for Umoja Inner Core Residential Housing Estate.

Another aspect that was incorporated in the plan was accessibility of the estate from surrounding residential estates and the entire city of Nairobi. Figures 2 and 3 show the location of the estate and its relationship with Outering Road, New Komo Rock Road, Jogoo Road and Moi Drive. This planning approach was intended to integrate residential and other activities in Umoja I Housing Estate with other urban activities in Nairobi City System.



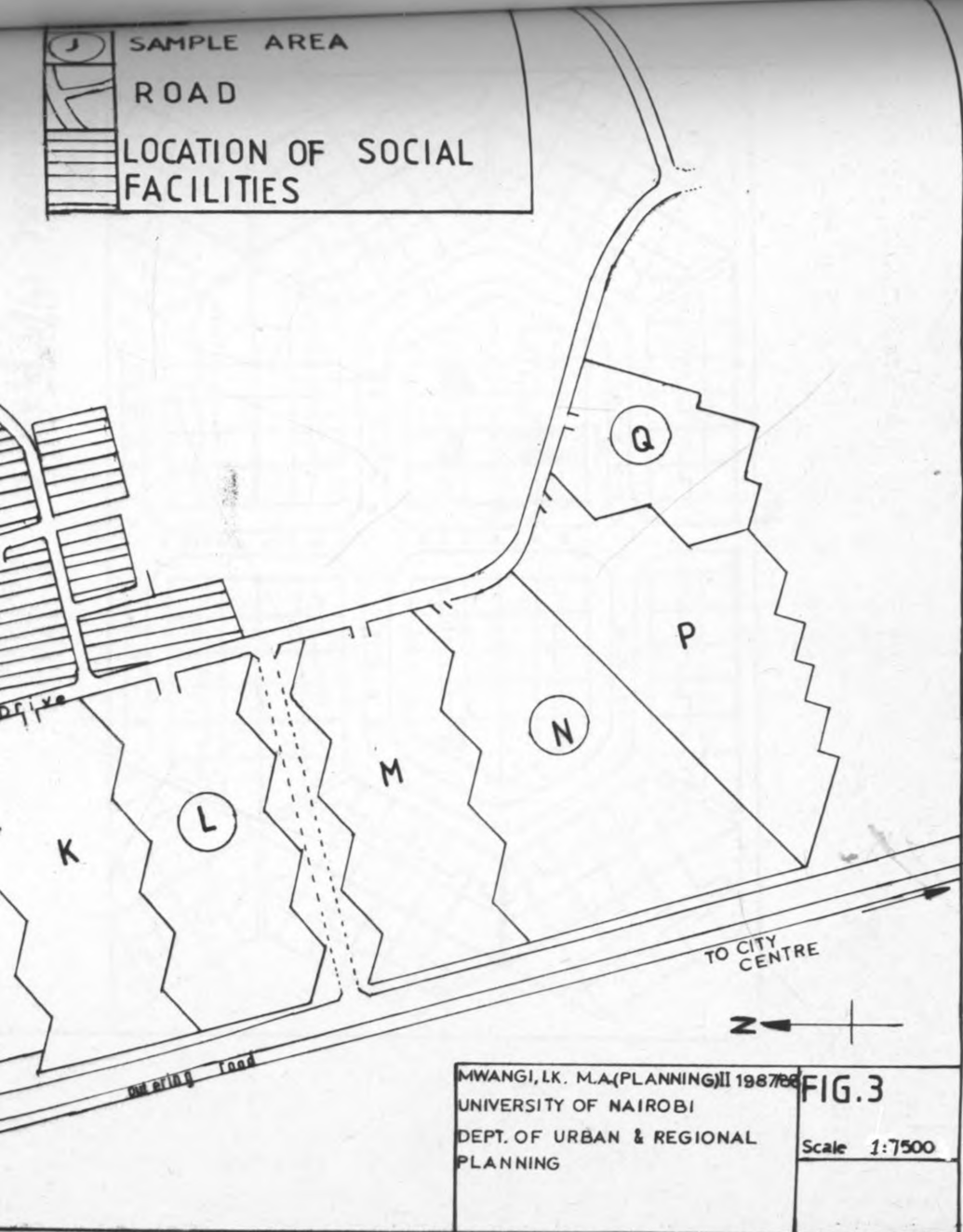
UMOJA I ESTATE: DISTRIBUTION OF SAMPLE



SAMPLE AREA

ROAD

LOCATION OF SOCIAL FACILITIES



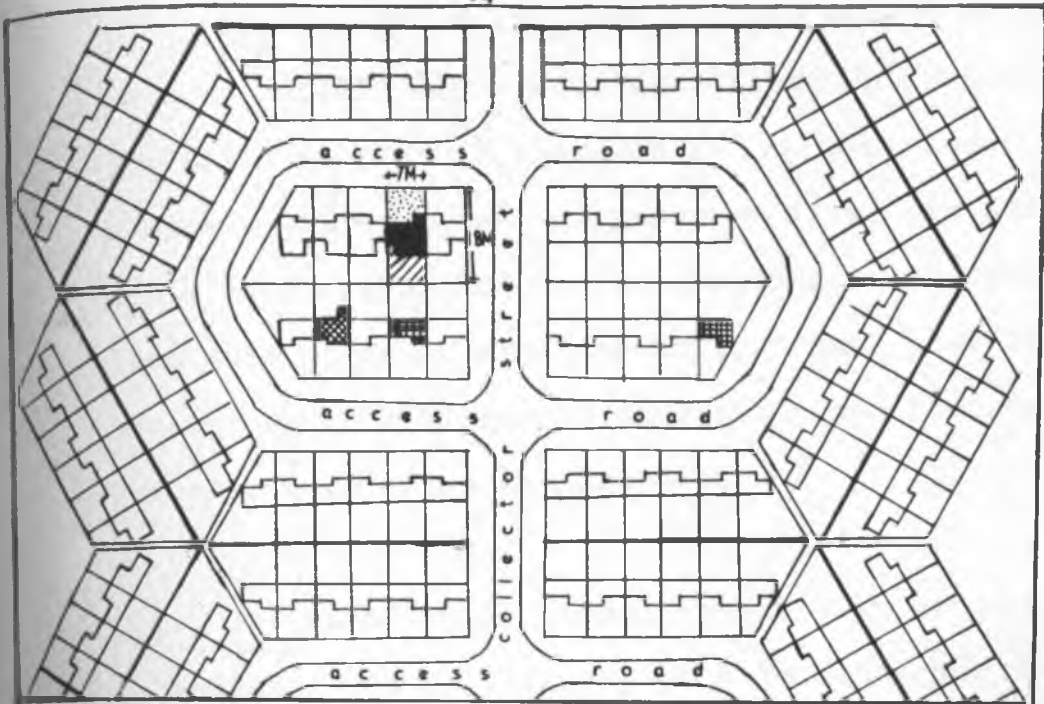
MWANGI, L.K. M.A.(PLANNING) II 1987
UNIVERSITY OF NAIROBI
DEPT. OF URBAN & REGIONAL
PLANNING

FIG.3








Scale 1:7500

88-1-8

AREAS



LEGEND

-  HOUSE TYPE PLAN 01
 -  HOUSE TYPE PLAN 02
 -  HOUSE TYPE PLAN 03
 -  REAR PRIVATE OPEN SPACE
 -  FRONT PRIVATE OPEN SPACE
 -  ESTATE FOOTPATHS
 -  (7x18)M=126M² PLOT
- } POSITIONS OF REAR AND FRONT EXTENSIONS RESPECTIVELY

MWANGI, I.K. M.A.(PLANNING) II 1987/88
 UNIVERSITY OF NAIROBI
 DEPT OF URBAN & REGIONAL
 PLANNING

FIG.4

(not to scale)

UMOJAI ESTATE: CHARACTERISTICS OF HEXAGONAL LAYOUT PLAN

3.6 Umoja I Estate Physical Plan

The layout of the plan for the entire estate is a "CRESCENT" that faces east along Outer Ring Road. The physical plan is based on a unit plot meant for a single storey house. A group of five, six and eight plots remain attached so that housing units built on them form a row of dwelling units. Each plot is accessible by a hierarchy of traffic and pedestrian travelways as shown in figure 4.

The resultant internal layout plan of plots form a hexagonal grid. This approach to landscape design was adopted in the physical plan as a control mechanism in ensuring accessibility and delimitation of plot sizes. All plots in the estate measure $7\text{m} \times 18\text{m} = 126\text{m}^2$.

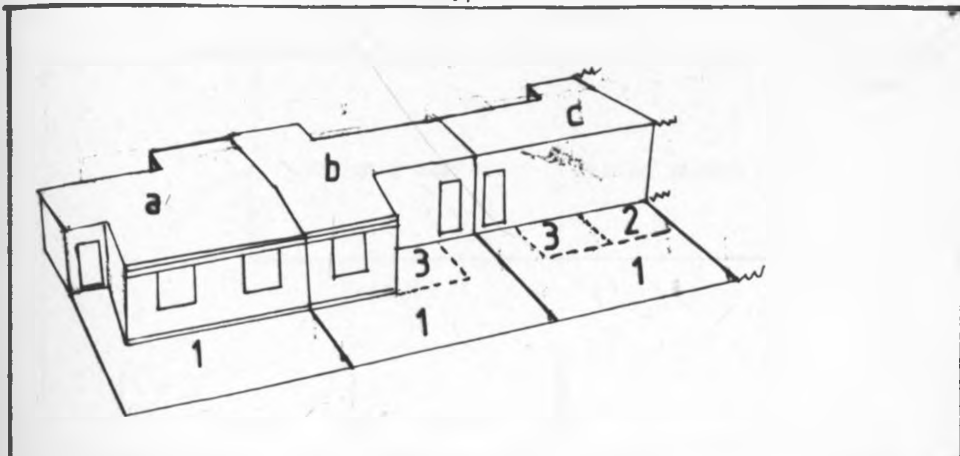
It has been indicated that the physical plan also emphasised that priority be given to vehicular and pedestrian traffic in the estate. Planning for vehicular traffic within the estate as a requirement has been accomplished by provision of secondary (collector) street system which form "T" junctions with the system of access roads.

While this planning phenomenon has adequately catered for vehicular circulation within individual sections of the estate, such traffic must gain

accessibility from one section to another within the estate by first entering the primary distributor and then secondary street system. Inter-section pedestrian traffic flows within the estate is facilitated through a system of footpaths.

The numerous "T" junctions expose pedestrians to perpetual danger from vehicular traffic because no side-walks were catered for in the plan. The problem is aggravated during rainy season when all foot paths which are not paved are impassable due to sticky mud of the black cotton soil. This forces pedestrian traffic to share the 6.5m. Secondary collector streets and 5.0m plot access roads with vehicular traffic.

The physical plan of the estate forms the basis on which electric power line, water mains and sewer system have been planned and articulated. Since the plots are demarcated so as to form double rows, water mains and sewer lines have been connected in such a way that sewer lines are located along the rear plot boundary while the water mains are connected along front boundary of the plot.



LEGEND

- (a) HOUSE TYPE PLAN 03
- (b) HOUSE TYPE PLAN 02
- (c) HOUSE TYPE PLAN 01
- (1) REAR PRIVATE OPEN SPACE
- (2) POSITION FOR ROOM 2
- (3) POSITION FOR ROOM 3

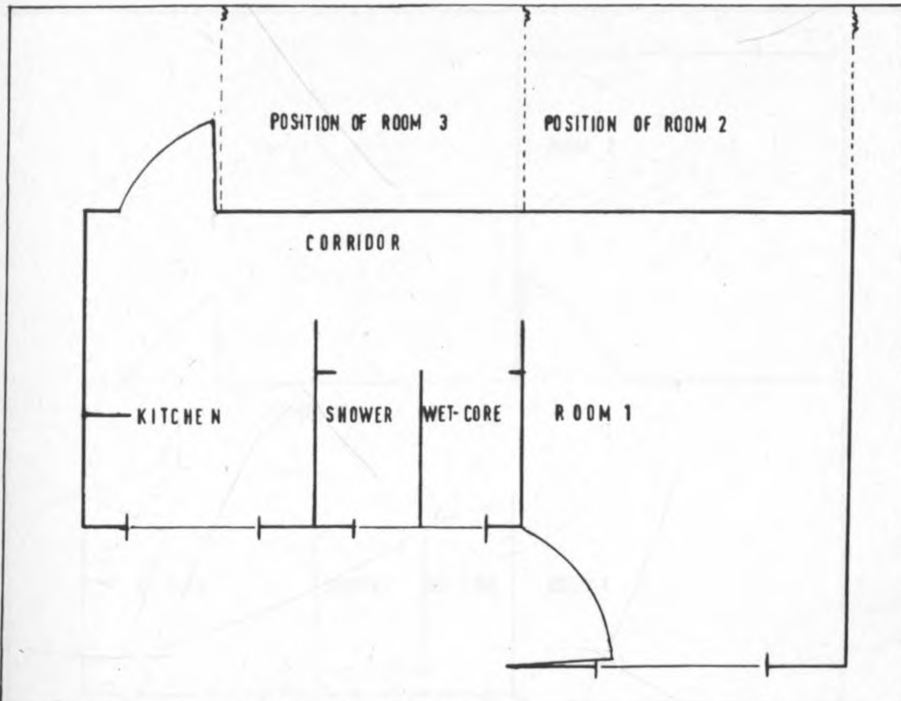
MWANGI, I K M.A. (PLANNING) II 1987/88
UNIVERSITY OF NAIROBI
DEPT OF URBAN & REGIONAL PLANNING

