Continuity and Change in Conservation:

A Study of the Relationship between Attitudes and

the Built Environment in Historic Old Town of Mombasa.

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DECLARATION

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

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To Nyaboke, Nyambura and the late Gathoni.

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LIST OF ACRONYMS

CADA	Conservation Areas Develoment Authority
COTAC	Conference on Training in Architectural Conservation
ICOMOS	International Council on Monuments and Sites
INTBAU	International Network for traditional Building, Architecture & Urbanism
MOTCO	Mombasa Old Town Conservation Office
NMK	National Museums of Kenya
OTM	Old Town of Mombasa
SPAB	Society for Protection of Ancient Buildings
UNESCO	United Nations Educational, Scientific and Cultural Organization

ABSTRACT

Dynamics of growth and development put enormous strain on land use activities in urban historic areas. New spatial patterns emerge that lead to both visual and functional contradictions, which are manifest in the inappropriate scale in urban historic areas. The variety and complexity inherent in traditional cities is being replaced by insipid high-rise accommodation. Old Town of Mombasa, Kenya, is one such historic area that is loosing its historic built heritage and individuality at an alarming rate. Mombasa has been for centuries a leading trading town on the East African littoral, bearing an architectural legacy of historic buildings and spaces having Arabic, Indian, European and Swahili heritages. Its old town has ornately carved doors, covered balconies, narrow streets and alleyways, rendering it a truly unique area. The study posits that the current situation is occasioned by lack of local community participation in the formulation of the standards and guidelines that govern conservation, hence the social disconnect. This study seeks to establish the typo-morphological characteristics of the historic built environment, and the residents' attitudes towards this environment. It further endeavours to establish the factors underlying the resident's perception of their urban historic neighbourhood. A field survey was conducted, whereby a sample of 693 residents was interviewed along a semantic differential scale, in order to elicit attitudes towards their built environment. Principal Component Analysis, based on correlation matrices, was used to uncover the latent structure of a large set of variables that influence the residents' perception of their conserved area. The results indicate that conservation in the old towns should strive to achieve appropriate order, maintenance and upkeep, scale, create serial vision, open views and panoramas where possible, enhance orientation and continuity, and achieve the necessary complexity without creating information overload or monotony. This flexible approach forms the basis of a framework for conservation of the local distinctiveness, so that the built heritage is experiential and not habitual.

Keywords: *Conservation, Old Town of Mombasa, Attitudes, Likability, Factor Analysis, Complexity.*

CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND TO THE PROBLEM

This research is anchored in the field of architectural conservation and is geared towards the enhancement of urban historic areas since they represent our past. The concern is directed at Old Town of Mombasa, Kenya, which is a place of great diversity and has been a gateway to the world for millennia. Old town of Mombasa (OTM) has captured influences from the African inland, the Arabian Peninsula, Persia and India and it constitutes a unique *Swahili* culture (Moriset, Kassim & Ali, 2009; Kiriama, Ballarin, Katana & Abungu, 2008; King & Procesi, 1990). It is a heritage asset and its sustainability would be a cornerstone of historic continuity.

Urban historic areas have outstanding universal value due to their architecture, homogeneity or place in the landscape (Jokilehto, 2002). The diversity in urban historic areas is embodied in the uniqueness and plurality of the identities therein and takes diverse forms across time and space. Inhabited historic towns continue to change because they have a living community. The protection of this tangible and intangible culture is 'regarded as a shared common good by which every one benefits' (Silverman & Ruggles, 2007a, p. 3).

Historic areas are global commons and contain unique and dynamic record of past human activity, reflecting the aspirations, skills and investment of successive generations. Ostrom, Burger, Field, Norgaard and Policansky (1999) demonstrate that a heritage area is a common pool resource, which is human constructed. It has also been shown that a community may suffer a tragedy when individual acts and decisions cumulatively degrade a commons (Nasar, 1998; Hardin, 1970, 1968). The nature of these decisions must be kept in check if our historic areas are to be protected and handed over to future generations in full authentic glory.

The protection of the historic environment involves conservation, an inclusive term to cover the breadth of activities aimed at safeguarding cultural heritage for the future through continuity and change (Feilden, 2003, 1994, 1979; Sarkar, 1996; Papageorgiou, 1971). Importantly, the built cultural heritage is finite and once destroyed cannot be retrieved and therefore:

> 'architectural conservation plays a vital role in ensuring that present and future generations can benefit from the built heritage both in terms of appreciation and enjoyment for its own sake, and for economic and social advantages that it can bring' (Orbaşli, 2008, p. ix).

Orbaşli (2008) opines that conservation of built heritage is an important vehicle through which communities can maintain and celebrate their individuality and diversity against a backdrop of globalisation. City form and appearance must satisfy the broader public who regularly experience it; therefore, 'to know the appeal of the city form, one must measure peoples responses' (Nasar, 1998, p. 2).

Changes in historic areas should be managed in ways that sustain the significance of places, the *genius loci* (Norberg-Schulz, 1980). Discordant changes in historic areas have huge impacts on the people and communities, disconnecting them from places around them as well as places of their past. This is reflected by the level of concern people continue to express about the loss of the local environment (Fitch, 1990).

Papageorgiou (1971) maintains that the most important factor in conservation is the attitudes of the inhabitants of the historic centres to their protection and survival. This is because 'both personal and community identities are formed through such tangible objects and intangible cultural performances, and a formation of a strong identity would seem to be a fundamentally good thing' (Silverman & Ruggles, 2007a, p. 3). On the contrary, the current approach to conservation of the built heritage has emphasized physical aspect of the place rather than the community living in that place (English Heritage, 2006; Fitch, 1990; Papageorgiou, 1971).

Research has shown that people like areas that have visual order, compatibility and cohesiveness and that they dislike disorder, chaos and the lack of uniform style (Nasar 2000, 1998; Kaplan & Kaplan, 1989). Developments in historic areas that are not contextual diminish the general preference of these areas, with grave implication to the stability of the social and economic fabric. The importance of ascertaining residents' attitudes of their environment and using it as a basis for conservation is bolstered by the observation by Nasar (2000) that 'certain groups such as architects favour higher discrepancies from the shared knowledge structure than others because they develop a more differentiated knowledge structure for buildings than others do' (p. 138).

Nasar (1998) observes that a city can evoke a sense of delight and pleasure, its ambience arising out of social cultural factors and also the physical form. To him, a good city appearance is not an abstract aesthetic phenomenon but 'depends on the evaluations of people who regularly experience the city' (p. vii). A corollary is that if the people appreciate and value the appearance, the city has good visual form. The historic part of a city should be conserved not just for the visual form, but 'to improve the community's meaning and appearance for the many people who experience it (Nasar, 1998, p. vii).

This thesis therefore examines the residents' evaluations of their urban historic area in line with community appearance in order to forestall a visual tragedy of the commons (Machan, 2001; Hardin, 1968). It incorporates the aesthetic dimension, inferred from area attitudes to the contemporary theory of conservation as advocated by Viňas (2005). These aspects are expounded in Section 2.7, dealing with the theoretical framework. The methodology for undertaking conservation of urban historic areas is therefore expanded with a view to achieving sustainability. The study extends the scope of aesthetic research to the realm of conservation of historic areas. This is in line with Chon's (2004) argument that aesthetic factors have major influences on judgements of community satisfaction.

In order to establish the meanings transmitted by urban historic environments, the investigation of how people respond to these historic environments is paramount. To this end, the study evaluates likability, a psychological construct comprising subjective assessments of feelings about the environment. It refers to the probability that an environment will evoke a strong and favourable evaluative response among the groups or the community experiencing it (Nasar, 1998; Chon, 2004). These assessments provide useful information for planning, design and management of historic areas.

The study further investigates the attitudes of the inhabitants of Old Town of Mombasa towards their built environment. The area is treated as a representative of urban historic areas along the East African littoral. Since the inhabitants will ultimately be responsible for conserving the historic heritage, a user attitude approach in conservation is necessary in order to ensure historic continuity while accommodating contemporary changes.

1.2 Problem Statement

The loss of urban scale is daily evidenced in urban historic areas. The variety and complexity that is inherent in the traditional cities is being replaced by out of scale high-rise accommodation (Barton, 2002; Avrami, 2000; Tibbalds, 1992; King & Procesi, 1990). Changing living standards and an urban population upsurge compel inhabitants of historic areas to radically alter the historic urban fabric. New spatial patterns emerge that lead to both visual and functional contradictions, such as inappropriate scale and colour (Forsyth, 2007a; Feilden, 2003; Fitch, 1990). These contradict the traditions and cultural heritage of a community. Discordant architectural forms supplant and destroy the original townscape character thus falsifying the authentic aesthetic experience of historic areas (Plate 1.1). In this process, the local populace is also replaced as the rent goes up and the true custodianship of the historic area is lost.

General neglect of historic buildings and decay of services is also a common phenomenon (Plate 1.2). The mimetic buildings in urban historic areas are not contextual and blur the visual distinction of area evolution (Plate 1.3). The result is that the historic areas' silhouettes and their social fabric have been undermined, thereby disconnecting inhabitants from places around them as well as places from their past. Fitch (1990) ably argues:

> 'that the efflorescence of internationalized prototypes has serious consequences since these imported architectural artefacts are ill adapted to a foreign environment and depend on the importation of high technology from the West, itself a very expensive operation and therefore not economically sustainable' (p.8).

As demonstrated by Moughtin, Cuesta and Signoretta (1999), visually bland and overpowering developments create psychological alienation (Plate 1.4). These buildings are a brutalising experience and the vernacular tradition is jeopardised.

Due to the fact that new and fancy buildings are perceived to be superior, they cause a disturbing feeling of private well being among a perceived public squalor and this could cause an unprecedented segregation of classes and ethnic groups. The disruption in the 'continuity of experience leads to placelessness and rootlessness' (Elkadi, 2007, p. 5). In some cases, historic centres of cities are seen as dangerous to modern life, and are removed or reduced to museum pieces (Lowenthal, 1998, 1985; Krier, 1979).

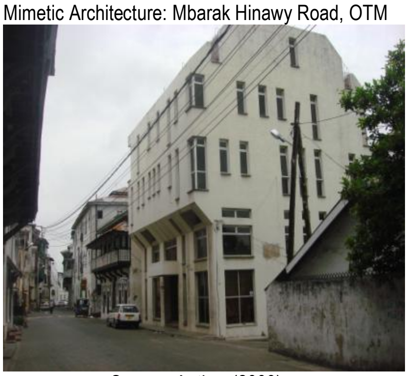
Plate 1.1
Building out of Scale: Bank of India, OTM

Source: Author (2009).

Plate 1.2
Neglect of a Historic Building in OTM

Source: Author (2009).

Plate 1.3
Mimetic Architecture: Mbarak Hinawy Road, OTM



Source: Author (2009).

Plate 1.4
Idiosyncratic Flats near a Mosque, OTM

Source: Author (2009).

The planning process adopted in the conservation of urban historic areas has failed to incorporate perceptual dimension and emphasis has been on the technical aspects of master planning. This technical approach promotes an elitist identity that perpetuates social exclusivity, offending human dignity, and calls into question the issue of human rights (Silverman & Ruggles, 2007b). Carmona, Heath, Oc and Tiesdell (2003) have shown that inflexible applications of technical standards frequently frustrate the creation of places. Catastrophically, the technical approach decimates the authentic architecture of historic areas (Orbaşli, 2008, 2000; Feilden, 1994) because these technical guidelines emanate from an assumed standard and purport to impose a standard of taste. The result is that the conservation efforts do not *infect* people aesthetically (Ittelson, 1976; Stolnitz, 1965).

A disconnect exists between the expert and community values. The planning system in place has failed to capture what matters to most people (Forsyth, 2007a; Nasar, 1998; Hershberger, 1988). The decisions taken by the conservation officials as representatives of the central government worsen the problem further by excluding the local image and environmental values in the conservation process. The experts do not seek to tap indigenous knowledge that can be very useful in the conservation process. The conservation discourse is 'dominated by paternalistic attitudes, values of significance being determined on behalf of, rather than, by the people' (Cherry, 2007, p. 13).

The professionals' decisions regarding the conservation of urban historic areas are within the philosophical framework of procedural planning (Lang, 1988) and do not take into account factors that may be important to the local community and therefore propagate the exclusion of the local perceptions. This precipitates a catastrophe to the urban commons. Unfortunately, this formalist philosophy is predominant in the Kenyan planning milieu.

In the Kenyan context, the conservation plan and other legal and institutional mechanisms notwithstanding, the Old Town Mombasa has continued to deteriorate at an alarming rate (Moriset, Kassim & Ali, 2009; Kiamba, 1995b, c). The conservation plan is a part-development plan (Kenya, 1996) which is prescriptive of solutions and does not promote the elements of public interest (King & Procesi, 1990). These design guidelines are applied across a variety of urban typologies and 'disregard the dissimilarities of places and tend to focus on the determination of simple transgressions rather than working at the principle of good design'

(Scheer & Scheer, 1998, p. 153). These guidelines are only useful in the creation of a nostalgic imagery. Carmona, Heath, Oc and Tiesdell (2003) advise designers to be 'wary of being too prescriptive about urban form, since that which is appropriate in one local climate and culture may not be so in another' (p. 10). The unpredictability of the growth phenomena of historic areas renders the use of prescriptive blueprints for conservation impertinent.

The visual clutter resulting from discordant architecture in urban historic areas is similar to the tragedy of the commons (Machan, 2001; Nasar, 2000, 1998; Hardin, 1970, 1968). What seems beneficial to each individual is detrimental to all individuals together. The inclination to design an image that stands out of context pollutes the aesthetics of the commons (Plate 1.5; Plate 1.6). Reshaping the townscape has been ignored at the expense of newness with no theoretical backing (Viňas, 2005; Larkham, 1996).

Plate 1.5
Building out of Bulk in OTM

Source: Author (2009).

Plate 1.6
Un-contextual Form in OTM

Source: Author (2009).

Empirical analysis of perceived quality of historic areas has lagged behind in research. Designers often disregard or misjudge popular values thereby producing uninviting places with the attendant loss of *genius loci* (Nasar, 2000, 1998; Norberg-Schulz). The dichotomy of preferences between the professionals and the inhabitants result in designs that are incompatible with the preferences of inhabitants. There is no consideration for the many people who experience the visual environment and this ignores the fact that any given building form will vary in the probability of evoking a strong image among the various observers (Nasar, 1998; Lynch, 1982, 1960). The group image, representing a consensus among people (Lynch, 1960) has not been utilised in conservation of urban areas. Therefore, as recommended by Nasar (2000, 1998) this thesis emphasizes the public evaluative image representing the responses shared by large numbers of people. This approach to urban conservation has previously been neglected. This research centres on commonalities of the perceptions since many people experience the same townscape and the shared judgements are of essence in the conservation of historic areas.

In the conservation of Old Town of Mombasa, there is no public input on matters of aesthetic preferences. User meanings have been ignored notwithstanding the dissimilarities of values between the designers and the inhabitants (Hershberger, 1988). This calls for use of popular preferences to guide design as one of the facets of public participation in conservation. Inhabitants' oriented approach to conservation would make the design controls more acceptable and result in a more likeable townscape. This way, the visual aesthetics of an urban historic area can be sustainable. The problems enumerated belie the expectation that a sustainable historic urban area be discernible, and community participation be practiced in order to foster an aesthetic experience.

These discrepancies lead to an important question that can be answered through the examination of the interaction between humans and the historic built environment: *What attitudes do inhabitants of historic urban areas have about the built environment?*

1.3 PURPOSE OF THE STUDY

To answer the above question the study is designed as a survey seeking to establish the aesthetic response to an urban historic area by its inhabitants. This is measured through attitudinal data to establish *likability*. The empirical findings are useful in understanding how a historic urban area is perceived, thus contributing to sustainable conservation.

1.4 STUDY OBJECTIVES

1.4.1 Ultimate Objective

To evolve a conservation model that will enhance the aesthetic character of urban historic areas taking cognisance of inhabitants' attitudes of their historic area.

1.4.2 Specific Objectives

- To establish the typo-morphological attributes of the Old Town of Mombasa.
- To find out the attitudes of the inhabitants of Old Town of Mombasa towards their historic built environment.
- To establish the relationship between the historic built environment in Old Town of Mombasa and the attitudes of inhabitants towards it.

1.5 STUDY ASSUMPTIONS

This thesis is based on assumptions that reflect the study's underpinning in theory, methodology and the substantive phenomenon under study. These realistic expectations are not tested in the study.

i. The urge to conserve 'derives from several interrelated presumptions: that the past was unlike the present; that its relics are necessary to our identity and desirable in themselves; and that tangible remains are finite and a dwindling commodity' (Lowenthal, 1985, p. 389).

ii. Different stakeholders will hold different values and significances about the built environment upon different times. A discrepancy does exist between what is perceived as significant by the experts and the quality or significance of the built heritage as perceived by the public (Sutherland, Teller & Tweed, 2000; Nasar, 1994, 1988; Hershberger, 1988; Michelson, 1968).

iii. As advocated by Wilbur (2000), humans everywhere have the capacity to form images, symbols and concepts. Although the contents of these may vary, the capacity is universal. Lynch (1960) has shown that despite the fact that each individual creates and bears his own image, there seems to be substantial agreement among members of the same group. Nasar (1998) categorically states that 'although we do not share the same evaluative images with one another (perfect agreement) we do have some overlaps in our evaluative images' (p. 4). This study therefore passes over individual differences, interesting as they may be.

iv. Environmental preferences are not matters of personal taste but representative of some generally consistent environmental values. Kaplan (1979), as cited by Nasar (1988), has argued that 'preference judgements are neither arbitrary nor idiosyncratic, but reveal common patterns of aesthetic values' (p.229). Similarly, concerning natural environments, Ulrich (1983) has shown that there is nothing to suggest that aesthetic preferences for natural environments are random or idiosyncratic. Oostendorp and Berlyne (1978) study (as cited in Nasar, 1988) show that individual differences in taste for architectural styles may not be as large as especially art theorists contend.

v. There is a mechanical relationship between symbolic and non-symbolic behaviour (Dobb, 1967). This assumption legitimises the use of a questionnaire to measure attitudes. This way, the verbal response to the questionnaire may be taken as indicative of likely action or behaviour.

vi. An object can have different dimensions of connotative meanings, which can be located in multidimensional property space, otherwise known as the semantic space in the context of the Semantic Differential Scale (Kothari, 2004; Osgood, 1967; Osgood, Suci & Tannenbaum, 1957).

vii. It is further assumed that environmental stimuli are coded internally in terms of continuously varying dimensions and the underlying dimensions are the same for all individuals (Garcia-Mira, Arce, & Sabucedo, 1997). These underlying dimensions are established through Factor Analysis.

1.6 STUDY SIGNIFICANCE

This research extends the work of Lynch (1960) on imageability, and Nasar (1998) on meanings, by applying the concept of likability to four distinct *districts* of an urban historic area that is designated as a *Conservation Area* in Kenya (Kenya, 2006, 1984a, 1984b). The application of psychometric properties of measures to conservation is a distinct contribution to the planning methodology and provides an opportunity for gathering data in a natural *situs.* Moreover, the measurement of the evaluative image, meaning and community appearance creates an objective basis for decisions and policy reasons (Nasar, 1998). Reviews by Kaplan and Kaplan (1989) have confirmed strong consensus in environmental preference thus dispelling the conventional wisdom that 'beauty is in the eye of the beholder' (Nasar, 1998, p. 28.) These consistencies in what people like and dislike in the environment can provide 'valid, reliable, and useful information for the planning, design, and management of desirable surroundings' (Zube, 1980, p. 1).

This study fills a research gap by investigating an overlooked aspect of planning in urban historic areas, that of community perception. It enriches and sharpens planning approaches in conservation by introducing the *'users attitudes'* aspect based on likability of the exterior built environment because '…governments have the power to control the visual quality of places that impact public life... whether a development occupies private or public land, or involves private or public resources, the exterior is a public object' (Nasar, 2000, p. 118). The perceived quality of the environment, not just the form, is emphasized in this study because it is the human perception and evaluation of form that gives it meaning (Nasar, 2000; Norberg-Schulz, 1986).

Of the numerous documents produced on conservation in East Africa, none was found to be involved on the perceptual dimension. No holistic studies in sustainable conservation are evidenced. This study therefore fills a research gap and sharpens the understanding of conservation by mapping the relationship between attitudes and conservation. The study delves beyond the technical aspects of master planning commonly applied in conservation.

Fabrigar, MacDonald and Wegener (2005) observe that researchers have typically defined attitude-behaviour consistency in terms of prediction and the importance of recognizing that attitude can predict or influence behaviour. This is important in the conservation of historic areas because the residents' attitudes towards the built environment can be used to infer how the historic fabric might be acted upon by its very custodians given attitudes are dispositions to behave in a certain way. This approach is important in conservation because the actions people take regarding their environment are based on their conceptions of the world (Šiđanin, 2007).

The study deals with a critical and often overlooked population in the Old Town of Mombasa, which is very diverse in its composition (King & Procesi, 1990). The proposed approach to conservation of built heritage can contribute to social inclusiveness, thereby alleviating contemporary stress (Lowenthal, 1985). The charm of this anachronistic place can alleviate rapid or dislocating change as it acts as a bank of past ways of life.

The examination of aesthetic experiences through attitudinal measures in historic areas can help answer questions about the kind of physical environment that make such places attractive and inviting, and how well they support the inhabitants preferences for the place. According to Chon and Shafer (2009), some 'landscapes in urban areas have been shown to evoke positive pleasurable reactions that can provide the restorative values often associated with more remote places' (p. 83). Aesthetic factors have also been shown to be a major influence on community satisfaction (Chon & Shafer, 2009; Lansing, Marans & Zehner, 1970). This research affords an opportunity for fruitful exploration with known techniques in the fields of architectural conservation and psychology.

The approach to conservation in this thesis, based on likability measures and attitudes, has important implications for creating an objective basis for decision-making and policy development. It focuses on the importance of group meanings and evaluation (Wilbur, 2000; Nasar, 1998; Lynch, 1960). Several studies have found that people tend to prefer popular or vernacular styles to the high styles designed by architects (Nasar, 2008, 2000, 1998). Furthermore, preferred environments have an important public policy connection 'by linking environmental appearance to human health and well-being' (Nasar, 2000, p. 146).

1.7 STUDY JUSTIFICATION

Urban historic areas are loci of important cultural property requiring protection and enhancement. Bearing our cultural heritage, these areas provide us with confidence and security to face the future. According to Lowenthal (1985), the past is omnipresent and collectively immortal, and the surviving past's most essential and pervasive benefit is to render the present familiar and comprehensible, thus making surroundings comfortable. This is not simply prettifying urban spaces but making time-spaces into works of art (Lefebvre, 1991). Historic areas are not just aesthetic objects but irreplaceable works. In any case, historically determined city forms possess a complexity that is impossible to fabricate using replicas and facsimiles (Fitch, 1990). Therefore, their conservation is critical as a repository of a community knowledge system.

Fitch (1990) has demonstrated historic cities to be theatres of memory, containing accumulative scenes of past actions whose impact on people is direct sensuous perception and intellectual cognition. The ability to recall and identify with our own past gives existential meaning, purpose and value because what succeeds has been shaped by precedents (Riegl, 1996; Lowenthal, 1985). The lessons from the past can enable us to foretell, if not forestall the future. This is well captured by Duclos (1975) as cited by Lowenthal (1985) in the following words:

> '….The usefulness of history…is a truth too generally receiv'd to stand in need of proof…The theatre of the world supplies only a limited number of scenes, which follow one another in perpetual succession. I seeing the same mistakes to be regularly follow'd by the same misfortunes, 'tis reasonable to imagine, that if the former had been known, the latter would have been avoided' (p.47).

Conservation of the past heritage has instructive parallels that can be used as a guide to current developments by drawing from the saturations of time. This will preserve traditional skills and craftsmanship, create new employment opportunities for artists, craftsmen, architects, technologists, etc, and encourage business promotion through specialised construction activities amongst the contractors, developers, material suppliers and traders. The benefits of tourism would also be reaped, in addition to improving the social-economic picture of the country. Furthermore, conserved historic areas create stability among the ethnic groups through social inclusion (King and Procesi, 1990).

Urban historic areas denote stored energy and the cost of making new buildings is high in terms of labour and materials (Fitch, 1990). Therefore, conservation of historic areas is advantageous in that the built forms will be used and reused until they wear out or fall apart. The building materials can then be cannibalised and salvaged for reuse in new combinations. This process conserves energy. The 'residual value of energy built into old cities is enormous, packed into streets, utilities, and buildings' (Fitch, 1990, p.32). Therefore, energy is wasted when any old building is pulled down. Conservation ensures protection of this stored energy.

In a 2002 paper, Starn observed that the Venice Charter of 1964 recognized the unity of human values and regarded ancient monuments as common heritage. Urban historic areas are therefore considered as universal commons and the common responsibility to safeguard them is recognized. It is the duty of all people to hand them in full richness of their authenticity thus preserving the *genius loci* (Whitbourn, 2007; Norberg-Schulz, 1980; ICOMOS, 1964). The protection of local significance as opposed to pegging conservation on universal standards of authenticity (that does not emphasize living cultural traditions) is necessary. This local significance is inferred from attitudinal survey as applied in this research.

According to UNESCO (1976), historic areas down the ages afford the most tangible evidence of the wealth and diversity of cultural, religious and social activities and their safeguarding and integration into the life of contemporary society is a basic factor in town-planning and land development. In face of the dangers of stereotyping and depersonalization, this living evidence of days gone by is of vital importance for humanity and for nations. People find in it both the expression of their way of life and its one of the corner stones of their identity in a globalising world.

Most historic urban areas developed incrementally and the circulation was peripatetic. The argument for conservation of such areas is well captured by the Conservation Plan for Old Town of Mombasa. The old town is seen as:

> 'microcosm which still retains much of the historical and cultural context of the pre-twentieth century town. The small narrow streets and alleyways with the *bui-bui* clad women, *hamali* cart operators who sell their goods door to door, roving coffee sellers, and mosques which call the faithful to prayer five times a day, together make up an area in which tradition, and a strong sense of neighbourhood and religion are still an important part of the lives of the residents' (King & Procesi 1990, p. 30)

This study is timely and deals with a special planning area (Kenya, 2006, 2002, 1996, 1984b). Old Town of Mombasa is an urban historic area, which is fast deteriorating in townscape character, despite the efforts by the National Museums of Kenya to have it recognized as a World Heritage Site. The Old Town of Mombasa has historical significance and its popularity with tourists attests to the value that humans give to history. The conservation of its continuous collective memory is therefore paramount.

With the profound influence of Islam on both the culture and the built form of Old Town of Mombasa, the architecture is as disparate as it is interesting and should be conserved for its tangible and intangible values. From a purely hedonistic/ epicurean point of view, the art inherent in the spatial planning, the decorations and ornamentation on the buildings is pleasurable. Universalistic hedonism, better known as utilitarianism, is therefore sufficient justification for conservation of urban historic areas. This is because the common good of the society, promoted through procuring and promoting the welfare of the greatest number of people, is a cardinal object of conservation (Dreier, 1993).

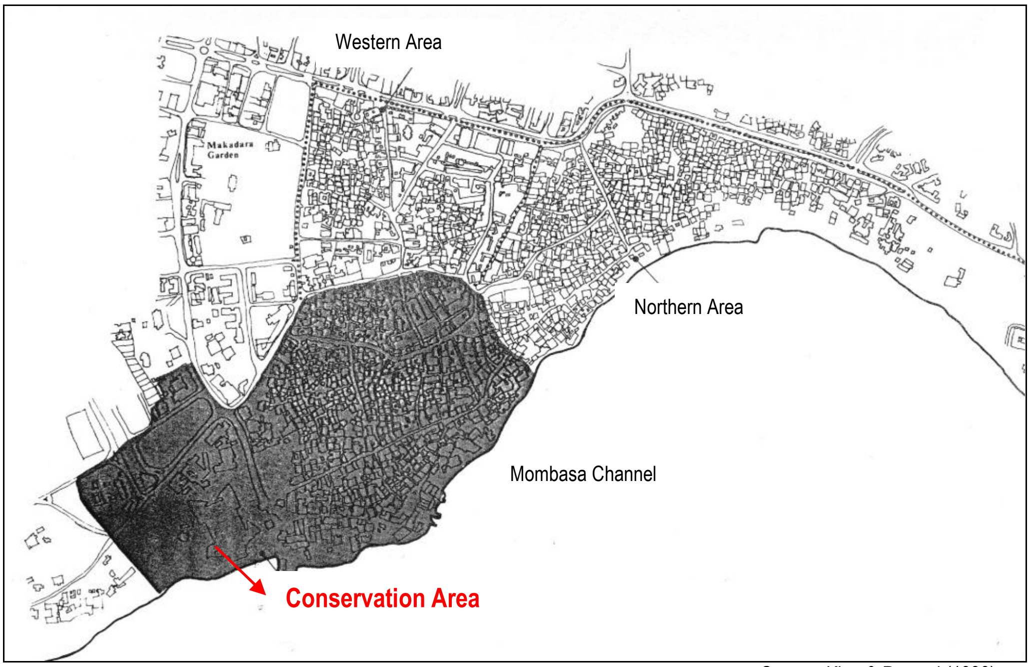
Conservation of urban historic areas will contribute to theory development. In the recent past, Carmona, Heath, Oc and Tiesdell (2003), have identified the desire for New Urbanism as the desire to design complete neighbourhoods that would be similar to the traditional neighbourhoods. Importantly, the Charter for New Urbanism of 1993 is styled on the *Congrès International d'Architecture Moderne, or, International Congress of Modern Architecture* (CIAM) 1933 Charter of Athens, a pioneering document in the field of architectural conservation (ICOMOS, 2009). CIAM was founded in 1928 and disbanded in 1959 and was a series of international conferences of modern movement architects. This theoretical search can be best served if historic areas are conserved for research and pedagogical ends.

1.8 Study Scope

Geographically, the Old Town of Mombasa, Kenya is considered as a representative of an urban historic area along the East African littoral. In Old Town Mombasa, the study focuses on the area declared as a Monument in Gazette Notice No. 2092 dated 24th April 1990. The Gazette Notice No 1779 of 3rd May 1991 subsequently confirmed the gazettement of this Conservation Area as a monument. Concerning the above gazettement, the definition of the

Conservation Area as…‘ All that area of land measuring approximately 13.0 hectares, known as the Old Town…’ is incorrect in the number of hectares, which are thirty one (31) (Map 1.1; Map 1.2). The greater Old Town of Mombasa comprises 72 ha (King & Procesi, 1990).

Map 1.1
Old Town of Mombasa Conservation Area in Context of the Greater Old Town



Source: King & Procesi (1990).

Map 1.2
Old Town of Mombasa Conservation Area

Source: Friends of Fort Jesus (2004).

Theoretically, the study is primarily concerned with the attitudinal aspects of perceptions of the built environment. Also considered are the typo-morphological aspects of the historic area and their relationship with resident's attitudes. This thesis considers the affective or emotional responses to the historic built environment, including the more positive reactions sometimes referred to as aesthetic experience. In order to enhance and manage the physical quality of urban historic areas, 'planners and designers must understand people's experience and response, for example aesthetic response to the environment which deals with both ecological and social value' (Chon, 2004, p. 31).

The research is designed as a survey utilising the personal interview as the main research method. Only a sample of the total population is dealt with. Due to the large number of variables, factor analysis is used to reduce them to a smaller number of factors for modelling purposes, since the large number of variables precludes modelling all the measures individually. No parsimony is gained by computing as many principal components (factors) as there are variables. Factor analysis is therefore used to seek conclusions through statistical techniques, rather than through the more traditional experimental route of manipulative control (Miller, 1991).

1.9 Study Limitations

The extent of generalisation that can be made from this study is limited to residents who have lived for at least five years in Old town of Mombasa. The subjects were residents of Old Town of Mombasa and the sample does not represent all the populations in the Old Town of Mombasa. Specifically, tourists and visitors are excluded from the study due to their temporality and that they are not the *bona fide* custodians of the built heritage.

Despite the fact that Old Town of Mombasa is taken as a representative of the urban historic areas along the East African littoral, there are many urban areas along the coastline, and these differ from one another in many aspects. Moreover, causal relationships cannot be inferred since there was no control through randomization and use of a control group. The findings here reflect a certain population, place and condition, and further study may be necessary to confirm whether they apply to other situations. This study, in the absence of making true causal imputations, argues for the stationary assumption as pointed out by Maxim (1999), where it is held that any relationship observed will be taken as time invariant. Further, the survey was only able to tap respondents who were accessible and cooperative. If a selected subject was unavailable the immediately succeeding one was considered.

The research was also impeded by the fact that in the Old Town of Mombasa the residents are suspicious of strangers. Old Town of Mombasa has a serious drug abuse problem, and arrest swoops are occasionally carried out. This worked against the study because some residents, especially the male youth, were suspicious of the researcher and his team. Confidence with the respondents was bolstered through production of the research permit and by having discussions with respondents in the presence of research assistants who lived in the study area. Village elders were also employed to accompany the researcher and his assistants to all the homes where interviews took place. The Chief and Sub-Chief of the Old Town of Mombasa also sensitised the residents on the ongoing research. Where possible, observation of the physical environment was used as a check to prevent misinformation.

1.10 Study Organisation

The research is arranged in six chapters each focusing on different aspects. Chapter one gives an introductory background to the research problem followed by the problem statement and the study purpose. The statement is followed by research objectives and the accompanying assumptions. The significance of the research problem and its justification are then described. The scope of the study is then explained and this chapter is finally capped by an explanation of the limitations inherent in the study.

Chapter two is a critical review of relevant literature. The philosophical and theoretical approaches to conservation are examined. The conservation of townscapes is also addressed with a view to constructing a conceptual framework for historic areas as a domain of sustainable environments. The role of the custodians of the built heritage is also tackled and this is linked with perception of the built environment. A theoretical framework is established by reviewing various theoretical approaches to the questions of perception, aesthetics, and conservation. Conceptual models emerge that link conservation to aesthetics and sustainability. Hypotheses are then presented followed by definition of terms.

Chapter three delves into the research methods used to investigate the research questions proposed in the previous chapter and begins by presenting a detailed discussion of the research approach. The research design and *situs* are then explained followed by research methods and data collection techniques. An elaborate discussion of the sampling procedure is demonstrated. The plan for data collection incorporating the training given to the research assistants is then presented. A discourse on how the data was processed, analysed and presented is demonstrated followed by a discussion on the reliability and validity of the data collected. The ethics that governed the study are then pointed out and thereafter followed by a discussion of the pilot survey.

Chapter four is a discourse on the Old Town of Mombasa. A broad base for understanding the old town is set by discussing it within the context of the Swahili Coast. This is followed by an elaborate discussion of its historical background. The legal framework for conservation in Kenya is then addressed, followed by a discussion of town planning in Mombasa. The development in the conservation area is then elucidated. This chapter further delves into a discussion of the Old Town of Mombasa townscape, with emphasis on the streetscape, neighbourhoods and public open spaces. The physiographic and natural conditions of the study area are then given a mention.

Chapter five looks at the typo-morphological characteristics of the Old Town of Mombasa. Figure-ground analysis of the area is undertaken. The chapter delves into the attitudes that residents hold about the built environment. Using factor analysis, the latent structure of the large data set is uncovered. The underlying dimensions of perception are then identified and the attendant models presented.

Chapter six comprises conclusions and recommendations. It is argued that conservation should strive to achieve the necessary complexity without information overload or deprivation. Confirmatory factor analysis of the identified factors is suggested as an area for further study.

CHAPTER TWO: LITERATURE REVIEW

2.1. Conservation of Urban Historic Areas

2.1.0 Introduction

This chapter provides a background of what conservation is, and its philosophical and theoretical approaches. The role of the custodians of the built heritage is also tackled and is linked with perception of the built environment. A theoretical framework is established by reviewing various theoretical approaches to the questions of perception, aesthetics, and conservation. Conceptual models emerge that link conservation to aesthetics and sustainability. Hypotheses are then presented.

2.1.1 Conceptual Approaches to Conservation

The conservation of urban historic areas is an extension of the methodology applied to architectural and other forms of conservation. It encompasses various aspects of building conservation and planning combined with social, economic and functional considerations (Orbaşli, 2008; Feilden, 2003, 1979). Conservation is normally carried out on historic buildings and historic areas. A historic building is one 'that gives a sense of wonder and makes us want to know more about the people and culture that produced it' (Feilden, 1994, p. 1). Such a building has architectural, aesthetic, historic, documentary, archaeological, economic, social and even political and spiritual values. As explained by Feilden (1994), its first impact is always emotional, for it is a symbol of cultural identity and continuity.

Urban historic areas comprise groups of buildings, properties or sites that have been designated as architecturally or historically significant. Buildings, structures, objects and sites within a historic area are normally divided into two categories, contributing and non-contributing, relating to their role in enhancing the built heritage. Historic areas greatly vary in size, some having hundreds of structures while others have just a few (Historic District-United States, 2009; Orbaşli, 2008; Rodwell; 2007; Kenya, 2006; Fitch, 1990). The values identified in historic buildings are also to be found in historic areas in varying combinations (Feilden, 2003).

According to Feilden (1994), conservation may be defined as 'the action taken to prevent decay' (p. 3). It embraces all acts that prolong the life of our cultural and natural heritage in order to ensure continuous transmission of artistic and human messages. Feilden further indicates that the basis of all conservation is legislation. Sarkar (1996, 1994) takes conservation to be the most generally acceptable and inclusive term to cover the breadth of activities aimed at safeguarding heritage for the future through *wise use* and deliberate *intervention* in order to control the rate of change.

As per the Burra Charter (ICOMOS, 1999), conservation refers to all the processes of looking after a place to retain its cultural significance. Forsyth (2007) celebrates that 'if one end of the conservation spectrum embraces the urban management of entire towns and cities, the other end, involving the care of individual buildings, ultimately concerns good construction practice and an understanding of how buildings were originally designed' (p.4). Dobby (1979) argues that conservation addresses itself to the tangible and the physical amid a horde of planning imponderables, and is bound to the continuation of past buildings although altered in varying degrees for the sake of posterity. Importantly, conservation of heritage areas:

> 'is less about the design of individual buildings (more the purview of architectural heritage) or their construction (engineering and building) but is rather about their spatial interrelationships in making something special larger than the mere sum of its parts. The spaces and

> connections between built structures are of just as much importance as the structures themselves' (Freestone, Marsden & Garnaut, 2008, pg. 157).

The conservation of historic urban areas presents aesthetic problems to the built heritage that are not found in isolated buildings e.g. former uniform streets being interrupted by incongruous replacements that are out of scale (Rodwell, 2007; Fitch, 1990). This heritage as Silverman & Ruggles (2007a) aver, is a concept which most people would assign a positive value. To them, the conservation of the tangible and intangible culture '…is generally regarded as a shared common good by which everyone benefits' (p. 3).

Orbaşli (2008) has shown conservation to involve 'maintaining the character of a historic quarter while still allowing it to evolve as a place to live in' (p. 6). Further conservation can be taken as the process of managing change while development is the mechanism that delivers change (Orbaşli, 2008; Sarkar, 1996). Tschudi-Madsen (1985) is cited by Roders (2007) observing that the word '*conservare* in Latin is derived from the prefix *con* which can mean *together with* and often has strengthening effect, and *servare,* which means to protect, to guard, to save' (p.158). In line with this, Orbaşli (2008) has emphasised that conservation is about the people and that approaches to conservation will be linked to values of the society at that time and 'the role of the conservation professional is to make balanced judgements that will help maintain the continuity of buildings and townscapes, while serving present day communities and their needs' (p. 6).

Larkham (1996) argues that conservation is now an accepted part of urban planning addressing itself to the problem of aging urban landscapes. He indicates that '…the production and maintenance of the physical fabric of the urban environment absorb a large amount of the wealth and that '…substantial problems arise as townscapes age and as the social and economic conditions under which they were created change' (p. 63). Some terms used in conservation and the degrees of change implied in a particular artefact are shown in Table 2.1. These degrees of intervention are expanded to form the various approaches to conservation.

Table 2.1
Degree of Change in Interventions in Historic Areas and Historic Buildings

	Change			
Action	**None**	**Some**	**Much**	**Total**
Cleaning				
Repair				
Preservation				
Enhancement				
Conservation				
Restoration				
Rehabilitation				
Reconstruction				
Demolition				

Source: Adapted from Feilden (1994); Dobby (1978).

Roders (2007) expanded the scales of intervention by introducing *deprivation* as an act of intervention. Passively, it involves abandonment, which is leaving the built environment to fall into decay and obsolescence without any particular concern. Actively, deprivation involves vandalism, which again contributes to the environment's obsolescence by the destructive and intentional actions. From Table 2.1, conservation of the built heritage covers all circumstances from absolute retention to demolition, for sometimes partial or complete demolition may be necessary for the benefit of the overall project (Roders, 2007; Highfield, 1991, 1987).

The various degrees of change in interventions illustrated in Table 2.1 are also regarded as *approaches* to conservation (Orbaşli, 2008). Several of these approaches are defined in the Venice Charter (ICOMOS, 1964; Appendix XV), a philosophical manifesto produced by the International Congress for Conservation in Venice in 1964. Similarly, the Burra Charter (ICOMOS, 1999; Appendix XVI) having regard to the Venice Charter, has expanded these approaches. Feilden (1994, 1979) has argued that conservation involves making interventions at various scales and levels of intensity, which are determined by the physical condition, causes of deterioration (Appendix VII), and anticipated future environment of the cultural property under treatment. These interventions or approaches must be considered both holistically and individually.

Orbaşli (2008) observes that 'conservation terminology can vary with language and according to the interpretation of different cultural communities' (p. 46). In the context of this thesis, conservation is used as the overarching term to include the intervention and management necessary to safeguard the cultural significance of historic buildings and historic urban areas. Several degrees of intervention may take place simultaneously in various parts of a building, or even a whole historic urban area (Feilden, 2003). These are maintenance, preservation, reproduction, restoration, reconstruction and re-evaluation or rehabilitation. Other approaches include redevelopment and urban renewal. These degrees are expounded in the glossary.

There are a number of contrasting approaches to the problem of fitting new buildings into old and valued townscapes. Larkham (1996) has identified and discussed the most significant as: deliberate contrast, the use of local architectural idiom, disguise, and the use of historicist styles (pp. 238-247). The concept of deliberate contrast enhances the *genius loci* of a place, because the buildings are specifically designed to do so, as opposed to buildings that ignore their surroundings. This concept is akin to the harmonic contrast of Papageorgiou (1971). The designed new structure:

> 'often deliberately seeks not to distract attention from pre-existing structure through repetition or pastiche but add a new well designed structure which itself could be an attraction and potentially listable in future' (Larkham, 1996, p. 238).

The application of the local architectural idiom in terms of style and materials in order to blend new developments with the character of an old historic area is a movement against the blandness of modern architecture. Unfortunately, this ‘pseudo-vernacular style soon became almost as undesirable as its predecessors, because little or no attempt was made to incorporate the true vernacular, that is, local characteristics’ (Larkham, 1996, p. 241). Blending of the new and the old may involve disguise in two ways. The first is an attempt to make large development appear less intrusive by creating the impression that it is subdivided or second, through façadism which involves retention of a façade so as to keep appearance with the obvious loss of authenticity (Larkham, 1996; Highfield, 1991, 1987). The last tactic, the use of ‘revival’ styles, involves the re-creation of building styles.

The application of the various approaches to conservation of historic buildings and areas requires the skills of a wide range of professionals (Orbaşli, 2008; Rodwell, 2007; Feilden, 1994). It is a multi disciplinary process dependent on teamwork that includes decision makers, a professional team, skilled crafts people and contractors. Appendix VI shows a skills matrix for the professionals involved in conservation, based on ‘ICOMOS Guidelines for Education and Training in the Conservation of Monuments, Ensembles and Sites’ (1993) and produced by Conference on Training in Architectural Conservation (COTAC) in 1993.

2.1.2 Historical Development of Conservation

Conservation related actions have had a long history, the earliest being spurred almost entirely by concern for the past and its people. Brown (1905), as cited by Larkham (1996) records that ‘the Greeks preserved the Hellenic monuments with honour, Roman emperors such as Hadrian also respected these *exemplaria Graeca,* and even their successors, Teutonic chieftains such as Theodoric of Rome, acted to preserve the monuments of that ancient city (Larkham, 1996, p. 33). It was not until mid to late eighteenth century that attitudes of the social elite towards the monuments and inheritance of the past began to change significantly.

According to Orbaşli (2008), 'by the nineteenth century in England, Germany and France, the word restoration had become synonymous with the reordering and reconstruction of monuments, often with little proven evidence, to what was thought to be the original design intention or simply to establish an assumed symmetry' (p. 17). Little respect was paid to authenticity or architectural evidence, all in the name of purity of style. Layers of evidence were removed, hence the loss of patina (Papageorgiou, 1971), and at times new additions were added to accomplish a desired style (Orbaşli, 2008; Larkham, 1996). Eugène Emmanuel Viollet-le Duc is associated with intensive restoration in France, whose theory was that the architecture of the present must be derived from that of the past, but not merely a revivalism (Larkham, 1996). Later on, the planning of Paris by Haussmann lost its setting by creation of boulevards through the dense urban areas (Orbaşli, 2008; Rassmussen, 1979).

The ongoing restorations were not without opposition. In England, these were consolidated in 1877 through the creation of the 'Society for the Protection of Ancient Buildings' (SPAB), with William Morris as its honorary secretary (Orbaşli, 2008). SPAB argued that to restore and to copy was to destroy authenticity and its manifesto has become a template for modern day conservation policy (Society for the Protection of Ancient Buildings, 2010; English Heritage, 2006, 1997; Larkham, 1996). The SPAB is a highly regarded conservation advisory body in the UK today.

John Ruskin, another prominent SPAB founder member, and author of the *Seven Lamps of Architecture* was an ‘avowed revivalist, without hope or desire of evolving any new, or contemporary, architectural style’ (Larkham, 1996, p. 35). Ruskin suggested that historic buildings needed to be maintained within their settings rather than being isolated in a landscaped park. He advocated repairs rather than decorative replacements; honesty in any intervention, avoiding decorative carving on stone replacements and dating all new work. Ruskin contended that real heritage lay in the genuine monument, not in modern replicas. Most importantly, Ruskin pointed out the value of historic cities, not only in terms of single monuments, but in the collective value of buildings, streets, and spaces that made up the character of old towns, which he feared were being lost to modern developments and street widening schemes (Orbaşli, 2008; Larkham, 1996).

The growing interest in heritage in the twentieth century, combined with nationalistic feelings in the aftermath of two world wars, and the economic value associated with cultural tourism defined conservation in Europe in the later part of the twentieth century (Orbaşli, 2008). The extensive rebuilding following World War II relegated conservation in favour of reproductions and mere rebuilding e.g. the historic centre of Warsaw was completely rebuilt on the basis of extensive pre-war documentation and is now inscribed in the UNESCO World Heritage List (Orbaşli, 2008; UNESCO, 2005).

Sarkar (1996) has shown that ‘the conservation philosophy in the communist countries of Europe is to ‘…restore with fanatic fidelity and with massive state support and control’ (p. 27). She mentions the example of Vienna, the capital of Austria, which can be a ‘case study for any country needing extra push to embark on serious preservation’ (p. 28). Pendlebury (2002), reports that the modern approaches to conservation derive from the moralistic and didactic 19th-century writings of John Ruskin and William Morris. Clear principles of intervention were evolved, which remain orthodox in architectural conservation. Moreover, stress is placed on the ‘sanctity of authentic historic fabric and the custodianship of buildings for future generations’ (p. 146). The history of conservation has thus been more of a campaigning movement gaining momentum against the modernist planning approaches.

Many international charters exist today that guide conservation (ICOMOS, 2009; Orbaşli, 2008; Roders, 2007; Whitbourn, 2007; Wells, 2007). The Athens charter of 1931 discouraged stylistic restoration in favour of conservation and repair that respected the various changes a building would have gone through. The Venice Charter (ICOMOS, 1964) moved from the idea of individual monument towards defining context and set out principles for conservation and extending the understanding of the historic monument from individual buildings to incorporate historic areas, both rural and urban. The charter recognised that people were becoming more conscious of the unity of human values and regard ancient monuments as common heritage. It emphasised the common responsibility to safeguard them for the future generations handing them in the full richness of their authenticity (Whitbourn, 2007). The Burra Charter (ICOMOS, 1999) which built on the Venice Charter was originally drafted in 1979 and revised in 1999 and brought clarity to a number of issues as well as definitions, including the concept of place. It is also a reflection of Australian concerns for the conservation of up to 40,000 years of indigenous heritage integrated with nature and based on oral conditions and overlaid with more than 200 years of European style heritage of settlers (Orbaşli, 2008; ICOMOS, 1999, 1964).

Table 2.2 shows various charters, which have been inspired by the Venice Charter. Not all charters have gained international cooperation and neither do charters drafted in one language translate well into others (Orbaşli, 2008). These charters are merely advisory documents on ethics and principles of conservation and they generally summarise the prevailing attitudes to conservation (Roders, 2007).

Table 2.2
ICOMOS Charters and other International Guidelines

ICOMOS Charters
International Charter for the Conservation and Restoration of Monuments and Sites (Venice Charter 1964)
Historic Gardens (Florence Charter 1981)
Charter for the Conservation of Historic Towns and Urban Areas (Washington Charter 1987)
Charter for the Protection and Management of the Archaeological Heritage (1990)
Charter on the Protection and Management of Underwater Cultural Heritage (1996)
International Cultural Tourism Charter (1999)
Charter on the Built Vernacular Heritage (1999)
Principles for the Preservation of Historic Timber Structures (1999)
Principles for Conservation and Restoration of Built Heritage (Charter of Krakow 2000)
ICOMOS Charter – Principles for the analysis, conservation and structural restoration of architectural heritage (2003)
ICOMOS Principles for the preservation and conservation/ restoration of wall paintings (2003)
Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas (2005)
Other Documents:
Guidelines on Education and Training in the Conservation of Monuments, Ensembles and Sites (1993)
Nara Document on Authenticity (1994)
Principles for the Recording of Monuments, Groups of Buildings and Sites (1996)
Stockholm Declaration (1998)

Source: Adapted from ICOMOS (2009); Orbaşli (2008); Roders (2007).

Since the formulation of the Venice Charter in 1964, new problems and complexities have emerged which have seriously challenged the adequacy of the document. In 2006, the International Network for Traditional Building, Architecture & Urbanism (INTBAU), *Venice Declaration on the Conservation of Monuments and Sites in the 21st Century* was adjudged to address some of these inadequacies. Specifically, the Venice Charter (ICOMOS, 1964) did not address the challenges beyond Europe and America, and overlooked the vital role that traditional building crafts continued to play. A number of logical contradictions have become evident within the Charter itself, or within its over-rigid interpretation. For example, Article 9 of the Venice Charter says new work must be distinct from the original composition and bear a contemporary stamp. However, this goal must be dynamically balanced with other needs, including the need for coherent and enduring human environments (INTBAU, 2009; ICOMOS, 1964). UNESCO's 1994 Nara Document on Authenticity recognises the different associations and different cultures have with the cultural heritage and the concept of authenticity, while at the same time ensuring an understanding of a common heritage of humanity (ICOMOS, 2009; Orbaşli, 2008; UNESCO, 1995).

Orbaşli (2008) has strongly argued that ‘while modernisation of the Western World since the Enlightenment took a model of separating religion and the spiritual from the scientific and tangible (rational), this has not always been the case in other parts of the world’(p. 24). In Japan, like other South East Asian countries, dismantling and rebuilding of cultural significant artefacts is seen as a valid means of conservation. The idea of renewal common to Eastern cultures is fundamentally contradictory to the principles of maintaining original fabric. Sarkar (1996) has observed that the Japanese method of dismantling and re-assembly has lead Western experts to argue that historic buildings in Japan are reconstructed regularly. In Africa, cultural heritage resides in oral traditions that were traditionally passed down through generations, and that are rapidly dying out today (Orbasli, 2008).

2.1.2.1 The Urban Conservation Movement

By the 1950s and 1960s, many of Europe’s historic centres had become run down areas, often seen as an obstacle to development, and many historic buildings and entire neighbourhoods were demolished. The advocates of the modern movement took little interest in historic buildings or historic character in their search for new utopian environments (Orbaşli, 2008). On the contrary, Fitch (1990) favours an incrementalist approach to urban development.

Area based conservation emerged in Britain in the 1960s (Orbaşli, 2008; Larkham, 1996; Sarkar, 1996). The council of Europe’s *European Architectural Heritage* year initiative in 1975 played an important role in raising awareness of the value of the built heritage to towns and cities, encouraging civic authorities to tackle some of the problems facing them (Orbaşli, 2008). The developments in Britain were replicated in Kenya, which was its colony.

The conservation movement started as a scholarly and elitist venture, but developed into a more popular and inclusive movement and a strong political tool for successive governments (Orbaşli, 2008; Larkham, 1996). Conservation has always been met with resistance yet the rate of destruction of cultural heritage the world over is considerably higher than the level of protection that can be offered (Orbaşli, 2008). Conservation is then reinterpreted to mean a process enabling historic buildings and settings to be maintained and changed if necessary and one that recognises the importance of those charged with the custodianship of the built heritage (Nezih & Guçhan, 2008; English Heritage, 2006; Norberg–Schulz, 1980; Papageorgiou, 1971).

2.1.3 Rationale for Conservation

It has been shown that conservation of the built heritage is more than a question of aesthetics since it touches our basic values, and pride in the past is the surest foundation for confidence in the future (Rodwell, 2007; Forsyth, 2007a; Feilden, 1994; Fitch, 1980, Dobby, 1978). Viňas (2005), has emphasised that conservation is practised in order to cope with our 'own inability to invent the present' (p. 172). This may be explained through the waning confidence in the 'present' and therefore an urge to revive the past. Less pessimistically, Constantine (1998) citing Hockney has said that conservation is done for love, although he offers no explanation what that love is for (Viňas, 2005, p. 172).

In his *Contemporary Theory of Conservation,* Viňas (2005) does not relate conservation to truth but to meanings. These meanings from a theoretical point of view give the rationale for conservation:

- To preserve or improve the scientific meanings of an object
- To preserve or improve the social, hi-cult symbolic meanings that an object has for large groups
- To preserve or improve the sentimental symbolic meanings that an object has for small groups or even individuals (p. 175)

These reasons are not mutually exclusive. Classical theories of conservation, generally taken as the approaches to conservation (Section 2.1.1), and based on the notion of pursuit of truth, cannot cope with these communicative phenomena, which are outside their conceptual frames. For as Cosgrove (1994) has argued, 'it is the act of conservation itself, that makes an object part of cultural heritage, not the cultural heritage that demands conservation' (Viňas, 2005, p. 176).

This shows that aesthetics, patriotism, history and loss are basic to conservation. The built environment has a capacity for survival and provides us with a historical record of previous ages and symbolises permanence and continuity, against the finite human lifetime (Rodwell, 2007; Papageorgiou, 1971). This distinctiveness has been recognised as the concrete reality humans have to face and come to terms with in their daily life (Norberg–Schulz, 1980). Local distinctiveness is also an important value that makes a place unique from another (Orbasli, 2008; Nasar, 2000, 1998).

2.1.3.1 Pro-Conservation Arguments

The legion of benefits the past provides clearly transcends nostalgia. Freud cited in Bernfeld (1951), has clearly stated that 'only a good-for-nothing is not interested in the past' (Lowenthal, 1985, p. 35). Conservation is important because of the charm of the past (Wilde, 1981). The concept of national heritage is equally affable, and is occasionally evoked for the purposes of justifying conservation so that the connection with a treasured past is maintained (Sarkar, 1996; 1994).

The surviving past's most essential and pervasive benefit is to render the present familiar since its traces on the ground and in our minds enable us make sense of the present. Orbaşli (2008) celebrates that historic areas are an intrinsic part of the built heritage. He shows that 'a desire to promote national identity or to explicitly stimulate domestic and international tourism is another reason' (p. 3).

Dobby (1978) has identified associational and psychological needs that derive from the concept of symbolism as further reasons for conservation of historic areas. He further identifies history, artistic design, and associations as the other grounds for conservation. The conservation of historic heritage is integral to our sense of identity. Ability to recall and identify with our past gives existence meaning, purpose and value (Norberg-Schulz, 1980). Furthermore, conservation can be for pedagogical reasons. We can learn from the past and this might 'enable men to foretell, if not to forestall, the future' (Lowenthal, 1985; p. 46). Conservation also provides relics for contemplation and these treasures of the past are enriching.

2.1.3.2 Anti Conservation Arguments

Nietzsche (1957) is cited by Lowenthal (1985) stating that 'every past is worth condemning' (p. 63). Morris (1978) further notes that 'the past is useless. That explains why it is past' (Lowenthal, 1985, p. 35). The past can also harbour evil memories whereby some relics may be dangerous or corrupting. Past architectural ensembles can also overwhelm the present. The danger also often lies:

> '…in our tendency to overate the past's importance or virtue by comparison with the present. The American National Trust promotes historic preservation with the slogan 'They don't build them like they used to. And they never will again-suggesting the inherent inferiority of today's architecture' (Lowenthal, 1985, p. 65).

Dobby (1978) has shown that the varied interpretation of the word conservation causes antagonisms from the many shades of opinions. Due to its close resemblance to conservative, it becomes even more provocative. Conservation is seen as inhibiting progress and change both materially and imaginatively. He argues that conservation condemns people to unsuitable conditions simply because historic buildings and historic areas are argued to be historically good. Orbaşli (2008) avers that protectionism continues to draw opposition when it is seen as a barrier to development; especially where the fight for conservation or modernity has pitted globalisation against identity.

Conservation is sometimes seen as imposing distortions upon the market system reducing profitability. Economists and more so developers see conservationists as inhibiting the natural growth and change of areas. Normally, commercial units will require large horizontal areas of sales space yet the historic areas provide retail units in small vertically divided sections (Lichfield, 1988).

A powerful argument that improvement schemes cause displacement of original inhabitants and that conservation of some areas is at the expense of other areas has been puf forward by Dobby (1978). He shows that conservation is often criticized, as the action of a minority imposed on a weaker majority at the latter's cost. Historians may regard conservation as an artificial attempt to interfere in inevitable change, even to the extent of trying to stop time or reversing it. The argument is that if in the past, conservation had the scope it has now, resistance to development would have deprived the present of the many monuments we now regard as sacrosanct.

Lowenthal (1985) avers that a past too much esteemed saps present purposes. This means that an over-indulgence in memory likewise shuts out present experience. Dickens argues that 'if the past makes such a bid for our attention, the present may escape us. The past must be buried in order that the living may experience life to the full' (Lowenthal, 1985, p. 65). Reverence for the past is therefore commonly seen to inhibit change, embargo progress, dampen optimism, and stifle creativity. As such, equating conservation with conservatism make the present a mere spectator of the past, weakening individuality, an indictment well expressed by Nietzesche (1957) in his *Use and Abuse of History*:

> '…over-attention to the past turns men into dilettante spectators, their creative instinct destroyed, their individuality weakened, seeing themselves as mere late comers born old and grey…'(Lowenthal, 1985, p. 65).

2.2 Principles and Philosophies of Conservation

The philosophy in conservation of the built heritage advocates a values-based approach based on integrity and authenticity (Orbaşli, 2008; Rodwell, 2007; de-la Torre, 2002). Integrity is related to wholeness and the test of authenticity is in genuiness. Authenticity is a requisite qualifying factor and a fundamental part of the modern conservation of cultural heritage, which can be complemented with the notion of integrity, especially when dealing with historic urban areas.

2.2.1 Integrity and Authenticity

Conservation must be undertaken with *integrity,* using materials appropriate for the purposes, in a fitting manner (Orbaşli, 2008). A historic area or building is a relic from the past and holds details and information about the past and 'this is its historic integrity' (Orbaşli, 2008, p. 51). The application of restoration or reconstruction to show how it looked like in the past defies integrity. This approach lacks moral soundness or unity. Integrity includes the following: physical integrity; structural integrity; design integrity; aesthetic integrity; integrity of the building within its setting and context and professional integrity of the building team (Jokilehto, 2007; Orbaşli, 2008; Feilden, 2003).

Jokilehto (2007) argues that:

> '…the condition of integrity in relation to cultural sites should be understood in the relevant historic context describing the state that a particular place has acquired by the present time. Integrity can be referred to visual, structural and functional aspects of a place. It is particularly relevant in relation to cultural landscapes and historic areas, but even a ruin can have its historic integrity in its present state and its setting' (p. 8)

Furthermore 'architecture is conceived in reference to a functional scheme, the basis for *social–functional integrity*…altering the function of, or introducing new uses to historic buildings and areas, may often cause conflicts' (Jokilehto, 2007, p. 8). It is necessary, therefore, to establish limits on the modifications that such function might cause, and recognise the character of an historic building as the basis for rehabilitation. The notion of functional integrity is particularly relevant in relation to large sites and landscapes, where traditional functions may be challenged by the introduction of modern technology and new priorities. It is useful for an appropriate balance in the policies of development and conservation, with due regard to the character of traditional uses (Jokilehto, 2007, 2006b, 2002).

Authenticity means that an historic building should be seen 'as a true testimony of the culture or traditions that it represents' (Jokilehto, 2007, p. 7). Authenticity implies genuineness, undisputed credibility and truthfulness. Conservation in many instances depends on interpretations of which there may be several, in which case there is not one truth (Orbaşli, 2008, de-la Torre, 2002). Authenticity in conservation relates to: design or form; materials; techniques; traditions and processes; place, context and setting; function and use (Orbaşli, 2008). Jokilehto (2007) indicates that the Nara Conference of 1994 noted that while the word 'authentic' was not necessarily used in all languages, it was possible to find corresponding words to express the intent. The *Nara Document on Authenticity* has emphasised that 'the diversity of cultures and heritage in our world is an irreplaceable source of spiritual and intellectual richness for all humankind' (UNESCO, Nara Document on Authenticity, 1995, par. 5). The World Heritage Convention requires sites to be nominated to the World Heritage List to be authentic.

The Nara Document states that:

> ‘All judgments about values attributed to cultural properties as well as the credibility of related information sources may differ from culture to culture, and even within the same culture. It is thus not possible to base judgements of values and authenticity within fixed criteria. On the contrary, the respect due to all cultures requires that heritage properties must be considered and judged within the cultural contexts to which they belong’ (UNESCO, Nara Document on Authenticity, 1995, par. 11).

It can thus be seen that replicas are fakes lacking authenticity. Authentic material is the only concrete evidence of history that can be carried into the future (Orbaşli, 2008). It is important to note that the sense of place can have greater value than the built form, and this is especially so in heritage areas (Norberg-Schulz, 1980). The contention is that authenticity resides in place, design and the spirituality of place more than in the material relics. Authenticity therefore has tangible and intangible aspects and it is at ‘the root of definition of outstanding universal value’ (Jokilehto, 2007, p. 7). Unfortunately, authenticity is unhelpfully and ambiguously subsumed into character and appearance (Rodwell, 2007).

2.2.2 Values-led Approach to Conservation

Urban historic areas are immovable cultural property ‘created by man’s multifaceted cultural traditions’ (Feilden, 1979, p. 6). The concept of a historic area embraces every place whether urban or rural, formed by man or by nature, and whose historical, aesthetic, artistic, ethnographic, scientific, legendary or literacy qualities justify its protection and enhancement (Rodwell, 2007; Feilden, 1979).

The significance of a building or a place of historic, architectural and cultural importance is its most defining value, the loss of which will devalue its cultural significance (de-la Torre, 2002).

In a value-based approach to conservation, a wider range of values are recognised, not all of which relate to the built environment. 'Values are qualities and characteristics that different users and different societies place on the cultural heritage at different times' (Orbaşli, 2008, p. 38). The values-based approach is therefore an analytical method in which value judgements have to be as objective as possible. Values will not have the same weighting, and some may be in opposition to each other, and a balanced decision making is necessary (Feilden, 2003; de-la Torre, 2002).

The conservation of cultural property demands the management of resources and a good sense of proportion. Objects chosen for treatment and the degree of intervention are predicated upon the values that can be assigned to cultural property. The values provide a framework for systematically setting the overall priorities in the scheduling of interventions. These values can be grouped into three headings namely:

> '*Cultural Values:* documentary value, historic value, archaeological and age value, aesthetic value, architectural value, townscape value, landscape and ecological value; *Use Values:* functional value, economic value, social value and political value *Emotional Values:* wonder, identity and continuity' (Feilden, 1979, p. 22).

The values identified above are by no means exhaustive. Other values identified are 'intended as an overview and starting point when embarking on a conservation project' (Orbaşli, p. 40). Some of these values that are of greater concern in this thesis are mentioned below. Age and rarity value concerns the fact that the older a structure or a neighbourhood is, the more value is likely to be attached to it. Rarity also relates to the occurrence of a building type or technique. Historic towns generally have exemplary qualities of design and high quality of craftsmanship and therefore have high architectural and artistic value (de-la Torre, 2002; Feilden & Jokilehto, 1998; Feilden, 1994).

The associative value is the association a place has with an event or personality in history (Feilden, 1994). Places of war, e.g. battlefields have a high associative value, even if there is no structure on site. They also posses emotional and spiritual values. We can learn a lot from historic areas, including their history, social relations and construction techniques and thus educational value is inculcated in us. Other values identified by Orbaşli are: emotional values, historic values, landscape value, local distinctiveness, political value, public value, religious and spiritual value, scientific research and knowledge value, social value, symbolic value, economic, technical value and townscape value (Orbaşli, 2008, pp. 38-46). Feilden (1994, 1979) recommends that the cost of conservation be allocated partially to each of the values in order to justify the total costs to the community.

In the conservation of an urban historic area, local distinctiveness provides a unique quality that makes an area different from anywhere else, a prime motivation for area conservation (Rodwell, 2007). Historic towns are often valued for their distinctive characteristics in the face of repetitive and similar international styles of architecture. Moreover, the meaning of a historic place to a local community, often as part of an ongoing interchange, constitutes the social value which is very important, the other values notwithstanding (Papageorgiou, 1971). Therefore community participation must be sought for conservation activities to be both successful and meaningful to the people (Sassi, 2006; King & Procesi, 1990; Feilden, 1994, 1979). This thesis accepts the argument by Elkadi (2007) that: the values of cultural built heritage should be place related, and the people's tradition, as opposed to the grand tradition of power, is what should be the subject of conservation.

It has also been recognized that the identification of significant heritage values 'is a complex issue and involves more than a rapid overview of the possible designated buildings in the areas in close vicinity of the project area' (Sutherland, Teller, & Tweed, 2000, p.2). The perceived quality of historical areas may indeed vary with time, age, gender, group, etc. Different stakeholders, including residents and professionals, place different values and significance upon different elements (Nasar, 1998, 1994; Hershberger, 1988). This poses a problem in determining whose value is to be conserved (de-la Torre, 2002). Sutherland, Teller and Tweed (2000) have developed a methodology based on survey design that can be adapted to different cultural and urban settings with the aim of providing indicators of the strength of people's perceptions with regard to the urban settings.

2.2.3 Principles of Conservation

Forsyth (2007b) has identified several philosophical principles to follow when devising conservation operations. He identifies *minimum intervention* and *reversibility* as the key words. Feilden (1994) has also enumerated a standard which must be vigorously observed in conservation work. The standard is summarised as below:

1. The condition of the building must be recorded before any intervention
2. Historic evidence must not be destroyed, falsified or removed
3. Any intervention must be to the minimum necessary
4. Any intervention must be governed by unswerving respect for the aesthetic, historical and physical integrity of cultural property
5. All methods and materials used during treatment must be fully documented (p. 6).

Further, Feilden (1994) suggests that any proposed intervention should:

1. be reversible or repeatable, if technically possible, or

2. at least not prejudice future intervention whenever this may become necessary;
3. not hinder the possibility of later access to all evidence incorporated in the object;
4. allow maximum amount of existing material to be retained;
5. be harmonious in colour, tone, texture, form and scale, if additions are necessary, but should be less noticeable than the original material, while at the same time being identifiable;
6. not to be undertaken by conservators/ restorers who are insufficiently trained or experienced, unless they obtain competent advice. However, it must be recognized that some problems are unique and have to be solved from first principles by trial and error basis (p. 6).

Due to the fundamental differences between the conservation of built heritage and the conservation of the arts, a wise application of the principles is called for. Architectural conservation of buildings, and more so of urban heritage areas, involves the site, setting, the people resident therein and the general physical environment (Forsyth, 2007b; Feilden & Jokilehto, 1998; Sarkar, 1996; Feilden, 1994).

These principles should only act as a guide and it is important to keep in mind that 'traditional materials and repair methods are not always the best (Forsyth, 2007, p.7). Therefore, it is sometimes futile to search for authenticity in the use of materials. The blanket refusal to allow change is artificial and damaging to historic areas. Buildings have always adapted to changing needs and situations and the refusal to be flexible may be an excuse for doing nothing (Forsyth, 2007). Forsyth (2007) advocates that conservation work on historic buildings and monuments should only be undertaken if:

1. it is based on accurate and reliable information
2. it uses traditional methods of repair where possible
3. It leads to a historically and emotionally satisfying, honest, appropriate and responsible result. (Forsyth, 2007, p. 32.)

Orbaşli (2008) contends that an overall project philosophy and approach should be determined case by case, notwithstanding other minor decisions regarding individual interventions, material decisions and considerations for integrity and authenticity. These basic principles are enumerated in Table 2.3. The Venice Charter and the Burra Charter are presented in Appendix XV and Appendix XVI respectively.

Table 2.3 Basic Principles of Building Conservation

Basic Principles of Building Conservation	
Understanding	Working with the Evidence- *Article 9, Venice Charter* Understanding Layers-*Article 11, Venice Charter* Setting and Context- *Article 7, Venice Charter*
Implementation	Appropriate Uses-*Article 5, Venice Charter* Material Repairs-*Article 2, Burra Charter* Tradition and Technology-*Article 4, Burra Charter* Legibility-*Article 12, Venice Charter* Patina of Time
Evaluation	New Problems May Require New Approaches Sustainability Interpretation

Source: Adapted from Orbaşli (2008); Roders (2007).

New conservation problems arise everyday, especially with the increase of stock of modern movement buildings under protection 'where the design concepts can at times override material considerations, or where materials have not performed adequately for the purpose' (Orbaşli, 2008, p. 61). Other dilemmas involve buildings whereby the only means of repair is to replace components. Therefore, approaches to conservation cannot be rigid and will have to be determined case-by-case (Forsyth, 2007; Feilden & Jokilehto, 1998).

Regarding sustainability, the reuse of an existing building is a more sustainable approach than complete renewal or replacement with a new building. Orbaşli (2008) upholds the view that 'many traditional building practices were sustainable in that buildings were repaired frequently but with small interventions' (p. 61).

Viňas (2005) citing Staniforth (2000), summarises the principle of sustainability as it applies to conservation thus:

> 'one of the keys of the future, and not just for conservation, is sustainability. The Brundtland definition of sustainable development which is development that meets the needs of the present without compromising the ability of the future generations to meet their own needs is reflected in the aim of the conservation of cultural heritage, which is to pass on maximum significance to future generations (p. 195).

Sustainability in conservation is akin to reversibility and minimum intervention, and has a long-term purposefulness, acknowledging future uses and the users who cannot express their opinions in the present time (Viňas, 2005). Professionals may therefore be called to speak for these future generations and that is why it is necessary for them to be qualified and knowledgeable before undertaking conservation operations (Orbaşli, 2008; Viňas, 2005; Feilden, 1994).

2.3 Continuity and Change in Conservation of the Built Heritage

Lowenthal (1985) has recognised that the *past* does indeed constrain the *present*, and that stability and changes are essential in the built heritage. There are certain elements of life and culture where continuity is an important concern. As argued by Kuban (1978), the quest for cultural continuity and cultural identity requires identifying the necessary linking elements. In architecture, it is assumed that these linking elements are old forms. The creation of mimetic architecture reduces the discussion to the methods of such imitation and erodes the continuation of symbolism (Lowenthal, 1998, 1985; Fitch, 1990). Traditional values embodied in some forms and spatial relationships continue to be cherished and these are the ones that should form the basis for seeking symbolisms in the architecture (Kuban, 1978).

Gottfried has argued that ‘in spite of all the direct precepts of tradition, the son advances in his own way…Aristotle was anxious to distinguish himself from Plato, Epicurus from Zeno…the work of time proceeds to the good of the race by necessary opposition’ (Lowenthal, 1985, p. 69). Furthermore Davis says that ‘when I want to be contemporary, the past keeps pushing in, and when I long for the past…the present cannot be pushed away’ (Lowenthal, 1985, p. 69). The past therefore puts constraints in the present, and this is especially evident in the maxim of minimum intervention (Forsyth, 2007; Sarkar, 1996, 1994) that is often advocated for in conservation. Tradition should not be an enemy of innovation though it does sometimes impede progress.

Conzen (1960) has demonstrated that the past, held in the urban fabric, is transmitted through time and made accessible to the individual through the experience of the sense of place or the *genius loci* (O’Brien, 1997). In his seminal book, *Genius Loci: Towards a Phenomenology of Architecture*, Christian Norberg-Schulz (1980) explains that *genius loci* is a Roman concept, whereby every individual being has its guardian spirit, the *genius*. The ‘genius thus denotes what a thing is or what it wants to be’, to use a word of Louis Kahn’ (p. 18).

Conservation areas are spaces with distinct characteristics, possessing their own *genius loci.* Character on one hand denotes a more general comprehensive atmosphere, and on the other, the concrete form and substance of the space defining elements (Norberg-Schulz, 1980, p. 13-14). Tourism, a common activity in historic areas, proves that the experience of different places is a major human interest. This fuels the concept of identification and orientation, which is well captured in the work of Kevin Lynch, whose concepts of node, path, district, edges and landmarks denote the basic spatial structures of orientation (Lynch, 1960).

The construction of the past has created many aspects of a monumental past, an empty past and a simulated past (O'Brien, 1997). The declaration of monuments and the inclusion in schedules of certain pieces of architecture, be they ruins, creates a monumental past. An empty past occurs when buildings cannot support the original function and may actually get to a monumental status. They may only serve the intentions of picturesque status. Mimetic developments create a simulated past where there is a disjunction between exterior and interior between form and function. However, these developments do not posses patina and only disguise the truth about the past. This thesis argues that in conservation areas, form does not necessarily follow function, as may have been the original intention of the builders. Adaptive reuse, as demonstrated by Orbaşli (2008), ensures continuity and change, clearly challenging the philosophy of 'form follows function' by Sullivan (1896).

2.4 Conservation of the Urban Historic Townscape

In his seminal book, *The Concise Townscape,* of 1961, Gordon Cullen explains townscape as the art of coherent three-dimensional composition, one in which the individual components of any urban landscape-the buildings, spaces and enclosures, the connections and closures, the vistas and views- knit together to form a set of relationships that are at one and the same time harmonious and contrasting, static and changing, and whose combined impact determines the physical sense of place and identity. Papageorgiou (1971) sees townscape as 'the visual and aesthetic aspect of an urban composition' (p. 75). This manmade composition has numerous constituent elements, all of which have specific functions and are the specific land uses (Chapin, 1972). Cullen (1961) appreciates that older towns and cities have been created over time, usually organically, and that they embrace different periods and styles. Rodwell (2007) has showed that an urban environment needs individual personality in the design of buildings.

The townscape when conceived as a spatial composition 'reflects the reality of three-dimensional space' (Papageorgiou, 1971, p. 75). Apart from its visual and spatial meanings, the townscape fulfils a further function as a sphere of human activities. It provides a mirror image of technological facilities, the aesthetic attitudes, and the dominant social structure of every historical period (Papageorgiou, 1971). Cullen (1971) further argues that 'if at the end of it all the city appears dull, uninteresting and soulless, then it is not fulfilling itself and has failed despite the fire having been laid and nobody has put a match to it' (p. 8). The emphasis in this thesis is on the townscape as a sphere of human activities since it both reflects and provides the framework for urban experiences and social activities. This is why 'so many people who live in historic settlements are so attached to their townscape' (Papageorgiou, 1971).

Save for a few isolated historic urban centres, most do not portray morphological homogeneity. Historic townscapes are made up of scores of diverse components, containing architectural styles and spatial conceptions deriving from different epochs. This plurality according to Papageorgiou (1971) does not constitute a discordant factor. As a matter of fact 'the townscape results from the accumulation of different elements which are not only representative of their own particular period, but also contribute to the total living composition in so far as they correspond to the social and creative needs of the later period' (p. 76). Discordant effects are produced, however, if the inherent morphological plurality of the townscape is 'reduced to a state of visual anarchy by the juxtaposition of incompatible products from different epochs or by the downright desecration of the older urban formations as a result of new urban developments' (p. 77).

Townscapes provide multiple publics and therefore:

> 'an integrated approach to urban conservation needs to acknowledge the multiplicity of publics and the often-competing values, ideologies, and interests in an urban context. It also needs to recognize the dynamic process of urban change and see diversity and contestation as an important facet of contemporary urban conditions' (Hou, 2004, pp. 36, 37).

Kaplan and Kaplan (1982a) have shown that diversity is powerful force in nature and that it plays a role in visual preference and that the general trend in our society towards efficiency and productivity has lead to a decline in diversity. Watt (1982) contends that 'a reason for preserving anything, particularly something rare, often turns out to be an argument in disguise for diversity' (p. 161). The rapid loss of diversity in urban historic areas is a serious and pervasive phenomenon where a large number of diverse entities are being replaced by a small number of similar entities. This is because we live in an age and a culture that puts tremendous emphasis on efficiency and productivity as desiderata for mankind (Watt, 1982).

2.4.1 Legibility of Urban Historic Areas

The traditional city, which has not been alienated by globalisation, is easy to read. Moughtin, Cuesta, and Signoretta (1999) opine that legibility is one of the qualities of a traditional city. Lynch (1960) demonstrated that a legible environment is one that is capable of being structured by people into accurate images. Five key features by which the user structures the image are: paths, edges, districts, nodes and landmarks (Lynch, 1960, pp. 46-90). Lynch's framework is a series of criteria to guide and evaluate urban design and leaves others to determine the physical form (Carmona, Heath, Oc & Tiesdell, 2003). These structuring ideas should help the designer to enhance the *genius loci* (Norberg-Schulz, 1980).

The seminal work of Sitte (1901) deals with delight and composition of public space. He loudly criticised above all, the artistic impoverishment of urban space that is, 'the aesthetic repertoire of architectural resources used to shape urban space' (Krier, 1979, p. 64). Cullen (1971) has explained that urban space is appreciated in serial vision as the observer moves around the city.

He categorically states that:

> 'Our original aim is to manipulate the elements of the town so that an impact on the emotions is achieved. A long straight road has little impact because the initial view is soon digested and becomes monotonous. The human mind reacts to a contrast, to the difference between things, and when two pictures (the street and the courtyard) are in mind at the same time, a vivid contrast is felt and the town becomes visible in a deeper sense. It comes alive through the drama of juxtaposition. Unless this happens, the town will slip past us as featureless and inert' (p.9).

In old towns, seldom are long straight roads found, and the paths are memorable. Moughtin, Cuesta and Signoretta (1999) have argued that it is a series of such dramatic pictures as they register on the mind, which makes a pathway memorable. This technique, they further assert 'because of the compositional nature of each view which is chosen for record is, of necessity, picturesque, exaggerating the charming aspects of the study area' (p. 57).

In order to understand a city, a basic visual analysis incorporating figure ground studies, showing the form and anti-form, are recommended in order to highlight weaknesses in the enclosure of public space, points of weak connections and the general characteristics of the spatial connection (Moughtin, Cuesta & Signoretta, 1999; Gibberd, 1955). Space syntax has emerged as a method for quantitative analysis of spatial configuration, and has been celebrated for its scientific precision as applied to morphological studies (Sima and Zhang, 2009). It provides a theory of interpreting the social relations and spatial form through a series of derived maps and unravels the hierarchical level in an area (Sima and Zhang, 2009; Hillier &Hanson, 1984). Generally, in urban historic areas, small-scale spaces are to be found and such spaces are said to be more integrated 'if all other spaces can be reached after traversing a small number of intervening spaces' (Moughtin, Cuesta & Signoretta, 1999, p. 78). The theory however ignores the perceptual dimension of the environment, is highly analytical and eschews normative theories.

Krier (1979) mentions two basic elements that constitute urban space: the street and the square. The square is produced by the grouping of houses around an open space while the street is 'the spread of a settlement once houses have been built on all available space around its central square. The streets we have in most of our old towns are peripatetic and unsuitable for the flow of motorised traffic. Historic towns have an inexhaustible diversity of spatial relationships produced by complex layout of road networks and 'should not engage in boulevard romanticism' (Krier, 1979, p. 19).

Various dimensions of urban design have been explored by Carmona, Heath, Oc, and Tiesdell (2003). These are the morphological dimension, perceptual dimension, social dimension, visual dimension, functional dimension and temporal dimension. The morphological dimension is important in the conservation of historic areas because these areas are principally protected because of their urban form (Moudon, 1997). Similarly, the perceptual dimension is important because it is possible to assess the users' attitudes towards the historic town, and use these attitudes as a basis of conservation.

In the study of urban morphology, Conzen (1960) took land uses, building structures, plot patterns and street patterns to be the most important, and emphasised the difference in stability of these elements. Moughtin, Cuesta & Signoretta (1999), argue that buildings, and particularly the land uses they accommodate, are the most resilient elements. The plot patterns change over time as the plots are subdivided or amalgamated, while the street pattern tends to be the most enduring. The approach developed by Rossi (1982), centres around the idea of architectural types and typology. In contrast to building type, which generally refers to function, the architectural type is morphological and refers to form (Moughtin, Cuesta & Signoretta, 1999). Architectural types are thus abstractions of basic ideas or forms that can be repeated with endless variation.

The historic city is a source of durable morphological types (Carmona, Heath, Oc &Tiesdell, 2003; Gosling & Maitland, 1984; Krier, 1979). These type elements are universal solutions to great simplicity and integrity, arrived over a period by the operation of anonymous forces of selection. The key types include the quarter, the urban block, and more specific types such as streets, avenues, arcades and colonnades (Gosling & Maitland, 1984). Scheer & Scheer (1998) have noted that design guidelines are applied across a wide variety of urban typologies, using very simple premises, without regard to dissimilarities of places. They tend to focus:

> 'on simple transgressions, rather than on working on the principles of good design…The net effect of this is that bland merely acceptable buildings which lack the happy accidents and individual quirks that are part of the environment' (Scheer & Scheer, 1999, p. 153).

As recommended by Sima and Zhang (2009), this study adopts the typo-morphological approach to analysis of an urban historic area since it is more in the domain of architecture, as opposed to the morphological dimension, which is the domain of geography. This thesis contends that the conservation of meanings is the most important as opposed to the conservation of functions. These meanings are to be found in the architectural types. Clearly, in urban Historic areas, function may have to follow form (Section 2.3).

2.5 COMMUNITY PARTICIPATION IN CONSERVATION OF THE BUILT HERITAGE

It has been emphasised that the most crucial factor in the conservation milieu is undoubtedly the attitude of the inhabitants of historic centres to their protection and revival (Papageorgiou, 1971). This therefore means that the success of operations in the protected areas depends largely on the sympathetic understanding and the moral and practical support of the population. A significant shift in planning theory in recent decades concerning the characteristics of the 'public' in contemporary societies has been identified by Hou (2004). The public is not taken as a unified group and acknowledgement of the differences and plurality of the public in terms of values, identities and interests has been made. This shift has important implications for the conservation of historic areas since it challenges the normative doctrines of preservation. Hou (2004), further argues that since the cultural values are diverse, the established preservation practice largely based on the narrow set of values as espoused in the Venice Charter (ICOMOS, 1964) are no longer adequate. Planning for historic areas needs to address diverse sets of views in an increasingly contested and pluralized urban context (Papageorgiou, 1971).

Community participation, in all its different guises, aims to involve the people who will be affected by a development in the decision-making process relating to its implementation and management (Sassi, 2006). Sustainable development at the local level must be implemented in a holistic process which inspires city people, and which gives them a sense of ownership and direct involvement (Girardet, 1999). This process, it is argued, must go beyond the basic consultation or informing to partially or totally hand over control of the project development and management to the local community. Sustainable conservation developed through community participation can therefore help to reduce social inequality and exclusion, and provide a high quality of life to individuals often marginalised from community life (Sassi, 2006).

Day (2003) has developed 'consensus design' as a method of community participation, which involves group in-depth analysis of the site, resulting in proposals through consensus. The important thing therefore is to incorporate the consumer of heritage in the choice process (Peacock & Rizzo, 2008). Jolly (1979), indicates that as state agencies develop and enforce their plans, they must provide for, encourage, and assist public participation. The public should help in shaping decisions and determine policy directions.

The true subjects in time and space are simply not the users or experiencers (sic) of, but produced by, and productive of, the architecture around us (Lefebvre, 1991). Such true subjects are the residents. Importantly, as Certeau (1984) cited in Borden, Kerr, Rendell & Pivaro (2001) argues, 'subjective self knowledge and collective understanding of the community are necessary stores from which the particularities of real cities can be revealed to resist the totalizing concept of the city' (p. 19). Thus, it can be seen that elimination of the unique and irrational must be resisted. For the subjects, the buildings that comprise built up heritage ceases to be objects and become places of epistemological and social negotiation conducted through the figure of the subject (Borden, Kerr, Rendell & Pivaro, 2001).

Successful conservation plans are identified as 'those that consider central historic urban areas as a common good, and mobilize resources and people to improve it all for the concerned' (Agha-Khan Trust for culture, 1996, p.188). This requires involvement at the onset of the planning process, of all the public institutions, constituencies and private groups active in the historic area. For example, in the preparation of the conservation plan for Zanzibar, it was assumed that the opinions of the various government bureaucracies necessarily represented those of the inhabitants. The plan advocated for stronger involvement of public institutions during the implementation phase, failing to recognise that the public may reject the implementation of policies they were barely involved in formulating (Agha-Khan Trust for Culture, 1996).

2.5.1 Conservation and Sustainability of Urban Historic Areas

Rodwell (2007) has explained that conservation and sustainability have been treated as two separate issues, and that there is need to forge new links since they share common ground despite having separate roots. Sassi (2006) cites Brundtland (1987) having defined sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sassi (2006) calls for the involvement of the community in the planning, realisation and upholding of its developments to ensure that changes to the community are in line with its needs, and therefore sustainable.

The historic built environment should be developed to be of human scale and of quality, to include pedestrian-friendly environments and community spaces that encourage human interactions. This will help create communities with a sense of identity and belonging that over time will strengthen a communal memory of place (Phillips, 2003; Tsourou & Barton 2000; Edwards & Turrent, 2000).

The sense of community is an enormously important valuable asset in any human settlement (Kaplan & Kaplan, 1982a). It is an important factor that makes towns good places to live in. Denman (1982) explains the meaning of a sense of community as a 'critical need for human beings living together and sharing even minimum values, goals and expectations of good life' (p. 278). Heavily funded urban programs such as urban renewal have failed to foster a sense of community. More functional communities are destroyed than aided (Denman, 1982). This result in social disorganization manifested as higher crime rates, drug abuse, decreasing respect for school and other institutions, juvenile delinquency and host of other sociably disruptive conditions (Fitch, 1990; Dobby, 1979). This scenario is common place in the Old Town of Mombasa, and now we have to depend on formal law enforcement agencies rather than community pressures to hold these disruptions in check.

According to Rodwell (2007), sustainability exhorts a constructive evolutionary approach, one that prioritises human development on the basis of equity between peoples and generations. It emphasizes diversity and promotes social inclusion. The coincidence between sustainability and conservation is seen in the "3 Rs', that is, reduce, reuse and recycle. The confluence is also evident in catchphrase *stay close to nature* which is underscored by the embracing concept of proximity. Bottom–up solutions to planning also afford a solid foundation in which to secure conservation and sustainability (Rodwell, 2007, p. 196).

2.6 PERCEPTION OF URBAN HISTORIC ENVIRONMENT

Perception is an active process of interaction between the organism and the environment where the organism seeks perceptually environmental homeostasis (Hilgard, 1982). Therefore an environment that has some stable reference points can still be a changing one in a dynamic equilibrium. A percept may be considered to be a 'mental image of the external environment' (Campbell, 1982, p. 25). Just how this mental image comes into existence is not known, but it is clear it is based on two kinds of information, one is the input from the senses, and the other is the memory of the previous experience. The memory content of perceptions is fundamentally important and includes not only an experiential record of events, but also some generalizations about spatial environments (Campbell, 1982).

2.6.1 The Ends of Perception

A fundamental issue in perception is how people *know* the environment. According to Kaplan and Kaplan (1982a), 'some philosophers speak of knowledge in terms of "true suppositions" but the truth is an elusive quality' (p. 54). Furthermore, he explains that most of what we know falls short of the truth in many ways since it is selective and thus incomplete and 'people disagree on matters of emphasis, thus denying the possibility of truth in any ultimate sense' (p. 54). Kaplan and Kaplan (1982a) categorically state that Lynch's discussion of legibility stands as a landmark in the literature relating the experience of the environment to the process of knowing. Lynch (1982) contends that 'moving elements in a city and in particular the people and their activities, are as important as the stationary physical parts'(p. 151) He further argues that our perception of the city is not sustained, but rather partial, fragmentary, mixed with other concerns. Nearly every sense is in operation, and the image is a composite of them all. Cities give special pleasure, and as constructions in space, over long spans of time, are temporal art (Lynch, 1982, 1972, 1960). Conservation areas, being part of cities must give this pleasure '…seen in all lights and all weathers' (Lynch, 1982, p. 151).

In urban historic environments, there are sufficient details to create vision fixation. Filin (1998) explains that a human being deals with similar visual unity in a forest where he feels too good. As such, visual perceptions will be revealed to the viewer episodically and serial vision results (Cullen, 1971). As Filin further (1998) expounds, unpleasant breaks will not be seen, however, some modern constructions usually characterises these unpleasant breaks that do not provide for saccadic automation, which is necessary for the enjoyment of the built environment.

A city is not only an object that is perceived and perhaps enjoyed by many people of diverse classes and character, but it is a product of many builders who are constantly modifying the structure for reasons of their own (Lynch, 1982, 1960). This thesis concurs with his argument that a city can be stable in the general outlines for some time, but it is ever changing in detail and only partial control can be exercised over its growth and form. No final result is possible, only a continuous succession of phases linking up well with the idea of continuously satisficing instead of optimization in conservation (Simon, 1982).

2.6.2 Contrasting Perceptions of the Built Environment

The artistic value inherent in an urban historic area must be allowed to become infectious (Orbaşli, 2008, 2000; Forsyth, 2007; Feilden, 1994; Stolnitz, 1965). The result of conservation efforts should be to unite people through the 'talking neighbourhood' which should be clear and genuine. It must move, infect people aesthetically. Very importantly, it is not the form, but ideas conveyed by the forms that should move the residents aesthetically. The aesthetics of historic areas should be seen as ends in themselves, or at most, ends to emotions. The emotional content must not be lost since '…environments always have a definite aesthetic quality' (Ittelson, 1976, p. 151).

Pocock and Hudson (1978) have suggested that the overall mental image of an urban environment will be: partial, not covering a whole city; simplified, omitting a great deal of information, idiosyncratic; every individual's image being unique; distorted, based on subjective, rather than real distance and direction. Relph (1976) as cited by Carmona, Heath, Oc, and Tiesdell (2003) argue that 'environmental images are not just selective abstractions of an object reality but are intentional interpretations of what is or what is not believed to be' (p. 88). Despite everyone effectively living in their own world, similarities in socialisation, past experience and the present urban environment mean that certain aspects of imagery will be held in common by large groups of people (Knox & Pinch, 2000; Nasar, 2000, 1998; Hershberger, 1988; Knox, 1982).

Kaplan and Kaplan (1982a) have raised the argument that what one knows is a powerful factor in what one sees. They further posit that what the planner knows and what the local resident knows about the same neighbourhood differ substantially, an idea also supported by the work of Hershberger in his 'A study of Meaning in Architecture' (1988), where he has documented several important differences in meanings attributed to buildings by architects and laypersons. Central to the research was the 'development of an instrument for assessing architectural meaning' (Nasar, 1988, p. 173). This differing knowledge of the same neighbourhood will necessarily cause divergent perceptions. When the planners' perceptions are translated unchecked, into policy, the local residents are unlikely to perceive either an improvement in their chosen neighborhood or a gain in their capacity to control their lives (Hershberger, 1988; Kaplan & Kaplan, 1982(a); Jacobs, 1982).

Michelson (1968) is cited by Bechtel (1997) as having discovered ‘that the average person tended not to like modern architecture for the very reason architects praised it: its simplicity’ (p. 139). He further observed that when given a choice between a decorated house and a simple one, most people chose a fancier one. Michelson noticed that people seem to prefer cluttered over unadorned environments. The explanation for this had already been supplied by Berlyne in 1963 by demonstrating that most people would choose complexity over simplicity (Bechtel, 1997). This is important for conservation of historic areas, because the homogenizing impact of modernistic developments tend to erode complexity.

Osgood, Suci and Tannenbaum (1954) in their seminal book, *The Measurement of Meaning,* argue that aesthetics can be studied as a form of communication. The ‘semantic differential taps the connotative aspects of meaning more immediately than the highly diversified denotative aspects that it should be readily applicable to aesthetic studies’ (p.290). In a study of urban environments, Herzog’s study of 1989 as cited in Bechtel (1997) where 354 subjects were exposed to 70 colour slides of urban environments and factor analyzed, the results yielded factors called: older buildings, concealed foreground, tended nature, and contemporary buildings. It is reported that tended nature was by far the most preferred. Using regression analysis, three variables were found to be predictors of the results: coherence, mystery, and nature. These results were further interpreted as supporting Kaplan’s information model of 1982 (Bechtel, 1997). Other studies cited by Bechtel (1997) supporting such a theory are by Orians (1980, 1986), Kaplan (1987) and Ulrich (1983).

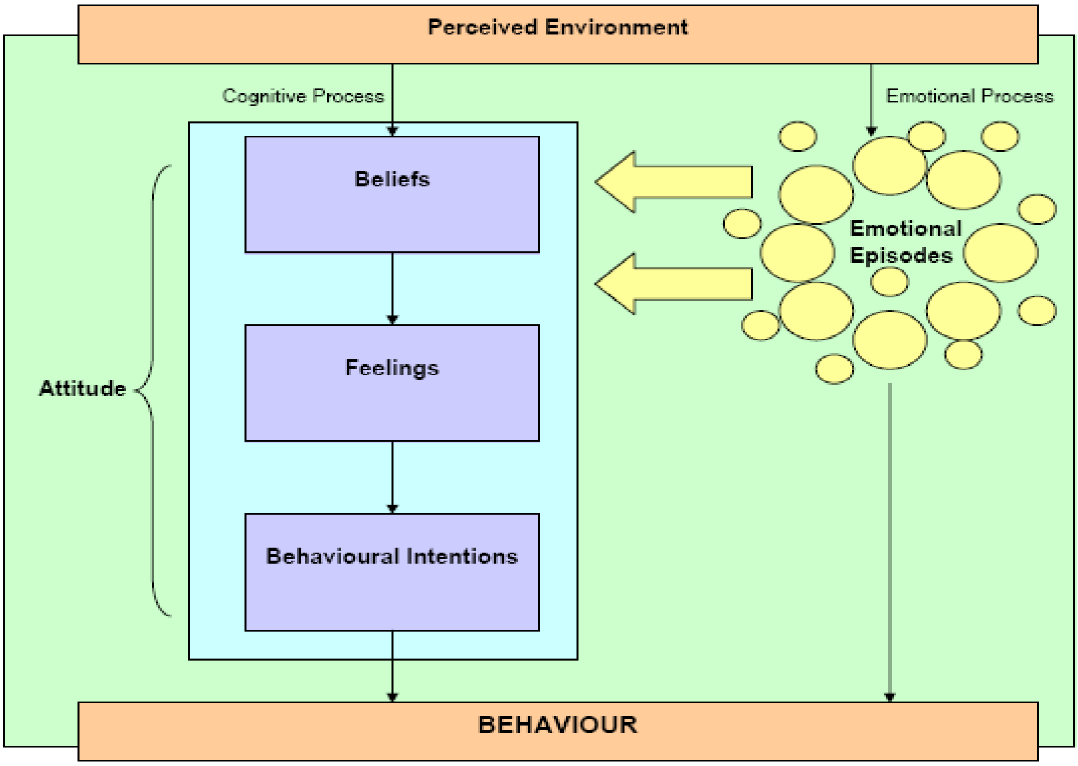
2.6.3 Values, Beliefs and Attitudes about the Environment

McShane and Von Glinow (2007) opine that emotions influence thoughts and behaviour and to explain this effect, knowledge about attitudes is necessary. They observe that ‘attitudes represent a cluster of beliefs, assessed feelings, and behavioral intentions towards a person, an object, or an event which is called an attitude object' (McShane & Von Glinow, 2007, p. 68). Attitudes are therefore judgements, whereas emotions are experiences. The importance of knowing attitudes towards the historic environment is because the attendant behaviour towards the built environment can be inferred, since attitudes are stable over time, as opposed to emotions which are experienced briefly.

According to McShane and Von Glinow (2007) attitudes comprise three components: beliefs, feelings, and behavioural intentions (Figure 2.1). Briefly, beliefs are established perceptions about an attitude object that is, what is believed to be true. Beliefs are perceived facts that are acquired from past experience and other forms of learning. Feelings represent positive or negative evaluations of attitude object. Like or dislike can assess feelings towards an attitude object. Behavioral intentions represent the motivation to engage in a particular behaviour with respect to the attitude object (McShane & Von Glinow, 2007, p. 68).

Traditional attitude theory assumed that feelings were calculated from beliefs about the characteristics of the object, person, event under consideration and these feelings influenced behavioral intentions (McShane & Von Glinow, 2007). Neural science research has enriched this view, as shown in Figure 2.1, that incoming information is routed to the emotional centre as well as the cognitive or logical reasoning centre of the brain. The emotional side of attitudes begins with the dynamics of the perceptual process, particularly perceptual interpretation. These are not calculated feelings but automatic and unconscious emotional responses. Figure 2.1 further shows that a tug of war can exist between logical analysis and emotional reaction but research has shown that the best decisions are made when a situation is logically evaluated (McShane & Von Glinow, 2007; Nutt, 2005). Emotions and attitudes usually lead to behaviour, but the opposite sometimes happens through the process of cognitive dissonance (McShane & Von Glinow, 2007; Cooper, 2000; Galinsky, Stone & Cooper, 2000; Festinger, 1957).

Figure 2.1
Model of Emotions Attitudes, and Behaviour



Source: Adapted from McShane & Von Glinow (2007).

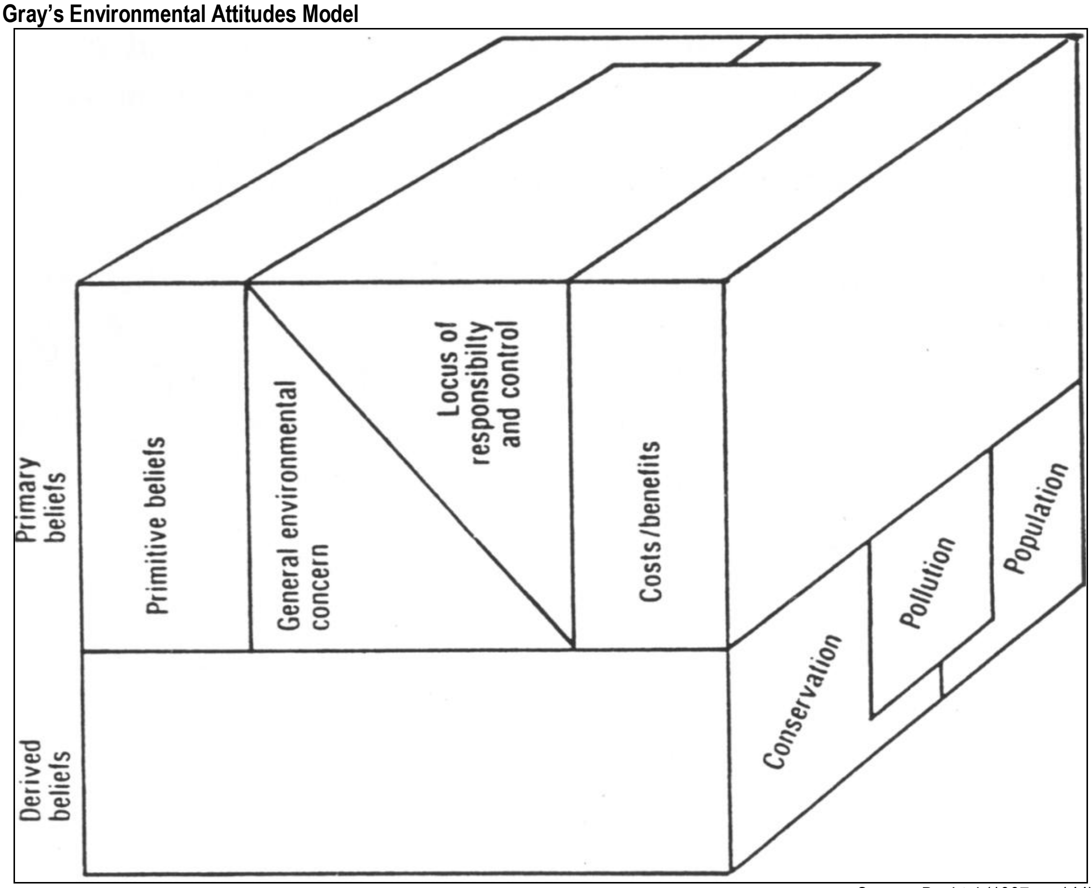
Bechtel (1997) citing Schwartz and Sagiv (1995) takes values to be ‘transsituational goals (terminal and instrumental) that express interests (individual, collective or both) concerned with a motivational type and they are evaluated according to their importance as guiding principles in a person’s life’ (p.108). Values are continuous across situations and are not stuck in one circumstance and they thus portray situation of continuity and change. Using factor analysis, Schwartz (1994) as explained by Bechtel (1997) found that values are concerned with a motivational type containing ten elements: hedonism, achievement, power, self-direction, stimulation, universalism, benevolence, security, conformity, and tradition (p. 109).

These underlying factors are important in conservation. As expounded in the study cited above, hedonism is concerned with pleasure in a healthy way, achievement relates to personal success while power refers to social status and prestige. Self-direction refers to being independent; stimulation refers to novelty and universalism to protection of the welfare of the community. Security is the concern with safety, while conformity is the restraint of actions. Tradition is respect for customs and norms (Bechtel, 1997, p. 109). The above factors are important for a wholesome community encompassing conformity and tradition. Forced endurance is avoided and Toffler's (1970) *Future Shock is* mediated.

Bechtel (1997) has elucidated a model proposed by Gray (1985) for attitudes towards the environment (Figure 2.2). The elements of Gray's model include the following:-*General environmental concern:* This is the pressing need for humanity to act in concert; *Primitive beliefs:* these include the belief that humanity is above and apart from nature, and the interdependency of all life is rejected. Another is the belief in progress and growth. Bigger is always better. Whatever happens, science will create a technology to solve any problem (the technological fix); *Costs/ benefits:* this includes both long term and short term aspects of the magnitude of any personal or societal threat; *Locus of responsibility and control:* what difference can one individual make, and are there areas where, a person can have an influence as opposed to others? (pp. 113-114).

Grays systematic indicate a dichotomy between primary beliefs and derived beliefs. Primary beliefs are basic to a person and essentially self evident to the person. Derived beliefs on the other hand are identifiably related to other beliefs. The primary beliefs and derived beliefs all compete for dominance in different contexts (Liljedahl, 2009).

Figure 2.2
Gray's Environmental Attitudes Model



Source: Bechtel (1997, p. 144).

Bearing in the mind the above, conservation, pollution, and population are seen as derived beliefs (Bechtel, 1997, p.114). Conservation denotes all attempts at reaching harmony with nature; pollution, the intrusion of synthetic substances into nature, and population refers to the finite capacity of the earth. Gray, Eckles and Fuehrer (1982) are reported by Bechtel (1997) to have twice tested the model.

Various personal dispositions towards the environment abound. Studies carried out by McKechnie in 1974 and 1978, cited in Bechtel (1997) reveal the various dispositions towards the environment. *Pastoralism* is opposition to development, concern about population, growth, and preservation of natural resources while *Urbanism* prizes high-density living, the variety of cultural and interpersonal experiences in the city. *Environmental adaptation* sees the environment to be modified to suit one's own needs, with opposition to government control, and the use of technology to solve environmental problems. *Environmental trust* denotes being responsive and open to the environment, feeling competent in it, as opposed to seeing the environment as fearful and unsafe. *Antiquarian* denotes enjoyment of old things, history, and a tendency to collect historical artifacts. *Need for privacy* is the need for physical isolation, enjoyment of solitude while *mechanical orientation* is enjoyment of working with hands, liking mechanical things, an interest in technology. *Communality* is a validity scale recording attention to test taking and responding in a modal fashion (Bechtel (1997, pp. 114-115). In the conservation of architectural heritage, pastoralism as an approach should be eschewed because it represses continuity and change. The antiquarian approach should also suffer a similar fate.

Belief systems arise as a response to environmental and social conditions. People do not hold attitudes, values, and beliefs as separate items; they are organized into belief systems that can be as large as whole culture or as small as a cluster of attitudes (Bechtel, 1997, p.121). They are many types of belief systems for example, the identity systems of Spicer (1971), held out by a group of humans who want to be seen as 'people'. A scientific way of doing things is advocated for by Kuhn (1970) and is one of the qualities of many belief systems that are considered more important to uphold than human life (Bechtel, 1997, p. 123). In historic areas where older cultures abound, we can safely say that belief systems are preserved as traditions. An offence to these traditions through the interruption of the visual order will therefore create a negative reaction by the majority of the non offending population.

Succinctly, values, attitudes, beliefs and belief systems are ways we have of organizing our knowledge of, and responses towards the environment around us. As shown by Bechtel

(1997) regardless of values, religious beliefs, or cultures, human abuse of the environment has been universal. The view that human beings are outside nature has to be replaced by an environmentally friendly paradigm that encourages sustainability of the environment. This idea is borrowed into the conservation milieu, in order to avert the tragedy of the commons (Machan, 2001; Nasar, 1998; Hardin, 1968).

2.7 Theoretical Framework

2.7.1 Introduction

The ends of planning and of protecting the built heritage should not be antagonistic activities. There is a need to reconcile the goals of producing a desirable future, which is inherent in planning activities, and the goals of conservation, which can be stated simply as *continuity* and *change*. The desirable future can actually be contained in the change. This study considers historic areas to be heritage items and therefore *commons* within the meaning of 'the Tragedy of the Commons'. For a historic area to be sustainable, it must be considered a system within the larger citywide planning system. The various subsystems inherent in the historic areas must also be sustainable. The perceptual dimension in urban design and planning is emphasised in this study because it has not been previously applied as a basis to guide conservation activity. The study is further grounded in the tenets of contemporary theory of conservation.

2.7.2 Aesthetic Quality of Historic Areas

The integration of aesthetic response to the environment has a long history in research (Chon & Shafer, 2009; Chon, 2004). The Landscape Preference Matrix (Kaplan & Kaplan, 1989) and the Prospect-Refuge theory (Appleton, 1975) are identified by Chon and Shafer (2009) as some frameworks which have been used to understand how environments affect people and their behaviour. Kaplan's approach is based on the human need to understand and explore the reason for gathering spatial information and simultaneously evaluating a place. Appleton's theory, simply put, is based on the idea that humans prefer places where they can see (have prospect) while being out of sight (have refuge).

Chon and Shafer (2009) cites Nasar (1997) having described aesthetic quality as an evaluative aesthetic experience in relation to the environment. This quality has been identified as having three components: a cognitive evaluation, an affective response and changes in behaviour. Russell and Snodgrass (1989) argue that the cognitive evaluation is an objective assessment of attributes, which leads to a better understanding of a place, while affective response is an emotional reaction to a place represented by a resulting internal state such as pleasure or arousal. Nasar (1998, 1997) is of the opinion that aesthetic response can be seen as having a probabilistic relationship to physical attributes in the environment, the probabilities stemming from the ongoing interaction experience of people with their surroundings.

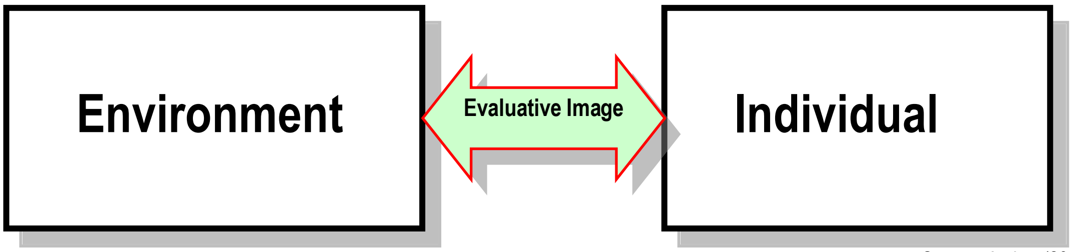
The perception of the aesthetic quality of the physical environment in a historic area is a psychological construct 'which involves an assessment of the environment and of people's feelings about the environment' (Chon & Shafer, 2009, p. 85). Nasar (1988b) has placed the measures of an environmental aesthetic into two categories: perceptual-cognitive responses and emotional-affective responses. The perceptual-cognitive responses refer to the identification and understanding of factors that contribute to the understanding of an environmental attribute. These deal with relative naturalness, coherence or complexity of a scene. On the other hand, affective responses represent emotional reactions to a scene e.g. pleasantness, exciting or fearful. Chon and Shafer (2009) point out that these affective responses are related to cognitive evaluations.

Both Lynch (1960) and Nasar (2000, 1998), have emphasised the importance of environmental elements that influence a city's image and community appearance. Lynch recognised the importance of meaning and evaluation, but his research emphasised identity and structure. Nasar argued that knowledge about imageability alone was not sufficient for shaping a city's appearance since people have feelings and associations about their surroundings and the imageable elements. These feelings and meanings are crucial to people's perception of, and reaction to, the environment. Furthermore, as imageability helps people orient themselves within a city, the evaluative responses affect people's decisions about how to behave (Chon and Shafer, 2009).

Borrowing from Nasar (2000, 1998, 1997), this thesis considers the shared perception of a historic area and focuses on the *evaluative image* or *likability*. This is because the conservation of historic areas should be primarily in the hands of the custodians of the culture that produce it and the heritage and the community image is relevant in the continuity and change of such an area (Papageorgiou, 1971). As shown by Chon and Shafer (2009), where people have capacity to act, connotative meanings affect behaviour, influencing decisions about whether to go somewhere and how to get there (Nasar, 1998). By studying how likable a place is, planners and community leaders can derive valuable information about how to improve the form and function of the facilities that make up these places (Chon & Shafer, 2009; Al-Kodmany, 2001). This study applies Nasar's ideas to conservation of a historic area and builds on the methodology for conservation. Specifically measures of evaluative response are applied to various distinct districts in the conserved area of the Old Town of Mombasa.

As show in Figure 2.3, an individual's evaluative image arises from the person, the environment and the ongoing interaction between the two. It may vary with biology, personality, socio-cultural experience, goals, expectations, internal and external factors. The environment also has many attributes. Nasar (2000, 1998) has shown that the evaluative image of the city will certainly vary across observers. This assumption leads to no meaningful analysis. He recommends bringing order to experiences that appear varied by finding agreement or universal principles. A number of studies cited by Nasar (2000, p. 123) have confirmed strong consensus on evaluations of environments including similarities in response across cultures for example, Hull and Revell (1989); Ulrich (1993); Canter (1969); Hershberger (1969); Hesselgren (1975); Kasmar, Griffin & Mauritzen (1968); Kaplan & Kaplan (1989); Nasar (1988).

Figure 2.3
Interaction between Environment and the Individual



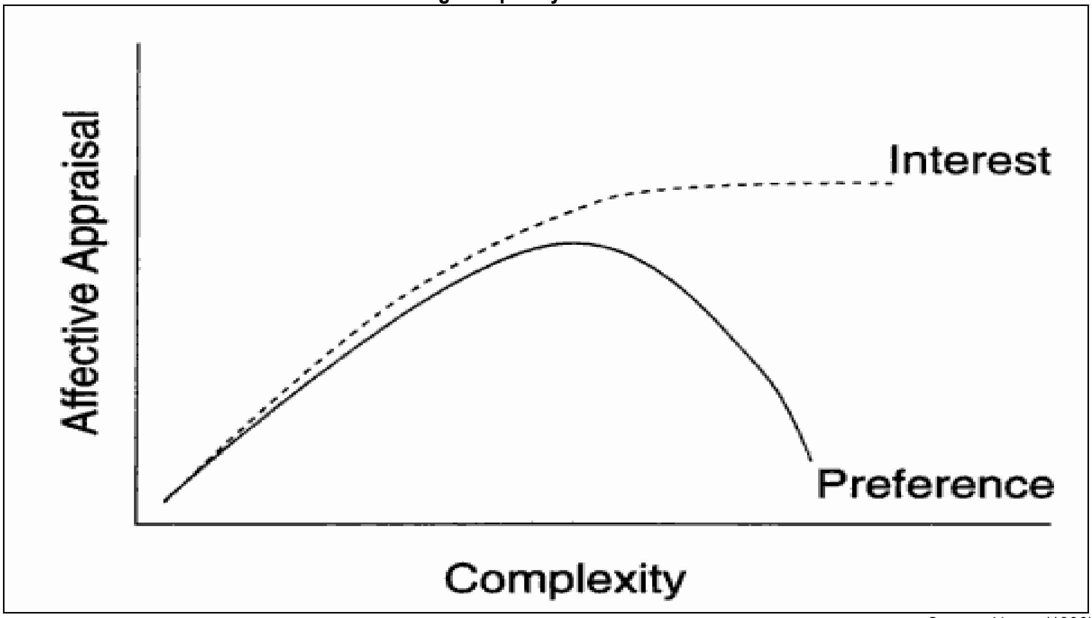
Source: Author (2010).

Nasar (2000) observes that 'research on environmental evaluation often takes a stimulus-response form, suggesting an environmental determinism, but evaluative responses conform to the interactional perspective' (p. 124). This means that the physical environment does not determine behaviour, but that behaviour is not independent of the physical environment. The ongoing interactions between the individual and environment have a probabilistic relationship to one another (Nasar, 2000, 1998). Individuals and groups may have certain idiosyncratic patterns of evaluation. Conservation of historic urban areas can be based on this two-way process of individual-environment interaction by shaping the observer or the physical environment. Importantly, changes in the physical environment can have more direct, widespread and lasting effects. Nasar (2000) citing Shirvani (1985) explains that by shaping the physical and spatial form of our cities we can influence the experience of many people. Therefore, conservation areas must be shaped appropriately so that the result is aesthetic and enjoyable (Forsyth, 2007; Feilden, 1994; Stolnitz, 1965).

Nasar (2000, 1998) has identified order, moderate complexity, naturalness, upkeep, openness and historical significance as environmental attributes relating to preference. Liked areas, he further argues, tend to have these attributes whereas disliked areas have their opposites, that is: disorder, low or high complexity, obtrusive man-made uses, dilapidation, restriction, and the absence of historic significance. Clearly, openness and naturalness lack in most historical cities due to the nature of their incremental development over long periods of time. It is necessary to search for environmental attributes that validly relate to such historic areas.

Complexity and related variables such as visual richness, ornamentation, information rate, diversity and variety have consistently appeared as a prominent aspect of response to surroundings (Nasar, 1998, 1988). Complexity is shown to involve different noticeable elements, and the distinctiveness between those elements. Figure 2.4 shows the expected pattern of response to complexity. In theory, interest should increase with complexity while preference should increase with complexity up to a point, after which preference decreases (Nasar, 1998).

Figure 2.4
Interest and Preference in Relation to Increasing Complexity



Source: Nasar (1998)

2.7.2.1 Likability

Nasar (1998) examined the visual quality of American cities by considering the shared public image of the city and its parts. He focused on the evaluative image or likability of the cityscape. A highly imageable city helps residents and visitors to better spatially orient themselves, to navigate the city and find their way (Chon & Shafer, 2009; Chon, 2004; Al-Kodmany, 2001), thus enhancing the enjoyment of the city (Chon, 2004; Lynch, 1960). Nasar (1998) extended the work of Lynch and argued that knowledge about identity and structure (imageability) is not enough. Lynch (1960) agrees that legibility may be necessary but is not sufficient for a likable environment. Because people have feelings and associations about their surroundings, both negative and positive, these feelings and meanings are crucial to people's perception of, and reaction to, the environment (Chon, 2004; Nasar, 1998).

Nasar therefore focussed on connotative meanings, or what he called *likability*. These meanings help us to make inferences 'such as guessing the quality of goods or the friendliness of the merchants in a commercial strip' (Nasar, 1998, p. 7). The emphasis on connotative meanings was deemed necessary because of their relevance in shaping urban form and their importance to behaviour. This study applies the concept of likability to historic areas, since where people have capacity to act, 'connotative meanings affect their behaviour, influencing decisions about whether to go somewhere and how to get there' (Nasar, 1998, p. 7). Evaluative response may also influence the choice of neighbourhood, place to shop, places of recreation, and travel routes. Given a real choice people would rather go to attractive places and avoid unattractive ones (Chon, 2004; Nasar, 2000; 1998).

2.7.3 Tragedy of the Commons

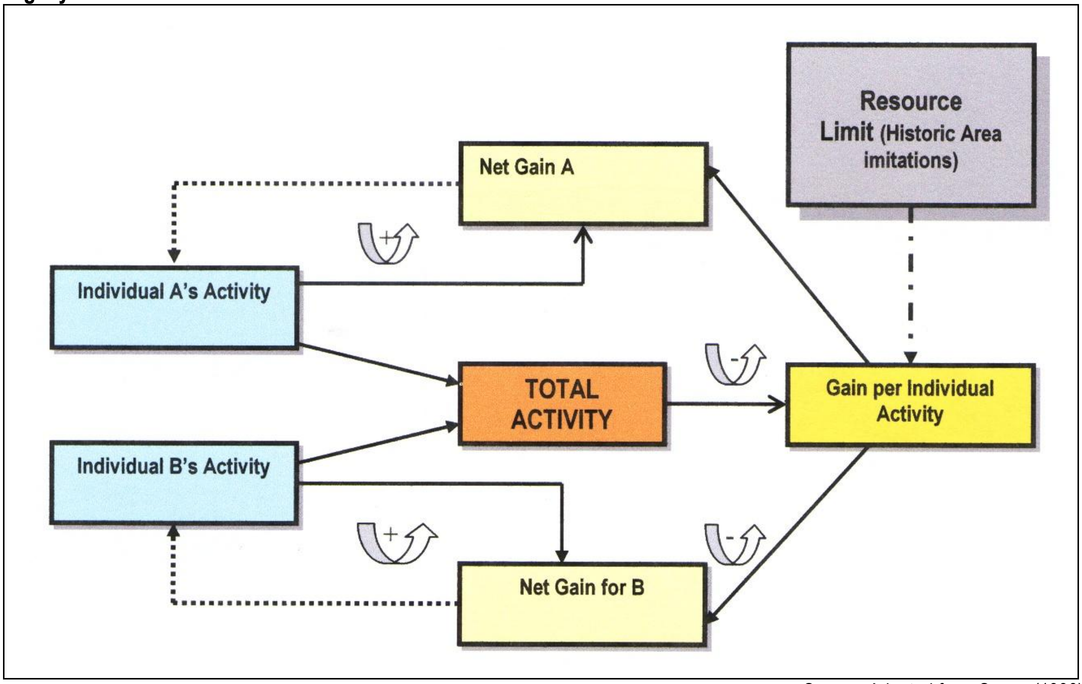
In a seminal paper, Garrett Hardin argued in 1968 that users of a commons are caught in an inevitable process that leads to the destruction of the resources on which they depend (Ostrom, Burger, Field, Norgaard & Policansky, 1999). The rational user of the Commons, Hardin argued, makes demand on a resource until the expected benefits of his or her actions equal the expected costs (Hardin, 1968). On account of each user ignoring the cost imposed on others, individual decisions cumulate to tragic overuse and potential destruction of an open access commons (Machan, 2001).

Nasar (1998) maintains that 'although cultural rules shapes our landscape, the aggregate outcome of individual decisions may yield a disagreeable community character for millions of commuters, shoppers, visitors and others who experience the city landscape' (p. 2). He argues that 'community appearance may suffer from a form of Tragedy of the Commons, where what appears good to each individual becomes harmful to the community. Alone each new building, sign or element may appear desirable and harmless, but the aggregate looks ugly and disturbing' (Nasar, 1998, p. 2). City form continually changes and therefore needs to be guided for a harmonious effect. It is the position of this thesis that the problem of urban historic areas and their continued erosion 'falls into the *no technical solution* problems and require a change in human values or ideas of morality' (Hardin, 1968, p. 1243).

A heritage area is a common pool resource, which is a product of civilization. When the resource users interact without the benefit of effective rules limiting access and defining rights and duties, substantial free riding in two forms is likely: overuse without concern for the negative effects on others, and a lack of contributed resources for maintaining and improving the common pool resource itself (Ostrom, Burger, Field, Norgaard & Policansky, 1999). Hardin (1968) eloquently argues that 'ruin is destination toward which all men rush, each pursuing his own interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all (p. 1244). Importantly, Hardin has illustrated the critical flaw of freedom in the commons: all participants must agree to conserve the commons, but any one can force the destruction of the commons. Thus, as long as we are free to exploit the commons, we are locked into a paradoxical struggle against ourselves—a terrible struggle that must end in universal ruin.

Borrowing this theory from biology, the Tragedy of the Commons is made to reappear in the historic area as both subtraction and addition into the commons. The addition of un-contextual developments into historic areas has the net effect of decreasing the aesthetics of the whole area (Nasar, 2000, 1998). In a reverse way, the tragedy of commons reappears in the problem of aesthetic pollution (Hardin, 1968) where it is a question of putting something in the commons as opposed to taking out. Residents wishing to cash in on increased population and increased number of tourists will be tempted to put up out of scale buildings in addition to distracting and unpleasant advertising signs into the line of sight. The commons will attract the increased demand for accommodation yet it is the individual developer who benefits from his increased supply (Figure 2.5).

Figure 2.5
Tragedy of the Commons



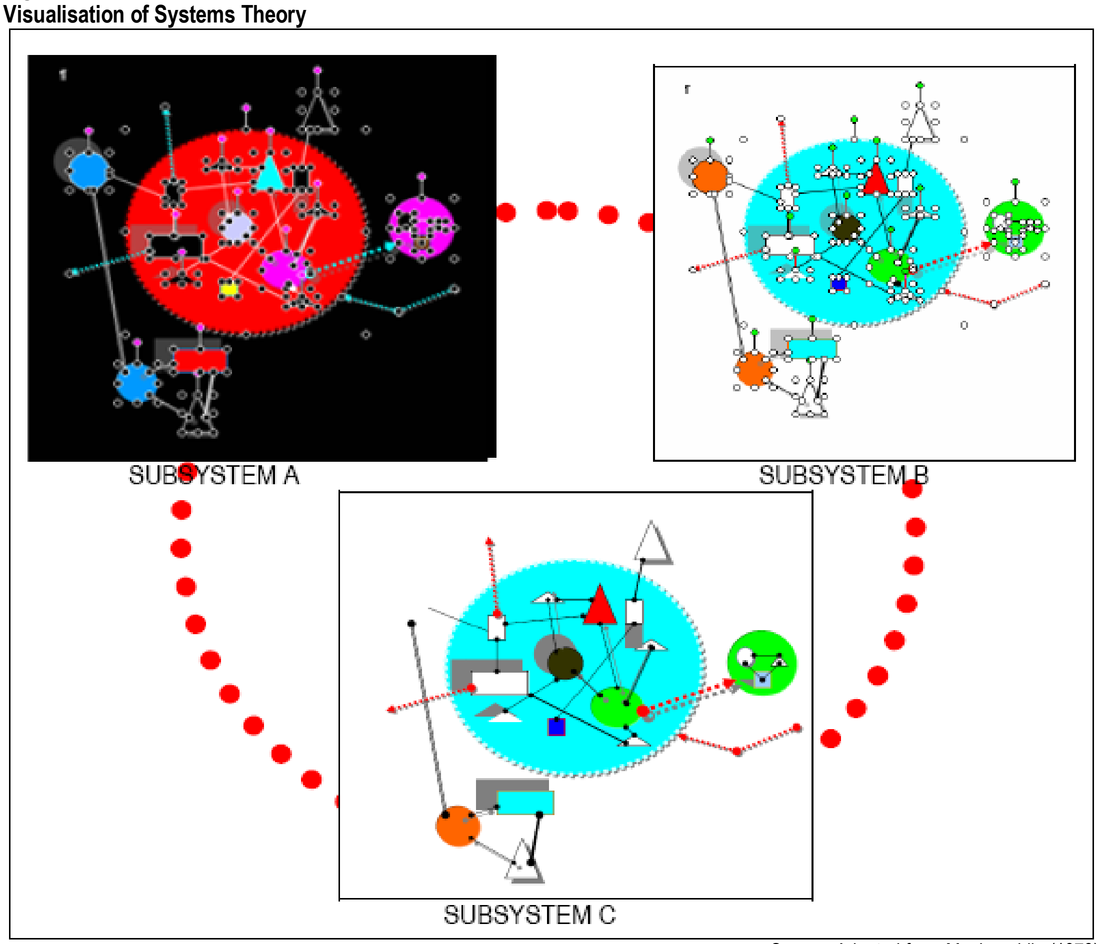
Source: Adapted from Senge (1990).

Hardin's proposed solution was either socialism or the privatization of free enterprise (Ostrom, Burger, Field, Norgaard & Policansky, 1999; Hardin, 1968). To avert a tragedy, a balance between self interest and common interest must be sought. This is because lack of contextual development is largely caused by self interest and this will affect many members of the community especially if they all decided to act in self interest. An urban system, like an eco-system, should tend towards self regulation, even in matters of aesthetics, so that individual ambitions are rewarded while retaining the desirable character of the historic towns.

2.7.4 Systems Approach to Conservation of the Built Heritage

MacLoughlin (1973) explains a system as a 'complex whole, a set of interconnected things or parts, an organized body of material or immaterial things and as group of objects related or interacting so as to form a unity' (p. 75). As a technical and general academic area of study, it predominantly refers to the science of systems that resulted from Bertalanffy's (1968) General System Theory (GST), among others, in initiating what became a project of systems research and practice. A system may be visualised as shown in Figure 2.6. It can be observed that a system is really a set of interconnected parts but each part may be seen as a system in itself and the whole system may be .2regarded as but one part of a larger system *ad infinitum* (MacLoughlin, 1973; Chapin, 1972). A system is therefore a part of a reality that can be seen as a separate unit. The system and the surround influence each other Conservation presents a complex reality.

Figure 2.6
Visualisation of Systems Theory

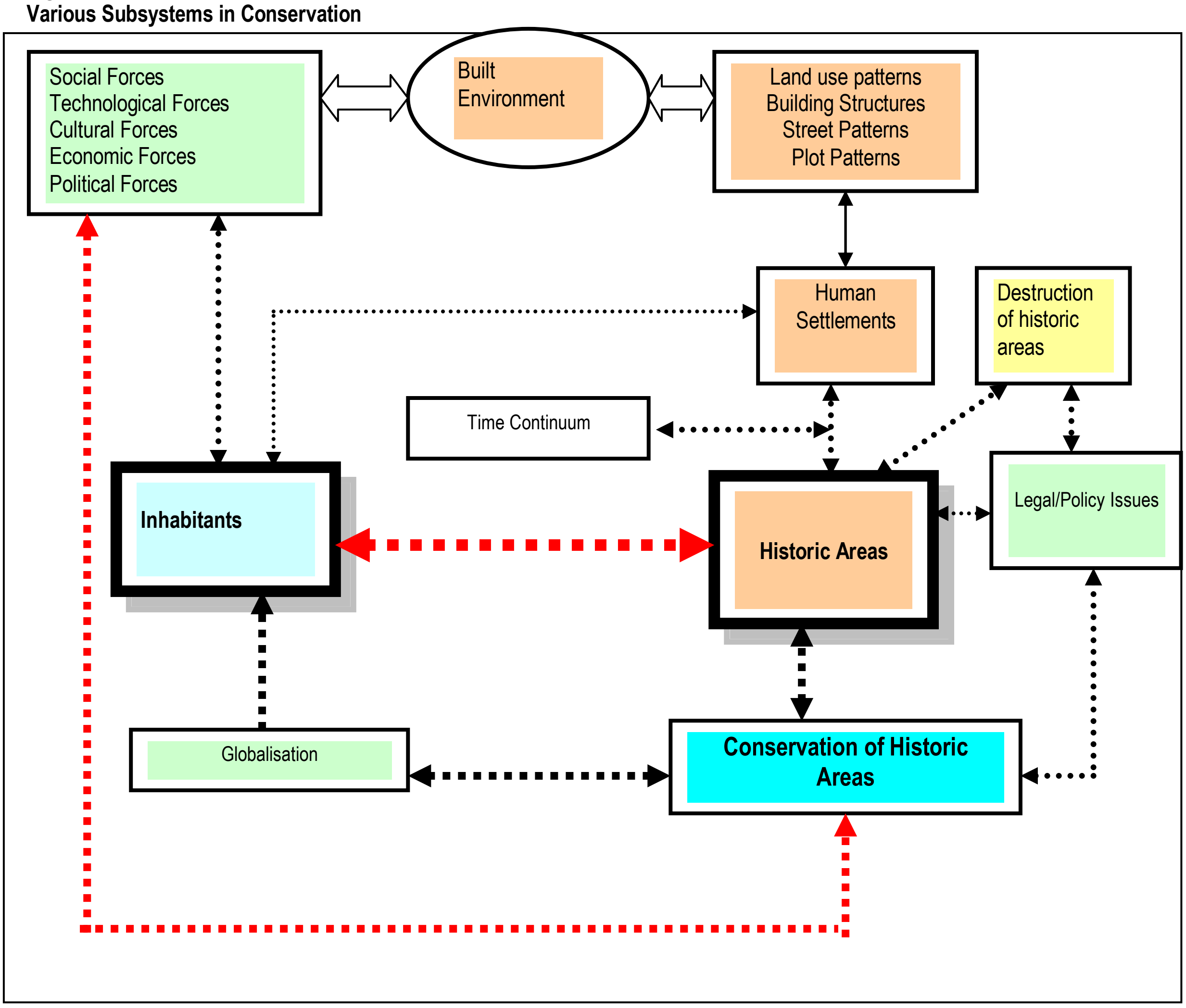


Source: Adapted from MacLoughlin (1973)

For the purposes of conservation of urban historic areas, the chosen system is defined as a matrix of regional and local interrelations comprising the land uses, which are the persistent activities taking place on land, and their connections. The physical manifestation of our system may be represented by the images of the city as conveniently classified into five types of elements that is: paths, edges, districts, nodes, and landmarks (Lynch, 1960, p.46).

In advocating for a systems approach to conservation, it is noted that a historic area, just like a city is not confined to the spatial scale of the building or to the city itself, but encompasses the whole multiscalar landscape produced by human activity (Borden, Kerr, Rendell & Pivaro, 2001; Lefebvre, 1991). In the conservation of historic areas, the inhabitants are given primacy because they are the custodians of the built environment subsystem (Figure 2.7).

Figure 2.7
Various Subsystems in Conservation



Source: Author (2010)

Figure 2.7 shows a conceptualisation of the systemic relationships in the conservation milieu. The social, technological, cultural, economic and political forces lead to development, which is spatially evident in land use patterns defining a human settlement. With the passage of time, in a continuum, the settlements gain a distinct character and an identity thereby acquiring values and meanings. Such settlements become historic due to their rich heritage and inherent values. These historic areas are living tissues with inhabitants and it is therefore necessary to conserve them. The historic areas are not immune to the forces of globalisation, which tend to cause obsolescence and homogenisation, a major threat to a historic urban area, which is a global commons (ICOMOS, 1964). Conservation of urban historic areas must also be within relevant social, technological, cultural, economic and political frameworks that are sympathetic to the existing historic setting so that discordant land use patterns and structures are not procured.

Kaplan and Kaplan (1982a) show that a system with more diversity is more stable. The diversity in urban historic areas is always in a process of flux. The temporary states we see in historic areas are their essence, and stable at the same time since the only constant thing is change. The system therefore must be manipulated such that its essence is not lost in the long term. This is because conservation induces a value beyond shelter, a moral force. According to Rossi (1982), one of the characteristics of a city is its diversity and differentiation, the totality and beauty in a city being made up of numerous different moments of formation and the unity of these formations is the urban unity as a whole. Homeostasis in the conservation system would lead to systemic stability.

2.7.4.1 The Law of Interdependence

This thesis is also anchored in the Law of Interdependence borrowed from ecology. According to Lovelock (1978) as cited by Bechtel, (1997, p.118) 'the entire biosphere is interrelated in ways that we do not yet know about. This situation is likewise played out in an urban historic area where one element depends on another and the injury of the element will of necessity have an impact on the whole system. The measurement of attitudes in historic urban area leads to a better understanding of the general system that encompass the field of conservation of the built heritage. The approach acknowledges the environment as a constant which is also captured in a different form in the Gaia hypothesis (Lovelock, 2000, 1995), albeit representing a literal form of the interdependence rule (Bechtel, 1987).

If every thing is interdependent, then, as Bechtel (1997) shows, everything that exists has a place in the scheme of things. A principle borrowed from evolution is that diversity seems to be the prominent way of nature. This law is applicable in urban historic areas, which because of their long duration during growth; display a lot of spatial diversity (Papageorgiou, 1971).

2.7.4.2 The Law of Limitation and Irreversibility

When the environment is damaged, it may not always be true that it cannot be repaired, 'but it must be clear that some things cannot be replaced and in our ignorance we must act as if all things are irreparable' (Bechtel, 1997, p.119). The built heritage is in a continuum from the past through the present and into the future, therefore actions undertaken today on the built environment will affect the future and are affected by the past. The deterministic approach to conservation of urban historic areas is therefore important for posterity. However, the conservation of built heritage tends to be premised on patterns of urban forms and prescribes particular forms (Carmona, Heath, Oc, and Tiesdell, 2003). This environmental determinism is questionable since their suitability in future is unknown. Therefore, the conservation of meanings is what this thesis advocates for, since the meanings once lost may be irretrievable.

2.7.5 Contemporary Theory of Conservation: Sustainable Conservation

Contemporary theory of conservation as developed by Viñas (2005) centres on the current democratic narratives and resorts to a contemporary conceptual tool: sustainability. The principle of sustainability introduces the concept of future users (Sassi, 2006; Brundtland, 1987) and the object under conservation becomes a source of meanings that can then be interpreted at different levels (Viñas, 2005). The principle of sustainability thus becomes a caveat for conservators, decision makers and users. Viñas argues that reversibility is an impossible goal, as opposed to minimum intervention and this is clearly in line with the *Law of Limitation and Irreversibility* (Bechtel, 1997). To him, conservation should aim at minimum intervention and maximum benefit, keeping in mind sustainability and adaptability.

Viñas (2005) builds on the traditional applications regarding the economic and ecological notion of sustainability, showing that contemporary theory argues for the importance of applying the concept to the significance of the object from one generation to another (Hidaka, 2008). In the process, the notion of negotiation, exemplified through community participation, in conservation is to be considered seriously because future users cannot complain or express their opinions. Professionals should exercise maximum caution in their activities since it is they who speak for future users (Peacock & Rizzo, 2008; Hidaka, 2008; Sassi, 2006; Viñas, 2005; Hou, 2004; Girardet, 1999; Papageorgiou, 1971).

Viñas (2005) asserts that contemporary theory of conservation is to be set against the classical theories known to the community of restoration specialists. He recognizes that this contemporary theory is articulated by diverse and as often fragmented sources that go beyond the universe of restoration (Hidaka, 2008). It is important to note that *contemporary* means those ideas about conservation that were developed since the 1980s especially with the polishing up of the Burra Charter (ICOMOS, 1999), as well as the critical appraisal of the principle of reversibility (Viñas, 2005). Conservation theory here has more relationship to conservation ethics although both are not synonymous. Importantly, as noted by Hillier (2007), the usage of the term theory denotes the generic principles underlying an approach to design. A universal application would render the built environment 'same and unchanging and therefore ultimately dull' (Hillier, 2007. p. 41).

Viñas (2005) presents the arguments on the shift in the conservation viewpoint: from objects to subjects. Conservation starts to be understood in a permanent relationship between objects and subjects, whether affected or involved. Contemporary theory of conservation acknowledges that truth is not the final goal of conservation and that 'truth is only desirable when stakeholders desire it, not necessarily because it is a moral imperative' (Viñas, 2005, p. 192). In addition to that, an argument against the truthfulness of heritage avers that believing in the existence of an object's true nature leads to the false assumption that a state of falsehood could exist, but in practice, objects do not exist in a state of falsehood, nor can they have a false nature. If they really exist, they are inherently real. Conservation may change an object to a different, preferred or desired state, but even then it, will not be more real than before (Pereira, 2007; Viñas, 2000).

Hidaka (2008) argues that the theory is not a radical relativism, but is rather about observing the importance of inter-subjectivity in the conservation process. Objects change into being capable of conservation interest due to their relevance to a considerable number of people within a community and among communities (Orbaşli, 2008). Their importance arises from the meanings attributed to the objects by the subjects and not from something inherent to the asset or material (Hidaka, 2008; Viñas, 2005). This approach goes against the authority of the heritage experts, but it does not exclude them. Rather it understands that instead of being about experts and non-experts, the relevant issue is the sum total of stakeholders or interested parties, thereby approximating the total conservation system (MacLoughlin, 1973; Bertalanffy's, 1968). It recognizes that in this universe, there will be meanings in confrontation, and that the syntheses that will take place in this relationship will be a result of decisions within a culture and among cultures and will depend on prioritizing the values identified by the interested parties (Viñas, 2005).

Contemporary theory of conservation applies a flexible criterion adapting it to cater for the subjects' needs. It is 'perhaps nothing less than a revolution of common sense' (Viñas, 2005, p. 199). Despite the emphasis on truth, it is not the core issue in conservation ethics. Contemporary theory stresses meanings of the 'meaning bearing elements to people e.g. artistic merit, colour, shape etc but not the relationships of these elements to truth. Importantly 'it is the affected people who know what the meanings the object posses and how it will best convey those meanings; it would not be ethically correct to impose a different point of view just because someone has some expertise in art history, organic chemistry, or in some conservation technique' (Viñas, 2005, p. 202).

This thesis is grounded in the tenets of contemporary theory of conservation, where meanings that objects have for people are given prominence. This way, one can predict how people will be affected by the conservation process. Conservation is treated as a means, not an end in itself and it is really a way of 'maintaining and reinforcing meanings in an object; (Viñas, 2005,

p. 213). Importantly, contemporary theory calls for combination of the meanings people have of an object to satisfy as many views as possible. The theory adapts itself to the needs of users which is considered more ethical than any scientific principle, which is only acceptable as relevant only if acceptable by the users. It can therefore be seen that contemporary theory of conservation need not substantially modify the field of conservation except in instances where people feel offended by the practice especially through exclusion.

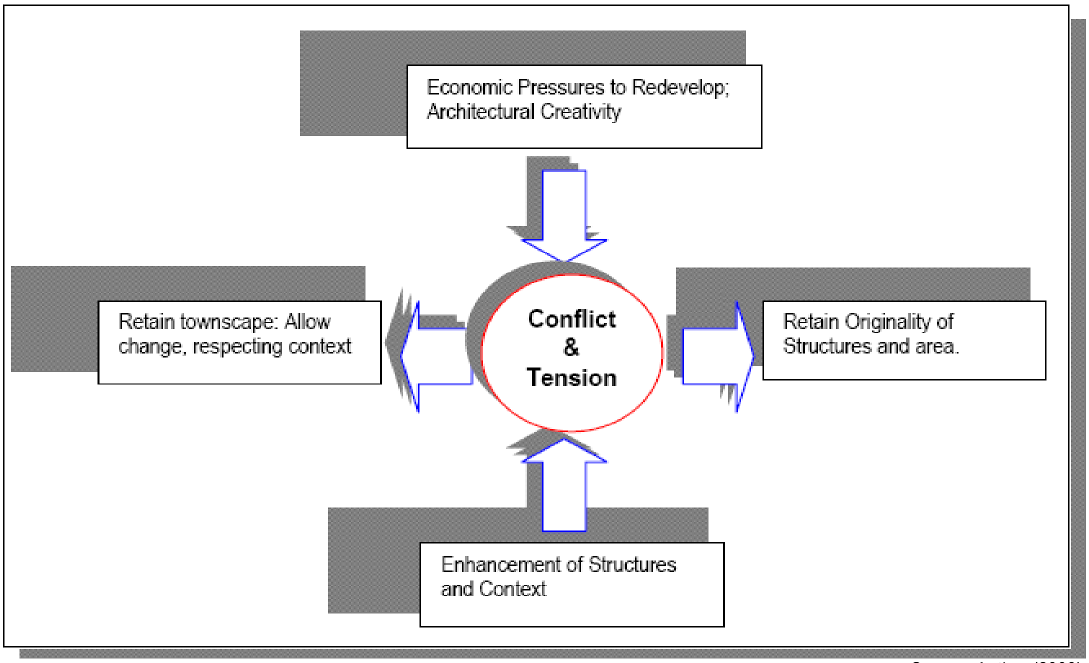
2.8 Conceptual Framework

Frankfort-Nachmias and Nachmias (1996) explain that a concept is an abstraction, a symbol, a representation of an object or one of its properties or a behavioural phenomenon. Concepts serve as components of theories and thus of explanations and predictions. They are the most critical elements in any theory because they 'define its content and attributes (Frankfort-Nachmias & Nachmias, 1996, p. 28).

Conservation policies lacking a deliberate design rarely lead to optimal outcomes. This study has conceptualised an aesthetic criterion as being one of the agencies to sustainable conservation. Once values inherent in an urban historic area have been identified, soliciting the participation of the current residents is of outmost importance since they are the producers and custodians of the historic environment. In any case, the residents are most acutely affected by the impacts of conservation actions. Their inclusion in the conservation process may lead to sustainability of the historic area.

As shown in Figure 2.8 conservation activities create tension in the general activity system of urban historic areas. Economic pressures to redevelop and the lack of creativity on part of individual actors threaten to decimate the built heritage. A generalised model of conservation exercise is presented in Figure 2.9, which enables one to understand the practice of conservation whereby the practitioners initiate an action to achieve a defined end.

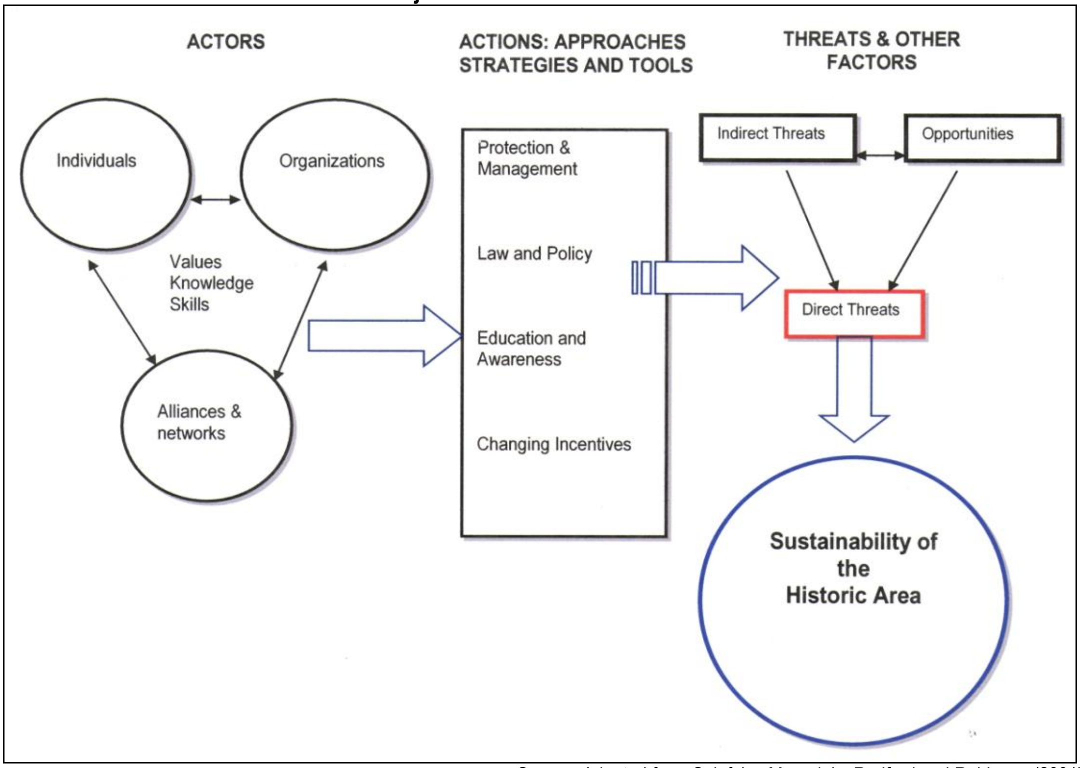
Figure 2.8
Tensions and Conflict in the Conservation of the Built Heritage



Source: Author (2009).

The starting point for a conservation project is the definition of what would be ultimately targeted in the historic area. Sustainability of the townscape is taken as the ultimate in this thesis. The state and conditions of the target area must then be described. Factors that threaten conservation of the particular built environment are identified. In this model, it is taken that threats to sustainability are because of human action or inaction and *force majeure* is eschewed. Figure 2.9 shows the direct threats, which negatively affect historic areas, for example demolitions. Indirect threats and opportunities are taken to be the drivers that lead to the direct threats, for example, the level of education, income level, government policy etc.

Figure 2.9
A Generalised Model of the Conservation Project for Historic Areas



Source: Adapted from Salafsky, Margoluis, Redford and Robinson (2001).

Figure 2.9 further shows the practitioners who undertake conservation actions. These practitioners have the values, skills and knowledge to make it happen. Individual practitioners are sometimes affiliated with organisations e.g. non-profit organisations, government agencies etc. Within each of the categories presented, alliances with other organisations to perform the conservation work are normally formed.

The presence of design guidelines in conservation areas is an indicator that the changes taking place in urban historic towns may not be producing the desired results. These design controls attempt to control individual actions for the good of the community. According to conventional wisdom, the variability in preference across time and individuals precludes the development of such guidelines yet research has repeatedly confirmed commonalities in architectural preferences (Nasar, 1994, 1988a; Hershberger, 1988).

Conservation guidelines attempt to shape the physical and spatial character of development in historic areas. This study accepts that such regulation is in the public good, but expands the scope of that regulation by introducing the idea of aesthetics, implying sense perception. Lang (1988) has shown that one of the fundamental goals of design has always been an aesthetic one involving the creation of 'delightful rooms, buildings, townscapes and landscapes' (p. 11). Aesthetics is operationalised as emotional evaluations, which are favourable since the goal is to create enjoyable places. Importantly, the pursuit of enjoyable surroundings does not imply uniform design criteria.

Figure 2.10 presents a conceptual model for the perception milieu of historic areas. It can be seen that the place attributes of urban historic areas elicit certain kinds of affective responses. As the model shows, the interactions between humans and the environment elicit an aesthetic response. Individual characteristics for example personality, age, education, cultural experiences, and goals will cause variations but also has 'some commonalities across individuals' (Nasar, 2000, 1998, 1997, 1994). The arrows in Figure 2.10 are probabilistic. The aesthetic response has a probabilistic relationship to the built environment and perception of the physical properties has probabilistic relationship to the actual physical properties present (Nasar, 1998).

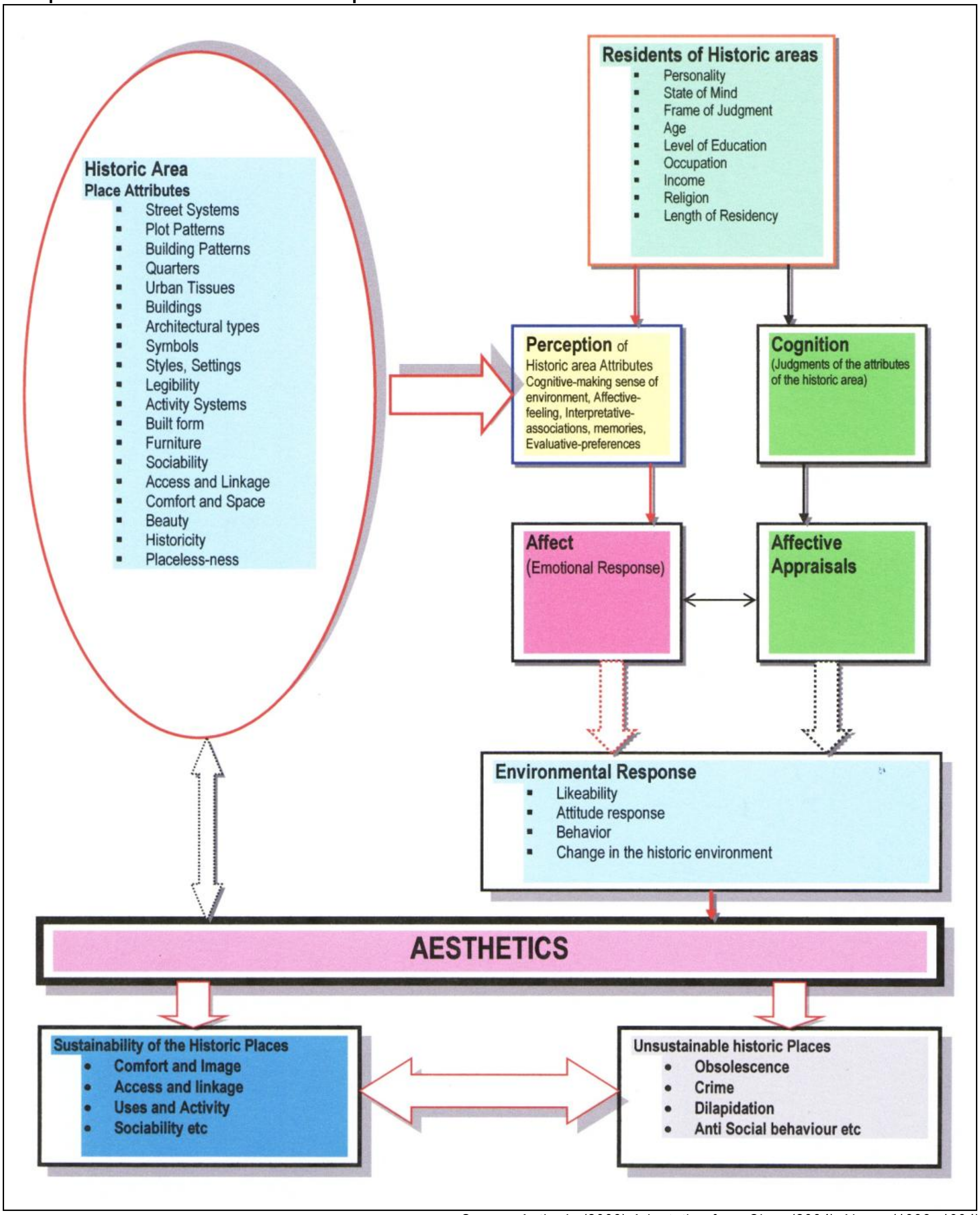
Zajonc (1984) has presented convincing evidence 'that rapid initial emotional responses to gross environmental responses can occur, independent of, and before cognition' (Nasar, 1994, p. 381). In Figure 2.10, the arrow from *perception* to *affect* shows a direct probabilistic relationship. Similarly, the arrows from *cognition* to affective *appraisal* to *aesthetics* show a probabilistic relationship of aesthetic response to cognitive process.

Emphasis in this study is on perception not cognition because perception is more than just seeing or sensing the urban environment and involves the more complex process of understanding the stimuli. It goes beyond the cognitive geography of Lynch (1960), by measuring the meaning people have of their built environment. Importantly, it is difficult to use Lynch's mental maps because they are not predictive since they reflect past experience (Sparks & Chapman, 2005) and are therefore excluded from the study.

The *environmental responses* are ultimately linked to aesthetics as the arrow shows. Aesthetics:

> 'is commonly known as the study of sensory or sensori-emotional values, sometimes called judgements of sentiment and taste. More broadly, scholars in the field define aesthetics as critical reflection on art, culture and nature. Aesthetics is a sub-discipline of axiology, a branch of philosophy, and is closely associated with the philosophy of art. Aesthetics studies new ways of seeing and of perceiving the world (Aesthetics. 2010, February 18).

Figure 2.10
Conceptual Model of Environmental Perception of Historic Areas



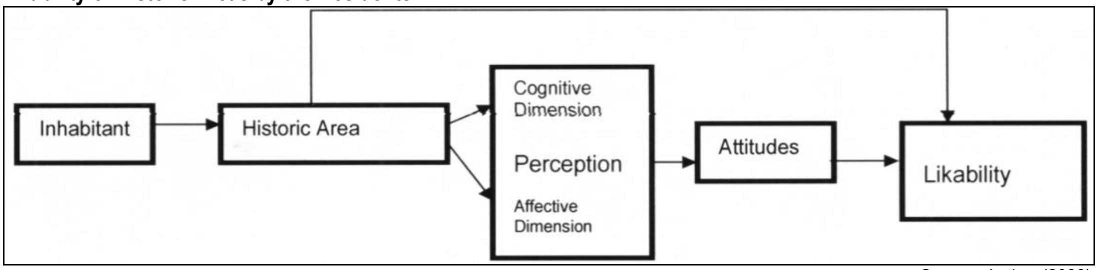
Source: Author's (2009) Adaptation from Chon (2004); Nasar (1998, 1994).

The aesthetic consideration in the conservation of urban historic areas influences the perceived quality of life and sense of well-being (Chon, 2004: Nasar, 1988). Additionally, aesthetic improvements are often emphasised as a strategy for revitalization for areas in decline, enhancement for sense of community, and vulnerability of crime (Chon, 2004; Nasar, 1998, 1997; Nasar & Jones, 1997). Aesthetic quality may also be assumed to contribute to the character and identity of a place. Place of high aesthetic quality will tend to become landmarks, over and above their specific roles in the activity system of the individual (Eben-Saleh, 2001 cited in Chon, 2004).

The introduction of the notion of aesthetics in the conservation of urban historic areas is important because such areas are generally known to possess complexity, which is one of the objective measures of aesthetics (Chon & Shafer, 2009; Chon, 2004). Therefore, historic areas will be sustainable if they are perceived as aesthetical, because aesthetics aims at enjoyment and satisfaction with the stimuli. This will be indicated by favourable attitudes of the evaluation. An aesthetic effect is deemed to occur when there is an effect on the perceived beauty of the urban historic area. If perceived as un-aesthetic, then sustainability will be difficult to achieve. On the other hand, adverse aesthetic effects on historic places are those that impair the character or quality of the area causing a diminishment in the enjoyment and appreciation of the area. A variety of studies on subjective responses to environments have demonstrated the importance of the aesthetic dimension of visually perceivable environmental qualities (Romice, 2001).

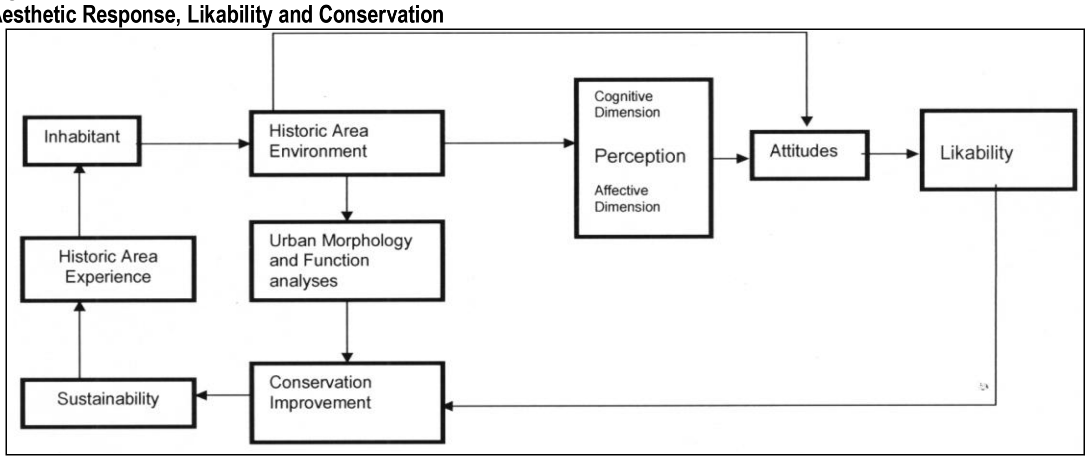
The visual quality of historic areas is measured by its likability (Nasar, 1998), referring to the probability that the scene will evoke a strong and positive response among the residents. Likability of urban historic areas by the residents is conceptualised as shown in Figure 2.11. Figure 2.12 shows the overall conceptual model of the study showing the relationship between perception, attitudes, likability and sustainability of historic areas through improvement in the practice of conservation.

Figure 2.11
Likability of Historic Areas by the Residents



Source: Author (2009).

Figure 2.12
Aesthetic Response, Likability and Conservation



Source: Author (2009).

A likable historic area will lead to conservation betterment and sustainability of the total system. That way, Hardin's (1968) Tragedy of the commons will be averted.

2.9 RESEARCH QUESTIONS

A number of research questions and hypotheses guide this research. The research questions are developed to help: understand the perceptual dimension of a conservation area, understand how specific characteristics of a conservation area relate to its likability and, examine if and how a historic area may be changed in a sustainable manner. Grounded on the above, the research is guided by the following basic question:

What attitudes do inhabitants of historic areas have about the built environment?

Based on the question above, the following sub-questions emerge.

1. What environmental characteristics are associated with the likability of urban historic areas?
2. What are the patterns of preference that underlie inhabitants' attitudes towards their urban historic environment?

2.10 WORKING HYPOTHESES

Null hypothesis (H_o).

There is no relationship between the historic built environment in Old Town of Mombasa and the attitudes of inhabitants towards it.

Scientific Hypothesis (H_a).

There is a relationship between the historic built environment in Old Town of Mombasa and the attitudes of inhabitants towards it.

2.10.1 Statistical Assumptions

It is assumed that observations are independently and randomly sampled from the population of interest. This means that the scores on the variable *attitude* are provided by different individuals. Further, it is assumed that this variable is randomly distributed in the population i.e. the normality assumption.

2.10.2 Significance of the Test Hypothesis

The hypotheses provide direction and help to bridge the gap between the problem and the evidence needed for its solution. Specifically, they enabled the researcher to 'assess the information collected from the standpoint of relevance and organisation' (Mugenda & Mugenda, 1999). It also forms the framework for the conclusions as solutions.

The test hypotheses are a link between attitudes and conservation. In this way, the theory of conservation is advanced beyond the technical approach. Since conservation, is 'laden with conflicts and contradictions, and there is no single universally agreed method or methodology, (Orbaşli, 2008, p. 38), the test hypotheses introduces a new dimension in the approach to conservation, whereby the attitudes of the custodians of the built heritage is given primacy. It is anticipated that if this aesthetic-led approach is espoused, then a contribution to the conservation philosophy can be made. The success of conservation work in urban historic areas is not only measured against the current values that a society attributes to heritage, but to attitudes as well.

2.11 Theoretical and Operational Definition of Key Terms

Attitude

Osgood, Suci and Tannenbaum (1954), aver that attitudes are learned and implicit and that they are inferred states of the organism that are presumably acquired in much the same manner that other such internal learned activity is acquired. To them 'they are dispositions to respond, but are distinguished from other such states of readiness in that they predispose towards an evaluative response' (p. 189). It is further explained that attitude is 'part of the semantic structure of an individual and may be correspondingly indexed' (p. 190).

Ajzen (2001) has shown that an attitude represents a summary evaluation of a psychological object captured in dimensions as good-bad, harmful-beneficial, pleasant-unpleasant and likable–dislikable. Dobb (1967) defines attitude as 'an implicit drive producing response considered socially significant in an individual's society' (p. 43). This definition from the psychological point of view is an implicit response which occurs within the individual as a reaction to stimulus patterns and which affects subsequent overt responses. According to

Frankfort-Nachmias and Nachmias (1996) ‘attitudes are general orientations that can incline a person to act in a certain manner when confronted with a certain stimuli’ (p. 252). Individuals express their attitudes through speech or behaviour only when they perceive the object of the mind. The interest in measuring attitudes is because they account for the respondent’s general inclination.

Attitudes are measured using attitude scales consisting of several attitude statements which the respondent rates. With attitudes, as with opinions, it cannot be assumed that the respondent knows what they mean and therefore a single question will not do (Frankfort-Nachmias & Nachmias, 1996). By using several attitude statements, the study was able to accurately ascertain both the strength of a respondent’s attitude and conditions under which his or her attitude may change. This is captured in Appendix II.

Urban Historic area

This is an area that gives a sense of wonder and makes one want to know about the people and the culture that produced it (Orbaşli, 2008, 2000; Larkham, 1996; Feilden, 1994). It has architectural, aesthetic, historic, documentary, archaeological, socio-economic, political, spiritual and symbolic values, but the first impact is always emotional for it is a symbol of our cultural identity and continuation-that is a part of our heritage (Feilden, 2003, 1994, 1979). A historic place is a structure, building, group of buildings, district, landscape, archaeological site or other place recognized for its heritage value. For a town or an urban sector to be regarded as a historic settlement or neighbourhood, Papageorgiou (1971, pg. 28) asserts that it must possess:

- An original and characteristic urban sector (originality of the composition)

- Significant architectural qualities (architectural and interesting buildings) whose structure points to a marked degree of continuity in the urban development of the settlement (aesthetic and historic value of the composition)
- A continuing social life i.e. some sort of civic activity, which presupposes the existence of an active population (living condition of the settlement)

From the above contention, it emerges that contrary to common belief, historic settlements do not have to be very old. The attribute historic refers to the whole historical development of the settlement and not simply to its origin in time. Consequently, interesting urban formations of quite recent times may also be classified as historic settlements. The designation of a settlement as a historic centre depends on the existence of an active social life.

Orbaşli (2008) has shown that historic areas may not necessarily be 'attractive' but will have other values for which they are designated. The buildings, group value, layout, morphology, open spaces, green spaces, links between buildings and to the wider landscape, setting and topography may all contribute to the distinguishing qualities of a historic area. The Old Town of Mombasa is taken to be the representative of such a historic area along the East African Littoral.

Inhabitant

In this thesis, an inhabitant is a person who lives or has a home in Old Town of Mombasa and is not a visitor. This is the local resident who has lived here for five years and above at the time of data collection. The term inhabitant is used interchangeably with 'resident'. Šiđanin (2007) citing Lynch (1960) has described such a person as one who 'has had long associations with some part of his city, and his image is soaked in memories and meanings' (p. 62).

2.12 DISCUSSION

A fundamental reorientation is needed in both the conceptual basis and the practical aspects of conservation of the built heritage. While the technical aspects of conservation, practiced today by the professionals in the field are good, a greater awareness of the process of change in the built environment, the underlying reasons for such change, and the complex relationships between humans and the environment calls for a situation in which change is guided in the built environment. A historic area may be visualized as an organism in evolution with a continuous struggle for survival of various architectures therein as conditions change. Importantly, the planning of such areas must not put emphasis on the future alone, but on the present. As such continuity and change will be achieved. This research is anchored in the tenets of planning ably put by MacLoughlin in 1973 thus:

> 'We know that actions taken by individuals and groups in their own interests can bring about conditions which give rise to serious social economic and aesthetic problems connected with the use of land. Planning seeks to regulate or control the activity of individuals and groups in such a way as to promote better performance of the physical environment in accordance with a set of broad aims and more specific objectives set in the plan' (p. 59).

In conservation, the process of change has not been fully understood, and change has always been treated as discontinuous thus explaining why conservation laws and regulations tend to freeze development. Change must therefore be interpreted as a continuum without the necessary feed backs. This change should be seen as invasion and succession *ad infinitum* but is stable of itself. This change is not a disturbance, but a fact of the system because it derives from the decisions of the inhabitants.

Moreover, the planning of conservation areas must be integrated within the larger urban framework for the city. Normally conservation areas are tucked in corners or in the middle of cities and treated as 'special planning areas'. A good example is the Kenyan case, where the Old Town of Mombasa has always been overlooked when the plans for the greater town are being developed (King & Procesi, 1990; Dyer, 1963; Kenya, 1971). Theoretically, it must be recognized that conservation areas are subsystems of a larger system which are defined by, and define the larger system. A continuous system, where change in one element will affect another should be a sound basis for conservation.

A historic area is a commons in the context of the *Tragedy of the Commons.* It is a commons because it belongs to all humankind and care must be taken not to abuse the commons by:

- Adding discordant development into it.
- Subtracting from the historical relics through wanton demolitions of buildings not deemed economically viable.

Contemporary theory of conservation takes meanings to be functions or values. This thesis borrows the concept of meanings as used by Osgood, Suci and Tannenbaum (1954), Nasar (1998, 1988), Hershberger (1988) and infuses them into the conservation milieu of urban historic areas. The present research also goes beyond the 'legibility' of the Image of the City (Lynch, 1960). It measures what is liked about historic environments since it is already known that people like *illegible* environments (Kaplan & Kaplan, 1982b; De Jonge, 1962) and uses this as a basis for sustainable conservation. This thesis fills a missing link by looking at conservation from a *'meaning point of view'* so that the community's attitudes are incorporated into the contemporary theory of conservation. This is a new way of looking at conservation and introduces what may be regarded as an 'aesthetic formula' (Eysenck, 1941, p. 83) in the conservation field. The study further enriches the use of sustainability in conservation by recognizing that you cannot have knowledge of *what is not*, i.e. future and therefore it is only meanings of what is not that can be anticipated and conserved. These meanings can be passed on from one generation to the other because the built heritage may not last *ad infinitum*. Since the assessment procedures designed to guide town planning decisions have often ignored public perceptions of the built environment, this study fills that gap, favouring the addressing of intangible considerations (Cherry, 2007). A community-based assessment is preferred as opposed to the professional led conservation. This study will therefore aid the regulation of the aesthetic aspect, which if left unregulated would lead to the loss or deterioration of the physical conditions of urban historic areas.

The typological process describes the transformation of types (a class or population of buildings or other elements) in which a generic process is repeated but the resulting sequence of specific transformations is not. This typological process is an interaction between humans and the environment which is well contemplated in the systems theory (Kropf, 2001). The term type assumes the repetitive production of a particular form (Sima & Zhang, 2009; Kropf, 2001; Moughtin, Cuesta & Signoretta, Rossi, 1982; Conzen, 1960) and this implies that the buildings were produced according to a common idea. Type is therefore the result of different number of people making an object according to a shared conception of the object. The changing face of old towns can therefore be seen as a typological change. This shared idea has fluxed and hence the discordant developments.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

As a scientific inquiry, this study concurs with Mugenda's (2008) position, that reality is stable and can be 'fragmented into concepts and variables' (p. 280). These variables are then described, observed and measured with the ultimate aim of explaining reality. This chapter is therefore based on the problem statement, objectives and hypotheses and outlines tasks that facilitate the collection of reliable and valid data.

This chapter delves into the research methods used to investigate the research questions proposed in the previous chapter. The chapter begins by presenting a detailed discussion of the research approach, which incorporates the theoretical basis for attitudinal scaling, and the major constructs are elucidated. The research design and *situs* are then addressed followed by research methods and data collection techniques. An elaborate discussion of the sampling procedure is demonstrated. The plan for data collection incorporating, the training of research assistants, is also addressed. A discourse on how the data was processed, analysed and presented is demonstrated followed by a discussion on the reliability and validity of the data collected. The ethics that governed this study are then presented and capped by a discussion on the pilot survey.

3.2 Research Approach

The approach in this research involves the generation of data, which is subjected to rigorous quantitative analysis. From the data base the characteristics and relationships about the population are inferred. This according to (Kothari, 2004) means 'a survey research where a sample of population is studied (questioned or observed) to determine its characteristics, and it is then inferred that the population has the same characteristics' (p. 5). This research describes and measures as precisely as possible, how residents perceive environmental stimuli, and the attitudes toward their historic environment. As advocated by Zeisel (1981), clear constructs are developed and then translated into concepts that can be counted as manifestation of the constructs. The perception of the historic environment is established through attitudinal scaling. Rainwater (1966) is cited by Zeisel (1981) as having successfully studied fear among the residents of Pruitt-Igoe housing project in St. Louis in a descriptive research. Further success is reported in a study by Altman, Nelson & Lett (1972) where a complex questionnaire was used to elicit sailors' attitudes about their families and activities at home (p.62). Good precedents for this research therefore exist.

The historic environment milieu has lagged behind on how to define and capture public attitudes and feed these into the way places change. Forsyth (2007) has shown that the emphasis has been more on the architectonic theme of architecture and the development of functional types than the physical perceptions of objects. The huge attachment that local communities have to the built environment's role in providing them with a sense of place has largely been ignored. This survey expresses the intangible aspect.

3.2.1 Designed Versus User Defined Environments

According to Nasar (2000, 1998, 1988a, 1988b), some visual preferences in the environment may be influenced by culture while others are universals, common to many cultures. Therefore, patterns of preference that emerge are taken as representing the universal. The objective measurement of perceived quality of environment is critical in this thesis, because of the position that good planning in historic areas should be based on the inhabitant's attitudes towards their physical environment.

This is because an attitude:

> 'characteristically provokes behaviour that is acquisitive *or* avertive, favourable *or* unfavourable, affirmative *or* negative toward the object or class of objects with which it is related. This double polarity in the direction of attitudes is often regarded as their most distinctive feature' (Allport, 1967, p. 8).

Therefore, the attitudes of the inhabitants of a historic area represent a form of readiness for attention or action of a definite sort and will create a tendency to act toward or against some environmental factor.

The question of empirically based guidelines for visual quality in the environment has been debated by Nasar (1988a), and it is clear that it might be argued that for private housing, the market will produce a desirable outcome. Recall that this thesis treats a conservation area as a commons, and as such, free choice will lead to ruin for all since it will create visual and spatial disorder at the neighbourhood level. Therefore, a sustainable conservation framework is necessary to avoid a tragedy in the historic commons. Nasar (1988b) also shows that the evidence of Groat (1982), Hershberger (1969) and Newman (1972) suggests that the educated intuition of the design professional may not result in a milieu that fits the visual needs of the residents, especially if they differ in style and social class from the professional.

One of the greatest difficulties of developing designed environments that promote user understanding, exploration and the conveyance of rich associations and meaning is the differing needs, motivation, and education of the designer and the user, and the resulting differences in perception and cognition between the two (Motloch, 1991). Generally, the designer places self-expression high as a motive force and uses an intellectualized approach to encoding and decoding meaning. Further more, the designer is apt to see the specific design project, rather than the phenomena of the place. The user, or the inhabitant of a place is motivated to understand and explore, has less intellectualized and more intuitive approach to decoding meaning. As Motloch (1991) further observes, the user perceives and ascribes meaning to the perceptual phenomena of place, rather than the specific elements or projects.