FIG.5




(NOT TO SCALE)

26/1/88

UMOJA I ESTATE: ARCHITECTURAL PERSPECTIVE



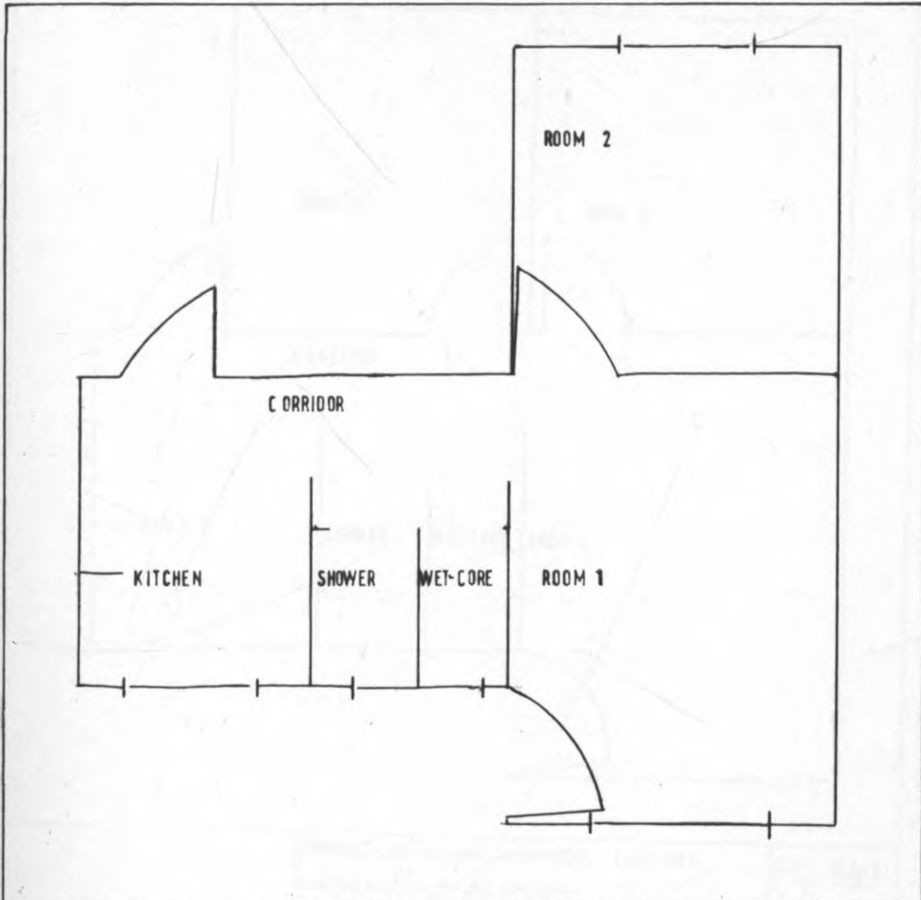
ROOM 1	= 2.82M X 4.0M
ROOM 2	= 2.82M X 2.81M
ROOM 3	= 2.50M X 2.81M
WET-CORE	= 0.77M X 1.31M
KITCHEN	= 2.05M X 2.70M
SHOWER	= 0.90M X 1.31M
CORRIDOR	= 1.76 M X 1.35 M

LEGEND	
	CONSTRUCTED WALL
	WALL TO BE CONSTRUCTED
	WINDOW

MWANGI, I.K. M.A.(PLANNING) II 1987/88
 UNIVERSITY OF NAIROBI
 DEPT. OF URBAN & REGIONAL PLANNING

FIG. 6(a)

UMOJA I ESTATE: HOUSE TYPE 01 GROUND PLAN (not to scale)

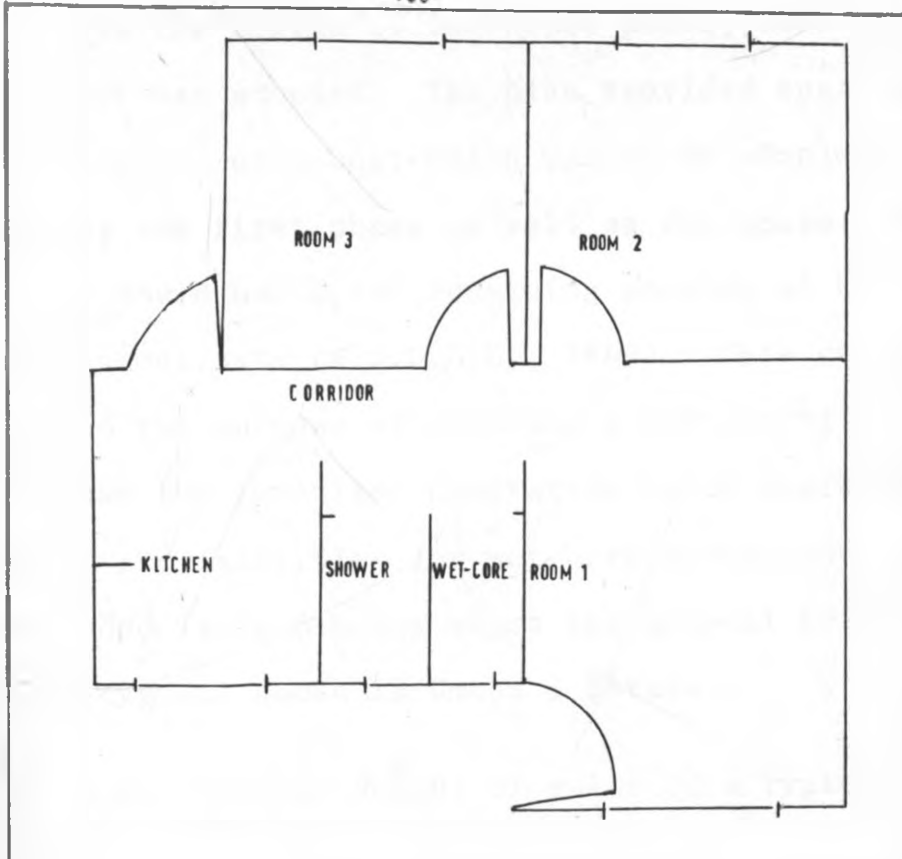


MWANGI, I.K. M.A. (PLANNING) II 1987/88
UNIVERSITY OF NAIROBI
DEPT. OF URBAN & REGIONAL PLANNING

FIG. 6(b)

(SEE FIG 6(a) FOR DIMENSIONS)

UMOJAI ESTATE: HOUSE TYPE 02 GROUND PLAN (not to scale)



MWANGI, LK. M.A.(PLANNING)II 1987/88
UNIVERSITY OF NAIROBI
DEPT. OF URBAN & REGIONAL PLANNING

FIG. 6(c)

(SEE FIG. 6(a) FOR DIMENSIONS)

UMOJAI ESTATE: HOUSE TYPE 03 GROUND PLAN (not to scale)

3.7 Housing Design and Plot Coverage

In the design of the house plans, Core Housing Concept was adopted. The plan provided space for both the portion of a unit which was to be completed during the first phase as well as the space on which the owner would build the remaining portion at his convenient date (R.H.U.D.O., 1983). This design served the purpose of availing a portion of the shelter for immediate habitation while basic household space and facilities for wet-core and kitchen were provided Table 3 below shows the general height of walls of a typical house in Umoja I Estate.

Table 3: General Height of walls of a typical complete house.

Section of Wall	Average Height(m)
Front out wall of room 1	2.405 \approx 2.4
Middle wall between 1, kitchen and wet-core on one hand, and room 2 and 3 on the other.	3.021 \approx 3
Outer wall of room 2 and 3	2.648 \approx 2.7

Source: Field Survey.

The ground plans and measurements of each house type plan version are shown on figure 6 (a), (b) and (c). Space use layout on each plot is shown on figure 4. Figure 5 shows architectural perspective of a

section of typical block of six units. Table 4 shows plot coverage for each version of house type plan and actual area of plot covered by built structures.

Table 4 : Original house area and plot coverage in Umoja I Estate.

House Type Plan	Area (m ²)	Original House plot percentage coverage
01 1 Room, kitchen and W/C	25.4	20.2
02 2 Rooms, kitchen and W/C	34.5	27.4
03 3 Rooms, kitchen and W/C	42.6	33.8

Source: R.H.U.D.O. (1983) Final Evaluation Report : Umoja I Estate.

The plot percentage coverage was calculated from corresponding ground area coverage for each house type version. The unit plot area of 126m² was used as a denominator.

3.8 Implementation of the Plan

There were two stages of plan implementation namely, formal and informal stages. Formal implementation stage is that in which qualified construction contractors were involved in construction of the three versions of house type plans. Two such construction companies were engaged on tender by the local authority. On the

other hand informal plan implementation has been an on going process where owners of housing units were expected to build one or two rooms so as to attain the expected planned state of a three roomed house.

Umoja Project Unit (U.P.U.) was the agency charged with the supervision of the implementation of the project during the formal stage. The Umoja Project Unit was formed by Nairobi City Council and was expected to be dissolved as soon as the project was completed.

The Unit was headed by a project director to whom the local authority had delegated authority and executive powers for decision making related to project implementation ranging from planning and designing to house buyer selection. The director was an engineer by training. The Umoja Project Unit had the work force shown below on table 5.

Table 5: Composition of Umoja Project Unit (as the formal plan implementation agency)

Designation	Number of Officers
Project Director	1
Project Engineer	1
Assistant Architects	2
Quantity Surveyors	2
Assistant Quantity Surveyors	6
Resident Engineers	4
Inspector of Works	12
Works Supervisor	30
Accountant	1
Total	59

Source: R.H.U.D.O. (1979) Kenya Shelter Study and A.I.D.'s Experience.

Note: The conspicuous omission of a planner.

Tables 6 and 7 show dates and number of units constructed, as well as differences in planned and delivered housing units during formal implementation stage.

Table 6 : Date and number of housing units constructed in Umoja I Estate. Each set of units was built by either of two builder companies contracted,

Date of Commencement of Implementation		Number of Housing units built
September	1975	542
September	1975	785
September	1975	547
April	1976	610
October	1976	100
June	1977	340
Total		2,924 units

Source: R.H.U.D.O. (1979) Kenya Shelter Study and A.I.D.'s experience.

Table 7 : Planned and actually delivered housing units in Umoja I Estate

House Type Plan	Planned Housing Units		Delivered Housing Units	
	No. of Units	Percentage (%)	No. of Units	Percentage (%)
01	870	30	2123	73
02	1305	45	637	22
03	725	25	164	5
Total	2900	100	2924	100

Source: R.H.U.D.O. (1979) Kenya Shelter Study and A.I.D.'s Experience.

The above discrepancy is explained by the fact that by changing the floor and roof detailed design as discussed earlier (see 3,4) and increasing the number of type plan 01 version which used less amount of building materials, it was possible to construct the 24 extra housing units.¹⁴

Umoja Project Unit was also responsible for the following aspects during formal implementation stage:

- (a) preparation of all site plans, tender documents as well as selection and management of construction contractors. Construction work included all infrastructures, dwelling units, schools, health centre and market.
- (b) Payment of all dues to contractors
- (c) Regulation of expansion of all dwelling units and correction of latent defects throughout formal implementation.

The water supply for the estate was accomplished by the laying out of a 10 inch diameter pipe from a 32 inch diameter pipe. The 10 inch diameter pipe is

14. No explanation was however obtained from existing documents to account for extra 149 houses counted during the field physical survey. The survey established that the estate has 3073 units and not 2924 units as shown on Table 7.

connected to lower hierarchies of water pipe system which link each housing unit with water mains. During planning and implementation stages the envisaged per capita water consumption was 60 litres per day per person.

Sewerage pipe system is made up of 9 inch diameter pipes which serve all sections at each plot level. The pipe is connected to each housing unit by a lower hierarchy of sewer pipe which drain domestic waste water and raw sewer from inside each unit. The 9 inch pipe is connected to a 15 inch diameter pipe which is the main sewer trunk in the estate. These planned water and sewer systems were designed and planned so as to cater for the planned housing units.

Informal implementation was to cover type 01 and 02 house plans which constituted 95% of all housing units as noted in Table 7, which meant that informal plan implementation was expected to play a significant role in the success or failure of Umoja I Housing Project. The implementing agents at the informal stage were the individual house buyers themselves as reflected in Clause 7 of Umoja Estate Tenant Purchase Agreement. The Clause says in part:

"...Further in the case of one and two roomed premises, the Tenant-Purchaser hereby agrees to erect or construct at his own expense, two and one additional rooms respectively in accordance with the approved plan for the whole unit...."