The designer's intellectualized processes may lead to what is called the grand tradition of design as opposed to the vernacular. The inexplicit nature of cognitive differences between designers and laypersons is problematic since these differences create ambiguities in meaning, which hamper communication and sometimes cause conflicts between the professional and his/ her client. Such situations are aggravated by the dichotomy between very real clients and statistically imagined users.

3.2.2 Dimensions of Perception

As noted by Nasar (2008, 1988c), one approach to examining dimensions of perception involves factor analysis of verbal descriptions of environments. As expected, this approach has been criticized because the results may be an artefact of the investigator's selection of scales. In response to this problem, the study selected professionals in architecture, design, fine art and planning to give a rating of the same environmental stimuli (in the form of photographs) for the purposes of establishing an objective yardstick. The study also sought to achieve a representative sample of respondents by using stratified random sampling in the already defined geographic zones.

3.2.2.1 Photographic stimulus

The sample stimulus consisted of one hundred colour photographs (100) of various urban scenes throughout the world (Appendix I).This sample was selected randomly from a pool of two hundred that were considered to represent diverse urban scenes. The stimulus was diverse because of potential differences in environmental preferences in relation to social and demographic characteristics of the population. The photographs comprised many architectural styles from around the world. As recommended by Nasar (1988a), colour photographs were used because of the evidence that responses to such stimulations accurately reflect responses on site. The evaluative response assessed was defined as likability representing amiability, friendliness, niceness, congeniality and generally a good scene that may evoke the desirability to be in that place.

The difficulties of controlling extraneous variables and getting respondents to different sites made the use of photographs viable. Various studies are cited Nasar (2000, p. 147) as having consistently shown that responses to colour photographs and slides as accurately reflecting onsite experience, and doing so more accurately, than to responses to black and white photos or drawings (Hull & Stewart, 1992; Kaplan & Kaplan, 1989; Feimer, 1984; Hershberger & Cass, 1974). The study therefore combined visual simulation and attitude measurements. Specifically, Feimer (1984) investigated the validity of simulation procedures using a respondent sample of over 1000 respondents and concluded that the magnitude of simulation effects is sufficiently small to be inconsequential for many practical and empirical applications (p. 77). It is therefore taken that ‘colour photographs correlate highly with responses to the real environment (Nasar, 1988c, p. 240)

Studies by Sonnenfeld (1966); Zube, Pitt, and Evans (1983) indicates potential differences in environmental preferences in relation to socio-demographic characteristics of the observer and such differences point to two research strategies: one aimed at finding the commonalities in preference across the groups and the other aimed at identifying group differences (Nasar, 1988a, p. 276). This thesis responds to the commonalities because of the relevance of such information in the design of public places in order to achieve an overall aesthetics of the heritage commons.

3.2.2.2 Procedure

The inhabitants of Old Town of Mombasa were exposed to one (1) unrelated colour photograph in order to explain the procedure. Thereafter, they were exposed to each of the one hundred (100) colour photographs rapidly, one photograph taking about five seconds to help anchor the judgement. The respondents were informed beforehand that they would be viewing one hundred scenes and they should imagine themselves in each of the scenes. They were asked to rate each of the scenes on the likability scale. The photographs were presented in the same order for all the respondents to mitigate order effects. Research ethics in terms of confidentiality, anonymity and informed consent were strictly followed.

The inhabitants were to rate the photograph stimuli on a scale of 1 to 7 as follows: *(1)Extremely liked, (2) Very liked, (3) Quite liked, (4) Neither liked nor disliked, (5) Quite disliked, (6) Very disliked, (7) Extremely disliked* (Appendix II).This 7-point semantic rating scale has successfully been used by Osgood, Suci and Tannenbaum (1957). Krosnick, Judd and Wittenbrink (2005), have also observed that beyond the 7-point scale, point meanings become considerably less clear. As is shown by Boslaugh & Watters (2008) when large data points are offered they can be analysed as interval data. The pilot survey did not reveal any difficulties in understanding of the rating scales by the inhabitants. Biographical data was also elicited from the respondents. They were to indicate their gender, marital status, age, highest level of education attained, main occupation, and religion.

To obtain an objective rating of the colour photographs, professionals in the built environment were requested to rate the photographs along the following variables: complexity, enclosure and idiosyncrasy (Appendix III). These ratings provided an objective a yardstick for describing the observations obtained from the residents (Nasar, 2000, 1998).

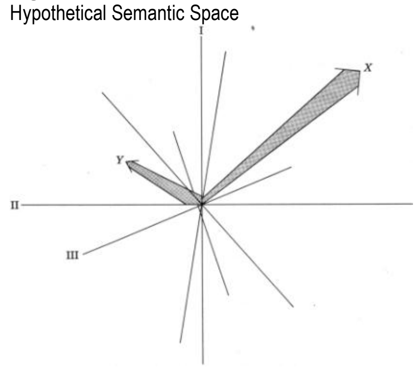
The professionals selected consisted of three (3) architects, two (2) artists, three (3) designers, two (2) architect/ planners and two (2) landscape architects giving a total of twelve (12) persons. The researcher considered them to have vast exposure and knowledge in the built environment having distinguished themselves in practice and academia. The sample of professionals was purposive, but there is no reason to believe that their descriptions differ systematically from those of other professionals practicing in conservation areas. Previous research by Nasar (1988) show that it is likely that the responses to the simulation accurately gauge a person's day-to-day experience.

3.2.3 Measurement of Inhabitants' Attitudes towards the Built Environment

It has been recognised that direct investigation of a person's experience of his environment is methodologically difficult but it is presumed that people can articulate their perception (Ebong, 1983). Thus semantic differential, a verbal technique is used to find out respondents attitudes towards their historic environment in this study. Hershberger (1988) uses the semantic differential, a general measuring technique developed by Osgood, Suci and Tannenbaum in 1957 to measure meaning through the assessment of its evaluation (Triandis, 1967). The technique is grounded in psycholinguistic theory (Ebong, 1983) and used to measure the meaning of word labels in relations to psychological meaning of the concepts, which the labels describe. Today semantic differential is particularly useful in the study of environmental psychology.

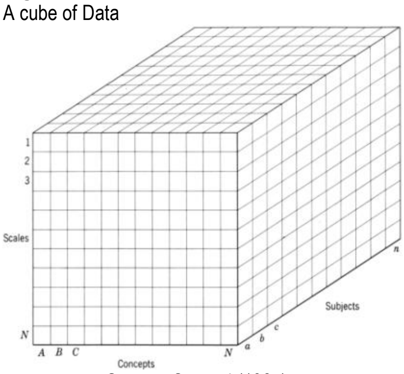
The measurement of meanings takes a hypothetical semantic space, which is assumed to be Euclidian (Osgood, 1967). This space has an origin that denotes meaninglessness. The meaning of a word or concept is represented by a vector from this point and the longer the vector in the semantic space, the more meaningful is the concept (Figure 3.1). The less the distance from the end points between the vectors the more similar in meaning is the concept under measurement. Verbal opposites on the semantic space would cancel out each other, component for component (Osgood, 1967; Osgood, Suci, Tannenbaum, 1957). The judgements of concepts against a set of semantic scales produce a cube as shown in Figure 3.2.

Figure 3.1
Hypothetical Semantic Space



Source: Osgood (1967).

Figure 3.2
A cube of Data



Source: Osgood (1967).

In Figure 3.2, the rows are defined by scales, the columns by concepts being judged, and the slices by the subjects doing the judgements. Each cell represents with a single value how a particular subject rated a particular concept against a particular scale.

It has been established that architects representations and responses to the designed environments become increasingly different from those of the non-professionals as a result of the architects professional education (Hershberger, 1988). Noting that architects ability to predict user responses become increasingly weaker as the distance from the user increase in terms of place, race, language, sex, age etc (Nasar, 1998c), it is important to measure how the users perceive their environments. This will enable design professionals to predict responses on their creations. Using factor analysis, valuable insight can be gained into the diverse attitudes people hold in their minds about the environments in which they live.

It is recognized that residents from different districts will develop different mental maps according to their place of residence and the extent to which they use some parts of the city (Sparks & Chapman, 2005). For this reason, the Old Town of Mombasa conservation area is divided into four districts following the approach by Lynch (1960). These districts are distinguishable by their typologies, levels of maintenance, the predominant functions and combinations of all these (Appendix II). The districts are:

- Zone 1-Area around Fort Jesus, KCB, Old Law Courts, Treasury Square, Municipal Council, DC's office
- Zone 2-Area around the waterfront: Mombasa Club, Old Port, Government Square, Fish Market, Bohora Mosque, Leven House, & Steps
- Zone 3-Residential area around Kibokoni Road, Kilindini Road, Mwea Tebere Road
- Zone 4- Mbarak Hinawy Road

The extent to which a district is homogenous and sharply differentiated from other parts of the old town is variable and so are its boundaries. These identified districts merge into one another. As noted by Garcia-Mira, Arce and Sabucedo (1997), designers and administrators of cities are naturally interested in the things that make people happy or unhappy about the places in which they live. However, the objective analysis of an individual's conception of the quality of his environment is clearly a difficult task, and complex conceptions of this type can be assumed to reflect the net response to a variety of environmental stimuli, both physical and social.

Craik (1971) and Craik and Feimer (1987) are cited by Garcia-Mira, Arce and Sabucedo, (1997) stating that researchers have no means of directly assessing a subjects' experience and problems involving subjectivity must necessarily be approached indirectly. The most widely used indirect approaches are those based on multivariate analysis and more specifically, data reduction techniques, that is, the identification of a smaller number of dimensions which facilitate the interpretation of a multi-dimensional problem. Factor Analysis is used in this study to uncover the latent structure (dimensions) of a large set of variables. As explained by Hinton, Brownlow, McMurray and Cozens (2004), factor analysis is an umbrella term for a set of statistical procedures that examines the correlations between variables in large sets of data to see if a smaller set of underlying variables or *factors* can explain the variation in the original set of variables. Principal Components Analysis, the most common form of factor analysis is used in this thesis to seek a linear combination of variables such that the maximum proportion of variance is extracted from the variables. The process then removes this variance and seeks a second linear combination, which explains the maximum proportion of the remaining variance, and so on. It finally results in orthogonal (uncorrelated) factors (Boslaugh & Watters, 2008; Ho 2006; Pallant, 2005).

Despite the deliberate and independent variations in the rules for sampling scales and concepts and the kinds of subjects used, Osgood (1967) and Osgood, Suci, Tannenbaum (1957) have concluded that three dominant orthogonal factors keep reappearing: An evaluative factor (represented by scales such as *good-bad, kind-cruel, honest-dishonest*), a potency factor (represented by scales such as *strong-weak, hard-soft, heavy-light*), and an activity factor (represented by scales like *active-passive, fast-slow, hot-cold*). Osgood (1967) explains that this means that there are at least three directions in the semantic space that are regions of relatively high density, in the sense of containing many highly correlated scales representing similar modes of qualifying. Evaluation, potency and activity appear to be the most salient modes of qualifying experience.

In this study, Factor Analysis is used to investigate the perceived quality of Old Town of Mombasa, a historic centre of about 10,000 inhabitants, in the coastal city of Mombasa, Kenya. As a basis for interpreting the results of Factor Analysis, subjects were asked to evaluate a number of aspects of each district in the conservation area on a series of bi-polar scales. The three aspects considered were: (1) Streets, (2) Open spaces, and (3) buildings. All three aspects were evaluated on 18 seven point-scales, namely: pleasant-unpleasant; appealing-repulsive; colourful-drab; pretty-ugly; planned-unplanned; attractive appearance-unattractive appearance; clean-dirty; well maintained-badly maintained; well conserved-poorly conserved; interesting-boring; good-deficient; important-not important; quiet-noisy; safe-unsafe; small-large; many-few; sufficient-insufficient; peaceful-busy. Similar scales have been used in previous studies (Garcia-Mira, Arce & Sabucedo, 1997; Craik, 1971).

The respondents were also asked to rank the four districts on a scale of 1-4 from the most favourite to the least favourite. Personal information on gender, marital status, age, highest level of education, main occupation, religion and the numbers of years one had been a resident in the Old Town of Mombasa was also collected (Appendix II).

3.3 Research Design

Kothari (2004) defines a research design as the arrangement of conditions for the collection and analysis of data, in a manner that aims to combine relevance to the research purpose, with economy in procedure. Research design is therefore the conceptual structure within which research is conducted and constitutes the blueprint for collection, measurement and analysis of data. The choice of a research design an investigator chooses to study a problem with depends on the way the problem is defined, what the investigator wants to know, the nature of the object under study, previously acquired knowledge on what the study is based on, and the type of results desired (Zeisel, 1981). Ng'ang'a, Kosgei and Gathuthi (2009) citing Kerlinger (1983) explain that research design is the 'plan, structure of investigation conceived so as to obtain answers to research questions and to control variance' (p. 49). The research design used in this thesis sets up a framework for adequate tests of relationships among variables and seeks to provide answers to the research questions.

Frankfort-Nachmias and Nachmias(1996) explains that although the experimental design is the strongest model of logical proof, many phenomena that are of interest to social scientists are not amenable to the straight forward application of experimental designs (p. 126). Research ethics that questions the experimental manipulation of individuals and the fact that randomization and experimental control could be guaranteed, called for a different research design, despite the strengths of the experimental design.

This study is designed as a descriptive research. This is a type of conclusive research that has as a major objective, the description of something (Malhotra, 2004). The research endeavoured to obtain information concerning the current status of the built environment in the Old Town of Mombasa and the attendant attitudes towards it. As a descriptive research, the study contains many variables, whose data is spread over a large number of respondents and a large geographical area. In this research, a sample survey research design (Malhotra, 2004) is conducted by obtaining a single representative sample of males and females from the target population only once, and asking them to respond to a number of questions regarding their attitude towards their environment (Appendix II). Zeisel (1981) has advocated for survey design when investigators want to find out in detail about phenomena such as housing satisfaction (p. 67).

Old Town of Mombasa is purposively taken as representative of other historical towns along the East African Coastline due to its accessibility and disparate architecture. Owing to the Islamic and Swahili Heritage, it is very similar to other stone towns along the littoral in terms of the built environment, and therefore a good representative. Old Town of Mombasa is under consideration for listing as a world heritage site by UNESCO. The research is then designed as a survey making enough provision for protection against bias and maximising reliability. The survey (Borg & Damien, 1989) was used to collect standardised information from a sample drawn from a predetermined population. Data was collected at one point in time then put on a descriptive framework. To overcome the methodological limitations of survey designs, multivariate statistical analysis such as multiple regression and factor analysis are used to approximate some of the operations that are naturally built into an experimental design.

3.4 RESEARCH *SITUS*

Situs refers to the place in which data is gathered (Miller, 1991). The *situs* in this thesis is natural, as existing in Old Town of Mombasa, since a situation and its contents cannot be fully observed if certain portions are excluded, as they might be if the situation was transferred to a contrived setting (Zeisel, 1981). Natural settings are particularly important because they offer a unique opportunity to observe phenomena a contrived setting cannot recreate. Zeisel has cited various studies as having been carried out successfully in natural settings for example: Gans' *Urban Villagers* (1962) and *Levittowners* (1967), Cooper's *Easter Hill Village* (1975), and Keller's *Study of Twin Rivers* (1976). Elements, relationships and dynamics that are salient were observed.

As a descriptive research, sets of variables are measured as they exist naturally, and people's responses to questions about phenomena are described with the aim of understanding the respondents' perception from which truism may then be constructed. As shown by Ng'ang'a, Kosgei and Gathuthi (2009), this is based on constructivist epistemology, which holds that reality is what the respondents generally perceive it to be. Interviews are used extensively to collect data from samples that represent the population.

3.5 RESEARCH METHODS

3.5.1 Introduction

Methods refer to means of gathering data that are common to all sciences or to a significant part of them (Kothari, 2004; Miller, 1991). They are the methods that were used in performing research operations. In this study, both primary and secondary data were collected. Primary data is obtained from the field while secondary data is from articles, books, magazines and newspapers (Mugenda & Mugenda, 1999). The data collected was both qualitative and quantitative.

3.5.2 Archival Methods

Archival records are a form of unobtrusive data (Frankfort-Nachmias & Nachmias, 1996). This means that it is non-reactive since at the time of recording there was no knowledge that it would be used for this research. From a conceptual–substantive view, secondary data was extensively used to better comprehend the historical context of Old Town of Mombasa. Existing available information, both published and unpublished was used. Locating the sources and retrieving the information was the starting point. The data was obtained from diverse sources including libraries, government documents, private collections and mass media. Earlier research was also considered and so were various commentaries on the relevant issues to the study. The internet was also extensively used. Some of these records had been compiled for general use and some for the purposes of research. Data on census, climate, building conditions and infrastructure was obtained. Old maps and photographs of Old Town of Mombasa were accessed and used for the purposes of obtaining a historical record of how the Old Town of Mombasa has been changing. The population census data was used for establishing the sample and for understanding the salient compositional features of the population (Central Bureau of Statistics, 2009). Private records and collections were more difficult to obtain. However, the researcher was able to access three old post card photographs of the Old Town of Mombasa seafront (Appendix XVII). This enabled the researcher to gain insights on how the Old Town of Mombasa has been transforming over time.

3.5.3 Personal Interview

The interviewer asked respondents questions designed to elicit answers pertinent to the research hypotheses (Frankfort-Nachmias & Nachmias, 1996) in this face-to-face, interpersonal role situation. It involved presentation of oral-verbal stimuli and reply in terms of oral-verbal responses (Kothari, 2004). This method allowed for flexibility in the questioning process. The researcher was also able to have a greater control over the intervening situation, where it was ensured that the various respondents did not consult one another before giving the responses. It was also possible to record the exact time, date and place that the interview took place. This ensured a high response rate. The researcher was able to collect supplementary information about the respondents, especially spontaneous reactions during the interviews that were useful in data analysis and interpretation. On the other side, this method lacked the anonymity inherent in a mailed questionnaire since the research assistants were known in the study area.

3.5.3.1 Schedule-structured interview

As recommended by Frankfort-Nachmias and Nachmias (1996), the researcher used the scheduled-structured interview where the number of questions and the wording of the questions were identical for all the respondents. The interviewers were instructed not to reword questions to but to ask them as exactly worded in the schedule. The interviewers were also required to ask the questions in the same sequence and to read them slowly. Only questions that are misinterpreted or misunderstood were repeated and clarified. The aforementioned ensures that variations within the responses can be attributed to actual differences between the respondents and not to variations in the interview. A crucial assumption made is that the respondents had a sufficiently common vocabulary so that it is possible to formulate questions, which have meaning for them (Frankfort-Nachmias & Nachmias, 1996). During the pilot study, no problems were experienced in relation to answering the questions.

For the ease of data processing, simple structured interviews were administered to the respondents. They were expected to provide and reveal their attitudes and opinions on a variety of variables. This method was used extensively because of it being more economical, it provided a safe basis for generalisation, and it required relatively lesser skill on the part of the interviewer (Kothari, 2004).

3.5.3.2 In-depth interview

Respondents who were known to have been extensively involved in conservation activities in Old Town of Mombasa were identified with the help of the Mombasa Old Town Conservation Office (MOTCO). An in depth interview was conducted focussing on the subjects experiences regarding how the Old Town of Mombasa has been changing in their life time and what they think can be done to make the old town sustainable. Despite the interview being structured, the respondents were given considerable liberty in expressing their ideas. The researcher had the freedom to decide the manner and the sequence of the questions and the freedom to explore motives. The main task for the researcher was to confine the respondents to the discussion of the issues in which he sought conversance.

3.5.4 Observation of the Physical Environment

Under this method, the researcher sought information by way of direct observation without asking any questions to respondents. One advantage accrued from this method was that information obtained related to what was currently happening and is 'not complicated by past behaviour or future intentions, (Kothari, 2004, p. 96). This method was 'highly imageable, unobtrusive, durable and easy to execute' (Zeisel, 1981, pp. 90-94). Direct observation eliminated any subjective bias. Since the method was independent of respondents' willingness to answer, it was relatively less demanding on active cooperation on part of the respondents', as happened with the interview method.

Observation of the physical environment was used to reinforce inferences made from the interview method. It consisted of observing how the historic town is physically structured, the land use patterns and how people have adapted to this historic setting. It also involved an examination of how new developments have contributed on the moulding of form, space and order in this zone, how discordant developments have affected aesthetics, originality, proportion etc. was also a major concern. The problems in the conservation area as evident in the built form were observed. This helped in establishing the relationship between contextual and discordant developments.

3.6 Data Collection Techniques

Kothari (2004) refers research techniques to be 'the behaviour and instruments we use in performing research operations such as making observations, recording data, techniques of recording data and the like' (p.7). Miller (1991) is more concise when he defines techniques as 'specific procedures that are used in a given method' (p. 117). The research methods discussed above generated the following techniques.

3.6.1 Techniques for the Archival Method

Subject indexes of archive holdings were examined and the relevant keywords established as recommended by Frankfort-Nachmias and Nachmias (1996). The researcher also familiarized himself with search guides, catalogues and data archives. The analyses of historical records were recorded as notes. Statistical compilations and manipulations were also undertaken of the quantitative data, and recorded in table format.

3.6.2 Techniques for Structured interviews

The respondents' attitudes were recorded using interview schedules. Standardised questions were used to enable collection of the same amount of data from all the respondents. The interviewer used a detailed schedule with open and closed sections. The interview schedules were administered through door-to-door execution, with the help of research assistants who had been 'trained to ask the questions in the same way' (Zeisel, 1981, p.157). Questionnaires for the conservation office and professionals in the built environment (key informants) were collected later (Appendices II, IIIA, IV and V).

3.6.3 Techniques for the observation of the physical environment

Sketches of particular interest where new spatial structures were found to be emerging were created to provide highly imageable scenarios. This were analysed against sketches and photographs of the existing built environment. Recording the condition of the built environment on maps and diagrams gave the researcher a better sense of how the Old Town of Mombasa is used more than looking at statistical tables. Base maps were used to record the character of the built environment.

Photographs were extensively used to record the built environment characteristics that needed quick documentation. Due to their accuracy, the use of photographs reduced the lengthy descriptions of a given phenomenon. The spatial composition of Old Town of Mombasa was recorded by carefully choosing the viewpoints along pathways at fifty metres intervals, both ways, on a tripod mounted camera. Particular views were also chosen to illustrate dramatic changes in composition, such as the point of emergence from a narrow passage into a bright and expansive public square.

Observation checklists prepared from previous diagnostic observations were used. The technique involved ticking off and filling a prepared list of features deemed important. This is important for verification and confirmation purposes. Physical measurements were conducted to establish the spatial patterns created by the built forms.

3.7 Sampling

3.7.1 Introduction

Sampling may be defined as 'the selection of some part of an aggregate or totality on the basis of which a judgement or inference about the aggregate or totality is made' (Kothari, 2004, p. 152). Empirically supported generalizations are usually based on partial information, because it is often impossible, impractical, or extremely expensive to collect data from all the potential units of analysis covered by the research problem. A subset of the population, a sample, is therefore used in this research to provide estimates of unknown values of population parameters from the sample statistics (Kothari, 2004; Frankfort-Nachmias & Nachmias, 1996). Sampling was used in this study in order to save time and money and to enable accurate measurements.

3.7.2 The Population and Sample Size

The universe or the super-population is a theoretical infinity of all elements that might exist throughout all time-space coordinates whose operational entity is the population (Maxim, 1999). Population refers to the total of items about which information is required (Kothari, 2004). The Central Bureau of Statistics of Kenya (CBS) estimated the population of the Old Town of Mombasa to be 27,518 people in 2009. King and Procesi (1990) established that the population of the conserved area is approximately a third of the old town population. This gives a figure of 9173 persons forming the target and accessible population. Time and resources allowing, Mugenda and Mugenda (1999) recommends that a researcher take as big a sample as possible to avoid the danger with small samples that do not reproduce the salient characteristics of the accessible population to an acceptable degree. Gay (1992) recommends that for descriptive studies ten per cent of the accessible population be an adequate sample size. This would give a sample size of 918 persons. This is a reputable sample size because it has been used successfully in previous studies in the area (King & Procesi, 1990).

Ng'ang'a, Kosgei and Gathuthi (2009) have produced a useful table that recommends a sample size of 370 for a population of 10,000 (p. 66). Patton (2002) argues that the sample size, like all aspects of research is subject to peer review, consensual validation and judgement. To him, what is crucial is that the sampling procedure and decisions be fully described, explained and justified so that the information users and peer reviewers have is the appropriate content for judging the sample.

This study utilises Factor Analysis in order to simplify a large number of inter-correlated measures to a few representative constructs or factors. Ho (2006) recommends that the sample size for such an exercise be 100 or larger. He provides a basic rule of the thumb where there should be at least five times as many cases as are variables entered into factor analysis. The measurement of likability involves 100 variables and therefore the minimum sample size acceptable is 500 persons. Boslaugh & Watters (2008) have shown that as the data set grows larger, the results become more reliable and echo Ho (2006) by recommending that the number of cases be larger than the number of variables in the input matrix. Tabachnick and Fidell (2001) suggest at least 300 cases for factor analysis while Nunnally (1978) recommends a 10 to 1 ratio: that is 10 cases for each item factor analysed (Pallant, 2005, p. 174). Clearly, the sample size of 918 persons recommended is within the theoretical confines.

3.7.3 Sampling Unit

Frankfort-Nachmias and Nachmias (1996) identify a sampling unit as a 'single member of a sampling population. The sampling unit in this thesis is a social unit, that is, the household. A household is defined following the conventions of the population census for the Republic of Kenya, as a unit of people who regularly eat together (Kenya, 2002; King & Procesi, 1990; Kenya, 1979). Further elaboration is given by the Central Bureau of Statistics [CBS], (2002), who define it more candidly thus: 'a person or a group of persons [generally bound by ties of kinship] who normally reside in the same compound under one roof or several roofs, are answerable to the same head and share a common source of food' (p. 11). The average number of household size in the Old Town of Mombasa is 5.8 (King & Procesi, 1990). Therefore, a total number of 1582 households form the target population mentioned earlier. Ten percent of this gives a sample size of 158.2 households, which are assumed to be evenly distributed in the conservation area.

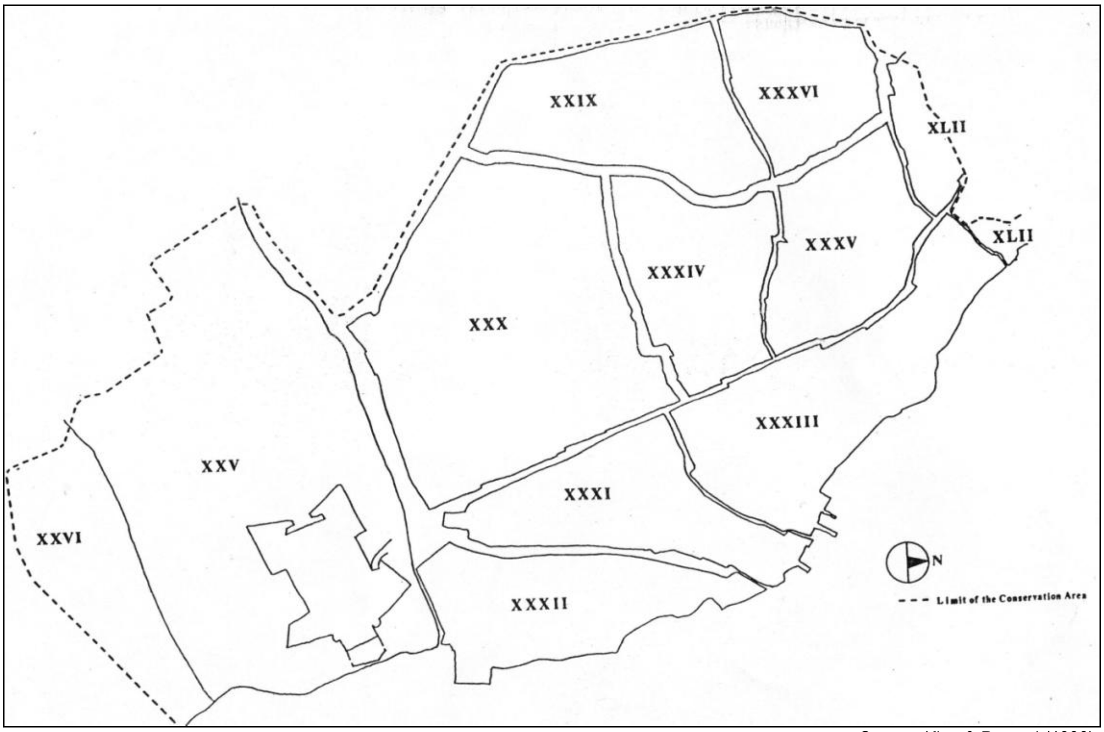
3.7.4 Sample Frame

This is the source list from which the sample is drawn (Kothari, 2004). The sample frame is developed from existing maps of the Old Town of Mombasa and relies heavily on the 1990 'Conservation Plan for Old Town of Mombasa' prepared by King and Procesi. Mombasa Island, Provisional Edition, Sheet 201/1/NE1 and Mombasa Island, Provisional Edition, Sheet 201/1/9NW2 being survey plans prepared in 1970 for the area were also consulted. The Mombasa Old Town Map of 2004 published for the Friends of Fort Jesus was very instrumental in identifying all the building plots and the significant buildings and open spaces in Old Town of Mombasa. The Enumerators Manual (2002) guided the process of identifying the households. The identification of the four districts in the Old Town of Mombasa was guided by Aldrick's Old Town of Mombasa Historical Guide of 1997. Moriset, Kassim and Ali's (2009) document on Old Town of Mombasa provided very useful maps and background information that was pertinent to the identification of these districts.

3.7.5 Sampling Method

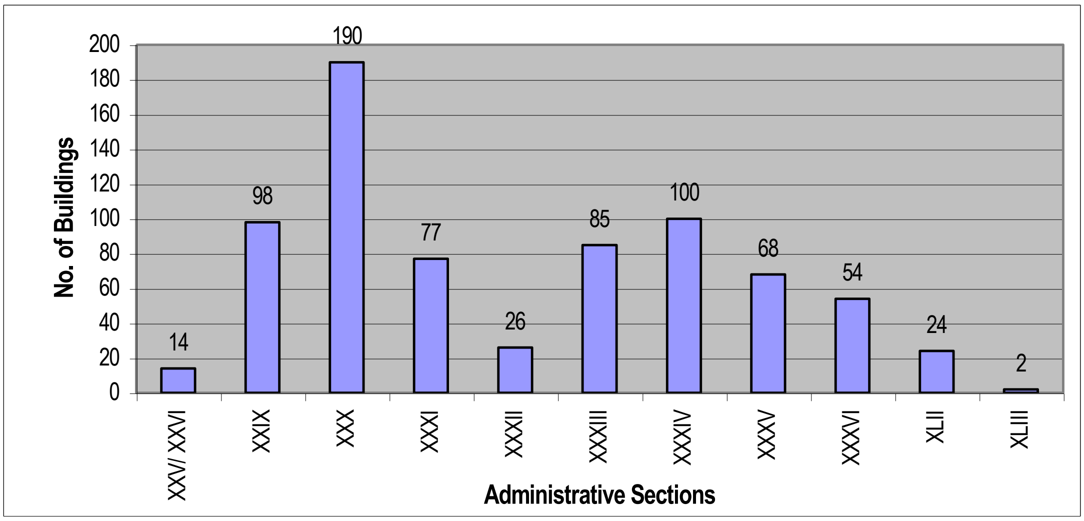
The conservation area is divided into 12 sections, XXIX through XXXVI in their entirety, and parts of sections XXV, XXVI, XLII and XLIII (Map 3.1). The conservation area has 774 plots of which 738 have buildings as shown in Figure 3.3. Of these 647, have residential uses as indicated in Table 3.1. The study utilised stratified random sampling by building type and geographical location to achieve desired representation from the various administrative sections. These administrative sections exist in the Old Town of Mombasa and are clearly delineated on survey maps and in the Conservation Plan for Old Town of Mombasa. This guaranteed that each administrative section was properly represented. It was known from secondary data sources that there exist a total of 738 buildings in the conservation area (Friends of Fort Jesus, 2004; King & Procesi, 1990). The buildings are distributed in the conservation area as shown in Figure 3.3.

Map 3.1
Administrative Sections in the Old Town of Mombasa



Source: King & Procesi (1990).

Figure 3.3
Distribution of Buildings in the Administrative Sections



Source: Adapted from King & Procesi (1990).

The 738 buildings are categorised into the following types: Swahili house, Mombasa traditional house, 1930-1950 shop house, Religious buildings, Commercial buildings Contemporary non-conforming buildings and other non-conforming buildings (King & Procesi, 1990). From the

Table 3.1 above, it is noted that not all plots had residential houses. Some plots also had more than one building.

Table 3.1
Sample Size

Section	No. of Plots	No. of Buildings	No. of Residential Houses	No. of Households	Sample size *10% of h/hold*
XXV/XXVI	16	14	0	0	**0**
XXIX	105	98	85	208	**21**
XXX	193	190	181	443	**44**
XXXI	73	77	65	159	**16**
XXXII	35	26	22	54	**5**
XXXIII	102	85	73	178	**18**
XXXIV	104	100	93	227	**23**
XXXV	62	68	56	137	**14**
XXXVI	57	54	49	120	**12**
XLII	24	24	23	56	**6**
XLIII	3	2	0	0	**0**
Total	**774**	**738**	**647**	**1582**	**159**

Source: Author (2009); King & Procesi (1990).

Once the sample was stratified by geographical location (administrative section), the next stage was to determine which building type the household was drawn from per administrative section. From the 'building classification by section' analysis by King and Procesi (1990, p. 83), the Table 3.2 below is extrapolated showing the distribution of sampled households per section and building type assuming an even distribution of households.

Table 3.2
Sample Distribution per Section and Building Type

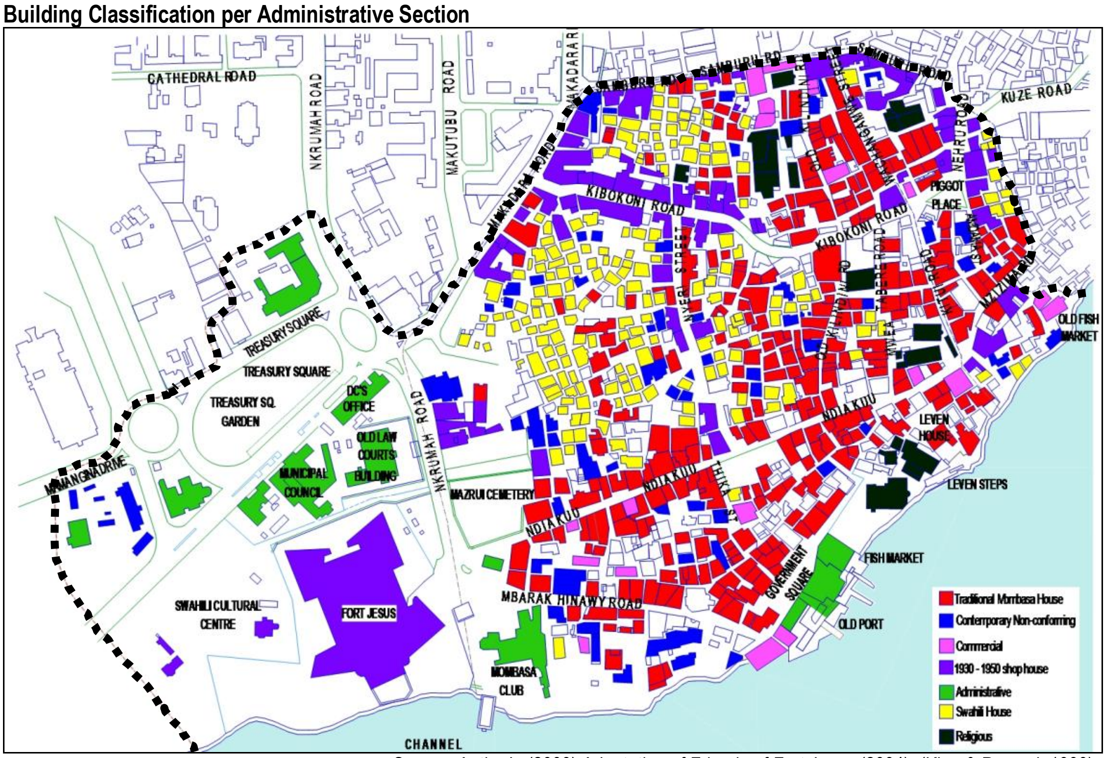
Section	Swahili	Mombasa Traditional house	1930-1950 Shop houses	Contemporary Buildings	Total Households
XXV/XXVI	0	0	0	0	**0**
XXIX	10	7	4	2	**23**
XXX	25	9	3	7	**44**
XXXI	1	12	0	3	**16**
XXXII	1	2	1	2	**6**
XXXIII	2	13	1	2	**18**
XXXIV	7	12	2	2	**23**
XXXV	2	10	2	2	**16**
XXXVI	1	7	4	1	**13**
XLII	2	3	1	1	**7**
XLIII	0	0	0	0	**0**
Total	**51**	**75**	**18**	**22**	**166**

Source: Author (2009).

Due to rounding off to whole numbers, the sample size increased from 159 to 166 households and was distributed as shown in Table 3.2. To select the building for household survey, a map indicating the building classification per administrative section (Map 3.2) was obtained and all the buildings with residential use were identified and numbered. Using the Enumerator's Manual (2002) developed by the Central Bureau of Statistics (CBS), all households were listed in each administrative section, which formed the enumeration areas. The quick count was conducted with the assistance of residents especially where there was more than one household in a compound or a housing unit (as recommended by CBS, 2002). All households per building type per enumeration area (administrative section) were located on the map.

The next stage involved drawing a random sample from the list so that the exact household for the survey could be identified. A table of random numbers was used (Frankfort-Nachmias & Nachmias, 1996, pp. 568-571). Members of each separate residential household in the selected building were interviewed. The interview schedule was pre-tested before administering it to the survey sample and the questions were redesigned to detect internal inconsistencies.

Map 3.2
Building Classification per Administrative Section



Source: Author's (2009) Adaptation of Friends of Fort Jesus (2004); (King & Procesi, 1990).

3.7.5.1 Subjects

A total of 965 interview schedules were availed to the research assistants and were to be filled by members of the household over thirteen years of age, who have lived in Old Town of Mombasa for a period of not less than five years. Of the 965 interview schedules, 272 were rejected for being filled incorrectly and incomplete. 693 were accepted, representing an acceptance rate of 72% return rate. Another 14 questionnaires were distributed among professionals working in the architecture, landscape architecture, planning, design and fine art fields, of which 12 were returned (85.714 %). Of the resulting final sample of 693 respondents, 339 (48.92%) were male and 320 (46.18%) were female. A total of 34 (4.91%) did not indicate their gender. The valid percentage of male and female respondents was 51.44 % and 48.56 % respectively.

A Chi-Square test as a *goodness of fit test* was undertaken to test the hypothesis that: the distribution of the gender variable within the population of Old Town of Mombasa follows a specific pattern of proportions, while the alternative hypothesis is that the distribution of the gender variable follows some other pattern. The findings were as follows:

Table 3.3
Chi-Square Test for Gender

	Respondent's Gender
Chi-Square(a)	.548
df	1
Asymp. Sig.	.459

(a) 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 329.5. Source: Author (2010).

Clearly, X^2 =.548, df=1, p>0.05, and therefore we can conclude that there is no significant difference between the observed and expected counts of gender, and we can reject the null hypothesis that the distribution of the gender variable within the population in Old Town of Mombasa follows a specific pattern of proportions. From Table 3.3 the assumptions that the lowest frequency in any cell should be more than 5 (Boslaugh & Watters, 2008; Ho, 2006; Pallant, 2005; Hinton, Brownlow, McMurray & Cozens, 2004) is also met.

3.7.6 Non-Probability Sampling

The identification of the four districts discussed under Section 3.2.3 and as shown in Appendix II followed purposive sampling. Purposive sampling allowed the researcher to use cases that had the required information with respect to the objectives of the study (Mugenda & Mugenda, 1999). To get in-depth information regarding the built environment characteristics of the Old Town of Mombasa, certain areas were selected because they manifested the phenomenon of interest intensely but not extremely. As recommended by Ng'ang'a, Kosgei and Gathuthi (2009), the sample selected represented a characteristic variable and did not necessarily represent other variables since it was based on the researchers experience.

The selection of twelve (14) professionals in the built environment for the purposes of obtaining an objective rating of the photographic stimuli (Appendix I & Appendix III) followed expert sampling which is a form of non-random sampling (Mugenda, 2008). It involved the selection of individuals who are recognised as experts in their fields. As is shown by Mugenda, expertise is not necessarily formal training but deep and wide knowledge in a specific area or subject. The experts selected were from both the academia and professional practice. A variation of expert sampling involved critical case sampling (Mugenda, 2008). Key informants in the conservation and Swahili culture were suggested by conservation officials for interview in matters pertinent to the research (Appendix IV).

3.8 PROGRAM FOR DATA COLLECTION

Consent was obtained from the relevant authorities both at the national and community level. It involved acquiring a written informed consent. Jomo Kenyatta University of Agriculture & Technology, through the department of Architecture assisted in obtaining permission from the Ministry of Education, Science and Technology, where a research permit was issued. The District Commissioner, Mombasa, further authorised the research through a letter copied to all the District Officers under his jurisdiction. The Chief of the Old Town of Mombasa and his Sub-chief were also informed of the researcher's presence in their areas of jurisdiction.

The Chief assisted the researcher in sourcing for research assistants and village elders. Fourteen (14) research assistants, each accompanied by a village elder were engaged for a period of two (2) weeks for the interviews. Of the fourteen (14) research assistants, seven (7) were female and seven (7) male.

3.8.1 Training of Interviewers

Interviewers were trained so that objective and reliable information could be obtained and maintained. The interviewers studied the interview schedule in detail and familiarised themselves with the interview conditions, logistics, controls, safeguards and variables being studied. This helped them conduct interviews without hesitation, backtracking or rereading the interview schedule. The interviewers were also encouraged to practice interviewing among themselves prior to commencing the exercise. The training of the interviewers was done in groups rather than with individuals. This made the training uniform and helped to standardise the procedure.

3.9 DATA PROCESSING

The data, after collection, was processed and analysed in accordance with an outline laid out for the purpose. Processing involved sorting, editing, coding, classification and tabulation of collected data 'so that they are amenable to analysis' (Kothari, 2004. p. 122). On the other hand, analysis involved computation of certain measures along with searching for patterns of relationships that exist among data groups.

3.9.1 Editing

The raw data from the interview schedules was examined to detect errors and omissions and these were corrected where possible. It involved the careful scrutiny of the schedules to ensure that the data were accurate, uniformly entered, as complete as possible, and well arranged to facilitate coding and tabulation. Field editing reviewed the schedules on the same day that they were returned by the research assistants in view of the difficulty in deciphering the various writing styles. Central editing was conducted in Nairobi, mainly to correct the obvious errors of entry in the wrong places. Obvious wrong replies, especially where a research assistant entered the same attitudinal rating for the respondent, representing a halo effect, were dropped.

3.9.2 Coding

After the data was centrally edited, the interview schedules were numbered and arranged in order, in readiness for coding. Coding refers to the process of assigning numerals or other symbols to answers so that responses can be put in a limited number of categories or classes (Kothari, 2004). Some questions had already been pre-coded and these were excluded from the process. The classes identified were both exhaustive and mutually exclusive. Every class was defined in terms of only one concept (unidimensionality). Once a coding scheme for each of the variables had been developed, this information was complied into a codebook. The codebook served as a guide for coders who translated the raw data into an input device for later use in computerised statistical analysis. Through coding, several replies were reduced to a small number of classes, which contained the critical information required for analysis. Some coding decisions were taken at the time of designing the interview schedule ensuring that the attitudinal choices were precoded, making it easy to enter the data straight away from the interview schedules.

3.9.3 Tabulation

When the mass of data was assembled, it became necessary to arrange it in some concise and logical order. This process of summarising raw data and displaying the same in compact form i.e. in the form of statistical tables is known as tabulation (Kothari, 2004). Tabulation was essential because it conserved space and reduced explanatory and descriptive statements to a minimum. It also facilitated the process of comparison in addition to facilitating the summation of items and the detection of errors and omissions. Finally, the researcher was able to have a basis for statistical computations. Tabulation was done by computer since the inquiry produced a large mass of data.

3.10 DATA ANALYSIS AND PRESENTATION

The Statistical Package for Social Sciences (SPSS 11.5) and Microsoft Excel 2003 were used in analysing and presentation of statistics. Sketches and photographs were also used to analyse and present pictorial data of the built environment. ArchiCad 12 was used in the analysis and presentation of spatial data. Descriptive statistics, also called summary statistics (Borg & Meredith, 1983) were used to describe the data collected on the sample along the various variables. The reduction of a mass of raw data to a few descriptive statistics simplified the task of data interpretation using factor analysis.

For the purposes of identification, a nominal scale was used where there was strict one-to-one correspondence between numbers and the objects. The assignment process was therefore isomorphic as recommended by Malhotra (2004). The numbers do not reflect the amount of characteristic possessed by the individuals responding to the interview schedule. *Gender, Marital Status, Occupation*, and the professed *Religion* were similarly ranked as nominal. The Highest level of *Education* was ranked as ordinal since it indicates the relative extent to which respondents' possess the characteristic. It is therefore possible to determine which respondent had more or less of education, but the magnitude of the differences cannot be known. Summary statistics were conducted on ordinal data. All attitudinal data was treated as interval data as recommended by Malhotra (2004). Importantly, the unit of measurement was arbitrary and the zero point was not fixed. The age of the respondents was treated as a ratio scale.

The computation of certain indices and measures along with the search for patterns of relationships that exist among the data variables constituted data analysis. It involved estimating the values of unknown parameters of the population and the testing of hypotheses. Both descriptive and inferential analyses were broadly employed. Specifically, multivariate analysis of the data was employed. This involved multiple regression analysis, multiple correlation analysis and factor analysis. The unidimensional analysis involved the calculation of several measures, mostly concerning one variable (measures of central tendency, dispersion, skewness, kurtosis, simple correlation and simple regression). For the data to be meaningful at a glance, the data was presented in tables, maps, graphs, photographs, sketches and in short descriptions.

3.11 RELIABILITY

The reliability of the data collected from the field was concerned with consistency of measurement (Weathington, Cunningham & Pittenger, 2010; Frankfort-Nachmias & Nachmias, 1996; Zeisel, 1981), that is, probability of obtaining the same if the study is conducted again. The reliability of the study was reinforced by increasing the number of measurements. Since the interview schedule contained attitudinal questions and not single questions, this enhanced reliability of the results of the subjective judgements. The reliability was further stepped up by use of internal checks through direct observation in order to reduce false constancy (Zeisel, 1981).

Cronbach's Alpha is the most popular method of examining reliability (Pallant, 2005). The calculation of Cronbach's Alpha is based on the number of *items* (i.e. the number of questions on a questionnaire) and the average inter-item correlation. If we assume that the questions are measuring a true score (for example a person's true level of happiness) then each individual question will measure the true score plus a certain amount of random error (Hinton, Brownlow, McMurray & Cozens, 2004). A high correlation between the different items will indicate they are measuring the same thing, as there will be only small values for the error. A low correlation will indicate that there is a lot of error and the items are not reliably measuring the same thing. The following guide was used as a gauge for reliability.

1. 0.90 and above shows excellent reliability
2. 0.70 to 0.90 shows high reliability
3. 0.50 to 0.70 shows moderate reliability
4. 0.50 and below shows low reliability (Hinton, Brownlow, McMurray & Cozens, 2004).

The pilot data on likability yielded Cronbach's Alpha of 0.8850 and a standardised Alpha of 0.9101. For the present study, the reliability coefficient for 100 items (photographic stimuli in Appendix 1) was calculated using SPSS 11.5 and yielded an alpha value of 0.9743 and a standardised item alpha of 0.9746. An alpha value of 0.9898 and a standardized alpha value of 0.9902 for the resident's attitudes towards the built environment indicate that the data has excellent reliability. The data on complexity, enclosure and idiosyncrasy was also subjected to the same test and an alpha value of 0.9692 and standardized alpha of 0.9703 was obtained. As recommended by Hinton, Brownlow, McMurray and Cozens (2004), the standardised Alpha is usually chosen and it clearly indicates that the data had high reliability. The high coefficients obtained imply that the items in the scale correlate highly among themselves and consistently measure the construct of interest (Mugenda, 2008).

3.12 VALIDITY

Validity refers to the degree which a test or research method accurately measures the construct of interest (Pittenger, 2003). To enhance content validity, the interview schedules were given to experts to review and give suggestions, as is recommended by Mugenda

(2008). The experts evaluated the construct the instrument was trying to measure and determined whether the set of items accurately represented the constructs. This ensured a reasonable number of randomly selected items from the domain of indicators. Construct validity was achieved through use of the semantic differential, which is grounded in psycho-linguistic theory. The study therefore utilised theoretically derived hypotheses, involving the concepts under investigation as recommended by Mugenda (2008). Mugenda further urges the use of the powerful statistical procedure, Factor Analysis to validate hypothetical constructs. This study therefore used Factor Analysis to cluster items that seemed to correlate highly with each other in defining a particular construct.

Following the pilot study, the questions were re-worded to be both concise and precise. The interviewers were advised to keep the respondent at ease so that they do not become bored or fatigued (maturation) and thus refuse to cooperate or respond to all questions. This reduced participant variability. To reduce the researcher variability, the interviewers were cautioned to be extra careful to avoid errors when recording data and to follow procedures consistently. Environmental variability was reduced by having the respondents interviewed indoors or under shade to reduce their discomfort. Zeisel (1981) recommends that ‘the more methods are used to simultaneously observe different traits of complex phenomena, the more the chance to validate techniques the researcher has, as long as the methods are related to what the Researcher wants to do’ (p. 81). The research design employed in this study enables the combination of the observation method to check the responses from the interview method.

3.13 PRE-TESTS AND PILOT SURVEY

In the pilot study, the interview schedules were pre-tested in order to estimate how long the survey will take, how many interviewers were needed and the cost implications. Specifically the pre-tests and pilot survey provided guidance on:

- The adequacy of the sampling frame.
- The variability with regard to the subject under investigation
- The non–response rate to be expected
- The suitability of the methods for collecting data. It was established that a great strain was placed on the interviewers and the respondents by the many questions and this necessitated revision of the interview schedules.
- The adequacy of the interview schedule. The ease of handling the schedule in the field was found to be laborious, and the layout was revised to a more efficient one. The wording was revised to be more simple, clear, direct, unambiguous and free from technical terms. Double barrelled questions and leading questions were eliminated.
- The efficiency of the instructions and general briefing of interviewers. A scrutiny of the completed trial schedules showed that some of the interviewers had not completed all the sections and this indicated the need to be more vigilant in the exercise.
- Codes chosen for pre-coded questions. Several pre-coded questions were revised to be open–ended since many respondents had responses outside the provided codes.
- The probable cost and duration of the main survey. From the pilot study, it appeared that the survey would take too long and cause budget overruns. The pilot study provided information on what economies could be made by thoroughly training research assistants and closely supervising them.

In general, the pilot survey helped to clarify many of the problems left unsolved by previous tests and resulted in major alterations of the interview schedule, and an increase in the efficiency of the enquiry.

3.14 Research Ethics

Several ethical issues arise during the conduct of social science research. These may be evoked by the research problem itself, the research setting, the procedures required by research design, methods of data collection, the kind of persons serving as the research participants, and the type of data collected (Frankfort-Nachmias & Nachmias, 1996). This research endeavoured to obtain informed consent, and to maintain privacy, anonymity and confidentiality.

To ensure informed consent, respondents were given an explanation of the procedures to be followed and their purposes. An offer to answer any inquiries concerning the procedures was made. An instruction that the person was free to withdraw consent and to discontinue participation in the research at any time without prejudice was also made. The different dimensions regarding privacy are sensitivity of the information, settings to be observed and dissemination of information (Frankfort-Nachmias and Nachmias, 1996). In this study, no intrusion was made into people's homes without consent. Personal information that is sensitive was not divulged. Anonymity and confidentiality protected the respondents since there was no way of knowing the identity of the respondent from the information they gave. The information was given anonymously and the researcher cannot link a name with the household data since no name was required. Confidentiality was assured since the household data was summarised in group statistics and one cannot link individual answers to a particular respondent.

The research adhered to a code of ethics where the principal researcher took responsibility for all decisions regarding procedural and ethical issues related to the study whether made by him or his research assistants. All actions conducted as part of the research were consistent with the ethical standards of the host community. Importantly, ethical issues were considered from the perspective of the host community. Furthermore, enumerators were instructed to collect data at the convenience of the respondents.

CHAPTER FOUR: OLD TOWN OF MOMBASA

4.1 INTRODUCTION

This chapter deals with the Old Town of Mombasa, which is the geographical study area. A broad base for understanding this urban historic area is set by discussing it within the context of the Swahili Coast. This is followed by an elaborate discussion of its historical background. The legal framework for conservation in Kenya is then covered, followed by a discussion of town planning in Mombasa. The development of the conservation area is then addressed. This chapter further delves into a discussion of the Old Town of Mombasa townscape with emphasis on the streetscape, neighbourhoods and public open spaces. The physiographic and natural conditions of the study area are then given a mention and this is capped by a brief discussion.

4.2 THE EAST AFRICAN LITTORAL: SWAHILI COAST

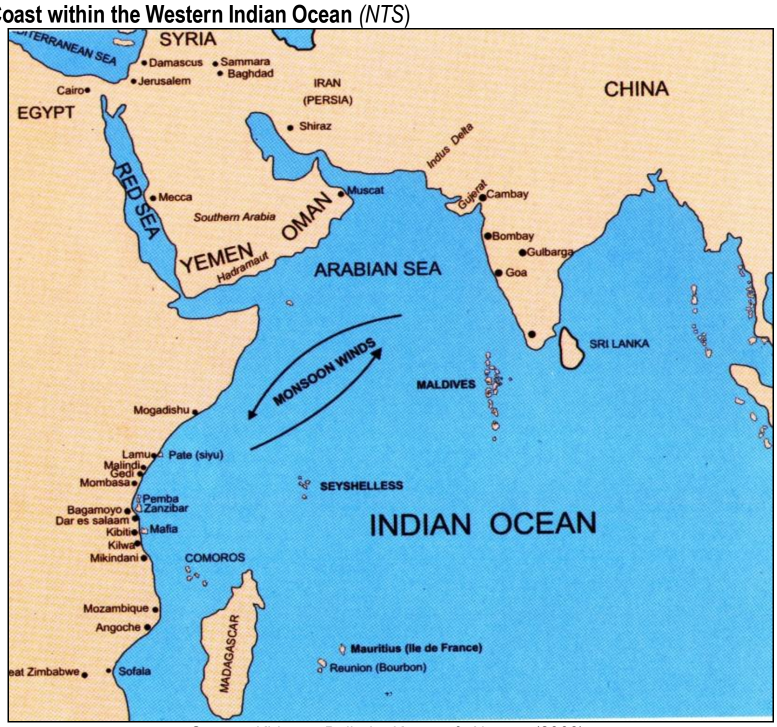
According to Kusimba (1999), Africans use the term 'Swahili Coast' to refer to the East African coast and its adjacent islands. Along the East African shoreline is a 20 kilometre wide strip of land, over 3000 km long extending from Mogadishu in Somalia to the North, to Cape Delgado in Mozambique in the south (Map 4.1). It includes several archipelagos in the Indian Ocean, including the Comoros and the Lamu archipelago, the islands of Mombasa, Pemba, Zanzibar, Mafia and Kerimbe (Kusimba, 1999, p. 21). The Swahili sites along the Kenyan coast are found either on the offshore islands or on the mainland very close to the shore, except for Gede, which is found six kilometres from the open sea at Watamu, and three kilometres from the Mida Creek (Kiriama, 2005).

In Arabic, *Sahel* or *Sahil* refers to coast, or shore, but by 14th Century A.D., some Arabs were using this word to refer to specific group of people inhabiting the East African coast from the mouth of river Jumba in the North to Cape Delgado in the south (Kiriama, Ballarin, Katana & Abungu, 2008). The location of these towns was determined by a combination of several factors: security from enemy attack, shelter from currents and winds of the Indian Ocean, availability of good anchorage facilities, proximity to sources of food, availability of fresh water and good communication network (Kiriama, 2005; Hoyle, 2002; Kusimba, 1999; King & Procesi, 1990). Mombasa was in a significant position in a great trade route, which linked Africa to the Arab, Persian and Indian lands. Navigation of these was made possible by the monsoons (Map 4.2). The *Kaskazi* or northeast monsoon winds blow between November to May and enables travelling from India and Arabia, while the *Kusi* or the southeast monsoon winds blow from July to September and sailors use them to travel from East Africa to Arabia and India (Moriset, Kassim & Ali, 2009; Kiriama, Ballarin, Katana & Abungu, 2008).

Map 4.1
Location of the Swahili Coast *(NTS)*

Source: Kiriama (2005).

Map 4.2
Map of Kenyan Coast within the Western Indian Ocean *(NTS)*

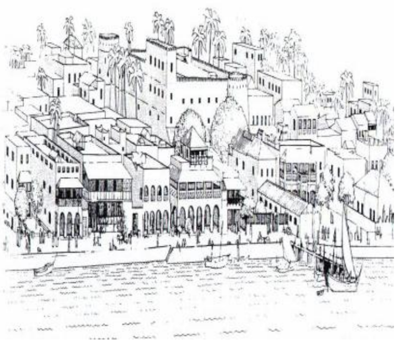


Source: Kiriama, Ballarin, Katana & Abungu (2008).

The northeastern monsoon winds brought ships with ironware, glassware, ceramics and textiles from Asia and Arabia, while the change in winds returned the ships to their lands with ivory and slaves (Moriset, Kassim & Ali, 2009; Kiriama, 2005, King & Procesi, 1990). No distinct pattern or style of architecture is known to have dominated the coastal built environment. The built up environment was as diverse as the population that inhabited the towns, and the Swahili have never formed a single polity but rather a congeries of structurally linked communities, each more or less autonomous and self-reliant (Kusimba, 1999; Middleton, 1992).

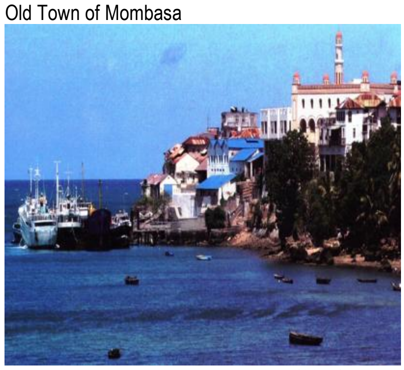
The Swahili are urban dwellers, and two types of towns can be distinguished: stone town and country town. The stone town mainly belonged to the rich merchants who lived in close-knit areas of large coral houses, separate from the common people (Kiriama, 2005). Such towns include Mombasa, Lamu, Pate and Jumba la Mtwana (Figure 4.1, Plate 4.1). Stone towns typically had larger populations, comprising of a dense settlement of permanent houses and public buildings of many kinds, with main streets and connecting alleys, and small gardens set among the houses and in ruined house sites (Middleton, 1992). The country towns were mostly owned by fishermen and farmers, and were made of less prominent materials such as mud and daub with coconut leaves *(makuti)* roofing.

Figure 4.1
Lamu Town



Source: Adapted from Siravo & Pulver (1986).

Plate 4.1
Old Town of Mombasa



Source: Moriset, Kassim & Ali (2009).

4.3 HISTORICAL BACKGROUND

A history of the East African coast can be glimpsed from documents written by traders in the first two centuries of the Christian Era (CE) and these include the *Periplus of the Maris Erythraei* (Periplus of *Erythraean* Sea) and Ptolemy's *Geography* (Moriset, Kassim & Ali, 2009). These classical texts mention towns and trading centres of Zanj, as the East African coast was called by the merchants of this time. The various towns that were settled in this region, although different in certain aspects, are bound together by culture, religion and background, which helped to shape their common history (King & Procesi, 1990). Mombasa has for centuries been one of the leading trading towns along the East African coast and the gateway to the interior of East Africa. The history of Mombasa goes back to the second century A.D. Nothing much, however, remains of this early and medieval history of the town. By end of the 15th century the town's history is quite well recorded and the major historical events and developments depended on the dominant or ruling group (King & Procesi, 1990).

Mombasa has had a long history. Al Idrisi, the Arab geographer at the court of Roger II of Sicily, was the first to mention the town by name, when writing in A.D. 1154 and is believed to have visited the town between A.D. 1066 and A.D. 1100 (Aldrick, McCrae, Macdonald & Maitland-Jones, 1997; King & Procesi, 1990). Ibin-batuta, the famous traveller referred to it in A.D. 1331 as a 'flourishing city with well-built wooden mosques', and observed that the inhabitants were of the Shafite Sunni sect of Muslims. He also referred to the coast south of Mogadishu and north of Mombasa as *sawahil* country (Moriset, Kassim & Ali, 2009). It is reported that when excavating the foundations for the Coast General Hospital extensions, south of Nyali Bridge, archaeological remains of a medieval city were found. This is collaborated by ancient Portuguese maps, which show a walled city of Moors (Map 4.3) situated along the bay just below the site of the hospital (Aldrick, McCrae, Macdonald & Maitland-Jones, 1997).

In A.D. 1850, the population of the town was about 10,000 and had grown to 25,000 by 1897. Interestingly, in A.D. 1500, the population was estimated at 10,000, roughly the same as medieval London (Aldrick, McCrae, Macdonald & Maitland-Jones, 1997). King and Procesi (1990) citing Jewell (1976) records that Dom Francisco D' Almeida who was the viceroy of India in 1505 wrote that Mombasa was:

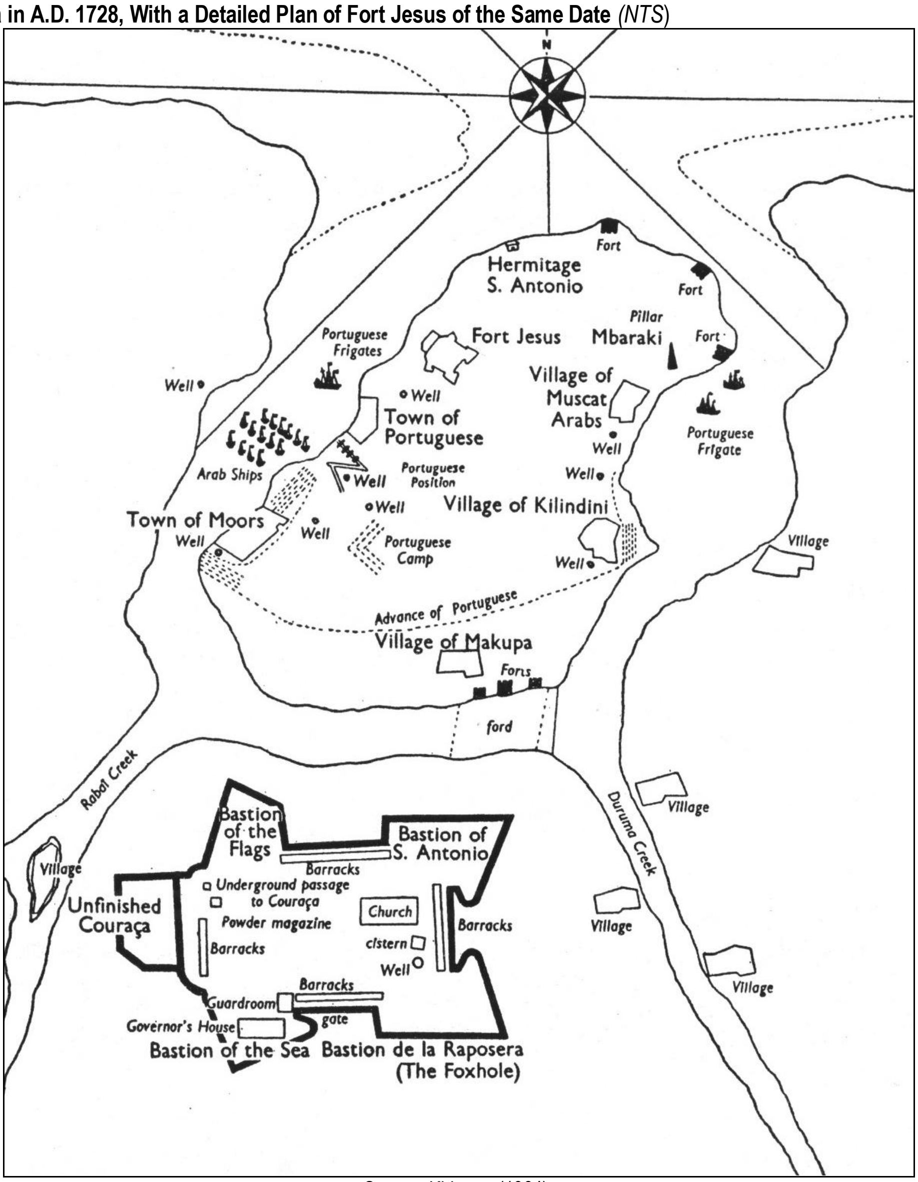
> '…built on rocks on the higher part of the Island and has no walls on the side of the sea; but on the land side is protected by a wall as high as a fortress. The houses are of the same type as those of Kilwa; some of them are three storied and all are plastered with lime. The streets are very narrow…all houses have stone seats in front of them, which makes the street narrower…there are so many balconies projecting over the streets under which one could shelter' (p. 14).

Unfortunately, this account was written when the Portuguese were sacking the city for the first time and it is unknown how many of these buildings survived (King & Procesi, 1990).

4.3.1 The Portuguese Period (A.D. 1498–A.D. 1697)

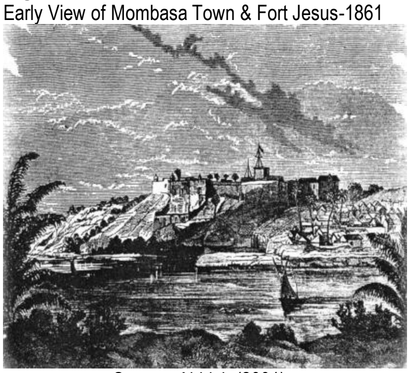
Vasco da Gama set out in A.D. 1497 to explore the Indian ocean and dropped anchor in Mombasa on 7th April 1498, but sailed on to Malindi soon afterwards due to the unfriendly reception by the people of Mombasa. This inimical encounter was the start of a not very cordial relationship that was to last 200 years (King & Procesi, 1990). In addition to the destruction of A.D. 1505, Mombasa was sacked by Nuno de Cuhna in A.D. 1528, and again in A.D. 1588 after a conspiracy of a Turk named Mirale Bey and the local inhabitants to displace the Portuguese from the coast. The cannibalistic Zimba also ravaged the nearby countryside and Mombasa was completely annihilated by A.D. 1589 (Aldrick, McCrae, Macdonald & Maitland-Jones, 1997; King & Procesi, 1990; Kirkman, 1981, 1974).

Map 4.3
Mombasa in A.D. 1728, With a Detailed Plan of Fort Jesus of the Same Date *(NTS)*



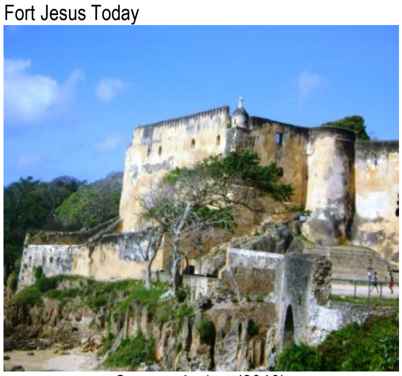
Source: Kirkman (1964).

Figure 4.2
Early View of Mombasa Town & Fort Jesus-1861



Source: Aldrick (2001).

Plate 4.2
Fort Jesus Today

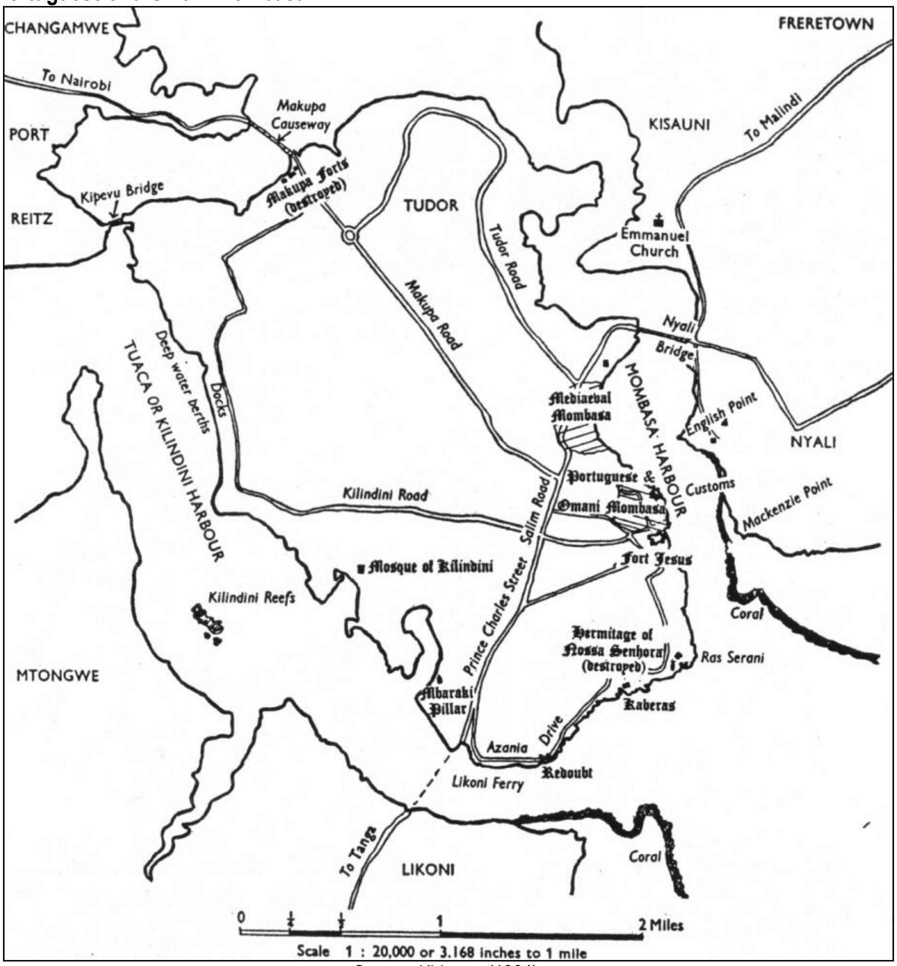


Source: Author (2010).

The most significant building of this period is Fort Jesus (Figure 4.2 and Plate 4.2). The construction of Fort Jesus begun in A.D. 1593 and was completed in A. D. 1597 and a small garrison stationed there. A small town called Gavana grew up beside the fort to cater for the traders and businessmen that were associated with Portuguese maritime trade. The town was walled to distinguish it from the Swahili town to the north (King & Procesi, 1990; Kirkman, 1964). The inhabitants were not all Portuguese given the fact that both Mandhry and Basheikh Mosques were founded in the area at about the same time that Fort Jesus was built. This town has since disappeared save the fort and the two mosques. The Old Town of Mombasa conservation area's boundaries are assumed to follow the original walls of this town except for some extensions (Map 4.4)

The Portuguese held Mombasa for almost a hundred years before losing it to the Arabs of Oman in A.D. 1698, after three years of the great siege of Fort Jesus (King & Procesi, 1990). A brief successful retake of Fort Jesus led by General Luis de Mello Sampio in A.D. 1728 lasted only one year, and the Portuguese were never to recover again (Kiriama, 2005; Aldrick, McCrae, Macdonald & Maitland-Jones, 1997).

Map 4.4
Medieval, Portuguese and Omani Mombasa



Source: Kirkman (1964).

4.3.2 The Arab Period (A.D. 1697– A.D. 1888)

After the defeat of the Portuguese, the Oman Arabs controlled the East African coast through locally based governors, with the most important being the Mazrui family and the Sultans of Zanzibar (Kiamba, 1995c). From the 1850s, Mombasa under the Arabs became increasingly prosperous and began to take the appearance it has today. Between 1850 and 1897, the population grew from 10,000 to 25,000 inhabitants. After 1850, Indian traders mainly from Zanzibar, but also from India, came and settled. Many of the houses in Old Town of Mombasa were built by Indian merchants and are architecturally similar to those in Zanzibar and parts of

India (Aldrick, McCrae, Macdonald & Maitland-Jones, 1997; Kiamba, 1995c; Middleton, 1992; King & Procesi, 1990).

4.3.3 The British Period (A.D. 1888– A.D. 1963)

The coastal strip remained part of the Sultanate of Zanzibar, but the British governed it until 1963 when it became part of Kenya as it is today. During the British colonial rule in East Africa, Mombasa became the major port of entry into the region for settlement and trade. Mombasa was the colonial capital of Kenya until 1906, when colonial administration was moved to the new and more central town of Nairobi. The Old Town of Mombasa was the starting point of most activities of the Europeans, as the new dominant settlers in East Africa. From 1900, the British Administration transferred its headquarters from Fort Jesus to new and more spacious quarters built around Treasury Square, and set up government residences along the sea front (Kiamba, 1995c; King & Procesi, 1990).

4.3.4 Mombasa (1963-to-date)

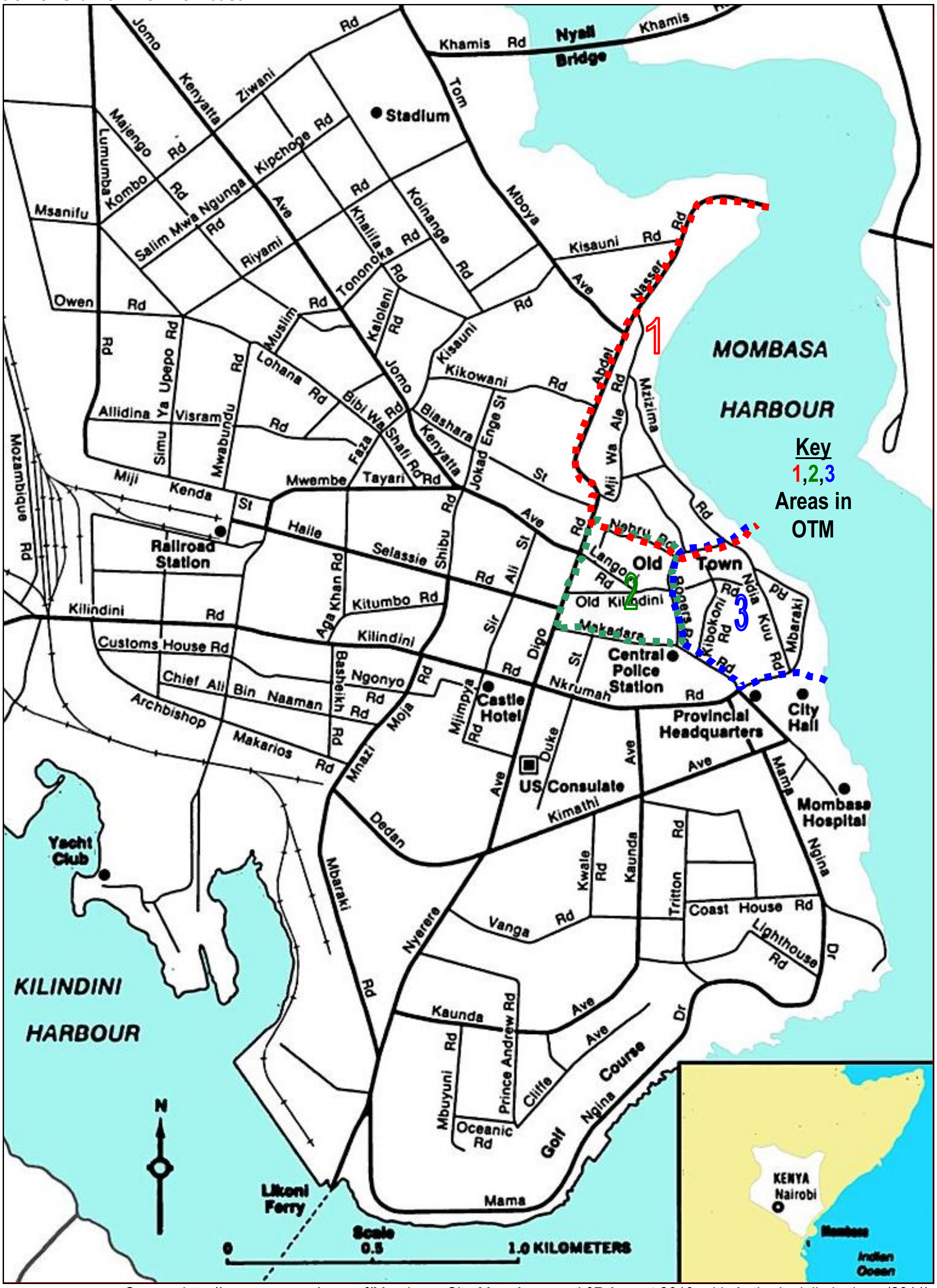
Mombasa is a major port of the East African littoral and the second largest city in Kenya. The main port and commercial activities have shifted away from the Old Town. The dhow harbour of the Old Town has been superseded by the container berths at Kilindini on the west side of the island. Largely passed over by modern physical development, the Old Town has retained a physical character of the above history of Mombasa (Aldrick, McCrae, Macdonald & Maitland-Jones, 1997; Kiamba, 1995c; King & Procesi, 1990).

4.4 Old Town of Mombasa Today

The Old Town takes up an area of approximately 72 hectares and is bounded on the east by the Mombasa channel, the south by Nkrumah road and Makadara road, and the west by Digo road and Abdul Nasser road, which eventually converges with the seafront at Allidina Visram High School (King & Procesi, 1990) (Map 4.5).

The Old Town has three semi-distinct areas within its boundaries: the first include the area north of the Gavana and Biashara street; the second incorporates the area bound by Samburu road, Makadara road, Digo and Biashara street; and the third roughly correspond to the old walled Portuguese Gavana which became the centre of commerce during the 18th and 19th centuries (Kiamba, 1995c; King & Procesi, 1990).

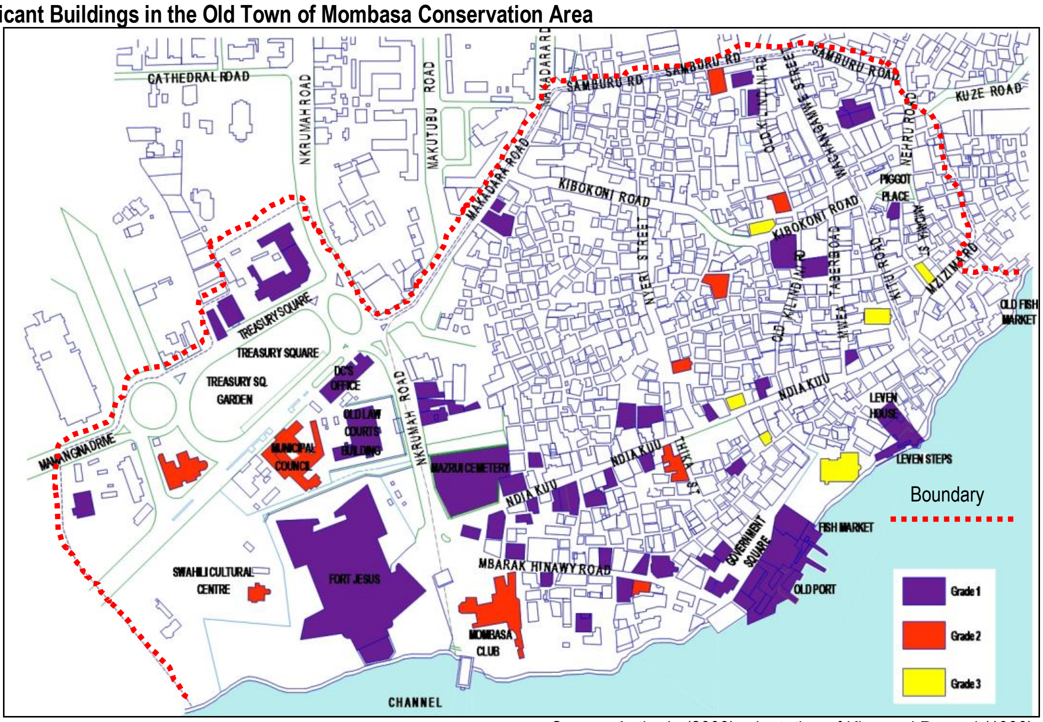
Map 4.5
Location of Old Town of Mombasa



Source: http://mappery.com/map-of/Mombasa-City-Map *Accessed 07 August 2010;* with Author's delimitations (2011).

The first area is characterized mostly by Swahili style housing development. These are one-storey houses, which are being replaced by bland high-rise flats. The second area, which borders Digo road (the newest of the three), has two types of building: the first type, the majority are located along the street fronts and have retained shops at their lower floor and residential spaces on the upper floor, most of which were built in the 1930 (King & Procesi, 1990); the second type are the Swahili style houses constructed as infill in the neighbourhoods surrounded by the street front buildings.

Map 4.6
Significant Buildings in the Old Town of Mombasa Conservation Area

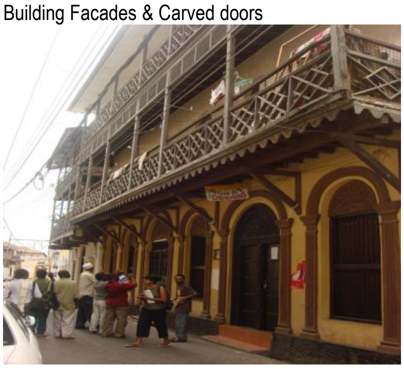


Source: Author's (2009) adaptation of King and Procesi (1990).

The third area measuring about 31 hectares in size is the subject of conservation and follows the boundaries of the walled Portuguese town known as Gavana, and has traditionally been the heart of Old Town of Mombasa (King & Procesi, 1990). This area is very important historically and contains many architecturally significant buildings (Map 4.6). Later on, this Gavana area became a Muslim area with the coming of the Mazrui Arabs and later, the Al-Busaidi dynasty. The Portuguese wall is thought to have run along Nkrumah and Madaraka Roads to the south, Samburu Road to the west and Wachangamwe Street (formerly called Wall Street) and Kitui Road to the North. To form the Conservation Area, a small section was added to the north of this border in order to include Piggot Place, and to the south, Treasury Square and Fort Jesus were added.

The three areas stand coherently together, their differences notwithstanding, and they also exhibit interdependency with the greater Mombasa town. Due to this long span of its existence, the Old Town of Mombasa is a collection of historical buildings that combine African, Arab, Indian, and European influences. Many of the buildings still have beautifully carved doors as well as elegantly styled balconies (Plate 4.3 and Plate 4.4).

Plate 4.3
Building Facades & Carved doors



Source: Author (2009).

Plate 4.4
Ornate Balconies

Source: Author (2009).

The choice of the third area for conservation was made for a variety of reasons (King & Procesi, 1990). Historically, it was the centre of activity for Mombasa between the 16th and 20th centuries. As Explained by Kiamba (1995), successive rulers including the Portuguese, the Mazrui, the al-Busaidi, and finally the British all centred themselves in this section of the Old Town because of its proximity to both the fort and the excellent harbour. Most of the prominent businessmen and civic leaders of Mombasa have also lived in this area, resulting in the best houses and shops being constructed here. Currently it has many of the oldest as well as most architecturally significant buildings and spaces that remain in the Old Town.

The streetscape of this area is largely lined on both sides with two and three storey buildings most of which abut each other and form a solid wall, hiding the existence of the neighbourhoods *(Mitaa)* behind them (Del-Bue, 1986). Entrance to these neighbourhoods from the main streets is by way of the narrow alleyways between some of the buildings. There are four main public places in the Conservation Area: The Treasury Square, Government Square, Piggot Place, and the Waterfront (Map 4.6).

4.5 Legal Framework for Urban Conservation in Kenya

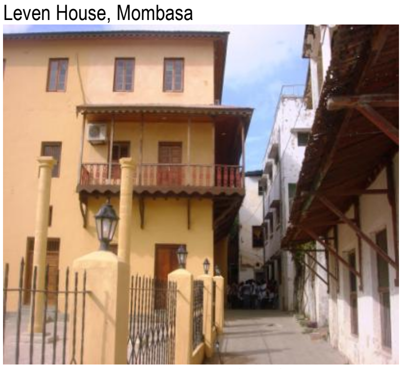
The conservation of heritage sites in Kenya is governed by the National Museums and Heritage Act of 2006. This is the successor of the Antiquities and Monuments Act, and the National Museums Act, both of 1984. The Antiquities and Monuments Act was enacted to provide for the preservation of antiquities and monuments in Kenya. The Act provided for comprehensive machinery for the control of antiquities and monuments that existed under the Preservation of Objects of Archaeological and Palaeontological Interest Act, which was first enacted in 1943 and revised in 1962. The National Museums Act provided for the 'establishment, control, management and development of the National museums and any other connected purposes' (Kenya, 1984a, p. 3).

The National Museums and Heritage Act of 2006 is the most current of a series of documents that govern conservation. This is an:

> 'Act of Parliament to consolidate the law relating to national museums and heritage; to provide for the establishment, control, management and development of national museums and the identification, protection, conservation and transmission of the cultural and natural heritage of Kenya; to repeal the Antiquities and Monuments Act and the National Museums Act; and for connected purposes' (Kenya, 2006, p. 128).

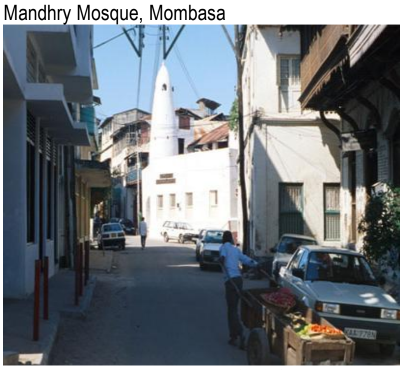
The Old Town of Mombasa is a historic district falls within the definition of cultural heritage as per the National Museums and Heritage Act of 2006. Within the Old Town are many monuments, for example, Fort Jesus built in A.D. 1593 and is one of the best examples of Portuguese military architecture, Leven house, the Mandhry Mosque, the Old port and the Old Law Courts among others (Plates 4.5, 4.6, 4.7, & 4.8).

Plate 4.5
Leven House, Mombasa



Source: Author (2009).

Plate 4.6
Mandhry Mosque, Mombasa



Source: Author (2009).

Plate 4.7
Old Port of Mombasa

Source: Author (2009).

Plate 4.8
Old Law Courts, Mombasa

Source: Author (2009).

The National Museums and Heritage Act of 2006 further defines a 'Monument' as:

1. A place or immovable structure of any age which being of historical, cultural, scientific, architectural, technological or other human interest, has been and remains declared by the Minister under section 25(1)(b) to be a monument;
2. A rock-painting carving or inscription made on an immovable object;

3. An ancient earthwork or other immovable object attributable to human activity;
4. A structure which is of public interest by reason of historic, architectural, traditional, artistic or archaeological interest attached to it; and has been and remains declared by the Minister under section 25(1)(b) to be a monument;
5. A shipwreck more than fifty years old; (Kenya, 2006, p.131)

In all the cases above a monument will include all such adjoining land that may be required for maintenance thereof. The act defines maintenance to include the fencing, covering in, repairing, restoring and cleansing of a monument or the fencing or covering of a protected area, and the doing of any act which may be necessary for the purpose of maintaining or protecting a monument or a protected area or of securing convenient access thereto (Kenya, 2006, p. 130)

The definition of a monument as a structure that is of public interest and possessing certain values is crucial in the conservation of Old Town of Mombasa. Clearly, the primacy of public interest is recognized but the legislation does not provide a mechanism for public participation in the making of conservation decisions.

The National Museums and Heritage Act of 2006 provides for the establishment, functions and the powers of the National Museums of Kenya, a body corporate. Specifically, the National Museums shall:

1. Serve as national repositories for things of scientific, cultural, technological and human interest;
2. Serve as places where research and dissemination of knowledge in all fields of scientific, cultural, technological and human interest may be undertaken;
3. Identify, protect, conserve and transmit the cultural and natural heritage of Kenya; and,

4. Promote cultural resources in the context of social and economical development. (Kenya, 2006, pp. 135-136)

It is clear that the National Museums of Kenya is the legally mandated body to undertake conservation. However, it has no capacity to either plan or supervise the implementation of any plan that it may undertake or that may be undertaken on its behalf. The practical defect of the conservation law is that it is quite separate from the mainstream planning legislation.

The Land Acquisition Act (Kenya, 1983) allows for the compulsory purchase of any area or any artefact that has been declared a historical monument under the National Museums and Heritage Act of 2006, if it is felt that it is in danger of being destroyed, injured or allowed to fall into decay. The power of eminent domain may be evoked if the owner of the land on which a monument is situated is unwilling to have the monument gazetted or declared as such voluntarily. However, that power to compulsorily acquire shall not be exercised in the case that the monument is used for religious observances; is under the guardianship of the National Museums of Kenya; and if the owner is willing to constitute the National Museums of Kenya guardian thereof as provided in law (Kenya, 2006).

The Physical Planning Act, Cap 286, of 1996 gives the power to the Director of Physical Planning after consultation with the Board of National Museums, to serve on the owner or occupier of a building which in the opinion of the Director is of special architectural value or historic interest, an order prohibiting the demolition, alteration or extension of such a building (Kenya, 1996, Section 47). Conservation areas are also contemplated under section 23 (1) of the same Act, where the Director is mandated to declare an area with unique development potential or problems as a special planning area for the purposes of preparation of a physical development plan, irrespective of whether such an area lies within or outside the area of a local authority.

Other regulations and procedures governing urban conservation in Kenya are also laid out in various legislation, guidelines and handbooks. Despite the above, most of these statutory documents are outdated and therefore do no respond to contemporary challenges. These guidelines are scattered in various legislations and need harmonisation (Kiamba, 1995b).

Kenya has been slow in developing policies and legislation covering urban conservation (Hoyle, 2002). The first substantial steps in conservation of Old Town of Mombasa date from the 1980's (Table 4.1). A pilot study carried out by Varkey and Roesch (1981), and a historical guide compiled by Aldrick, McCrae, Macdonald and Maitland-Jones in 1985 preceded the UNDP funding and UNESCO technical assistance for the National Museums of Kenya/ Mombasa Municipal Council conservation planning study. This was designed to provide a legal and technical framework for the preservation and development of the Old Town, to promote a better understanding of the area's historical and architectural heritage, and to generate employment through restoration and rehabilitation activity (Hoyle, 2002).

Detailed studies carried out from 1985–89 included an inventory of buildings (Aldrick, 1995) and led in 1991 to the gazetting of a 31 hectares conservation area, roughly corresponding to the 16th century Portuguese walled town (Gavana), to the establishment of a Mombasa Old Town Conservation Office (MOTCO), and to the preparation and publication of a detailed Conservation Plan (King & Procesi, 1990). At Mombasa, there is generally close cooperation between MOTCO and the Municipal Planning Office, and new conservation by-laws were introduced in 1997 under the Local Government Act (Hoyle, 2002; Abungu, 1998; Aldrick, 1995).

Table 4.1
Old Town of Mombasa conservation: Significant Events, Documents and Publications, 1960-2010.

Year	Events	Documents, Publications
1960		Boxer and Azevedo
1964		Kirkman
1968		De Blij
1974		Kirkman
1981	UNDP/ UNESCO/ NMK Conservation Project	Varkey and Roesch
1983	Antiquities and Monuments Act (Kenya) National Museums Act (Kenya)	
1985		Aldrick, McCrae, Macdonald and Maitland-Jones
1989	Conservation Plan Completed	
1990	Conservation Area gazetted	King and Procesi
1993		Sabini
1994	EU programme for Revival And Development of Swahili Culture	Nelson
1995	Swahili Cultural Centre opened	Aldrick
1996	UNDP/ EU conservation Trust Fund	Aldrick
1997	Conservation by-laws (Mombasa and Local Government Act	
1998		Abungu
2000		Hoorweg, Foeken and Obudho
2003		Moriset
2005		Kiriama
2006	National Museums and Heritage Act	
2008		Kiriama, Ballarin, Katana and Abungu
2009		Moriset, Kassim and Ali

Source: Author (2010); updated from a compilation by Hoyle (2002).

Old Town of Mombasa was gazetted as a monument under the Monuments and Antiquities Act of 1983 in 1990. This followed the successful completion of a conservation plan for the area. The conservation plan was a technical exercise which established guidelines for and control on future development, which would encourage growth while preserving the natural environment, important architectural features, and the historical character of a living and a growing town. The conservation plan set out to:

1. Determine the permitted uses of land and buildings which will be compatible to the special character of the old town
2. Indicate buildings, architectural features, and other streetscape elements in the Old Town of Mombasa subject to protective measures
3. Regulate with a set of by-laws building activity in order to encourage orderly and structurally sound development, and limit changes that are unsympathetic to the character of the Old Town

4. Provide the planning framework for more detailed schemes to improve the infrastructure and spaces in the Old Town. (King & Procesi, 1990, p. 10)

The components of the Conservation Plan constituted the Building Regulations, Plans, a Land Use Map, a Development Plan, and a Traffic and Parking Map for the conservation area, along with a Technical Report. The Conservation Plan was in effect a *'Part Development Plan'* for the Historic Old Town of Mombasa. This is well in accordance with the then Land Planning Act. The Conservation Plan was prepared in compliance with The Antiquities and Monuments Act, Section 4[1] [a] (Kiamba, 1995c; King & Procesi, 1990).

The Conservation plan includes policies on land use, which specifies the various types of growth, and changes that are appropriate for the historical character of the Conservation Area. The policies on land use are a codification of the traditional land use pattern to protect it from encroachment by changing land values and other pressures. In order to preserve the currently established patterns, land use and subsequent development was categorized into zones. The development plan makes specific proposals governing the development of the buildings and open spaces in the Conservation Area. A strategy was organized by which effective conservation measures can be implemented for the preservation of the townscape and significant elements within that townscape. The plan also recommends the upgrading of various public spaces in the area. In addition, policies aimed at helping to relieve the traffic and parking problems, and suggestions for the improvement of the infrastructure and tourism are included (Kiamba, 1995c, 1995a; King & Procesi, 1990)

According to the Building Regulations, within the designated Conservation Area, the National Museums of Kenya (NMK) has the responsibility for overseeing the Municipal Planning Office in technical matters relating to the Plan. In this regard, the NMK acts as the 'authority' in accordance with the National Museums and Heritage Act of 2006.

4.6 Town Planning in Mombasa

The first comprehensive planning scheme for Mombasa was in 1926, enacted under the Town Planning Ordinance of 1919, covering only the island. It was felt then that the Old Town had special needs that could not be addressed within the document. The scheme set up the Mombasa Municipal Board responsible for implementation of the plan (King & Procesi, 1990; Del-Bue, 1986).

Principal issues dealt with included pooling and redistribution of land into regular shaped plots, establishment of road reserves, basic zoning rules that divided areas into industrial and non-industrial uses, and a maximum density rule limiting the number of dwellings to 20 per each acre. Areas outside the district were then controlled through the Public Health Ordinance of 1928, which allowed certain planning decisions to be made on health related grounds. With the upgrading of the board to a council in 1961, all of the areas within the district came under the authority of the municipality (King & Procesi, 1990).

In 1962, a Master Plan designed as an advisory plan, and having no statutory basis, suggested the upgrading of transportation and roads, improved housing and the upgrading of several areas of the island. In 1971, a draft Physical Development Plan was prepared providing a mandate for further studies to be carried out on issues affecting the Municipality. Further documents include the Mombasa Transport Study and the Mombasa Pollution and Waste Disposal Study completed in 1976 (King & Procesi, 1990).

In 1981, the National Museums of Kenya sponsored a pilot study for the conservation of the Old Town of Mombasa (Varkey & Roesch, 1981). Four years later, with funding by UNDP and technical assistance provided by UNESCO, the NMK, with the involvement, albeit minimal, of the Municipal Council of Mombasa (because of its responsibility for town planning of Mombasa), initiated a conservation planning study (the Mombasa Old Town Planning Project). This study culminated in 1990 with the Conservation Plan for the Old Town of Mombasa, Kenya. The results of this study led to the gazettement, in April 1990, of the historic town (Kiamba, 1995c).

4.7 Development of the Old Town of Mombasa Conservation Area

The development of the Conservation Area has historically taken place along Ndia Kuu and around the Old Port (Map 4.6). From the time of Portuguese, Ndia Kuu existed as a footpath that linked Fort Jesus with the Swahili Town, north of the Gavana. Over time, it has grown to be the major business and residential axis in the Conservation Area (King & Procesi, 1990). The name 'Ndia Kuu' translated from Swahili means 'Main Street'. It is not surprising therefore, that much of the important building activity in the town would take place along this road. The same holds true for Mbarak Hinawy Road (formally Vasco da Gama Road) and the Old Port area, which were also very important. Most of the oldest buildings that remain standing in the Conservation Area are found in the section bounded by these roads and the seafront (Plates 4.9, 4.10, 4.11, 4.12.)

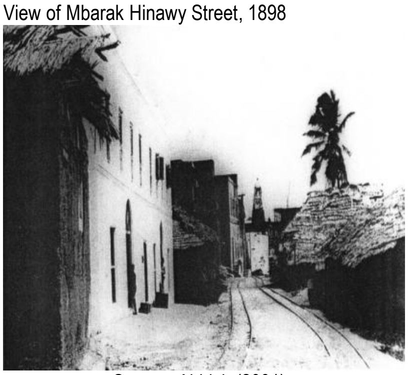
Plate 4.9
View of Ndia Kuu Road, 1895

Source: Aldrick (2001).

Plate 4.10
View of Ndia Kuu Road, 1910

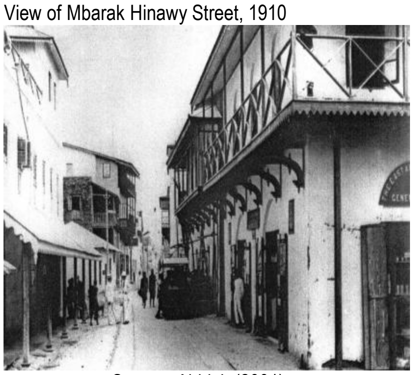
Source: Aldrick (2001).

Plate 4.11
View of Mbarak Hinawy Street, 1898



Source: Aldrick (2001).

Plate 4.12
View of Mbarak Hinawy Street, 1910



Source: Aldrick (2001).

The area west of Ndia Kuu was generally less dense than its eastern side. Fewer buildings were sited in this area, and some had more open land around them. There were also more dwellings of a non-permanent variety, made with mud and thatch. It is only within the last century that the mud and the thatch buildings in this area began to be reconstructed with stone and density began to increase (Aldrick, 2001, 1995; King & Procesi, 1990).

As is normal with all traditional Swahili communities, a system of *Mitaa* or neighbourhoods developed along family or clan lines. A *Mtaa* (singular) generally contained a group of houses whose residents were all members of the same extended family system and who depended on this neighbourhood for much of their social and economic development. *Mitaa* (plural) names were usually derived from a prominent local building or street near the neighbourhood.

In recent years, although the names are still often used, the actual *Mitaa* have become less defined. The reason centres on the fact that more of the extended families are beginning to disburse and other people are moving into the neighbourhoods, blurring some of the distinction (Moriset, Kassim & Ali, 2009; Kusimba, 1999; Aldrick, McCrae, Macdonald & Maitland-Jones, 1997; Middleton, 1992; King & Procesi, 1990). The early pathways that separated some of the Mitaa eventually developed into a system of roads, which are roughly on a north-south axis, running in the same direction as the shoreline, and on an east-west axis perpendicular to the water. Because none of the roads is actually in straight line, the system creates a series of irregularly shaped areas defined by the crooked street boundaries.

The *Mitaa* tend to be houses of related people and some areas have names indicating the origins of the people living there. Other names have been known to refer to features or events in the area at the time. *Langoni* for instance marks the place of the west door or gate in the town (no longer existing). The narrow side streets were never intended for use by motorcars. They are usually referred to as *kitoto* or k*itotoni* (meaning the place of the small children).The common non-motorised transport other than walking is in the form of handcarts or *mkokoteni,* also sometimes called *hamali* carts (Aldrick, McCrae, Macdonald & Maitland-Jones, 1997), (Map 4.7).

With the coming of the British, the system of land development became formalized. The Land Titles Ordinance of 1908 set up a system that divided the town into administrative sections based on the existing roads, and gave numbers to all of the plots. The British system was adapted and simplified after independence. The conservation area is currently divided into 11 administrative sections, XXIX through XXXVI in their entirely, and parts of sections XXV, XXVI, XLII and XLIII (King & Procesi, 1990), (Map 3.1).

4.8 THE OLD TOWN OF MOMBASA TOWNSCAPE

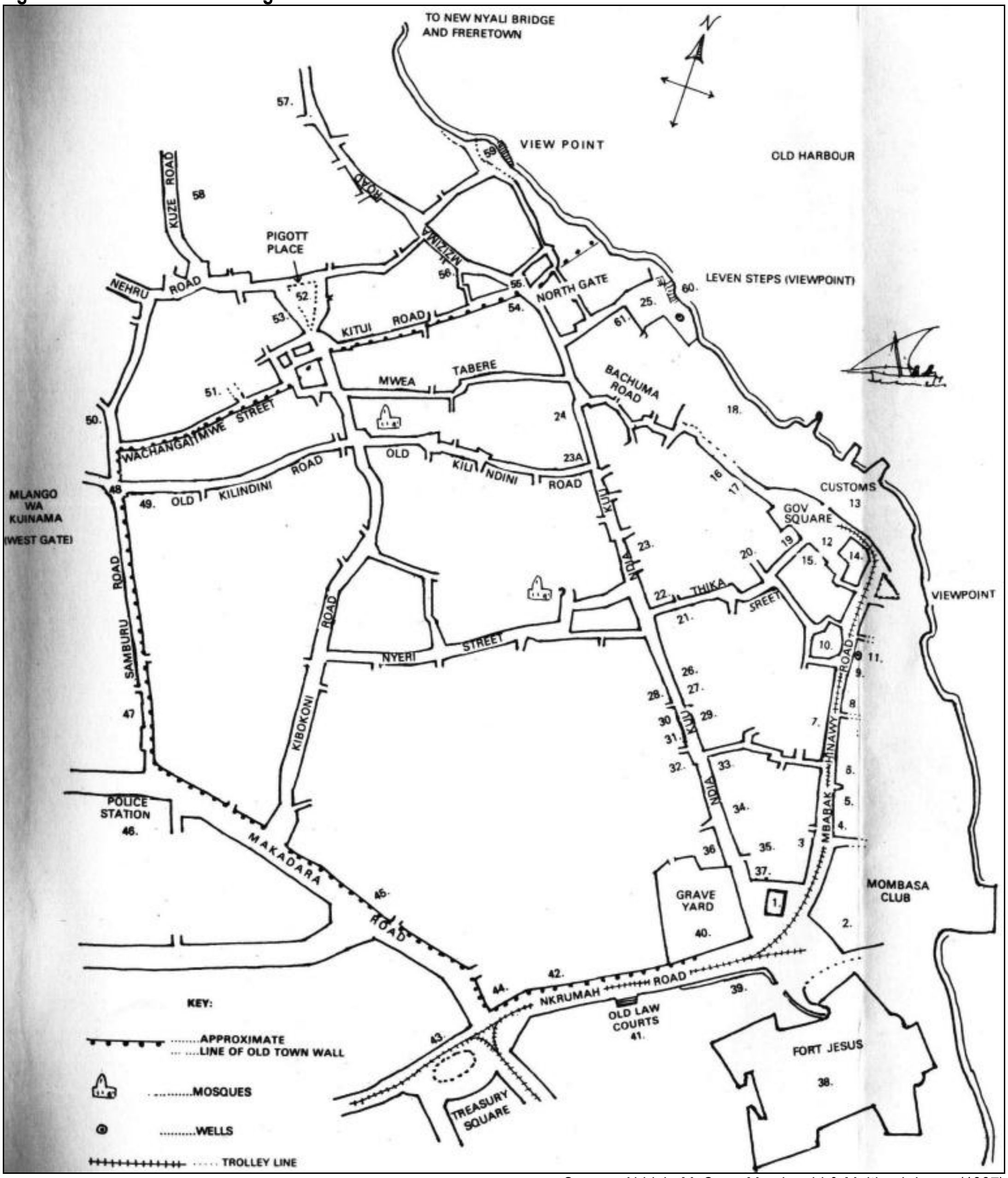
The Old Town of Mombasa is a labyrinth of tiny streets that are straight for short sections within their length, but generally turning, twisting, opening into each other and into private courtyards. The Old Town of Mombasa fits well into Leon Krier's *Quartier,* 'an area of up to 33 hectares within which there would be all urban functions' (Broadbent, 1990, p. 196). The population of such an area is idealized to be 10000 to 15000 people including working and culture. It is the size in which a person can cross in less than 10 minutes. The Old Town of Mombasa bears a lot of similarity with most traditional Islamic towns where 'one of the key physical features is the dense network of narrow wandering alleyways, public open spaces being small and irregular, through routes being relatively rare, and with numerous cul-de-sacs' (Larkham, 2005, p. 45).

A visitor to the conservation area usually approaches along Nkrumah Road from the central business district (Map 4.7). The first view of the area would be the large garden and administrative buildings located at Treasury Square. The garden contains a number of old trees, benches and small pavilion, which serve as a welcome shade from the strong tropical sun (King & Procesi, 1990). The surrounding buildings, with their pediments, arches, columns and verandas definitely give a strong air of the administrative function that they contain. Overall, Treasury Square could be delineated as the most formal space in the conservation area (Plate 4.13 and Plate 4.14).

Continuing past Treasury Square and the old Law Courts Buildings, with the impressive clock tower, the visitor would next arrive at the imposing presence of Fort Jesus. The fort, which sits on the south side of the road, forms a very strong barrier forcing one's attention to the north.

This area, the intersection of Ndia Kuu, Mbarak Hinawy Road and Fort Jesus, forms a true entrance to the Old Town.

Map 4.7
Significant Streets and Buildings in Old Town of Mombasa

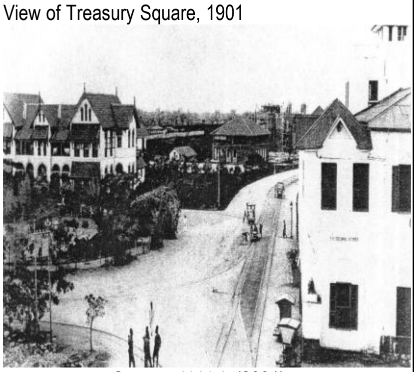


Source: Aldrick, McCrae, Macdonald & Maitland-Jones (1997).

Key

1 Jubilee hall	22. Hansing & Co.	43. Grand Hotel/ Standard Bank
2. Mombasa Club	23. Reitz's Grave	44. East African Standard Offices
3. Anils Arcade	24. 1st Library	45. Datoo's Auction House
4. Acraf House	25. View Point	46. Central Police Station
5. Ali's Curio Shop	26. White House	47. Samburu Road Houses
6. Dalal House	27. Criterion	48. Mlango wa Kuinama
7. The Africa Hotel	28. Swahili Bakery	49. Bandri Road
8. Old Standard Bank	29. Balcony House	50. Badala Mosque
9. Indian Plasterwork	30. Pandya House	51. Memon Mosque
10. Mandhry Mosque	31. Bismarck Soccer club	52. Piggot place
11. Mandhry Well	32. Whiteways	53. Glen's Building
12. Government Square	33. Lookmanji	54. Ithna Asheri Mosque
13. Customs House	34. Staircases	55. North Gate
14. Old Post Office	35. Mosque	56. Kitovuni-Pillar House
15. Allidina Visram/ Sanaa Gallery	36. Old Edward St. Store	57. Mkanyageni Mosque
16. Scent Emporium	37. Ali's Curio Market	58. Jmat Khana
17. Italian Consulate	38. Fort Jesus	59. Old Fish Market
18. Bohora Mosque	39. Wavell Memorial	60. Leven Steps
19. The Old Treasury	40. Mazrui Grave Yard	61. Leven House
20. Berkely Place	41. Old Law Courts	
21. The Club	42. Cecil Hotel/ Bank of India	

Plate 4.13
View of Treasury Square, 1901



Source: Aldrick (2001).

Plate 4.14
View of Treasury Square, 2010

Source: Author (2009).

4.8.1 Streetscape

Ndia Kuu and Mbarak Hinawy roads range in width from 6 to 10 metres and are lined along both sides with two and three storey buildings. Most of the buildings are very simple in their appearance. Decoration may include carved or arched doors, or possibly a stringer, and almost all the windows have wooden shutters. However, the buildings are somewhat modest. This plain character is punctuated by some buildings, which stand out from their neighbours because of the beautifully carved wooden balconies and fine plasterwork. The varying façade treatments together create an interesting street pattern (Plates 4.15 and 4.16).

Plate 4.15
View of Ndia Kuu

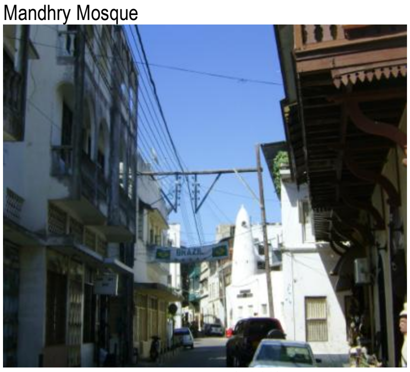
Source: Author (2010).

Plate 4.16
View of Mbarak Hinawy Road

Source: Author (2010).

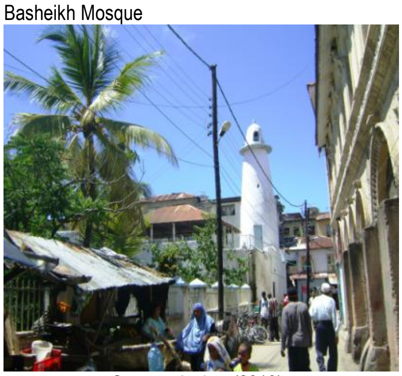
A particular feature that occurs along Mbarak Hinawy road is the very distinctive minaret on the Mandhry mosque (Plate 4.17). The minaret, a cone shaped tower, becomes the natural focus of the eye as one walks down the street. This form is specific to some Swahili mosques and also occurs in the Basheikh Mosque on Old Kilindini Road (Plates 4.17 and 4.18)

Plate 4.17
Mandhry Mosque



Source: Author (2010).

Plate 4.18
Basheikh Mosque



Source: Author (2010).

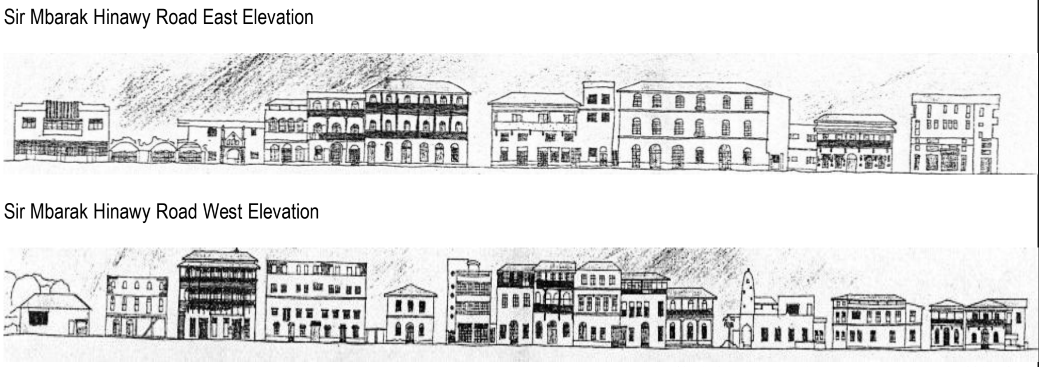
Some of the buildings along these two streets were originally designed with shops on the bottom storey. The old shop houses can still be discerned today by the Gujarat style carved doors, which usually signified the business entrance. Many of these shops have now been converted into residential space, but there are some that still have their original commercial use. Since there are a few *barazas* (stone benches) located along these streets, people often sit on their front steps in order to carry out the important social interaction that is common to street life in Swahili culture.

The streetscape of Ndia Kuu and Mbarak Hinawy roads is similar in many ways to that of the smaller streets, such as old Kilindini Road, Kitui Road and Nyeri Street. These roads tend to be somewhat narrow, however, and not as active as the larger ones (King & Procesi, 1990). Two roads with different streetscape pattern are Kibokoni and Samburu Roads, which are lined, for the most part with a later style of shop house that was constructed between 1930 and 1950 (Kiamba, 1995a; King and Procesi, 1990). These streets are characterised by an almost continuous line of large commercial type doors, used as business entrances. Many contain import/ export and wholesale establishments, and many more are used as storage spaces.

4.8.1.1 Mbarak Hinawy Road

Mbarak Hinawy road runs between the Mombasa Club and Jubilee Hall and brings one into old town past the Mandhry mosque to Government Square (Map 4.7), (Figure 4.3). This road takes its name from Sir Mbarak bin Ali Hinawy who was the *liwali* (i.e. representative of the sultan of Zanzibar, the former ruler of the coastal strip) from 1931 to 1959. This road was previously known as Vasco da Gama Street, although the famous Portuguese sailor never actually set foot in Mombasa, being deterred by the warlike attitude of the inhabitants as he sailed by in 1498, en route to India (Aldrick, McCrae, Macdonald & Maitland-Jones, 1997).

Figure 4.3
Mbarak Hinawy Road Elevations



Source: Author (2009); Adapted from King & Procesi (1990).

Varieties of buildings occupy the zone between the Old Port and Mbarak Hinawy Road, and most are oriented towards the road rather than the harbour. Mbarak Hinawy Road is a convenient landside boundary of the urban waterfront zone. Mombasa Club, built in 1897 by Rex Bousted, is a good example of a building located along this road. It served the expatriate community throughout the British colonial period, and continues beyond its centenary to flourish as a multiracial, international social venue, occupying a prime site overlooking Fort Jesus and the entrance to the Old Harbour from the Indian Ocean (Hoyle, 2002; Aldrick, McCrae, Macdonald & Maitland-Jones, 1997; King & Procesi, 1990).

Several buildings along the Mbarak Hinawy Road are of interest because of their connections with the early development of Mombasa as a European trading settlement, and for their modern role in the developing tourism economy of the Old Town. Many tourists who visit Fort Jesus also make a brief detour into the Old Town along Mbarak Hinawy Road or Ndia Kuu, where numerous shops sell artefacts and souvenirs of varying style and quality. Arcaf House is a modern construction on a site where a fine two-storey building, occupied in the 1890s by William Oswald & Company existed. In contrast, a neighbouring building on the east side of the road remains largely unaltered since the time when it was occupied from 1903 by Thomas Hulton & Sons, general merchants and safari agents (Hoyle, 2002), (Map 4.7).

4.8.1.2 Ndia Kuu

This street has existed since the Portuguese times, when it was known as *La Rapozeira* [the fox hole] (Aldrick, McCrae, Macdonald & Maitland-Jones, 1997), (Figure 4.4). The houses along this street were built by the Indian businessmen who came to Mombasa during the second half of the 19th Century, and who rented them to organisations such as the Church Missionary Society and the Imperial British East Africa Co. (King & Procesi, 1990). The street contains many a fine collection of carved doors and plasterwork.

Figure 4.4
Ndia Kuu Elevation

Ndia Kuu Street East Elevation

Source: Author (2009), updated from King & Procesi (1990).

4.8.2 Neighbourhoods

King and Procesi (1990), identify three types of neighbourhoods in the Old Town of Mombasa.

- The Swahili styled neighbourhood
- The Mombasa styled houses
- The water front area near Fort Jesus

All are located behind the solid walls formed by street front buildings, and entrance to these areas is by way of narrow alleyways between some of the buildings.

The Swahili neighbourhoods are found on the interiors of section XXIX, XXX, XLII and parts of XXXIV (Map 3.1). The predominant building type, the Swahili house, a one-storey structure that is rectangular in plan (Plate 4.19), is being replaced by high rise flats (Plate 4.20).The pathways, which are all pedestrian, are defined by the facades of the buildings and are often crooked or make sudden turns with the variation of plot sizes and shapes. The buildings are generally detached and unless blocked by an owner, there are pathways on all four sides of each building. Many of the houses have *barazas* at their front façade, and much of the social life of the area takes place within these informal meeting spaces created in the alleys (King & Procesi, 1990). The overall atmosphere of the Swahili neighbourhood can be characterized as informal and inviting of social interaction (Del-Bue, 1986).

Plate 4.19
Swahili House

Source: Author (2010).

Plate 4.20
Flats replacing the Swahili House Type

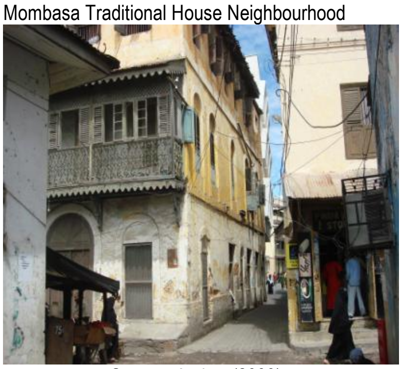
Source: Author (2010).

In contrast to the Swahili areas, the neighbourhoods with the traditional Mombasa houses are much less conducive to public interaction (Plate 4.21). The buildings are two or three storeys and sit along narrow alleyways that follow the irregular shapes of plots. Due to the heights of buildings, these areas are denser than the Swahili neighbourhoods, and the alleyways are much less conducive to stopping and socializing with neighbours (King & Procesi, 1990). Instead, they push the pedestrian along towards his/her destination. Where the alleyways widen, the residents sometimes create informal gathering places. Carved doors, carved wooden balconies or wrought-iron balconies, external staircases and ornate plaster carvings, characterize traditional Mombasa houses. These neighbourhoods are located in sections XXXI, XXXIII, XXXV, XXXVI, and parts of XXXIV (Map 3.1).

The third type of neighbourhood is found on the waterfront in section XXXII (Plate 4.22). The owners of these plots were particularly important and wealthy people in Mombasa, such as Sir

Ali Bin Salim and Sir Mbarak bin Hinawy, both past *liwali*s (Arab Governors) of Mombasa (King & Procesi, 1990). The plots in this area are slightly larger than those in other areas. Many of the buildings have been radically altered, modernized, or torn down and replaced by new buildings. As a result, there are very few older buildings in this area.

Plate 4.21
Mombasa Traditional House Neighbourhood



Source: Author (2009).

Plate 4.22
Water Front Neighbourhood

Source: Author (2010).

4.8.3 Public Open Spaces

The three main public open spaces in the Conservation Area with the exception of Treasury Square are the Government Square, Piggot Place and the waterfront. The Government Square is given over to loading for the Old Port and as the rubbish collection point for the Conservative Area. Piggot Place (Plate 4.23) is used for parking cars and there is an electrical substation, which is located approximately at its centre. The waterfront has been developed as a park (Plate 4.24).

Plate 4.23
Piggot Place

Source: Author (2010).

Plate 4.24
Water Front, Old Town of Mombasa

Source: Author (2010).

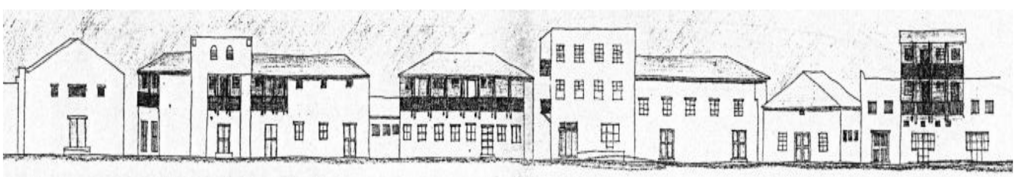
4.8.3.1 The Government Square

The Government Square, strongly associated with European administrators and Asian entrepreneurs in the late 19th and early 20th centuries (Seidenberg, 1996 as cited by Hoyle, 2002), provides access to Mombasa Old Port, which is now managed by the Kenya Ports Authority (Map 4.6 and Map 4.7). The port complex includes the customs building, commercial warehouses and a fish market, which gives rise daily to considerable vehicular and pedestrian traffic, and to substantial quantities of garbage piled high in the open square. On the south side of the square are several buildings that formed part of the early British colonial government/ trading complex in the 1890s (Hoyle, 2002; King & Procesi, 1990).

The curio/ carpet shop, now known as the Lamu Gallery, occupies the site of Mombasa's first Post Office, which later became a temporary immigration office during the First World War (Hoyle, 2002). The dominant building on the south-western side of the square is the Sanaa Gallery, which from 1899 was the house and main office of Allidina Visram (1851-1916). His memorial in Treasury Square indicates that he was a leading Indian merchant and planter, and one of the pioneers who helped to open up the country to trade and civilization (Figure 4.5; Plates 4.25 and 4.26). This building also housed, at different times around the turn of the century, the East Africa and Uganda transport offices, a parcel post office and the National Bank of India (Playne, 1909 as cited by Hoyle 2002; King and Procesi, 1991).

Figure 4.5
Government Square

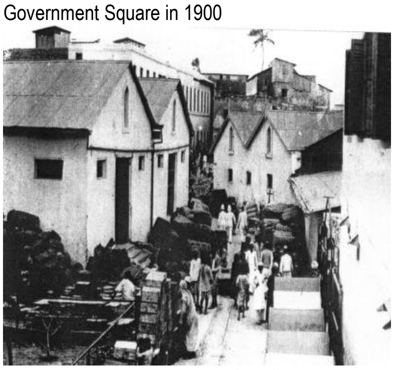
Elevation of the Government Square from the Port



Source: Author (2009); Adapted from King & Procesi (1990).

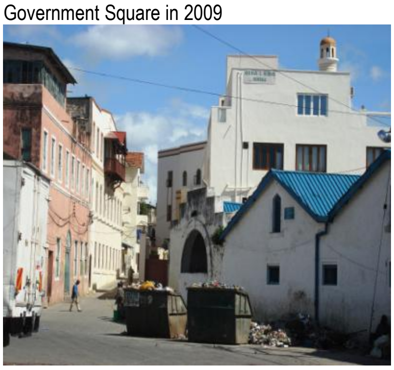
The Government Square received special emphasis in the 1990 Conservation Plan; some improvements, including repaving, have been achieved with financial support from the Kenya Ports Authority and the local Bohora Community. The Bohora Mosque is an important modern building occupying a commanding position overlooking the Old Harbour. Standing on the site of an earlier mosque built in 1901 by the Jeevanjee family, the present mosque was constructed in 1982 as a replica of a mosque in Sanaa, Yemen (Plate 4.27 and Plate 4.28). Those brave enough to ascend the narrow minaret are rewarded with a fine panorama of the Old Town and Harbour (Hoyle, 2002).

Plate 4.25
Government Square in 1900



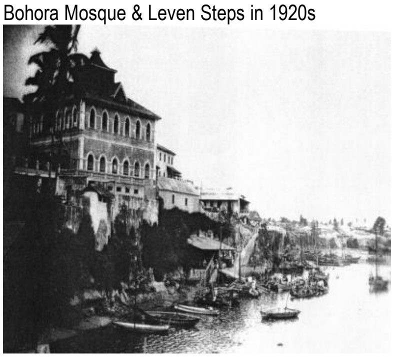
Source: Aldrick (2001).

Plate 4.26
Government Square in 2009



Source: Author (2009).

Plate 4.27
Bohora Mosque & Leven Steps in 1920s



Source: Aldrick (2001).

Plate 4.28
New Bohora Mosque in 2009

Source: Author (2009).

Most of the waterfront buildings north of the Bohora Mosque are residential in character, but at the northern limit of the Conservation Area, there is an old Fish Market with warehouses and the remains of a steep flight of stone steps to the beach. Some of these facilities have now fallen into disuse (Hoyle, 2002; King & Procesi, 1990).

4.8.3.2 Water Front

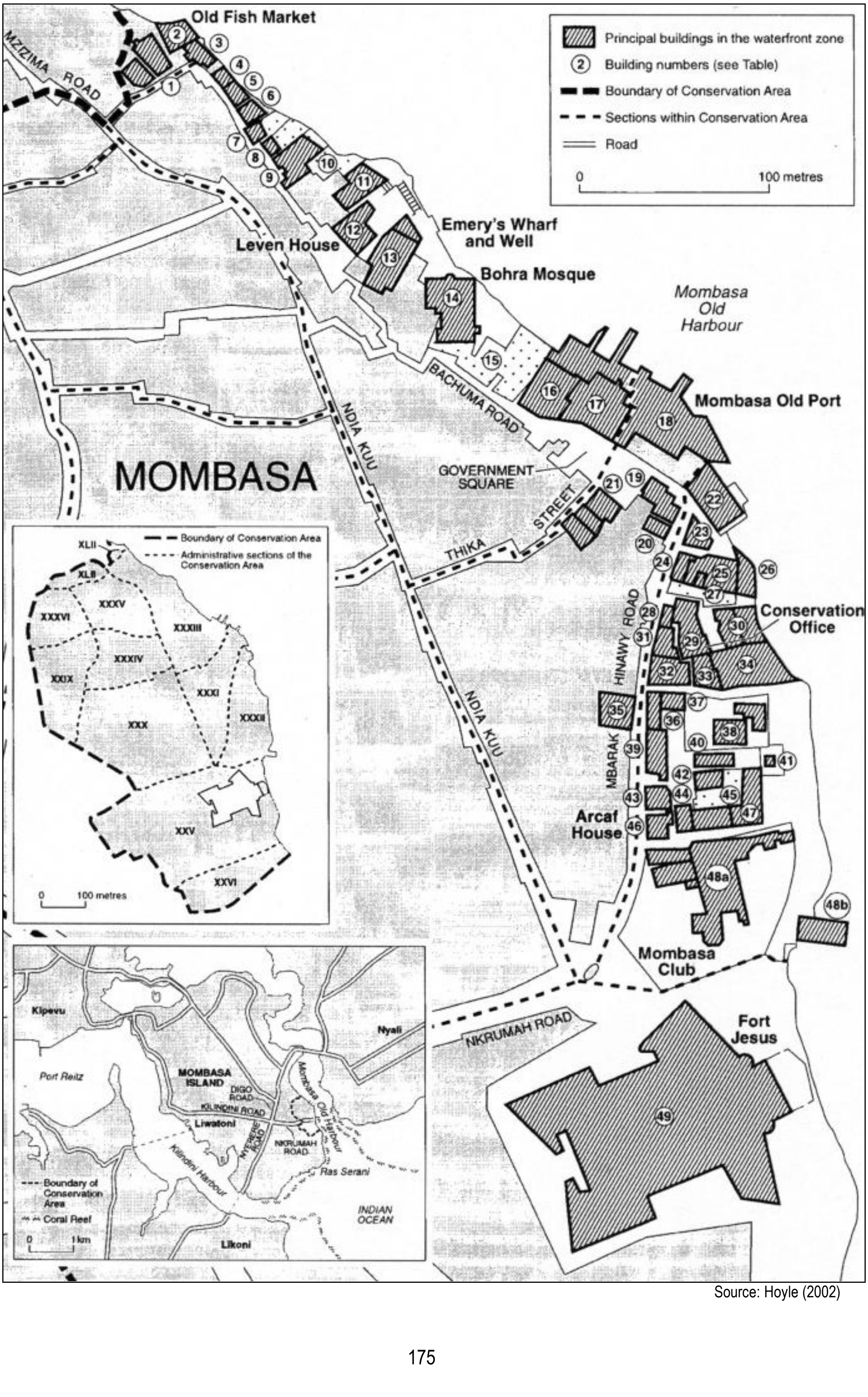
Access to the urban waterfront in Old Town of Mombasa is not clear-cut. Hoyle (2002) explains that:

> '…Unlike Lamu and, for that matter, Zanzibar and Dar-es-Salaam in Tanzania, where the urban core zone faces directly onto the water and provides an area of constant and varied interaction between urban and maritime activities, the Old Town at Mombasa is mostly oriented inwards towards itself and towards the central business district of the modern town, and so to a large extent turns its back on the Old Harbour and the sea' (p. 186)

This is because of the raised coral reefs dating from the Pleistocene period. Moreover, much of Mombasa Island, including the area occupied by the Old Town, is composed of coral reef and coral breccias which provide a somewhat uneven plateau surface along the Old Town waterfront, evidenced by the steep, often almost vertical cliffs between 7 and 10m high (Hoyle, 2002).

The waterfront has no causeway, not even a footpath, along most of the maritime perimeter of the urban conservation area. Public access to the water front is available only at certain points such as Fort Jesus and the Leven Steps (Map 4.8 and Table 4.2). Although certain functional access points, such as the Old Port obviously provide clear exceptions to this general lack of water-oriented activity, many properties, public and private, appear to turn their backs to the water and also, regrettably, to use the sea cliff and the foreshore as a garbage dump (Hoyle, 2002).

Map 4.8
The Waterfront of Old Town of Mombasa



Source: Hoyle (2002)

Table 4.2
The Mombasa Water Front: Building Characteristics

No	Section	Plot	Date	Building/ function	R	S	B	C
1	XLIII	72-3		Fish warehouses	Mb	1		A
2	XLIII	16		Old fish market and steps to beach	Mb	1		P
3	XXXIII	16		Private residential	Mb	3		P
4	XXXIII	17		Pumping station	Mb	1	B	A
5	XXXIII	18		Private residential	Mb	3	B	A
6	XXXIII	19		Private residential	Mb	3	B	A
7	XXXIII	20		Private residential	Mb	3	B	A
8	XXXIII	21		Private residential	F	3	B	A
9	XXXIII	24, 103		Private residential	F	3	B	A
10	XXXIII	25		Open space				
11	XXXIII	6		Private residential	Mb	2	B	A
12∗	XXXIII	33	1906	Leven house	Mb	3	B	P
∗		102	1825	Emery's wharf, well, tunnel and steps				P
13	XXXIII	5		Private residential	Mb	2/3		
14∗	XXXIII	5	1983-4	Bohora mosque	F	1	B	G
15	XXXIII	59-64, 100		Open space associated with Bohora mosque				G
16∗	XXXIII	3		Fish market	Mb	1		A
17∗	XXXIII	101		Old port customs building	Mb	2		A
18	XXXIII	73		Mombasa old port: KPA ware houses	Mb	1		A
19∗	XXXI	8	1899	Lamu gallery (old post office)	Mb	2	B	A
20∗	XXXI	9		Curio shop/ private residential	Mb	2	B	A
21∗	XXXI	10		Sanaa gallery (Allidina Visram's house)	Mb	2	B	A
22	XXXII	14		Private commercial warehouse	Mb	1		P
23	XXXII	15		?				
24	XXXI	12		Residential				
25	XXXII	7		Private residential/ storage	Mb	2		P
26	XXXII	4	1989	Private residential	T	4	B	G
27	XXXII	16		Private drive way to plot 19				
28∗	XXXII	17	1901	Mandhry mosque well				A
29	XXXII	18	1930s	Conservation office	F	2		G
30	XXXII	12, 19	1970s	Private residential block of flats	F	2		G
31∗	XXXII	6	Pre-1914	Traditional residential houses	Mb		B	P
32∗	XXXII	23		Private residential/storage, Nansherd & co.			B	P
33	XXXII	22	1990	Modern private house	F	3	B	G
34	XXXII	13, 20, 21	1880s	Private residential	F	4	B	G
35∗	XXXI	5	1904	Private residential, former Africa hotel	Mb	3	B	P
36	XXXII	25	After 1909	Private residential	F	3		P
37	XXXII	24		Private residential	F	4		A
38∗	XXXII	9a, 9b	1980s	Private residential, multiple occupancy	Mb	2		A
39	XXXII	26	1951	Private residential	Mb	2	B	P
40	XXXII	27		Private residential, older buildings altered	Mb	3	B	G
41	XXXII	8		Sewerage station	F	1		A
42	XXXII	28		Private storage/ commercial	Mb	2		A
43∗	XXXII	34	1900	Residential/commercial, curio shop	Mb	2	B	P
44	XXXII	33		Private residential, multiple occupancy	Mb	3	B	G
45	XXXII	29, 31-32		Private open land				
46	XXXII	35	1978	Acraf House: residential/ offices/ curio shop	F	4		G
47	XXXII	30		Private residential	F	3	B	P
48a∗	XXXII	1	1897	Mombasa club	T	3	B	G
48b		36		Swimming pool				G
49∗	XXV	80	1596	Fort Jesus	F/T	3	B	R

No — Number of plot or buildings as shown on the map
Section — Old Town planning zone
Plot — Plot number
Date — Year of first construction/ opening, where known
R — Roof: Mb=Mabati (Corrugated iron); T=tiles; F=flat
S — Number of storeys
B — Balcony or veranda on one or more levels, sometimes enclosed
C — Condition: R=Restored (with completion year); Good=good; A=adequate; P=poor; D=derelict; C=construction/renovation in progress
∗ — Listed buildings of architectural significance (Source: Hoyle 2002)

4.9 Physiographic and Natural Conditions

Mombasa District lies within the coast lowland, which rises gradually from the sea level in the east to slightly over 76.2m above the sea level in the mainland west. The highest point is found at Nguu Tatu Hills on the mainland north, which rises to 122m above sea level (Kenya, 2002). The weather patterns in Mombasa are dominated by the Northeast monsoon, which blows from November to March, and the southwest monsoon, which blows from April to October. The hot season occurs during the northeast monsoon, with the two hottest months being February and March. At this time the temperatures range between 35^0c and 37^0c and the relative humidity reaches between 70% and 80%. During these two months, it can be uncomfortable to walk in Mombasa. The two coolest Months, July and August are more pleasant with temperatures in the range of 22^0c and 27^0c (Kenya, 2002, King & Procesi, 1990).

The total annual rainfall varies between 1015-1270 mm, with a mean of 1040 mm (Kenya, 2002). The rainfall pattern is characterized by two distinct long and short seasons corresponding to changes in the monsoon winds. The long rains occur in March-July and average 655 mm with a peak of 330 mm in May and correspond to the South Easterly monsoons. The average total annual rainfall during the long rains is about 655 mm, with a reliability of 60 per cent (Kenya, 2002). The short rains start towards the end of October lasting until December, and correspond to the North Easterly monsoons, which are comparatively dry. The short rains average a peak 240 mm, with about 100 mm in November. The annual mean temperature is 26.4^0c with a minimum of 21^0c and a maximum of 32^0c. The hottest month is February, with a maximum average of 32^0c while the lowest temperature is in

July. Average humidity at noon is about 65 per cent (Kenya, 2002; Kenya Meteorological Department, 1984).

4.10 Discussion

Mombasa is an old city. It was an established settlement centuries before the European colonial powers came to East Africa. It dates back to the medieval times, when it was an important Islamic trading port and one of the main centres of Swahili civilization that flourished along the East African littoral between the 13 and 15th centuries. The natural setting of Mombasa affords it several advantages. The protected harbour with deep anchorage, a moderately high coral rock island to settle on with good but controllable connections to the main land provided a key site to exercise influence.

The distinctive pattern of the Old Town of Mombasa has survived many changes and absorbed numerous developments over the past, but retains its inherent artistic and architectural values as well as a thriving community. The deterioration of the building stock and the worsening condition of the townscape compromises the historical quality of the Old town. The Old Town of Mombasa reflects the policies and choices made at the local and national level through the legal framework. It is also a physical imprint of a culture and its evolution over time. Since culture is integral with the built form, and is of high quality, conservation of this urban historic area is called for, to ameliorate the deterioration of this cultural artefact and to enhance its great diversity.

CHAPTER FIVE: DATA ANALYSIS AND DISCUSSION

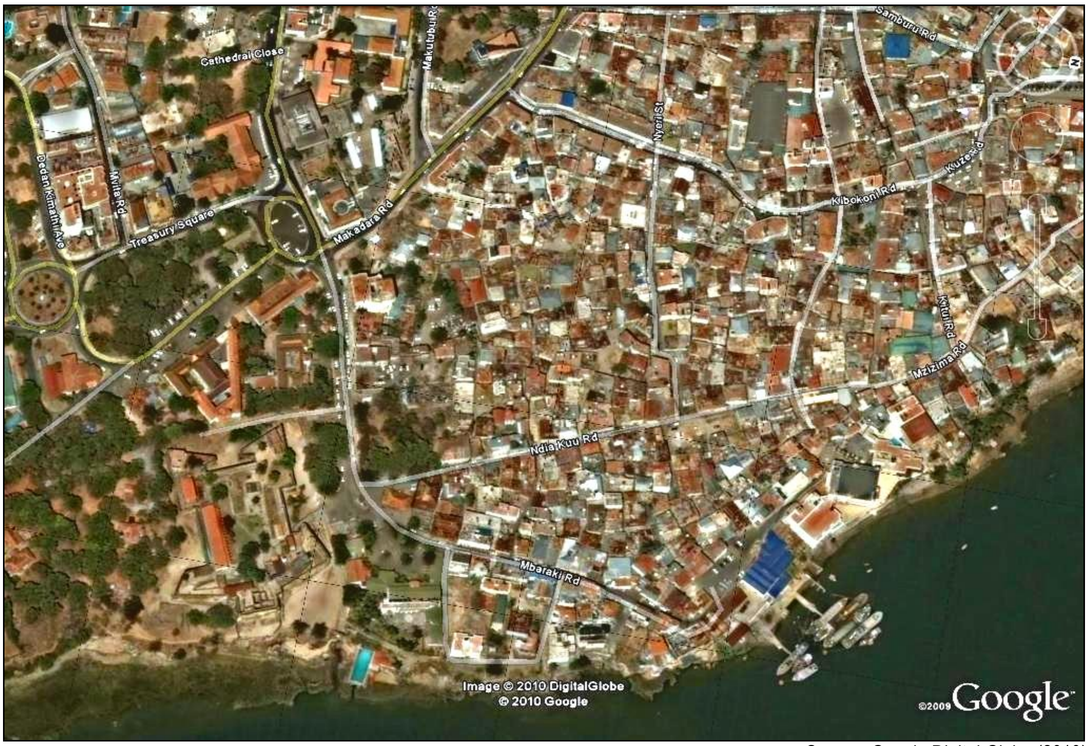
5.1 Introduction

This chapter looks at the typo-morphological characteristics of the Old Town of Mombasa. Figure-ground analysis of the area is undertaken. The chapter delves into the attitudes that residents hold about the built environment. Using factor analysis, the latent structure of the large data set is uncovered. The underlying dimensions of perception are then identified and the attendant models presented.

5.2 Typo-morphological Attributes of Old Town of Mombasa

The Old Town of Mombasa has a distinctive spatial pattern (Plate 5.1). It has survived many changes and absorbed developments over millennia and it continues to function as a community. The conservation area (Kenya, 2006, 1984a, 1984b; King & Procesi, 1990) in Old Town of Mombasa is approximately 31 hectares (Map 1.1 and Map 1.2) and is the area under study. The Old Town of Mombasa has been inhabited by a richly diverse group of communities: aboriginal Africans, Arabs, Asians, Portuguese and the British, who have co-existed for hundreds of years. The various social, political, religious and economic activities of these groups have created a distinct character and culture, which together has come to define this old town. The visible aspect of this unique character is a collection of historical buildings dating from the 16th century, which combines, African, Arabic and European influences. Many of these buildings still exist, with beautifully carved doors as well as elegantly styled balconies attached to their turn of the century facades (UNESCO, 2010; Moriset, Kassim & Ali, 2009; Kiriama, 2005; Hoyle, 2002; Kusimba, 1999; Middleton, 1992; King & Procesi, 1990).

Plate 5.1
An Aerial View of Old Town of Mombasa



Source: Google Digital Globe (2010).

5.2.1 Figure-Ground Study of Old Town of Mombasa

The figure-ground theory is founded on the study of relative land coverage of buildings as *solid mass* to open *voids* (Trancik, 1986).The solid mass is also referred to as *figure* and the void as *ground*. The Old Town of Mombasa urban historic environment has a complex pattern of solids and voids (Figure 5.1 and Figure 5.2), and the figure-ground approach clarifies the structure of its urban space by establishing a hierarchy of spaces of different sizes that are individually enclosed but ordered directionally in relation to one another.

The figure-ground approach provides an immediate understanding of the Old Town of Mombasa's urban form by rendering solids as *black* and voids as *white* to represent the vegetation, streets, open spaces and courtyards. The Indian Ocean is rendered blue. The old town is thus conceived as an enormous mass carved away to create outdoor rooms. The dark and light patterns of the Old Town of Mombasa reveal that public spaces are conceived no less carefully than buildings.

In the Old Town of Mombasa, public or semi-public spaces possess a distinct character whether it is a mosque interior, courtyard or public urban space. The Government Square, one of the most important open spaces in Old Town of Mombasa (Map 4.6 and Plate 4.29) is easily identified as a *figural* element in the city, with the surrounding buildings acting as a back up field or *ground* into which the element has been placed, or rather, carved away.

Figure 5.1
Old Town of Mombasa Urban Solids: *the Form is depicted by the black rendering.*

Source: Author (2010).

Figure 5.2
Old Town of Mombasa Urban Voids: *the Anti –form is depicted by the black rendering.*

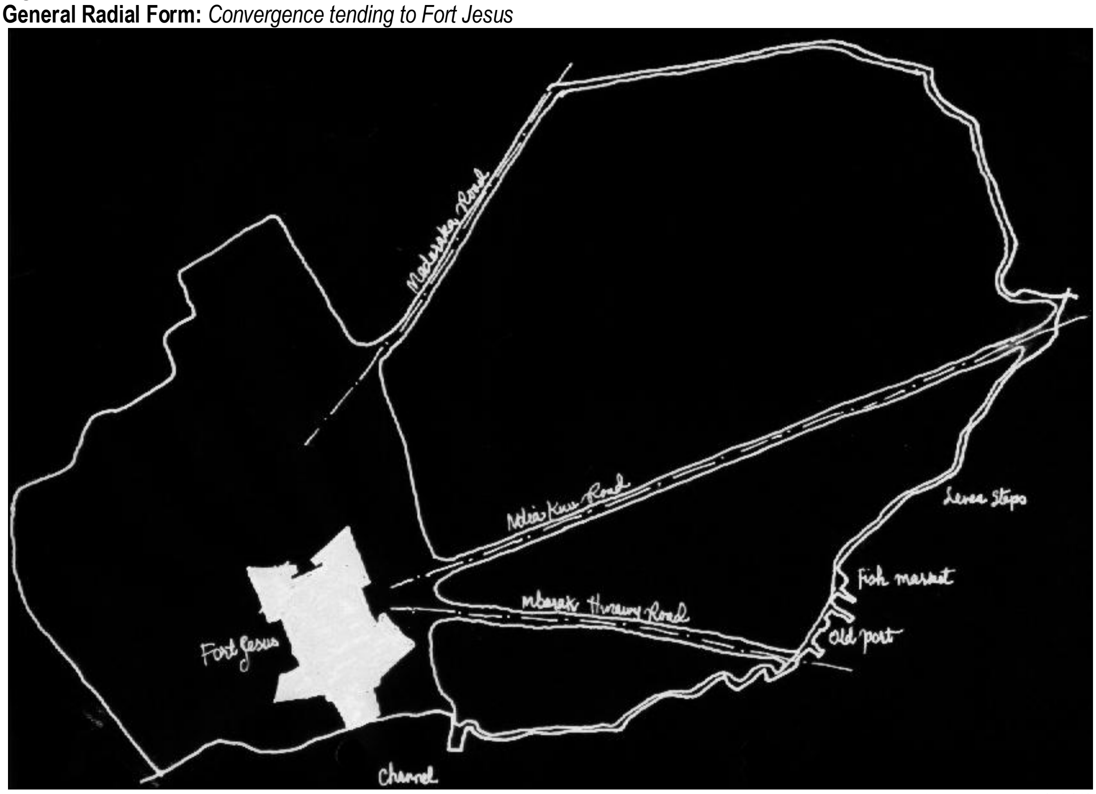
Source: Author (2010).

Figures 5.1 and 5.2 reveal the Old Town of Mombasa as a clearly defined system of solids and voids. Except for area around Fort Jesus (the largest building in Figure 5.1), the building coverage is denser than the exterior space, thereby creating positive voids or space-as-object (Trancik, 1986). The open space or the anti-form as shown in Figure 5.2 is carved out of the building mass. It is contiguous since the internal and external space are linked forming spatial continuity. The open space in Old Town of Mombasa is more figural than the solids that define it. The Old Town of Mombasa is an elaborate mesh between the block pattern and the individual buildings, which is rendered intelligible and vivid through this simple graphic convention.

The Old Town of Mombasa takes a general radial-concentric network, albeit with disfigurations, with three axis of open spaces (streets) emanating from Fort Jesus and spreading roughly in a radial manner across the whole conservation area (Figure 5.3). The core, Fort Jesus, is both a symbolic and functional centre for this organisation. It is a visually dominant form, and the radiating streets are subservient to it.

This general pattern of the Old Town of Mombasa is best seen and appreciated from an aerial view. When it is viewed from the ground level ‘its central core element may not be clearly visible, and the radiating pattern of its linear arms may be obscured or distorted through perspective (Ching, 1979, p. 81). Combinations of grid, angular axial and organic patterns are also evident (Figure 5.4).

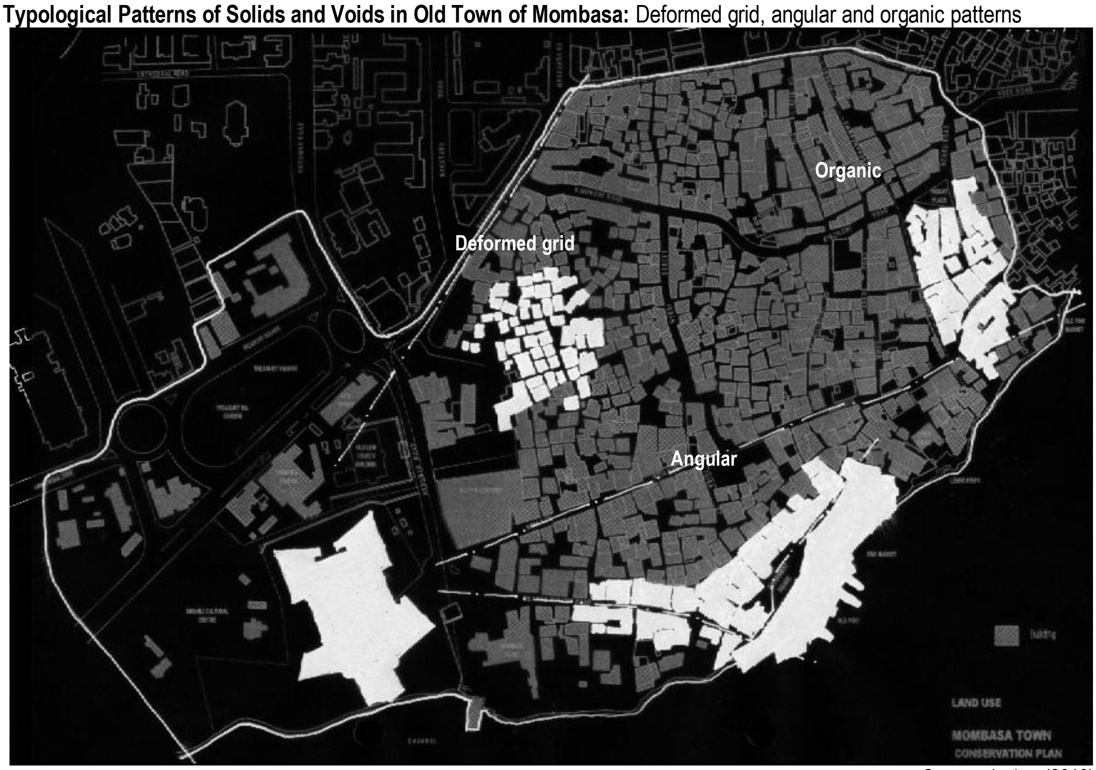
Figure 5.3
General Radial Form: *Convergence tending to Fort Jesus*



Source: Author (2010).

The radiating arms in the Old Town of Mombasa are represented by Makadara Road, Ndia Kuu and Sir Mbarak Hinawy Road.

Figure 5.4
Typological Patterns of Solids and Voids in Old Town of Mombasa: Deformed grid, angular and organic patterns



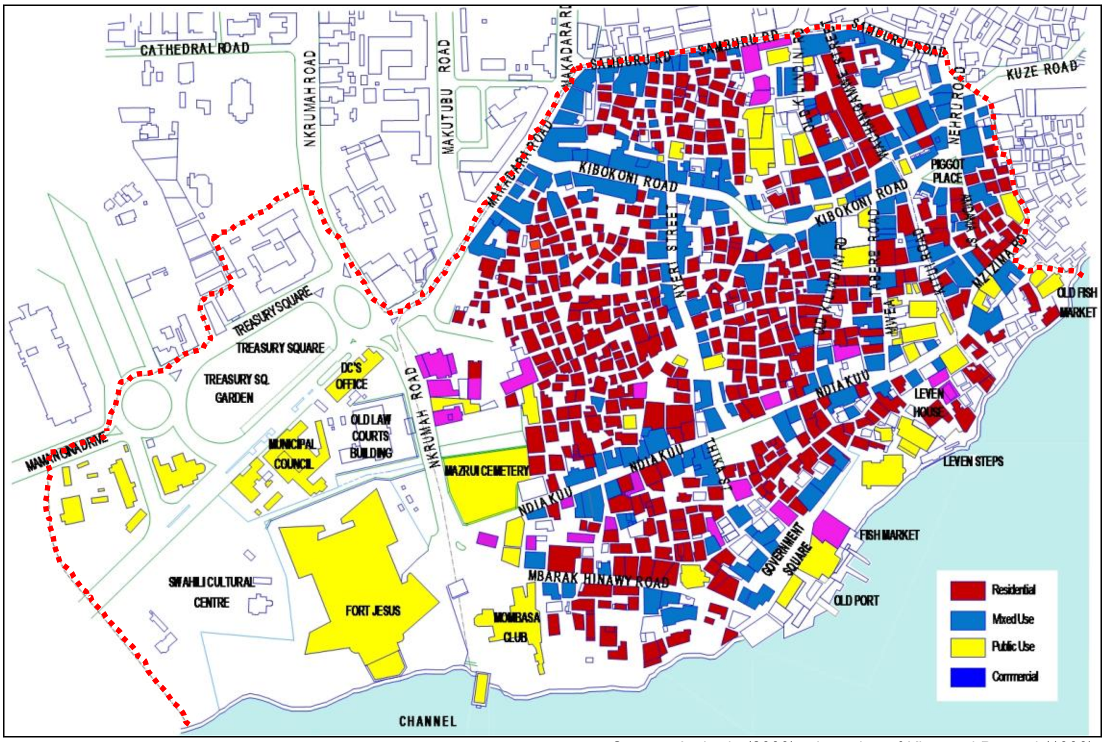
Source: Author (2010).

The patterns presented in Figure 5.4 represent the various plot patterns. They are irregular, related to one another in an inconsistent manner, generally asymmetrical and dynamic.

5.2.2 Land Use Patterns

In the Old Town of Mombasa, various land uses are evident (Map 5.1). These include residential, mixed use (residential and commercial), commercial, public purpose (religious and government administrative use). King and Procesi (1990) remark that the Old Town of Mombasa served as the centre of business and administrative life of Mombasa due to its location next to the Old Port and Fort Jesus. However, the growth of Kilindini Port on the other side of the Island shifted the importance of the Old Port (Plate 5.2) and stimulated the movement of many businesses especially those associated with shipping to move closer to the newer port.

Map 5.1
Land Uses in Old Town of Mombasa



Source: Author's (2009) adaptation of King and Procesi (1990).

Plate 5.2
The Old Port of Mombasa before 1982-*View from the Indian Ocean*

Source: Crystal Springs, 7 Star Picture, Mombasa (Pre-1982).

The provision of facilities in the current port buildings is not in keeping with the dynamic evolution of contemporary uses. The port facilities have fallen into disuse due to the drastic decline in dhow trade. However, the little activity in trade is under the control of Kenya Ports Authority (KPA).

The Old Port is no longer a significant attraction to tourists who visited to see the wooden dhows (Plate 5.2). This is exacerbated by the fact that it is also an untidy spot. It boasts an unhygienic toilet block and eating-place. The loading and unloading of lorries in the adjacent government square is also a traffic nightmare. These lorries sometimes damage building balconies and walls in this precinct.

In 1990, King and Procesi recorded that residential plots took up 28% of the conservation area, while plots with some sort of commercial use made up 21%. Mixed use plots, usually consisting of commercial activities on the ground floor and residential spaces on upper floors took up 17% and commercial plots making up the other 4%. Businesses were found to be along the major streets affording them greater visibility although small grocery stores are located within the neighbourhoods, known as *mitaa,* for greater convenience (King & Procesi, 1990).

Curio shops are clustered around Fort Jesus and the Ndia Kuu road as this is the area most frequented by tourists (Map 5.1). Along Kibokoni Road are several wholesale shops. Other commercial activities spread through out the conservation area are; grocery stores, restaurants, video libraries, electrical repair shops and other retail shops. Hawking of vegetables and fruits is also common in Old Town of Mombasa.

Public purpose buildings account for 35% of the total conservation area, but occupy only 6% of the actual number of plots (King & Procesi, 1990). This high ratio is explained by the fact that most are located at the Treasury Square, and are on large pieces of land. Some of these buildings include the Fort Jesus, Municipal Council of Mombasa offices and Mombasa District Headquarters. Behind the Treasury Square is the Old Law Courts Building (Map 5.1).

The conservation area has 13 mosques serving the population in old town, which is predominantly Muslim. There are no primary or secondary schools in the conservation area, although several *madarasa*, teaching Islamic religious education were noted. Two public gardens account for 9% of the conserved area: the Treasury Square and the smaller Wavell Memorial outside Fort Jesus.

The Old Town of Mombasa has many open plots, which are undeveloped and surrounded by buildings. Some have resulted from the collapse of buildings through neglect. These spaces serve as informal playgrounds for children, meeting places for residents, and as places for drying clothes. The Piggot place is underutilised and sometimes serves as a place for auctions (Map 5.1). The waterfront has been improved and upgraded into a small garden for the public. The land uses presented are varied in type. Buildings of different ages coexist in irregular shapes, mixes and alignments. This contradicts the arguments for zoning, which is an aspect of procedural planning that is currently practiced. Overall, the open spaces including streets constitute 58.71 % of the conservation area. The built up space takes the remainder, 41.29% of the total area.

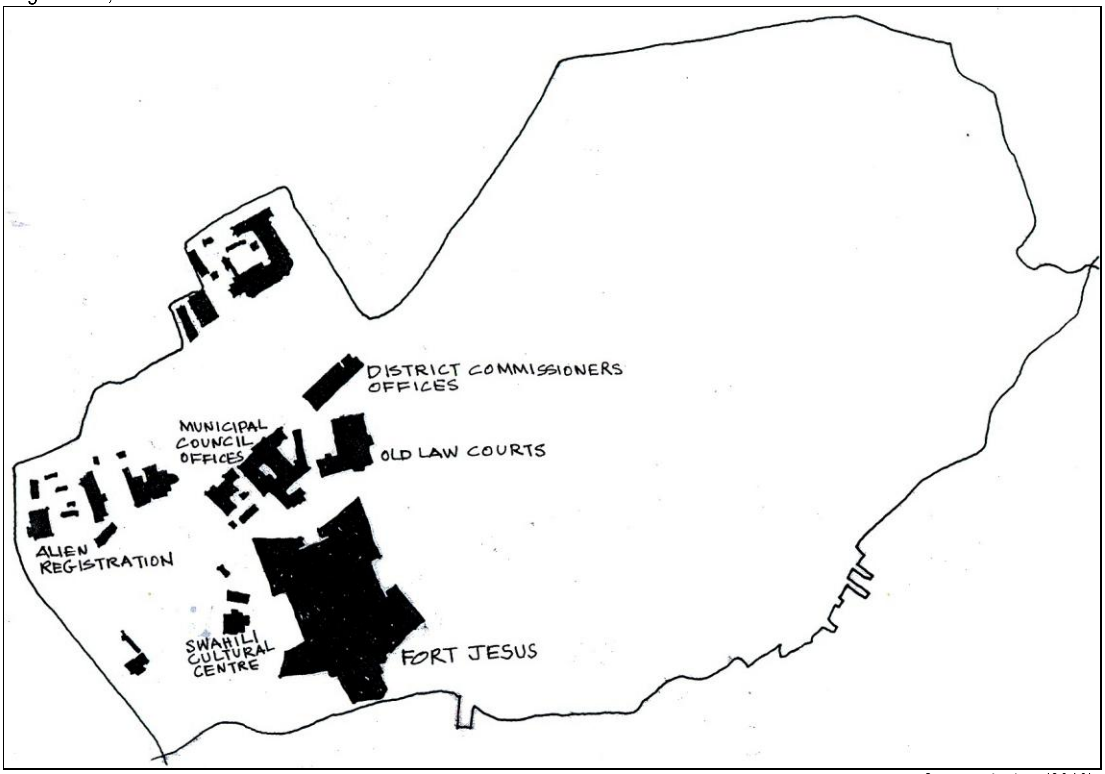
5.2.3 Urban Solids in the Old Town of Mombasa

Trancik (1986) has shown that the figure-ground approach helps in articulating the difference between urban solid and voids. This is important since solids and voids contribute to the design and perception of public space.

5.2.3.1 Public Monuments and Institutions

The first important type of solids can be classified as public monuments or institutions, which serve as centrepieces of a city (Trancik, 1986). In the Old Town of Mombasa, Fort Jesus is the most prominent and forms a visual focus. It sits prominently in an open space announcing its presence and significance. Others include the Old Law Courts building, DC's office and Municipal offices (Figure 5.5). All these buildings are characterised by grand entries.

Figure 5.5
Public Monuments and Institutions: *Fort Jesus, Old Law courts, Municipal Council, Swahili Cultural Centre, Alien Registration, D.C. Office*



Source: Author (2010).

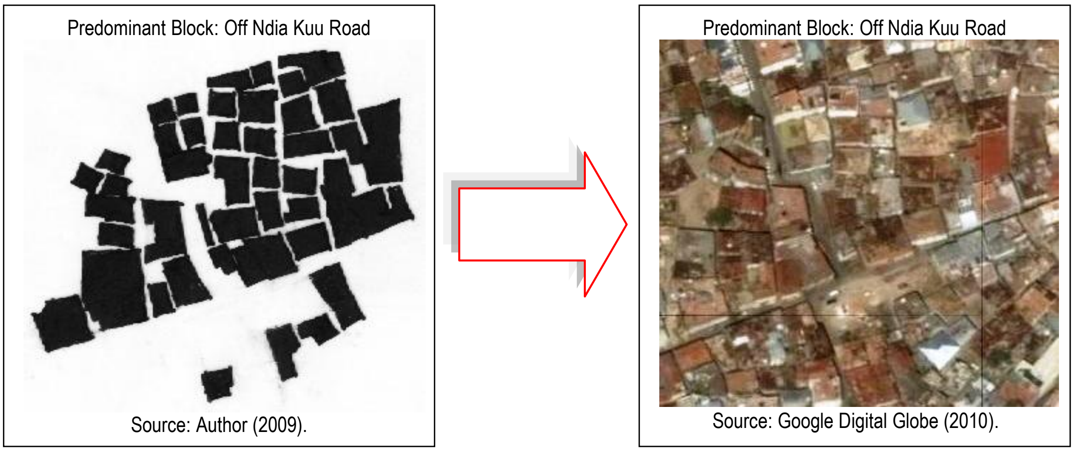
These public monuments act as nodes and are strategic points within Old Town of Mombasa. The observer travels to or from them. They condense particular uses and are the focus of the old town (Figure 5.3). These urban solids fit well within Poète's theory of permanencies (Rossi, 1982). Fort Jesus, in a large measure, reflects the fact that the past is being experienced now, giving meaning to permanencies, which are past and are still being experienced. These monuments reveal persistency, which are very vital physical signs of the past.

Fort Jesus and the Old port have acted as nucleus of aggregation at different times in the development of Old Town of Mombasa. They are dominant and have participated in the evolution of the city over time in a permanent way. They are the principal generators of the urban form of Old Town of Mombasa, and remain constant.

5.2.3.2 Predominant Field of Urban Block

Another category of solids in Old Town of Mombasa is defined by the predominant type of urban block. The size, pattern and orientation of the urban block are the most important elements in the composition of public spaces (Trancik, 1986). Various repetitive shapes of parcels forming a pattern can be identified in Old Town of Mombasa and these are mainly determined by the land use, resulting in districts of consistent forms (Figure 5.6).

Figure 5.6
Predominant Blocks

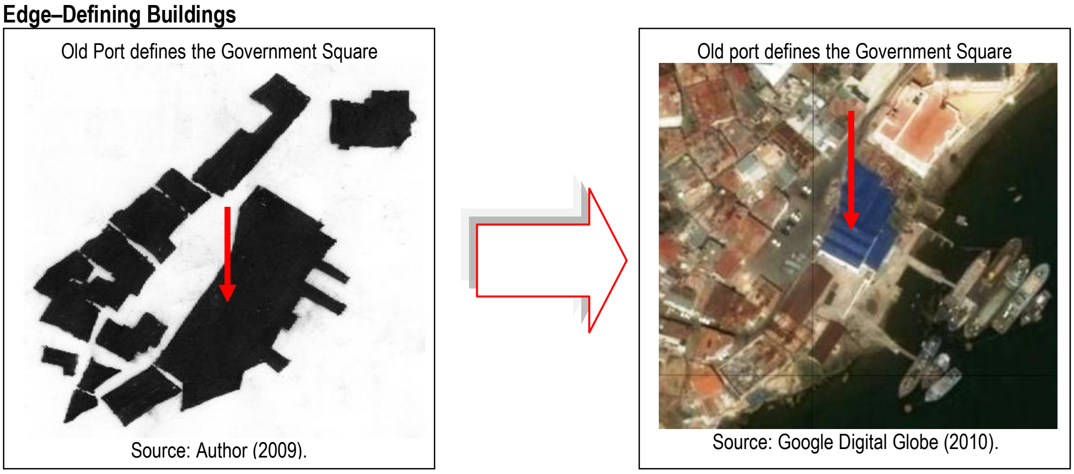


Source: Author (2009). Source: Google Digital Globe (2010).

5.2.3.3 Directional/ Edge-Defining Buildings

The third category of solids is formed by directional or edge-defining buildings. These are generally non-repetitive, specialised forms and often in linear configuration. In the Old Town of Mombasa, edge-defining buildings are exemplified by the buildings along the waterfront that violate the dominant urban block field. They are also found along Mbarak Hinawy road and Ndia Kuu Roads where they conceal the character of the buildings behind them and define axial lines of movement. The buildings along the waterfront are also edge-defining solids (Figure 5.7).

Figure 5.7
Edge–Defining Buildings



Source: Author (2009). Source: Google Digital Globe (2010).

5.2.4 Urban Voids in the Old Town of Mombasa

There are certain definable urban voids in the Old Town of Mombasa. These are carved out of the solids to provide functional and visual continuities. Five types of urban voids with different degrees of openness and enclosure are identified.

5.2.4.1 Entry Foyer

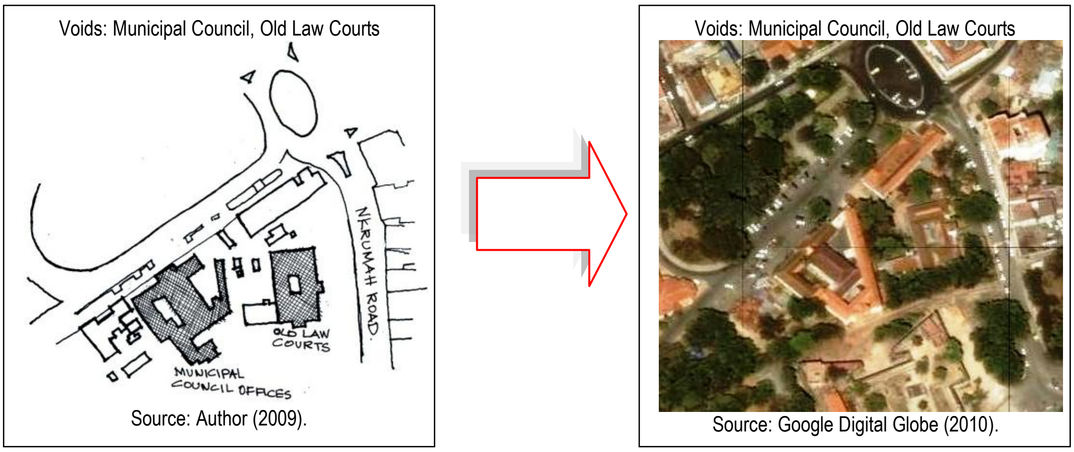
The entry foyer (Figure 5.8) establishes important transitions from private to public territory. An example in the Old Town of Mombasa is the transition space as one enters the Mombasa club, a private entity.

Figure 5.8
Entry Foyers in Old Town of Mombasa

5.2.4.2 Inner Block Void

The inner block void is another type of an urban void found in the Old Town of Mombasa. It provides a place for utility. In the Old Law Courts, the void is used as a circulation area. The Municipal Council of Mombasa building has a courtyard. Fort Jesus presents an extensive inner void form in which other lesser structures are situated. Courtyards in private and public buildings also fall into this category (Figure 5.9). The courtyard house is not common in Old Town of Mombasa.

Figure 5.9
Block Voids in the Old Town of Mombasa



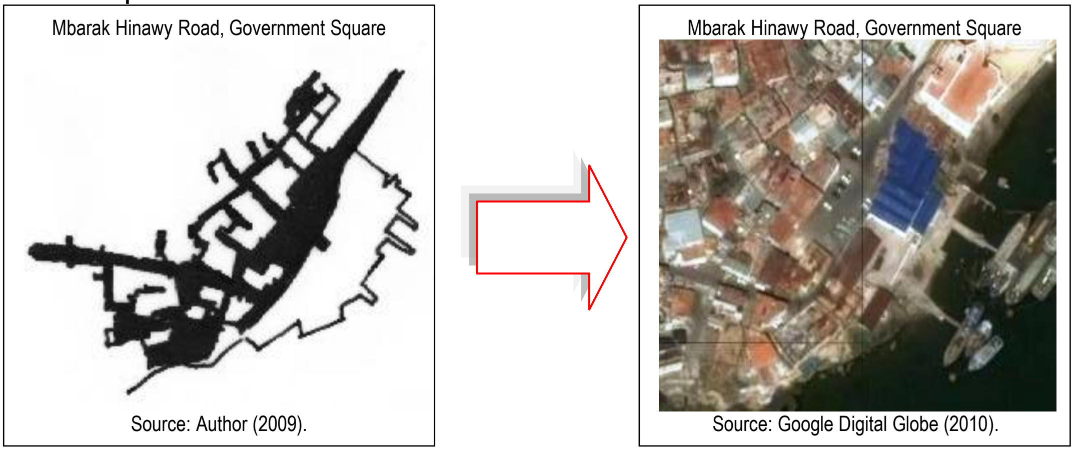
5.2.4.3 Primary Network of Streets and Squares

The third category of voids is the primary network of streets and squares. In the Old Town of Mombasa, the streets and squares unify the area and contain active public life (Figure 5.10 and Figure 5.11). Two large squares are very vibrant: the Treasury Square and the Government square. Other areas where buildings have either collapsed or been demolished also serve as smaller squares where children can be seen playing. The streets in the Old Town of Mombasa contain a very active community life. People gather to talk and shop and tables are set out for dinning purposes especially in the late afternoon and evenings. The streets are thus community foci. The variety of street morphology is a good recipe for vitality.

The high density of building arrangements create a network of roads and paths best suited to pedestrian use, that is peripatetic, along which are shops, house entrances, *dakas* and *barazas* providing points for observation and social interaction. Balconies and verandas further allow interaction between the private and public sphere of the street. The street actually acts as a living room for the whole community (Varkey, Roesch, 1981). Sometimes the roads widen up into squares and public places accommodating trade.

Squares are produced by the grouping together of buildings around an open space, affording a high degree of control of the inner space. In the Old Town of Mombasa, commercial and cultural activities are deemed appropriate functions to a square.

Figure 5.10
Street and Squares in the Old Town of Mombasa



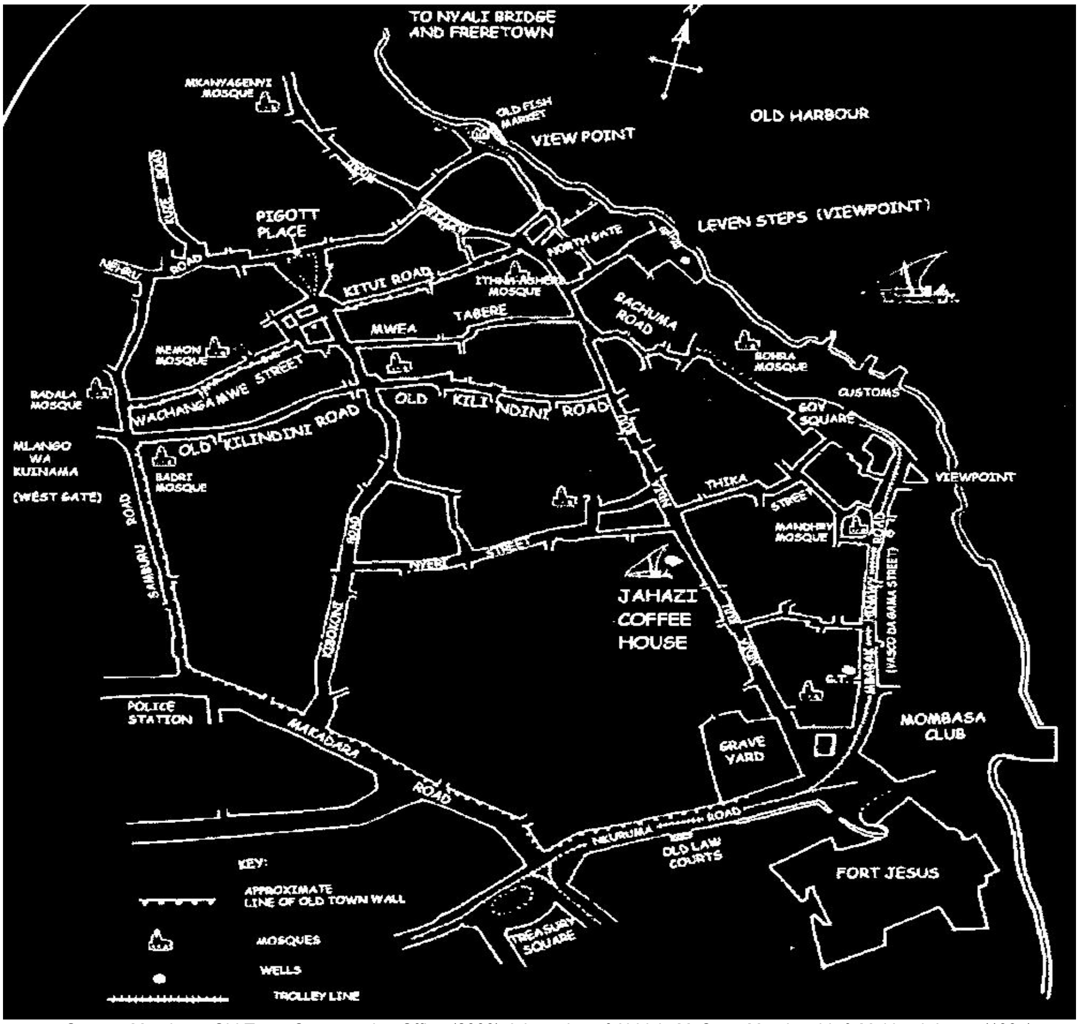
Mbarak Hinawy Road, Government Square

Source: Author (2009).