By 1979 more than 50% of all dwelling units had been fully developed. However, as the informal implementation process took place some house owners expanded their housing units beyond allowable size (Plates 3, 4, 5, 6 and 7 (a), (b) and (c). Warner and Wicks (1983) have shown that by June 1982, 160 houses; about 5% of dwelling units within Umoja I Housing Estate had built dwelling structures that were not catered for in the original plan while 14 plots had extra toilets.

Another aspect of plan implementation that had been described by the Auditor General (1980) as resulting in unsightly conditions in Umoja I Estate was the removal and dumping of black cotton soil within the estate's open spaces. The soil had been dug out during preparation of foundations for new building structures (Plates 1 and 2).



PLATE 1: Complete foundation for a front extension



PLATE 2: Completing a slab for a front extension.
Note: The wall of a neighbouring extension.



PLATE 3: Single story front extension

Note: Water tank at the top and position of door.



PLATE 4: Back extension (shown by arrow)

Note: ● Water tank on roof top
● Narrow passage for open space
● Children shown have no enough space to play on.
● Air circulation, sunlight and space for drying cloth are very limited.



PLATE 5: A wooden back extension (Emphasise ineffectiveness of Development Control enforcement)



PLATE 6: Back extension (shown by arrow of a second house in a row.

- Note:
- Problem of accessibility when the owner of the first house builds back extension.
 - Short posts indicating plot boundary.



- 7(c)
- NOTE 7(a): A four storey structure (flat) replacing original house and with 100% plot coverage.
(b): A two storey extension with a concrete stair-case.
(c): Two adjacent double storey extensions
Note: Children playing on an access road.



PLATE 8(a): A building on public open space
a waiting to be put into intended
use.



PLATE 8(b): A building on public open space
used as a meat shop.

Note: Solid waste disposed from
nearby extension to the left
of photo.



PLATE 9: A collector street in Umoja I Estate.

3.9 Conclusion

Formal plan implementation of Umoja I Estate was accomplished by professionally qualified personnel who were attached to the Umoja Project Management Unit, which as noted earlier was represented by Umoja Project Committee on policy matters in all council meetings. The exclusion of a planner in Umoja Project Management Unit as the formal implementing agency was significant omission. Formal implementation of the project was undertaken between 1975 and 1978.

Informal plan implementation has been an on going process undertaken by house owners. The process has resulted in construction of housing units which were not catered for in the original plan. The existence of such units which had not been catered for in way by services and infrastructural facilities in the original plan reflect a significant deviation from the planned environment.

The next chapter analyses data and information collected in the field on the basis of hypothesis formulated in Chapter One. The data and information collected was intended to provide an explanation for the "over implementation" of Umoja I Estate Plan during informal plan implementation period.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.0 Introduction

The current Chapter contains analyses of both primary and secondary data. Quantitatively analysed sample survey data and inferences made from it are first dealt with. Analysis of information related to general hypothesis is then presented.

4.1 Hypothesis Testing

The Chi-square model and contingency tables have been used in carrying out significance testing for the first two specific hypotheses (See 1,7,4 and Appendix - II). Each of the two specific hypotheses was tested in two stages.

4.1.1 Specific Hypothesis 1 : Contingency tables

The first specific hypothesis was tested. The results obtained are shown below:

H_0 : There is no difference in perception of adequacy of originally planned housing units between those who have and those who have not constructed unauthorised structures.

H_1 : Alternative

Step 1: Umoja I Estate Residents' perception of plot size.

Table 8 : Observed Frequencies (O_i)

	Plots with Extensions (h_e)	Plots without Extensions (h_w)	Total
Households Perceiving Adequacy of original plan of plot size	32	26	58
Households perceiving inadequacy of original plan of plot size	18	22	40
Totals	50	48	98

Source: Sample data

Table 9: Calculations of Expected Frequencies

Cell Cell	Observed Frequencies (O_i)	Calculations	Expected Frequencies (E_j)
1	32	$\frac{50 \times 58}{98} = \frac{2900}{98} = 29.59$	29.59
2	18	$\frac{50 \times 40}{98} = \frac{2000}{98} = 20.41$	20.41
3	26	$\frac{48 \times 58}{98} = \frac{2784}{98} = 28.41$	28.41
4	22	$\frac{48 \times 40}{98} = \frac{1920}{98} = 19.59$	19.59

Source: Sample data

Table 10: Expected Frequencies (E_j)

	Plots with Extensions (h_e)	Plots without Extensions (h_w)	Totals
Households perceiving adequacy of original plan of plot size	29.59	28.41	58
Households perceiving inadequacy of original plan of plot size	20.41	19.59	40
Totals	50	48	98

Source: Sample Data

Calculations of the χ^2 Value

$$\begin{aligned}
 \chi^2 &= \sum_{i=1}^n \frac{(O_i - E_j)^2}{E_j} \quad \text{----- Chi-square Model} \\
 &= \frac{2.41^2}{29.59} + \frac{-2.41^2}{20.41} + \frac{-2.41^2}{28.41} + \frac{2.41^2}{19.59} \\
 &= 0.1960 + 0.2848 + 0.2042 + 0.2965
 \end{aligned}$$

$$\chi^2_{\text{Cal.}} = 0.9809$$

$$\underline{\underline{0.98}}$$

The rejection level was set at $\alpha = 0.05$ with one degree of freedom ($df = 1$). Using the Chi-square test the critical value is set at 3.84. This value is greater than the calculated value of 0.98. The null hypothesis is therefore accepted.

Step 2: Umoja I Estate Residents' perception of the 3-room house

Table 11 : Observed Frequencies (O_i)

	Plots with Extensions (he)	Plots without Extensions (hw)	Total Total
Household perceiving satisfaction of the 3-room House	14	16	30
Households Not perceiving satisfaction of the 3-room house	36	34	70
Totals	50	50	100

Source: Sample Data

Table 12: Calculations of Expected Frequencies

Cell	Observed for frequencies (O_i)	Calculations	Expected Frequency (E_i)
1	14	$\frac{50 \times 30}{100} = \frac{1500}{100} = 15$	15
2	36	$\frac{50 \times 70}{100} = \frac{3500}{100} = 35$	35
3	16	$\frac{50 \times 30}{100} = \frac{1500}{100} = 15$	15
4	34	$\frac{50 \times 70}{100} = \frac{3500}{100} = 35$	35

Source: Sample Data

Table 13: Expected Frequences (E_j)

	Plots with Extensions (He)	Plots without Extensions (hw)	Total
Households perceiving satisfactions of the 3-room house	15	15	30
Households not perceiving satisfaction of the 3-room house	35	35	70
Total	50	50	100

Source: Sample Data

$$\begin{aligned} \chi^2_{\text{Cal.}} &= \frac{1^2}{15} + \frac{-1^2}{35} + \frac{-1^2}{15} + \frac{1^2}{35} \\ &= 0.067 + 0.029 + 0.067 + 0.067 \\ &= \underline{\underline{0.23}} \end{aligned}$$

The rejection level was again set at $\alpha = 0.05$ with one degree of freedom ($df = 1$). Since the critical value in the Chi-square table which is 3.84 is far much greater than the calculated value of 0.23 the null hypothesis is accepted,

In both steps of analysis the first specific hypothesis that; there is no difference in perception of adequacy of originally planned housing units between those who have and those who have not constructed unauthorised structures, has been accepted.

4.1.2 Specific Hypothesis 2 : Contingency tables

The second specific hypothesis was tested and results are as shown below:

H_0 : There is no difference in perception between Umoja I Estate residents who have and those who intend to construct unauthorised structures; on consequences of their action on a planned environment,

H_1 : Alternative.

Step 1: Umoja I Estate residents' perception of consequences of their action on a planned environment; the use of private open spaces.

Table 14: Observed Frequencies (O_i)

	Plots with Extensions (h_e)	Plots without Extensions (h_w)	Tot Tot
Households perceiving negative consequences on the environment by building structures	18	26	44
Households not perceiving negative consequences of the environment by building structures	32	24	56
Total	50	50	100

Source: Sample Data

Table 15: Calculations of Expected Frequencies

Cell	Observed Frequencies (O_i)	Calculations	Expected Frequency E_j
1	18	$\frac{50 \times 44}{100} = \frac{2200}{100} = 22$	22
2	32	$\frac{50 \times 56}{100} = \frac{2800}{100} = 28$	28
3	26	$\frac{50 \times 40}{100} = \frac{2200}{100} = 22$	22
4	24	$\frac{50 \times 56}{100} = \frac{2800}{100} = 28$	28

Source: Sample Data

Table 16: Expected Frequencies (E_j)

	Plots with Extensions (h_e)	Plots without Extensions (h_w)	T
Households perceiving negative consequences on the environment by building structures	22	22	
Households not perceiving negative consequences on the environment by building structures	28	28	
Total	50	50	

Source: Sample Data

Calculations of the χ^2 value

$$\chi^2 = \sum_{i=1}^n \frac{(O_i - E_j)^2}{E_j} \text{ -----Chi-square Mode}$$

$$\begin{aligned} \chi^2_{\text{Cal.}} &= \frac{-4^2}{22} + \frac{4^2}{28} + \frac{-4^2}{22} + \frac{4^2}{28} \\ &= 0.727 + 0.571 + 0.727 + 0.571 \\ &= 2.596 \\ &= \underline{\underline{2.60}} \end{aligned}$$

As in the previous hypothesis, rejection level was set at $\alpha = 0.05$ with one degree of freedom (df = 1). The critical value in the Chi-square table is 3.84. This value is greater than the calculated value of 2.60. This implies that the null hypothesis is accepted.

Step 2: Umoja I Estate residents perception of consequences of their action on a planned environment; the use of public open spaces .

Table 17: Observed Frequencies (O_i)

	Plots with Extensions (h_e)	Plots without Extensions (h_w)	Total Total
Households perceiving negative consequences on the environment by building structures	29	37	66
Households not perceiving negative consequences on the environment by building structures	18	11	29
Total	47	48	95

Source: Sample Data

Table 18 : Calculations of Expected Frequencies

C Cell	Observed Frequencies (O_i)	Calculations	Expected Frequencies (E_j)
1	29	$\frac{47 \times 66}{95} = \frac{3102}{95} = 32.65$	32.65
2	18	$\frac{47 \times 29}{95} = \frac{1363}{95} = 14.35$	14.35
3	37	$\frac{48 \times 66}{95} = \frac{3168}{95} = 33.35$	33.35
4	11	$\frac{48 \times 29}{95} = \frac{1392}{95} = 14.65$	14.65

Source: Sample Data

Table 19 : Expected Frequencies (E_j)

	Plots with Extensions (h_e) NM	Plots without Extensions (h_w)	Total
Households perceiving negative consequences on the environment by building structures	32.65	33.35	66
Households not perceiving negative consequences on the environment by building structures	14.35	14.65	29
Total	47	48	95

Source: Sample Data

$$\begin{aligned}
 \chi^2_{\text{cal.}} &= \frac{-3.65^2}{32.65} + \frac{3.65^2}{14.35} + \frac{3.65^2}{33.35} + \frac{-3.65^2}{14.65} \\
 &= 0.408 + 0.928 + 0.400 + 0.909 \\
 &= 2.645 \\
 &= \underline{\underline{2.65}}
 \end{aligned}$$

At a rejection level of $\alpha = 0.05$ and one degree of freedom ($df = 1$), the calculated Chi-square is 2.65. This value is similarly less than the critical value of Chi-square of 3.84, Consequently the null hypothesis has been accepted and the alternative rejected.

Discussion

The resultant calculated Chi-square values vis-a-vis the critical values; all set at $\alpha = 0.05$ and one degree of freedom are shown on table 20 below. It is noted that both null hypotheses have been accepted. This means that statistically all observed differences between the observed and expected frequencies are as a result of chance variation.

The most serious phenomenon that is affecting original planned state of Umoja I Estate arises from perceived satisfaction of the 3-room house. The phenomenon has the smallest calculated Chi-square value of 0.23 (table 20). The value confirms that construction of extensions in Umoja I Estate is not explained by lack of satisfaction with the 3-room house.

The above statistical value and its implication is further validated by the fact that out of the sample of houses visited only 5% of those with extensions were meant to provide additional space for family accommodation. The other 95% of the houses had extensions which were for renting.

Similarly, out of the sample houses without extensions 60% of the respondents had intention to

construct extensions while 40% did not. The 60% proportion indicated that the extensions would be for rental purposes rather than for additional space for family accommodation.

Table 20 : Comparison between Critical and Calculated Chi-square values

Phenomenon Tested	Critical Chi-square Value	Calculated Chi-square Value
Satisfaction by the 3-room house	3.84	0.23
Perception of Plot Size	3.84	0.98
Perception of consequences on planned environment by building structures on private open spaces	3.84	2.60
Perception of consequences on planned environment by building structures on public open spaces	3.84	2.65

Source: Sample Data

The other phenomenon that least explain construction of unauthorised structures in Umoja I Estate is perception of inadequacy of the 126m² planned plot size per housing unit. Calculated Chi-square value for this phenomenon is 0.98, also far much smaller than critical value of 3.84 (table 20). The calculated value strongly confirm that residents of the estate consider the size of plots to be adequate.

Finally, the other two phenomena; namely perception of consequences on planned environment by building structures on private open spaces has a calculated Chi-square of 2,60, that of building structures on public open spaces has a value of 2.65.