Mbarak Hinawy Road, Government Square

Source: Google Digital Globe (2010).

Figure 5.11
General Street Character in Old Town of Mombasa



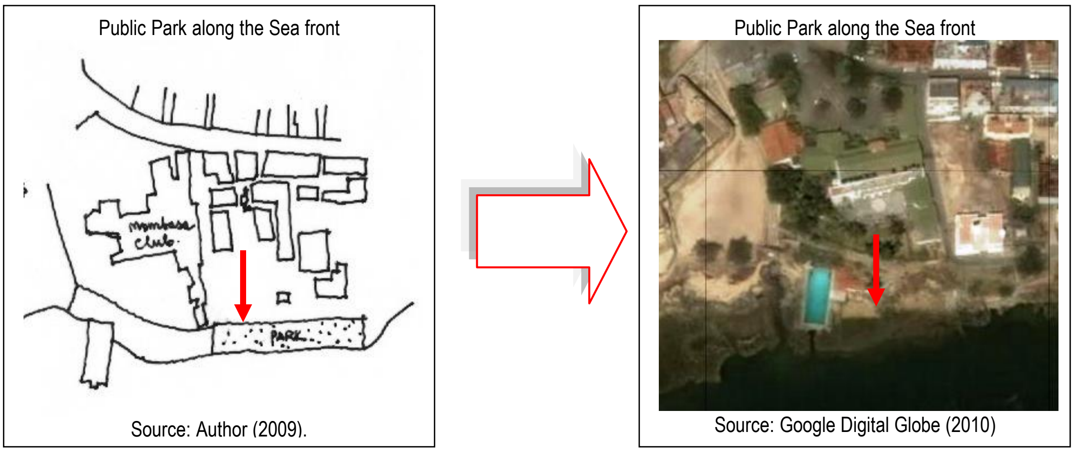
Source: Mombasa Old Town Conservation Office (2009) Adaptation of Aldrick, McCrae, Macdonald, & Maitland-Jones (1997).

The streets in Old Town of Mombasa function as areas for public circulation and recreation. Most buildings are predominantly accessed directly from the street and a state of cooperation between the internal and external urban space is maintained. The basic layout of the streets in Old Town of Mombasa has persisted over time, and presents a continuous vitality, albeit interrupted by non contextual building typologies. These invasive typologies have the capacity to sap the streets character leaving only their physical locus.

5.2.4.4 Parks and Gardens

Public parks and gardens are larger type of voids that contrast with the architectural form. The Treasury Square and the park next to Mombasa Club provide relief from hot and humid Mombasa environment in addition to enabling passive recreation (Figure 5.12).

Figure 5.12
Parks and Gardens in the Old Town of Mombasa



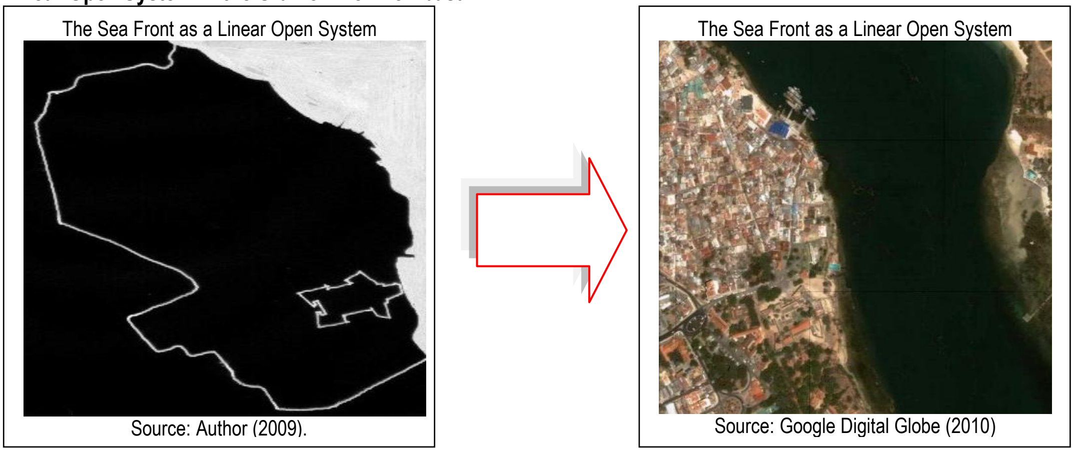
Public Park along the Sea front — Source: Author (2009).

Public Park along the Sea front — Source: Google Digital Globe (2010)

5.2.4.5 Linear Open System

The final urban void found in the Old Town of Mombasa is the linear open system exemplified by the waterfront (Figure 5.13). It establishes a categorical edge definition of the conservation area. It also links spaces along it, since travel by boat is possible. The waterfront contrasts with the built up area thereby ‘providing a pervasive presence to the landscape (Trancik, 1986, p.106).

Figure 5.13
Linear Open System in the Old Town of Mombasa



The Sea Front as a Linear Open System

Source: Author (2009).

The Sea Front as a Linear Open System

Source: Google Digital Globe (2010)

The waterfront is both a *path* and an *edge.* As a path, it is used as a movement channel by boats and canoes to connect places along the oceanfront. A pedestrian sea front promenade does not exist in Old Town of Mombasa and therefore, the waterfront becomes a very important transportation channel. As an edge, it acts as a break from, or boundary between, the built up area and the oceanfront and helps in defining the gazetted conservation area.

Urban solids in the Old Town of Mombasa are interconnected through design in such a way as to make the voids emerge as a figural network of linked places. This protects the dialogue between the void and solid from getting lost. Since the building bulk is becoming more and more vertical, the spatial network may become less successful if the linkages are severed.

The analysis shows that the space occupied by the buildings is not privileged over that occupied by open areas, and therefore, the street level vibrancy is maintained since there is an inscription of the human scale. The figures and the ground are reversible, and are therefore interdependent. The figure-ground approach further demonstrates the precept of contextual design. In the Old Town of Mombasa, at the scale of the building and the scale of the city as a whole, this should not be lost. The relationship between *outside* and *inside* and *building* and *place* are distinctive features of the *genius loci*. The environmental context conditions the buildings, and the buildings in turn exert an outward pressure on the Old Town of Mombasa built fabric. The relationship between buildings and their context suggests a dynamic interplay between solid and void or the figure and ground. This idea can be extended to the conservation of the new and the old built forms.

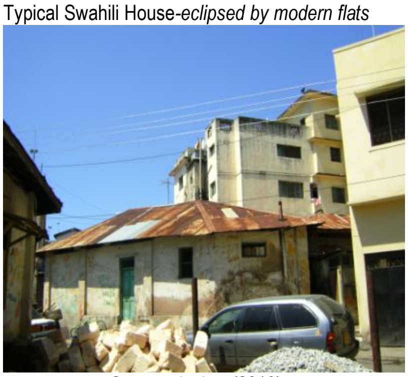
5.2.5 Building Typologies

Various building typologies are evident in the Old Town of Mombasa. The analysis herein is monothematic and is based on the physical form. This is defined by the way the area looks, types of houses, architecture, building period, functions and urban design as recommended by Wassenberg and Goetgeluk (2005). The existing architecture of Old Town of Mombasa successfully blends styles from diverse sources including African, Arab, Indian and European building traditions (King & Procesi, 1990). Islam has also had a profound impact on the built form in addition to the culture. A disparate and an exciting architecture has therefore ensured. Rossi (1982) has explained that the form in which residential building types are realised, the typological aspect that characterises them, is closely bound to the urban form. Social differentiation is signified by changes in height and level of detailing.

5.2.5.1 The Swahili House

In 1990, King and Procesi identified 192 Swahili style houses making 26% of the buildings in the conservation area. This typology is a natural development of a traditional style of building found along the East African littoral. The Swahili house was originally built of mud and wattle, or coral rag and was roofed by thatch from the coconut palm, locally known as *makuti.* The study did not find any thatched Swahili houses. Thatch has been replaced by corrugated sheets locally known as *mabati* (Plates 5.3, 5.4, 5.5 and Figure 5.14). Discussions with the residents revealed that the Swahili houses were being demolished to pave way for high-rise flats.

Plate 5.3
Typical Swahili House-*eclipsed by modern flats*



Source: Author (2010).

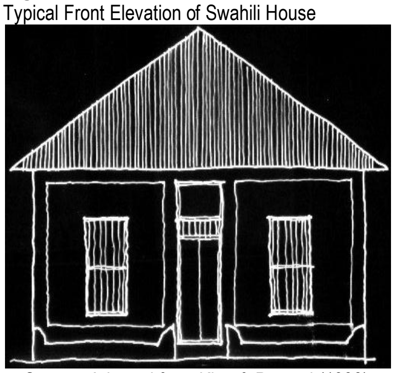
Plate 5.4
Swahili House with Ventilation Stack

Source: Author (2010).

Plate 5.5
Swahili Houses adjacent to the site of Old Portuguese church

Source: Author (2009).

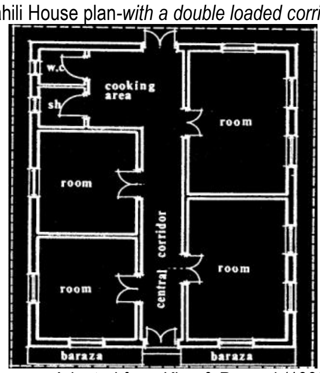
Figure 5.14
Typical Front Elevation of Swahili House



Source: Adapted from King & Procesi (1990).

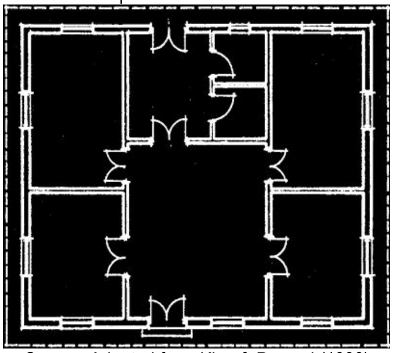
The plan of the Swahili house is generally rectangular with the necessary adoptions to the plot shape. The most common plan has a central double loaded corridor starting at the front entrance right up to the back (Figure 5.15). The wet areas are located at the back of the house. The other type of Swahili house plan has a central room from which other functions are distributed (Figure 5.16). The main entrance opens directly to this central room as do the bedrooms, kitchen and bathing area.

Figure 5.15
Swahili House plan-*with a double loaded corridor*



Source: Adapted from King & Procesi (1990).

Figure 5.16
Swahili House plan-*with a central room*



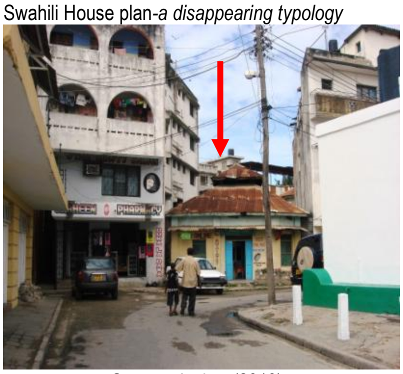
Source: Adapted from King & Procesi (1990).

The façade of the Swahili house is generally symmetrical (Figure 5.14) with a centrally located door, flanked by windows on either side. The windows have a vertical orientation and have wooden shatters that open to the outside. A traditional element of the Swahili house is the *baraza*, a bench like construction on the front of the house that pays an important role in the social life (Plate 5.6). Due to economic reasons, the Swahili house is a disappearing typology since it is being replaced by bland high-rise flats (Plate 5.7).

Plate 5.6
Baraza used to place wares

Source: Author (2009).

Plate 5.7
Swahili House plan-*a disappearing typology*

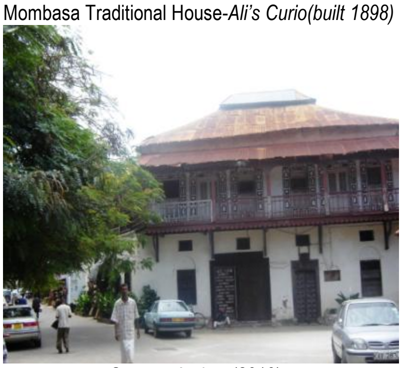


Source: Author (2010).

5.2.5.2 Mombasa Traditional House

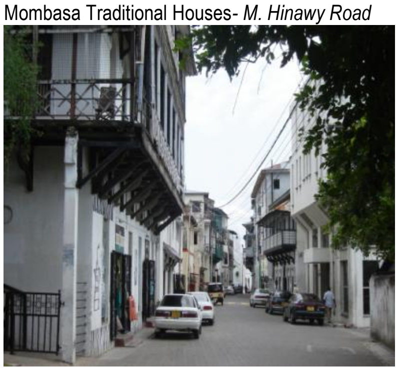
King and Procesi (1990) mention that most of the building stock under this category was built in the 1930s, although some of them may be newer. This typology is related more to the cosmopolitan architecture of Zanzibar than that of the 18th century Lamu to the North (Plate 5.8 and Plate 5.9). These Buildings are of coral construction and are generally two storied.

Plate 5.8
Mombasa Traditional House-*Ali's Curio(built 1898)*



Source: Author (2010).

Plate 5.9
Mombasa Traditional Houses- *M. Hinawy Road*

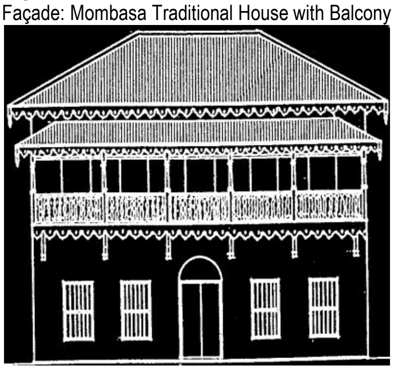


Source: Author (2010).

King and Procesi (1990) aver that no single plan for this typology is evident but there are certain characteristics that can be stated for some. The houses that are constructed of mangrove (*boriti)* poles have long thin rooms moving back parallel from the main façade, the rooms being no more than three metres owing to the maximum structural strength of the *boriti* poles. The basic façade is characterised by a solid surface with voids cut for the door and windows (Figure 5.17). These buildings sometimes have *barazas* like the traditional Swahili houses. In some buildings, the ground floor is taken by a shop and the living quarters are upstairs (Figure 5.18 and Figure 5.19).

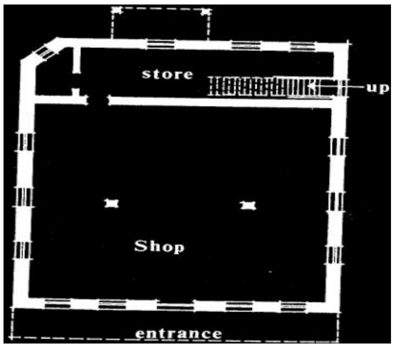
The Traditional Mombasa house typology has also drawn elements from European and Indian influences. This is evident in the arched doors and windows, stringcourses to delineate floors, finely carved finials attached to roof edges and gabled roofs covered with wooden latticework.

Figure 5.17
Façade: Mombasa Traditional House with Balcony



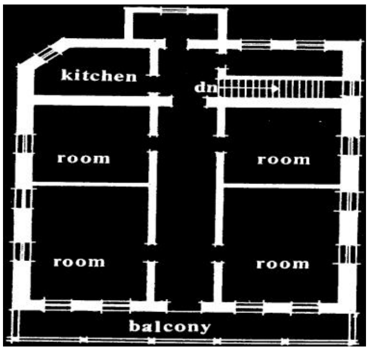
Source: Adapted from King & Procesi (1990).

Figure 5.18
Ground Floor Plan: Mombasa Traditional House



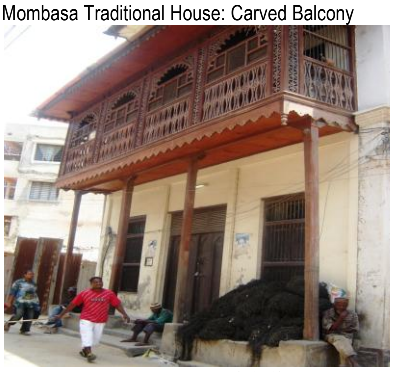
Source: Adapted from King & Procesi (1990).

Figure 5.19
First Floor Plan: Mombasa Traditional House



Source: Adapted from King & Procesi (1990).

Plate 5.10
Mombasa Traditional House: Carved Balcony



Source: Author (2009).

Three important features introduced into the Mombasa traditional house are the carved wooden balconies (Plate 5.10), external staircases (Plate 5.11) and the ornate plaster carvings (Plate 5.12).

Plate 5.11
Mombasa Traditional House: External Staircase

Source: Author (2009).

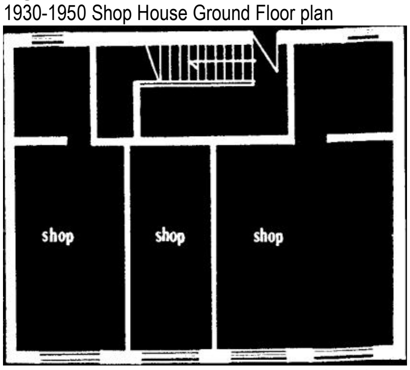
Plate 5.12
Mombasa Traditional House: Ornate Plaster

Source: Author (2009).

5.2.5.3 The Shop House

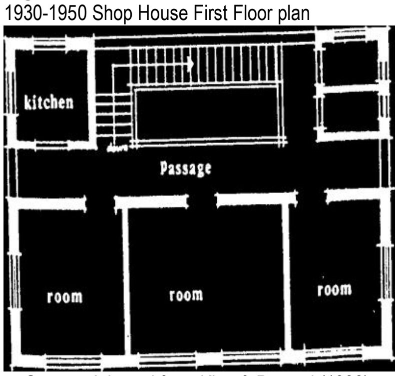
Most of the shop houses are located along Kibokoni Road, Samburu Road, Nyeri Street and Piggot Place (Figure 11 and Map 4.6). They are mostly of mixed use, with commercial activity occurring on the ground floor, and residential space above (Figure 5.20 and Figure 5.21). Some exceptions exist, where the residential space is replaced by office space. The shop houses were largely built by Indian businessmen who work and live in them.

Figure 5.20
1930-1950 Shop House Ground Floor plan



Source: Adapted from King & Procesi (1990).

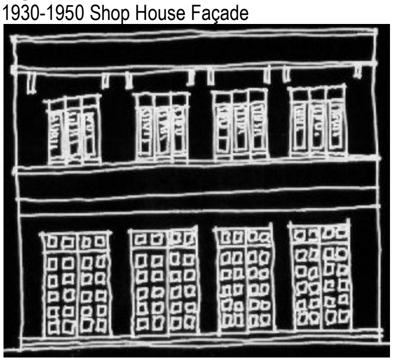
Figure 5.21
1930-1950 Shop House First Floor plan



Source: Adapted from King & Procesi (1990).

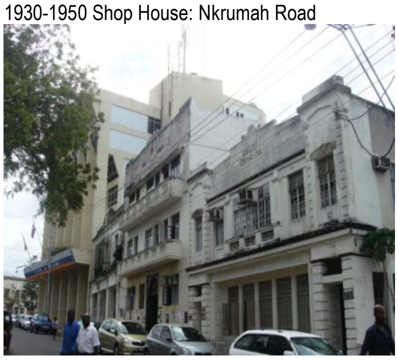
The walls are made of coral blocks or concrete blocks, with reinforced concrete pillars. The façade of the 1930-1950 shop houses has a very solid appearance with the ground floor being dominated by massive wooden doors that open into the shops (Figure 5.22).

Figure 5.22
1930-1950 Shop House Façade



Source: Adapted from King & Procesi (1990)

Plate 5.13
1930-1950 Shop House: Nkrumah Road

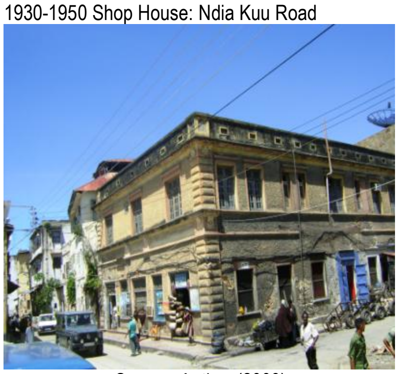


Source: Author (2009).

Plate 5.14
1930-1950 Shop House: Piggot Place

Source: Author (2009).

Plate 5.15
1930-1950 Shop House: Ndia Kuu Road



Source: Author (2009).

Many of the 1930-1950 shop houses have Art Deco detailing on their facades (Plates 5.13, 5.14 and 5.15), exhibiting the use of elegant lines associated with that style. Art deco is characterized by long, thin forms, curving surfaces, and geometric patterning. The practitioners of the style attempted to describe the sleekness they thought expressive of the machine age.

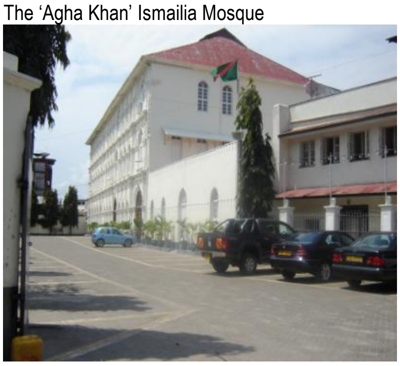
5.2.5.4 Religious Buildings

The conservation area is reported as consisting of 22 religious buildings, of which 13 are mosques (Plates 5.16, 5.17, 5.18, 5.19) and the rest are support buildings, wells and social halls for the mosques (King & Procesi, 1990). The mosques are of two types: those catering for the Swahili community and those that were constructed by other Indian sects that settled in Mombasa (Del-Bue, 1986). The Swahili mosques are all Sunni and are characterized by simple plans and facades. The Basheikh and Mandhry mosques are reputed to have been built in the sixteenth century (Plate 4.19 and Plate 4.20). These two mosques have unusual minarets resembling the one in Shela, Lamu Island (King & Procesi, 1990). These minarets have a form similar to the Swahili pillar tombs. Almost all the mosques have *barazas* where people sit, mainly in the afternoon. The Indian Mosques are decorated on the exterior in the tradition of India. There are two Bohora Mosques and two Ithnasheri community mosques, both which are Shiite sects. Another belongs to the Memon, a Sunni sect. To use the words of Kostof (1992), the physical presence of God is spread through out the area. These mosques are the focus of the community. Mosques are 'important centres for religious and social activities for the various neighbourhoods or *mitaa* and thus provide a distinct physical place for meetings, festivities and prayers for men' (Varkey & Roesch, 1981, p. 32)

Plate 5.16
Prominent Minaret of Bhadala Mosque

Source: Author (2009).

Plate 5.17
The 'Agha Khan' Ismailia Mosque



Source: Author (2009).

Plate 5.18
Mosque under Renovation

Source: Author (2009).

Plate 5.19
Bohora Mosque

Source: Author (2009).

5.2.5.5 Commercial Buildings

A functional criterion is used in delimiting this typology because of the inherent variety in the physical form. This category includes the warehouses that are made of lime and coral construction, with very plain facades and iron sheets *(mabati)* roofs. Also included in this category is the multiple-shop building, which is one storey. Several carpentry workshops and garages adorn old town (Plates 5.20 and 5.21).

Plate 5.20
Shops Along Ndia Kuu Road

Source: Author (2009).

Plate 5.21
Carpentry Workshops

Source: Author (2009).

5.2.5.6 Colonial/ Administrative Buildings

These buildings were constructed by the British, mainly to house administrative functions They include the Old Law Courts, the first Treasury (District Commissioner's Office today), Old Post Office and most of the other building around the treasury square (King & Procesi, 1990). Others in this categorization are the Mombasa Club, and the remains of Jubilee Hall. They are made of a mixture of local and European materials e.g. coral, lime mortar and plaster and clay roofing tiles. Some have colonnaded verandahs and display neo-classical influences of columns with capitals, pediments, arched windows and doors and plaster moulding (Plate 5.22 and 5.23). Simple façades like the Old Port building also exist (Plate 5.4).

Plate 5.22
The District Commissioners Office

Source: Author (2009).

Plate 5.23
Kenya Commercial Bank

Source: Author (2009).

This typology represents the British colonial period of Mombasa. Furthermore, they are strongly related to Old Town of Mombasa, as 'they formed its new administrative centre for many decades, being initially placed just next to the existing town, due to lack of space within it' (Varkey & Roesch, 1981, p. 29). Despite that, this typology does not sit in the old town proper, but forms very important landmarks.

5.2.5.7 Contemporary Non-Conforming Buildings

All newer buildings are contained in this category. These have adopted modern methods of construction and building materials. Reinforced concrete, concrete blocks, decorative pre-cast concrete blocks, Portland cement plaster are used in construction. This category is well represented by the insipid high rise flats that threaten the aesthetic coherence of Old Town of Mombasa. Most of these buildings are clearly out of scale and some are actually mimetic of the existing architecture. They rise three to four floors and in the process dwarf the existing building stock (Plates 5.24, 5.25, 5.26 and 5.27).

Plate 5.24
Uncontextual Apartments in OTM

Source: Author (2009).

Plate 5.25
An out of Bulk Building/ Inappropriate Detailing

Source: Author (2009).

Plate 5.26
Mimetic Private Villa along the Waterfront

Source: Author (2009).

Plate 5.27
Building out of Scale/ Inappropriate Colour

Source: Author (2009).

Globalisation, and the need to cash in on increased rents, is leading to the growth of this category by leaps and bounds, thereby undermining the *genius loci* of the Old Town of Mombasa.

5.2.5.8 Other Non-Conforming Buildings

This category is best exemplified by Fort Jesus, and contains buildings that are not easily classifiable into any of the foregoing categories. In 1990, King and Procesi identified 18 such buildings. Plates 5.28, 5.29, 5.30 and 5.31 show four such examples.

Plate 5.28
Building with an 'Interior Vault'

Source: Author (2009).

Plate 5.29
Continuous Covered Balcony

Source: Author (2009).

Plate 5.30
An Unusual 'Long' Building

Source: Author (2009).

Plate 5.31
Buttressed Building

Source: Author (2009).

This typology includes most of the public monuments. These have an 'absolute clarity and are distinguishable on the basis of their form and their exceptional nature in the urban fabric' (Rossi, 1982, 99). They leap out as clearly identifiable forms in the maps, the most notable being Fort Jesus.

5.2.6 Discussion

Although many building typologies and styles can be identified in Old Town of Mombasa, they all together create a distinctive urban historic environment. From the analysis it is evident that building typologies in the Old Town of Mombasa are not homogeneous or static but complex and changing amalgams of old and new forms. The various types represented refer principally to the visual and physical characteristics. Like in matters of style, this implies that other buildings share similar features. After all 'all the buildings in the style will not necessarily have identical characteristics, for the number of shared features may vary, but most will have a large number of them' (Conway and Roenisch, 2005, p. 168)

The types presented here are not images to be imitated entirely or copied but ideas to serve as basis for various designs of buildings. These typologies are generative tools for conceiving new forms that are contextual in the urban historic area. The dynamism of lifestyles and the need to provide current accommodation place the emphasis on the form and not the planning aspect of particular typology. This is because the plan should continuously adapt to changing needs (Section 2.3). *Type* remains constant and unchanging, underlying all built *cases* (Broadbent, 1990; Rossi, 1982). Constant changes occur to the corpus of buildings in the Old Town of Mombasa, but the old town continues to exist through all these changes, and our 'concept of it as a particular city will be founded in our memories' (Broadbent, 1990, p. 168). The study of these typologies provides a method of restoring historic continuity and provides the possibility of unlimited variations that will cater for the concept of continuity and change, thus ensuring sustainability.

This approach has taken into consideration types that can produce conceptual tools and make the architectural design language in the Old Town of Mombasa richer. These types are instruments for continuity and change, thus providing a transformation ingredient. In the context of conservation of Old Town of Mombasa, the adherence to type will build consistency, and this will enable buildings of different styles to sit very comfortably side by side, if they have certain elements in common.

It has been shown that the aesthetic value of the different spatial types is 'independent of short-lived functional concerns as it is of symbolic interpretations which may come from one age to the next (Krier, 1979, p. 19). Contextual building types can thus serve as models for conservation today. The architectural types elucidated establish the basic continuity that underlies the apparent diversity in Old Town of Mombasa. In some of these types, the original function is obsolete and contemporary uses have been adapted. In such cases, *function follows form*.

The building types described, have developed according to needs and aspirations to beauty. As Rossi (1982) opines, a type is associated with a way of life, although specific shapes vary widely. To him type is the very idea of architecture, and in spite of changes it has always imposed itself on the *feelings and reason* as the principle of architecture and the city. This thesis argues that a typology is modified by people's attitudes who may disregard it or 'misrepresent it by imposing on it the rigor of a model that would imply the conditions of an identical copy' (Rossi, 1982, p. 40).

The elucidated typologies save for the *Contemporary Non-conforming*, are constant and manifest themselves in the Old Town of Mombasa with the necessary adaptations. Recall that these typologies are monothematic and are primarily concerned with external appearance, which is closely related to likability and aesthetic experience. Guided by the hypothesis that the city is both a man-made object and a work of art, (Rossi, 1982), the dynamic processes in Old Town of Mombasa will tend towards more evolution than preservation, and contextual typologies should be propelling agents of this evolution.

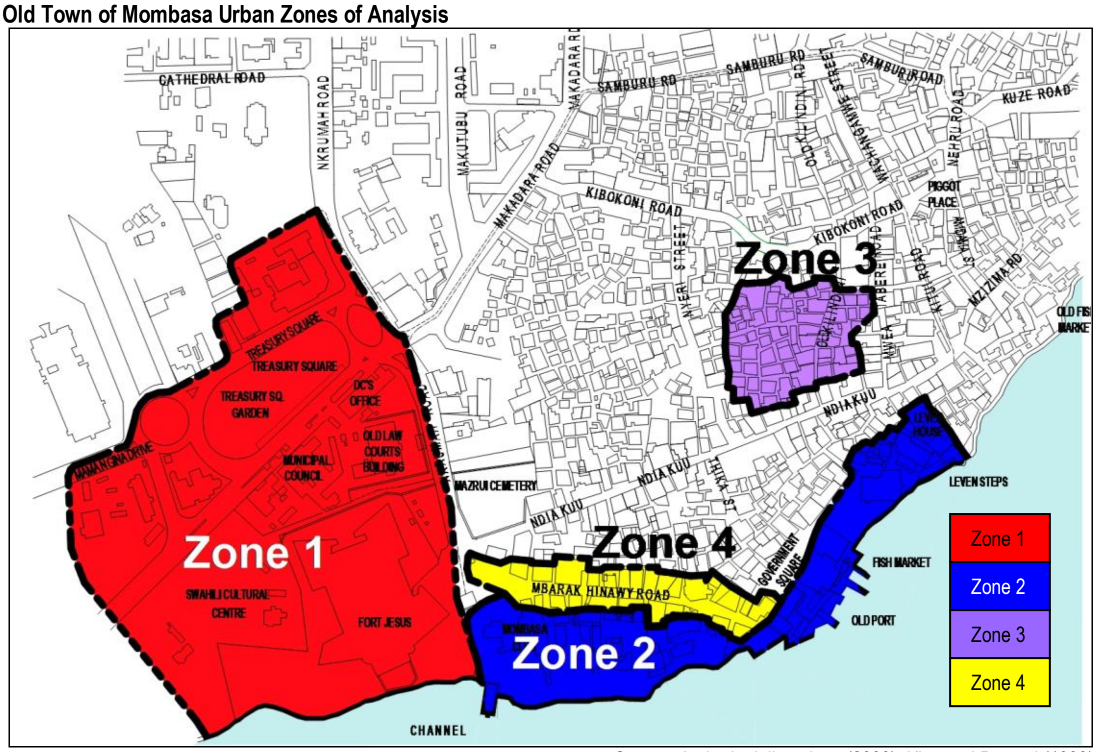
It emerges that in conservation of historic urban areas, the popular cliché, *'form follows function'* (Form Follows Function, 2011, March 19; Sullivan, 1896) is antagonistic to the conceptions of typology. Notably, the notion of functionality is derived from biological analogy, but the building can take different functions in its lifetime through conversions and adaptive reuse. That being the case, the notion of form follows function is not tenable in conservation and it appears that *function follows form*, literally. This thesis argues that sustainable conservation can be anchored on the maxim: *Function follows typology* and that; *Typology follows attitudes.*

5.3 ATTITUDES TOWARDS THE HISTORIC BUILT ENVIRONMENT

5.3.1 Introduction: Zones of Analysis

The thesis identified four (4) zones or districts, defined essentially by their location, imprint on the ground, topographical limits and physical presence (Map 5.2). They constitute Lynch's (1960) districts in that they can be distinguished in the urban whole, yet, harmoniously merge to comprise the whole. These zones, from a morphological point of view have physical homogeneity. This homogeneity is manifested in that the areas have 'consistent modes and types of living' (Rossi, 1982).

Map 5.2
Old Town of Mombasa Urban Zones of Analysis



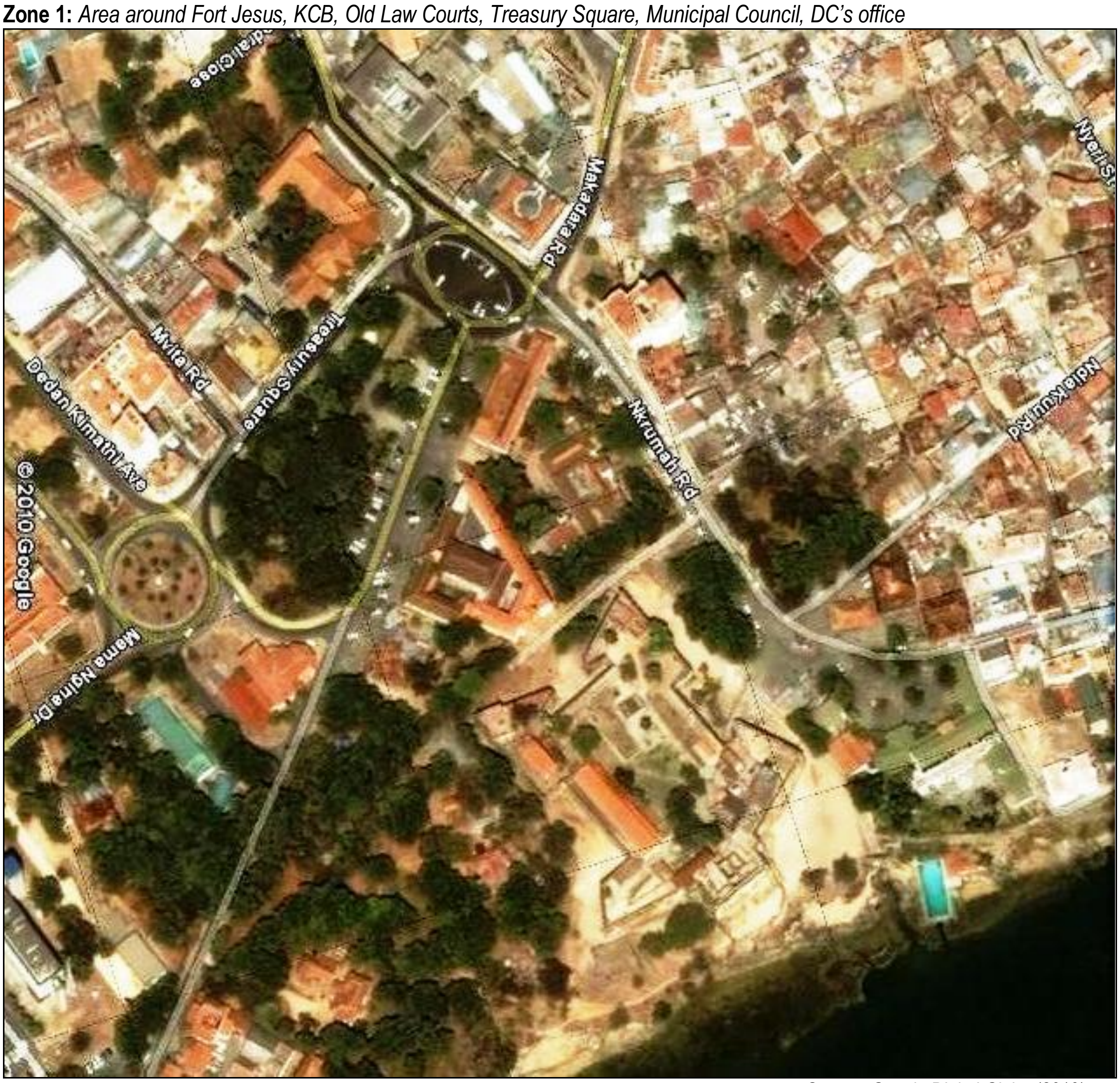
Source: Author's delineations (2009); King and Procesi (1990).

The four zones are urban precincts. Their differences create tension, which is their characteristic 'urban aesthetic'. They reveal entirely unexpected views, aspects and images giving an aesthetic delight. The choice of these four zones is within systems theory and specifically that of the 'city as constituted of many parts' (Rossi, 1982).

5.3.1.1 Zone 1

Zone 1 is characterised by European architecture, the oldest being Fort Jesus, dating 1593 AD. This zone is the home to the Municipal Council of Mombasa offices, the District Commissioners offices, The Old Law Courts Building, the Swahili Cultural Centre and the Kenya Commercial Bank Building. The largest open space in the conservation area, the Treasury Square, is located here and has a well-maintained garden. The buildings in this zone are freestanding structures surrounded by ample open space (Plate 5.32). The streets and the buildings are generally well maintained.

Plate 5.32
Zone 1: *Area around Fort Jesus, KCB, Old Law Courts, Treasury Square, Municipal Council, DC's office*



Source: Google Digital Globe (2010).

5.3.1.2 Zone 2

Zone 2 comprises the waterfront in general, Mombasa Club, the Government Square, Fish Market, Bohora Mosque and adjacent buildings (Plate 5.33). Several business activities take place in this zone. The Mombasa Club, a private members club and the oldest in Kenya, provides recreation activities. There is a variety of mixed-use buildings in this zone, best exemplified by Leven house, which contains a restaurant, Mombasa Old Town Conservation Office (MOTCO) offices, and guest rooms on the uppermost floor. Import and export trade is still carried on at the old port albeit with decreased volumes of cargo. The streets in this zone are well maintained. There is also a public park along the oceanfront, which similarly is well maintained. Overhanging balconies are commonplace in this zone, which enhances the interior-exterior experience of urban space. *Barazas* are also common creating outdoor seating places.

Plate 5.33
Zone 2: *Waterfront, Mombasa Club, Old Port, Government Square, Fish Market, Bohora Mosque, Leven House & Steps*

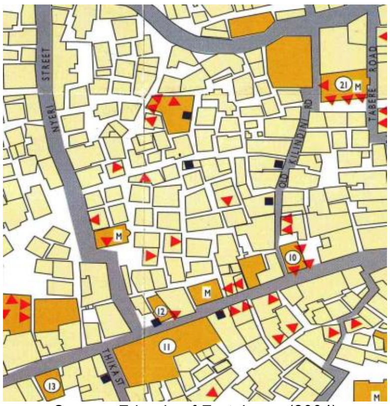
Source: Google Digital Globe (2010).

The Government Square is hard landscaped with concrete paving blocks *(Cabro)*. One section of the square is used as a garbage damp, thus attracting flies and cats. It also emits an obnoxious smell. All in all, the Government Square is a vibrant urban space, due to the adjacent port and fish market activities, which draw in a lot of people for trade. A fresh water well, at the bottom of Leven house and Steps, is used by young men for bathing and washing clothes. This well is however secluded from public view, and is reported to be a haven for drug users, thus making it insecure.

5.3.1.3 Zone 3

Plate 5.34
Zone 3: *Residential area around Kibokoni Road, Kilindini Road, and Mwea Tebere Road*

Source: Google Digital Globe (2010)


Source: Friends of Fort Jesus (2004)

Zone 3, previously predominated by the Swahili house typology is now being replaced by high-rise flats (Plate 5.34). This invasive non-conforming typology does not augur well for conservation of the Old Town of Mombasa, since it replaces the earlier more sustainable typologies developed over long periods of time. The flats are built with much thinner walls *(concrete blocks instead of traditional coral rags)*, and have air-conditioning, as opposed to the traditional passive methods of ventilation and cooling.

Various activities were noted to take place in this zone. The residents were observed to be playing board games, taking naps or generally conversing on the *barazas*. The area has fruit stalls, shoe repair shops, water kiosks etc. Children were observed to be playing on the streets especially around the *madarasa* (Islamic schools). Various wells are also present, and young men bearing, *hamali* (handcarts) used for ferrying water for sale, are commonly encountered. Very noisy auto rickshaws popularly know as *tuk-tuks*, vie for space in the narrow streets with pedestrians, exposing the residents to accidents, noise and air pollution.

The condition of the streets in this zone has deteriorated. Buildings are generally badly maintained and some have been left to collapse altogether. There is evidence of plant growth on the roofs and walls, and broken drainage pipes are common. The storm water drains were observed to be clogged with rubbish. The spatial organization of the Swahili houses in this zone has resulted in the creation of courtyards. Narrow pathways widen to form the courtyards and then narrow again to form the streets. The courtyards are used for drying clothes, trade, recreation, parking etc.

The cars, the *tuk-tuks,* handcarts and pedestrians all compete for space on the street. Barazas and loose urban furniture also compete for the same space. The narrow streets are shaded in some places by the buildings, which channel cool breezes making the streets pleasant during the day notwithstanding the hot weather.

5.3.1.4 Zone 4

Plate 5.35
Zone 4: *Mbarak Hinawy Road*

Source: Google Digital Globe (2010).

Mbarak Hinawy Road comprises Zone 4 (Plate 5.35). It is similar in many aspects to Ndia Kuu Road. Buildings along this road have ornately carved and projecting balconies, overlooking the street thus providing the necessary street surveillance. Highly decorated Indian, Lamu and Zanzibari doors are also common. The Mombasa Traditional House is a conspicuous typology in this zone. Most of the buildings are painted in white, off-white and cream colours.

Walking along Mbarak Hinawy road, one observes various shops dealing mainly in curios. People sit on verandahs and at the entrance steps. The balconies act as resting spaces and cast shadows on the street below. Mandhry mosque acts as a node along the street.

The street is paved in pre-cast concrete blocks *(Cabro)* which extends all the way to the Government Square. The open storm water drainage channel along this Mbarak Hinawy road is well maintained. The buildings lining the street are generally well kept, although in some, vegetation can be seen growing on the walls. Electricity and telephone lines crisscross the street in an unsightly manner, thus reducing the general aesthetic experience.

Mbarak Hinawy road is just wide enough for two cars to pass each other, and has numerous alleys projecting from it in approximately orthogonal orientations along its entire length. The buildings along the street are generally three floors high and very ornate. This zone is also frequented by tourists.

5.3.2 Residents Zone Rankings

The residents of Old Town of Mombasa were asked to rank the four zones, from the most favourite to the least favourite. From the *mode*, Zone 1 is the most preferred followed by Zone 2, Zone 4 and finally Zone 3 (Table 5.1). From the *mean*, Zone 2 was rated the most favourite area. The standard deviation indicates that Zone 1 had the most variability in preference while Zone 2 had least variability. It is important to note that there are no residential premises in Zone 1.

Table 5.1
Ranked Positions of the Four Zones on the Favourite (1) To (4) Least Favourite Scale

		Zone 1	Zone 2	Zone 3	Zone 4
N	Valid	598	599	597	597
	Missing	95	94	96	96
Mean		2.3227	2.2922	2.9296	2.4841
Std. Error of Mean		.05337	.03795	.04330	.04551
Median		2.0000	2.0000	3.0000	3.0000
Mode		1.00	2.00	4.00	3.00
Std. Deviation		1.30500	.92880	1.05792	1.11209
Variance		1.70303	.86266	1.11920	1.23674
Skewness		.271	.155	-.405	-.121
Std. Error of Skewness		.100	.100	.100	.100
Kurtosis		-1.665	-.872	-1.205	-1.353
Std. Error of Kurtosis		.200	.199	.200	.200
Range		3.00	3.00	3.00	3.00
Minimum		1.00	1.00	1.00	1.00
Maximum		4.00	4.00	4.00	4.00

Source: Author (2010).

The one sample Kolmogorov-Smirnov test, more commonly know as the K-S test, was undertaken to test the normality of the distribution. The results are shown in Table 5.2.

Table 5.2
One-Sample Kolmogorov-Smirnov Test

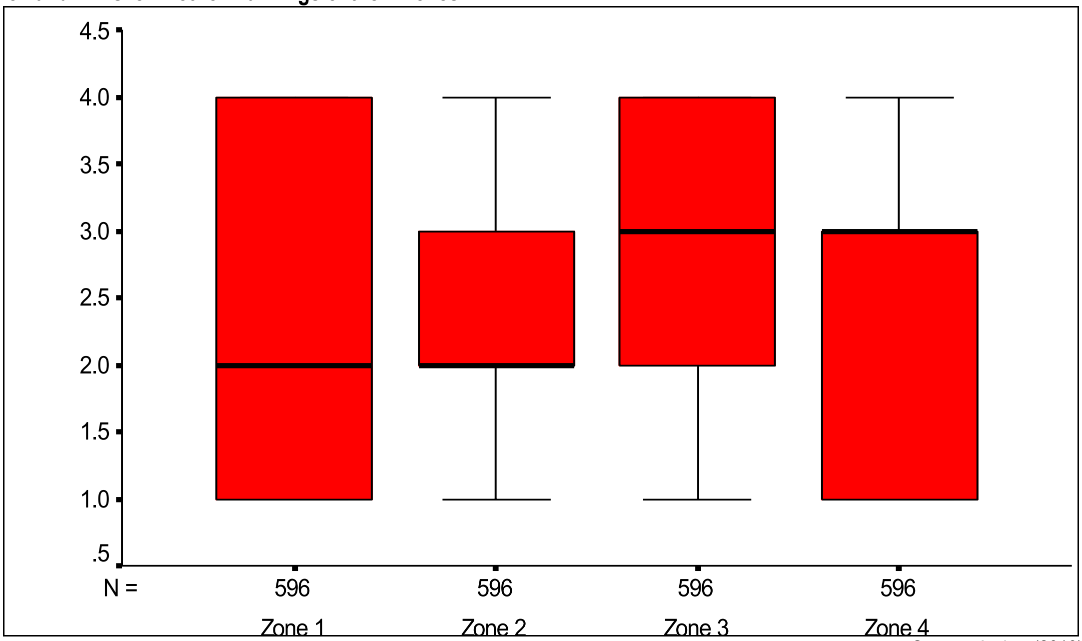
		Zone 1	Zone 2	Zone 3	Zone 4
N		598	599	597	597
Normal Parameters(a,b)	Mean	2.3227	2.2922	2.9296	2.4841
	Std. Deviation	1.30500	.92880	1.05792	1.11209
Most Extreme Differences	Absolute	.259	.208	.263	.236
	Positive	.259	.208	.192	.192
	Negative	-.227	-.193	-.263	-.236
Kolmogorov-Smirnov Z		6.342	5.085	6.424	5.777
Asymp. Sig. (2-tailed)		.000	.000	.000	.000

a Test distribution is Normal.
b Calculated from data.
Source: Author (2010).

The *Asymp. Sig*. (2-tailed) values for all the four zones are < 0.05, which are significant. The null hypothesis for the Kolmogorov-Smirnov test is that *the data is normally distributed;* therefore, the observed distribution does not correspond to the theoretical distribution. The assumption of normality is violated, which is quite common in large samples (Pallant, 2005) and there is no need for transformations. The One-Sample Kolmogorov Test output reports where the *Most Extreme Differences* are. These indicate the difference between the observed cumulative and the theoretical cumulative distribution. From the results, these differences are small, thereby indicating that our distribution is not very different from the normal distribution, calling for no data transformations. The data returned positive skews for Zone 1 and Zone 2, and negative skews for Zone 3 and Zone 4 respectively (Table 5.1).

Boxplots were used to compare the distribution of scores for the four zones. From Figure 5.23, showing the box and whisker plot for the four zone rankings, the thick lines indicate the median values; red shaded boxes indicate the 25th and 75th percentile, which is where 50% the data falls. The protruding lines or whiskers indicate the 5th and 95th percentiles. The whiskers connect the highest and lowest scores that are not considered outliers (Pallant, 2005; Hinton, Brownlow, McMurray & Cozens, 2004). Outliers are normally indicated by the small circles and extreme scores by asterisks; however, this data set has been corrected to remove outliers and extreme scores which were the result of input errors.

Figure 5.23
Box and Whisker Plot for Rankings of the 4 Zones

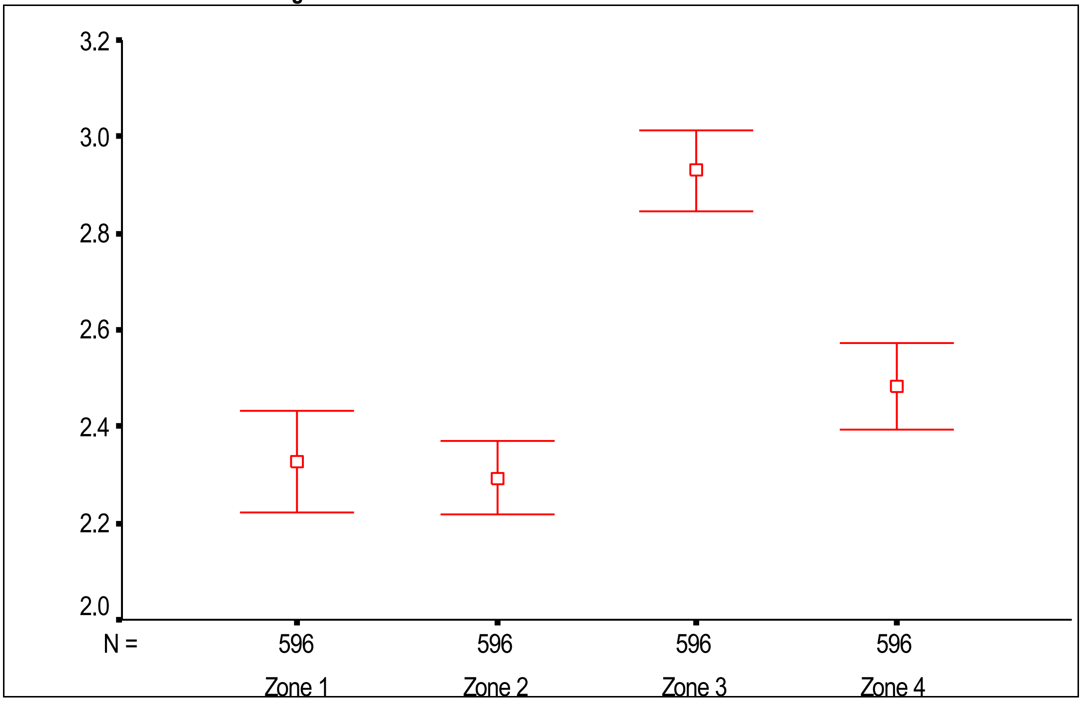


Source: Author (2010).

The box and whisker plots confirm that the distributions are more or less asymmetrical (except for Zone 3). The smallest spread of values is for Zone 2, which has the smallest box. The highest and the lowest scores are the same in all zones, representing a ceiling and a floor effect, where scores by design could not go beyond or below a certain value, *a priori*. The median is the same for Zone 1 and Zone 2; and the same for Zone 3 and Zone 4. It is also observed that the overall ranking of the zones by *mean* and *mode* follows the same pattern discussed above (Table 5.1). The distributions of preference on all the four zones are dissimilar and this may be attributed to their disparate physical conditions.

By examining the Error Bar Chart (Figure 5.24), the zone rankings are on the X-axis and the preference ratings on the Y-axis. The square in the middle of the bar represents the mean. The two whiskers that accompany the mean are the 95 % confidence intervals. We can see that Zone 3 had the least favorable ranking while Zone 2 was the most desirable, and also had the narrowest confidence interval.

Figure 5.24
Error Bar Chart for Zone Ranking



Source: Author (2010).

The Box and Whisker plots, in addition to the Error Bar Chart for the four zones, (representing Lynchian (1960) districts), show the different zonal attitudinal evaluations. Zone 1 is the most preferred while Zone 3 is the least preferred. All else held constant, this can be attributed to their differences in complexity. The one-way repeated measures ANOVA (Analysis of Variance) was used to compare the residents' preferences of the four different zones. The same participants were used for each of the conditions of the independent variable. The advantage when the same participant is used in all the conditions of the independent variable is that we are able to remove the individual differences from the analysis before the calculation of the statistic (Hinton, Brownlow, McMurray & Cozens, 2004). The one way repeated measures ANOVA answers the question: *Is there a change in confidence scores over the four zones?* The zones represent the independent variable while scores on the preference scale represent the dependent variable. The test shows whether there is a significant difference among the four sets of scores. The Multivariate Test results are shown in table 5.3.

Table 5.3
Multivariate Tests (b)

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
ZN_PREF	Pillai's Trace	.194	47.526(a)	3.000	593.000	.000	.194
	Wilks' Lambda	**.806**	**47.526(a)**	**3.000**	**593.000**	**.000**	**.194**
	Hotelling's Trace	.240	47.526(a)	3.000	593.000	.000	.194
	Roy's Largest Root	.240	47.526(a)	3.000	593.000	.000	.194

a Exact statistic
b Design: Intercept Within Subjects Design: ZN_PREF
Source: Author (2010).

The one-way repeated measures ANOVA comparison of scores on the Zone Preference (ZN-PREF) in the four zones is significant. Hinton, Brownlow, McMurray & Cozens (2004), recommend the use of the Wilk's Lambda. *There was a significant difference for preference in the four zones [Wilks' Lambda=.806, F (3, 593)= 47.526, p<.0005, multivariate partial eta squared=.194].* The p value is less than .05; therefore we can conclude that there is a statistically significant effect of the zone on preference. This suggests that there was a change in confidence scores across the four different zones. The effect of size on this result is given by the Partial Eta. Using commonly used guidelines (.01=small, .06=moderate, .14=large effect) this result (.194) suggests a large effect size (Pallant, 2005; Cohen, 1988). From the significance test, we can conclude that there is *statistically a significance difference in the zone preference*.

Table 5.4
Mauchly's Test of Sphericity (b)
Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon(a) Greenhouse-Geisser	Huynh-Feldt	Lower-bound
ZN_PREF	.737	181.307	5	.000	.844	.848	.333

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.
a May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.
b Design: Intercept Within Subjects Design: ZN_PREF
Source: Author (2010).

The Sphericity assumption for ANOVA requires that *the variance of the population difference scores for any two conditions are the same as the variance of the population difference scores for any other two conditions,* a condition that is normally violated (Pallant, 2005). The

Maulchly's Test of Sphericity table above, gives a Maulchly's test statistic of .737, df=5; $p<0.05$. We can conclude that the Sphericity assumption has not been met. However as this is a multivariate analysis, which does not require Sphericity, there is no need for compensation (Pallant, 2005). Consulting the alternative Epsilon value quoted in the Greenhouse-Geisser column, the value of .844 is close to 1.00 and therefore indicates no major Sphericity problems, and we can therefore be confident that Sphericity do not affect the calculations (Pallant, 2005; Hinton, Brownlow, McMurray & Cozens, 2004).The values from the Sphericity Assumed row (Table 5.5) in the Test of Within-Subjects Effects table are taken.

Table 5.5 Tests of Within-Subjects Effects
Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
ZN_PREF	Sphericity Assumed	153.196	**3**	51.065	**32.930**	**.000**
	Greenhouse-Geisser	153.196	2.533	60.485	32.930	.000
	Huynh-Feldt	153.196	2.545	60.206	32.930	.000
	Lower-bound	153.196	1.000	153.196	32.930	.000
Error(ZN_PREF)	Sphericity Assumed	2768.054	**1785**	1.551		
	Greenhouse-Geisser	2768.054	1507.007	1.837		
	Huynh-Feldt	2768.054	1513.984	1.828		
	Lower-bound	2768.054	595.000	4.652		

Source: Author (2010).

From Table 5.5, it can be seen that: $F(3, 1785)=32.930$, $p<0.01$. As $p<0.01$, this indicates that we have found a significant difference in the zone preferences. By inference, we therefore reject the study H_o: *There is no relationship between the historic built environment in the Old Town of Mombasa and the attitudes of the inhabitants towards it.* However, it is not known where the significant differences lie. This is tested under Pairwise comparisons (Table 5.8) The Tests of *Within-Subjects Contrasts* table is generated by SPSS by default and is a trend analysis (Table 5.6). This examines the trends displayed in the data and gives information as to the underlying model that best fits the data.

Table 5.6 Tests of Within-Subjects Contrasts
Measure: MEASURE_1

Source	ZN_PREF	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
ZN_PREF	Linear	35.992	1	35.992	18.128	.000	.030
	Quadratic	25.591	1	25.591	13.630	.000	.022
	Cubic	91.613	1	91.613	116.092	.000	.163
Error(ZN_PREF)	Linear	1181.358	595	1.985			
	Quadratic	1117.159	595	1.878			
	Cubic	469.537	595	.789			

Source: Author (2010).

We can see that significant linear, quadratic and cubic trends are found:

{F (1, 595)=18.128; p<0.05}, {F (1, 595)=13.06; p<0.05}, {F (1, 595)=116.092; p<0.05}. The ANOVA calculated is a one factor model and information from the *Tests of Between Subjects Effects* gives information with reference to the intercept (Table 5.7). The intercept tells us that our overall mean is significantly different from zero.

Table 5.7
Tests of Between-Subjects Effects
Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	14995.151	1	14995.151	54872.038	.000	.989
Error	162.599	595	.273			

Source: Author (2010).

The Pairwise Comparisons shown in Table 5.8 gives a multiple comparison for means of all paired combinations of the four repeated measures conditions, which are adjusted by the Bonferroni Method (Hinton, Brownlow, McMurray & Cozens, 2004). This table shows where significant differences that were evident in the calculation of ANOVA are located.

Table 5.8
Pairwise Comparisons
Measure: MEASURE_1

(I) ZN_PREF	(J) ZN_PREF	Mean Difference (I-J)	Std. Error	Sig.(a)	95% Confidence Interval for Difference(a)	
					Lower Bound	Upper Bound
1	2	.034	.074	1.000	-.162	.229
	3	**-.602(*)**	**.087**	**.000**	-.832	-.373
	4	-.154	.080	.324	-.366	.057
2	1	-.034	.074	1.000	-.229	.162
	3	**-.636(*)**	**.054**	**.000**	-.779	-.493
	4	**-.188(*)**	**.067**	**.031**	-.365	-.011
3	1	**.602(*)**	**.087**	**.000**	.373	.832
	2	**.636(*)**	**.054**	**.000**	.493	.779
	4	**.448(*)**	**.067**	**.000**	.271	.625
4	1	.154	.080	.324	-.057	.366
	2	**.188(*)**	**.067**	**.031**	.011	.365
	3	**-.448(*)**	**.067**	**.000**	-.625	-.271

Based on estimated marginal means
* The mean difference is significant at the .05 level.
a Adjustment for multiple comparisons: Bonferroni.
Source: Author (2010)

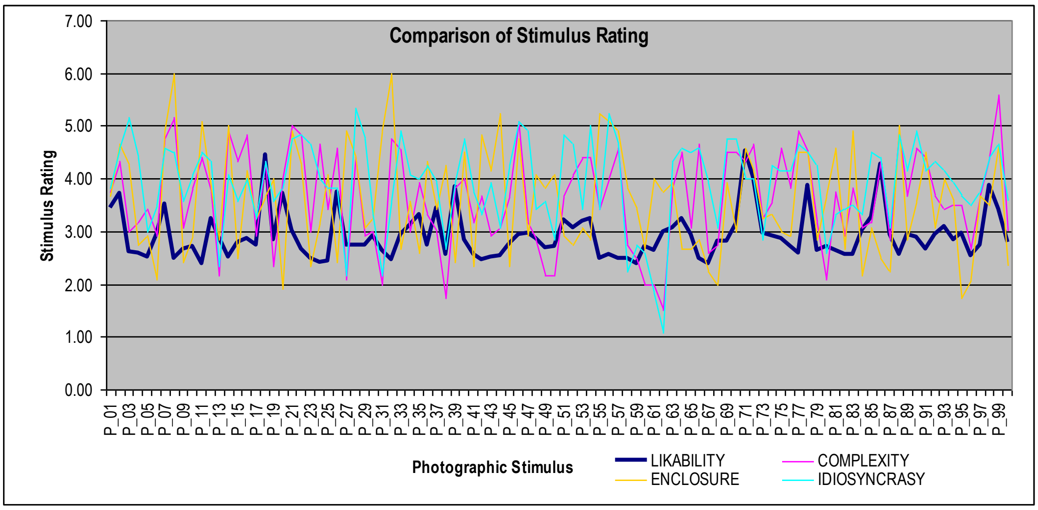
All the possible comparisons for the four zones are shown above. In each comparison, one level is given the identifier 'I' and the second 'J.' The *Mean Difference* column, indicates the resulting figure when the mean of one level of the variable (J) has been subtracted from a second level (I). The *Sig.* column enables an assessment of whether the mean differences between the levels of the variable are significant. The pair wise comparison that are significantly different ($p<0.05$), are bolded. The results indicate that the significant comparisons are those of: Zone 1 and Zone 3, Zone 2 and Zone 3, Zone 2 and Zone 4, and, Zone 3 and Zone 4. Insignificant comparisons are those of Zone 1 and Zone 2, and, Zone 1 and Zone 4. These zones are highly complex. The *Std. Error* values are small, indicating low variability in the predicted mean differences. The *Confidence Interval* for the difference indicates that we are 95% confident that the true population mean difference will be between the upper and lower limits.

5.3.3 Likability of Environmental Scenes

To examine the likability dimension of the built environment, the residents of the Old Town of Mombasa were exposed to stimuli of 100 photographs (Appendix I) (Section 3.2.2). They were requested to rate the stimuli on the likability scale. An objective rating was obtained by having professionals in the built environment rate the same photographic stimuli on their *complexity*, *enclosure* and *idiosyncrasy* (Appendix IIIa). The mean ratings are indicated Figure 5.25. As is evident, mean likability is generally rated lower than the other variables i.e. complexity, enclosure and idiosyncrasy.

Appendix IIIb shows a summary of the ratings of the environmental stimuli (photographs of various urban scenes), administered to both the professionals and the inhabitants of Old Town of Mombasa. The urban scenes were exposed to the residents for a very short time (about 5 seconds), and an immediate response obtained. Overall, the public responded most favourably to the scenes of moderate complexity. The likability of the urban scenes indicates the potential impact that the built environment has on humans. As is shown by Nasar (1988d), the accuracy of the judgements notwithstanding, they may well influence behaviour. This has serious consequences for the sustainability of urban historic areas.

Figure 5.25
Comparison of Stimulus Rating

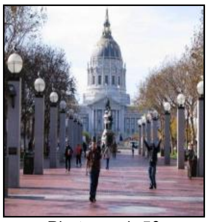
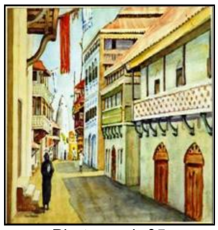
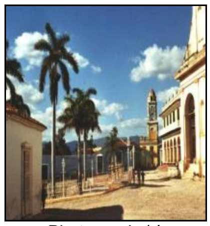


Source: Author (2010).

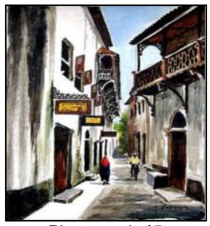
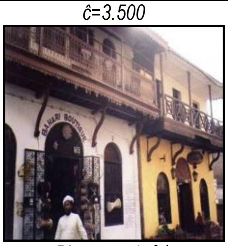
Plate 5.36 indicates the fifteen (15) most liked scenes, moderately liked scenes and least liked scenes. They are accompanied by their attendant complexity. The most preferred stimulus (Photograph 59) evokes a strong vista. Evidently, the inhabitants of Old Town of Mombasa preferred scenes with small discrepancies from the *styles* that have parallels in Old Town of Mombasa. Monumental scenes were found to be very attractive.

Plate 5.36
Likability of Environmental Stimuli

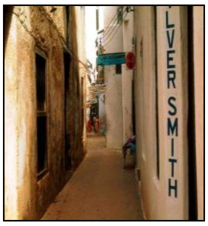
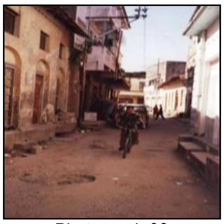
A: This section show 15 most liked urban scenes. The most liked scene is Photograph 59. The complexity of the urban scene is indicted as $\hat{c}$.

$\hat{c}$=2.500  Photograph 59	*$\hat{c}$=2.583*  Photograph 67	*$\hat{c}$=4.417*  Photograph 11	*$\hat{c}$=4.667*  Photograph 24	*$\hat{c}$=3.417*  Photograph 25
$\hat{c}$=4.750  Photograph 32	*$\hat{c}$=3.667*  Photograph 42	*$\hat{c}$=3.000*  Photograph 23	*$\hat{c}$=4.583*  Photograph 57	*$\hat{c}$=5.167*  Photograph 08
$\hat{c}$=3.417  Photograph 55	*$\hat{c}$ =4.667*  Photograph 66	*$\hat{c}$ =2.750*  Photograph 58	*$\hat{c}$ =3.147*  Photograph 05	*$\hat{c}$=4.917*  Photograph 14

B: This section shows 15 urban scenes of moderate likability. The complexity of the urban scene is indicted as $\hat{c}$.

$\hat{c}$=3.667  Photograph 97	*$\hat{c}$=4.417*  Photograph 28	*$\hat{c}$=2.083*  Photograph 27	*$\hat{c}$=2.967*  Photograph 29	*$\hat{c}$=3.667*  Photograph 45
$\hat{c}$=3.000  Photograph 100	*$\hat{c}$=4.333*  Photograph 15	*$\hat{c}$=4.500*  Photograph 69	*$\hat{c}$=2.750*  Photograph 68	*$\hat{c}$=4.000*  Photograph 40
$\hat{c}$=3.500  Photograph 94	*$\hat{c}$=2.333*  Photograph 19	*$\hat{c}$=2.833*  Photograph 48	*$\hat{c}$=4.833*  Photograph 16	*$\hat{c}$=4.583*  Photograph 75

C: This section show 15 most disliked urban scenes. The most disliked scene is Photograph 71. The complexity of the urban scene is indicted as

$\hat{c}$=3.335  Photograph 35	$\hat{c}$=3.412  Photograph 99	$\hat{c}$=3.440  Photograph 01	$\hat{c}$=3.442  Photograph 37	$\hat{c}$=3.535  Photograph 07
$\hat{c}$=3.714  Photograph 20	$\hat{c}$=3.724  Photograph 02	$\hat{c}$=3.761  Photograph 26	$\hat{c}$=3.849  Photograph 39	$\hat{c}$=3.867  Photograph 78
$\hat{c}$=3.878  Photograph 98	$\hat{c}$=4.031  Photograph 72	$\hat{c}$=4.279  Photograph 86	$\hat{c}$=4.459  Photograph 18	$\hat{c}$=4.523  Photograph 71

The complete set of photographs showing urban scenes used as stimuli is shown in Appendix I.

The responses to the urban scenes showed shared meanings. While the residents were not queried for reasons for their preference, the pattern of results and character of the urban scenes suggest some tentative explanations. Consider the presence of two very natural scenes that were liked. This is exemplified by the physical condition at the Treasury Square (Zone 1), in the Old Town of Mombasa, which is dominated by freestanding buildings, and is surrounded by well-maintained open spaces with lots of greenery. This calls up associations with elegance, colonial authority and a perceived high standing in society. The least liked scenery were also the least complex and most disorderly, containing dilapidated buildings, uncollected garbage etc, akin to Zone 3. Scenes with water are liked, as shown by the inclusion of photograph 32. Clearly, this is a reflection of Zone 2, with its associated aristocracy and wealth, and open views of the ocean.

Multiple regression analyses were used to explore the relationships among variables: likability, complexity, enclosure and idiosyncrasy (Appendix IIIb). Likability is taken to be the dependent (criterion) variable, while complexity, enclosure and idiosyncrasy are the independent variables (predictor). Theory indicates that likability is a connotative meaning of the environment (Chon, 2004; Nasar, 1998) which is operationised as complexity, enclosure and idiosyncrasy in the study.

The intention was to answer the questions: *How well do the three measures of the built environment (complexity, enclosure and idiosyncrasy) predict likability? Which is the best predictor of likability?* To answer these questions, the model assumes no multicollinearity and singularity (Pallant, 2005), and this is confirmed in Table 5.10 where none of the independent variables are seen to be highly correlated (R=.9 and above), and none of the independent variable is a combination of other independent variables, since all variables were scaled independently. The relationships are also assumed to be linear and the points are distributed along a straight line (Hinton, Brownlow, McMurray & Cozens, 2004). Multiple regression tells us how much of the variance in the dependent variable can be explained by the independent variables. It also gives an indication of the relative contribution of each independent variable. Most importantly, the study was able to determine the statistical significance of the results, both in terms of the model itself, and the individual independent variables (Pallant, 2005)

The *Stepwise method* was used to conduct the multiple regressions. This method adds predictor variables to the regression that best correlate with the dependent variable, and subtracts predictor variables that least correlate. In this way, a regression equation is generated using only the predictor variables that make a significant contribution to the prediction (Hinton, Brownlow, McMurray & Cozens, 2004). The variables *entered/ removed* *table* shows that the Stepwise method of regression has been used (Table 5.9). SPSS has entered only two variables, Complexity and Enclosure, which are significantly correlated with likability, as seen in the correlation matrix (Table 5.10).

Table 5.9
Variables Entered/Removed (a)

Model	Variables Entered	Variables Removed	Method
1	Complexity	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	Enclosure	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a Dependent Variable: Likability
Source: Author (2010).

Table 5.10
Correlations

		Likability	Complexity	Enclosure	Idiosyncrasy
Likability	Pearson Correlation	1	.293(**)	-.148	.199(*)
	Sig. (2-tailed)	.	.003	.143	.047
	N	100	100	100	100
Complexity	Pearson Correlation	.293(**)	1	.270(**)	.707(**)
	Sig. (2-tailed)	.003	.	.007	.000
	N	100	100	100	100
Enclosure	Pearson Correlation	-.148	.270(**)	1	.069
	Sig. (2-tailed)	.143	.007	.	.498
	N	100	100	100	100
Idiosyncrasy	Pearson Correlation	.199(*)	.707(**)	.069	1
	Sig. (2-tailed)	.047	.000	.498	.
	N	100	100	100	100

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Source: Author (2010).

The correlation matrix above is useful for checking patterns, and for multicollinearity. Significant correlations are highlighted underneath the output table with a * for a significance of $p<0.05$ and ** for $p<0.01$. The results indicate that an increase in complexity and idiosyncrasy leads to an increase in likability. Enclosure is not significantly related to likability.

Table 5.11
Model Summary(c)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square	F Change	df1	df2	Sig. F Change	
1	.293(a)	.086	.077	.43658	.086	9.234	1	98	.003	
2	.376(b)	.142	.124	.42530	.055	6.269	1	97	.014	1.431

a Predictors: (Constant), Complexity
b Predictors: (Constant), Complexity, Enclosure
c Dependent Variable: Likability
Source: Author (2010).

By observing the model summary above (Table 5.11), produced through the stepwise method, two models have been produced. Model 1 includes complexity, whereas Model 2 includes Complexity and Enclosure. Idiosyncrasy is totally excluded from the models. The R value (0.293) in Model 1 is the multiple correlation coefficient between the predictor variables and the dependent variable. As this model has only one predictor variable, complexity, the R value is the same as the Pearson's correlation coefficient in the correlation matrix (Table 5.10). In Model 2, the independent variables: Complexity and Enclosure are entered, generating a multiple correlation coefficient, R=0.376.

The *R Square* is a measure of how much the variability in the outcome is accounted for by the predictors. For Model 1, complexity accounts for 8.6% of the variation in likability, while in Model 2, this value increases to 14.2 % of the variance in likability accounted for by complexity and enclosure. The *Adjusted R Square* corrects for bias in R^2. The *Std. Error of the Estimate* is a measure of the variability of the multiple correlation. The *Dublin-Watson* value informs us on the tenability of the assumption of independent errors. The value of 1.431 is closer to 2, and as such, the assumption has almost been met (Field, 2009).

The ANOVA tests the significance of each regression model to see if the regression predicted by the independent variables explains a significant amount of the variance in the dependent variable (Hinton, Brownlow, McMurray & Cozens, 2004). The results of the tests are shown in Table 5.12.

Table 5.12
ANOVA (c)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.760	1	1.760	9.234	.003(a)
	Residual	18.679	98	.191		
	Total	20.439	99			
2	Regression	2.894	2	1.447	8.000	.001(b)
	Residual	17.545	97	.181		
	Total	20.439	99			

a Predictors: (Constant), Complexity
b Predictors: (Constant), Complexity, Enclosure
c Dependent Variable: Likability
Source: Author (2010).

Both regression models explain a significant amount of the variation in the dependent variable.

Model 1: F(1,98)=9.234; p<0.005

Model 2: F(2,97)=8.000; p<0.005

The models significantly improve the ability to predict likability based on *complexity*, and *complexity and enclosure*. This tests the null hypothesis that: The *multiple R in the population equals zero.* The models in this case reaches statistical significance (Sig=.003 and Sig= .001). The parameters of the model are given in the coefficients Table 5.13 below.

Table 5.13
Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.393	.181		13.198	.000	2.033	2.753					
	Complexity	.147	.048	.293	3.039	.003	.051	.244	.293	.293	.293	1.000	1.000
2	(Constant)	2.673	.209		12.784	.000	2.258	3.088					
	Complexity	.180	.049	.359	3.679	.000	.083	.278	.293	.350	.346	.927	1.079
	Enclosure	-.112	.045	-.245	-2.504	.014	-.201	-.023	-.148	-.246	-.236	.927	1.079

a Dependent Variable: Likability
Source: Author (2010).

The *Unstandardized Coefficients B* column gives the coefficients of the independent variables in the regression equations for each model.

Model 1: Likability=2.393+0.147Complexity

Model 2: Likability=2.673+0.18Complexity–0.112Enclosure

From the *Standardized Coefficients Beta* column, the contribution of each individual variable to the model can be assessed. The Beta weight is the average amount the dependent variable increases when the independent variable increases by one standard deviation, all other independent variables being held constant (Hinton, Brownlow, McMurray & Cozens, 2004). *t* tests are performed to test the null hypothesis that: *the beta value is significantly higher or lower than zero.* By observing the *Sig.* values in the table above, we can see that for model 1, complexity is significant ($p<0.05$). However for Model 2, both complexity ($p<0.05$) and Enclosure ($p<0.05$) are significant predictors. Model 2 is preferred as it accounts for more variance. Some variables were excluded from the models and are indicated in the Table 5.14 below.

Table 5.14
Excluded Variables (c)

						Collinearity Statistics		
Model		Beta In	t	Sig.	Partial Correlation	Tolerance	VIF	Minimum Tolerance
1	Enclosure	-.245(a)	-2.504	.014	-.246	.927	1.079	.927
	Idiosyncrasy	-.016(a)	-.119	.906	-.012	.500	1.999	.500
2	Idiosyncrasy	-.079(b)	-.580	.564	-.059	.484	2.066	.451

a Predictors in the Model: (Constant), Complexity
b Predictors in the Model: (Constant), Complexity, Enclosure
c Dependent Variable: Likability
Source: Author (2010).

The *Beta In* value gives an estimate of the beta weight if it was included in the model at this time (Hinton, Brownlow, McMurray & Cozens, 2004). The results of *t* tests for each independent variable are detailed with their probability values. From Model 1, the value of *t* for enclosure is significant ($p<0.05$), but has been removed from the model by the stepwise method used. *t* value for idiosyncrasy is not significant ($p>0.05$). In Model 2, idiosyncrasy is once again removed and has a *t* value that is not significant ($p>0.05$). Notice that complexity is not included in the table as it is included in both models. An indication of the contribution that each excluded predictor variable would have made had it been included in the model is indicated by the partial correlations. The *Collinearity Statistics Tolerance* values are all above

0.1. As recommended by Hinton, Brownlow, McMurray & Cozens (2004), values below 0.1 would indicate a serious problem.

Using the *Enter method*, also known as direct regression or simultaneous method, (Hinton, Brownlow, McMurray & Cozens, 2004), where all the variables are entered in at once, a multiple correlation coefficient, R, value of 0.380 is obtained. Complexity, Enclosure and Idiosyncrasy (independent variables), together account for 14.5 % of the variance in likability (Table 5.15).

Table 5.15
Model Summary (b)

					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.380(a)	.145	.118	.42676	.145	5.409	3	96	.002	1.422

a Predictors: (Constant), Idiosyncrasy, Enclosure, Complexity
b Dependent Variable: Likability
Source: Author (2010).

The ANOVA table is then produced which tests the significance of the regression model. The results are shown in Table 5.16.

Table 5.16
ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.955	3	.985	5.409	.002(a)
	Residual	17.484	96	.182		
	Total	20.439	99			

a Predictors: (Constant), Idiosyncrasy, Enclosure, Complexity
b Dependent Variable: Likability
Source: Author (2010).

We can see from Table 5.16 that the *Sig.* (p value)=0.002. As $p<0.05$, our predictions are significantly better than would be expected by chance. The regression line predicted by the independent variables explains a significant amount of the variance in the dependent variable. This model is reported as: {$F(3, 96)=5.409$; $p<0.05$}. The next output, the coefficients table, shows which variables are individually significant predictors of the dependent variable: likability (Table 5.17).

Table 5.17
Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.757	.254		10.840	.000	2.252	3.261					
	Complexity	.210	.071	.418	2.973	.004	.070	.350	.293	.290	.281	.451	2.217
	Enclosure	-.117	.046	-.255	-2.559	.012	-.207	-.026	-.148	-.253	-.242	.897	1.115
	Idiosyncrasy	-.044	.076	-.079	-.580	.564	-.195	.107	.199	-.059	-.055	.484	2.066

a Dependent Variable: Likability
Source: Author (2010).

The following model is obtained:

Model 1: Likability=2.757+0.210Complexity–0.117 Enclosure–0.044Idiosyncrasy

From the model's Beta analysis, it emerges that complexity has the greatest influence on likability. The more complex an environment is, the more it is preferred, up to an inverted U-optimal level. In Table 5.17 *Standardized Coefficients Beta* column, it is clear that if complexity is increased by one standard deviation, then likability would increase by 0.418 standard deviations. *Therefore, a change occasioning an increase in complexity in the built environment would lead to an increase in preference of the built environment. Similarly, a change occasioning an increase in enclosure and idiosyncrasy would lead to a decrease in likability of the historic area. Complexity is the best predictor of likability.*

t tests are performed to test the two-tailed hypothesis that: *The beta value is significantly higher or lower than zero.* It can be seen that the constant, complexity and enclosure are significant ($p<0.05$), but complexity gives the largest *t* value (2.973) save for the y-intercept (10.840).

Despite the assumption of no singularity, *Idiosyncrasy* was found to be highly correlated to *Complexity* ($r=0.707$, $N=100$, $p<0.01$). An increase in Idiosyncrasy of the built environment would lead to an increase in complexity of the built environment. There was a low correlation between Enclosure and Complexity (r=0.270, N=100, p<0.05). By applying the Stepwise method, where Complexity is taken to be the dependent variable that can be predicted by Idiosyncrasy and Enclosure, two models resulted as shown below (Table 5.18).

Table 5.18
Model Summary (c)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.707(a)	.500	.495	.64337	.500	97.899	1	98	.000	
2	.741(b)	.549	.540	.61400	.049	10.600	1	97	.002	1.919

a Predictors: (Constant), Idiosyncrasy
b Predictors: (Constant), Idiosyncrasy, Enclosure
c Dependent Variable: Complexity
Source: Author (2010)

In Model 1 above, the independent variable, Idiosyncrasy accounts for 50% of the variance in Complexity, while in Model 2, Idiosyncrasy and Enclosure, both accounts for 54.9% of the variance in Complexity. Using the Stepwise method, SPSS produced an ANOVA for each model (Table 5.19).

Table 5.19
ANOVA (c)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.523	1	40.523	97.899	.000(a)
	Residual	40.564	98	.414		
	Total	81.087	99			
2	Regression	44.519	2	22.259	59.045	.000(b)
	Residual	36.568	97	.377		
	Total	81.087	99			

a Predictors: (Constant), Idiosyncrasy
b Predictors: (Constant), Idiosyncrasy, Enclosure
c Dependent Variable: Complexity
Source: Author (2010).

The ANOVA tests the significance of each regression model to see if the regression predicted by the independent variables explains a significant amount of the variance in the dependent variable. Both regression models explain a significant amount of variation in the dependent variable. The null hypotheses that: *The R in the population equals Zero*; and *the multiple R in the population equals zero*, are rejected.

Model 1: F(1,98)= 97.899; p<0.005

Model 2: F(2,97)= 59.045; p<0.005

The coefficients table shows which variables are individually significant predictors of the dependent variable (Table 5.20).

Table 5.20
Coefficients (a)

Mode l		Unstandardize d Coefficients		Standardize d Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Boun d	Upper Boun d	Zero - order	Partia l	Part	Toleranc e	VIF
1	(Constant)	.538	.319		1.686	.09	-.095	1.171					
	Idiosyncras	.788	.080	.707	9.894	.00	.630	.946	.707	.707	.70	1.000	1.00
2	(Constant)	-.121	.366		-.332	.74	-.847	.604					
	Idiosyncras	.771	.076	.692	10.12	.00	.620	.922	.707	.717	.69	.995	1.00
	Enclosure	.203	.062	.223	3.256	.00	.079	.326	.270	.314	.22	.995	1.00

a Dependent Variable: Complexity
Source: Author (2010).

The regression equations are shown below:

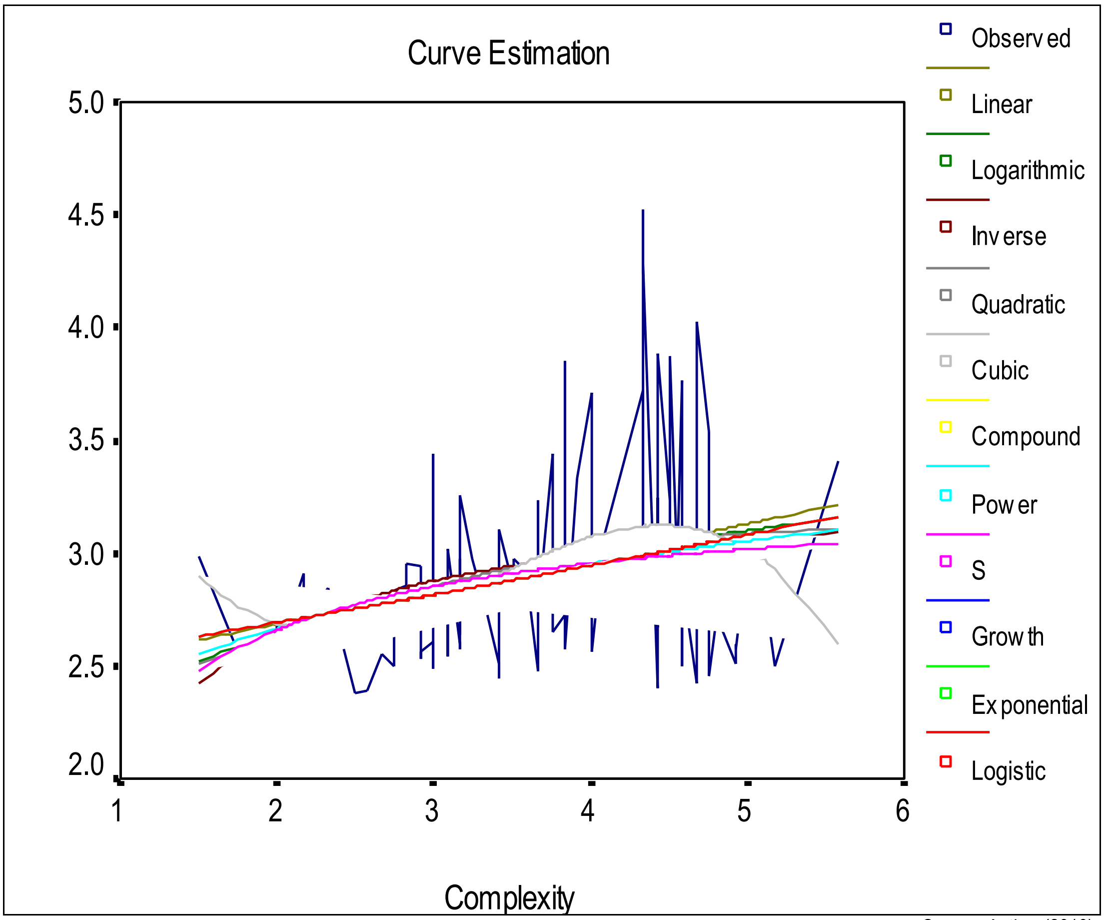
Model 1: Complexity=0.538+0.788 Idiosyncrasy

Model 2: Complexity=-0.121+0.711Idiosyncrasy+0.203 Enclosure

t tests were performed to test the two-tailed hypothesis that: *the Beta value is significantly higher or lower than zero.* For Model 1, Idiosyncrasy is significant (p<0.05) while the constant of the equation is not (p>0.05). In Model 2, both Idiosyncrasy and Enclosure are significant (p<0.05), while the intercept is not (p>0.05).