The two values are also less than the Chi-square critical value of 3,84, although they are significantly greater than 0,23 and 0,98 discussed earlier. The values, however, further confirm the fact that construction of unauthorised structures in Umoja I Estate is not an automatic response to inadequacy of originally planned housing units. All the residents perceived the housing units to be adequate,

The calculated values of the two phenomena underscore the fact that a significant number of residents of the estate are aware of the consequences of their action on a planned urban environment by building unauthorised structures. From the sample survey 54% of the respondents who live in houses with extensions are aware of environmental and other dangers resulting from construction of such structures, 46% of the respondents in this category were found not to be aware.

Similarly 68% of the respondents who live in houses without extensions are aware of the negative effects of constructing unauthorised structures in a planned urban environment. 32% of the respondents were found not to be aware of the consequences.

4.2 General Hypothesis

The basis for the general hypothesis has been explained in Chapter one. The null hypothesis is that lack of resources to enforce development control by the City Commission rather than absence of legal powers explain the construction of Umoja I Estate.

As indicated in the entire Chapter two particularly analysis on planning legislation (pp.59-75) of this thesis Nairobi City Council is a planning authority. Also under the legal powers to the authority through the Local Government Act 1963 and The Local Government Adoptive By-Laws (Building) Order 1968, Nairobi City as a planning authority is adequately provided for with legal powers.

On the basis of the general hypothesis it is evident that the prevalent ineffective enforcement of development control in housing estates within Nairobi is explained by unavailability of resources as well as ineffective use of what is available. The two

aspects of resource use have been found to be part of the underlying explanations for construction of unplanned extensions in Umoja I Estate.

During the field survey three broad categories of resources and the manner of their influence on development control were identified.

(a) Inadequacy of Planners and Levels of Their Utilization

Seven out of nine officers in the City Planning and Architecture Department with whom discussions were carried out separately, emphasised that development control problems were greatly a result of shortage of man-power. Moreover a number of the officers currently working in the Development Control Section are not fully qualified. Insufficiency of trained man power is illustrated by the table below:-

Table 21 : Technical staff in Development control Section

Title of Officers	Approved Establishment No. of Planning Officers	Existing No. in the Posts of Planning Officers
Assistant Director of Planning	1	1
Chief Assistant Planner	1	-
Principal Development Control Officer	3	1
Senior Assistant Planner (Development Control)	6	1
Development Control Officer	10	3
Development Control Assistant I	12	8
Development Control Assistant II	12	-
Development Control Assistant III	12	3
Total	57	17

Source: City Planning and Architecture Department - 1987.

It was established that Development Control Section had only two fully trained planners. The two planners had a degree in planning. One of them professionally qualified and therefore registered as a member of Architectural Association of Kenya, According to Establishment Records, the posts which academic and professional qualification were required

range from the post of Assistant Director to Development Control Officer. A total of twenty one such officers with planning degrees were expected to have been recruited to work in Development Control Section.

According to table 21 above, only five such officers were working in these posts. Yet amongst them, only two had been trained at a level of planning degree. Of the other three two had diplomas in planning and engineering respectively. The third had some training in planning at a level lower than diploma which was not given.

Officers who were discharging their duties as Development Control I were expected to be University graduates with at least a first degree awaiting further training in planning. Such officers are expected to work for 6 months before sponsorship to institutions where they obtain planning degrees. At the time of data collection the section had no such prospective trainee officers. The eight that were in those posts were not eligible because they had got in such positions through promotion rather than recruited for training purposes. They had no first degrees. Moreover. these officers were supposed to be twelve,

Development Control Assistant II and III were supposed to be twelve in each category making a total of twenty four officers. According to establishment records the twenty four officers were supposed to have attained formal education of either form four or form six and a diploma in planning in order for them to discharge their responsibilities. At the time of this study no officers had been recruited to the level of Development Control Assistant II. Even among Development Control Assistant III only three such officers had been recruited.

The above analysis indicate that while a total of thirty six Development Control Assistants were required only eleven had been recruited. It is noted that there are salient features related to man-power in Development Control Section. First, that the section is understaffed by 70.2%. Secondly, the section had only two academically qualified planning officers instead of twenty

Recruiting of Planning Man-power for Nairobi City Commission

While it could be argued that officers who were not academically qualified as planners could perform equally well after long experience in a planning office,

it should be noted that such experience should be supported by academic qualification attained during formal education. Such experienced officers remain for a long time inadequately equipped with necessary theoretical and other broad planning knowledge.

Before 1984 when Employment Act Cap. 226 was enacted all members of staff for Nairobi City Commission were entirely recruited by the local authority. However, since then all senior technical staff and graded clerical staff are recruited by Public Service Commission on request by the Local Authority. Jobs groups for these personnel range from scale 1 to 14. All Development control planning officers from Development Control Officers (graduate trainee planners) to Assistant Director of Planning are employed in scales that occur in this range. Scale 1 is that of a Town Clerk,

All ungraded staff in the Commission on the other hand are still recruited by the local authority. They include Development Control Assistants I, II and III in this case. These personnel have jobs designated from 15 to 21; 21 being the lowest.

Transportation of Officers to Sites

Transportation of development control inspection officers to development sites and planning schemes is accomplished in two ways. First, information obtained from the local authority indicated that this task is expected to be accomplished by use of vehicles of the planning authority. However this expectation is not fully realized because of lack of vehicles particularly set aside for the task. Hence use of this form of transportation is possible only when vehicles are not required for other purposes.

Secondly, use of personal/private vehicles by the officers is encouraged. There is even money set aside for paying the officers mileage in accordance with details set out in Table 22.

In spite of the above transportation provisions discussions with the officers revealed that officers rarely make site visits. This opinion was formed as it became clear that no data or information was available at City Planning and Architecture Department on extensions in the study area. The officers did not know when actual construction took place.

Table 22 : Mileage paid to Development Control officers on private vehicles

Capacity of Vehicle (C.C.)	Kshs. per Km.
901 - 1000	1,90
1001 - 1100	2,30
1101 - 1200	2,50
1201 - 1300	2,60
1301 - 1400	2,80
1401 - 1500	2,95
1501 - 1600	3,20
1601 - 1700	3,30
1701 - 1800	3,50
1801 - 1999	4,65
Over 2000	4,05

Source: City Planning and Architecture Department
- 1987.

(b) Enlightened Citizenry and Local Leadership

Lack of these two aspects as resources were confirmed by both field survey, discussions with officers and information from existing documents. It was found out that there is an apparent non-appreciation of the dangers of illegal structures by both local politicians and citizens (Kenya Times, Friday, July 24 1987 pp.7). This phenomenon has been

prevalent and it is for this reason that The Standard, July, 27 1987 pp.6 reminded the leaders that Nairobi City has reached a stage of development where they ought to take firm decisions on development matters for the benefit of all at present and future generations.

In 1983, the issue of illegal development was on the Works and Town Planning Committee Minutes on 31st August, 1983 but; deliberation on the issue was deferred without any conclusive course of action. On 3rd December, 1983, Housing Development Committee recommended to the Town Clerk and City Planning and Architecture to demolish illegal extensions and developments.

The inability of the local authority to accomplish this task was explained by the Nairobi City Commission when it issued a "stop order" for further construction of illegal structures which had been erected. However, the Commission expressed reservation as to how and when demolition would commence (Daily Nation, Wednesday April 4, 1986 p.3). It was considered that politicians would accuse Nairobi City Commission of harassing city citizens,

Similarly, this hesitancy was again evident when the Commission raised the issue of pulling down illegal structures and strengthen development control measures simultaneously. Nairobi as a planning authority is therefore placed in development control enforcement dilemma in that the very politicians who make the law are the same who are against its enforcement (Daily Nation, Friday April 18, 1986 pp.16).

The dilemma has persisted inspite of the fact that the unauthorized structures in the estate have consistently been regarded as a problem. This is reflected in the Nairobi City Commission Minutes of Proceeding Books. In Minute 3 of Housing Development Committee for 3rd December 1986, the Committee noted that Umoja I Estate had extensions which were not approved.

Enlightened citizenry as a resource in development control was established as a limiting factor in Nairobi. Respondent officers indicated that there is a very high degree of disrespect of City Planning By-laws by Nairobi residents. This has been confirmed by calculated Chi-square values of the second specific hypothesis. The disrespect of the planning by-laws was described by respondents as a result of strong drive to make money by private developers.

(c) Policy Making Organ of the Planning Authority

The Works and Town Planning Committee is the policy making organ for all urban physical planning and development control matters. Planning policies and approval of plan proposals are discussed during Committee Meetings which are held at least once every month.

The composition of the Works and Town Planning Committee is made up of Chief Planning Officers, City Commissioners (who represented the Councillors at the time of the field survey) and appointed members of the public. Analysis of Nairobi City Commission and for Nairobi City Council minutes indicated that Works and Town Planning Committee has deliberated over unauthorised development in the study only once in 1983 (see (b) above). For the entire city the 1983 to 1986 minutes book of Committee Meeting showed that no decision has ever been taken in regard to unauthorised structures,

Table 23 shows the number of housing plans approved by Works and Town Planning Committee by the data shown¹⁵. It was noted that out of these approved plans, none was for the study area or neighbouring housing estates which are also characterised by construction of authorised development

15. These plans relate to alteration and extension of housing units mainly in freehold land areas of the Cit

Table 23: Approved plans that relate to housing

Date of Approval	Number of Housing Plans
By 6th August, 1980	1994
By 31st August, 1981	3041
By 6th September, 1982	2108
By 31st August, 1983	174
By 23rd November, 1984	6111
By — November, 1985	1224
By 12th November, 1986	1352

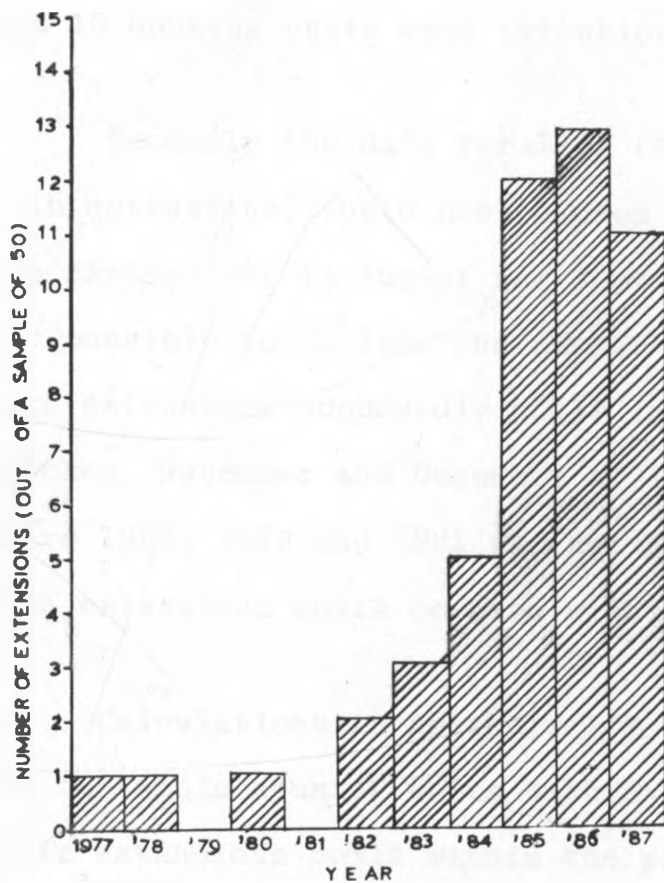
Source: Nairobi City Commission

The Committee as a policy making organ of the planning authority was therefore found to be least involved in matters pertaining to development control matters in specific housing estates/projects as priority planning matters.

4.3 Rate of Construction of Illegal Development

Figure 7 represents the trend of construction of extensions between 1977 and August/September of 1987. The figure shows that construction of extensions began in early 1977. In this study a period of five years (1982 to 1986) has been used to illustrate rate of increase of construction of the extensions (Appendix III).

The choice of 1982 to 1986 period was made due



1/3/88

MWANGI, I.K., M.A (PLANNING) 1987/88
UNIVERSITY OF NAIROBI
DEPT. OF URBAN & REGIONAL
PLANNING

FIG. 7

UMOJA I ESTATE: PATTERN OF INCREASE OF ILLEGAL DEVELOPMENTS (EXTENSIONS)

to two reasons. First as shown on figure 7 the sample data is continuously represented in the five years, 1982, 1983, 1984, 1985 and 1986. Distribution of sample data for the five year period is 2, 3, 5, 12 and 13 housing units with extensions respectively.

Secondly the data for 1987 (11 housing units with extensions) could not be used because the survey was carried out in August and September. Hence it was not possible to include the number of housing units with extensions supposedly built in the months of October, November and December of 1987. Also sample years 1987, 1979 and 1981 did not have housing units with extensions which occurred within the sampled units,

Calculations in Appendix III show that out of the 50 sample housing units with extensions, 35 had their extensions built within the period of 1982 to 1986. On the basis of the five year period, an average of 7 sample housing units per annum had their extensions built.

The total number of housing units with extensions in the sample areas as determined during the physical survey was 329. Hence the proportion 35 out of 50 sample housing units with extensions represented a total of 230 housing units. From these calculations

it follows that the proportion represented by 7 as the average number of sample housing units with their extensions built per annum within the five year period is 46 housing units.

On the basis of the above analysis and calculations on Appendix III, the rate of construction of extensions on private open spaces in Umoja I Estate between 1982 and 1986 within sample areas was 46 extensions on different plots per annum. Expressed as a percentage of the proportion total number of extensions represented in the five year period, the rate is an average of 20% per annum.

Since the sample is a random one the above rate represents a rate of 468 housing units/extensions per five years (1982 to 1986). This is an average rate of 123 housing units/extensions per annum within this period.

During the time when this physical survey was carried out the entire housing estate had 668 housing units with extensions (Table 24). Out of these, 615 units had their extensions built between 1982 and 1986. Hence only 57 housing units had their extensions built between 1977 and 1981. On average this was a rate of about 11 extensions per annum within first five

near period. Both average rates for construction of extensions within both periods conform to the trend illustrated on figure 7 for which data was randomly collected in the field.

Tables 25 and 26 presents two aspects of space covered by extensions in sample housing units. Table 25 represents approximate open space area of respective plots that is covered by corresponding sample extensions. The average size of the extensions was determined to be 26.6m^2 . This is more than 50% area of a complete original planned housing units which has an area of 42.0m^2 . Table 26 represents data on area of main room for respective sample extensions. Average size of the rooms was similarly determined at 8.27m^2 . This area is within the range of 11.3m^2 , 8.0m^2 and 7.0m^2 , for rooms 1, 2 and 3 respectively for a complete original planned house in the estate (Figures 6 (a) and 6 (c)).

Additional spaces resulting from modification of the main house which were identified were found to be small and least numerous in the estate. Practically measured additional modifications had an average area of 2.7m^2 and these were confined to room 1 which is used as seating room. The area is significantly small compared to calculated average area of 26.2m^2 for the separate extensions (Table 25),

Table 24: Umoja I Estate Physical Survey

Section of Estate	No. of House Units	Plots without Extensions	No. of units with extension or modified	% of Extensions/modifications	No. of Extensions in sample areas	No. of extensions with more than one floor	No. of Floors (Storeys)	No. of Permanent structures in public spaces
A	170	132	38	22.4 ≈ 22		2	each with 5 storeys	--
C*	265	216	49	18.5 ≈ 19	49	2	2 floors each	1
D	149	110	39	26.2 ≈ 26		2	2 floors each	--
E*	196	161	35	17.9 ≈ 18	35	-	-	1
F	159	117	42	26.4 ≈ 26		-	-	-
G*	154	113	41	26.6 ≈ 27	41	4	2 floors each	-
H	229	162	68	29.3 ≈ 29		3	2 Floors each	2
J*	301	225	76	25.2 ≈ 25	76	7	6 with 2 floors each 1 with 3 floors	-
K	240	175	66	27.1 ≈ 27		3	2 with 2 floors each. 1 with 3 floors	-
L*	244	200	44	18.0 ≈ 18	44	1	2 floors	2

M	240	199	41	18.8 ≈ 19		1	2 floors	1
N*	335	268	67	20 ≈ 20	67	6	2 floors each	1
P	271	224	45	17.3 ≈ 17		2	2 Floors each	-
Q*	120	103	17	14.2 ≈ 14	17	-	-	-
Total	3073	2401	668	Average % 21.9 ≈ 22.0	-	-	-	-

* Sample areas

Source: Sample Data

Table 25: Approximate plot coverage by extensions

Extension Number on Sampling series	1	2	3	4	5	6	7	8	9	10	11	12
Approximate plot coverage (M ²) Extensions	25	19	21	28	24	21	32	20	21	28	22.5	28

13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
19	30	22	24	28	-	-	35	-	-	31.5	31.5	20	24	20.1	28	22.5	13.2	26.25

34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	Average
32	-	28	20	-	35.9	27	31.5	18	-	18	24	40	35	40	35	24	26.2 M ²

Source: Sample Data.

Table 26 : Approximate sizes of habitable room in extensions

Extension Number on Sampling series	1	2	3	4	5	6	7	8	9	10	11
Approximate size of a Habitable Room in Extensions (M ²)	9	7	7.5	9.7	10.5	7.5	6.25	-	8.75	10.75	7.5

12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
10.5	7.0	-	6.0	9.75	10.5	7.2	9.0	9.3	-	9	7.5	8.75	8.75	8.75	10.5	9	4.5	10.5	9.0

32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
9.2	9.2	9.0	-	10.5	10.	10	10.5	10.5	8.4	9.0	7.5	9.0	-	9.3	10.5	5.1	10.5	12

Average 8.27M²

Source: Sample Data.

4.4 Additional Waterpipe Connections

The physical survey showed that all housing units with extensions have additional water pipe connections to the originally planned main system. The extensions have also water storage tanks installed to serve households who have rented the extensions.

The storage tanks have an average capacity of 216 litres of water at any one given time. Hence 668 extensions that were in existence at the time of the survey hold 144,288 litres of water which was not incorporated in designing and laying out water pipe system and capacity in the original estate plan. Moreover, even at the time of this study, this extra water required in the estate has not made Nairobi City Commission replace original planned water reticulation system in the estate with another of greater capacity,

Assuming that water consumption in Umoja I Estate has remained at 60 litres per person per day as originally planned; and the household size of 3 of as determined in sample survey data in extensions, about 120,240 litres of water was required per day by all households living in extensions at the time of this study. This amount of water flow was not catered for in the planning and designing for water supply in Umoja I Estate.

On the other hand all main houses in Umoja I Estate has domestic water storage tank with a capacity of 367 litres each. On the basis of established number of main houses of 3073 units the domestic storage tanks in the estate store 1,127,791 litres of water at any one time. Hence at the time of this study amount of water stored in domestic water tank in the estate had increased by 12.79% due to construction of extensions.

On the other hand using the planned water consumption level of 60 litres per person per day and the household size of 4 according to original plan (and which was also established in sample survey) water consumption per day in the main house of the entire estate is 737,520 litres. Hence comparing this volume with that consumed in all extensions (as indicated above) at the time of study, water consumption had increased by 16.30% per day in the entire estate.

Similarly each extension has a toilet that use flash water stored in cisterns of volumes ranging from 8 to 10 litres of water. Hence, at the time of study all toilet water cisterns in extensions held 5344 litres to 6680 litres of water that was not catered for in the original plan.

4.5 Additional Sewer Connections

All toilets that have been constructed for use by tenants living in extensions are connected to the main estate sewer system by additional sewer pipes. Since the main sewer line is connected to the main housing units from the back. It is only the back extensions that have their additional sewer pipes directly connected to main sewer system. Additional sewer pipes serving front extensions are connected to domestic waste water pipes - man holes before being directed to the main sewer system.

While section 199 of Local Government Adoptive By-Laws (Building) Order 1968 stipulate that any additional sewer connection must be accomplished after a notice for such connection has been submitted to the responsible local authority, section 200 emphasise that such additional sewer pipe connection must be authorized by the local authority. It was established that these sections of the by-laws were never complied with in making additional sewer pipe connections to serve the extensions. While this is disregard of the local authority, it was discovered that no records of extensions constructed existed in official records of the local authority. It was not possible therefore for the authority to estimate the extent to which sewer system had been interrupted in Umoja I Estate.

Since construction of extensions is an on-going process in the estate, connection of additional unauthorised sewer pipes will similarly continue. Consequently, the volume of additional sewer and domestic waste water discharged into the original planned sewer line system will continue to increase. These processes will increasingly overload the designed capacity of sewer system in Umoja I Estate.

4.6 Solid Waste Production and Disposal

Due to illegal nature of the extensions, dust bins for domestic solid waste disposal by households living in them are not supplied by Nairobi City Commission. Hence all domestic solid waste produced by households who live in the extensions is not catered for by the local authority when planning for solid waste collection.

On the basis of a household size of 3 in extensions, the total number of people living in the 668 extensions at the time of data collection was 2004. Solid waste production in Nairobi has been estimated at 1,3 Kg. per person per day (Cleansing Department, 1984). Hence the population living in extensions at the time of this study were producing 2605.2 Kg. of domestic solid waste per day. This is 18,236.4 Kg. per 7 day week and 78,156 Kg. per 30 day month.

The field survey established that domestic solid waste produced by households living in the extensions is accumulated in old cartons or old polythene bags before being disposed to empty public open spaces or at the edge of estate streets. According to the definition of the term development, disposal of solid waste in this manner constitute development of the land, though in a negative sense.

Essentially, activities of disposing domestic solid waste by an increasing number of households living in extensions is contributing to environmental pollution in the estate.

4.7 The Purpose for Building Extensions

Extensions that have been built in Umoja I Estate are meant for letting to tenants on monthly basis. Only spaces resulting from modification of originally planned housing units were used as additional shelter for households.

The main purpose for constructing extensions is basically to raise extra income. Table 27 attests to this fact.

Table 27: Rents paid by tenants living in extensions

Rent (Ksh)	Number of Tenants	Percentage of Tenants
Below 499	1	2.0
500 - 749	-	-
750 - 999	14	28.0
1000 - 1049	7	14.0
1050 - 1099	2	4.0
1100 - 1149	10	20.0
1150 - 1199	1	2.0
1200 - 1249	4	8.0
1250 - 1299	2	4.0
1300 - 1349	3	6.0
1350 - 1399	-	-
1400 - 1449	-	-
1450 - 1499	1	2.0
1500+	1	2.0
Modified House	2	4.0
Non-Response Tenants in Extension	2	4.0
	50	Total= 100%

Source: Field Survey.

It was established that only 2.0% of sample households living in extensions spend Ksh. 499 and below per month on housing. This percentage was very low compared to 22% of sample spending the same amount of money on housing and living in the main houses. Yet extensions were found to be smaller shelter space than the main housing units.

It was further found out that while landlords paid Ksh. 265.50, Ksh. 308.50 and Ksh. 320.50 to pay for the units house type plans 01, 02 and 03 respectively per month, households in extensions paid their rents directly to the landlords. Consequently landlords made significant profits on the extensions they build. The highest amount of money paid as rent for extensions in Umoja I Estate was Ksh. 1500 per month.

The above aspect serve to underscore two underlying facts about construction of extensions in the study area. First, that construction of extensions is meant to generate extra income for the landlords. This revelation is in sharp contrast with one of the objectives of Umoja I Estate Housing Guaranty Project by Nairobi City Local Authority and Agency for International Development as the funding agency, namely; that providing shelter not additional income to the allottee (see section 3 of this thesis).

This is a practical illustration of one of the specific hypotheses discussed and therefore it is an indication that construction of extensions is not a response to inadequacy of originally planned housing units. Secondly, this finding is a practical reinforcement on the ideology of development control as explained by Vagale (1970), that "profitable economic rent being the motive of most real estate developers and owners of land property, more often than not, there is a strong tendency to maximise their profits without conforming to planning regulations".

4.8 Population

The size of population that was planned for in Umoja I Estate has been discussed in Chapter Three. Current population situation has been indicated in sections 4.4, 4.5 and 4.6 of this chapter. The age distribution of the households in the estate illustrate the fact that population in the study area is young. Population sample statistics in the table below serve as a basis of making inference for the age distribution of heads of households. Only two and four household heads in main house and extensions that did not respond to this question respectively.

Table 28. Age Distribution for households in main houses and extensions.

Age Group	Percentage of Respondents	
	Main House	Extensions
15 - 19	6.1	2.7
20 - 24	8.4	21.6
25 - 29	22.5	40.6
30 - 34	25.5	18.9
35 - 39	14.3	16.9
40 - 44	10.2	-
45 - 49	2.0	-
50+	1.0	-
	100%	100%

Source: Sample Data.

The table show that all heads of households living in extensions are below 40 years of age. On the other hand 86.8% of the heads of households living in the main houses are below this age. However while 64.9% of the heads of households living in extensions are aged between 25 and 29 years, only 47% of heads of household living in the main house occur in this age group.

The above facts show that while the entire population in the estate is generally young, the portion living in the extensions is comparatively younger

than that in main houses. This means that extensions offer immediate housing alternatives for newly employed people from colleges and young immigrants from other areas of the city. These are people who are at early years of wage employment.

In reference to rent data on table 27, and assuming that each household spend the conventional quarter of their monthly income to pay for housing, such tenants must be getting Ksh. 2000 to Ksh. 6000 per month. This finding is further confirmed by the fact that occupations of the respondents in extensions ranged from Bank clerks to newly employed University graduates.

Table 29 presents educational level attained by sample household heads in both main houses and extensions. While the level of education should serve the purpose of confirming the ability to pay required rents, it is also show that Umoja I Estate households have attained some formal education which should constitute a basis for enlightening it on the importance of planned urban environment.

Table 29: Levels of education attained by households living in main houses and extensions.