The Curve Estimation procedure was used to produce curve estimation regression statistics and related plots for 11 different curve estimation regression models. A separate model is produced for each dependent variable as shown in Figure 5.26. This approach was useful because it checked the expected inverted U curve (Figure 2.4), where preference increases with complexity and then decreases forming an inverted U curve.

Figure 5.26
Curve Estimation



Source: Author (2010).

Except for the Quadratic, Cubic and the observed data estimation curves, the other estimations follow a general linear pattern which is confirmed by the Pearson product correlation coefficient (r=0.293, N=100, p<0.01). If a quadratic curve is fitted, the approximation seems to follow Nasar's (1998) model of affective appraisal (likability) being predicted by *interest,* which together with *preference* are aspects of complexity. The equation can be written as:

Likability=2.008349+0.379679Complexity–0.032791Complexity^2

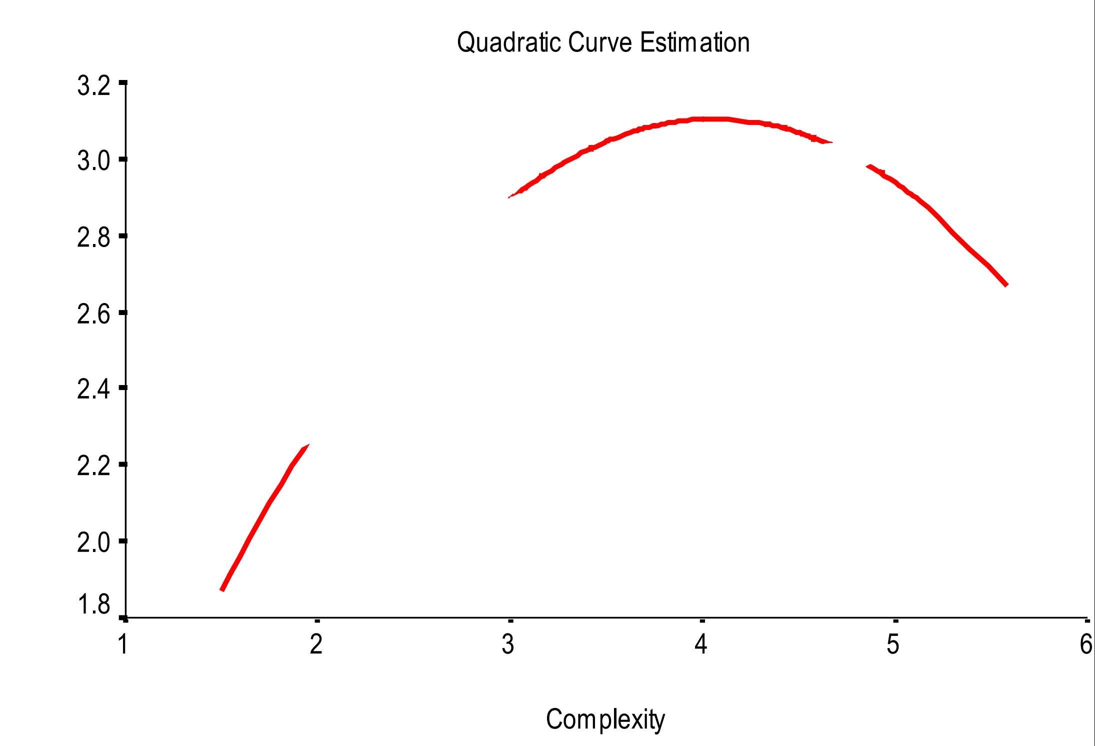
The ANOVA test indicates that the regression line predicted by complexity explains a significant amount of variance in likability {F (2, 97)= 4.81428; p<0.05}. The R Square value was 0.09030, indicating that the independent variable account for about 9% of the variance in likability. Evidently, the quadratic function is quite small and if excluded, the resulting relationship is linear. *t* test for the beta value indicated that only the constant was a significantly higher or lower than zero {Sig. (p value=0.0012)}. This model is rejected as it is not theoretically meaningful. The cubic model generates an R^2 value of 0.13077, indicating that the model accounts for about 13% of the variability in likability. This is the highest for the eleven curve estimations. The cubic model is given in the equation below.

Likability=5.371804–2.855920Complexity+0.9435564Complexity^2–0.093332 Complexity^3

The ANOVA results for the cubic model were: F (3, 96)=4.81436; p<0.005). Clearly, the regression line is significant. *t* tests for the beta values were all significant at p<0.05, except of the constant, which returned a p value of 0.718. However the cubic function in the model is quite small and the model is not theoretically sound.

When curve estimations for the quadratic equation (without constant in the equation) are undertaken (Figure 5.27), the best approximation to theoretical expected pattern of response to complexity is achieved (Nasar, 1998).

Figure 5.27
Interest and Likability in Relation to Increasing Complexity



Source: Author (2010).

The model is given as:

Likability=1.529690Complexity–0.188409Complexity^2

The redefined R Square value of 0.97592 indicates that the model accounts for about 97% of the variability in likability. The ANOVA results for this model indicate that the predictors are significantly better than would be expected by chance. Therefore, the regression line predicted by the independent variables explains a significant amount of the variance in likability {F (2, 98)=2027.03417; p<0.0001}. *t* tests, to test the two tailed hypothesis that: *the beta value is significantly higher or lower than zero*, showed that complexity was indeed a significant predictor of likability (p<0.0001).

Figure 5.27 shows that likability increases with increase in complexity up to a point and then decreases. A moderate complexity is liked. This is consistent with various studies that have found *preference* to have an inverted U-shaped function in relation to independently scaled *complexity* and, the finding in controlled studies for preference of moderate complexity (Chon & Shafer, 2009; Chon, 2004; Nasar, 2000, 1998). Nasar (1998) has demonstrated that complexity and related variables (such as visual richness, ornamentation, information rate, diversity and variety) have consistently appeared as prominent aspects of our response to surroundings. He has also shown that complexity involves the number of different noticeable elements and the distinctiveness between those elements.

5.3.4 The Underlying Dimensions of Perception

The residents of the Old Town of Mombasa were asked to rate 100 photographs of various urban scenes on a likability scale of 1 to 7, as the environmental stimuli (Appendix I; Appendix II; Section 3.2.2). Factor analysis, (Principal Components Analysis, PCA) with *varimax rotation* was used for the orderly simplification of the large number of inter-correlated measures (10,000 correlation values), to a few representative constructs (factor or components). The statistical assumption is that all the variables are correlated (Pallant, 2005). It has been shown that variables sharing similar underlying dimensions are highly correlated and those measuring dissimilar dimensions have low correlations (Ho, 2006). Principal Components Analysis (PCA), the most widely used data reduction technique was employed in factor extraction by compressing the large number of variables into a smaller, more manageable data set (Boslaugh & Watters, 2008). It does this by looking for 'clumps' or groups among the inter-correlations of a set of variables (Pallant, 2005). Principal Components Analysis is also used for testing hypothesis based on the general linear model since it 'produces variables that are orthogonal, meaning that one of the major assumptions of the general linear model can be easily met' (Boslaugh & Watters, 2008, pg. 298). No *a priori* number of factors was specified. Appendix XIV shows the factor analysis model and the procedure for conducting it.

The Principal Components Analysis was applied to answer the question: *What is the underlying factor structure of likability?* The procedure, based on correlations, assumed that the relationship between variables is linear (Pallant, 2005). A correlation matrix was generated and variables that had low loadings, $r<0.5$, with any other variable, were excluded from the analysis (Boslaugh & Watters, 2008; Ho, 2006; Pallant, 2005; Hinton, Brownlow, McMurray & Cozens, 2004). A total of 28 variables were excluded and factor analysis rerun with the remaining 72 variables.

The *Bartlett's Test of Sphericity* was used to test the adequacy of the correlation matrix, i.e. the correlation matrix has significant correlations among at least some of the variables (Ho, 2006; Pallant, 2005). It tested the hypothesis that*: the correlation matrix is an identity matrix*, that is, all diagonal terms are identity (1) and all off diagonal terms are nought (0).The results are shown in Table 5.21.

Table 5.21
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.947
Bartlett's Test of Sphericity	Approx. Chi-Square	23165.119
	df	2556
	Sig.	.000

Source: Author (2010).

The Bartlett's test yielded an Approx. Chi-Square value of 23165.119 and an associated level of significance smaller than 0.001, that is, $p<0.001$, and we can therefore conclude that there are relationships among the variables (Hinton, Brownlow, McMurray & Cozens, 2004. Therefore, factor analysis is an appropriate tool to identify underlying dimensions of perception. *The hypothesis that the correlation matrix is an identity matrix is therefore rejected.* The implication of Bartlett's test is that the correlation matrix can be factorized and there are relationships among the variables, which are a reflection of relationships between attitudes and the built environment, measured as likability. Once again, the study H_o: *there is* *no relationship between the historic built environment in the Old Town of Mombasa and the attitudes of the inhabitants towards it,* is in jeopardy.

The *Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)* is calculated using correlations and partial correlations to test whether the variables in the sample are adequate to correlate, that is, it calculates whether the variables are so highly correlated that we cannot distinguish between them (Hinton, Brownlow, McMurray & Cozens, 2004). A general rule of the thumb is that a KMO value greater than 0.5 is satisfactory for factor analysis to proceed (Hinton, Brownlow, McMurray & Cozens, 2004). Pallant (2005) recommends a value greater than 0.6. By observing the above results, the KMO is 0.947, and therefore, we can proceed with factor analysis (Table 5.21). This result substantially rules out multicollinearity in the data set. In order to determine the number of factors to retain, *Parallel Analysis*, also known as *Humphrey-Ilgen Parallel Analysis* was used. Parallel analysis is recommended as the best method to assess the number of factors to retain, by selecting the factors that are greater than random (Lance, Butts & Michels, 2006; Velicer, Eaton & Fava, 2002). The actual data was factor analysed and eigenvalues compared with the random solution from parallel analysis, which had 100 replications (Pallant, 2005). The results are shown in the Table 5.22.

Table 5.22
Comparison between Humphrey-Ilgen Parallel Analysis and Actual Data Eigenvalues

Component Number	Actual Eigenvalue from PCA	Criterion Value from Parallel analysis	Decision
1	20.864	1.8656	Accept
2	9.264	1.8069	Accept
3	2.869	1.7545	Accept
4	2.003	1.7173	Accept
5	1.689	1.6859	Accept
6	1.521	1.6688	Reject
7	1.340	1.6386	Reject
8	1.258	1.6110	Reject

Source: Author (2010).

A systematic comparison of the eigenvalues obtained from SPSS, with the corresponding first value from the random results generated by parallel analysis, was undertaken. Five factors that were greater than the criterion random were accepted and retained (Table 5.22). Another commonly used rule for deciding if a factor is important for retention is to only take factors with an eigenvalue of 1 or greater. An eigenvalue of 1 means that the factor can explain as much variability in the data as a single original variable (Hinton, Brownlow, McMurray & Cozens, 2004). Using the criteria for retaining only factors with eigenvalues greater than 1, twelve (12) factors are retained as shown in the Table 5.23.

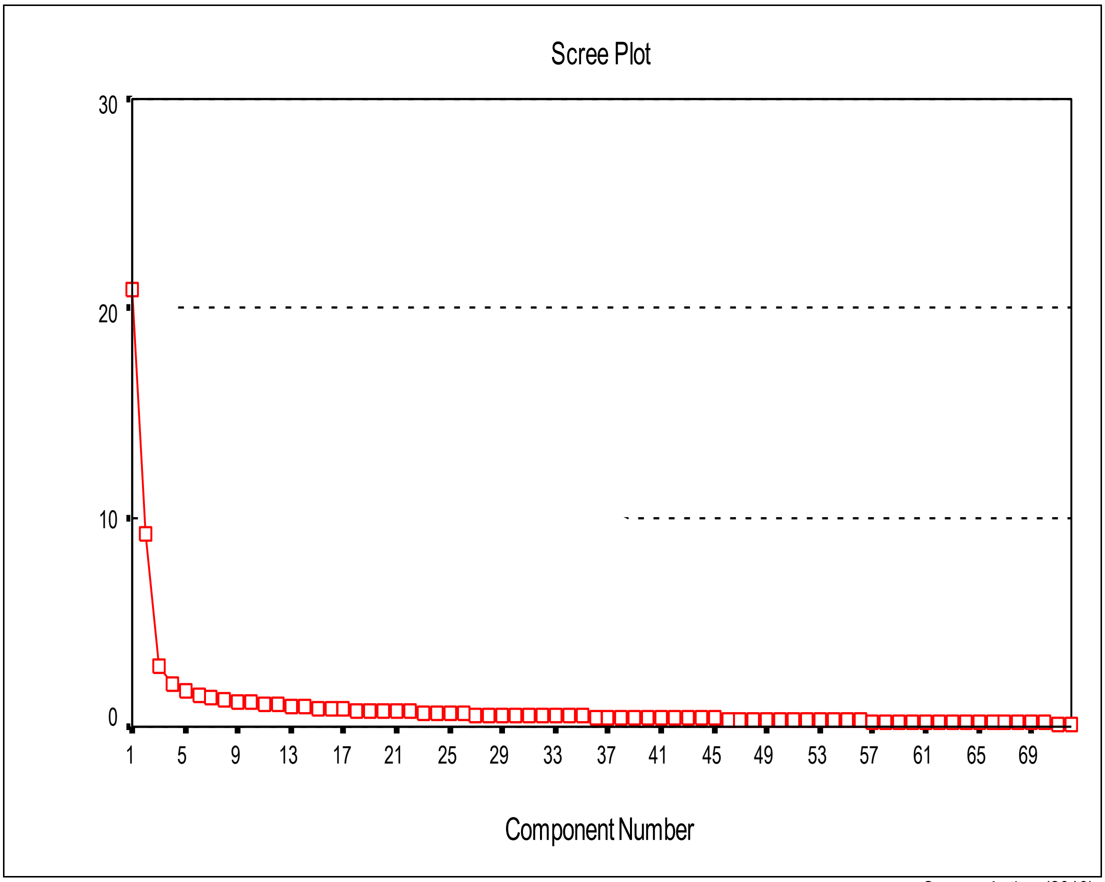
Table 5.23
Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	20.864	28.978	28.978	20.864	28.978	28.978	13.726	19.064	19.064
2	9.264	12.867	41.845	9.264	12.867	41.845	9.215	12.798	31.863
3	2.869	3.984	45.829	2.869	3.984	45.829	4.553	6.323	38.186
4	2.003	2.782	48.610	2.003	2.782	48.610	3.487	4.843	43.029
5	1.689	2.345	50.956	1.689	2.345	50.956	2.844	3.950	46.980
6	1.521	2.112	53.068	1.521	2.112	53.068	1.971	2.737	49.717
7	1.340	1.861	54.930	1.340	1.861	54.930	1.789	2.484	52.201
8	1.258	1.747	56.676	1.258	1.747	56.676	1.781	2.474	54.675
9	1.167	1.621	58.297	1.167	1.621	58.297	1.537	2.134	56.810
10	1.126	1.564	59.861	1.126	1.564	59.861	1.508	2.095	58.905
11	1.107	1.538	61.399	1.107	1.538	61.399	1.503	2.088	60.992
12	1.022	1.419	62.818	1.022	1.419	62.818	1.315	1.826	62.818
13	.959	1.331	64.150						
Rows indicating components 14 to 71 have been excluded from table.									
72	.148	.205	100.000						

Extraction Method: Principal Component Analysis.
Source: Author (2010).

The *Total Variance Explained* section (Table 5.23), presents the number of common factors computed, the eigenvalues associated with these factors, the percentage of total variance explained by each factor, and the cumulative percentage of variance accounted for by the factors. Although 72 components (factors) have been computed, not all are useful in representing the 72 variables. Using the criteria of selecting eigenvalues greater than 1, the 12 factors account for 62.818% of the total variance. The rotation method changes the eigenvalues and variance explained by each factor but keeps the total variance the same. The extracted factors are shown in the *Rotation Sums of Squared Loadings* column. If five factors are retained as derived from parallel analysis, these factors account for 50.956% of the total variance in the data. Another method of determining the number of factors to retain is the Scree plot. The factors are the X-axis and the eigenvalues are the Y-axis. The factor with the highest eigenvalue is the first component; the second component has the second highest eigenvalue and so on (Figure 5.28).

Figure 5.28
Scree Plot

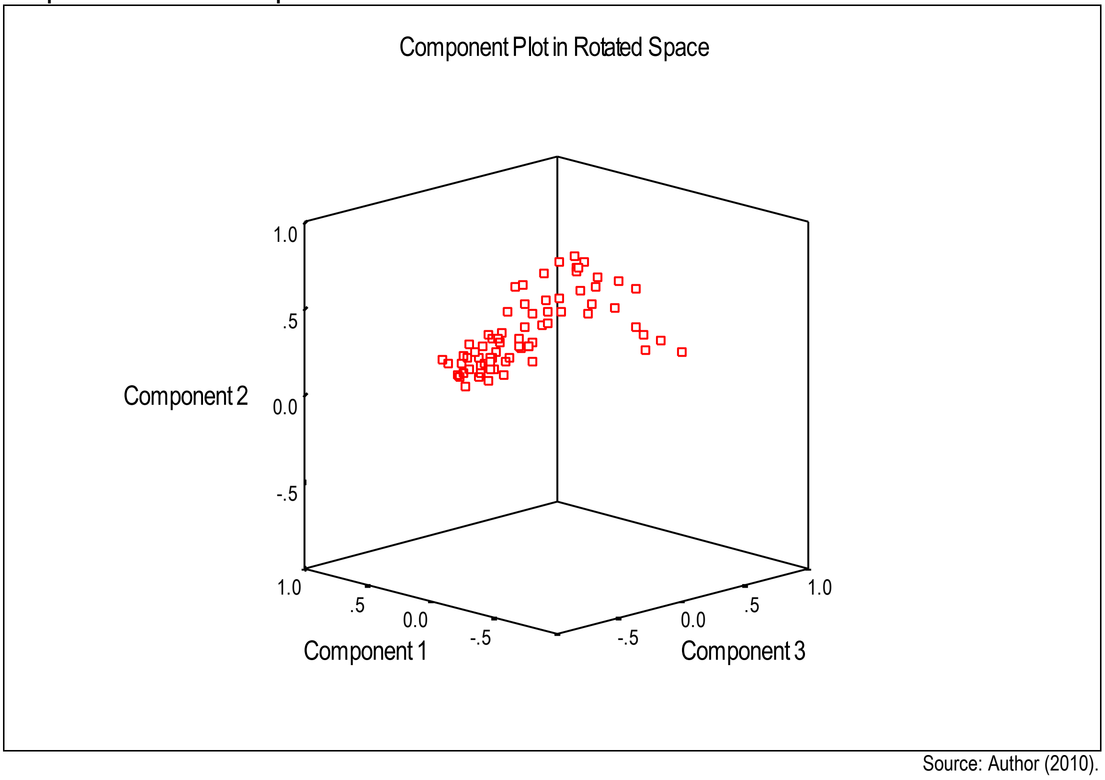


Source: Author (2010).

The Scree test is used to identify the optimum number of factors that can be extracted before the amount of unique variance begins to dominate the common variance structure (Ho, 2006). The graphical plot above shows a steep slope between the large factors and the gradual trailing off of the rest of the factors. The point at which the curve begins to straighten out (the elbow) is considered to indicate the maximum number of factors to extract (Ho, 2006; Hinton, Brownlow, McMurray & Cozens, 2004). From the Scree plot, a three factor model is sufficient to represent the data set.

As recommended by Pallant (2005), this study retains five factors identified through the Humphrey-Ilgen parallel analysis, since 'both Kaiser's criterion and Catell's Scree test tend to overestimate the number of components' (pg. 175). Since there are more than two variables, we can think of them as defining as space, just as two variables define a plane (Section 3.2.3, Figure 3.1 and Figure 3.2). The component plot for the first three factors is shown in Figure 5.29. It indicated how the variables are clustered in 3-D space. It is not possible to illustrate a 5-D space but suffice to say that a three factor model produces a scatter plot of the most important factors.

Figure 5.29
Component Plot in Rotated Space



Source: Author (2010).

In order to interpret the factors, *Varimax* rotation was used. This is the most commonly used orthogonal rotation and attempts to minimise the number of variables that have high loadings on each factor (Ho, 2006; Pallant, 2005; Hinton, Brownlow, McMurray & Cozens, 2004). It rotates the axis of the factors such that orthogonality is preserved, while maximising the sum of variances of the loadings (Boslaugh & Watters, 2008). This does not affect the total amount of variance accounted for by the five factors, but changes in the relative proportion of variance between the factors occur, as shown in Table 5.23. The rotated component matrix is used to induce factor meanings (Table 5.24).

Table 5.24
Rotated Component Matrix (a) *The photographic stimuli is denoted as: lik_*

Variable	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
lik_56	**.793**	.071	-.105	-.041	.144	-.073	.157	.047	-.002	.045	.027	-.043
lik_57	**.788**	.052	-.076	-.004	.161	.016	.064	.101	.032	-.069	-.010	-.013
lik_43	**.740**	-.013	.003	-.016	.067	.094	-.001	-.099	.242	.124	.077	-.020
lik_58	**.723**	-.008	-.055	.195	.084	.027	.168	-.145	.083	-.096	.135	-.007
lik_96	**.702**	.099	-.034	.032	.031	-.020	-.114	.123	-.062	.205	-.114	-.203
lik_08	**.697**	.063	-.050	.073	-.009	.179	-.030	.063	-.168	-.167	.063	.071
lik_38	**.694**	.024	.000	.061	.060	.084	-.008	-.050	.165	.024	.055	.078
lik_11	**.693**	-.010	-.077	.174	.168	.101	-.037	-.015	-.050	-.130	.166	.108
lik_03	**.680**	-.014	.082	.054	.011	.096	-.049	.110	-.012	-.011	.236	.271
lik_59	**.668**	.097	-.038	.116	.104	.085	.228	-.150	.198	-.213	.044	.025
lik_41	**.657**	.038	.060	.002	.022	.094	.150	.025	.353	.171	-.020	-.123
lik_81	**.642**	-.057	-.081	.141	.301	-.001	.008	.089	-.081	.259	-.010	.113
lik_79	**.641**	-.020	.023	.233	.219	.040	.011	.157	.059	-.017	-.031	-.037
lik_61	**.606**	.105	-.008	.135	.213	.199	.282	-.186	-.043	.238	-.026	.010
lik_55	**.602**	.199	-.085	.136	.139	-.046	.084	-.043	.074	-.395	-.108	.047
lik_83	**.594**	.174	.012	.260	.152	-.121	-.022	.122	-.041	.131	.041	.161
lik_80	**.591**	-.039	.058	.256	.101	.090	.185	.205	-.036	.283	.000	-.067
lik_69	**.590**	.065	.220	.346	.083	-.002	.073	.139	-.055	.092	.053	.120
lik_42	**.548**	.086	-.013	-.023	.231	.116	.201	.139	.393	-.174	-.131	-.041
lik_29	**.548**	.249	.009	-.014	.080	.258	-.010	.048	.049	.156	.458	.026
lik_88	**.541**	.170	-.100	**.481**	.045	.120	-.009	-.015	-.149	.029	.013	-.106
lik_28	**.537**	.112	.034	.134	.234	.215	.034	-.025	.030	.186	.474	.049
lik_74	**.531**	.072	.134	.476	-.031	.066	.035	.087	.063	.060	-.135	.176
lik_60	**.520**	.225	.010	.234	.064	.184	.504	-.079	-.039	.077	.095	.033
lik_67	**.516**	.145	.035	**.463**	.051	-.011	.261	.122	-.026	.024	.218	-.102
lik_68	**.502**	.366	.120	**.476**	-.014	-.059	.152	.093	-.032	.076	.083	-.030
lik_32	**.459**	.079	-.060	.124	**.454**	.324	.111	-.003	.096	-.008	.208	-.046
lik_75	**.441**	.159	.221	**.431**	.022	.257	-.147	.144	.148	.057	-.235	.035
lik_51	.054	**.761**	.201	.036	.055	-.027	-.037	-.083	-.041	-.043	.047	-.090
lik_52	.070	**.739**	.099	.008	.103	.004	.027	.086	.000	.033	-.046	-.052
lik_53	-.017	**.737**	.209	.105	-.008	.089	-.035	.057	.034	-.099	-.079	.080
lik_34	-.033	**.718**	.147	.119	.074	.168	.121	-.010	.059	.053	.069	.120
lik_35	-.015	**.692**	.151	.112	.132	.121	.123	-.008	.118	.124	.078	.161
lik_54	.051	**.683**	.210	.143	.034	-.022	.054	-.014	.079	-.012	-.040	.146
lik_65	.149	**.671**	.054	.193	-.009	-.191	.015	.098	.107	-.009	.020	-.061
lik_26	-.127	**.610**	.369	-.130	.057	.126	-.021	.138	.003	.049	.072	-.013
lik_45	.205	**.609**	-.063	.134	-.018	.015	.012	.101	.438	-.004	.096	.001
lik_64	.037	**.607**	.356	.144	.158	-.011	.154	-.104	-.170	-.092	.109	-.128
lik_33	.254	**.598**	-.072	.081	-.130	.297	.033	.186	.038	.124	.071	.045
lik_01	.069	**.549**	.255	.063	.126	.088	.083	.091	-.013	.091	.198	.503
lik_37	.127	**.527**	**.431**	-.058	.150	.062	.107	-.029	-.180	-.022	.138	-.195
lik_92	.153	**.509**	.075	.204	.001	.112	-.086	.482	-.077	.158	.126	.092
lik_16	.092	**.440**	.122	.152	.111	.276	.305	.334	.054	-.105	-.102	.163
lik_15	.164	**.440**	-.019	.211	.367	.084	.217	.146	-.041	-.154	.069	.360
lik_85	.218	**.416**	.152	.218	.039	.097	.165	.394	-.100	.384	-.057	.098
lik_86	-.248	.161	**.744**	.029	-.070	-.059	-.077	.085	.081	-.022	.103	-.049
lik_98	.032	.204	**.729**	.091	.017	.068	-.053	.024	.115	-.078	-.191	.033
lik_71	-.014	.135	**.696**	.048	-.106	-.089	.050	-.037	.034	.131	-.084	.293
lik_18	.053	.252	**.686**	-.011	-.123	-.053	.071	-.102	-.050	.135	.091	.123
lik_78	-.192	.229	**.640**	.126	.096	.060	-.082	.191	.019	-.086	.187	-.256
lik_39	-.039	**.509**	**.592**	-.075	-.018	.086	.061	-.068	-.135	.119	-.094	-.170
lik_20	.005	**.411**	**.466**	.004	-.013	.328	.184	.162	-.168	-.048	.050	.032
lik_02	.211	.343	**.463**	.084	.044	.161	.039	.082	-.093	.154	.043	.418
lik_07	.152	**.414**	**.433**	.039	.077	.044	.262	.078	-.255	-.001	.047	.051
lik_76	.238	.348	-.004	**.529**	.151	.253	-.033	-.026	.137	.029	.048	.030
lik_89	.191	.350	.080	**.503**	.236	.147	.133	.302	.161	.038	.120	.050
lik_87	**.433**	.163	.159	**.477**	.006	.126	.054	.023	-.006	.082	.043	.144
lik_66	**.413**	.261	-.052	**.453**	.261	-.134	.217	-.018	.016	-.207	.021	.040
lik_24	.398	.143	-.120	-.093	**.676**	.087	.104	.092	.076	-.042	-.079	.003
lik_23	.386	.248	-.062	.022	**.578**	.152	-.102	-.057	.106	-.049	.014	.056
lik_82	**.452**	.023	.034	.244	**.558**	-.020	.078	.109	.038	.100	.080	.062
lik_91	**.458**	.069	-.029	.273	**.493**	-.086	-.126	-.006	-.015	.226	.172	-.039
lik_31	.297	.212	.074	.202	.242	.582	.160	.137	.038	-.100	.149	.036
lik_30	.218	**.494**	-.033	.142	.052	.570	-.117	.108	.005	.099	-.020	.076
lik_62	.368	.088	.175	.178	.360	.370	.152	-.195	.034	.181	.057	-.021
lik_48	.495	.252	.063	.047	-.015	.013	.554	.162	.143	.077	.080	.076
lik_49	.387	.195	.090	.256	.165	-.045	.401	-.023	.370	-.092	.120	.053
lik_94	.040	**.541**	.059	.055	.059	.027	-.006	.552	-.009	-.094	.097	.033
lik_90	.114	.382	.039	.371	.058	.159	.185	.386	.093	.088	.157	-.081
lik_44	**.467**	.142	-.050	.089	.331	.022	.032	-.103	.552	-.021	.105	-.022
lik_84	**.433**	.178	.239	.241	.138	-.016	.039	-.029	.038	.501	.093	.146
lik_27	.386	.240	.093	.113	.038	-.008	.159	.217	.086	-.067	.548	.106

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 18 iterations.
Source: Author (2010).

In interpreting the factors, the size of factor loadings (correlation coefficients between the variables and the factors they represent) are used. As shown by Ho (2006), large loadings indicate that they are representative of the factor, while small loadings suggest they are not. Hinton, Brownlow, McMurray & Cozens (2004) recommend a cut-off point of 0.4 for deciding which variables to show loading on each factor. This is represented by the bolded values in Table 5.24.

The five factors can be understood in terms of the properties of the stimuli, that is, the photographs. These are coded as *lik_* in Table 5.24. The photographs constituting the factors are indicated in the Table 5.25 below. The highest loadings variables per factor are used to identify the nature of the underlying latent variable represented by each component (factor) as recommended by Pallant (2005).

Table 5.25
Factor Interpretation

Factors (Components)	Stimuli (Photograph): *Coded as lik_ in the Analysis*
Factor 1	56,57,43,58,96,08,38,11,03,59,41,81,79,61,55,83,80,69,42,29,88,28,74,60,67,68, 32, 75,87,66,82,91,44,84
Factor 2	51,52,53,34,35,54,65,26,45,64,33,01,37,92,16,15,85,39,20,07,30,94
Factor 3	86,98,71,18,78,39,20,02,07
Factor 4	88,74,67,68,75,76,89,87,66,
Factor 5	32,24,23,82,91,

Source: Author (2010).

A Factor Score Coefficient Matrix is produced which shows the scores for each variable on each factor (Table 5.26). This indicates the relative weight that each variable contributes to each factor. The factor loadings, (analogous to Beta), indicate how each variable should be assigned in creating a factor.

Table 5.26

Component Score Coefficient Matrix *The photographic stimuli is denoted as: lik_*

	Component											
Variable	1	2	3	4	5	6	7	8	9	10	11	12
lik_01	-.024	.046	-.007	-.057	.034	-.039	-.014	-.029	-.004	.026	.096	.385
lik_02	.020	-.014	.084	-.052	-.001	.041	-.034	-.008	-.048	.037	-.028	.306
lik_03	.103	-.040	.042	-.082	-.086	.012	-.130	.060	-.032	-.098	.146	.207
lik_07	.021	.014	.076	-.061	.033	-.029	.158	.016	-.205	-.046	-.021	-.010
lik_08	.129	.006	-.003	-.057	-.107	.091	-.106	.019	-.185	-.204	.009	.044
lik_11	.079	-.016	.002	.013	-.010	.021	-.124	-.036	-.101	-.164	.095	.079
lik_15	-.051	.022	-.051	.023	.160	-.042	.088	.034	-.088	-.128	-.017	.272
lik_16	-.035	-.015	-.002	-.025	.023	.126	.188	.186	.013	-.086	-.155	.084
lik_18	.031	-.011	.166	-.040	-.061	-.059	.015	-.097	.003	.046	.058	.069
lik_20	.004	-.020	.095	-.066	-.028	.188	.103	.069	-.120	-.091	-.012	-.033
lik_23	-.001	.035	-.009	-.060	.258	.023	-.150	-.054	.011	-.037	-.049	.044
lik_24	-.005	.000	-.007	-.154	.342	-.027	.040	.105	-.022	-.006	-.146	-.003
lik_26	.000	.072	.048	-.127	.029	.028	-.049	.053	.017	.025	.022	-.049
lik_27	.014	-.023	.018	-.033	-.065	-.087	.023	.114	.045	-.101	.404	.042
lik_28	.004	-.022	.000	-.011	.021	.068	-.061	-.072	.003	.082	.324	-.006
lik_29	.050	.023	-.022	-.109	-.077	.102	-.095	-.022	.020	.062	.313	-.024
lik_30	.004	.063	-.073	-.002	-.068	.339	-.148	-.037	-.009	.034	-.079	.017
lik_31	-.038	-.067	.021	.030	.034	.349	.050	.038	-.010	-.121	.049	-.027
lik_32	-.026	-.042	.003	-.009	.156	.156	.015	-.022	.013	-.023	.100	-.073
lik_33	.031	.107	-.106	-.056	-.165	.142	-.032	.024	.018	.076	.001	-.011
lik_34	-.043	.112	-.055	.009	-.011	.043	.033	-.118	.030	.049	.007	.059
lik_35	-.053	.105	-.052	-.003	.026	.001	.035	-.109	.079	.109	.009	.095
lik_37	.029	.063	.080	-.088	.060	-.015	.031	-.054	-.157	-.046	.069	-.209
lik_38	.091	.001	.018	-.059	-.070	.021	-.087	-.046	.081	-.016	.005	.056
lik_39	.028	.062	.114	-.077	.001	.033	.030	-.082	-.085	.067	-.106	-.185
lik_41	.070	-.012	.038	-.107	-.085	.034	.063	.035	.237	.137	-.065	-.129
lik_42	.047	-.032	.045	-.123	.045	.041	.089	.144	.225	-.102	-.160	-.043
lik_43	.096	.004	.024	-.102	-.073	.031	-.072	-.065	.145	.074	.020	-.026
lik_44	-.009	.010	.016	-.014	.084	-.040	-.062	-.069	.359	.027	.053	-.018
lik_45	-.003	.115	-.072	.000	-.101	-.055	-.074	-.004	.301	.036	.052	-.022
lik_48	.024	-.006	-.014	-.113	-.088	-.054	.373	.100	.068	.072	-.015	.013
lik_49	-.037	-.026	.027	.065	.007	-.085	.224	-.037	.223	-.039	.053	.015
lik_51	.025	.165	-.028	-.021	-.010	-.081	-.095	-.145	-.062	-.030	.014	-.100
lik_52	.015	.149	-.056	-.071	.025	-.073	-.027	-.012	-.028	.041	-.083	-.074
lik_53	.010	.125	-.019	.005	-.041	.005	-.093	-.053	.006	-.081	-.092	.040
lik_54	-.004	.119	-.022	.019	-.019	-.082	-.028	-.102	.039	-.005	-.067	.096
lik_55	.093	.045	-.005	-.001	-.014	-.065	-.035	-.038	-.047	-.307	-.115	.050
lik_56	.116	.032	-.022	-.151	-.007	-.109	.060	.050	-.068	.018	-.041	-.051
lik_57	.120	.008	.005	-.129	-.002	-.042	-.025	.090	-.047	-.083	-.066	-.023
lik_58	.068	-.005	.002	.033	-.070	-.013	.038	-.122	-.009	-.099	.073	-.020
lik_59	.066	.008	.007	-.015	-.065	.030	.078	-.118	.063	-.162	-.005	.015
lik_60	-.002	.004	-.044	.030	-.069	.075	.325	-.121	-.084	.051	-.002	-.027
lik_61	.022	.015	-.033	-.019	.027	.087	.172	-.174	-.080	.170	-.102	-.029
lik_62	-.040	-.040	.043	.043	.124	.208	.068	-.180	-.004	.115	-.023	-.061
lik_64	-.013	.086	.037	.046	.062	-.067	.055	-.145	-.163	-.084	.056	-.150
lik_65	.016	.142	-.059	.040	-.047	-.202	-.056	-.011	.051	.008	-.005	-.078
lik_66	-.018	.023	-.030	.186	.078	-.156	.075	-.070	-.070	-.162	-.020	.012
lik_67	-.004	-.029	-.004	.168	-.057	-.066	.123	.024	-.059	-.025	.133	-.145
lik_68	.021	.035	-.013	.165	-.088	-.109	.030	-.027	-.057	.011	.023	-.082
lik_69	.045	-.052	.065	.081	-.014	-.062	-.020	.059	-.060	-.008	-.009	.055
lik_71	.014	-.050	.185	-.007	-.025	-.077	.010	-.036	.076	.047	-.081	.222
lik_74	.032	-.038	.033	.174	-.087	.009	-.047	-.003	.028	-.016	-.147	.112
lik_75	.030	-.037	.070	.155	-.055	.147	-.183	.041	.103	-.019	-.226	-.010
lik_76	-.061	.023	-.041	.251	-.007	.122	-.109	-.138	.074	-.004	.006	-.018
lik_78	-.038	-.074	.207	.066	.082	.017	-.096	.137	.047	-.116	.158	-.264
lik_79	.057	-.047	.045	.024	.054	-.024	-.059	.115	-.004	-.057	-.073	-.056
lik_80	.028	-.061	.020	.021	.000	.008	.112	.129	-.038	.168	-.069	-.112
lik_81	.047	-.020	-.018	-.037	.118	-.073	-.033	.055	-.091	.151	-.078	.071
lik_82	-.034	-.057	.034	.039	.276	-.106	.002	.077	-.016	.052	-.004	.022
lik_83	.056	.021	-.015	.029	.026	-.163	-.091	.041	-.062	.046	-.019	.108
lik_84	-.004	.004	.021	.036	.032	-.089	-.014	-.085	.051	.335	.012	.073
lik_85	-.013	.014	-.029	-.018	.007	-.023	.111	.206	-.051	.252	-.130	.007
lik_86	-.017	-.069	.230	.026	.011	-.045	-.082	.072	.118	-.064	.104	-.071
lik_87	.002	-.025	.020	.191	-.073	.041	-.039	-.074	-.019	-.005	-.005	.074
lik_88	.031	.031	-.056	.204	-.068	.044	-.078	-.103	-.160	-.034	-.023	-.128
lik_89	-.087	-.038	-.002	.187	.074	.014	.028	.130	.103	.003	.042	-.023
lik_90	-.066	-.017	-.028	.115	-.017	.037	.095	.197	.068	.049	.076	-.141
lik_91	-.018	.002	-.004	.082	.233	-.149	-.155	-.033	-.043	.138	.091	-.058
lik_92	.007	.038	-.039	-.005	-.030	-.016	-.115	.256	-.040	.059	.048	.014
lik_94	.010	.038	-.019	-.080	.020	-.068	-.052	.351	-.014	-.098	.035	-.018
lik_96	.131	.049	-.009	-.095	-.045	-.056	-.123	.086	-.075	.116	-.137	-.193
lik_98	.023	-.059	.230	.018	.025	.039	-.086	.023	.107	-.107	-.163	.003

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Source: Author (2010).

The following regression models are produced, which are linear combinations of the original variables. They represent hypothetical constructs that affect at least two of the measurement variables.

Factor 1= (0.116)lik_56+ (0.120)lik_57+ (0.096)lik_43 + (0.068)lik_58+ (0.131)lik_96 +(0.129)lik_08+ (0.091)lik_38+ (0.079)lik_11+ (0.103)lik_03+ (0.066)lik_59+ (0.070)li_41 +(0.047)lik_81 +(0.057)lik_79 + (0.022)lik_61+(0.093)lik_55 +(0.056)lik_83 +(0.028)lik_80 +(0.045)lik_69 +(0.047)lik_42 +(0.050)lik_29 +(0.031)lik_88 +(0.004)lik_28 +(0.032)lik_74 +(-0.002)lik_60 +(-0.004)lik_67 +(0.021)lik_68 +(-0.026)lik_32 +(-0.037)lik_75 +(-0.025)lik_87 +(-0.018)lik_66 +(-0.034)lik_82 +(-.018)lik_91 +(-0.009)lik_44+(-0.004)lik_84

Factor 2=(0.165)lik_51 +(0.149)lik_52 +(0.125)lik_53 +(0.112)lik_34 +(0.105)lik_35 +(0.119)lik_54 +(0.142)lik_65 +(0.072)lik_26 +(0.115)lik_45 +(0.086)lik_64 +(0.107)lik_33 +(0.046)lik_01 +(0.063)lik_37 +(0.038)lik_92 +(-0.015)lik_16 +(0.022)lik_15 + (0.014)lik_85 +(0.062)lik_39 +(-0.020)lik_20 +(0.014)lik_07 +(0.063)lik_30 +(0.038)lik_94

Factor 3= (0.080)lik_37 +(0.230)lik_86 +(0.230)lik_98 +(0.185)lik_71 +(0.166)lik_18 +(0.207)lik_78 +(0.114)lik_39 +(0.095)lik_20 +(0.084)lik_02 +(0.076)lik_07

Factor 4= (0.204)lik_88 +(0.174)lik_74 +(0.168)lik_67 +(0.165)lik_68 +(0.155)lik_75 +(0.251)lik_76 +(0.187)lik_89 +(0.191)lik_87 +(0.186)lik_66

Factor 5= (0.156)lik_32 +(0.342)lik_24 +(0.258)lik_23 +(0.276)lik_82 +(0.233)lik_91

Factor scores for each respondent on the above factors were calculated and saved in SPSS as regression scores to be used in further multivariate analysis (DiStefano, Zhu & Mîndrilă, 2009). The factors are interpreted as follows:

Factor 1: Complexity

This factor is identified as *complexity.* As defined by Nasar (1988b), complexity refers to the number of different elements and the distinctiveness between those elements. The photographic stimuli comprising this factor are visually rich and orderly. They constitute urban squares, streets, historic areas and greenery. Most photographs have human traffic. This is consistent with previous research which shows that complexity and related variables (such as visual richness, ornamentation, information rate, diversity and variety) have consistently appeared as prominent aspects of our response to our surroundings (Nasar, 1998, 1988c).

It also emerges that the inhabitants of Old Town of Mombasa disliked scenes that indicated congestion and lacked a coherent style. They like areas with order, plants and trees, views of water, well kept buildings and a general sense of organisation. This finding contravenes conventional wisdom that beauty is in the eye of the beholder. It clearly shows that there are strong consistencies in likes and dislikes in the environment. This idea also emerged in Nasar's studies in Knoxville and Chattanooga (Nasar, 1998).

From the results, it can be inferred that the residents of old town of Mombasa prefer built environments of moderate complexity. The zones of analysis (Section 5.3.1) all have different levels of complexity, which is defined by their typo-morphological characteristics, activity levels, upkeep etc. These results also confirm that there is a shared conception of an object since 'human response to the environment is mediated by some version of it' Kropf, 2001, p. 34). This mediating version is conceived as a mental image or idea. This idea plays an important role in conservation through the appearance of certain things and the disappearance of others.

The Old Town of Mombasa is quite diverse in the detailing and ornamentation of its buildings façades. The built environment is elegant, with ornate Arabic and Indian balconies. Lamu and Zanzibari doors are also common. As a historic urban area, the Old Town of Mombasa has visual variety and the movement through it is episodic in character. Complexity is enhanced by the intricate detailing, which is sometimes extravagant. However, a balance between information overload and information deprecation is achieved.

Research has also confirmed preference in conjunction with order in the landscape and related variables such as legibility, identifiability, distinctiveness and complexity (Chon, 2004; Kaplan & Kaplan, 1989; Nasar, 1988a, 1988b; Lynch, 1960). It has been suggested that 'likability of an environment can be enhanced by increasing visual order and by increasing design features that help improve perceived order' (Nasar, 1998, p. 73). Complexity is identified as adding interest to this order. Under this factor, complexity, urban scenes that appeared historic were colligated. Historic significance rests on observer's perception (Nasar, 2008). An environment could either have authentic historic significance or simply look historic to the observer. It would appear that historicity is related to complexity, which is not a far fetched conjecture, since most urban historic areas are very ornate, being products of vernacular and folk traditions. This tends to produce a complex environment.

In the factor complexity, numbers of different noticeable elements and the distinctiveness between those elements is evident from the photographic stimuli. The streets and squares in the stimuli share complex enclosing elements. There is also a continuous variation in the width and textures creating a visual richness. Conservation plans should therefore endeavour to deliver the desired visual richness.

Factor 2: Scale

Most of the photographs that fall under this factor have the urban scenes enclosed on both sides and creating narrow streets. Since the streets are narrow, it is expected that this would create a feeling of claustrophobia. However, the inhabitants of Old Town of Mombasa, are used to these spaces, and it is doubtful if this feeling is the norm rather than the exception. The treatment of the paths' edges acknowledges the human scale and the pedestrian by forcing the car to find its way around the area. The narrowness of the street creates a feeling of strong enclosure. This gives a great sense of location, defining the area. This further increases the social contact between the residents.

Old cities were planned for pedestrians. The height to width ratio of the streets is such that it enhances a strong sense of location and privacy. It also bolsters surveillance, thus reducing vandalism. Moreover, streets are not of uniform width and were best suited for slow movement. In the Old Town of Mombasa, this is largely the case, although in some of the streets, it is common to have motor vehicles mingling with the pedestrians. The vehicles reduce the complexity and desirability of this area by adding visual clutter and generally being a nuisance to pedestrian flow.

The photographic stimuli under this category further exhibit serial vision, as exposited by Cullen (1971). This is evidenced by the visual variety; surprise and interest created through the varying treatment of the buildings. It provides a sense of progression through space. Moreover, the curve of the streets constantly changes the view and encloses linear spaces. The movement along a path reveals different episodes to the pedestrian. Continuity is an important aspect in the design of a network of spaces whereby one space naturally leads to another. The photographic stimuli describing this factor show related intimate spaces, having some positive contrast. Old Town of Mombasa epitomises the concept of contrasting spaces, common in many historic towns. The underlying concept is that the spaces contain a ‘narrowing and an opening up’ which together with the uniqueness of the space, emphasises contrast. The absence of monotony is a clear indication of the richness of variety in the environment, which is usual in historic towns. Design in historic urban areas should therefore strive to enhance scale, serial vision and continuity of space and all these contribute to the complexity of an area.

Factor 3: Maintenance

The photographic stimuli comprising this factor indicated dilapidations of the built environment, flooding, uncollected garbage on the streets, collapsed buildings and generally bad maintenance. The built environment was in summary, unkempt. This factor is therefore defined as *maintenance,* and is in conformity with previous studies (e.g. Nasar, 1998; Kaplan

& Kaplan, 1989). Studies on fear and crime, show that fear and actual crime relate to physical incivilities such as dilapidation, or a milieu showing an absence of care (Newman, 1972). The dislike for incivilities may actually increase disorder, thus reducing preference or may reflect an increase in the built content, again depressing preference. This is the case for Zone 3 in the Old Town of Mombasa, which has most of the characteristics defined by this factor. This factor was identified as *upkeep* by Nasar (1998). Well maintained historic areas improve the visual quality, which is not just good for aesthetics, since a city's appearance of disorder and neglect can heighten sensory overload, stress and fear among residents and visitors (Chon & Shafer, 2009; Chon, 2004; Nasar, 2000, 1998). Maintenance is a factor showing the negative pole of upkeep and is also sometimes referred to as physical incivilities. It functions as cues to social disorder (Nasar, 2008; Perkins & Taylor, 1996).

Factor 4: Greenery

This factor is identified as *Greenery* and is akin to Nasar's (1998) *naturalness*. The photographic stimuli falling under this factor generally had vegetation. This quality refers to the presence of vegetation, water or mountains (Nasar, 1998). The respondents liked built areas that had greenery. Naturalness is one of the most significant dimensions of human perception (Chon, 2004; Nasar, 1998, 1988c). The importance of this dimension is believed to be due to the restorative and stress recovery value of nature (Kaplan, 1995; Kaplan & Kaplan, 1989). The presence of vegetation has been found to strengthen the imageability of elements (Lynch, 1960). In the Old Town of Mombasa, Zone 1 had the most vegetation and was also the most likable. Historic urban areas can improve their evaluative image by adding natural elements and providing views to nature where possible.

Factor 5: Spaciousness

Scrutinising the photographic stimuli that define this factor, it is discerned that the residents of Old Town of Mombasa preferred photographs having open spaces, presence of large water bodies and the presence of monumental scenery. Significantly, this factor did not have stimuli representing restricted places, crowding, congestion or narrow streets. This factor is therefore defined as *spaciousness.* Lynch (1960) found that vistas and panoramas strengthen the effect and memorability of nodes. Research by Nasar (1988a) confirms increases in preference as being associated with openness. Nasar (1998) argues that the preference for open views may arise from perceived status meanings associated with open space, from an increase in perceived order associated with openness, or from openness itself. In the Old Town of Mombasa, Zone 2, the area around the waterfront is the most open, and is historically associated with the wealthy who settled along the waterfront. In Old Town of Mombasa, the waterfront is enjoyed by the residents as observers of the scenery and as participants in the space. This factor suggests that people enjoy open space and prefer open views.

5.3.5 Residents Attitudes towards Old Town of Mombasa Built Environment

The Old Town of Mombasa conservation area was divided into four zones (Section 3.2.3; Section 5.3; Map 5.2). Factor Analysis (Principal Components Analysis) was used to investigate the perceived quality of these zones. The residents were asked to evaluate a number of aspects of each of these zones on a series of bi-polar scales. Three aspects were considered: (1) Streets, (2) Open spaces and (3) Buildings. All the three aspects were evaluated on 18 seven point-scales, namely: pleasant-unpleasant; appealing–repulsive; colourful-drab; pretty-ugly; planned-unplanned; attractive appearance-unattractive appearance; clean–dirty; well maintained-badly maintained; well conserved-poorly conserved;

interesting-boring; good-deficient; important-not important; quiet-noisy; safe-unsafe; small-large; many-few; sufficient-insufficient; peaceful-busy. This gives 54 items per zone (Appendix II). The coding is give below:

Code	Description	Code	Description
z1s	Zone 1 Streets	Pr_Ug	Pretty-Ugly
z1o	Zone 1 Open Spaces	Pl_Up	Planned-Unplanned
z1b	Zone 1 Buildings	At_Un	Attractive Appearance-Unattractive Appearance
z2s	Zone 2 Streets	Cl_Di	Clean-Dirty
z2o	Zone 2 Open Spaces	Ma_Ba	Well Maintained-Badly Maintained
z2b	Zone 2 Buildings	Co_Ba	Well Conserved-Poorly Conserved
z3s	Zone 3 Streets	In_Bo	Interesting-Boring
z3o	Zone 3 Open Spaces	Go_De	Good-Deficient
z3b	Zone 3 Buildings	Im_No	Important-Not Important
z4s	Zone 4 Streets	Qu_No	Quiet-Noisy
z4o	Zone 4 Open Spaces	Sa_Un	Safe-Unsafe
z4b	Zone 4 Buildings	Sm_La	Small-Large
Pl_Un	Pleasant-Unpleasant	Ma_Fe	Many_Few
Ap_Re	Appealing-Repulsive	Su_In	Sufficient_Insufficient
Co_Dr	Colourful-Drab	Pe_Bu	Peaceful_Busy

5.3.5.1 Zone 1

The 54 items of residents' attitudes were subjected to Principal Components Analysis (PCA). Prior to performing PCA, the suitability of the data for factor analysis was assessed. The correlation Matrix revealed the presence of many coefficients above 0.3 and thus the data was deemed suitable (Pallant, 2005). The Kaiser-Meyer-Olkin value was 0.960, exceeding the recommended value of 0.6 (Pallant, 2005) and the Bartlett's Test of Sphericity reached statistical significance (p<0.001), supporting the factorability of the correlation matrix.

Eight (8) factors with eigenvalues exceeding 1, and explaining 72.905% of the variance were obtained. An inspection of the Scree plot revealed a clear break after the fourth factor. This was further supported by Humphrey-Ilgen Parallel Analysis, which only showed four factors greater than random. Varimax rotation was performed to reveal a simple structure that is easily interpreted (Table 5.27). The four factors had strong loadings on different variables. The four factor solution explained 64.0585% of the variance with Factor 1 contributing 51.604%, Factor 2 contributing 5.286%, Factor 3 contributing 3.783% and Factor 4 contributing 3.386% of the variance.

Table 5.27
Rotated Component Matrix (a)

Variable	Component							
	1	2	3	4	5	6	7	8
z1b_Ma_Ba	**.753**	.154	.343	.126	-.004	.169	.077	.086
z1b_Co_Ba	**.748**	.184	.259	.174	.024	.229	.111	.056
z1b_Cl_Di	**.726**	.200	.339	.164	.060	.060	.072	.060
z1b_In_Bo	**.721**	.245	.169	.216	.125	.210	.060	.122
z1b_Go_De	**.708**	.228	.136	.158	.163	.274	.112	.164
z1b_At_Un	**.704**	.285	.243	.137	.220	-.040	.070	.094
z1b_Im_No	**.668**	.184	.167	.070	.231	.319	.243	.110
z1b_Pr_Ug	**.645**	.287	.198	.098	.438	-.037	.101	.194
z1b_Pl_Up	**.627**	.320	.221	.146	.318	-.041	.031	.130
z1b_Co_Dr	**.612**	.269	.156	.095	.497	-.022	.102	.173
z1b_Qu_No	**.605**	.187	.129	.132	.219	.348	.260	.227
z1b_Ap_Re	**.559**	.276	.144	.087	.549	.051	.143	.192
z1b_Sa_Un	**.539**	.161	.073	.190	.195	.283	.322	.292
z1o_Pr_Ug	.278	**.718**	.188	.231	.192	.173	.099	.135
z1o_Pl_Up	.295	**.700**	.274	.177	.178	.217	.041	.153
z1o_Co_Dr	.262	**.686**	.167	.187	.271	.203	.139	.097
z1o_Cl_Di	.261	**.664**	.349	.270	.016	.089	.228	.075
z1o_At_Un	.348	**.662**	.287	.158	.157	.151	.096	.131
z1o_Ap_Re	.289	**.640**	.249	.137	.358	.265	.118	.082
z1o_Ma_Ba	.237	**.630**	.296	.304	.018	.097	.267	.084
z1o_Co_Ba	.263	**.593**	.330	.326	.048	.074	.329	.038
z1o_Pl_Un	.252	**.498**	.211	.130	.427	.338	-.041	.085
z1o_Go_De	.386	**.473**	.160	.365	.384	.251	.191	-.039
z1o_Im_No	.391	**.442**	.137	.366	.345	.236	.236	-.056
z1s_Su_In	.151	.396	.327	.340	.075	.374	.220	.174
z1s_Ma_Ba	.220	.206	**.729**	.274	.104	.107	-.026	.104
z1s_Co_Ba	.219	.260	**.713**	.246	.063	.237	.011	.105
z1s_Cl_Di	.325	.290	**.695**	.175	.114	.033	.162	.095
z1s_At_Un	.302	.237	**.687**	.133	.210	.072	.241	.084
z1s_Pl_Up	.311	.268	**.575**	.119	.262	.197	.255	.136
z1s_Ap_Re	.216	.209	**.556**	.133	.474	.346	.112	.082
z1s_In_Bo	.339	.330	**.531**	.114	.091	.342	.056	.107
z1s_Pr_Ug	.214	.255	**.525**	.211	.410	.231	.246	.125
z1o_Sm_La	.127	.123	.154	**.799**	.075	-.010	-.009	.191
z1o_Ma_Fe	.203	.208	.230	**.659**	-.013	.104	.088	.180
z1o_Su_In	.218	.290	.268	**.633**	.139	.074	.206	.121
z1o_Sa_Un	.257	.358	.193	**.629**	.202	.166	.119	-.072
z1s_Sm_La	.006	.101	.088	**.611**	.152	.261	.131	.331
z1o_Qu_No	.395	**.443**	.146	**.513**	.225	.227	.110	-.040
z1s_Ma_Fe	.014	.227	.202	**.453**	.068	.374	.383	.239
z1b_Pl_Un	**.526**	.243	.122	.125	.605	.113	.066	.177
z1s_Pl_Un	.237	.098	**.443**	.157	.577	.339	.050	.075
z1s_Co_Dr	.161	.157	**.460**	.225	.512	.294	.191	.131
z1o_In_Bo	.326	.387	.141	.326	.494	.283	.066	.014
z1s_Qu_No	.229	.288	.261	.155	.244	.643	.050	.129
z1s_Sa_Un	.236	.278	.284	.260	.105	.559	.063	.218
z1s_Im_No	.317	.320	.299	.124	.244	.536	.192	.013
z1s_Go_De	.318	.318	**.463**	.115	.122	.481	.157	.055
z1b_Pe_Bu	.394	.199	.171	.133	.075	.126	.681	.265
z1o_Pe_Bu	.245	.281	.099	**.506**	.253	-.008	.569	-.067
z1s_Pe_Bu	.157	.379	.315	.220	.103	.170	.563	.085
z1b_Sm_La	.183	.062	.133	.276	.175	.032	.017	.799
z1b_Ma_Fe	.367	.138	.136	.162	.039	.169	.125	.709
z1b_Su_In	**.426**	.196	.226	.162	.082	.199	.302	.522

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 14 iterations.
Source: Author (2010).

The factors are interpreted as follows:

Factor I

The factor structure is clear, with the highest loading being .753 on the variable, *Well maintained-Badly Maintained*. Factor I is comprised of variables describing *buildings* in Zone 1 (Map 5.2; Plate 5.32), in the Old Town of Mombasa. This is the area consisting of public monuments and institutions (Figure 5.2). The buildings in this area are free standing, and represent the administrative typology related to the British colonial period, with the exception of Fort Jesus. The factor consists of scales such as: Well maintained-Badly maintained, Well Conserved-Poorly Conserved, Clean-Dirty, Interesting–Boring, Good-Deficient, Attractive Appearance-Unattractive appearance, Important-Not Important, Pretty-Ugly etc. This factor is consequently labelled *novelty.* The building typologies in this area show no obvious antecedents. From the Component Score Coefficient Matrix (Appendix VIII), the following regression model is derived.

Novelty/ Atypicality=.215maintenance$_b$+ .214conserved$_b$+ .194Cleanliness$_b$+ .182Curiosity$_b$+ .164Goodness$_b$ +.151Attractiveness$_b$ +.137Importance$_b$ +.078Prettiness$_b$ +.102Organization$_b$ +.065Colorfulness$_b$ +.103Tranquility$_b$ +.032Charm$_b$ +.078Safety$_b$ +.025Pleasantness$_b$ +.010Ampleness$_b$

$_b$ denotes that the variable relates to buildings.

Factor II

Factor II is related to the *open spaces* in Zone 1. The main scales are: Pretty-Ugly, Planned-Unplanned, Colourful-Drab, Clean-Dirty, Attractive-Unattractive, and Appealing–Repulsive etc. This area has the largest open space in the Old Town of Mombasa, the Treasury Square. It is also an area having a lot of greenery as is shown by the *Anti-form* (Plate 5.3). This factor is therefore labelled *Pleasantness*. It is important to note that this area is also the most vegetated in the Old Town of Mombasa. The regression coefficients for this factor are as shown in Appendix VIII.

The factor is modeled as:

Pleasantness=.266Prettiness$_o$+ .259Organization$_o$+ .240Colourfulness$_o$+ .218Cleanliness$_o$+ .233Attractiveness$_o$+ .014Charm$_o$+ .197Maintenance$_o$+ .153Conservation$_o$+ -.132pleasantness$_o$+ .040Goodness$_o$+ .023Importance$_o$+ .026Tranquility$_o$

$_o$ denotes that the variable relates to open spaces.

Factor III

Factor III is related to the *streets.* The descriptors here are: Well maintained-badly Maintained, Conserved-Poorly Conserved, Clean-Dirty, Attractive appearance-Unattractive Appearance etc. This factor is labelled *maintenance.* The streets in this zone were observed to be very clean and well maintained, which is understandable, since the area hosts the Municipal Council Headquarters and the District commissioners offices, among other important administrative offices, and is the administrative face of the Island. The coefficients for the regression model are in Appendix VIII. Maintenance is regressed as follows:

Maintenance=.280Maintenance$_s$+ .247Conservation$_s$+ .256Cleanliness$_s$+ .249Attractiveness$_s$+ .165Organization$_s$+ .141Charm$_s$+ .128Curiosity$_s$+ .132Prettiness$_s$+ .095Pleasantness$_s$+ .101Colourfulness$_s$+ .070Goodness$_s$

$_s$ denotes that the variable relates to streets.

Factor IV

This factor is related to the quantity and perceived condition of the *open spaces* and *streets*. It is dominated by the scales: Small-Large, Many-Few, Sufficient-Insufficient, Safe-Unsafe, and Peaceful- Busy. This factor clearly indicates the quantity and quality of the open spaces and is labelled ***serenity*** of the open areas. It is closely related to relaxation. The attendant beta coefficients are shown in Appendix VIII. The factor is modelled as follows:

Serenity=.363Size$_o$+ .258Adequacy$_o$+ .217Ampleness$_o$+ .241Safety$_o$+ .221Size$_s$+ .167Tranquility$_o$+ .083Adequacy$_{s+}$ .134Engangement$_o$

$_o$ denotes that the variable relates to open spaces and $_s$ to streets.

5.3.5.2 Zone 2

In Zone 2, the same procedure in Principal Components Analysis, as applied in Zone 1, was used. The correlation matrix was adjudged to be adequate due to the presence of many coefficients greater than 0.3. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.951, clearly greater than the recommended minimum value of 0.6. The Bartlett's Test of Sphericity yielded a $p<0.001$; therefore it was concluded that relationships exist among the variables. PCA yielded 8 factors with eigenvalues greater than 1, which explained a cumulative 72.581% of the total variance in the data.

The Scree plot started to level at 5 factors. This was supported by the results of parallel analysis, which showed only 6 factors with eigenvalues exceeding the corresponding criterion values for a randomly generated data matrix of the same size. The rotated pattern structure is shown below (Table 5.28). The Component Score Coefficient Matrix is shown in Appendix IX, and is used to construct the regression models for every factor.

Table 5.28
Rotated Component Matrix (a)

	Component							
	1	2	3	4	5	6	7	8
z2o_Co_Ba	**.793**	.166	.125	.122	.150	.018	.241	-.002
z2o_Ma_Ba	**.775**	.202	.094	.116	.107	.096	.246	-.065
z2o_At_Un	**.759**	.175	.298	.149	.098	.010	.160	.041
z2o_Cl_Di	**.759**	.124	.071	.123	.020	.110	.194	-.085
z2o_Pl_Up	**.702**	.183	**.410**	.178	.109	.012	.122	.004
z2o_Pr_Ug	**.700**	.215	**.417**	.192	.133	.070	.041	-.007
z2o_Co_Dr	**.695**	.228	**.404**	.186	.092	.119	.062	.071
z2o_Ap_Re	**.690**	.296	**.447**	.079	.056	.193	-.084	.132
z2o_Pl_Un	**.689**	.248	**.422**	.056	-.004	.227	-.120	.141
z2o_In_Bo	**.675**	.242	.097	.109	.412	.069	.192	.057
z2o_Go_De	**.602**	.234	.124	.112	**.533**	.112	.121	.047
z2o_Sa_Un	**.484**	.202	-.033	.323	.360	.347	.054	-.228
z2o_Sm_La	**.457**	.129	.057	.262	.254	.389	-.020	-.200
z2b_Pl_Up	.179	**.790**	.223	.140	.067	.007	.107	-.177
z2b_At_Un	.161	**.772**	.274	.141	.150	-.019	.134	-.123
z2b_Ma_Ba	.248	**.745**	.048	.151	-.004	.209	.291	.007
z2b_Pr_Ug	.143	**.738**	**.410**	.187	.184	.008	-.047	-.127
z2b_Co_Ba	.269	**.727**	.081	.169	.025	.130	.273	.121
z2b_Cl_Di	.252	**.720**	.105	.110	.000	.134	.278	-.044
z2b_Co_Dr	.188	**.703**	**.419**	.209	.182	.052	-.069	-.102
z2b_Ap_Re	.203	**.691**	**.461**	.171	.150	.144	-.142	-.095
z2b_In_Bo	.224	**.684**	.191	.192	.191	.155	.148	.276
z2b_Go_De	.203	**.659**	.170	.181	.272	.226	.089	.286
z2b_Pl_Un	.243	**.619**	**.411**	.177	.045	.173	-.230	.010
z2b_Qu_No	.131	**.613**	.073	.303	.265	.254	.132	.239
z2b_Im_No	.123	**.513**	.228	.253	.410	.188	-.022	.362
z2s_Pl_Up	.214	.219	**.759**	.159	.168	.009	.224	-.086
z2s_Pr_Ug	.244	.242	**.750**	.157	.153	.082	.201	-.052
z2s_Co_Dr	.276	.273	**.723**	.195	.109	.126	.225	.028
z2s_At_Un	.197	.250	**.718**	.083	.153	.067	.345	.016
z2s_Pl_Un	.351	.221	**.709**	.155	-.014	.257	-.010	.116
z2s_Ap_Re	.396	.294	**.695**	.152	.002	.230	.044	.133
z2s_In_Bo	.228	.273	**.486**	.111	.299	.201	.442	.025
z2s_Go_De	.159	.361	.396	.103	.389	.362	.311	.015
z2b_Suf_In	.142	.355	.122	**.703**	-.003	.079	.089	-.106
z2b_Ma_Fe	.097	.278	.286	**.700**	-.079	.125	-.064	.038
z2b_Pe_Bu	.055	.295	.133	**.666**	.430	-.083	.040	.112
z2s_Pe_Bu	.132	.039	.149	**.572**	.385	.120	.194	.115
z2s_Su_In	.165	.178	.189	**.570**	.082	.278	.325	-.084
z2s_Ma_Fe	.160	.095	.197	**.565**	.042	.418	.185	-.095
z2b_Sm_La	.193	.179	.114	**.554**	.133	.108	.038	.327
z2o_Pe_Bu	.248	.089	.080	**.538**	.531	.122	-.031	-.124
z2o_Ma_Fe	**.418**	.136	.068	**.514**	.056	.288	.140	-.383
z2o_Su_In	.390	.259	.035	**.495**	.171	.305	.125	-.360
z2b_Sa_Un	.244	**.445**	-.030	**.472**	.349	.212	.137	.168
z2o_Im_No	.386	.222	.265	.115	**.638**	.192	.026	.023
z2s_Im_No	.003	.249	**.404**	.173	**.536**	**.408**	.135	.061
z2o_Qu_No	**.423**	.214	.090	.193	**.526**	.341	.027	-.094
z2s_Qu_No	.128	.211	.262	.136	.264	**.664**	.133	.003
z2s_Sm_La	.162	.120	.208	.303	.075	**.618**	.166	.124
z2s_Sa_Un	.164	.288	.097	.322	.263	**.576**	.300	-.048
z2s_Ma_Ba	.359	.206	.258	.170	.034	.218	.667	.032
z2s_Co_Ba	**.403**	.203	.333	.154	.073	.174	.616	.029
z2s_Cl_Di	.283	.167	.351	.192	.057	.177	.588	-.082

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 12 iterations.
Source: Author (2010).

The six factor solution explains 68.649% of the total variance in the data with Factor 1 accounting for most of the variance at 45.551%.

The factors are interpreted as follows:

Factor I

This factor is defined by 16 variables, all having a loading greater than 0.4. All, save one variable, deals with *open spaces* in this zone. It is important to note that Zone 2 represents the area incorporating the waterfront, Mombasa Club, Government Square, Fish Market, Bohora Mosque, Leven House and Steps etc. This factor incorporates variables such as: Well maintained-Badly maintained, Well Conserved-Badly Conserved, Clean-Dirty, and Good-Deficient etc. This factor is judged to be *upkeep* of the open spaces. The factor is regressed as follows:

Upkeep=.160Conservation$_o$+ .154Maintenance$_o$+ .145Attractiveness$_o$+ .163Cleanliness$_o$+ .117Organisation$_o$+ .116Prettiness$_o$+ .120Colourfulness$_o$+ .129Charm$_o$+ .140Pleasantness$_o$+ .114Curiosity$_o$+ .085Goodness$_o$+ .059Safety$_o$+ .061Size$_o$+ .039Adequacy$_o$+ .031Tranquility$_o$+ .011Conservation$_s$

$_o$ denotes that the variable relates to open spaces and $_s$ to streets.

Factor II

Buildings comprise this factor. The main descriptors are: Planned-Unplanned, Pretty-Ugly, Colourful-Drab, and Appealing-Repulsive etc. The buildings in this zone form angular and organic patterns. The Mombasa Traditional House is a common typology in this zone. These buildings are very ornate and reflect an amalgam of European and Indian influences. This factor is labelled *Elegancy/ Ornateness.*

Elegancy/ Ornateness=.179Organisation$_b$+ .162Attractiveness$_b$+ .169Maintenance$_b$+ .135Prettiness$_b$+ .153Conservation$_b$+ .164Cleanliness$_b$+ .119Colourfulness$_b$+ .114Charm$_b$+ .112Curiosity$_b$+ .103Goodness$_b$+ .099Pleasantness$_b$+ .094Tranquility$_b$+ .043Importance$_b$+ .040Safety$_b$

$_b$ denotes that the variable relates to buildings.

Factor III

The variables that comprise this factor deal with organization and attractiveness of *open spaces* and *streets.* The factor therefore deals with open areas in general. It is made up of variables like: Planned-Unplanned, Pretty-Ugly, Colourful-Drab, Appealing-Repulsive, Planned-Unplanned, Attractive-Unattractive, Interesting-Boring etc. This factor is labelled O*rganisation /Orderliness.*

Organisation/ Orderliness=.046Organisation$_o$+ .047Prettiness$_o$+ .034Colourfulness$_o$+ .044Charm$_o$+ .040Pleasantness$_o$+ .061Prettiness$_b$+ .061Colourfulness$_b$+ .075Charm$_b$+ .058Pleasantness$_b$+ .211Organisation$_s$+ .198Prettiness$_s$+ .173Colourfulness$_s$+ .178Attractiveness$_s$+ .168Pleasantness$_s$+ .148Charm$_s$+ .080Curiosity$_s$+ .085Importance$_s$

$_o$ denotes that the variable relates to open spaces and $_s$ to streets.

Factor IV

This factor Combines variables dealing with all the three aspects: *Streets, Open Spaces* and *Buildings*, in almost equal measure. The variables include: Sufficient-Insufficient, Many-Few, Peaceful-busy, Small-Large, and Safe-Unsafe etc. Clearly, this factor is holistic, and is labelled *adequacy*. It relates to the quantities of the described aspects of the conservation area.

Adequacy=.252Ampleness$_b$+ .274Adequacy$_b$+ .237Engagement$_b$+ .183Engagement$_s$+ .159Ampleness$_s$+ .149Adequancy$_s$+ .213Size$_b$+ .132Engagement$_o$+ .116Adequacy$_o$+ .083Ampleness$_o$+ .095Safety$_b$

$_b$ denotes that the variable relates to buildings, $_s$ to streets and $_o$ to open spaces.

Factor V

Only four variables describe this factor, three dealing with the *open spaces* and one with the *streets*. However the descriptor scales are three: Important-Not important and Quiet-Noisy and Good-Deficient. In totality, this factor deals with the anti-form in Zone 2 and covers the perceived importance of the open areas.

Importance=.223Goodness$_o$+ .291Importance$_o$+.213Importance$_s$+196Tranquility$_o$

$_o$ denotes that the variable relates to open spaces and $_s$ to streets.

Factor VI

This factor is defined by the street character and open spaces. It deals with: Important-Not important, Quiet-Noisy, Small-Large, and Safe-Unsafe. This factor addresses a cognitive aspect of the streets and is gauged as *Relaxation.* Zone 2 has perceived openness and this is because of the expansive ocean, which gives an unobstructed view. The feeling of safety, adequacy and peacefulness creates a feeling of relaxation.

Relaxation=.130Importance$_s$+ .373Tranquility$_o$+ .348Size$_s$+ .259Safety$_s$

$_s$ denotes that the variable relates to streets and $_o$ to open spaces.

5.3.5.3 Zone 3

The correlation matrix for Zone 3 was inspected and found adequate due to the presence of many coefficients above 0.3. The Kaiser-Meyer-Olkin value was 0.971, distinctly exceeding the recommended value of 0.6. The Bartlett's Test of Sphericity was statistically significant, p<0.001, supporting factorability of the correlation matrix. Using PCA, five factors were obtained which had eigenvalues greater than 1. The five factors accounted for 77.550 % of the total variability in the data. Catell's Scree test indicated that four factors should be retained, and this was confirmed by Parallel analysis, which showed only 4 factors with eigenvalues exceeding the corresponding criterion values for a randomly generated data matrix of the same size. Factor 1 accounted for most of the variance in the data set at 59.85%. The rotated factor pattern for Zone 3 is shown in Table 5.29 below. The factor loadings, analogous to Beta, are shown in Appendix X.

Table 5.29
Rotated Component Matrix (a)

	Component				
	1	2	3	4	5
z3s_Col_Dr	**.821**	.208	.278	.210	.151
z3s_Ap_Re	**.811**	.204	.336	.176	.215
z3s_Pl_Un	**.788**	.212	.314	.212	.216
z3s-Pr_Ug	**.782**	.270	.334	.238	-.009
z3s_At_Un	**.779**	.269	.323	.197	-.093
z3s_Pl_Up	**.776**	.242	.351	.219	.031
z3s_Ma_Ba	**.737**	.257	.286	.284	-.287
z3s_Go_De	**.736**	.292	.370	.167	-.053
z3s_In_Bo	**.735**	.287	.372	.176	-.100
z3s_Co_Ba	**.730**	.281	.317	.250	-.269
z3o_Ap_Re	**.706**	.183	.242	**.427**	.367
z3o_Pl_Un	**.705**	.166	.231	**.418**	.354
z3s_Cl_Di	**.705**	.225	.290	.278	-.263
z3o_Pl_Up	**.623**	.241	.303	**.480**	.110
z3o_Pr_Ug	**.601**	.242	.287	**.553**	.092
z3s_Qu_No	**.599**	.355	.321	.253	-.150
z3o_Co_Dr	**.591**	.230	.266	**.547**	.184
z3o_At_Un	**.566**	.267	.280	**.538**	.033
z3s_Im_No	**.515**	.469	.380	-.057	.111
z3s_Ma_Fe	.307	**.780**	.090	.072	.017
z3o_Pe_Bu	.098	**.778**	.132	.357	.096
z3s_Sm_La	.286	**.773**	.142	.046	.025
z3s_Pe_Bu	.262	**.770**	.062	.149	-.027
z3b_Pe_Bu	.109	**.757**	.259	.174	.025
z3b_Ma_Fe	.061	**.755**	**.414**	.105	.103
z3b_Sm_La	.131	**.733**	.251	.115	.051
z3o_Sm_La	.150	**.728**	.164	.328	-.061
z3b_Sa_Un	.126	**.709**	.451	.028	.015
z3s_Sa_Un	.365	**.708**	.187	-.029	-.090
z3s_Su_In	.461	**.687**	.079	.073	-.060
z3b_Su_In	.168	**.661**	.398	.158	.092
z3o_Ma_Fe	.172	**.657**	.144	.496	.030
z3o_Sa_Un	.171	**.650**	.185	.398	-.119
z3o_Su_In	.207	**.586**	.199	.499	.028
z3o_It_No	.355	**.416**	.373	.379	.083
z3b_Go_De	.375	.302	**.748**	.123	-.016
z3b_In_Bo	.380	.249	**.734**	.262	-.063
z3b_At_Un	**.407**	.249	**.729**	.267	.058
z3b_Pl_Up	**.421**	.252	**.716**	.282	.095
z3b_Co_Ba	.363	.204	**.711**	.349	-.130
z3b_Cl_Di	.356	.218	**.705**	.312	-.101
z3b_Ma_Ba	.363	.229	**.697**	.385	-.135
z3b_Pr_Ug	**.408**	.272	**.685**	.324	.163
z3b_Co_Dr	.386	.266	**.673**	.339	.213
z3b_Im_No	.230	**.438**	**.641**	.007	.074
z3b_Qu_No	.291	.381	**.635**	.178	-.087
z3b_Ap_Re	**.501**	.226	**.628**	.263	.342
z3b_Pl_Un	**.518**	.227	**.595**	.274	.340
z3o_Co_Ba	**.405**	.249	**.428**	**.652**	-.007
z3o_Ma_Ba	**.451**	.230	.396	**.637**	-.031
z3o_Cl_Di	**.474**	.206	.336	**.615**	-.002
z3o_In_Bo	**.445**	.266	**.454**	**.609**	.035
z3o_Go_De	**.500**	.255	**.421**	**.590**	.048
z3o_Qu_No	.399	.300	**.427**	**.562**	-.132

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 9 iterations.
Source: Author (2010).

The factors are interpreted as follows:

Factor I

This factor is dominated by variables dealing with *streets* and *open spaces* in Zone 3. The streets and open spaces, *the anti-form*, in this zone are in a condition of disrepair, making them disorderly. It is a zone of intricate network of streets whose typological pattern is the deformed grid. Organic patterns are also evident in some parts. The factor presents a general evaluation of the anti form and is labelled *pleasantness.* It is highly loaded on: Colourful-Drab, Appealing-Repulsive, Planned-Unplanned, Pretty-Ugly, and Attractive-Unattractive etc. The streets have no upkeep or civilities and are noisy due to the auto rickshaws, popularly known as tuk-tuks. This factor is a reflection of the negative pole of attractiveness.

Pleasantness=.139Colourfulness$_s$+ .133Charm$_s$+ .123Pleasantness$_s$+ .119Prettiness$_s$+ .128Attractiveness$_s$+ .118Organisation$_s$+ .113Maintenance$_s$+ .112Conservation$_s$+ .075Charm$_o$+ .078Pleasantness$_o$+ .106Cleanliness$_s$+ .041Organisation$_o$+ .027Prettiness$_o$+ .071Tranquility+ .026Colourfulness$_o$+ .022Attractivenesso+ .080Importance$_s$- .036Attractivess$_b$- .034Organisation$_b$- .042Prettiness$_b$- .004Charm$_b$+ .003Pleasantness$_b$- .056Conservation$_o$- .037Maintenence$_o$- .019Cleanliness$_o$- .044Curiosity$_o$- .022Goodness$_o$

$_b$ *denotes that the variable relates to buildings,* $_s$ *to streets and* $_o$ *to open spaces.*

Factor II

This factor is holistic in nature and incorporates variables covering the *buildings, streets* and *open spac*es. It deals with the sufficiency, size, safety, quietness, attractiveness, importance, etc. of the three aspects. This factor is adjudged to *be Adequacy*.

Adequacy=.128Adequacy$_s$+ .118Engagement$_o$+ .125Size$_s$+ .125Engagement$_s$+ .112Engagement$_b$+ .017Adequacy$_b$+ .111Size$_b$+ .102Size$_o$+ .096Safety$_b$+ .109Safety$_s$+ .105Ampleness$_s$+ .085Ampleness$_b$+ .083Adequacy$_o$+ .080Safety$_o$+ .064Ampleness$_o$+ .023Curiosity$_o$+ .030Importance$_b$

$_b$ *denotes that the variable relates to buildings,* $_s$ *to streets and* $_o$ *to open spaces.*

Factor III

Buildings dominate this factor. The descriptors include: Many-Few, Good-Deficient, interesting-Boring, Attractive-Unattractive, Planned-Unplanned, Well conserved-Badly conserved etc. This zone was previously dominated by the Swahili House typology, which is now being replaced by bland high-rise flats (Plate 5.12). This factor is very sensitive to the condition of the buildings, which are badly maintained. This factor is identified as *Arousal.*

Arousal=.064Adequacy$_b$+ .174Goodness$_b$+ .157Curiosity$_b$+ .148Attractiveness$_b$+ .138Organisation$_b$+ .147Conservation$_b$+ .149Cleanliness$_b$+ .064Maintenance$_b$+ .120Prettiness$_b$+ .116Colourfulness$_b$+ .156Importance$_b$+ .136Tranquility$_b$+ .093Charm$_b$+ .079Pleasantness$_b$+ .147Conservationo$_b$+ .007Curiosity$_o$- .009Goodness$_o$+ .013Tranquility$_o$

$_b$ *denotes that the variable relates to buildings and* $_o$ *to open spaces.*

Factor IV

12 variables describe this factor, all dealing with *open spaces*. These are the variables having a loading above 0.4 on the factor as shown in Table 5.28. The main descriptors are highly loaded on: Well conserved-Badly conserved, Well-maintained-Badly maintained, Clean-Dirty etc. Clearly, the factor deals with the condition of the streets only, and may be labelled as street *upkeep*. This is well in line with the finding that Zone 3 was the least preferred area and was very disorderly and untidy.

Upkeep=.049Charm$_o$+ .047Pleasantness$_o$+ .087Organisation$_o$+ .128Prettiness$_o$+ .127Colourfulness$_o$+ .127Attractiveness$_o$+ .164Adequacy$_o$+ .157Ampleness$_o$+ .194Conservation$_o$+ .185Maintenance$_o$+ .177Cleanliness$_o$+ .160Curiosity$_o$+ .147Goodness$_o$+ .152Tranquility$_o$

$_o$ *denotes that the variable relates to open spaces.*

5.3.5.4 Zone 4

Similar to the previous three zones, the 54 items of residents' attitudes were subjected to Principal Components Analysis with Varimax rotation. The correlation matrix was deemed adequate as it had many coefficients greater than 0.3. The Kaiser-Meyer-Olkin value was 0.977, clearly exceeding the recommended value of 0.6, and the Bartlett's test achieved statistical significance, p<0.001, thus supporting the factorability of the correlation matrix.

Principal Components Analysis revealed five factors with eigenvalues greater than 1, accounting for 77.531% of the total variation in the data. An inspection of the Scree plot revealed two factors above the elbow. The Humphrey-Ilgen parallel analysis showed two factors greater than the random generated data matrix of the same size. The two factor model accounts for 70.391% of the total variance in the data set, with Factor 1 accounting for 67.188% and Factor 2 accounting for the remaining 3.273%. Varimax rotation was performed to aid in the interpretation of the two components. The results are shown in Table 5.30. The

Component Score Coefficient Matrix (Appendix XI) was used to construct the regression models.

Table 5.30
Rotated Component Matrix (a)

Variable	Component				
	1	2	3	4	5
z4s_Co_Dr	**.711**	.323	.258	.292	.253
z4s_Pr_Ug	**.708**	.352	.249	.285	.211
z4s_Co_Ba	**.697**	.370	.358	.217	.122
z4s_At_Un	**.696**	.382	.309	.227	.162
z4s_Pl_Up	**.690**	.347	.308	.258	.188
z4s_In_Bo	**.689**	.342	.315	.213	.185
z4s_Go_De	**.686**	.365	.309	.231	.193
z4s_Cl_Di	**.685**	**.401**	.310	.241	.096
z4s_Ma_Ba	**.685**	.365	.359	.242	.092
z4s_Ap_Re	**.630**	.292	.319	.289	.408
z4s_Sa_Un	**.602**	.232	.250	.451	.189
z4s_Im_No	**.575**	.323	.409	.245	.260
z4s_Qu_No	**.567**	.242	.393	.380	.235
z4s_Pl_Un	**.550**	.243	.248	.225	.504
z4s-Su_In	**.534**	.303	.186	.508	.278
z4o_In_Bo	.361	**.730**	.313	.213	.090
z4o_Co_Ba	.398	**.726**	.273	.189	.073
z4o_Ma_Ba	**.424**	**.712**	.294	.214	.163
z4o_Go_De	.319	**.707**	.328	.256	.112
z4o_Pl_Up	.357	**.676**	.274	.238	.297
z4o_Cl_Di	.394	**.671**	.287	.288	.162
z4o_At_Un	.386	**.663**	.285	.226	.272
z4o_Pr_Ug	.374	**.653**	.290	.276	.325
z4o_Im_No	.269	**.633**	.335	.385	.175
z4o_Co_Dr	.409	**.620**	.272	.278	.380
z4o_Ap_Re	.366	**.608**	.229	.265	.488
z4o_Qu_No	.250	**.605**	.374	.411	.118
z4o_Pl_Un	.300	**.577**	.171	.239	.540
z4o_Sa_Un	.264	**.568**	.346	.395	.224
z4o_Su_In	.211	**.533**	.170	.529	.349
z4o_Pe_Bu	.207	**.479**	.298	.385	.479
z4o_Sm_La	.245	**.477**	.265	.463	.172
z4b_Im_No	**.403**	.358	.639	.292	.171
z4b_Go_De	.386	.361	.638	.308	.216
z4b_Qu_No	.331	.340	.635	.346	.197
z4b_Sa_Un	.323	.282	.616	.477	.116
z4b_At_Un	**.414**	.353	.606	.250	.280
z4b_In_Bo	.358	**.439**	.601	.294	.213
z4b_Ma_Ba	.434	**.409**	.579	.237	.151
z4b_Co_Ba	.369	**.443**	.576	.211	.170
z4b_Ap_Re	.364	.285	.570	.229	.527
z4b_Cl_Di	**.423**	**.416**	.553	.279	.165
z4b_Pl_Up	**.477**	.364	.539	.237	.298
z4b_Pr_Ug	**.449**	.346	.535	.211	.414
z4b_Co_Dr	**.436**	.339	.521	.226	.455
z4b_Ma_Fe	.275	.202	.428	.676	.080
z4s_Ma_Fe	**.456**	.199	.087	.637	.198
z4o_Ma_Fe	.170	**.490**	.145	.630	.253
z4b_Sm_La	.121	.236	.363	.621	.029
z4s_Sm_La	**.461**	.222	.101	.611	.101
z4b_Su_In	.293	.290	.413	.598	.205
z4b_Pe_Bu	.290	.299	.431	.512	.258
z4s_Pe_Bu	**.468**	.270	.262	.471	.329
z4b_Pl_Un	.309	.266	.497	.219	.616

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 10 iterations.
Source: Author (2010).