Level of Education	Percentage of Respondents	
	Heads of Households in the main House (%)	Heads of Households in the extensions (%)
Std. (1-7)	9	6
Form (1-4) O Level	56	48
Form (5-6)"A" Level	13	4
Diploma	7	6
University	10	6
No formal education	5	-
Non-respondents	-	22
	100%	100%

Source: Sample Data

4.9 Conclusion

This chapter has established that construction of unauthorised structures started in 1977 when Umoja I Estate was first settled. The purpose of building extensions has not been provision of additional dwelling space for respective households, but rather for the purpose of financial gain. In spite of legal powers bestowed on Nairobi City Local Government as the planning authority, the City Commission has not been able to enforce development control partly due to the role of politicians. There is also significant lack of staff

in Development Control Section of the City Planning and Architecture Department.

Consequently, Umoja I Estate residents have taken advantage of this situation resulting to an increasing trend in construction of unauthorised structures as shown on figure 7. This phenomenon is going on with its resultant distortion on the original plan of the estate because of inappropriate domestic solid waste disposal particularly by households living in extensions, additional pipe connections to the water mains and sewer line systems, resulting in greater reduction of open spaces as well as interference with aesthetic attributes of the estate amongst others. These have been happening during the informal plan implementation stage of the project.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents three aspects of the study. First, a summary of findings is made based on the author's interpretation of data and information analysed in chapter 4. Secondly, a conclusion is made reflecting on the extent to which the objectives set out by the author were achieved.

The conclusion reflects on the prospects of a successful development control enforcement in the City of Nairobi and chances of a successful informal implementation of an urban physical plan similar to Umoja I Housing Guaranty Project; particularly as it relates to maintenance of planned urban environments. Finally, recommendations on specific aspects of development control enforcement and plan implementation are made.

5.1 Summary of Findings

The field study established that construction of unauthorised housing units is least explained by non-satisfaction of the originally planned 3 - room house with a wet-core. Similarly the phenomenon is not explained by inadequacy of planned plot sizes as

originally planned and demarcated (Table 20). Consequently violation of the Nairobi City Planning by-laws is not based on an automatic response to dissatisfaction either with the houses or the plot sizes in Umoja I Estate.

Rather, the motive for constructing extension is financial gain resulting from house rents.

Umoja I Estate house owners are operating like individual real estate developers of urban landed property wishing to maximise profits from their investments. Those who have made these investments have done so depending on their financial ability to invest in the structures and on their perception of how best to use open space on individual plots. It is further evident that those who have not constructed extensions have not done so mainly due to lack of enough finances to purchase building materials and engage masons.

As regards perception of consequences of building extensions in a planned environment, the results of the second specific hypothesis show that the residents are not enlightened. This finding is confirmed by discussions in the preceding paragraph where it has been shown that it is financial limitation rather than environmental or legal considerations that

have prevented them from building them. Therefore those who have not constructed extensions should be expected to do so as soon as they are financially capable.

It was found that additional house construction is contributing to the following effects:

(a) Water Supply System

There has been illegal and therefore unmonitored connection of additional water pipes, installation of domestic water-tanks, and flush toilet water cisterns. The water storage tanks stored 12.79% more water in excess of what was planned for. On the other hand consumption of water per day had increased by 16.30% due to additional population living in the extensions.

(b) Sewer Line System

There has been continued illegal and unmonitored connection of additional sewer pipes to that which was originally designed.

(c) Domestic Solid Waste Disposal

Households living in extensions are not supplied with dustbins. Domestic solid waste from the extensions is disposed in the estate public open spaces, and in some cases on private open spaces. At the time of this

study 2,605.2 Kg. of domestic solid waste per day was being produced from 668 extensions that were in existence. As more extensions are built more solid waste production and disposal is expected to take place.

(d) Reduced Private Open Spaces

Use of private open space for construction purpose has two implications. First it means that it is increasing the number of physical structures per unit plot. While this is being done, it does not cater for direct accessibility for the extension particularly those located at rear open space. Both the original house and extension occupants are denied environmentally essential amenity open space, while wind circulation within estate at ground level is increasingly reduced.

Secondly since the extensions are meant for habitation by an additional population it means that more people would be living in inappropriately designed and located structures in view of ventilation. This trend is also set for overcrowding on individual plots a situation that is likely to result to anti-social behaviour such as theft, thuggery as well absence of privacy for households. Reduction of private open space has also resulted to children turning on to the busy

access roads and streets to play and thus exposing them to vehicular traffic accidents.

(f) Increased Trend of Construction

the 668 extensions that were built by the time field study was carried out represented 21.9% of 3073 housing units in the estate. This took about ten years (1977 to 1987) to construct. If the process is to go on unintervened, the remaining 78.1% of houses without extensions should be expected to have them not later than the next 30 years; at least by 2010s A.D.

A situation where every plot has an unauthorised structure has serious implications on the part of Nairobi City Local Government as a planning authority, mainly with regard to provision of basic infrastructure such as water. Other areas of concern would be related to poor environmental health in terms of domestic waste generation and disposal, sewer system utilization capacity and environmentally unsuitable housing units for habitation.

The factors that were found to be contributing to the above problems were:

(i) The Role of Politicians

While it is the politician who makes the laws for better governance of the society for which he is the leader, it is the same politician who influence application of the same laws to society. As shown in chapter four (4.2 (b)) existence of unauthorised structures and continued construction is largely attributed to politicians. When Nairobi City Commission wished to invoke the city planning by-laws so as to demolish unauthorised structures as well as to prevent further constructed, the local authority was faced with opposition by politicians who argued that such an act would be a harassment of the city residents.

The above phenomenon indicates that local politicians are incapacitated from taking remedial action by fear that their political support would be withdrawn by city residents who would be affected by demolition. This means that where application of the law statutes imply putting politicians in disfavour with citizens, then the politicians will hinder enforcement of such laws or by-laws; and vice-versa. In such circumstances, the politicians project themselves as self-interested personalities who would advocate for only which serves their interests.

(ii) City Planners

City Planners were excluded from the Umoja Project Unit when this unit was formed as the formal implementing agency. Hence planners did not take part during formal plan implementation stage.

During informal plan implementation stage, Umoja I Estate residents have similarly excluded the City Planners from participation. The residents do not apply for planning permission from City Planning and Architecture Department as required under the city planning by-laws. Neither do they submit their building plans for approval.

Due to complete exclusion of the City Planners by both plan implementing agencies, this has created apathy on their part. Their professional and legal powers, right to sanction and oversee development plans implementation and their role to guide overall development of the city has been eroded. They have therefore been watching helplessly as unauthorised structures are built in Umoja I Estate.

(iii) Umoja I Estate Residents

The residents of Umoja I Estate have taken advantage of the apparent protection from the politicians, apathy of the City Planners and the dilemma in Nairobi City

Commission to construct unauthorised structures continuously. This has been reinforced by lack of enlightenment about the environmental as well as infrastructural effects by their actions.

(iv) Inadequacy of Housing Units in the City

It was established that as soon as an extension was completely built, tenants moved in. This means that extensions as dwelling units are filling an existing gap of inadequacy of housing units. This fact is underscored by the observation in the field that households living in the extensions were young and newly employed (Tables 28 and 29).

(v) Inadequate Planning Man-Power

In Development Control Section only 29.8% of established posts of graded planning personnel was recruited to work as development control officers. Consequently, the section being responsible for all development control matters in the City of Nairobi is highly under staffed.

5.2 Conclusion

The study set out to achieve three objectives. To offer an explanation for construction of unauthorised structures in Umoja I Housing Estate, to explain failure of the local authority to enforce development

control by-laws and to consider the likely consequences of continued construction of extensions.

In the first objective the focus was on determining whether original plot sizes for complete housing units were adequate in Umoja I Estate. It has been established that both the plot size and the original planned 3 - room house and wet-core were adequate.

On the second objectives, the author established that factors (i), (ii), (iii), (iv), and (v) as discussed in (5.3) had a negative effect on Development control in the estate. These included the role of the politicians, apathy of City Planners, inadequacy of housing units in the city, ignorance of Umoja I Estate residents and inadequate planning staff in Development Control Section of City Planning and Architecture Department.

Finally the last objective sought to determine trend of construction of unauthorised structures in the estate. This objective was achieved as shown in section 4.3. A rate of 20% per annum was determined for five year period (1982 to 1986); while figure 7 show that even for the year 1987 for which only the first nine months were considered, construction of unauthorised structures had increased than previous

years. Implications of the increased rate have also been discussed in previous section of this chapter. These include overloading of domestic water and waste water systems. Chart 1(a) and (b) summarises these conclusions.

5.3 Recommendations

(1) Nairobi City Commission

- (a) Its development Control Section is highly understaffed. Since grade personnel for the local authority is recruited by the Public Service Commission under 1984 Employment Act, it is recommended that the Nairobi City Commission should make an urgent request for recruitment of the other 70.2% of Development Control Officers.
- (b) The Works and Town Planning together with Housing Development Committees of Nairobi City Commission should work together towards a policy of action that will involve officers of respective departments in order to revitalize development control enforcement in housing estates as an urgent planning matter. This should involve the political arm of the local authority, namely presently appointed Commissioners (or elected Councillors

at a future date when they replace the commission). This should be accompanied by immediate enforcement of the following:

- A house by house survey should be made to map out housing units with extensions and those without, as well as those undergoing extension construction.
- All housing units with extensions being constructed should not be allowed to build any. This should be ensured by constant inspection.
- That all housing units with extensions be clearly mapped out and nature of the structures noted. Either of the following recommendations could be adopted in this regard:
 - (i) A penalty/fine should be made for all those who have constructed unauthorised structures. This penalty should be determined based on area in M^2 of the developed open space, and/or;
 - (ii) Based on the space in M^2 of the open space developed, it should be determined the amount of money spent on the structure; basing on the rate of return of the said structure per annum. The structures should be allowed to stay for the period over which it will repay itself after which it should be demolished.

- (c) The success of this programme should go hand in hand with an increased process of housing delivery not only based on the number of people likely to be without shelter when finally extensions are demolished, but rather on a wider city housing scheme(s) catering for both low and middle income groups. It is further recommended that this approach to housing programme would require support from central government and local research institutions.
- (d) For a successful housing plan implementation process it is important that City Planners be involved at all stages. This is important if it is accepted that they are aware and conversant with all facets of physical plan implementation.
- (e) The local authority should reduce or entirely exclude amount of work done during the informal plan implementation stage in housing schemes. Currently the perception of citizens on the importance of maintaining planned urban environment is low. Since they have yet to be enlightened on the consequences of the unauthorised structures in urban environments, delivery of incomplete implemented housing project would

always be eventually characterised by unplanned structures when people settled in them.

(2) Politicians

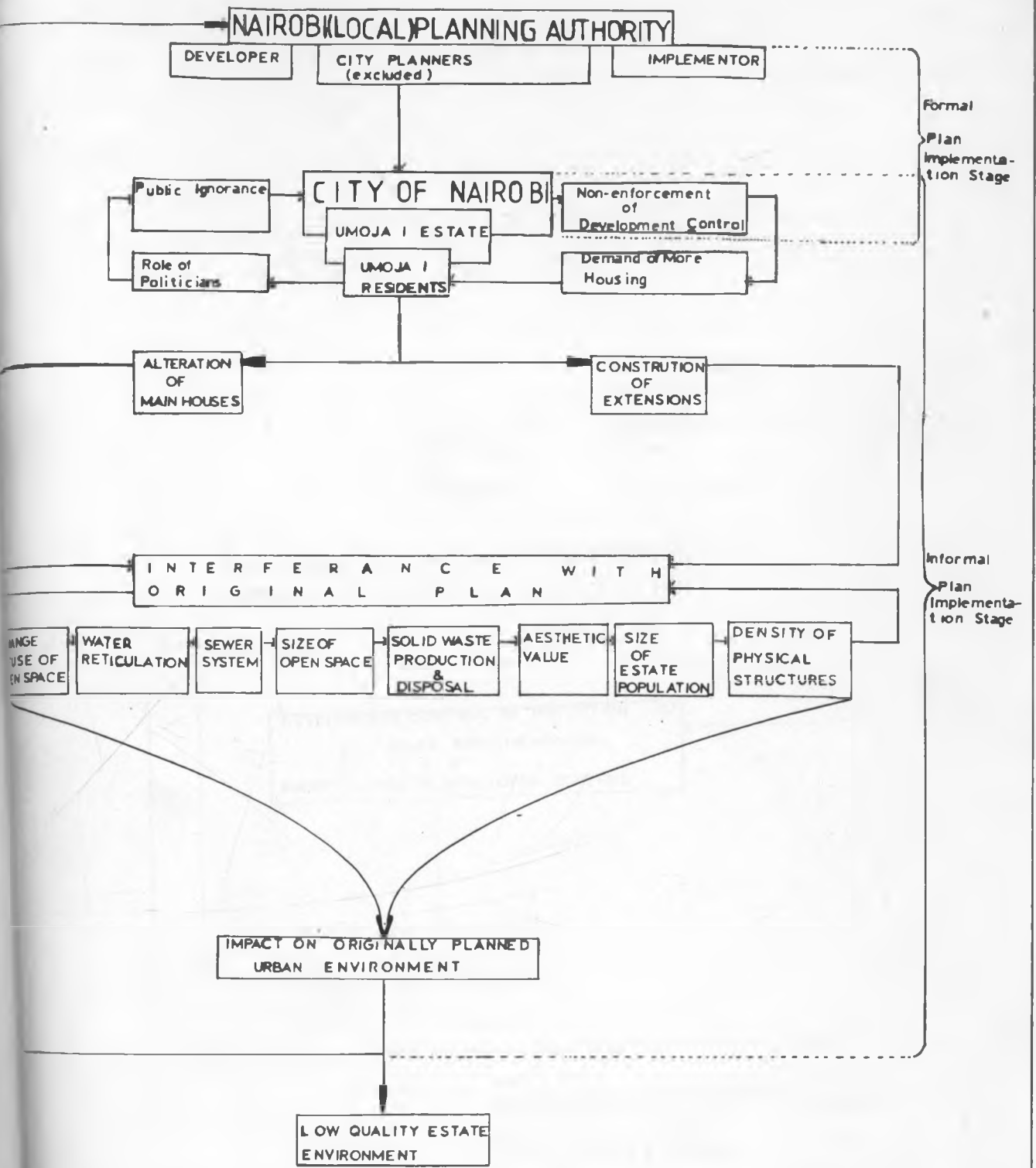
The role of the politicians both as law makers and leaders who assist citizens abide with such laws is very clear. However, it is the human character and nature of prevalent interests of politicians more than anything else that determine success or failure of plan implementation process where direct or indirect public participation is evolved.