The factors are interpreted as follows:

Factor I

This factor is defined primarily by the condition of the *streets* in Zone 4 (Mbarak Hinawy Road). Of the 25 variables describing the factor, 18 deal with the streets, and six with the buildings and 1 with open spaces. The descriptors scale deals with the general aesthetic character of street, with both cognitive and affective properties. This evaluative dimension is labelled *ornateness.* The buildings and open spaces descriptors are subsumed in this main factor. The streets in this zone are highly ornate, and the Mombasa Traditional House typology is conspicuously present in the area. The streets are also very well maintained and this area is frequented by tourists because of its aesthetics. The measures of central tendency, mode, mean and median indicted that Zone four was ranked third on the preference scale.

ornateness=.174Colourfulness$_s$+ .177Prettiness$_s$+ .169Conservation$_s$+ .170Attractivenes$_s$+ .164Organisation$_s$+ .169Curiosity$_s$+ .162Goodness$_s$+ .165Maintenance$_s$ + .109Appealingness$_s$+ .128Safety$_s$+ .088Importance$_s$+ .086Tranquility$_s$+ .086Pleasant$_s$+ .082Ampleness$_s$+ .010Maintenance$_o$- .017Colourfulness$_o$- .030Importance$_b$- .029Attractiveness$_b$- .003Maintenance$_b$- .010Cleanliness$_b$+ .010Organisation$_b$- .012Prettiness$_b$- .022Colourfulness$_b$+.075Adequancy$_s$+ .087Size$_s$+ .039Engagement$_s$

$_b$ denotes that the variable relates to buildings, $_s$ to streets and $_o$ to open spaces.

Factor II

This factor is mainly defined by *open spaces*. The factor loads highly on: Interesting-boring, Well conserved-Badly conserved, Well maintained-Badly maintained, Good-Deficient. The emphasis is on the condition of the open spaces and this factor is therefore labelled *upkeep.* The streets in this zone are well kept and the area is attractive.

Upkeep=.015Cleanliness$_s$+ .209Curiosity$_o$+ .214Conservation$_o$+ .184Maintenance$_o$+ .192Goodness$_o$+ .153Organisation$_o$+ .160Cleanliness$_o$+ .148Attractiveness$_o$+ .129Prettiness$_o$+ .136Importance$_o$+ .102Colourfulness$_o$+ .092Charm$_o$+ .126Tranquility$_o$+ .088Pleasantness$_o$+ .096Safety$_o$+ .070Ampleness$_o$+ .028Engagement$_o$+ .066Size$_o$+ .008Curiosity$_b$+ .006Maintenance$_b$+ .030Conservation$_b$+ .006Cleanliness$_b$+ .061Adequancy$_b$

$_b$ denotes that the variable relates to buildings, $_s$ to streets and $_o$ to open spaces.

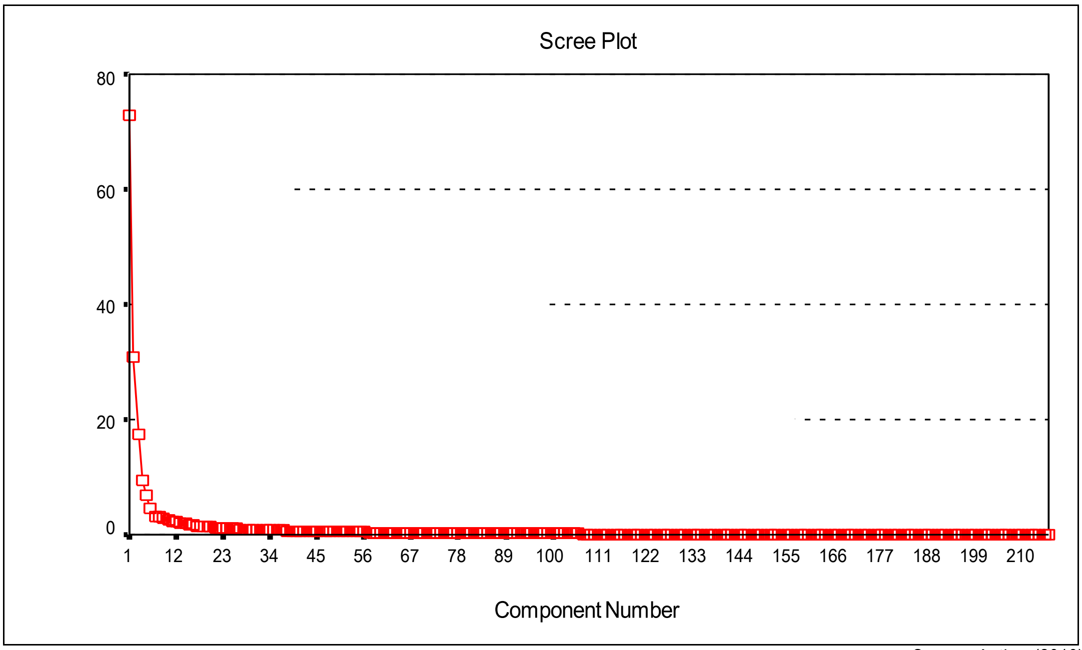
5.3.5.5 All Zones Combined.

After running individual Principal Components Analysis for the four zones, a combined factor analysis was undertaken in order to identify underlying dimensions that explain the correlations in the combined data set. A new set of uncorrelated variables was obtained for use in subsequent multivariate analysis. The variables were 216, being the equivalent of 54 variables for the four zones. The correlation matrix had 46,656 values.

The Kaiser-Meyer-Olkin Measure of sampling adequacy was 0.883, a meritorious value greater than the recommended 0.6 (Pallant, 2006), and the Bartlett's Test of Sphericity yielded an *Approx.* X^2 value of 105081.3, df (23220), and an associated level of significance smaller than 0.001, that is, $p<0.001$. We can conclude that there are relationships among the variables (Hinton, Brownlow, McMurray & Cozens, 2004). The correlation matrix is factorable since the null hypothesis that: *the intercorrelation matrix comes from a population in which the variables are noncollinear (i.e. an identity matrix),* is rejected.

Principal Components Analysis revealed 26 factors with eigenvalues exceeding 1 and explained 82.322% of the total variance in the data. The Humphrey-Ilgen parallel analysis showed eight components (factors) with eigenvalues exceeding the corresponding criterion values for a randomly generated data matrix of the same size. An inspection of the Scree plot (Figure 5.30) showed five factors to be above the elbow. The five factor model accounts for 63.530% of the variance in the data. Factor 1 accounts for 33.771%, Factor 2 accounts for 14.231%, Factor 3 accounts for 8.025%, Factor 4 accounts for 4.307%, and Factor 5 accounts for 3.195% of the total variance in the data.

Figure 5.30
Scree Plot



Source: Author (2010).

The Rotated Component matrix aided in the interpretation of the factors and is shown in Appendix XII. The Component Score Coefficient Matrix for all Combined Zone analysis is shown in Appendix XIII and provided the factor loadings that are analogous to Beta. These were used in constructing the regression models for the five factor solution. The factors are interpreted as follows:

Factor I

A total of 68 variables describe this factor. Out of this, 54 variables representing 79.411% of the total variables deal with Zone 4. The highest loadings deal with open spaces (0.878), and streets (0.868). This zone, despite being ranked 3rd in terms of preference is well conserved and is very ornate. This factor can be labelled as *order*, representing a high degree of organization and removal of clutter which increases complexity and likability. This factor is forward looking and presents what is desirable. The regression model for this factor is given as:

Order=.027Colourfulness$_{z4o}$+ .026Charm$_{z4s}$+ .027Colourfulness$_{z4s}$+ .027Maintenance$_{z4o}$+ .026Charm$_{z4o}$+ .027Prettiness$_{z4b}$+ .032Maintenance$_{z4s}$+ .028Goodness$_{z4b}$+ .031Goodness$_{z4s}$+ .031Attractiveness$_{z4s}$+ .032Conservation$_{z4s}$+ .025Prettiness$_{z4o}$+ .028Prettiness$_{z4s}$+ .033Cleanliness$_{z4s}$+ .026Colourfulness$_{z4b}$+ .031Curiosity$_{z4s}$+ .027Attractiveness$_{z4b}$+ .026Organisation$_{z4b}$+ .027Curiosity$_{z4b}$+ .026Importance$_{z4b}$+ .027Cleanliness$_{z4o}$+ .026Attractivess$_{z4o}$+ .027Maintenance$_{z4b}$+ .026Importance$_{z4s}$+ .027Cleanliness$_{z4b}$+ .027Organisation$_{z4o}$+ .026Conservation$_{z4b}$+ .024Goodness$_{z4o}$+ .024Curiosity$_{z4o}$+ .025Tranquility$_{z4s}$+ .028Organisation$_{z4s}$+ .023Charm$_{z4b}$+ .026Conservation$_{z4o}$+ .022Importance$_{z4o}$+ .024Engagement$_{z4s}$+ .028Ampleness$_{z4s}$+ .023Tranquility$_{z4b}$+ .026Engagement$_{z4b}$+ .021Safety$_{z4o}$+ .022Safety$_{z4b}$+ .022Pleasant$_{z4o}$+ .024Safetyz4s+ .020Tranquility$_{z4o}$+ .018Engagement$_{z4o}$+ .024Pleasantness$_{z4s}$+ .025Sufficiency$_{z4b}$+ .022Pleasantness$_{z4b}$+ .020Ampleness$_{z4o}$+ .024Adequacy$_{z4b}$+ .022Adequacy$_{z4o}$+ .020Size$_{z4o}$+ .025Adequacy$_{z4s}$+. 026Size$_{z4s}$+ .026Size$_{z4b}$+ .004Importance$_{z2b}$+ .003Goodness$_{z2b}$+ .002Tranquility$_{z2o}$- .001Importance$_{z2o}$- .015Size$_{z3o}$- .003Prettiness$_{z2b}$- .004Colourfuless$_{z2b}$- .007Charm$_{z2b}$- .002Curiosity$_{z2b}$- .005Prettiness$_{z2s}$- .002Organisation$_{z2s}$- .003Colourfulness$_{z2s}$- .001Appealingness$_{z2s}$- .004Imporance$_{z2s}$- .003Tranquility$_{z2s}$

Factor II

This factor is dominated by descriptors dealing with Zone 3, with emphasis on *streets* and *open spaces* i.e. the anti-form. The variables deal with appeal, planning, pleasantness, prettiness, colourfulness etc. Zone 3 was the least preferred area and least orderly. This factor may be termed as *maintenance*. The lack of general maintenance and associated feelings of vulnerability reduce its appreciated complexity.

Maintenance=.045Charm$_{z3s}$+ .043Pleasantness$_{z3s}$+ .039Organisation$_{z3s}$+ .040Prettiness$_{z3s}$+ .040Pleasantness$_{z3o}$+ .042Colurfulness$_{z3s}$+ .040Attractiveness$_{z3s}$+ .037Prettiness$_{z3o}$+ .039Goodness$_{z3s}$+ .042Curiosity$_{z3s}$+ .030Goodness$_{z3o}$+ .041Maintenance$_{z3s}$+ .041Charm$_{z3o}$+ .041Conservation$_{z3s}$+ .030Charm$_{z3o}$+ .037Colourfulness$_{z3o}$+ .040Pleasant$_{z3o}$+ .031Charm$_{z3b}$+ .031Pleasantness$_{z3o}$+ .035Attractiveness$_{z3o}$+ .032Organisation$_{z3b}$+ .029Prettiness$_{z3b}$+.030Attractiveness$_{z3b}$+ .032Maintenance$_{z3o}$+ .030Conservation$_{z3o}$+ .037Colourfulness$_{z3b}$+ .027Maintenance$_{z3b}$+ .029Conservation$_{z3b}$+ .040Cleanliness$_{z3s}$+ .028Cleanliness$_{z3o}$+ .028Curiosity$_{z3b}$+ .024Cleanliness$_{z3b}$+ .023Tranquility$_{z3o}$+ .026Goodness$_{z3b}$+ .032Tranquility$_{z3s}$+ .021Curiosity$_{z3o}$+ .022Tranquility$_{z3b}$+ .024Importance$_{z3s}$+ .021Importance$_{z3b}$+ .0001Ampleness$_{z3o}$+ 0.010Maintenance$_{z2o}$+ .008Pleasantness$_{z2o}$- .001Engagement$_{z3s}$- .005Engagement$_{z3o}$- .010Size$_{z3s}$- .006Adequacy$_{z3s}$- .015Size$_{z3b}$- .011Adequacy$_{z3b}$- .003Engagement$_{z3b}$-.015Adequany$_{z3o}$-.008Safety$_{z3s}$- .007Safety$_{z3s}$- .007Safety$_{z3b}$- .003Adequacy$_{z3o}$- .009Safety$_{z3o}$+ .004Ampleness$_{z3s}$-.003Ampleness$_{z3b}$

Factor III

A total of 51 variables describe this factor. Of these 50 variables representing 98.04% are descriptors from Zone 1. This is a zone characterized by a high level of complexity from the colonial architecture, and also Fort Jesus, being a meritorious work of fortification and representing an unsurpassed example of high renaissance architecture. This area has a lot of greenery, representing very generous anti-form. This factor is therefore judged to be *Greenery/ verdancy.*

Greenery-Verdancy=.058Charm$_{z1s}$+ .054Prettiness$_{z1s}$+ .047Organisation$_{z1s}$+ .059Colourfulness$_{z1s}$+ .048Pleasantness$_{z1o}$+ .048Charm$_{z1o}$+ 041Attractiveness$_{z1s}$+ .051Pleasantness$_{z1s}$+ .047Importance$_{z1s}$+ 039Curiosity$_{z1o}$+ .038Goodness$_{z1o}$+ 0.036Cleanliness$_{z1s}$+ .042Tranquility$_{z1s}$+ .042Organisation$_{z1o}$+ .044Goodness$_{z1s}$+ .043Curiosity$_{z1s}$+ .034Attractiveness$_{z1o}$+ .042Conservation$_{z1s}$+ .034Importance$_{z1o}$+ .031Conservation$_{z1o}$+ .041Prettiness$_{z1o}$+ .044Colourfulness$_{z1o}$+ .022Pleasantness$_{z1b}$+ .036Maintenance$_{z1s}$+ .027Cleanliness$_{z1o}$+ .032Safety$_{z1s}$+ .027Maitenance$_{z1o}$+ .020Tranquility$_{z1o}$+ .018Charm$_{z1b}$+ .022Importance$_{z1b}$+ .029Ampleness$_{z1s}$+ .029Engagement$_{z1s}$+ .015Prettiness$_{z1b}$+ .019Organisation$_{z1b}$+ .015Tranquility$_{z1b}$+ .017Colourfulness$_{z1b}$+ .012Goodness$_{z1b}$+ .009Ampleness$_{z1o}$+ .012Curiosity$_{z1b}$+ .010Conservation$_{z1b}$+ .014Attractiveness$_{z1b}$+ .012Maintenance$_{z1b}$+ .010Safety$_{z1o}$+ .011Cleanliness$_{z1b}$+ .013Safety$_{z1b}$+ .022Adequacy$_{z1s}$+ .012Ampleness$_{z1b}$+ .011Engagement$_{z1o}$+ .010Engagement$_{z1b}$- .001Ampleness$_{z1o}$+ .009Engagement$_{z2b}$- .002Size$_{z1o}$+ .018Size$_{z1s}$+ .008Adequacy$_{z1b}$+ .007Size$_{z1b}$

Factor IV

Variables depicting open spaces in Zone 2 comprise this factor. The open spaces in Zone 2 are vast, especially when the ocean is considered. This zone has a well maintained garden at the sea front. This factor is therefore judged to be *conservation* The area is also well maintained.

Conservation=.121Conservation$_{z2o}$+ .113Attractiveness$_{z2o}$+ .113Maintenance$_{z2o}$+ .120Cleanliness$_{z2o}$+. 123Curiosity$_{z2o}$+ .111Goodness$_{z2o}$+ .091Prettiness$_{z2o}$+ .103Safety$_{z2o}$+ .096Organisation$_{z2o}$+ .096Size$_{z2o}$+ .075Colourfulness$_{z2o}$+ .078Ampleness$_{z2o}$+ .080Adequancy$_{z2o}$+ .074Charm$_{z2o}$+ .076Pleasantness$_{z2o}$+ .086Engagement$_{z2o}$+ .056Tranquility$_{z2o}$+.060Importancez2o+ .011Maintenance$_{z2s}$+ .009Conservation$_{z2s}$

Factor V

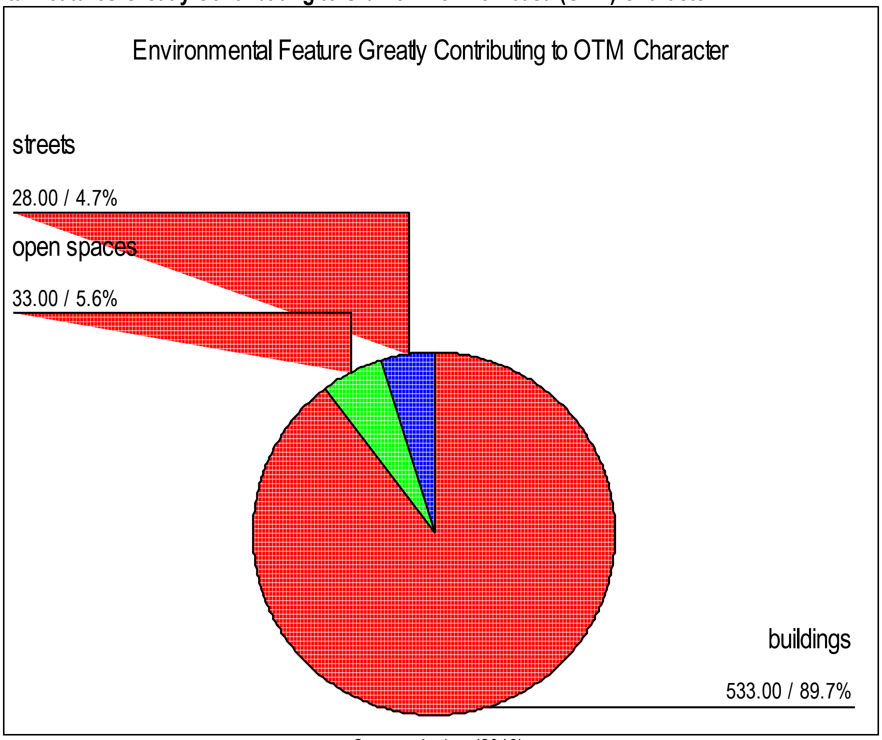
This factor is denoted by 16 variables, 5 for buildings, 5 for open spaces and 6 for streets. All of them describe Zone 3. The descriptors deal with sufficiency, engagement, size, maintenance, conservation, safety etc. This factor is described as *activity.*

Activity=.051Ampleness$_{z3o}$+ .032Engagement$_{z2b}$+ .098Engagement$_{z3s}$+ .085Engagement$_{z3o}$+ .129Size$_{z3s}$+ .126Adequancy$_{z3s}$+ .122Size$_{z3b}$+ .099Adequacy$_{z3b}$+ .080Engagement$_{z3b}$+ .103Size$_{z3o}$+ .117Safety$_{z3s}$+ .084Safety$_{z3b}$+ .073Adequacy$_{z3o}$+ .080Safety$_{z3o}$+ .093Ampleness$_{z3s}$+ .077Ampleness$_{z3b}$

5.3.6 Contributing/ Non Contributing Environmental Features to OTM Character

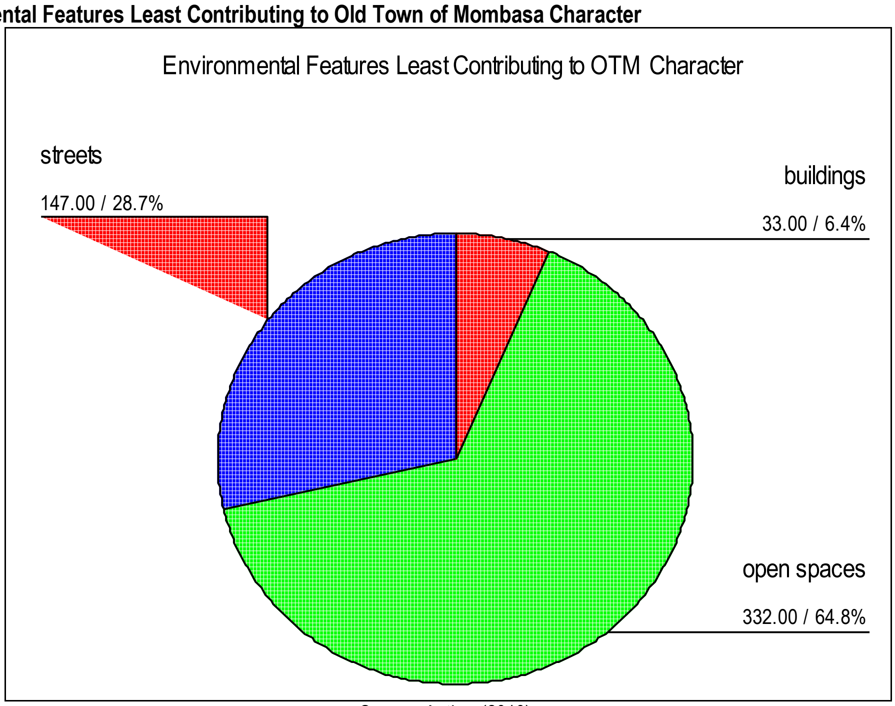
The residents of Old Town of Mombasa were asked what environmental features they felt contributed the greatest, and the least to the character of their historic urban area. The results are shown in Figure 5.30 and Figure 5.31

Figure 5.31
Environmental Features Greatly Contributing to Old Town of Mombasa (OTM) Character



Source: Author (2010).

Figure 5.32
Environmental Features Least Contributing to Old Town of Mombasa Character



Source: Author (2010).

From the results, the buildings, representing the urban solids or form, were perceived to be the greatest contributor to the urban historic character, by 89.7 % of the valid respondents.

The anti-form, represented by a combination of the streets and open spaces attracted a combined total of 10.3% with the streets contributing 4.7% and the open spaces 5.6% respectively. When the question was put in the reverse, the pattern was also reversed, albeit in differing proportions. The open spaces were perceived to contribute least to the historic character of the Old Town of Mombasa (64.8%), followed by the streets (28.7%) and finally buildings (6.4%). These responses suggest that the inhabitants of the Old Town of Mombasa take cognisance of the values inherent in the built environment and are generally offended by the condition of open spaces. Observation of the physical environment revealed that some of the open spaces were unkempt and infested with vermin.

5.3.7 Discussion

In the Old Town of Mombasa, buildings erected around the same period have the same characteristics. They are often found grouped in certain areas, easily identified as *mitaa.* The buildings in the historic urban areas have a variety of uses, which have been changing over time. The buildings are also detailed in different expressive styles and characteristics. These aspects of design are important for individual buildings, but in the context of the whole urban historic commons, the adherence to type is what builds consistency. This is because type helps to define the fundamental relationships between a building and its neighbours.

From the analysis, the Old Town of Mombasa has been classified into four (4) four zones following Lynch's (1960) criteria. These different zones or *districts* have different typo-morphological characteristics, creating diverse environmental attitudes. Their inherent built environment also exhibit different complexity, enclosure and idiosyncrasy. There are also differential preferences for the different zones. It would therefore be plausible to say that the attitudes inhabitants of historic areas have about the built environment are clearly related to the condition of that built environment. The evaluative image of the Old Town of Mombasa show areas of agreement, and develops from an ‘interaction between the environment and the observers…’(Nasar, 1998, p.78). Environmental preferences are therefore related to the characteristics of the area. The most preferred zone in the Old Town of Mombasa was also the most ornate (Table 5.31). Increase in visual richness, openness and naturalness, maintenance, and decreases in presence of nuisances, e.g. uncollected garbage, unkempt buildings and open spaces etc., lead to increased preference.

The inhabitants of the Old Town of Mombasa prefer areas with: moderate complexity, possess a human scale, are well maintained and have greenery, and those that are spacious or contain open views. These characteristics, emerging from Principal Components Analysis of the photographic stimuli are found in varying degrees in the conservation area. The analysis from the urban historic area itself indicated that residents preferences are underlined by: novelty of the area, pleasant environment, good maintenance and upkeep, serenity, ornamentation, order, perceived adequacy of the environment for the intended purpose, vibrancy or presence of human activity, the importance attached to the facilities, how relaxing the facilities are, and the arousal level. Some of the factors identified were on the negative pole, and this is confirmed by the author’s physical observation of the built environment. All appropriate factors have been modelled as regression equations and are similar in form to Eysenck’s (1941) aesthetic formulas. These *aesthetic formulas for conservation* account for the non-chance factors operating in the judgements of the respondents.

Table 5.31
Summary of Factors

Zone	**Zone Preference** *by Mean, Median and Mode*	**Complexity**-*Authors assessment on a Rank of 1 to 4*	**Typo-morphological characteristics/ Descriptions**	**Emerging Factors/ Components**
Zone 1	2.3227 2 1	1	▪ European Architecture ▪ Generous Anti form ▪ Public Monuments and Institutions ▪ Zone of Street Convergence ▪ Well Maintained ▪ Complex Architecture ▪ Has inner block voids	▪ Novelty/ Atypicality ▪ Pleasantness ▪ Maintenance ▪ Serenity
Zone 2	2.2922 2 2	2	▪ Waterfront ▪ Expansive Ocean Views ▪ Well maintained ▪ Angular Patterns ▪ Status symbol ▪ Mombasa Traditional House ▪ Linear open system ▪ Parks and gardens ▪ Very generous Anti-form ▪ Direction, Edge defining buildings	▪ Upkeep ▪ Elegancy/Ornateness ▪ Organisation/ Orderliness ▪ Adequacy ▪ Importance ▪ Relaxation
Zone 3	2.9296 3 4	4	▪ Mainly a residential area ▪ Deformed grid ▪ Organic Patterns ▪ Swahili House ▪ Repetitive shapes of parcels ▪ Generally untidy ▪ Non conforming flats ▪ Disorderly Environment	▪ Pleasantness ▪ Adequacy ▪ Arousal ▪ Upkeep
Zone 4	2.4841 3 3	3	▪ Well conserved Street ▪ Mombasa Traditional House ▪ Non conforming buildings ▪ Entry foyers	▪ Ornateness ▪ Upkeep
All Zones Combined: Order, Maintenance, Greenery/ Verdancy, Conservation, Activity				
Residents Likability: Complexity, Scale, Maintenance, Greenery, Spaciousness				

Source: (Author, 2010).

The Old Town of Mombasa has clearly defined *genius loci* and as a conservation area, the *place* must be considered before *buildings*. It is an area of mixed uses and is thus very active, day and night. It generally operates on the human scale, although this is under threat from the mushrooming discordant architecture. The urban historic area is also peripatetic. The residents are desirous of urban scenes that are intricate, joyous and have visual delight. These aspects should be encouraged. It has emerged that the conservation of buildings would create the greatest impact to the aesthetics of the Old Town of Mombasa. The production of the various building typologies and the ensuing arrangement of the same to create morphological patterns in an urban area, results from inhabitants attitudes. The diverse typologies are a reflection of the diverse attitudes towards the built environment. The commonality of the attitudes, showing a shared idea, leads to repetition, although a variation in the production of the built type is not uncommon. This typological process represents an interaction between humans and the environment (Kropf, 2001). This interaction is clearly contemplated in the Systems Theory. The identified attitudes may also be indicative of the values people have about the built environment, and this points to the need for a change in the conservation approach.

Humans expend both mental and physical energy in the typological process (Kropf, 2001) and this input distinguishes the built form from the natural environment. Because buildings types do not change, but humans change them, then the attitudes of the changers is important. Furthermore, Kropf has shown that human beings respond in terms of differences, which are caused by perceptions. These differences must be mediated through the process of continuity and change. The *a posteriori* classification of individual buildings together to form a type implies that the buildings were produced out of a common idea, *the attitudes*. This common idea should be the driver of continuity and change in conservation of the built heritage.

The identified typologies are characterised by certain morphological configurations governing their internal organization and the relationship to adjacent structures and spaces. The elements of type are also seen to have global functions associated with them such as circulation, entry, public space, private space and so on. However, as argued by Scheer and Scheer (1998), a building designed for a specific use may change its function over time without undergoing a typological transformation. It also emerges that a given type tends to create certain street configurations, which in turn tend to create certain block and district types. This in turn causes differentials in attitudes.

It can be reasoned out that beauty is not in the eye of the beholder as conventional wisdom dictates. This thesis rejects that notion, that beauty is a matter of individual taste, lacking standards or guidelines that decision makers could use. Visual disorder in the Old Town of Mombasa should be converted to a more agreeable environment. The mushrooming hodgepodge of buildings, parking lots and chaotic advertisement signs may be good for business but may not be good for the overall historic area. Each new building may appear harmless or desirable on its own, but when considered as part of the larger built environment system, it is very injurious to the commons, thus precipitating a visual *tragedy of the commons*. To avert this tragedy, corrective solutions that meet with general approval have been identified as factors in this thesis.

This research demonstrates that the conservation milieu can be expanded by using user attitudes. The importance of complexity of the built environment in encouraging desirability has been demonstrated. Conservation professionals should develop empirical data through such a study to guide local decisions and actions. This will provide a scientific basis for conservation, and gain public support for the decisions made. This would ultimately contribute to improvements in the image of the built environment, by enhancing the perceived quality of historic urban areas.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

This study presented an opportunity to expand the scope of aesthetic research in the realm of conservation of urban historic areas. The conservation of such areas presents aesthetic problems that are not found in isolated buildings. The study sought to establish the typo-morphological characteristics of an urban historic area, as well as the attitudes of the inhabitants' towards the built environment. It was hypothesised that there is no relationship between the historic built environment in the Old Town of Mombasa and the inhabitants' attitudes towards it. Urban historic areas are conceived as *commons* suffering aesthetic pollution, which eventually precipitates a tragedy, destroying the whole commons. As a system, it is desirable to have variety in the historic built environment, so that the system is moved towards stability. Grounded within the contemporary theory of conservation, this study expands the scope of sustainability in conservation through user attitudes. From an attitude framework, we might think of affective influences on decision making as influences of the affect on attitudes towards actions (Fishbein & Ajzen, 1975). The concept of likability (Nasar, 1998) was used as a guiding concept in the study. This thesis demonstrates that a scientific survey can assess community perception of urban historic areas.

The Old Town of Mombasa was taken as representative of an urban historic area along the East African littoral. It ranks as one of the most important in Kenya, in terms of both its architectural and historic interest. Its significance is reflected in the extensive number of statutorily listed buildings, the number of tourists who visit the area, and its international recognition. However, the conservation area is yet to be designated as a world heritage site, but efforts in this direction, spearheaded by the National Museums of Kenya abound.

6.2 Theoretical Implications

Likability, as used in this thesis is the result of certain aesthetic responses to environmental attributes, and 'it is an antecedent to behave' (Chon, 2004, p. 157). This aspect was examined for an urban historic area, the Old Town of Mombasa. A likable urban historic area can be easily sustained due to the favourable evaluations. This way, the *Tragedy of the Commons* will be averted. The scope of conservation is expanded through the introduction of psychological concepts into the conservation theory.

The theoretical orientations of this study are found in the work of Lynch (1960) and Nasar (1998). It is also embedded in the theoretical postulations of von Bertalanffy (1968), Hardin (1968), MacLoughlin (1973), Lovelock (1978), Bechtel (1997), and Viňas (2005). It recognises the importance of environmental characteristics that influence community appearance, and proceeds to derive these characteristics for an urban historic area. These are delineated as *aesthetic formulas for conservation*. These formulas, representing an evaluative response, can be criteria for decision making in the conservation of urban historic areas. Clearly, this builds on the contemporary theory of conservation by Viňas (2005), which is deficient in this aspect.

Studies by Nasar (1998) have shown that knowledge about imageability is not sufficient for shaping city appearance. The meanings and feeling people have about the built environment are crucial to their reaction to the environment. Imageability helps people in way finding, while the environmental response may affect people's movement, and very importantly, how they *treat* the built environment. This has serious implications for conservation because the evaluative response can be a criterion on decision making in selecting the conservation intervention on historic buildings and designated areas. Research indicates that evaluative images and meanings can provide valid, reliable, and useful information for the planning, design and management of desirable surroundings (Chon, 2004; Kaplan & Kaplan, 1989; Zube, 1980). Nasar (1998), has stressed the relevance of meanings in the shaping of city form, and where people have the capacity to act, these meanings affect their behaviour.

Appleyard (1976) as cited by Chon (2004) has shown that the most imageable buildings in a city elicit the strongest evaluations, both positive and negative. It follows that if people like imageable urban historic areas, then these areas will probably convey positive evaluative image. If they dislike them, a negative evaluative image is conveyed. This study has sought a proficient explanation of factors that affect the concept of likability, so that it can be accomplished in a specific setting. This thesis has set out a new way of conceptualising conservation, and a model of relationships leading to the likability of urban historic areas. It extends the field of urban conservation, by incorporating a new measure, likability. This also enriches Viñas (2005) contemporary theory of conservation.

The findings of this study indicate that likability is a useful measure to examine perceptions of urban historic areas, and their relationship to aesthetic response, which actually represent the intent to behave. Great interest in urban historic areas abounds, but little empirical research has actually been conducted on the topic from a likability perspective. Few studies have focussed on examining the perceptions of urban historic areas by residents, and the relationship on aesthetics. As found in many studies, likability measures and community appearance provide important implications for creating an objective basis for decision-making and policy development.

The current concept of conservation emphasizes the importance of architectural heritage as both a work of art and a historic document (Charola & Henriques, 2005). This concept may lead to contradictory technical approaches during conservation intervention. To find the right approach to conserving an urban historic area, the inhabitants' attitudes must be determined first. This is akin to the determination of values *a priori* of individual monuments before conservation, which is advocated in conservation philosophy today.

Recall that the mid 19th century industrial revolution and the ensuing social changes resulted in a revised perception of ancient monuments and the development of the concept of architectural heritage, as well as the importance of conservation. The ensuing philosophical approach in conservation crystallised in the 1964 Charter of Venice document (ICOMOS, 1964). The perception of the conservation problem as a purely technical one leads to an erroneous methodology when interventions are being carried out. It must be remembered that conservation is a cultural activity with technical implications, rather than a technical activity with cultural implications. The approach demonstrated in this study is people-centred, and is well encapsulated within the maxims of contemporary theory of conservation, and tenets of social inclusivity and democracy.

The substantive issue in conservation is the shaping of the urban historic environment at scales greater than a single monument. Conservation theory, then, as projected in this thesis, is addressed to human experiences, that are derived from the conserved artefacts that transcend public or private objects. The *procedural theory* approach to conservation, based on such matters as rationalism, incrementalism, participation, group processes and communication, really show intelligence can be exercised on behalf of a community, not by the community *per se*. It is demonstrated that non-commodifiable human experiences can be mined and conserved. This seeks integrity across the properties in the built environment without indigenous correctness. In one place, therefore, local identity may derive from history, and in another from contemporariness.

Much of the attitudes towards the aesthetics of the built environment and their potential conservation are by culture: society and experience. Particularly, as Larkham (1996) shows, the majority of the west is dominated by the aesthetic of the Renaissance, with its emphasis on regularity, repetition and emphasis. The urban plan is dominated by the tenets of the beaux-arts aesthetic, with concepts of regularity, planned vistas and formal geometric layouts creating both familiarity and surprise. The mediaeval aesthetic is thus superseded, which is based on local availability of materials and technology. The conservation aesthetic developed in this thesis goes beyond the current practice of blending in, and has a wider spatial and temporal view. In the words of Biddle (1980), conservation should be more receptive to development that will 'be recognised as being of positive value to the areas' appearance once completed' (p. 11).

The conservation of historic areas has relied for long on procedural planning methodologies. These react to proposals arising from developers and do little to encourage development activity in areas of low demand. Studies on human response to the built environment have also been impeded by a number of unresolved theoretical and methodological problems. These are the challenges of nomenclature, obtaining replicable results, scope and the assumptions about human perception. This thesis presents an attempt to develop an approach that would allow for a meaningful relationship between theory and method, and indeed combines two distinct disciplines, architectural conservation and environmental behaviour. This is a critical requisite for development of the field of architectural conservation.

In the conservation of historic areas, this study has delineated the built environment in terms that describe an interaction with the perceiving inhabitant. An integrated approach is used to analyse a historic area from objective and perceived terms. The findings in judgements of likability suggest that respondents are basing their judgements of aesthetic quality on the properties of the built environment. This is checked through the simultaneous and concurrent examination of the objective and perceived qualities of the environment. This approach suggests that the manipulation of the built environment by the conservation professional (Appendix VI), will lead to different experiences by the people. Conservation areas can therefore be designed, making use of such features as complexity, ornateness and pleasantness, in order to meet planning objectives. The desirability of any proposed interventions in urban historic areas can also be determined before execution.

This thesis complements the planning theory applied in conservation by introducing affective appraisal as a subset of the conservation planning system. The study contends that urban historic areas have affective qualities that have been previously ignored in planning. These are judgements directed at the built environment and measured through semantic differentials, carefully constructed to avoid confounding affective with non-affective meanings. The amount of agreement among individuals on these qualities was established empirically. At a larger scale, for the design of public places to have visual appeal to the many and diverse users, decision makers must integrate extant knowledge of environmental preferences into the design.

6.3 Methodological Implications

The methodology espoused here is firmly grounded on empiricism, based on perceptual experience and not intuition or revelation. This approach is scientific and rigorous, representing a positivist approach. The results from the study fall within the philosophy of science, regarding the ability to falsify a theory. The blending of empiricism and humanities with the critical thinking and problem solving skills of design is a pointer in the establishment of an integrated approach to conserving the built environment, and the intangible aspects that imbue it with meaning. Perception may be investigated based on responses to physical objects, psychological stimuli or abstract concepts (Garcia-Mira, Arce, & Sabucedo, 1997; MacCallum, 1974). In the present study, factors underlying perceived environmental quality were investigated based on subjects' evaluations of an area known to them. Factors were also investigated on the subjects' responses to images of urban environments. This approach enables the construction of an integrated representation of large historic area.

The data collection techniques used in the thesis should be stressed: by asking the respondent to rank the four zones identified in the historic area, from favourite to the least favourite, the subject responses are not affected by any preconceptions of factors, which might govern the attitudes towards the neighbourhood quality. The results of this study also illustrate the value of factor analysis for the identification of the environmental characteristics affecting perceived neighbourhood quality, and confirm that indeed such techniques identify the underlying attributes on which individuals rate their environment. The insights obtained in this way provide a useful basis for decision making by the designers of urban historic environments. The objective analysis of an individual conception of quality of the built environment is clearly a difficult task. Yet, designers and administrators are interested in things that make people happy. Factor analysis, a data reduction technique is used because researchers have no means of assessing subjects' responses.

A methodological problem confronting urban conservation is the objective and measurable involvement of the community in conservation. The methodology demonstrated in the study creates an opportunity for public input in matters of aesthetic preferences, prior to any interventions. Recognising that attitudes are multifarious phenomena, a three-pronged approach to conservation is used: the detailed analysis of the typo-morphological characteristics, perceptual measurement through stimulation, and the attitudinal measure towards a real and experiential environment. The combination of multivariate analysis and archetypal description elaborate the measurement of meaning in a conservation area.

Nasar (1988c) has shown that the attempt to quantify emotional responses to visual attributes of the environment has involved the employment of a variety of methods (p. 107). These studies have varied in the choice of subjects, scenes, modes of presentation, measures of environmental attributes, measures of effect and analytic procedures. For the purposes of application, ecological validity is desirable. This study approximates as closely as possible the real conditions to which the results apply. This is because a diverse and representative sample of respondents, and stimuli were used. Indeed, the features of the environment and the kinds of responses obtained were relevant to naturalistic experience, as shown by the choice of research *situs* (Section, 3.4). Attitudes elicitation via the semantic differential scales produced direct and comprehensive information.

The clarification of, and agreement on, visual objectives and their implementation are without doubt amongst the weakest stages of the planning process (Lozano, 1988). This design shortcoming is well reflected in large-scale projects that are unable to evoke satisfactory aesthetic responses from the lay public or critics. On the contrary, many urban creations of the past present a widespread consensus on their positive visual qualities. Despite the poor and inadequate procedure to infuse visual inputs in the design process, the visual qualities of the built environment are very important. The influential work of Lynch (1960) which developed a systematic approach to study visual elements of the built environment, based on the perceived image by the people, is a testament to this. Venturi's (1966) *Complexity and Contradiction in Architecture* brought a refreshing change from the canonical aesthetics of modern movement (Lozano, 1988). This study has been able to demonstrate a methodology for analysis to evaluate built forms and spaces of the built environment in urban historic areas, and infuse these in the planning process, as practised today.

6.4 PRACTICAL IMPLICATIONS

The methodology used here can be very useful in helping anyone understand how people view their environment and what they like and dislike about it. Conservation officials should strive to understand the attitudes of those they serve. The methods in this thesis can be very useful towards that goal.

Although there are by-laws to control development in the Old Town of Mombasa, sustainable conservation is hampered by lack of public input. Every day, conservation work is conducted through the development control process that leaves aesthetic considerations to the developer. It is suggested that planners adopt a polling approach to see how the public responds to developments in urban historic areas. This *heritage-custodian-oriented-approach* would make design reviews more acceptable to everyone, and result in more appealing urban historic areas. Ultimately, a sustainable urban historic area may be accomplished.

In the conservation of urban historic areas, the socially rooted determinants of urban land use should not be left out. This is because social values are viewed as motivating behaviour, resulting in a certain organised form of action by a people or groups (Chapin, 1972). In conservation, the aesthetic values, inferred from attitudes, indicate a shared mass social value representing consensus by a majority of people. This mass value has long been established elsewhere, to be indeed a self-sufficient ecological force having a very real causative influence upon land use (Chapin, 1972; Firey, 1947). The rational economic interest in urban historic areas, which are major drivers for discordant archetypes, cannot be seen as self given-ends in themselves. These interests must be balanced with social values and interests, represented by aesthetic needs.

The invasion and subsequent succession of the desirable contextual typologies by bland high-rise flats, lacking in adequate order and variety, (and therefore low in complexity); will eventually lead to the aesthetic demise of urban historic areas. While residents do hold certain property rights, the authority in charge of conservation has a right to control the visual aesthetics. Communities should be able to regulate aesthetics, and the conservation office should determine that the old town community should be beautiful as well as healthy. In a similar way that local authorities deal with obscenity, they should deal with buildings that decrease aesthetic values of the built environment. This can be achieved through the creation of a *Design Review Board*, or such other legal entity, which will expand the approval process to include aesthetics review. Aesthetic reviews should represent an indispensable component of zoning ordinances. Although urban historic areas may have the legal rights to regulate aesthetics, they may not have the political will to do so against the wishes of many residents who support rights to private property. The power of eminent domain should then be called into question.

The local controls for aesthetics should take place within a comprehensive and seriously pursued program to enhance the community appearance (Evans-Cowley & Nasar, 2004). The conservation of urban historic areas could benefit from George and Campbell (2000) four item criteria for design controls:

1. The controls should be clearly articulated and demonstrate public interest;
2. They should have demonstrable links to the stated intent;
3. They should be applied early in the design or decision process; and
4. They should encourage a variety of acceptable decisions.

For items 1 and 2, the conservation office should use a survey of the public. If most residents reject a proposed development, then it is probable that the development could harm the urban historic area's appearance since it is contrary to the community's standards. The present study has applied early in the conservation process item 3, which could lead to certain development prohibitions or rectifications. It is contended that the various factors identified in this thesis would allow for a variety of design decisions as advocated under item 4. A proactive approach to urban conservation is called for, where planners should not *follow* development, but should try to anticipate changes and respond quickly.

The major implications of this study are to identify design cues that can enhance the aesthetic condition of urban historic areas in order to ensure sustainability. As shown by Nassauer (1995), cited in Chon (2004), design cues can reveal powerful messages of ecological beauty that shows human care and stewardship. Despite the limitations in the present research on attitudes in historic urban areas, it reveals shared preferences and processes underlying aesthetic response. It suggests a direction for design and a set of physical and human characteristics worth further attention. In the control of area aesthetics, the concerned conservation office need not produce uniformity or boredom. It can encourage variety by having different criteria for different context or precinct, as is demonstrated by the zone analyses. In order to ensure that historic areas are sustainable, the conservation office should encourage:

1. Good upkeep and maintenance, and *conservation* of the built environment.
2. Moderate complexity through ornamentation and contextual designs.
3. Moderate discrepancies from the traditional typologies in order to create arousal.
4. Familiar historical elements to create a pleasant environment.
5. Openness, vistas, panoramas, and greenery where possible.
6. Order in the composition through removal of clutter, dilapidations and other nuisances e.g. advertisements, poles and hanging wires.

Urban historic areas constitute unique built environments defined by the historic character and the *genius loci*. The enhancement of this spirit of place should aim at diversity not uniformity, as uniformity will depress environmental complexity. These areas are continuously in flux, evolving to meet the needs of a contemporary society. As valuable cultural artefacts, conservation in historic areas should; be based on an understanding of the town's morphological development; have respect of the setting; be appropriate in scale, height and volume to the inherent morphology of the town and the existing typologies; and, contribute, rather than mimic or compete with the existing townscape character. The designers must therefore strive to add something to the conservation area, which could itself be *listable* in future, and attractive. Urban historic areas, being greater than the composing buildings, can accommodate more diversity within them. This increase in diversity will lead to a complex built environment, which is likable.

The *genius loci*, may be sustained if the traditional forms are used to guide new developments in Old Town of Mombasa. This will include:

1. Low scale dense development patterns. Greater density and compactness of the urban form will allow efficiency in services provision; increase the potential of walking and community interaction and cohesiveness.
2. A mix of land uses. This would continue to create complex neighbourhoods, fostering community integration and cohesiveness.
3. A variety of houses and plot sizes. This would lead to an increase in complexity of the whole area. It would also hinder exclusivity.
4. Adaptability of building forms and urban patterns. This would accommodate change while ensuring continuity.
5. Traditional building types. This easily gel into the historic urban area and are well adapted to the local climate. The use of modern building materials and technologies need not impose any change in site planning or even interior arrangements.

Summing it up, the traditional urban patterns should be zealously guarded, and these patterns may be used as a model for new development. This would allow any new developments to remain in an appropriate setting, but not rigid and fixed individual buildings in a place. This flexible approach is more sustainable, and may borrow from the medieval master masons that were able to build whole towns, based on variations of common types, at a consistence visual-quality level.

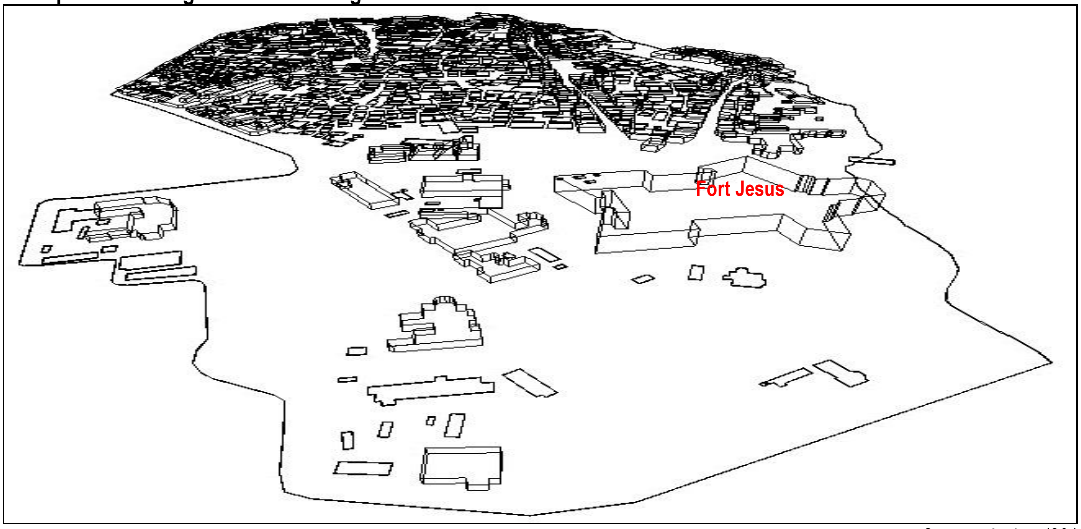
As shown by Papageorgiou (1971), an urban historic area rarely constitutes a homogenous formation. This is because it is composed of architectural styles and spatial concepts that have accumulated over time. The inherent structural law is that every creative epoch introduces new elements into the traditional townscape, which make their contribution to the morphological plurality of the urban composition. This plurality does not constitute a discordant factor. Discordant effects are produced if the inherent morphological plurality of the townscape is reduced to a state of visual anarchy by the juxtaposition of incompatible products of different epochs or by the discretion of older urban formations because of new developments.

The results from the Old Town of Mombasa, indicates that urban historic area is a sphere of human activities reflecting and providing a framework for urban experiences. This framework is summarised below and should be applied *mutatis mutandis* during conservation exercises.

6.4.1 Free Alignment of Buildings

Some buildings in urban historic areas can be viewed from a variety of vantage points. This means that the urban space is plastic, clearly emphasising the dynamism of human movement. There is a mixture of autonomous buildings, which are not set out in line. The most important buildings are arranged as free standing, resulting in a highly fictile arrangement. This is clearly indicative of anthropocentricism, which is a product of daily urban experience. The impression of cohesion made by the total composition represents an important element that must be protected when new developments are undertaken within historic settlements. The area around Fort Jesus (Zone 1) has many freely aligned buildings (Figure 6.1). The area contains a lot of public monuments and institutions.

Figure 6.1
Example of Free alignment of Buildings: *The Fort Jesus Precinct*

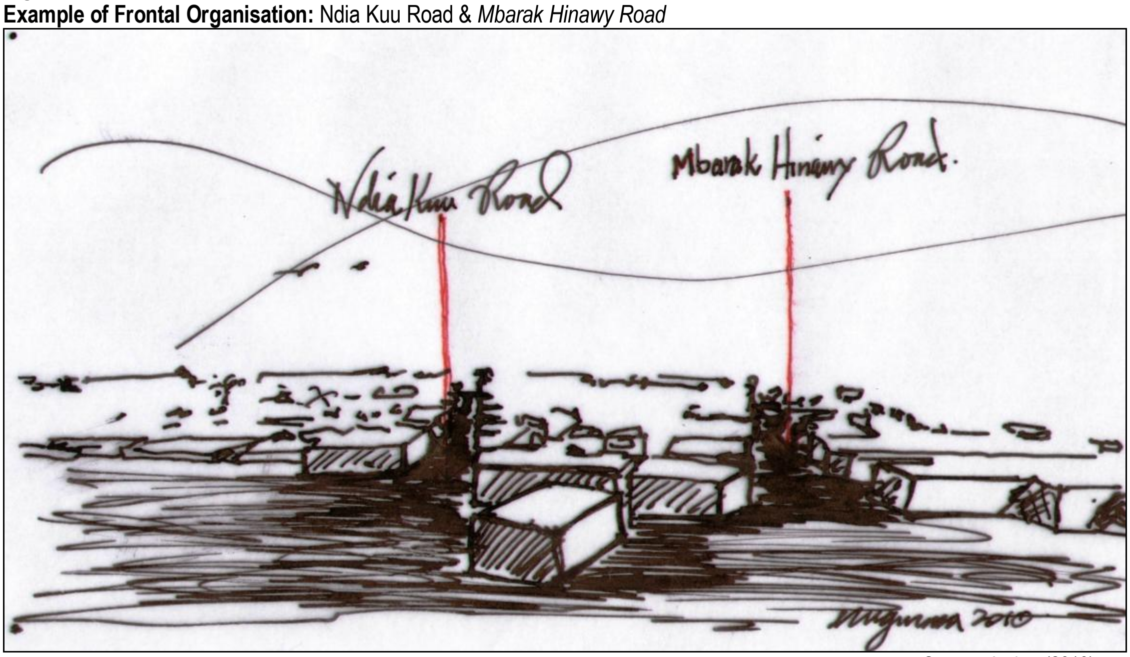


Source: Author (2010).

6.4.2 Frontal Organisation

In some instances, compact blocks of buildings with irregular rooflines interspersed with buildings of symbolic or practical significance for example mosques are found in the town. These variations in height and mass create focal points of interest to the observer. The human scale is very important because this organisation provides a rigid movement (Figure 6.2). Frontal organisation is well articulated in Zone 4 which encompasses Mbarak Hinawy Road.

Figure 6.2
Example of Frontal Organisation: Ndia Kuu Road & *Mbarak Hinawy Road*



Source: Author (2010).

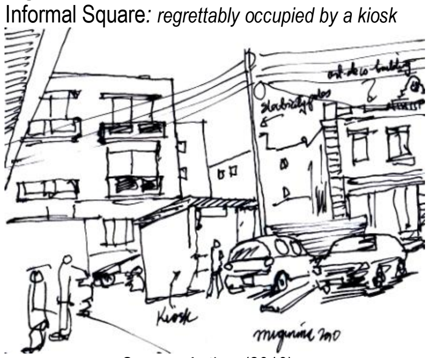
6.4.3 Free Alignment of Streets

The freely aligned streets, where they exist, lead to focal points of secular and religious life and so on, creating a three dimensional image of the built environment (Figure 6.3).The freely aligned squares are more or less enclosed, setting up an interrelated pattern, and making up a great wealth of experiences. The constant variations in the width of the streets, small open spaces and the total absence of the gridiron and regular geometry fulfil an aesthetic function. There is very close integration of the built and unbuilt urban space. Squares of varying sizes create a joyous play, enhancing a great human need, aesthetics (Figure 6.4).

Figure 6.3
Free Alignment of Streets

Source: Author (2010).

Figure 6.4
Informal Square*: regrettably occupied by a kiosk*



Source: Author (2010).

The irregularities of the open spaces and streets create pleasant effects that stimulate interest. These typical irregularities are due to the gradual historical development of most urban historic areas over long durations of time. Zone 3, previously dominated by the Swahili house typology, exhibits the best example of freely aligned streets.

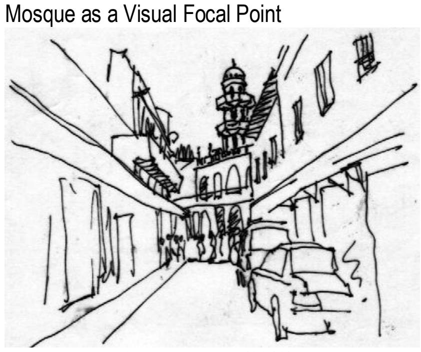
6.4.4 Spontaneity

Closely related to free alignment is spontaneity and unexpected views. Figure 6.5 evinces a walk down Mbarak Hinawy Road, and then, suddenly the Government Square appears! *(in the direction of the arrow).* This property, spontaneity, must be guarded in our historic urban areas, whenever it occurs, since it enhances human experience. It is closely related to serial vision. The axial system creates an aura of rigid grandeur, and may lack spontaneity. Whenever possible, irregularity in street alignment and building arrangement should be encouraged in order to reap the full joyous experience of the urban built environment. The existing focal points, which sometimes appear suddenly and unexpectedly, should not be attenuated (Figure 6.6). This property is found in all the zones, but is more pronounced in Zone 2, 3 and 4.

Figure 6.5
Sudden Entrance to the Government Square

Source: Author (2010).

Figure 6.6
Mosque as a Visual Focal Point

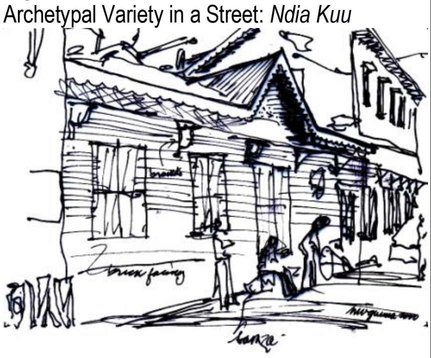


Source: Author (2010).

6.4.5 Disparity and Variety

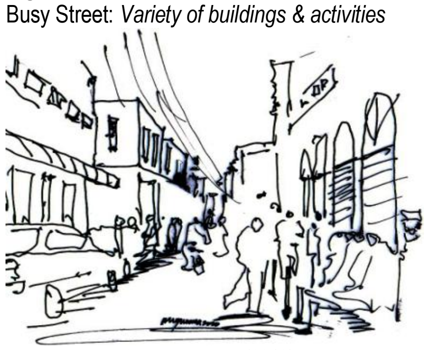
This is represented by a variety of archetypes and morphological patterns in an urban historic area (Figure 6.7 and Figure 6.8). Disparity and variety enhances complexity of the place, creating *genius loci*. There is production of innumerable focal points of interest in order to engage the user through variations in height and bulk, so that something new at every turn is produced. The quality of the townscape in urban historic areas is also influenced to a considerable degree by the decorative forms and elements that are found on the streets and facades of buildings. These must be in keeping with the townscape, or they will clash with it. Disparity and variety in the urban historic environment can be achieved using different scales. These physical scales are necessary because they indicate the differing gradations of activities. By creating a diversity of scales, new contextual forms can be offered in the conservation milieu.

Figure 6.7
Archetypal Variety in a Street: *Ndia Kuu*



Source: Author (2010).

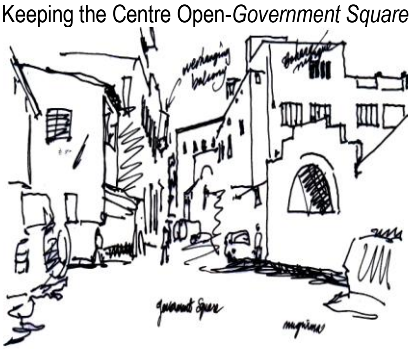
Figure 6.8
Busy Street: *Variety of buildings & activities*



Source: Author (2010).

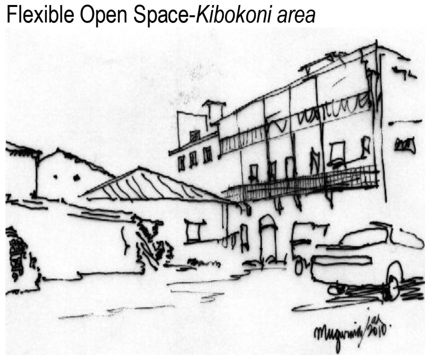
Disparity and variety in an urban historic area presents itself in various ekistical formats. In the squares and open spaces, the centre is generally kept open and monuments placed to the side (Figure 6.9). Indeed, many spaces are highly flexible, bearing no geometric regularity that tends to be imposed by rational planning theory (Figure 6.10).

Figure 6.9
Keeping the Centre Open-*Government Square*



Source: Author (2010).

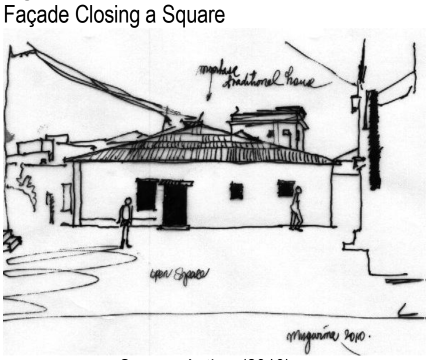
Figure 6.10
Flexible Open Space-*Kibokoni area*



Source: Author (2010).

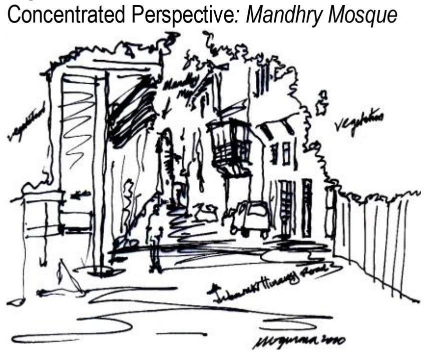
Sometimes, a building façade serves to close the square (Figure 6.11), and buildings are not generally placed in the middle of a square. Urban historic areas also display a variety of perspective effects, which are concentrated on monuments (Figure 6.12). The mixture of building types on the same street creates variety and complexity at a larger urban scale (Figure 6.13). An urban historic area with great variety of forms and spaces, possess a wealth of motifs and is highly aesthetic to people.

Figure 6.11
Façade Closing a Square



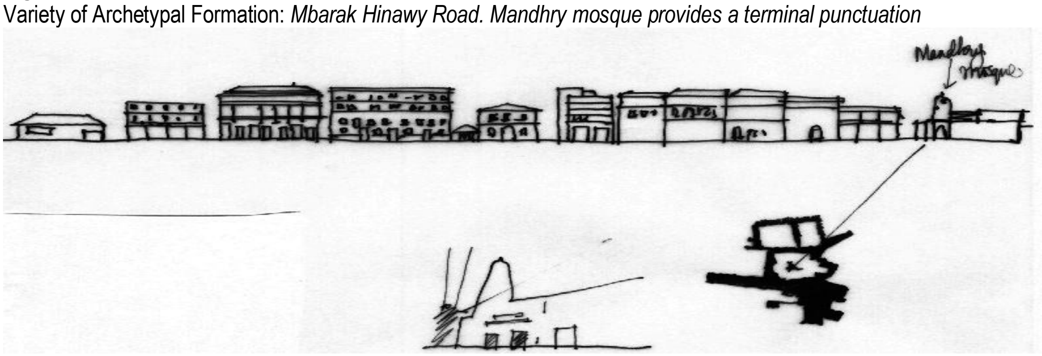
Source: Author (2010).

Figure 6.12
Concentrated Perspective*: Mandhry Mosque*



Source: Author (2010).

Figure 6.13
Variety of Archetypal Formation: *Mbarak Hinawy Road. Mandhry mosque provides a terminal punctuation*



Source: Author (2010).

In the creation of focal points, outmost care must be exercised so the human vision is not concentrated on objects that are not historically authentic, for example communication masts. These out of scale formations create misplaced dominance and thus denigrate the aesthetics of Old Town of Mombasa (Figure 6.14). This occurs despite the fact that they can be used in way finding. The existing focal points should be enhanced and not blocked. Figure 6.15, shows the prominent tower of the Old Law Courts, Mombasa, which is an important townscape element reminiscent of minarets of the various mosques found in the old town.

Figure 6.14
Telecommunication Mast: *Visually Offensive*

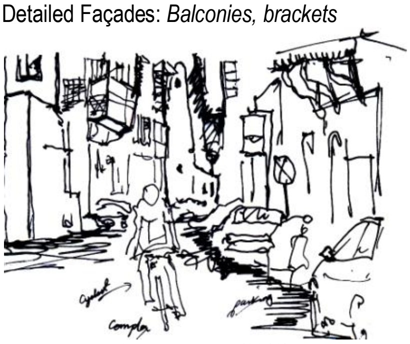
Source: Author (2010).

Figure 6.15
Old Law Courts: *Prominent Tower & Steps*

Source: Author (2010).

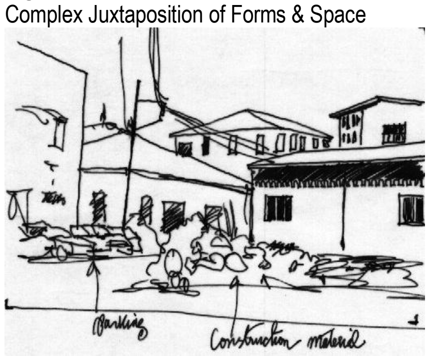
At the building detail level, the variety is immense. From outstanding balconies to carved doors, this variety and disparity contribute immensely to complexity of the built environment, in a way akin to a mature ecosystem, which has resilience and inertia. Indeed, the coarsely textured façades along a street tend to arrest the eye, since a 'complex face enhances the public space by inviting pause' (Porteous, 1996, p. 219). Figure 6.16 shows this complexity in Mbarak Hinawy road. The overhanging balconies with ornately carved balconies are outstanding features of Old Town of Mombasa houses. They vary from the strictly functional to the elaborately decorated and enclosed. The Old Town of Mombasa, like many urban historic areas, exhibits an irregular rhythm amongst heights, depths, constrictions, openness, darkness and light and so on. These irregular rhythms created by varying building heights, composite juxtapositions add to the townscape variety and its *romantic* nature (Figure 6.17).

Figure 6.16
Detailed Façades: *Balconies, brackets*



Source: Author (2010).

Figure 6.17
Complex Juxtaposition of Forms & Space



Source: Author (2010).

The diversity of building types, detailing, space formations etc creates a *stable* townscape; in the same way that species diversity in a mature ecosystem, alluded to earlier on, creates a stable ecosystem. Sustainable historic townscapes should therefore have high diversity and complexity, as this creates many dynamic relationships in the area, be they visual, functional or otherwise. This idea is very similar to the complex food webs found in mature ecosystems.

6.5 General Conclusions

The thesis focuses on the methodological and analytical issues involving human attitudes towards the built environment, with specific reference to urban historic areas. The concept of likability was used as a guide. Likability studies, as shown by Chon (2004), have focussed on the evaluative meaning or affective response. Lynch (1960) argued that environmental image has three parts: identity, structure and meaning. Nasar (1998) emphasised that imageability cannot be fully explained without meaning. He extended Lynch's work by suggesting that likability (affective response) increases imageability, and imageability emphasises likability (Chon, 2004).

The impact of a good public environment on image and attraction is enormous. A historic urban area with strong attractions may benefit from the removal of vehicular traffic, which will complement these attractions. Variety in urban historic areas engenders human response and leads to distinctiveness and vitality. The important lesson as shown by Bradshaw (2005) is that variety and vitality come from retaining and reshaping the heritage of a place. Areas of mixed uses, smaller scales and local distinctiveness should form a sound basis for sustainable conservation.

The cogency of urban historic areas is often seen in terms of the value they present to those who use them or interact with them. Yet, these cultural heritages are assets that have been passed down to the present generation, and must be passed onto others after us, not simply consumed by the present generations for whatever purpose (Orbasli, 2008). Better still, the built heritage can be pictured as having being borrowed from the future generations. The role of the conservation professional (Appendix VI), is that of caretaking, maintaining the asset for future generations, while facilitating changes that make this possible. The professional stands guided by the people's attitudes and their likability, as demonstrated in this study. The pedagogic moral duty to conserve our heritage and to pass on the accomplishments of our ancestors and ourselves can be easily served through the attitudinal approach to conservation elucidated in this thesis.

The attitudinal approach to conservation accepts that permanence is illusionary. A fixed past is not what we need, as propagated through the master planning approach to conservation, but one which we continuously interact with, fusing the past with the present. Indeed, the past may be our own creation (Lowenthal, 1985). The approach in this thesis shows that conservation must not segregate a tangible past and require it to be unlike the present, since the past and the present are not mutually exclusive but inseparable realms. The factors identified in this thesis will enable the past heritage to be malleable, thereby making it real and experiential.

The majority of the efforts in conservation of the built heritage encompass various aspects of building conservation and planning, with social, economic and functional considerations being emphasised, and less attention paid to the benefit of these to the host community. Historic urban areas can provide social as well as psychological benefits to the society 'that could enhance urban dwellers' well-being and livability, which induces sustainable communities' (Chon, 2004, p. 163). It has been pointed out that most people want a kind of sanctuary for their living environment, which means a well-balanced environment, relatively devoid of nuisance, overcrowding, noise, danger, air pollution, dirt, trash and other unwelcome intrusions (Jacobs & Appleyard, 1987). Visual quality characteristics that enhance the image of the historic urban areas make them more attractive, promoting social benefits that are essential for human life.

The public participation process demonstrated in this study, will enhance the inhabitants' sense of commitment to the historic area, increase the user satisfaction and create realistic expectations of outcomes. By using the approach attested to herein, it would be possible to accurately predict public meanings, other than having prescriptive judgements by conservation officials. These public meanings can be used to create distinctive elements in order to survive the effects of globalisation, which generally have a homogenising effect on the urban landscape. The tendency for sameness and loss of distinctiveness reduces variety and vitality. Since the goals of urban environment are both individual and collective, a sustainable historic area, realised through user preferences will balance these goals.

The conservation of an historic area will require an integrated approach. This involves an inclusive view of the multiple needs in the community, ranging from housing and economic needs to protection and redefinition of cultural identity, and most importantly aesthetic needs. This approach acknowledges the multiplicity of publics, and the often-competing values, ideologies and interests in an historic urban area. The integrated approach will recognise the dynamic process of urban change, and see diversity as an important facet of contemporary urban conditions. The findings in this study are particularly relevant towards improving community and public process in conservation. They indicate a move from the concept of monuments to places of memory. The concept of a memorable place is broader, and the conservation of meanings and significances in urban historic area should be paramount.

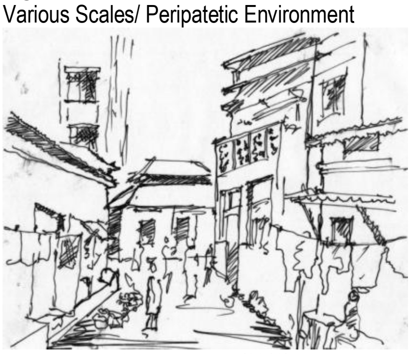
This thesis argues that the conservation of urban historic areas should protect the spirit of the place. This elusive phenomenological concept is created through history in a particular place of a town or a city, and requires an individual method of approach (Nezih & Guçhan, 2008; Norberg–Schulz, 1980; Cullen, 1971; Worskett, 1969). The character of place and its meanings to local residents has been explored by Norberg-Shultz (1980). Place is formed through time by its unique and distinctive character, and is the base of both a building and its users (Nezih & Guçhan, 2008). Consequently, the custodians of the built heritage, who are the residents, are responsible for giving *spirit* to a place through their actions and logical experiences in the place. Kroft (1996) has stressed the relationship between the *observer* and *observed* as being important, and therefore, researchers should use objective and comprehensive tools if they are to properly designate and conserve the local distinctiveness of historical urban contexts (Nezih & Guçhan, 2008). The present work casts light on a people's aesthetic preferences for the built environment. It articulates predictive mathematical formulae that describe underlying relations between certain attributes of the built environment and people's reaction to them. The application of the formulae can lead to local distinctiveness, which is a pointer to sustainable conservation.

The basic question that initiated this study is: *What attitudes do inhabitants of historic areas have about the built environment?* This question elicited two research questions, and the results for each question are presented below.

1. What environmental characteristics are associated with likability of urban historic areas?

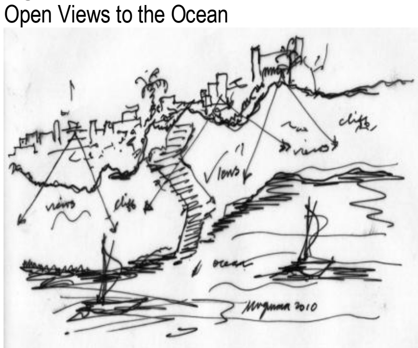
This question was answered using Principal Components Analysis with varimax rotation, and was based on Nasar's (1998) likability. It involved the orderly simplification of 10,000 values, to a few factors or components. The study found *Complexity, Scale, Maintenance, Greenery* and *Spaciousness* as the main aesthetic attributes. Complexity comprises visual variety, orderliness and coherency. Scale is composed of enclosure and a great sense of location or orientation, serial vision and generally a peripatetic environment (Figure 6.18). Maintenance appears as a negative pole of upkeep, represented by incivilities, which are a cue to social disorder. Greenery is identified as verdure and vegetation. Spaciousness is defined through open views, vistas and panoramas (Figure 6.19).

Figure 6.18
Various Scales/ Peripatetic Environment



Source: Author (2010).

Figure 6.19
Open Views to the Ocean



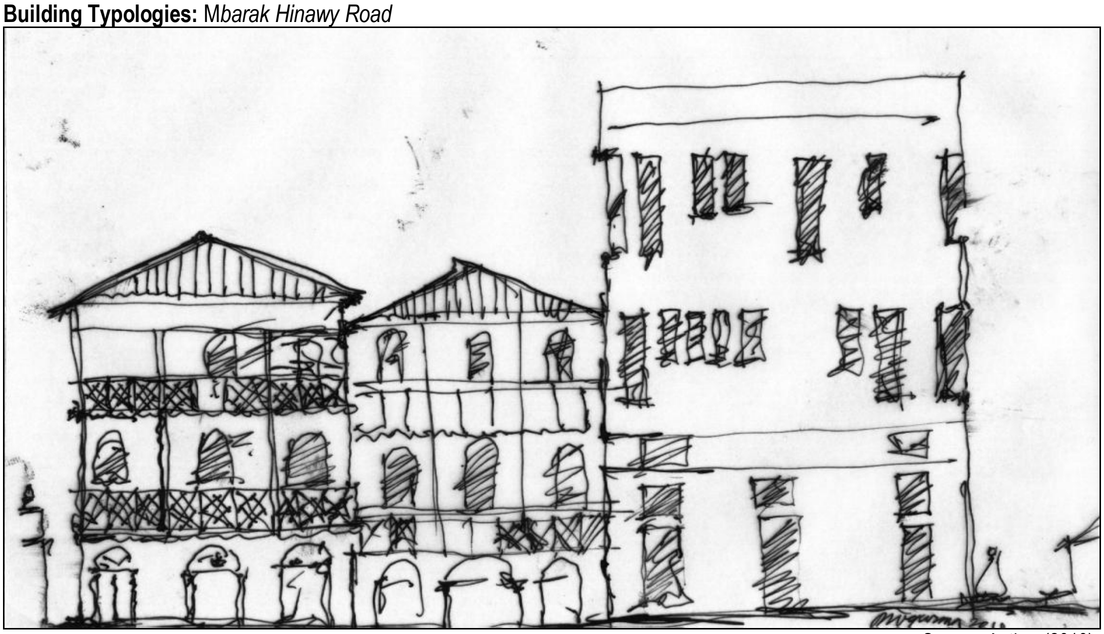
Source: Author (2010).

2. What are the patterns of preference that underlie inhabitants' attitudes towards their historic urban environment?

In a similar manner to question 1 above, Principal Components Analysis was used for the orderly simplification of data. The Old Town of Mombasa conservation area was divided into four zones for this purpose, and different factor analysis for the individual zones undertaken. From the zones' analysis, it was clear that novelty, pleasantness, maintenance, serenity, ornamentation, order, adequacy, importance, relaxation and arousal were the main factors that underlie inhabitants' attitudes towards their urban historic area. In the simplification of the overall matrix (46,656 variables from a 216 by 216 matrix), it emerged that: order, maintenance, greenery, conservation and the perceived activity in the urban historic areas were the main factors.

The study also sought to establish the typo-morphological attributes of the Old Town of Mombasa. The figure ground analyses show that the voids and solids are manipulated such that none overwhelms the other. In other words, the urban historic area exhibits figure ground reversal. The typologies identified refer to forms as opposed to functions, and challenges the philosophy that *form follows function*. This rallying cry for *Modernism* to some extent achieved this correspondence at the building scale, but not at the urban level (Kelbaugh, 2007). In urban historic areas, the historical archetypes keep working well and remain alive. They are reproduced in models and are filled with new and different uses. These typologies are abstractions of the basic principles, ideas or forms and are in way tantamount to design templates (Figure 6.20). This study contends that the consistency of these templates is derived from people's attitudes. Importantly, the tested and tried archetypes that have evolved over time represent enduring attitudes and offer a better point of departure for conservation of urban historic areas than the current master planning approach, because the archetype, really, is objective reality.

Figure 6.20
Building Typologies: M*barak Hinawy Road*



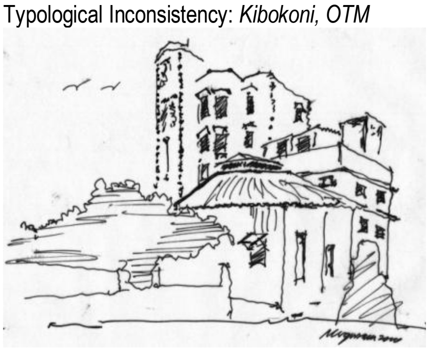
Source: Author (2010).

The idea of typology is essentially what the current conservation design paradigm lacks. These typologies have accrued multiple meanings, as they accumulate objects referencing various cultural sources. The conservation professional must therefore strive to create continuity of experience and history through typologies. If these typologies keep working well 'they will remain alive and are reproduced and refilled with new and different uses' (Kelbaugh, 2007, p. 83).

It has been recognised in planning, that public interest is a determinant of land use. The public is entitled to a visually pleasant area. The Mombasa Old Town Conservation office should be obligated to provide for the possibility of reasonable aesthetic satisfaction of the inhabitants of the old town. This thesis has provided a methodology for determining the aesthetic level of a people. The identified factors should be inbuilt in the conservation process to provide for aesthetic design review. The justification falls under *amenity*, a cardinal aspect of planning, and will relate to the perceptual aspects of urban surroundings; their aesthetic appearances to the eye and the comfort and enjoyment offered to other senses (Chapin, 1972). Moreover, the aesthetics of a place is a dimension of public health and mental well-being, and therefore policy makers are urged to recognise it as a basis for regulatory controls in conservation of urban historic areas. In any case urban historic areas act as cushions against Toffler's concept of 'future shock' (Toffler, 1970).The conservation of the familiar is of value in stabilising group identity, lest the future arrives too soon, causing a shock.

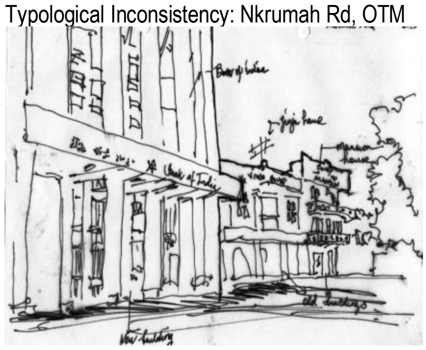
The purpose of aesthetic design review, as identified earlier, would be to combat visual blight, maintain property values and protect public investment, and to provide a measure of coherence in the environment. It would be necessary to restrict some private property rights by an institutionalised agency in order to control the visual chaos. These aesthetic reviews should not be applied across a variety of urban typologies, without regard to the dissimilarities of places. This is because urban coherence depends much more on typological consistency than on the uniformity of architectural style, signage, materials and colours (Scheer & Scheer, 1998). The critical scale relationships among the elements of a given type demands respect, especially if new developments in urban historic areas are to insert themselves properly in the typological hierarchy of the urban environment. Figure 6.21 and Figure 6.22 show typological inconsistencies which should be avoided.

Figure 6.21
Typological Inconsistency: *Kibokoni, OTM*



Source: Author (2010).

Figure 6.22
Typological Inconsistency: Nkrumah Rd, OTM



Source: Author (2010).

6.6 RECOMMENDATIONS

The Kenyan Government planning policies for environmental stewardship should be effective in the protection of all aspects of the historic built environment. As a physical survival of our past, the built heritage is to be valued and protected for its own sake, as a central part of our cultural heritage and sense of identity. The Kenyan Constitution recognises culture as the foundation of the nation and as the cumulative civilization of the Kenya people and nation. Specifically, the 'State shall promote…cultural heritage' (Kenya, 2010, Clause 11 [2] [a]). The presence of this cultural heritage adds to the quality of our lives by enhancing the familiar and cherished local scene, and sustaining the sense of local distinctiveness. This is an important aspect of the character and appearance of our urban historic areas.

The function of the planning process is to regulate the development and use of land in the public interest. Planning is an important instrument for protecting and enhancing the environment in our country, and conserving the built heritage. Our all-pervasive built heritage cannot be conserved unchanged, and the means to identify what is special in the historic environment, to define the capacity for change, and to assess the impact of development proposals *inter alia,* must be explicated. The protection of the built heritage is not intended to freeze historic properties in time. The need to upgrade homes to modern standards is acceptable, but these changes should take place in the most sympathetic way possible. The elements that lead to a property being protected must be maintained. Attention is also called to the Burra Charter (ICOMOS, 1999), which is a good set of principles and guidelines on heritage and management. It represents *best practices* for all people who provide advice, make decisions or carry out works on places of heritage value. Overall, it recommends a cautious approach to change.

6.6.1 Administrative Framework

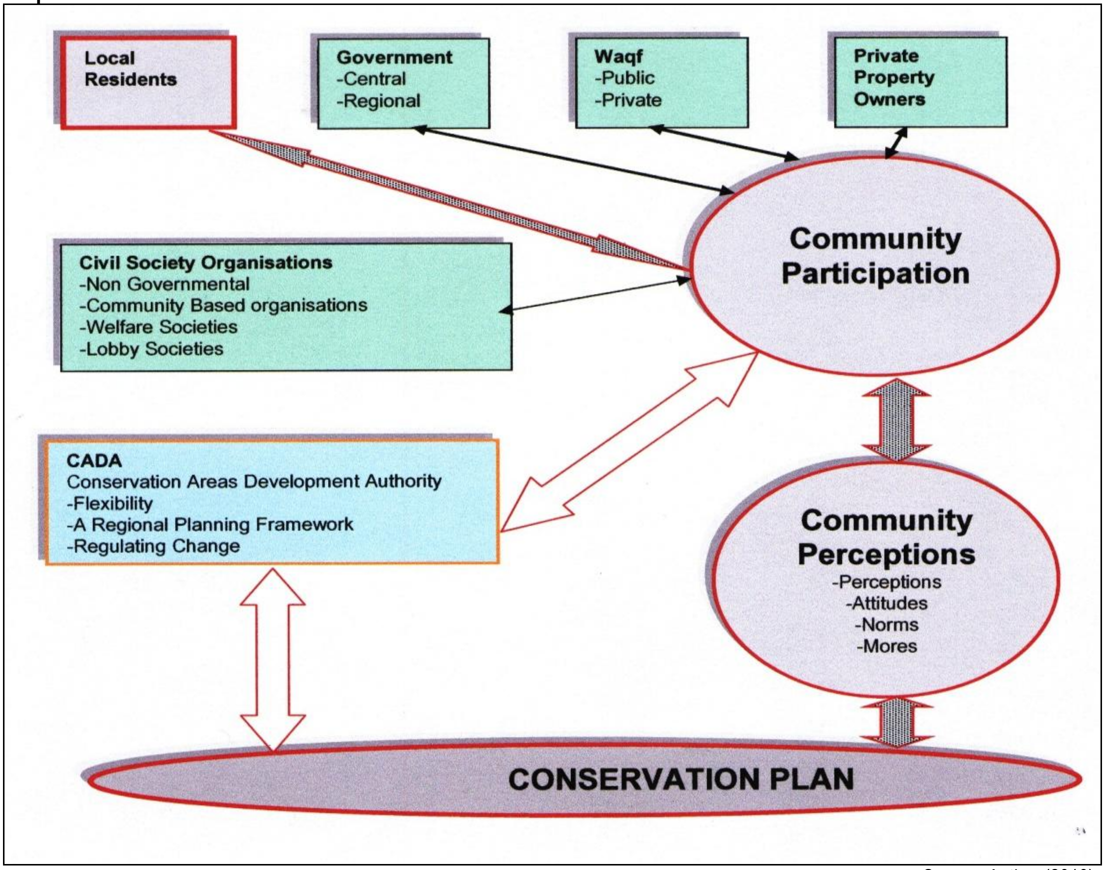
This thesis argues for a strong planning authority, for the Old Town of Mombasa (Figure, 6.23). This idea has been ably demonstrated in other historic towns; with enormous success. The Stone Town Development Authority in Zanzibar is a case in point. It is suggested that this authority be named CADA (Conservation Areas Development Authority), which would operate within the physical boundaries of the area defined as a *conservation area* (Kenya, 2006; King & Procesi, 1990). It would have its comprehensive powers, functioning in the manner of an independent government bureau. It would also represent a public-private partnership and would give a voice to the local residents as well as to external investors. The CADA shall:

1. Ensure the participation of the community in the identification of values in the conservation area from time to time, as these are bound to change.
2. Have the responsibility of planning in all the urban historic areas, including aesthetic control.
3. Have the responsibility and authority for conserving all historic monuments.
4. Define and enforce building codes and regulations to conserve the historic character of the conserved area.
5. Undertake the mandatory review of all new construction within that area.
6. Undertake the bulk of the infrastructure and commercial development within the designated area.
7. Be responsible for the financial aspects that aim at integrated land use.
8. Have financial authority to borrow and use some of these borrowings to provide working capital.

Assuming that CADA is duly constituted and empowered with the necessary legislative framework, the proposals that emanate from this study can be implemented. CADA would ensure flexibility in planning, having an open-ended framework that is not prescriptive in nature. Active participation of the inhabitants would also be sought. The process of conservation would involve the community, so that they can influence development in response to their needs, aspirations and perceptions. This will ensure that home-grown values are used in planning a conservation area.

Through the activities and operations of CADA, the heritage area will be able to provide emotional security and a sense of belonging to those who live in it, because it is a place with a unique urban morphology and identity. Sustainability can be assured if CADA adopts a bottom-up approach to conservation. Furthermore, CADA should uphold planning principles and encourage participation of the local people in the planning process as a given. Building consensus will be primal in this respect. Partnerships from the local level to the international level should also be sought. CADA would be audited by the Central government and be responsible to the legislature and executive to check these comprehensive powers which can lead to corruption.

Figure 6.23
Proposed Conservation Model



Source: Author (2010).

6.6.2 Urban Historic Area Policies

The following section outlines policies that relate to Old Town of Mombasa in general. These policies should be addressed within the development proposals. It is recommended that different precincts in the conservation area be identified and specific policies made on them. This is because the Old Town of Mombasa is not homogenous in terms of its typo-morphological characteristics as demonstrated in the preceding chapter. Nevertheless, a common ground is identified in this thesis. CADA would be responsible for putting these policies and subsequent standards and guidelines into practice. This study advocates embracing the benefits of typologies in conservation. Architectural types can provide the vocabulary for sustainable conservation. These types, however, must be inflected with new programmatic needs, where necessary. The architectural brilliance of individual buildings is subservient to getting the right types for a particular street or neighbourhood, since a collection of beautiful building does not necessarily constitute *genius loci*, as it may lack coherence as a system. It is recommended that true conservation should deal with this sense of place, in collaboration with the people who *sense* the place. These policies give guidance and advice on how development in Old Town of Mombasa should take place. They form best practices.