It is suggested that there be established a forum for planners, politicians and commissioners of the local authority where they would constantly discuss and appraise problems related to City Planning in general and that related to development control within housing estates in particular. Such forum would pay much attention to urban planning matters than the usual District Development Committee (D.D.C.) meetings which discuss all aspects of development matters. Moreover it is such forum that politicians as policy makers and planners as technocrats, would establish and evolve a working rapport for the good of society.

(3) Practicing Planners

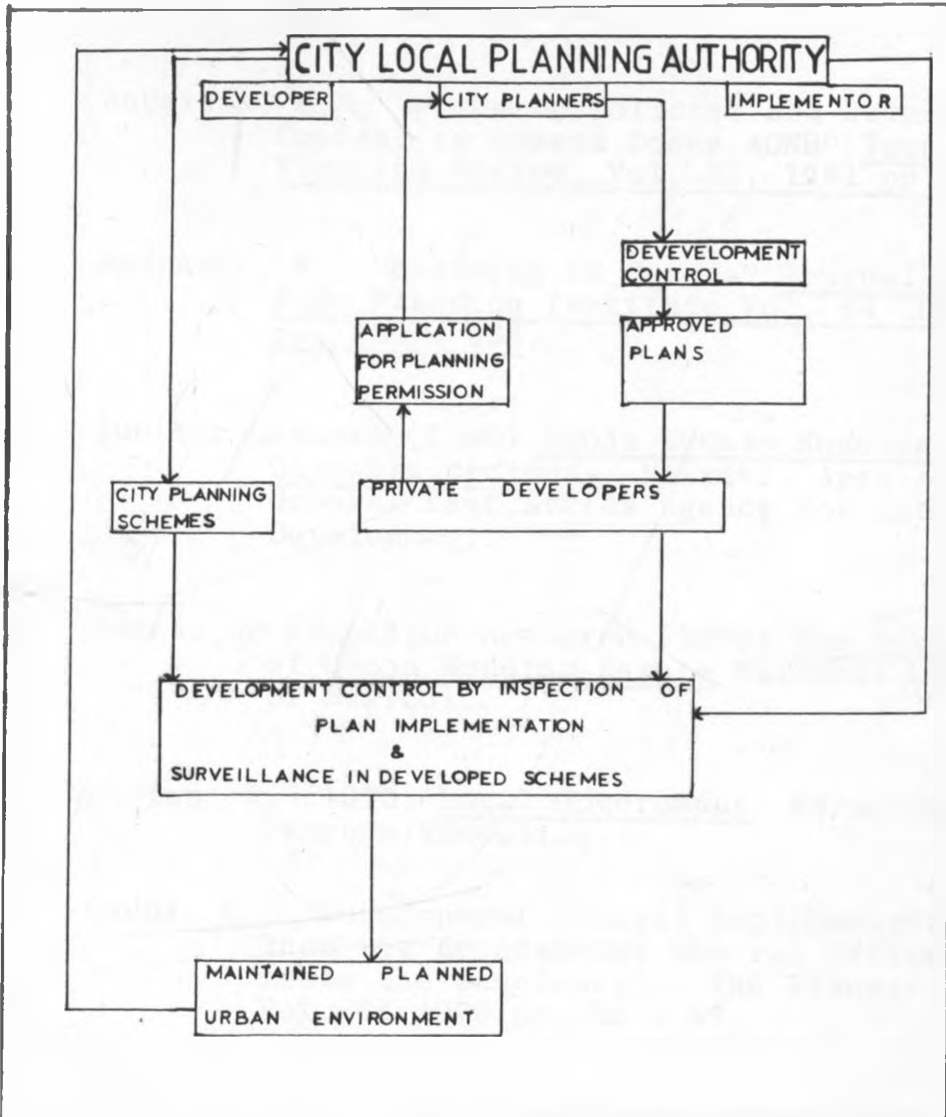
Except for efforts made by City Planners during routine Works and Town Planning Committee meetings to draw the attention of the policy makers within Nairobi City Commission on presence of unauthorised developments, little has been done by practicing planners as a body of professionals. No collective view or professional advice has been given to Nairobi City Commission as the Local Planning Authority on matters related to the current development control problems. In spite of the existence of Architectural Association of Kenya that incorporate Planners Architects; Land Economists and Quantity Surveyors.

It is recommended that these services be made available to Nairobi City Commission routinely so that problems related to development control in the city can be gradually minimised and finally rooted out of the city development process.



MWANGI, I.K. M.A (PLANNING) II 1987/88
 UNIVERSITY OF NAIROBI
 DEPT. OF URBAN & REGIONAL PLANNING

CHART. 1
 (a)



MWANGI, I.K. M.A. (PLANNING) [1987/88]
UNIVERSITY OF NAIROBI
DEPT OF URBAN & REGIONAL
PLANNING

CHART.1
(b)

UMOJAI ESTATE: ENVISAGED ROLE OF (NAIROBI) LOCAL
AUTHORITY IN PLAN IMPLEMENTATION

BIBLIOGRAPHY

1. Alder, J. (1979) Development Control London: Sweet and Maxwell.
2. Anderson, M.A. "Planning Policies and Development Control in Sussex Downs AONB" Town Planning Review, Vol. 52, 1981 pp. 5-26.
3. Andrassy, F. "Planning in Uganda" Journal of the Town Planning Institute Vol. 44 1957 - 1958 pp. 134 - 136.
4. Auditor General (1980) Umoja Estate Housing Guaranty Project. Nairobi: Area Auditor General East Africa Agency For International Development.
5. Bureau of Education Research (1978) The Residents of Umoja Housing Estate Nairobi: University of Nairobi.
6. Buxton, R. (1973) Local Government Harmondsworth: Penguin Education.
7. Caddy, C. "Development Control Implementation: When the development Control Officer meets the developer". The Planner Vol. 64 1978 pp. 86 - 87.
8. Chebkati, W.W. (1985) The Legal Framework of Physical Planning in Kenya University of Nairobi: Unpublished L.L.B. Dissertation.
9. City Council of Nairobi, "Minutes of Proceedings, 1976 - 1980". Nairobi: City Planning and Architecture Department.
10. City Council of Nairobi:(1978) Report on the Proposed 2nd Phase of N.C.C./U.S.A.I.D. Umoja Housing Scheme Nairobi: Nairobi City Council.

11. Clarke, J.J. (1948) An Introduction to Planning with Reference to the Town and Country Planning Act 1947 London: Cleaver - Hume Press Ltd.
12. _____(1962) Planning Law 1962 London: Franey and Co.; Ltd.
13. Cleansing Department (1984) Introduction to Cleansing Services in Nairobi Nairobi: Nairobi City Commission.
14. Coldham, S.F.R. (1977) Registration of Title to Land in the Former Special Areas of Kenya. London: London School of Oriental African Studies (Unpublished Ph.D. Thesis).
15. Colony of Kenya (1931) "An Ordinance to Amend The Law Relating to Town Planning" Kenya Colony Ordinances Vol. X, 1931 pp. 214 - 238. Nairobi: Government Printer.
16. Colony and Protectorate of Kenya - Town Planning Act 1931. London: HMSO
17. Colony and Protectorate of Kenya - Sessional Paper No. 2 of 1961: The Constitution on Local Authorities Nairobi: Government Printer.
18. Davies, L. "Planning in Parliament" The Planner, Vol. 64, 1978 pp. 146-147
19. Davies, H.W.E. et. al. "Policy Forum: The Relevance of Development Control" Town Planning Review Vol. 51, 1980, pp. 5-24.
20. Daily Nation "City Commission Warns on Unlicensed buildings"
Daily Nation Wednesday April 9th 1986 pp. 3.
21. _____, "Extension of Houses Worries Authorities: The Law says you can't construct buildings in any way you want"
Daily Nation Friday April 18th 1986 pp. 16

22. Daily Nation "City Homes to be Demolished"
Daily Nation Friday November 7 1986 pp. 1
and pp. 36.
23. _____, "Two Killed as building collapses"
Daily Nation July 23rd 1987 pp. 1.
24. _____, "City builders get Ultimatum"
Daily Nation July 24th 1987 pp. 28.
25. Dyer, H.T. "Planning in Commonwealth Kenya"
Journal of Town Planning Institute Vol. 45,
1958 - 1959 pp. 12 - 15.
26. Doxiadis, C.A. (1968) Ekistics: An introduction
to the Science of Human Settlements London:
Hutchinson.
27. Freedman, J.L. (1975) Growding and Behaviour
San Francisco: W.H. Freeman and Co. pp. 119-
135.
28. Finney, J. "Development Control: An Enabling
Activity" The Planner, Vol. 64, 1978
pp. 82 - 83.
29. Garner, J.F. (1975) (Ed) Planning Law in Western
Europe Amsterdam: North Holland Publishing
Company.
30. Gibberd, F. (1955) Town Design Ipswich: W.S.
Cowell Ltd.
31. GOK . (1963) The Local Government Adoptive
By-Laws (Building) Order 1968 (Legislative
Supplement No. 6) Nairobi: Government
Printer.
32. _____ (1978) Local Government Act 1978 CAP 265 Laws
of Kenya, Revised Edition Nairobi:
Government Printer.
33. Grootenhuis, D.G. (1975) The Use of Open Space
in Low-cost Housing: The Umoja I Cases.
Nairobi: U.S.A.I.D., Regional Housing and
Development Office.

34. Hagman, D.G. (1975) Urban Planning and Land Development Law St. Paul Minn.; West Publishing Co.
35. Hall, P.A. (1975) Kenya: Law in Development Process Tuft University: Fletcher School of Law and Diplomacy (Unpublished Ph.D. Thesis).
36. Hagwood, I. "Development Control: Design in Development Control" The Planner Vol. 64 1978 pp. 124-125.
37. Heap, D. (1973) An Outline of Planning Law London; Sweet and Maxwell.
38. _____ (1973) "Development Control Policy Notes" Encyclopedia of Planning Law and Practice Vol. 3 pp. 4513 - 4535.
39. _____ (1978) The Land and the Development: Turmoil or Torment? London: Stevens and Sons.
40. _____ (1978) An Outline of Planning Law London: Sweet and Maxwell Seventh Edition.
41. Jackson J.N. (1963) Surveys for Town and Country Planning London: Hutchinson University Library.
42. Jackson, P.W. (1970) Local Government London: Butterworths.
43. Kandie, J.K. (1982) The Politics of Local Government: The Politico - Legal Aspects of the Local Government System: The Case of the Nakuru Municipality University of Nairobi: Unpublished L.L.B. Dissertation.
44. Kanyeihambwa, L.B. (1983) "Planning Law in East Africa" Planning in Progress Vol. 4.

45. Kenya Republic of (1980) Kenya Low-Cost Housing By-Law Study. Nairobi: Saad Yahya and Associates et. al.
46. Kenya Times "Building By-Laws must be Tightened"
Kenya Times Friday July, 24 1987 pp. 6.
47. _____ "Illegal Buildings to go" Kenya Times
Friday July 24, 1987 pp. 1 and 7.
48. Khamati, A. (1976) The Legal Control of the Use of Urban Land with specific reference to Nairobi. University of Nairobi: Unpublished L.L.B. Dissertation.
49. Lapin, L.L. (1982) Statistics For Modern Business Decisions. New York: Harcourt Brace Jovanovich.
50. Mabogunje, A.L. et. al (1978) Shelter Provision in Developing Countries: The Influence of Standards and Criteria New York: John Wiley and Sons.
51. McAuslan, P. (1978) Land, Law and Planning London: Weidenfeld and Nicolson.
52. _____ (1980) The Ideologies of Planning Law
New York: Praeger Publishers.
53. _____ (1973) Control and Urban Planning
London: Faber and Faber.
54. Mabale, A.F. (1980) The Development and Administration of Local Government in Kenya. University of Nairobi: Unpublished L.L.B. Dissertation.
55. Mwangi, T.W. (1985) A study of selected infrastructural facilities in Njoro and Nessuit sublocations in Nakuru District. University of Nairobi: Unpublished B.Sc. Dissertation.

56. McLoughlin, J.B. (1971) Urban and Regional Planning
New York: Praeger Publishers.
57. Nyangeri, E.N. (1985) Solid Waste Disposal Urban Areas. Tampere University of Technology: Unpublished Postgraduate Dissertation.
58. Ola, C.S. (1977) Town and Country Planning Law in Nigeria. Ibadan: Oxford University Press.
59. Pearce, J.B. "Property Rights Vs. Development Control: A preliminary evaluation of alternative Planning Policy Instrument". Town Planning Review Vol. 52, 1981 pp. 47-59.
60. Protectorate of Kenya - Town Planning Ordinance 1919, Laws of Kenya 1926 Vol. II pp. 82-139. Nairobi: Government Press.
61. Purdue, M. (1977) Cases and Materials on Planning Law London: Sweet and Maxwell.
62. Raison, T. "Development Control: What are the Options?" The Planner Vol. 63, 1977 pp. 3-5.
63. Ratchiffe, J. "Development Control: anathema or nescience?" The Planner Vol. 64, 1978 pp. 188 - 189.
64. Ray, T. "Development Control: The Major Issue" The Planner Vol. 64, 1978 pp. 56-57.
65. RHUDO (1979) The Kenya Shelter Sector Study and A.I.D's Experience. Nairobi: Regional Housing and Urban Development Office.
66. _____ (1980) Final Evaluation Report: Umoja I Estate. Nairobi: Regional Housing and Urban Development Office (R.H.U.D.O.).
67. Simmonds D. "Planning Versus Development Control" The Planner Vol. 64, 1978 pp. 186-187.

68. Smith, A. "Development Control" Journal of the Town Planning Institute Vol. 59 1973 pp. 129-130.
69. Sunday Nation "New City Housing Plan Comes Under Heavy Fire", Sunday Nation, Sunday, June 21st 1987 pp. 4.
70. Taylor J.L. "Development Control: Teaching Development Control" The Planner Vol. 64 1978 pp. 154-155.
71. Telling, A.E. (1986) Planning Law and Procedure London: Butterworths.
72. The Land Planning Act - CAP 303 1970 Laws of Kenya Nairobi: Government Printer Revised Edition (1970).
73. The Standard "Illegal Structures: City Hall Guilty!" The Standard Monday, July 27, 1987 pp. 6.
74. _____, "How Local Governments should be improved". The Standard Friday, August 28 1987 pp. 6.
75. The City Council of Nairobi (1981) Planning By-Laws Nairobi: City Planning and Architecture Department.
76. The Kenya (Land) Order in Council (1960). The Development and Use of Land (Planning) (Regulations 1961) Nairobi: Government Press.
77. Vagale, L. (1970) Development Control: Its Importance in Regulation Urban Growth Ibadan: Town Planning Department; Technical College, Ibadan (Unpublished Paper).
78. Vickery, D. "Development Control: A New Sense of Purpose" The Planner Vol. 64, 1978 pp. 24-25.
79. Waithaka, A. (1986) Housing Problems Faced by the Law-Income Groups in Flamingo Phase One and Pangani Site and Service Scheme Based

in Nakuru Town. University of Nairobi:
Unpublished B.A. (Land Economics)
Dissertation.

80. Warner D.B. and Hicks, J.F. (1983) Water Sewerage Design Criteria for Umoja II Housing Project in Nairobi. Washington: Wash Interim Report No. 104-3 January 1983.
81. Waweru and Associates (1977) Low-cost Housing and Squater Upgrading Study. Draft Final Report Vol. II. Nairobi: Waweru and Associates.
82. Webster, D.H. (1958) Urban Planning and Municipal Public Policy. New York: Harper and Brothers.
83. White, L.W.T. et. al. (1948) Nairobi Master Plan for a Colonial City. London: HMSO.

APPENDICES

APPENDIX I: /

SAMPLE AREAS AND SAMPLING DISTRIBUTION IN UMOJA I HOUSING ESTATE

SAMPLE AREA	SAMPLING IN HOUSE (PLOTS) WITH EXTENSIONS (he)				SAMPLING IN HOUSE (PLOTS) WITHOUT EXTENSIONS (hw)				
	TOTAL NUMBER OF PLOTS WITH EXTENSIONS	APPROXIMATE NUMBER OF EXTENSIONS TO BE VISITED	ACTUAL NUMBER OF PLOTS WITH EXTENSIONS VISITED	EVERY OTHER PLOT WITH EXTENSION THAT WAS VISITED	TOTAL NUMBER OF PLOTS WITHOUT EXTENSIONS	APPROX. NUMBER OF PLOTS WITHOUT EXTENSIONS TO BE VISITED	ACTUAL NUMBER OF PLOTS WITHOUT EXTENSIONS VISITED	EVERY OTHER PLOT WITHOUT EXTENSION THAT WAS VISITED	TOTAL NUMBER OF PLOTS (HOUSING IN:) IN EACH SAMPLE AREA/ SECTION
C	49	7.4	7	7th	216	8.3	8	27th	265
E	35	5.3	5	7th	161	6.2	6	27th	196
G	41	6.2	6	7th	113	4.3	4	28th	154
J	76	11.5	12	6th	225	8.7	9	25th	301
L	44	6.6	7	6th	200	7.7	8	24th	244
N	67	10.1	10	6th	268	10.4	11	26th	335
Q	17	2.5	3	5th	103	4.0	4	25th	120
TOTAL	329		50		1286		50		1615

APPENDIX II

2x2 CONTINGENCY TABLE MODEL AND DEGREE OF FREEDOM
FORMULAR

(a) Contingency Table model for observed frequencies

- This table is made up of categorised data of the observed phenomenon.

CATEGORY	GROUP I	GROUP II	TOTALS
A	a_i	b_i	TA
B	a_{ii}	b_{ii}	TB
TOTALS	T_i	T_{ii}	T

Rows: $a_i + b_i = TA$

$$a_{ii} + b_{ii} = TB$$

Columns: $a_i + a_{ii} = T_i$

$$b_i + b_{ii} = T_{ii}$$

Grand Total = $TA + TB = T_i + T_{ii} = T$

(b) Contingency Table Model for expected frequencies.

- The sums of observations in every combination of each category and group have their product determined. This product is expressed as a probability of the

grand total which gives the value of expected frequency in the corresponding cell of expected frequency contingency table.

CATEGORY	GROUP I	GROUP II	TOTALS
A	$\frac{T_i \times TA}{T}$	$\frac{T_{ii} \times TA}{T}$	TA
B	$\frac{T_i \times TB}{T}$	$\frac{T_{ii} \times TB}{T}$	TB
TOTALS	T_i	T_{ii}	T

Values of row, columns and grand totals in the expected frequency contingency table must all times be equal to those in corresponding cells of the observed frequency contingency table. No cell in the expected frequency table should contain a value of less than five.

(c) Calculation of χ^2 value

$$\chi^2 = \frac{\left(a_i - \frac{T_i \times T_A}{T} \right)^2}{\frac{T_i \times T_A}{T}} + \frac{\left(b_{ii} - \frac{T_{ii} \times T_A}{T} \right)^2}{\frac{T_{ii} \times T_A}{T}} + \frac{\left(a_{ii} - \frac{T_i \times T_B}{T} \right)^2}{\frac{T_i \times T_B}{T}} + \frac{\left(b_{ii} - \frac{T_{ii} \times T_B}{T} \right)^2}{\frac{T_{ii} \times T_B}{T}}$$

(d) Degree of Freedom (df)

The degree of freedom for obtaining χ^2 critical in chi-square table is calculated thus:

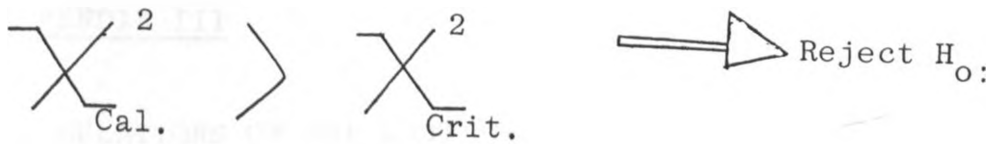
$$df = (c - 1) (r - 1)$$

where: d = degrees of freedom
 c = number of columns
 r = number of rows

(e) Rejection or Acceptance of Null Hypothesis

Using $\alpha = 0.05$ significance level.

(i)

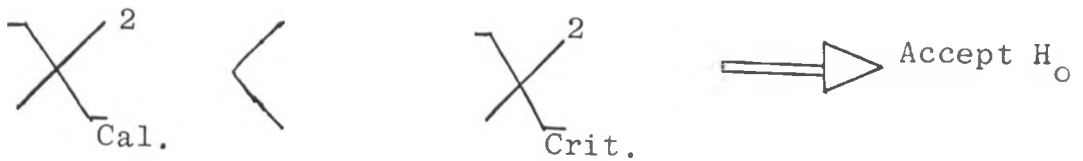


$$df = (c-1)(r-1) \quad df = (c-1)(r-1)$$

$$\alpha = 0.05$$

$$\alpha = 0.05$$

(ii)



$$df = (c-1)(r-1)$$

$$df = (c-1)(r-1)$$

$$\alpha = 0.05$$

$$\alpha = 0.05$$

and $\chi^2_{\text{Cal.}}$ = Calculated Chi-square Value

$\chi^2_{\text{Crit.}}$ = Critical Chi-square value.

APPENDIX III

CALCULATIONS OF THE RATE OF UNAUTHORIZED STRUCTURES
(EXTENSIONS)

A.	<u>STEP I</u>	<u>YEAR</u>	<u>NO. OF EXTENSIONS</u>
	1.	1982	2
	2.	1983	3
	3.	1984	5
	4.	1985	12
	5.	1986	13
			<hr/>
		Total	35
			<hr/>

STEP 2: Average number of sample extensions per sample years is:

$$\frac{35}{5} = 7$$
$$= \underline{\underline{7 \text{ extensions per year per sample area.}}}$$

STEP 3: Proportion of actual extensions constructed between 1982 and 1986 in sample areas is:

$$\frac{35}{50} \times 329 = 230.3$$

$$= \underline{\underline{230 \text{ extensions}}}$$

NB: 329 is the total number of extensions in the sample areas (Figure 3 and Appendix I).

STEP 4: Average rate of extension construction in each sample area per annum is:

(= proportion of extensions constructed in any one sample year)

$$\begin{aligned} \frac{7}{35} \times 230 &= 0.2 \times 230 \\ &= 46 \text{ extension per sample area per} \\ &\quad \underline{\underline{\text{sample year.}}} \end{aligned}$$

Expressed as a percentage of total number of extension built within a single sample year is:

$$\begin{aligned} \frac{46}{230} \times 100 &= 20\% \\ &= 20\% \text{ per annum (in the years 1982,} \\ &\quad \underline{\underline{1983, 1984, 1985 and 1986)}} \end{aligned}$$

B. STEP 5: Proportion of extensions constructed in the entire estate during the five sample period is:

$$\begin{aligned} \frac{35}{50} \times 668 &= 467.6 \\ &= \underline{\underline{468}} \end{aligned}$$

NB: 668 is the total number of extensions in Umoja I Estate determined during physical survey in the field (Table 24)

⇒ Number of extensions constructed in each of the fourteen areas (= sections) in the entire estate per year is

$$\frac{468}{5} = 93.6$$
$$= \underline{\underline{94 \text{ extensions per year}}}$$

STEP 6: 94 extensions in the entire estate that were built per year during the five years considered in these calculations (1982, 1983, 1984, 1985 and 1986) expressed as a percentage of the total number of extensions built in all fives, is:

$$\frac{94}{468} \times 100 = 20.08547$$
$$\underline{\underline{20.1\%}}$$

Conclusion: The 20% proportion calculated from sample statistics compares favourably with 20.1% calculated using physical survey data.

APPENDIX IV

DEFINITIONS OF DEVELOPMENT CONTROL

Heap (1973): Development control is legal permission that is sought by a private individual, group of private developers or a planning authority to carry out development.

Garner (1975 (Ed): Development control is ensuring the "right" (planned) development either by private entrepreneur or public agencies; as well as prevention of carrying out "wrong" (unplanned) development.

Becannia, J.M.R. in Garner (1975)(Ed): Development control is a process by which control of planning is achieved through licensing of planning so that urban physical structures adhere to a plan.

Khamati (1976): Development control is the legal control of the use of urban land applied in the context of plan formulation, implementation and temporal development of planned system.

Ola (1977): Development control is an intergral part of a master plan and it consitutes a tool for implementing and administering the operationalized plan.

Alder (1979): Development control is essentially a method of licensing planning permission that is required for the carrying out of any development on land.

McAuslan (1980): Development control is viewed by the property - owner as the sharp-end of the planning system which stops him what he wants to do with his land and thus constitutes a non-natural barrier which is overcome by seeking legal or other professional advice to overcome.

Chebkatı (1985): Development control is public control of private land and property as the major procedural techniques of developing land in a particular way, and controlling its future use once such land is developed.