6.6.2.1 Statement of Significance

Old Town of Mombasa is an important concentration of buildings forming an attractive historic townscape. The setting is enhanced by the Indian Ocean. Views to and from the ocean contribute to the historic area's townscape value. All buildings, grand and modest, create streetscapes of interest, though there have been a few unwelcome intrusions. The varied character adds to interest.

I. Generally, all original buildings should be maintained and conserved as they collectively make up the character of Old Town of Mombasa.

II. Specifically, all significant and contributory individual or groups of buildings identified in the '*A Conservation Plan for Old Town of Mombasa'* (King & Procesi, 1990) must be retained and carefully conserved. Demolition of any of these buildings is not appropriate, as it would severely impact on the heritage character and significance of the urban historic area.

III. Any proposals affecting significant or contributory buildings not listed by Mombasa Old Town Conservation Office (MOTCO) need to be considered in a similar manner to that of listed buildings since they contribute to townscape value.

IV. Alterations or additions affecting buildings which are important as part of a group must maintain those elements which unite the buildings and retain the group value.

V. Discordant alterations and developments should be reversed wherever possible in conjunction with development applications for other work.

VI. The open areas and especially those with vegetation, for example the Treasury Square, must be carefully retained. Intrusions should not be made to create parking spaces.

VII. Well designed, high quality infill development which respects scale, form, proportions and materials of the Old Town of Mombasa should be favourably considered on sites which are not identified as significant or contributory.

6.6.2.2 General Conservation Standards

Based on the above policies, the following standards ensue:

i. Avoid removing or altering the historic material and distinctive architectural features: if it is original and in good shape, endeavour to keep it. This means that the heritage value of the place must be conserved. Character defining elements, e.g. the ornate details must be safeguarded.

ii. The changes in the old town which, over time, have become character defining in their own right must be conserved. These changes may be significant as good examples of their own style or as evidence of changing needs and taste. These should not be assumed to be historically worthless just because they are not part of the original building. After all, the most revered buildings are usually the most changed e.g. Fort Jesus.

iii. The conservation of heritage should involve minimum intervention necessary on the built fabric.

iv. For economic viability, uses for a historic building that requires minimum or no change to its character defining elements should be sought in the first instance.

v. False authenticity should not be created. Buildings should not be made to look old than they really are. Conservation work must recognize that each historic building is a record of its time, place and use.

vi. Protect and stabilise historic buildings until subsequent intervention is undertaken. Such protection should be undertaken *in situ*. Where there is potential danger of loss due to disturbance, mitigation measures should be undertaken to limit damage and loss of character defining elements. A good example is Leven house, Old Town of Mombasa.

vii. The condition of the character defining elements in an urban historic place should be thoroughly evaluated to determine the appropriate intervention. Only the gentlest means possible for any intervention should be employed. The respect for the heritage value when making the intervention is paramount.

viii. Maintenance is cardinal to good conservation. This should be undertaken as an ongoing basis. The repair of historic buildings should be undertaken using recognised conservation methods. Where character defining elements are missing or extensively damaged, these can be replaced, if there are surviving prototypes.

ix. If no evidence of original materials or detailing exists, it is recommended that alterations should be detailed in a simple manner and contemporary design, yet fit in the character of the building. This will discourage false authenticity.

x. All interventions in the historic urban area should be thoroughly documented for future reference. These interventions, should be identifiable upon close inspection, and should be physically and visually compatible with the historic place. Where possible, such interventions should be reversible, should the need arise in future.

xi. Repair rather than replace whenever possible. If replacing, match the forms, materials, and detailing of sound versions of the same elements. It would not be desirable to invent something that *might have been*. The replacement of missing features should be based, as far as practically possible, on sufficient physical, documentary, and/or oral evidence.

xii. New additions to a historic place or any new construction must be physically and visually compatible with, subordinate to, and distinguishable from the historic place.

xiii. Original openings should not be altered. Enlarging or reducing the size of an opening can dramatically change the character of historic building and distort the overall aesthetic of the precinct.

xiv. Surface cleaning should be done by the gentlest means possible. This will preserve patina of age.

xv. Original building materials and architectural detailing should not be covered by newer materials.

Based on the policies and standards, specific design guidelines ensure (Appendix XVII). The conservation guidelines are intended to assist the property owners, the design professionals (Appendix VI), and the contractors who are considering working in Old Town of Mombasa. Such work includes changes to existing buildings, demolition, or new construction. The design guidelines are not rigid set of rules, but serve as a guide in making improvements that are compatible with the historic area's character. They set broad parameters, which are open ended, in which changes should occur, while upholding ample opportunity for design creativity and individual choice. They are therefore not prescriptive in nature. The guidelines provide the owner and the proposed Conservation Areas Development Authority, CADA, a way to determine the appropriateness of the proposed work for the long term interest of the historic urban area. It is proposed that a *Certificate of Appropriateness* be obtained from CADA before any development can proceed, save for ordinary repair and maintenance which does not result in an exterior change, and interior work such as plumbing, wiring, and plastering.

The proposed guidelines do not require a building owner to make improvements nor force him/ her to revert the property back to the way it was at a particular time in the past, as is common in radical restoration. The guidelines are structured for negotiating solutions which will give the owner substantial benefit without causing substantial harm to the urban historic district as is currently the case. It is proposed that a mechanism for appealing a decision of CADA be provided, say to the regional government. This will be necessary in case a *Certificate of Appropriateness* is denied, or subsequent conditions are imposed on the building owner or developer before full approval.

6.7 Final Conclusion

The Old Town of Mombasa, like most historical cities has an infinite variety of spatial forms and buildings that shape them. This interplay of the morphological characteristics and typologies is critical in their fascination. The homogenising effects of contemporary buildings cannot be tolerated both physically and psychologically. In the spirit of continuity and change, new buildings, additions and other modifications to the historic urban area must participate in a dialogue with the substance of the past. Contemporary architecture should not stand disconnected from the basic structural elements of the old town, as is currently the case.

All buildings in a historic urban area, whether private or public, contribute to the urban experience, and therefore, none should be an irritant to this experience. The key to cure blandness in contemporary architecture in historic areas is to require new developments to obey the overall structural logic and provide a reciprocating response in its design to the existing spatial conditions. The approach can be thorough harmonic integration or contrast, not through shock and awe. This way, the coherence and vitality of the urban historic area will not be compromised. As demonstrated by Rossi (1982), the complexity of historic towns is tied to their scale; therefore, the brutal gigantism of contemporary discordant urban forms should be eschewed. However, it must be held that some of the mammoth buildings in old town have been legitimized by their place in history, for example, Fort Jesus.

In urban historic areas, the past is being experienced in the present, that is why conservation is critical, to ensure continuity and change. Development activities in such areas should strive to continue to give meanings to these past permanencies, as they themselves, move towards being revered permanencies. Therefore, Architecture, especially in historic areas, has more to do with existence, and is not a fashion, to be discarded. This is because its fundamental aspects have been seen to outlive all fashions.

6.7.1 Areas for Further Research

This research did not manipulate the urban scenes used as stimuli. The manipulation of scenes along the attributes of interest would allow for the varying of environmental attributes and the control of others. This is necessary so that confounding relationships, if any, may be reduced through an improvement of internal validity. The use of digital simulations would be handy in the manipulation, since they can identify environmental modifications that would likely improve the evaluative responses. No causal inferences can be made from this study.

The results from this survey design may not predict long-term patterns of preference. Initial reactions to an urban historic area may change over a generation for a population. It is important for researchers to begin to apply the scientific method to data on aesthetics in urban historic areas, collected over long periods. Meta analysis, to integrate findings of previous studies statistically, should also be undertaken, with emphasis on urban historic areas. It would be necessary to get a true understanding of how attitudes develop over time.

Comparative studies of likability in the many urban historic areas along the East African littoral should be tackled. Factors such as size, climate, location and history, may affect likability. Importantly, an examination of likability in other conserved urban areas such as Lamu and Zanzibar may help identify the key issues in conservation and perception. The study should also be replicated in other areas of the world, where the cultures are different and a comparative analysis undertaken.

This study did not consider the attitudes of special groups such as children, the elderly, tourists, the disabled etc in the Old Town of Mombasa. Due to their special circumstances, and environmental experiences, they may have unique attitudes towards the historic built environment. As special populations, their likability should be investigated. Individual differences scaling (IDS), a type of multi-dimensional scaling technique, should be used in identifying and characterizing the subjective internal scales on which people judge different built environments. IDS is of particular interest in environmental psychology research, since it facilitates evaluation of the extent to which the importance of such scales differs among subjects or groups of subjects. The empirical instruments used to measure attitudes quantitatively do not provide much insight into the social aspects of the phenomenon. Urban historic areas are not static and the people who live in them are continuously changing, and so does the built environment. Further research is necessary in order to know a great deal about the status system of the historic area, and about the values of and behavior of the inhabitants.

Principal Components Analysis was used in identifying factors underlying inhabitants' attitudes. These factors should be treated as hypotheses for further testing through Confirmatory Factor Analysis, a statistical technique used to verify the factor structure of a set of observed variables. It will allow the researcher to test the hypothesis that: a relationship between observed variables and their underlying latent constructs exists. The identified factors through Principal Components Analysis would be used to postulate the relationship patterns *a priori,* and then test the hypothesis statistically.

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GLOSSARY

Aesthetics is the philosophy of art or the philosophical reflection on the nature of art and our experience of beauty (Miller, 1998).

Anastylosis is a special type of restoration 'involving the re-erection of fallen stones to create an accurate and comprehensible version of the original structure' (Feilden, 1979, p. 27). Plenderleith (1968) recommends anastylosis where it is possible to determine where each residual fragment fits. Most importantly, restoration is appropriate only if there is sufficient evidence of an earlier state of the fabric (ICOMOS, 1999).

Built Environment denotes the specific visual properties of the physical environment in a built environment setting. Built environment '…is the man-made environment, environment that is planned, constructed and changed by man on the basis of a continually evolving scientific technology whose limits are by no means in sight… An appropriately designed physical environment could be expected to evoke or at least to serve as a locus of a range of expected behaviours whose variations could be studied as a function not of physical parameters, but of those complex social and psychological determinants that are rooted in human activities and relationships' (Proshansky, Ittelson, Rivlin, 1976, p. 170).

Consolidation (or Direct Conservation) is the physical addition or application of adhesive or supportive materials into the actual fabric of cultural property in order to ensure its continued durability or structural integrity (Orbaşli, 2008; Ashurst, 2007; Feilden, 1994, 1979).

Genius loci refers to the special atmosphere of a place, that is, the guardian/ pervading spirit of a place. In classical Roman religion, a *genius loci* was the protective spirit of a place. It was often depicted in religious iconography as a figure holding a cornucopia, patera and/or a snake.

Hedonism is a school which argues that pleasure is the only intrinsic good. This is often used as a justification for evaluating actions in terms of how much *pleasure* and how little *pain* (i.e. suffering) they produce. In very simple terms, a hedonist strives to maximize this net pleasure (pleasure minus pain).

Likability is the environmental aesthetic experience that causes evaluations that are related to potential behaviour resulting from the interaction between cognitive evaluation and affective human response to the built environment. The affective response is an emotional way that people respond to and evaluate the environment, while cognitive evaluation is a psychological process through which people acquire, retain and process information in the built environment (Chon, 2004).

Maintenance entails the continuous protective care of the *fabric* and *setting* of a *place*, and is to be distinguished from repair. Repair involves *restoration* or *reconstruction* (ICOMOS, 1999). *Prevention of Deterioration/ Indirect Preservation* means protecting the cultural property through the control of its environment thus preventing agents of decay and damage from being active. It includes the control of humidity, temperature, light, and other measures to prevent arson, theft and vandalism (Orbasli, 2008; Feilden, 1994).

Modernism in its broadest definition is modern thought, character, or practice. More specifically, the term describes both a set of cultural tendencies and an array of associated cultural movements, originally arising from wide-scale and far-reaching changes to Western society in the late nineteenth and early twentieth centuries. The term encompasses the activities and output of those who felt the "traditional" forms of art, architecture, literature, religious faith, social organization and daily life were becoming outdated in the new economic, social and political conditions of an emerging fully industrialized world.

Perception is explained by Bechtel (1997) as the 'apprehension of the immediate environment through sensory input while cognition is apprehending without the necessity of an external stimulus' (p 149). Perception is taken to denote the ability to understand or have an insight. More so, it means a way of seeing things, in this case the urban historic environment. Carmona, Heath, Oc, and Tiesdell (2003) observe that perception involves the gathering, organising, and making sense of information about the environment. The four most valuable senses in interpreting and sensing the environment are vision, hearing, smell and touch. The sensory stimuli are usually perceived and appreciated as an interconnected whole (Carmona, Heath, Oc, & Tiesdell, 2003). Perception is therefore a complex phenomena and 'an understanding of the total environmental network within which perceiving takes place, both as a source of information and as an arena for action is an essential first step in unraveling this complexity' (Ittelson, 1976, p.143). Perception is measured through response to the attitude surveys. The relationship between attitude and perception is also well captured whereby perception is seen as the drive orienting the individual to pay attention to the stimulus pattern evoking the attitude (Dobb, 1967). Operationally, perception is the response on the psychometric and psychological scale in Questionnaire II. As explained by Bechtel (1997), the perception of the environment has at once a healing and soothing quality, while at the same time its importance is diminished in preference to human powers by our own belief systems.

Preservation deals directly with the cultural property with the aim of keeping it in the same state (Feilden, 1994). ICOMOS (1999) in the Burra Charter defines preservation as maintaining the fabric of a place in its existing state and retarding deterioration. Preservation is appropriate where the existing fabric or its condition constitutes evidence of cultural significance, or where insufficient evidence is available to allow other conservation processes to be carried out (ICOMOS, 1999).

Reconstruction means returning a place to a known earlier state and is distinguished from *restoration* by the introduction of new material into the fabric (ICOMOS, 1999). Reconstruction of historic buildings and centres using new materials may become necessary due to disasters like fire, earthquake or war, but the reconstructions cannot have the patina of age (Feilden, 1994; Papageorgiou, 1971). The moving out of entire buildings to new sites in the public interest is another form of reconstruction (Orbaşli, 2008; Feilden, 1994, 1979). This entails some loss of essential cultural values and the generation of new environmental risks. The classic example is the temple complex of Abu Simbel (XIX Dynasty, Egypt), moved to prevent its inundation by the Aswan Dam but was subsequently exposed to wind erosion (Feilden, 1979). In rare cases, reconstruction may also be appropriate as part of a use or practice that retains the cultural significance of the place (ICOMOS, 1999). Reconstruction may be justifiable if a building is an integral part of a streetscape, a square or a complex and where its absence would detract from the integrity of the whole (Orbaşli, 2008; ICOMOS, 1999).

Redevelopment is a process created by the government to assist a city in eliminating blight from a designated area, and to achieve desired development, reconstruction, and rehabilitation including (but not limited to): residential, commercial, industrial, and retail. The State allows a locality to capture much of the property tax from new development in redevelopment areas to accomplish these goals.

Re-evaluation or Rehabilitation is 'the best way of preserving buildings as opposed to objects which is to keep them in use, a practice which may involve…modernization with or without adaptive alteration' (Feilden, 1994, p. 10). ICOMOS (1999) argue that adaptation is acceptable only where it has minimal impact on the cultural significance of the place. Adaptive reuse of buildings is often the only way that historic buildings can be brought up to contemporary standards by providing modern amenities (Mitchell, 2008; Orbaşli, 2008; Lichfield, 1988; Feilden, 1979). *Conservative surgery*, as opposed to *radical surgery* in the adaptation new uses, is required so that the *genius loci* (Norberg-Schulz, 1980) is upheld.

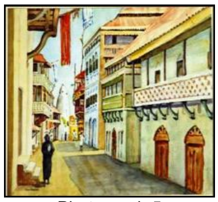
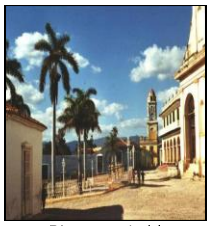
Reproduction connotes copying an extant artefact, in order to replace some missing or decayed, generally decorative parts, to maintain its aesthetic harmony (Feilden, 1994, 1979). A reproduction of a valuable cultural property may be made and substituted for the original, which is then moved to a safer place.

Restoration revives the original concept or legibility of the object (Orbaşli, 2008; Viňas, 2005; Feilden, 1994). ICOMOS (1999) in the Burra Charter defines restoration as returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material. Forsyth (2007) reports that until William Morris founded the Society for the Protection of Ancient Buildings (SPAB) in 1877, a ruthless philosophy of restoration and reconstruction was the norm, best exemplified in the Gothic Revival. Restoration also entails superficial cleaning, but with full respect for the patina of age (Feilden, 1994).

Urban Renewal means the clearing and rebuilding and redevelopment of urban slums. Urban renewal has been seen by proponents as an economic engine and a reform mechanism and by critics as a mechanism for control. It may enhance existing communities, and in some cases result in the demolition of neighbourhoods. Urban renewal is often part of the gentrification process.

APPENDICES

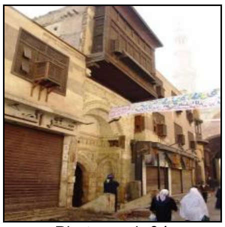
APPENDIX I: PHOTOGRAPHS SHOWING URBAN SCENES USED AS STIMULI

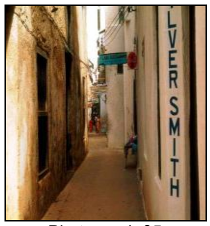
 Photograph 1	 Photograph 2	 Photograph 3	 Photograph 4	 Photograph 5
 Photograph 6	 Photograph 7	 Photograph 8	 Photograph 9	 Photograph 10
 Photograph 11	 Photograph 12	 Photograph 13	 Photograph 14	 Photograph 15
 Photograph 16	 Photograph 17	 Photograph 18	 Photograph 19	 Photograph 20
 Photograph 21	 Photograph 22	 Photograph 23	 Photograph 24	 Photograph 25
 Photograph 26	 Photograph 27	 Photograph 28	 Photograph 29	 Photograph 30


Photograph 31


Photograph 32


Photograph 33


Photograph 34



Photograph 35


Photograph 36


Photograph 37


Photograph 38


Photograph 39

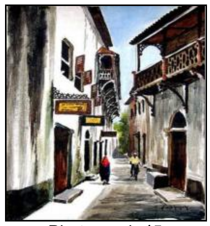

Photograph 40


Photograph 41

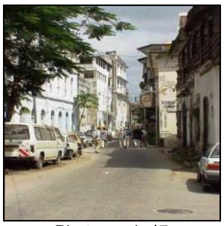

Photograph 42


Photograph 43


Photograph 44


Photograph 45


Photograph 46


Photograph 47


Photograph 48


Photograph 49


Photograph 50


Photograph 51


Photograph 52


Photograph 53

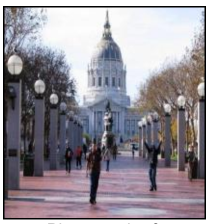

Photograph 54


Photograph 55


Photograph 56


Photograph 57


Photograph 58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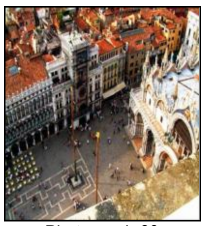
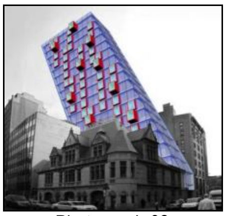
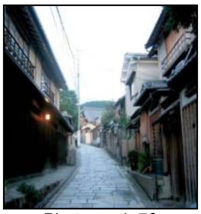

Photograph 60

 Photograph 61	 Photograph 62	 Photograph 63	 Photograph 64	 Photograph 65
 Photograph 66	 Photograph 67	 Photograph 68	 Photograph 69	 Photograph 70
 Photograph 71	 Photograph 72	 Photograph 73	 Photograph 74	 Photograph 75
 Photograph 76	 Photograph 77	 Photograph 78	 Photograph 79	 Photograph 80
 Photograph 81	 Photograph 82	 Photograph 83	 Photograph 84	 Photograph 85
 Photograph 86	 Photograph 87	 Photograph 88	 Photograph 89	 Photograph 90


Photograph 91


Photograph 92


Photograph 93


Photograph 94


Photograph 95


Photograph 96


Photograph 97


Photograph 98


Photograph 99


Photograph 100

Photograph Credits:

Authors photographs *4, 33, 40, 65, 85, 86, 92*

http://www.google.co.ke/images *1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 24, 25, 27, 29, 30, 33, 34, 35, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 58, 59, 60, 62, 64, 71, 72, 73, 74, 77, 78, 80, 84, 88, 90, 91, 93, 94, 98, 99,*

From the Archives of Dr. F. M. Mburu *20, 23, 26, 28, 31, 32, 36, 50, 57, 61, 63, 66, 67, 68, 69, 70, 75, 76, 79, 81, 82, 83, 87, 89, 95, 100*

APPENDIX II: HOUSEHOLD INTERVIEW SCHEDULE

Jomo Kenyatta University of Agriculture & Technology
DEPARTMENT OF ARCHITECTURE

STRICTLY CONFIDENTIAL

Continuity and Change: A Study of the Relationship between Attitudes and the Built Environment in Historic Old Town of Mombasa

Declaration

We will greatly appreciate your assistance in this study. Your answers are of particular importance since you have been selected as part of the 'sample' representative of the residents of Old Town of Mombasa. Under no circumstances will your individual answers be divulged- they will be used in combination with those of other people responding to the study. Thank you.

Interviewer: Date: Time:

Respondent's Street/ Mtaa: Survey Area:

RESIDENTS' ATTITUDES TOWARDS OLD TOWN OF MOMBASA BUILT ENVIRONMENT

Section 1

1. What environmental features *(for example buildings, open spaces, and streets)* do you feel contribute **greatly** to the character of Old Town of Mombasa?

2. What environmental features (*for example buildings, open spaces, and streets)* do you feel contribute **least** to the character of Old Town of Mombasa?

3 What are the main problems you experience in the Old Town of Mombasa? (List them in order of priority below e.g. Security, burglary, drug abuse, poor roads, lack of shopping facilities, waste disposal, crowding, lack of water etc.

Problem	Cause	Possible Solution

4. What do you think are the three most important improvements that could be made to enhance the character or appearance of the Old Town of Mombasa?

i. ii. iii.

5. In your opinion, do development proposals *(for example: new construction, alterations on existing buildings, demolitions)* respect the historic character of the conservation area? Please explain your answer.

6. In your opinion what should be done to improve the conservation efforts in Old Town of Mombasa?

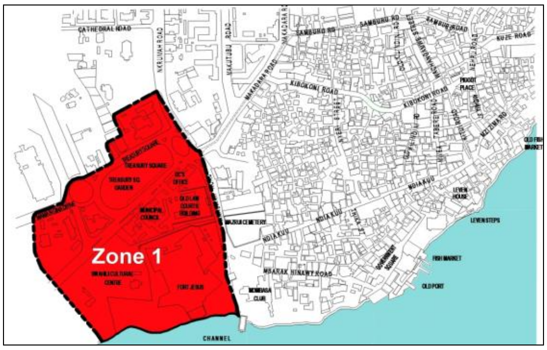
Section 2

The photographs shown depict the built environment in selected zones in Old Town of Mombasa. You are requested to circle the number that best describes your attitude in terms of the characteristics described, as shown below.

Good	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***Bad***
1. Extremely Good								7. Extremely bad
2. Very Good								6. Very Bad
3. Quite Good								5. Quite Bad
				4. Neither good nor bad				

The circle at 3 means quite good

Zone 1-Area around Fort Jesus, KCB, Old Law Courts, Treasury Square, Municipal Council, DC's office



Attitudes towards neighbourhood characteristics-zone 1

Streets

Pleasant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unpleasant*
Appealing	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Repulsive*
Colourful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Drab*
Pretty	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Ugly*
Planned	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unplanned*
Attractive Appearance	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unattractive appearance*
Clean	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Dirty*
Well Maintained	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Badly Maintained*
Well conserved	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Poorly Conserved*
Interesting	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Boring*
Good	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Deficient*

Important	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Not Important*
Quiet	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Noisy*
Safe	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unsafe*
Small	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Large*
Many	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Few*
Sufficient	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Insufficient*
Peaceful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Busy*

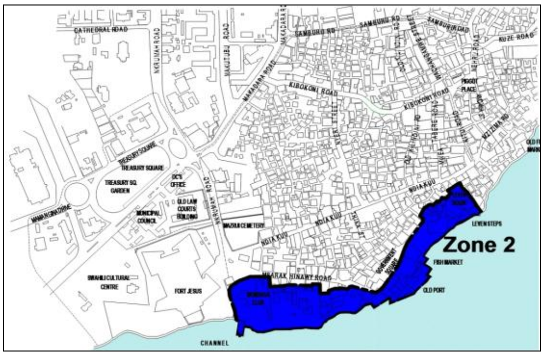
Open Spaces

Pleasant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unpleasant*
Appealing	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Repulsive*
Colourful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Drab*
Pretty	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Ugly*
Planned	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unplanned*
Attractive Appearance	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unattractive appearance*
Clean	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Dirty*
Well Maintained	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Badly Maintained*
Well conserved	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Poorly Conserved*
Interesting	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Boring*
Good	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Deficient*
Important	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Not Important*
Quiet	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Noisy*
Safe	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unsafe*
Small	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Large*
Many	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Few*
Sufficient	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Insufficient*
Peaceful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Busy*

Buildings

Pleasant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unpleasant*
Appealing	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Repulsive*
Colourful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Drab*
Pretty	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Ugly*
Planned	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unplanned*
Attractive Appearance	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unattractive appearance*
Clean	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Dirty*
Well Maintained	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Badly Maintained*
Well conserved	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Poorly Conserved*
Interesting	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Boring*
Good	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Deficient*
Important	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Not Important*
Quiet	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Noisy*
Safe	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unsafe*
Small	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Large*
Many	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Few*
Sufficient	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Insufficient*
Peaceful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Busy*

Zone 2-Area around the waterfront: Mombasa Club, Old Port, Government Square, Fish Market, Bohora Mosque, Leven House, & Steps



Attitudes towards neighbourhood characteristics-zone 2

Streets

Pleasant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unpleasant*
Appealing	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Repulsive*
Colourful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Drab*
Pretty	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Ugly*
Planned	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unplanned*
Attractive Appearance	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unattractive appearance*
Clean	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Dirty*
Well Maintained	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Badly Maintained*
Well conserved	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Poorly Conserved*
Interesting	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Boring*
Good	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Deficient*
Important	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Not Important*
Quiet	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Noisy*
Safe	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unsafe*
Small	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Large*
Many	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Few*
Sufficient	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Insufficient*
Peaceful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Busy*

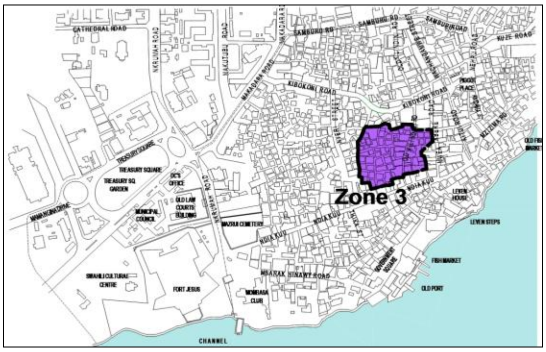
Open Spaces

Pleasant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unpleasant*
Appealing	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Repulsive*
Colourful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Drab*
Pretty	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Ugly*
Planned	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unplanned*
Attractive Appearance	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unattractive appearance*
Clean	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Dirty*
Well Maintained	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Badly Maintained*
Well conserved	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Poorly Conserved*
Interesting	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Boring*
Good	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Deficient*
Important	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Not Important*
Quiet	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Noisy*
Safe	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unsafe*
Small	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Large*
Many	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Few*
Sufficient	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Insufficient*
Peaceful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Busy*

Buildings

Pleasant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unpleasant*
Appealing	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Repulsive*
Colourful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Drab*
Pretty	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Ugly*
Planned	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unplanned*
Attractive Appearance	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unattractive appearance*
Clean	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Dirty*
Well Maintained	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Badly Maintained*
Well conserved	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Poorly Conserved*
Interesting	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Boring*
Good	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Deficient*
Important	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Not Important*
Quiet	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Noisy*
Safe	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unsafe*
Small	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Large*
Many	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Few*
Sufficient	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Insufficient*
Peaceful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Busy*

Zone 3-Residential area around Kibokoni Road, Kilindini Road, Mwea Tebere Road



Attitudes towards neighbourhood characteristics-zone 3

Streets

Pleasant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unpleasant*
Appealing	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Repulsive*
Colourful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Drab*
Pretty	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Ugly*
Planned	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unplanned*
Attractive Appearance	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unattractive appearance*
Clean	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Dirty*
Well Maintained	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Badly Maintained*
Well conserved	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Poorly Conserved*
Interesting	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Boring*
Good	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Deficient*
Important	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Not Important*
Quiet	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Noisy*
Safe	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unsafe*
Small	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Large*
Many	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Few*
Sufficient	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Insufficient*
Peaceful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Busy*

Open Spaces

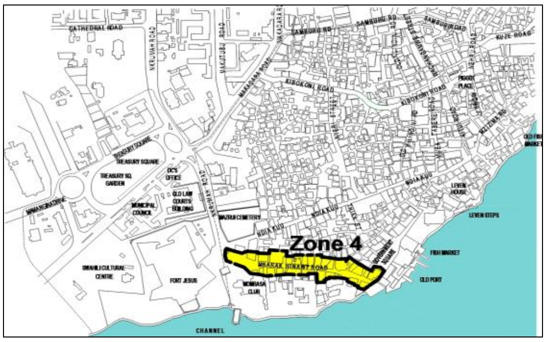
Pleasant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unpleasant*
Appealing	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Repulsive*
Colourful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Drab*
Pretty	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Ugly*

Planned	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unplanned*
Attractive Appearance	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unattractive appearance*
Clean	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Dirty*
Well Maintained	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Badly Maintained*
Well conserved	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Poorly Conserved*
Interesting	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Boring*
Good	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Deficient*
Important	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Not Important*
Quiet	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Noisy*
Safe	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unsafe*
Small	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Large*
Many	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Few*
Sufficient	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Insufficient*
Peaceful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Busy*

Buildings

Pleasant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unpleasant*
Appealing	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Repulsive*
Colourful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Drab*
Pretty	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Ugly*
Planned	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unplanned*
Attractive Appearance	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unattractive appearance*
Clean	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Dirty*
Well Maintained	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Badly Maintained*
Well conserved	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Poorly Conserved*
Interesting	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Boring*
Good	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Deficient*
Important	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Not Important*
Quiet	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Noisy*
Safe	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unsafe*
Small	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Large*
Many	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Few*
Sufficient	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Insufficient*
Peaceful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Busy*

Zone 4- Mbarak Hinawy Road



Attitudes towards neighbourhood characteristics-zone 4

Streets

Pleasant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unpleasant*
Appealing	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Repulsive*
Colourful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Drab*
Pretty	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Ugly*
Planned	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unplanned*
Attractive Appearance	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unattractive appearance*
Clean	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Dirty*
Well Maintained	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Badly Maintained*
Well conserved	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Poorly Conserved*
Interesting	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Boring*
Good	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Deficient*
Important	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Not Important*
Quiet	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Noisy*
Safe	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unsafe*
Small	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Large*
Many	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Few*
Sufficient	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Insufficient*
Peaceful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Busy*

Open Spaces

Pleasant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unpleasant*
Appealing	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Repulsive*
Colourful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Drab*

Pretty	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Ugly*
Planned	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unplanned*
Attractive Appearance	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unattractive appearance*
Clean	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Dirty*
Well Maintained	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Badly Maintained*
Well conserved	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Poorly Conserved*
Interesting	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Boring*
Good	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Deficient*
Important	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Not Important*
Quiet	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Noisy*
Safe	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unsafe*
Small	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Large*
Many	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Few*
Sufficient	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Insufficient*
Peaceful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Busy*

Buildings

Pleasant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unpleasant*
Appealing	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Repulsive*
Colourful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Drab*
Pretty	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Ugly*
Planned	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unplanned*
Attractive Appearance	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unattractive appearance*
Clean	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Dirty*
Well Maintained	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Badly Maintained*
Well conserved	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Poorly Conserved*
Interesting	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Boring*
Good	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Deficient*
Important	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Not Important*
Quiet	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Noisy*
Safe	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Unsafe*
Small	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Large*
Many	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Few*
Sufficient	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Insufficient*
Peaceful	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Busy*

Section 3

Kindly rank the four zones on a scale of 1-4. Favourite (1) to least favourite (4)

Zone	Rank
Zone 1	
Zone 2	
Zone 3	
Zone 4	

Section 4

The photographs shown in the album depict urban environments. You will probably like some pictures more than others. For each photograph, circle the number that fits your feelings.
(**1**)Extremely liked (**2**) Very liked, (**3**) Quite liked, (**4**) Neither liked nor disliked, (**5**) Quite disliked (**6**) Very disliked, (**7**) Extremely disliked.

Photo 1	1 2 3 4 5 6 7
Photo 2	1 2 3 4 5 6 7
Photo 3	1 2 3 4 5 6 7
Photo 4	1 2 3 4 5 6 7
Photo 5	1 2 3 4 5 6 7
Photo 6	1 2 3 4 5 6 7
Photo 7	1 2 3 4 5 6 7
Photo 8	1 2 3 4 5 6 7
Photo 9	1 2 3 4 5 6 7
Photo 10	1 2 3 4 5 6 7
Photo 11	1 2 3 4 5 6 7
Photo 12	1 2 3 4 5 6 7
Photo 13	1 2 3 4 5 6 7
Photo 14	1 2 3 4 5 6 7
Photo 15	1 2 3 4 5 6 7
Photo 16	1 2 3 4 5 6 7
Photo 17	1 2 3 4 5 6 7
Photo 18	1 2 3 4 5 6 7
Photo 19	1 2 3 4 5 6 7
Photo 20	1 2 3 4 5 6 7
Photo 21	1 2 3 4 5 6 7
Photo 22	1 2 3 4 5 6 7
Photo 23	1 2 3 4 5 6 7
Photo 24	1 2 3 4 5 6 7
Photo 25	1 2 3 4 5 6 7
Photo 26	1 2 3 4 5 6 7
Photo 27	1 2 3 4 5 6 7
Photo 28	1 2 3 4 5 6 7
Photo 29	1 2 3 4 5 6 7
Photo 30	1 2 3 4 5 6 7
Photo 31	1 2 3 4 5 6 7
Photo 32	1 2 3 4 5 6 7
Photo 33	1 2 3 4 5 6 7
Photo 34	1 2 3 4 5 6 7
Photo 35	1 2 3 4 5 6 7
Photo 36	1 2 3 4 5 6 7
Photo 37	1 2 3 4 5 6 7
Photo 38	1 2 3 4 5 6 7
Photo 39	1 2 3 4 5 6 7
Photo 40	1 2 3 4 5 6 7
Photo 41	1 2 3 4 5 6 7
Photo 42	1 2 3 4 5 6 7
Photo 43	1 2 3 4 5 6 7
Photo 44	1 2 3 4 5 6 7
Photo 45	1 2 3 4 5 6 7
Photo 46	1 2 3 4 5 6 7
Photo 47	1 2 3 4 5 6 7
Photo 48	1 2 3 4 5 6 7
Photo 49	1 2 3 4 5 6 7
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Photo 62	1 2 3 4 5 6 7
Photo 63	1 2 3 4 5 6 7
Photo 64	1 2 3 4 5 6 7
Photo 65	1 2 3 4 5 6 7
Photo 66	1 2 3 4 5 6 7
Photo 67	1 2 3 4 5 6 7
Photo 68	1 2 3 4 5 6 7
Photo 69	1 2 3 4 5 6 7
Photo 70	1 2 3 4 5 6 7
Photo 71	1 2 3 4 5 6 7
Photo 72	1 2 3 4 5 6 7
Photo 73	1 2 3 4 5 6 7
Photo 74	1 2 3 4 5 6 7
Photo 75	1 2 3 4 5 6 7
Photo 76	1 2 3 4 5 6 7
Photo 77	1 2 3 4 5 6 7
Photo 78	1 2 3 4 5 6 7
Photo 79	1 2 3 4 5 6 7
Photo 80	1 2 3 4 5 6 7
Photo 81	1 2 3 4 5 6 7
Photo 82	1 2 3 4 5 6 7
Photo 83	1 2 3 4 5 6 7
Photo 84	1 2 3 4 5 6 7
Photo 85	1 2 3 4 5 6 7
Photo 86	1 2 3 4 5 6 7
Photo 87	1 2 3 4 5 6 7
Photo 88	1 2 3 4 5 6 7
Photo 89	1 2 3 4 5 6 7
Photo 90	1 2 3 4 5 6 7
Photo 91	1 2 3 4 5 6 7
Photo 92	1 2 3 4 5 6 7
Photo 93	1 2 3 4 5 6 7
Photo 94	1 2 3 4 5 6 7
Photo 95	1 2 3 4 5 6 7
Photo 96	1 2 3 4 5 6 7
Photo 97	1 2 3 4 5 6 7
Photo 98	1 2 3 4 5 6 7
Photo 99	1 2 3 4 5 6 7
Photo 100	1 2 3 4 5 6 7

Section 5

Respondent's Personal Information

1. Gender: _Male _Female.
2. Marital Status _Single _Married _Widowed _Divorced _Separated
3. Age: _Under 18 _18<24 _24<30 _30<36 _36<42 _42<48 _48 & Above
4. Highest Level of Education Attained: _Primary _Secondary _Diploma _Graduate _Postgraduate _Other__
5. Main Occupation: _Student _Not working _Self Employed _Employed _Pensioner _Other____________
7. Your Religion: _Muslim _Hindu _Protestant _Catholic _Judaism _Atheist _Other________________
8. Number of Years Residence in Old Town of Mombasa: _<1yr _>1<5yrs _>5<10yrs _>10yrs<20yrs _>20yrs

APPENDIX IIIA: QUESTIONNAIRE FOR PROFESSIONALS IN THE BUILT ENVIRONMENT

JOMO KENYATTA UNIVERSITY OF AGRICULTURE & TECHNOLOGY

DEPARTMENT OF ARCHITECTURE

STRICTLY CONFIDENTIAL

Continuity and Change: A Study of the Relationship between Attitudes and the Built Environment in Historic Old Town of Mombasa

Declaration

This study is governed by the ethics of Social Science Research and no personal information will be divulged. Your participation in this study will be highly appreciated. **The information provided under this survey shall be used for academic purposes only.**

THANK YOU.

Respondent's name (optional): Date: Time:

RESPONDENT'S PERSONAL INFORMATION

1. Gender: _Male _ Female
2. Marital Status: _Single _Married _ Windowed _Divorced _Separated
3. Appropriate age: _under 18 _18<24 _24< 30 _30<36 _36<42 _42<48 _48 & above
4. Highest level of Education attained: _Primary _Secondary _Diploma _Graduate _Postgraduate _Other
5. Main Occupation: _Student _No working _Self Employed _ Employed _ Pensioner _Other
6. Your Religion: _Muslim _Hindu _Protestant _Catholic _Jew _Atheist _Other

The photographs shown in the album depict street scenes. For each photograph circle the number that best fits your feelings describing the shown environment.

VARIABLE 1: COMPLEXITY

(**1**)Extremely complex (**2**) Very complex, (**3**) Quite complex, (**4**) Neither complex nor simple, (**5**) Quite simple (**6**) Very simple, (**7**) Extremely simple

Photo 1	1 2 3 4 5 6 7	**Photo 34**	1 2 3 4 5 6 7	**Photo 67**	1 2 3 4 5 6 7
Photo 2	1 2 3 4 5 6 7	**Photo 35**	1 2 3 4 5 6 7	**Photo 68**	1 2 3 4 5 6 7
Photo 3	1 2 3 4 5 6 7	**Photo 36**	1 2 3 4 5 6 7	**Photo 69**	1 2 3 4 5 6 7
Photo 4	1 2 3 4 5 6 7	**Photo 37**	1 2 3 4 5 6 7	**Photo 70**	1 2 3 4 5 6 7
Photo 5	1 2 3 4 5 6 7	**Photo 38**	1 2 3 4 5 6 7	**Photo 71**	1 2 3 4 5 6 7
Photo 6	1 2 3 4 5 6 7	**Photo 39**	1 2 3 4 5 6 7	**Photo 72**	1 2 3 4 5 6 7
Photo 7	1 2 3 4 5 6 7	**Photo 40**	1 2 3 4 5 6 7	**Photo 73**	1 2 3 4 5 6 7
Photo 8	1 2 3 4 5 6 7	**Photo 41**	1 2 3 4 5 6 7	**Photo 74**	1 2 3 4 5 6 7
Photo 9	1 2 3 4 5 6 7	**Photo 42**	1 2 3 4 5 6 7	**Photo 75**	1 2 3 4 5 6 7
Photo 10	1 2 3 4 5 6 7	**Photo 43**	1 2 3 4 5 6 7	**Photo 76**	1 2 3 4 5 6 7
Photo 11	1 2 3 4 5 6 7	**Photo 44**	1 2 3 4 5 6 7	**Photo 77**	1 2 3 4 5 6 7
Photo 12	1 2 3 4 5 6 7	**Photo 45**	1 2 3 4 5 6 7	**Photo 78**	1 2 3 4 5 6 7
Photo 13	1 2 3 4 5 6 7	**Photo 46**	1 2 3 4 5 6 7	**Photo 79**	1 2 3 4 5 6 7
Photo 14	1 2 3 4 5 6 7	**Photo 47**	1 2 3 4 5 6 7	**Photo 80**	1 2 3 4 5 6 7
Photo 15	1 2 3 4 5 6 7	**Photo 48**	1 2 3 4 5 6 7	**Photo 81**	1 2 3 4 5 6 7
Photo 16	1 2 3 4 5 6 7	**Photo 49**	1 2 3 4 5 6 7	**Photo 82**	1 2 3 4 5 6 7
Photo 17	1 2 3 4 5 6 7	**Photo 50**	1 2 3 4 5 6 7	**Photo 83**	1 2 3 4 5 6 7
Photo 18	1 2 3 4 5 6 7	**Photo 51**	1 2 3 4 5 6 7	**Photo 84**	1 2 3 4 5 6 7
Photo 19	1 2 3 4 5 6 7	**Photo 52**	1 2 3 4 5 6 7	**Photo 85**	1 2 3 4 5 6 7
Photo 20	1 2 3 4 5 6 7	**Photo 53**	1 2 3 4 5 6 7	**Photo 86**	1 2 3 4 5 6 7

Photo 21	1 2 3 4 5 6 7	**Photo 54**	1 2 3 4 5 6 7	**Photo 87**	1 2 3 4 5 6 7
Photo 22	1 2 3 4 5 6 7	**Photo 55**	1 2 3 4 5 6 7	**Photo 88**	1 2 3 4 5 6 7
Photo 23	1 2 3 4 5 6 7	**Photo 56**	1 2 3 4 5 6 7	**Photo 89**	1 2 3 4 5 6 7
Photo 24	1 2 3 4 5 6 7	**Photo 57**	1 2 3 4 5 6 7	**Photo 90**	1 2 3 4 5 6 7
Photo 25	1 2 3 4 5 6 7	**Photo 58**	1 2 3 4 5 6 7	**Photo 91**	1 2 3 4 5 6 7
Photo 26	1 2 3 4 5 6 7	**Photo 59**	1 2 3 4 5 6 7	**Photo 92**	1 2 3 4 5 6 7
Photo 27	1 2 3 4 5 6 7	**Photo 60**	1 2 3 4 5 6 7	**Photo 93**	1 2 3 4 5 6 7
Photo 28	1 2 3 4 5 6 7	**Photo 61**	1 2 3 4 5 6 7	**Photo 94**	1 2 3 4 5 6 7
Photo 29	1 2 3 4 5 6 7	**Photo 62**	1 2 3 4 5 6 7	**Photo 95**	1 2 3 4 5 6 7
Photo 30	1 2 3 4 5 6 7	**Photo 63**	1 2 3 4 5 6 7	**Photo 96**	1 2 3 4 5 6 7
Photo 31	1 2 3 4 5 6 7	**Photo 64**	1 2 3 4 5 6 7	**Photo 97**	1 2 3 4 5 6 7
Photo 32	1 2 3 4 5 6 7	**Photo 65**	1 2 3 4 5 6 7	**Photo 98**	1 2 3 4 5 6 7
Photo 33	1 2 3 4 5 6 7	**Photo 66**	1 2 3 4 5 6 7	**Photo 99**	1 2 3 4 5 6 7
				Photo 100	1 2 3 4 5 6 7

VARIABLE 2: ENCLOSURE

(**1**)Extremely enclosed (**2**) Very enclosed (**3**) Quite enclosed (**4**) Neither enclosed nor open (**5**) Quite Open (**6**) Very Open (**7**) Extremely Open

Photo 1	1 2 3 4 5 6 7	**Photo 34**	1 2 3 4 5 6 7	**Photo 67**	1 2 3 4 5 6 7
Photo 2	1 2 3 4 5 6 7	**Photo 35**	1 2 3 4 5 6 7	**Photo 68**	1 2 3 4 5 6 7
Photo 3	1 2 3 4 5 6 7	**Photo 36**	1 2 3 4 5 6 7	**Photo 69**	1 2 3 4 5 6 7
Photo 4	1 2 3 4 5 6 7	**Photo 37**	1 2 3 4 5 6 7	**Photo 70**	1 2 3 4 5 6 7
Photo 5	1 2 3 4 5 6 7	**Photo 38**	1 2 3 4 5 6 7	**Photo 71**	1 2 3 4 5 6 7
Photo 6	1 2 3 4 5 6 7	**Photo 39**	1 2 3 4 5 6 7	**Photo 72**	1 2 3 4 5 6 7
Photo 7	1 2 3 4 5 6 7	**Photo 40**	1 2 3 4 5 6 7	**Photo 73**	1 2 3 4 5 6 7
Photo 8	1 2 3 4 5 6 7	**Photo 41**	1 2 3 4 5 6 7	**Photo 74**	1 2 3 4 5 6 7
Photo 9	1 2 3 4 5 6 7	**Photo 42**	1 2 3 4 5 6 7	**Photo 75**	1 2 3 4 5 6 7
Photo 10	1 2 3 4 5 6 7	**Photo 43**	1 2 3 4 5 6 7	**Photo 76**	1 2 3 4 5 6 7
Photo 11	1 2 3 4 5 6 7	**Photo 44**	1 2 3 4 5 6 7	**Photo 77**	1 2 3 4 5 6 7
Photo 12	1 2 3 4 5 6 7	**Photo 45**	1 2 3 4 5 6 7	**Photo 78**	1 2 3 4 5 6 7
Photo 13	1 2 3 4 5 6 7	**Photo 46**	1 2 3 4 5 6 7	**Photo 79**	1 2 3 4 5 6 7
Photo 14	1 2 3 4 5 6 7	**Photo 47**	1 2 3 4 5 6 7	**Photo 80**	1 2 3 4 5 6 7
Photo 15	1 2 3 4 5 6 7	**Photo 48**	1 2 3 4 5 6 7	**Photo 81**	1 2 3 4 5 6 7
Photo 16	1 2 3 4 5 6 7	**Photo 49**	1 2 3 4 5 6 7	**Photo 82**	1 2 3 4 5 6 7
Photo 17	1 2 3 4 5 6 7	**Photo 50**	1 2 3 4 5 6 7	**Photo 83**	1 2 3 4 5 6 7
Photo 18	1 2 3 4 5 6 7	**Photo 51**	1 2 3 4 5 6 7	**Photo 84**	1 2 3 4 5 6 7
Photo 19	1 2 3 4 5 6 7	**Photo 52**	1 2 3 4 5 6 7	**Photo 85**	1 2 3 4 5 6 7
Photo 20	1 2 3 4 5 6 7	**Photo 53**	1 2 3 4 5 6 7	**Photo 86**	1 2 3 4 5 6 7
Photo 21	1 2 3 4 5 6 7	**Photo 54**	1 2 3 4 5 6 7	**Photo 87**	1 2 3 4 5 6 7
Photo 22	1 2 3 4 5 6 7	**Photo 55**	1 2 3 4 5 6 7	**Photo 88**	1 2 3 4 5 6 7
Photo 23	1 2 3 4 5 6 7	**Photo 56**	1 2 3 4 5 6 7	**Photo 89**	1 2 3 4 5 6 7
Photo 24	1 2 3 4 5 6 7	**Photo 57**	1 2 3 4 5 6 7	**Photo 90**	1 2 3 4 5 6 7
Photo 25	1 2 3 4 5 6 7	**Photo 58**	1 2 3 4 5 6 7	**Photo 91**	1 2 3 4 5 6 7
Photo 26	1 2 3 4 5 6 7	**Photo 59**	1 2 3 4 5 6 7	**Photo 92**	1 2 3 4 5 6 7
Photo 27	1 2 3 4 5 6 7	**Photo 60**	1 2 3 4 5 6 7	**Photo 93**	1 2 3 4 5 6 7
Photo 28	1 2 3 4 5 6 7	**Photo 61**	1 2 3 4 5 6 7	**Photo 94**	1 2 3 4 5 6 7
Photo 29	1 2 3 4 5 6 7	**Photo 62**	1 2 3 4 5 6 7	**Photo 95**	1 2 3 4 5 6 7
Photo 30	1 2 3 4 5 6 7	**Photo 63**	1 2 3 4 5 6 7	**Photo 96**	1 2 3 4 5 6 7
Photo 31	1 2 3 4 5 6 7	**Photo 64**	1 2 3 4 5 6 7	**Photo 97**	1 2 3 4 5 6 7
Photo 32	1 2 3 4 5 6 7	**Photo 65**	1 2 3 4 5 6 7	**Photo 98**	1 2 3 4 5 6 7
Photo 33	1 2 3 4 5 6 7	**Photo 66**	1 2 3 4 5 6 7	**Photo 99**	1 2 3 4 5 6 7
				Photo 100	1 2 3 4 5 6 7

VARIABLE 3: IDIOSYNCRASY
This is measure of unusualness/ unusual features/ eccentricity/oddity

(**1**)Extremely idiosyncratic (**2**) Very idiosyncratic (**3**) Quite idiosyncratic (**4**) Neither idiosyncratic nor common (**5**) Quite Common (**6**) Very Common (**7**) Extremely Common

Photo 1	1 2 3 4 5 6 7	**Photo 34**	1 2 3 4 5 6 7	**Photo 67**	1 2 3 4 5 6 7
Photo 2	1 2 3 4 5 6 7	**Photo 35**	1 2 3 4 5 6 7	**Photo 68**	1 2 3 4 5 6 7
Photo 3	1 2 3 4 5 6 7	**Photo 36**	1 2 3 4 5 6 7	**Photo 69**	1 2 3 4 5 6 7
Photo 4	1 2 3 4 5 6 7	**Photo 37**	1 2 3 4 5 6 7	**Photo 70**	1 2 3 4 5 6 7
Photo 5	1 2 3 4 5 6 7	**Photo 38**	1 2 3 4 5 6 7	**Photo 71**	1 2 3 4 5 6 7
Photo 6	1 2 3 4 5 6 7	**Photo 39**	1 2 3 4 5 6 7	**Photo 72**	1 2 3 4 5 6 7
Photo 7	1 2 3 4 5 6 7	**Photo 40**	1 2 3 4 5 6 7	**Photo 73**	1 2 3 4 5 6 7
Photo 8	1 2 3 4 5 6 7	**Photo 41**	1 2 3 4 5 6 7	**Photo 74**	1 2 3 4 5 6 7
Photo 9	1 2 3 4 5 6 7	**Photo 42**	1 2 3 4 5 6 7	**Photo 75**	1 2 3 4 5 6 7
Photo 10	1 2 3 4 5 6 7	**Photo 43**	1 2 3 4 5 6 7	**Photo 76**	1 2 3 4 5 6 7
Photo 11	1 2 3 4 5 6 7	**Photo 44**	1 2 3 4 5 6 7	**Photo 77**	1 2 3 4 5 6 7
Photo 12	1 2 3 4 5 6 7	**Photo 45**	1 2 3 4 5 6 7	**Photo 78**	1 2 3 4 5 6 7
Photo 13	1 2 3 4 5 6 7	**Photo 46**	1 2 3 4 5 6 7	**Photo 79**	1 2 3 4 5 6 7
Photo 14	1 2 3 4 5 6 7	**Photo 47**	1 2 3 4 5 6 7	**Photo 80**	1 2 3 4 5 6 7
Photo 15	1 2 3 4 5 6 7	**Photo 48**	1 2 3 4 5 6 7	**Photo 81**	1 2 3 4 5 6 7
Photo 16	1 2 3 4 5 6 7	**Photo 49**	1 2 3 4 5 6 7	**Photo 82**	1 2 3 4 5 6 7
Photo 17	1 2 3 4 5 6 7	**Photo 50**	1 2 3 4 5 6 7	**Photo 83**	1 2 3 4 5 6 7
Photo 18	1 2 3 4 5 6 7	**Photo 51**	1 2 3 4 5 6 7	**Photo 84**	1 2 3 4 5 6 7
Photo 19	1 2 3 4 5 6 7	**Photo 52**	1 2 3 4 5 6 7	**Photo 85**	1 2 3 4 5 6 7
Photo 20	1 2 3 4 5 6 7	**Photo 53**	1 2 3 4 5 6 7	**Photo 86**	1 2 3 4 5 6 7
Photo 21	1 2 3 4 5 6 7	**Photo 54**	1 2 3 4 5 6 7	**Photo 87**	1 2 3 4 5 6 7
Photo 22	1 2 3 4 5 6 7	**Photo 55**	1 2 3 4 5 6 7	**Photo 88**	1 2 3 4 5 6 7
Photo 23	1 2 3 4 5 6 7	**Photo 56**	1 2 3 4 5 6 7	**Photo 89**	1 2 3 4 5 6 7
Photo 24	1 2 3 4 5 6 7	**Photo 57**	1 2 3 4 5 6 7	**Photo 90**	1 2 3 4 5 6 7
Photo 25	1 2 3 4 5 6 7	**Photo 58**	1 2 3 4 5 6 7	**Photo 91**	1 2 3 4 5 6 7
Photo 26	1 2 3 4 5 6 7	**Photo 59**	1 2 3 4 5 6 7	**Photo 92**	1 2 3 4 5 6 7
Photo 27	1 2 3 4 5 6 7	**Photo 60**	1 2 3 4 5 6 7	**Photo 93**	1 2 3 4 5 6 7
Photo 28	1 2 3 4 5 6 7	**Photo 61**	1 2 3 4 5 6 7	**Photo 94**	1 2 3 4 5 6 7
Photo 29	1 2 3 4 5 6 7	**Photo 62**	1 2 3 4 5 6 7	**Photo 95**	1 2 3 4 5 6 7
Photo 30	1 2 3 4 5 6 7	**Photo 63**	1 2 3 4 5 6 7	**Photo 96**	1 2 3 4 5 6 7
Photo 31	1 2 3 4 5 6 7	**Photo 64**	1 2 3 4 5 6 7	**Photo 97**	1 2 3 4 5 6 7
Photo 32	1 2 3 4 5 6 7	**Photo 65**	1 2 3 4 5 6 7	**Photo 98**	1 2 3 4 5 6 7
Photo 33	1 2 3 4 5 6 7	**Photo 66**	1 2 3 4 5 6 7	**Photo 99**	1 2 3 4 5 6 7
				Photo 100	1 2 3 4 5 6 7

THANK YOU

APPENDIX IIIB: PHOTOGRAPHIC STIMULI MEAN RATING

P_ *Denotes Photograph No.*

PHOTO	LIKABILITY	COMPLEXITY	ENCLOSURE	IDIOSYNCRASY
P_01	3.440828	3.750000	3.666667	3.833333
P_02	3.724292	4.333333	4.666667	4.583333
P_03	2.611360	3.000000	4.250000	5.166667
P_04	2.603886	3.166667	2.750000	4.416667
P_05	2.511144	3.416667	2.916667	3.000000
P_06	2.941353	2.916667	2.083333	3.500000
P_07	3.535232	4.750000	4.916667	4.583333
P_08	2.497041	5.166667	6.000000	4.500000
P_09	2.681138	3.083333	2.416667	3.583333
P_10	2.731231	3.833333	2.916667	4.083333
P_11	2.404192	4.416667	5.083333	4.500000
P_12	3.236882	3.750000	3.833333	4.333333
P_13	2.905405	2.166667	2.833333	2.333333
P_14	2.511905	4.916667	5.000000	4.083333
P_15	2.793413	4.333333	2.500000	3.583333
P_16	2.873874	4.833333	4.166667	4.000000
P_17	2.737631	2.916667	3.250000	3.250000
P_18	4.458894	4.333333	3.666667	4.333333
P_19	2.854573	2.333333	4.000000	3.583333
P_20	3.714072	4.000000	1.916667	3.833333
P_21	3.019490	5.000000	4.916667	4.750000
P_22	2.674141	4.833333	4.250000	4.833333
P_23	2.494768	3.000000	2.333333	4.666667
P_24	2.420659	4.666667	3.166667	4.000000
P_25	2.437967	3.416667	4.083333	3.833333
P_26	3.761261	4.583333	2.416667	3.833333
P_27	2.749249	2.083333	4.916667	2.166667
P_28	2.747748	4.416667	4.416667	5.333333
P_29	2.753383	2.916667	3.083333	4.750000
P_30	2.929535	3.000000	3.250000	3.333333
P_31	2.643284	2.000000	4.916667	2.166667
P_32	2.459701	4.750000	6.000000	3.583333
P_33	2.953731	4.545455	2.666667	4.916667
P_34	3.116592	3.000000	3.583333	4.083333
P_35	3.334828	3.916667	2.583333	4.000000
P_36	2.736842	3.333333	4.333333	4.250000
P_37	3.441617	3.000000	3.416667	3.916667
P_38	2.556886	1.750000	4.250000	2.666667
P_39	3.849398	3.833333	2.416667	3.916667
P_40	2.851351	4.000000	4.500000	4.750000
P_41	2.568862	3.166667	2.333333	3.750000
P_42	2.478326	3.666667	4.833333	3.333333
P_43	2.529148	2.916667	4.166667	3.916667
P_44	2.535232	3.083333	5.250000	3.083333
P_45	2.771772	3.666667	2.333333	4.250000
P_46	2.957704	5.083333	4.750000	5.083333
P_47	2.979042	3.166667	2.916667	4.916667
P_48	2.858859	2.833333	4.083333	3.416667
P_49	2.697605	2.166667	3.833333	3.583333
P_50	2.719457	2.166667	4.083333	2.833333
P_51	3.232980	3.666667	2.916667	4.833333
P_52	3.070571	4.083333	2.750000	4.666667
P_53	3.196697	4.416667	3.083333	3.416667
P_54	3.251515	4.416667	2.833333	5.000000
P_55	2.500752	3.416667	5.250000	3.416667
P_56	2.564565	4.000000	5.083333	5.250000
P_57	2.496229	4.583333	4.916667	4.666667
P_58	2.503748	2.750000	3.833333	2.250000
P_59	2.381955	2.500000	3.416667	2.750000
P_60	2.723724	2.000000	2.666667	2.583333
P_61	2.653614	2.000000	4.000000	1.833333
P_62	2.992504	1.500000	3.750000	1.083333
P_63	3.081571	3.833333	3.916667	4.333333
P_64	3.244713	4.500000	2.666667	4.583333
P_65	2.945701	3.083333	2.666667	4.500000
P_66	2.502242	4.666667	2.833333	4.583333
P_67	2.389728	2.583333	2.250000	3.916667
P_68	2.832572	2.750000	2.000000	3.083333
P_69	2.815038	4.500000	3.916667	4.750000
P_70	3.137462	4.500000	3.000000	4.750000
P_71	4.523308	4.333333	4.583333	4.000000

P_72	4.034743	4.666667	4.166667	4.000000
P_73	2.968278	3.250000	3.250000	2.833333
P_74	2.915152	3.583333	3.333333	4.250000
P_75	2.882353	4.583333	3.000000	4.166667
P_76	2.728916	3.833333	2.916667	4.166667
P_77	2.598507	4.916667	4.500000	4.666667
P_78	3.867069	4.500000	4.500000	4.500000
P_79	2.636090	3.166667	2.833333	4.250000
P_80	2.717949	2.083333	3.666667	2.583333
P_81	2.651584	3.750000	4.583333	3.333333
P_82	2.560423	2.916667	2.666667	3.416667
P_83	2.568421	3.833333	4.916667	3.500000
P_84	3.018154	3.083333	2.166667	3.333333
P_85	3.263238	3.166667	3.083333	4.500000
P_86	4.278539	4.333333	2.500000	4.416667
P_87	2.945455	2.833333	2.250000	3.083333
P_88	2.565152	4.916667	5.000000	4.833333
P_89	2.946809	3.666667	2.833333	4.166667
P_90	2.891403	4.583333	3.583333	4.916667
P_91	2.667678	4.416667	4.500000	4.166667
P_92	2.954614	3.666667	3.083333	4.333333
P_93	3.099548	3.416667	4.000000	4.166667
P_94	2.853474	3.500000	3.583333	3.916667
P_95	2.975867	3.500000	1.750000	3.666667
P_96	2.551515	2.666667	2.083333	3.500000
P_97	2.745840	3.666667	3.666667	3.750000
P_98	3.878012	4.416667	3.500000	4.416667
P_99	3.412387	5.583333	4.666667	4.666667
P_100	2.786145	3.000000	2.333333	3.583333

Source: Author (2010).

APPENDIX IV: INTERVIEW GUIDE FOR KNOWLEDGEABLE PERSONS

Jomo Kenyatta University of Agriculture & Technology
DEPARTMENT OF ARCHITECTURE

STRICTLY CONFIDENTIAL

Continuity and Change: A Study of the Relationship between Attitudes and the Built Environment in Historic Old Town of Mombasa

Declaration

This study is governed by the ethics of Social Science Research and no personal information will be divulged. Your participation in this study will be highly appreciated. **The information provided under this survey shall be used for academic purposes only.**

THANK YOU.

Interviewer:	Date:	Time

Interview Guide for Knowledgeable Persons

1. In your opinion which are the most important buildings, open spaces, areas, streets that define the conservation area?
2. What do you think are the most important issues facing Old Town of Mombasa Conservation Area?
3. What do you think are the three most important improvements that could be made to enhance the special character or appearance of the Old Town of Mombasa Conservation Area?
4. Do you feel that the approval process for development is effective in the protection of the Historic built environment and why?
5. Do you feel that the government provides enough guidance on how to best manage and protect the historic areas and why?
6. Would you comment on the laws and regulations governing conservation in the Old Town of Mombasa?
7. In your opinion do development proposals in the Old Town of Mombasa respect the historic character of buildings and conservation areas within their proposals?
8. Do you think the Municipal Council of Mombasa take into account the built historic environment of Old Town of Mombasa when making planning decisions in the Old Town of Mombasa?
9. Do you think more can be done by the Municipal Council of Mombasa to protect the historic heritage of Old Town of Mombasa?
10. Do you think the Mombasa Old Town Conservation Office (MOTCO) takes into account the built historic environment of Old Town of Mombasa when making planning decisions in the Old Town of Mombasa?
11. Do you think more can be done by the Mombasa Old Town Conservation Office (MOTCO) to protect the historic heritage of Old Town of Mombasa?
12. In your opinion, what should be done to improve the conservation efforts in Old Town of Mombasa?

Thank you for participating in this interview.

APPENDIX V: INTERVIEW GUIDE FOR CONSERVATION OFFICER

Jomo Kenyatta University of Agriculture & Technology
DEPARTMENT OF ARCHITECTURE

STRICTLY CONFIDENTIAL

Continuity and Change: A Study of the Relationship between Attitudes and the Built Environment in Historic Old Town of Mombasa

Declaration

This study is governed by the ethics of Social Science Research and no personal information will be divulged. Your participation in this study will be highly appreciated. **The information provided under this survey shall be used for academic purposes only.**

Interviewer:	Date:	Time:

Interview Guide for Officials in Mombasa Old Town Conservation Office (MOTCO)

1. What is the role of MOTCO in the conservation of the Old Town of Mombasa?
2. What are the problems and challenges you experience in the conservation of the Old Town of Mombasa?
3. What are the sources of stresses and problems associated with the conservation of the Old Town of Mombasa?
4. What are the possible solutions to these problems and challenges?
5. What are the opportunities for the sustainability of the historic character of the Old Town of Mombasa?
6. What guides development control in the Old Town of Mombasa conserved zone?
7. Kindly describe the approval process for development in the Old Town of Mombasa.
8. In what areas does MOTCO collaborate with the Municipal Council of Mombasa in conservation of the Old Town of Mombasa?
9. Are there areas of conflict between MOTCO and Municipal Council of Mombasa in conservation of the Old Town of Mombasa?
10. What are the various land uses in the conserved area?
11. Are there any conflicts among these land uses?
12. What has been the impact of the National Museums and Heritage Act of 2006 in the conservation of the Old Town of Mombasa since its enactment in 1996?
13. To what extent do you think that the community is aware of conservation efforts in Old Town of Mombasa?
14. What would you say is the community's attitude towards conservation in general?
15. What is the role of the interest groups for example Non-governmental Organisations (NGOs) and Community Based organisations (CBOs) in the conservation of the Old Town of Mombasa?
16. How has the old town been changing culturally, socially, economically, physically/functionally in the recent 10 years?
17. Are there any new developments proposed in the Old Town of Mombasa?
18. In your opinion, what is the future of the Old Town of Mombasa?

Thank you for participating in this interview.

APPENDIX VI: SKILLS MATRIX FOR DIFFERENT PROFESSIONALS INVOLVED IN CONSERVATION

Professional	a	b	c	d	e	f	g	h	i	j	k	l	m	n	Score
Administrator or owner			x	x				x	x	x		x	x	x	8
Archaeologist	x	x	x	x				x	x	x	x	x	x		10
Architect	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Art/ architectural historian		x	x	x	x	x	x	x	x			x	x		10
Builder or contractor	x				x	x	x	x	x			x	x	x	9
Conservation or historic Buildings officer (Municipality)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Conservator	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Engineer (Civil or Structural)		x		x	x	x	x		x			x	x		8
Environmental Engineers			x	x	x	x	x	x	x		x	x	x		10
Landscape Architect or Historic garden conservators	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Master craft worker		x				x	x	x	x		x	x	x		8
Materials scientist		x		x	x	x	x	x	x		x	x	x		10
Building economist (Quantity surveyor)				x			x	x	x	x	x	x	x	x	9
Surveyors	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Town planner			x	x				x	x	x	x	x	x	x	9
Curator	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14

Source: Adapted from Orbaşli (2008); COTAC (1993); ICOMOS (1993).

Key:

ICOMOS Guidelines for Education and Training in the Conservation of Monuments, Ensembles and Sites (1993) clearly states that conservation works should only be entrusted to persons competent in these specialist activities. Education and training for conservation should produce a range of professionals, conservationists who are able to:

a) read a monument, ensemble or site and identify its emotional, cultural and use significance; **b)** understand the history and technology of monuments, ensembles or sites in order to define their identity, plan for their conservation, and interpret the results of this research; **c)** understand the setting of a monument, ensemble or site, their contents and surroundings, in relation to other buildings, gardens or landscapes; **d)** find and absorb all available sources of information relevant to the monument, ensemble or site being studied; **e)** understand and analyze the behaviour of monuments, ensembles and sites as complex systems; **f)** diagnose intrinsic and extrinsic causes of decay as a basis for appropriate action; **g)** inspect and make reports intelligible to non-specialist readers of monuments, ensembles or sites, illustrated by graphic means such as sketches and photographs; **h)** know, understand and apply UNESCO conventions and recommendations, and ICOMOS and other recognized Charters, regulations and guidelines; **i)** make balanced judgements based on shared ethical principles, and accept responsibility for the long-term welfare of cultural heritage; **j)** recognize when advice must be sought and define the areas of need of study by different specialists, e.g. wall paintings, sculpture and objects of artistic and historical value, and/or studies of materials and systems; **k)** give expert advice on maintenance strategies, management policies and the policy framework for environmental protection and preservation of monuments and their contents, and sites; **l)** document works executed and make same accessible; **m)** work in multi-disciplinary groups using sound methods; **n)** be able to work with inhabitants, administrators and planners to resolve conflicts and to develop conservation strategies appropriate to local needs, abilities and resources.

Table 2.2 indicates that the architect, conservation officer, conservator, landscape architect, surveyors and curators have a great responsibility in ensuring the success of conservation work. Planners have a wider remit of making decisions concerning the development and use of land and can play an important role in the historic environment and in determining the future of historic buildings (Orbaşli, 2008). COTAC (1993) argues that there should be a presumption in favour of conservation of monuments, ensembles and sites, but this does not mean an unquestioning policy of preservation at any price. Architects clearly have a particular responsibility to provide a broader historical and urbanistic perspective than political advantage seekers and real estate opportunists, to emphasize that architectural value isn't just a matter of fleeting current taste, and to speak out vigorously against threats of architectural assassination (Mitchell, 2008).The usual swings of fashion must be arrested and the relics of history protected. Communities must take the greatest care of their architectural patrimony since the destruction of historic areas would leave a gaping void in history. Mitchell (2008) put forth the idea that the most complex, diverse, and interesting cities emerge, gradually over many years, from countless incremental interventions and adjustments. It is a bottom-up process, without a master plan (Rodwell, 2007).

APPENDIX VII: CAUSES OF DETERIORATION TO CULTURAL PROPERTY

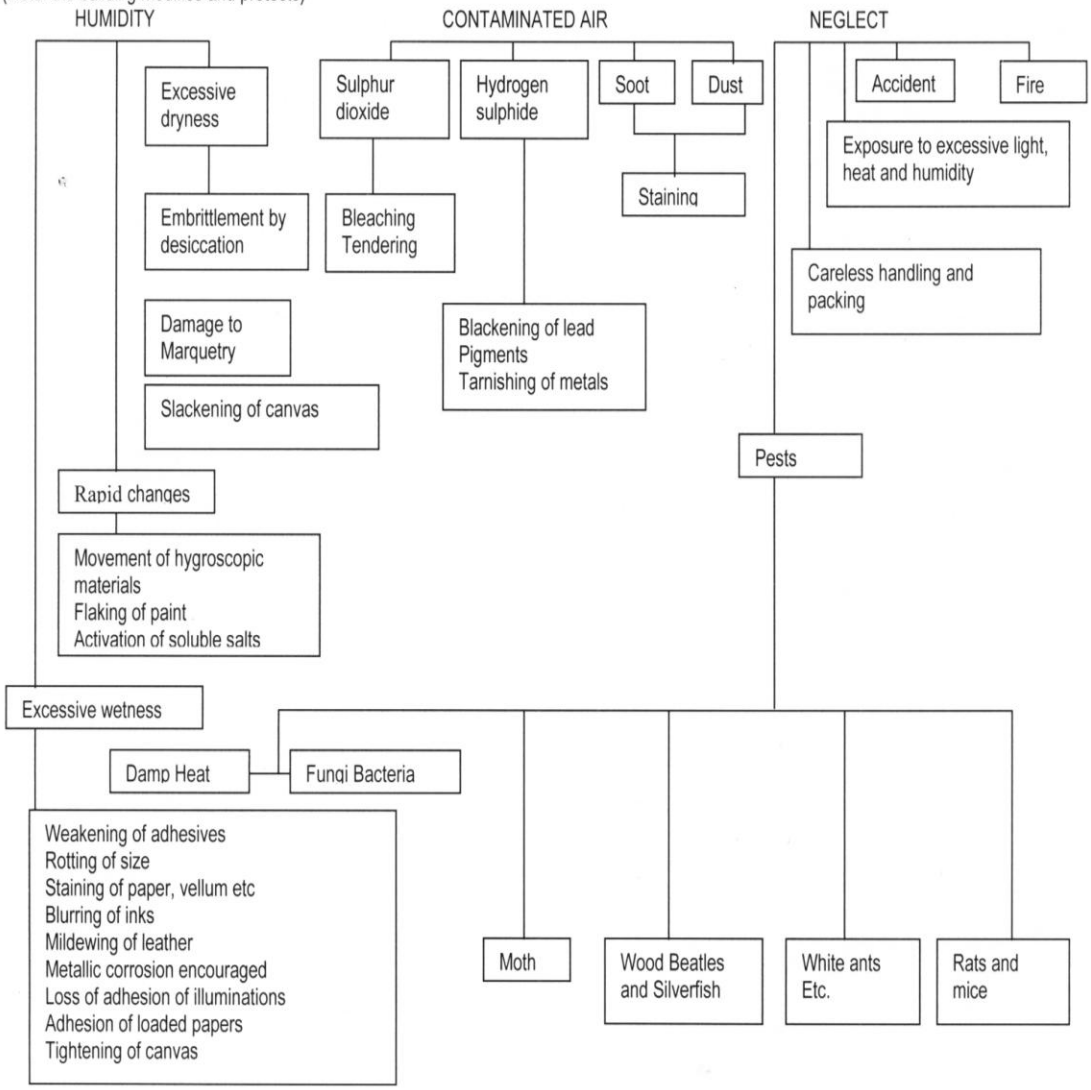
EXTERNAL CAUSE OF DECAY:

The sun produces LIGHT with ULTRA VIOLET and HEAT RADIATION

Climatic Causes	Biological and Botanical Causes	Natural Disasters
Seasonal temperature changes	Animals	Tectonics
Daily temperature changes	Birds	Earthquakes
Precipitation of rain and snow	Insects	Tidal waves
Ice and frost	Trees and plants	Floods
Ground water and moisture in soil dust	Fungi moulds and lichens	Avalanches
		Volcanic eruptions, Exceptional winds
		Fire

INTERNAL CAUSES OF DECAY:

(Note: the building modifies and protects)



MAN MADE CAUSES OF DECAY:

Neglect of preventive conservation	Wars	Environmental pollution	Vandalism and arson
	Purposeful alteration	Water abstraction	Theft

Source: Adapted from Feilden (1979); Plenderleith (1968)

APPENDIX VIII: ZONE 1 COEFFICIENTS- COMPONENT SCORE COEFFICIENT MATRIX

Variable	Component 1	2	3	4	5	6	7	8
z1s_Pl_Un	-.061	-.147	.095	.006	.256	.073	-.040	-.038
z1s_Ap_Re	-.079	-.089	.141	-.041	.177	.058	-.004	-.026
z1s_Co_Dr	-.103	-.119	.101	.003	.228	.023	.064	.000
z1s_Pr_Ug	-.087	-.066	.132	-.027	.151	-.034	.096	.000
z1s_Pl_Up	-.037	-.041	.165	-.076	.042	-.046	.103	.008
z1s_At_Un	-.027	-.057	.249	-.055	.024	-.141	.100	-.023
z1s_Cl_Di	-.004	-.014	.256	-.029	-.045	-.162	.017	-.008
z1s_Ma_Ba	-.016	-.053	.280	.056	-.045	-.095	-.146	.000
z1s_Co_Ba	-.018	-.031	.247	.024	-.092	.001	-.126	-.006
z1s_In_Bo	.017	.018	.128	-.054	-.102	.099	-.084	-.006
z1s_Go_De	.010	-.015	.070	-.062	-.091	.209	.004	-.060
z1s_Im_No	.004	-.023	-.026	-.053	-.010	.261	.042	-.093
z1s_Qu_No	-.026	-.014	-.052	-.029	-.009	.346	-.087	-.004
z1s_Sa_Un	-.011	-.011	-.029	.019	-.091	.287	-.098	.048
z1s_Sm_La	-.079	-.089	-.068	.221	.040	.085	-.034	.125
z1s_Ma_Fe	-.095	-.049	-.040	.083	-.039	.146	.180	.057
z1s_Su_In	-.057	.046	.007	.024	-.083	.126	.028	.035
z1s_Pe_Bu	-.075	.028	.029	-.067	-.024	-.033	.360	-.024
z1o_Pl_Un	-.058	.132	-.055	-.050	.125	.092	-.157	.025
z1o_Ap_Re	-.064	.196	-.047	-.091	.072	.016	-.042	.024
z1o_Co_Dr	-.062	.240	-.080	-.071	.028	-.015	-.032	.043
z1o_Pr_Ug	-.049	.266	-.068	-.050	-.028	-.036	-.082	.071
z1o_Pl_Up	-.044	.259	-.026	-.075	-.049	-.010	-.130	.084
z1o_At_Un	-.020	.233	-.008	-.079	-.057	-.054	-.076	.061
z1o_Cl_Di	-.031	.218	.035	-.035	-.127	-.098	.029	.013
z1o_Ma_Ba	-.035	.197	.009	-.016	-.117	-.084	.063	.012
z1o_Co_Ba	-.027	.153	.028	-.003	-.095	-.107	.120	-.034
z1o_In_Bo	-.017	.014	-.088	.071	.177	.060	-.073	-.073
z1o_Go_De	.010	.040	-.089	.069	.092	.035	.015	-.123
z1o_Im_No	.022	.023	-.094	.073	.074	.035	.058	-.140
z1o_Qu_No	.055	.026	-.086	.167	-.010	.044	-.075	-.137
z1o_Sa_Un	.023	-.026	-.039	.241	.010	.002	-.060	-.160
z1o_Sm_La	.006	-.091	.001	.363	-.008	-.101	-.169	.025
z1o_Ma_Fe	.022	-.053	.013	.258	-.099	-.027	-.094	.012
z1o_Su_In	-.012	-.042	.017	.217	-.005	-.086	.009	-.027
z1o_Pe_Bu	-.013	-.074	-.061	.134	.096	-.133	.365	-.166
z1b_Pl_Un	.025	-.027	-.065	-.018	.258	-.069	-.042	.041
z1b_Ap_Re	.032	-.004	-.049	-.054	.223	-.119	.023	.054
z1b_Co_Dr	.065	.000	-.030	-.036	.190	-.163	-.011	.042
z1b_Pr_Ug	.078	.011	-.009	-.039	.144	-.177	-.022	.053
z1b_Pl_Up	.102	.034	.008	-.001	.062	-.163	-.089	.014
z1b_At_Un	.151	.006	.022	.003	-.010	-.147	-.058	-.029
z1b_Cl_Di	.194	-.058	.068	.030	-.128	-.056	-.063	-.081
z1b_Ma_Ba	.215	-.085	.060	.013	-.183	.037	-.061	-.078
z1b_Co_Ba	.214	-.083	.001	.033	-.171	.087	-.039	-.107
z1b_In_Bo	.182	-.038	-.053	.046	-.102	.062	-.092	-.047
z1b_Go_De	.164	-.044	-.078	.005	-.079	.106	-.041	-.020
z1b_Im_No	.137	-.085	-.065	-.051	-.025	.131	.093	-.061
z1b_Qu_No	.103	-.075	-.091	-.038	-.026	.145	.093	.018
z1b_Sa_Un	.078	-.076	-.107	-.016	-.016	.100	.145	.066
z1b_Sm_La	-.084	.008	-.007	.021	.062	-.116	-.118	.498
z1b_Ma_Fe	-.004	.025	-.039	-.052	-.077	.001	-.038	.409
z1b_Su_In	.010	-.009	-.014	-.070	-.069	.003	.113	.255
z1b_Pe_Bu	.009	-.056	-.033	-.103	-.045	-.039	.469	.059

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Source: Author (2010).

APPENDIX IX: ZONE 2 COEFFICIENTS- COMPONENT SCORE COEFFICIENT MATRIX

Variable	Component							
	1	2	3	4	5	6	7	8
z2s_Pl_Un	.012	-.051	.168	.004	-.118	.116	-.114	.092
z2s_Ap_Re	.019	-.032	.148	-.002	-.112	.084	-.082	.105
z2s_Co_Dr	-.039	-.041	.173	.014	-.011	-.042	.039	-.003
z2s_Pr_Ug	-.053	-.045	.198	-.002	.039	-.074	.032	-.086
z2s_Pl_Up	-.064	-.049	.211	.009	.068	-.133	.056	-.121
z2s_At_Un	-.066	-.037	.178	-.031	.049	-.088	.124	-.028
z2s_Cl_Di	-.026	-.028	.035	.002	-.033	-.028	.257	-.060
z2s_Ma_Ba	.005	-.015	-.022	-.011	-.071	.003	.300	.056
z2s_Co_Ba	.011	-.024	.006	-.016	-.041	-.031	.270	.044
z2s_In_Bo	-.058	-.023	.080	-.062	.104	-.024	.174	-.012
z2s_Go_De	-.074	.007	.048	-.106	.129	.101	.088	-.033
z2s_Im_No	-.113	-.035	.085	-.077	.213	.130	-.005	-.007
z2s_Qu_No	-.053	-.019	.016	-.109	.006	.373	-.046	-.013
z2s_Sa_Un	-.047	.005	-.057	-.028	-.002	.259	.061	-.036
z2s_Sm_La	-.020	-.049	-.006	.010	-.128	.348	-.022	.138
z2s_Ma_Fe	-.031	-.059	.014	.149	-.120	.157	.003	-.043
z2s_Su_In	-.040	-.037	.000	.159	-.076	.026	.102	-.039
z2s_Pe_Bu	-.038	-.093	.011	.183	.123	-.114	.066	.115
z2o_Pl_Un	.140	-.015	.040	-.042	-.129	.128	-.174	.137
z2o_Ap_Re	.129	-.010	.044	-.039	-.091	.081	-.151	.121
z2o_Co_Dr	.120	-.032	.034	.014	-.058	-.016	-.060	.079
z2o_Pr_Ug	.116	-.035	.047	.016	-.018	-.059	-.067	.002
z2o_Pl_Up	.117	-.040	.046	.023	-.019	-.105	-.012	.016
z2o_At_Un	.145	-.032	-.003	.013	-.030	-.099	.014	.061
z2o_Cl_Di	.163	-.011	-.076	-.012	-.077	-.003	.031	-.030
z2o_Ma_Ba	.154	.002	-.081	-.030	-.029	-.038	.060	-.024
z2o_Co_Ba	.160	-.017	-.067	-.012	.005	-.102	.068	.029
z2o_In_Bo	.114	-.007	-.075	-.054	.152	-.098	.048	.048
z2o_Go_De	.085	-.016	-.053	-.070	.223	-.078	.006	.021
z2o_Im_No	.009	-.033	.022	-.086	.291	-.026	-.052	-.031
z2o_Qu_No	.031	-.015	-.043	-.072	.196	.094	-.071	-.105
z2o_Sa_Un	.059	-.003	-.086	-.007	.089	.104	-.062	-.190
z2o_Sm_La	.061	-.021	-.044	-.018	.029	.172	-.111	-.164
z2o_Ma_Fe	.039	-.019	-.034	.116	-.079	.065	-.020	-.295
z2o_Su_In	.024	.012	-.056	.083	-.018	.063	-.025	-.293
z2o_Pe_Bu	-.011	-.065	.000	.132	.221	-.108	-.069	-.118
z2b_Pl_Un	.006	.099	.058	-.011	-.080	.078	-.209	-.027
z2b_Ap_Re	-.032	.114	.075	-.036	-.001	.021	-.157	-.142
z2b_Co_Dr	-.038	.119	.061	-.011	.032	-.066	-.101	-.148
z2b_Pr_Ug	-.051	.135	.061	-.017	.048	-.097	-.079	-.177
z2b_Pl_Up	-.028	.179	-.020	-.037	-.017	-.085	.015	-.200
z2b_At_Un	-.042	.162	-.002	-.037	.035	-.123	.035	-.163
z2b_Cl_Di	.003	.164	-.086	-.055	-.089	.009	.101	-.053
z2b_Ma_Ba	.006	.169	-.116	-.048	-.116	.059	.102	.001
z2b_Co_Ba	.017	.153	-.106	-.020	-.098	-.003	.102	.102
z2b_In_Bo	-.002	.112	-.060	-.014	-.016	.000	.030	.221
z2b_Go_De	-.008	.103	-.063	-.035	.023	.050	-.009	.222
z2b_Im_No	-.030	.043	-.014	.011	.110	.006	-.060	.280
z2b_Qu_No	-.026	.094	-.086	.017	.012	.052	.019	.195
z2b_Sa_Un	.005	.040	-.109	.095	.057	-.019	.022	.155
z2b_Sm_La	.020	-.046	-.026	.213	-.059	-.052	-.022	.326
z2b_Ma_Fe	-.023	-.017	.053	.274	-.177	-.027	-.102	.069
z2b_Suf_In	-.021	.022	-.014	.252	-.117	-.094	-.006	-.060
z2b_Pe_Bu	-.055	-.022	.006	.237	.164	-.267	.008	.089

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Source: Author (2010).

APPENDIX X: ZONE 3 COEFFICIENTS- COMPONENT SCORE COEFFICIENT MATRIX

Variable	Component				
	1	2	3	4	5
z3s_Pl_Un	.123	-.012	-.041	-.074	.160
z3s_Ap_Re	.133	-.013	-.031	-.097	.159
z3s_Col_Dr	.139	-.012	-.055	-.073	.102
z3s-Pr_Ug	.119	-.009	-.033	-.058	-.040
z3s_Pl_Up	.118	-.013	-.023	-.069	-.004
z3s_At_Un	.128	-.008	-.029	-.074	-.112
z3s_Cl_Di	.106	-.021	-.031	-.011	-.264
z3s_Ma_Ba	.113	-.016	-.038	-.013	-.285
z3s_Co_Ba	.112	-.011	-.025	-.034	-.269
z3s_In_Bo	.113	-.006	-.004	-.083	-.117
z3s_Go_De	.114	-.004	-.006	-.090	-.076
z3s_Im_No	.080	.052	.033	-.181	.087
z3s_Qu_No	.071	.009	-.017	-.021	-.158
z3s_Sa_Un	.059	.109	-.028	-.128	-.076
z3s_Sm_La	.027	.125	-.051	-.081	.029
z3s_Ma_Fe	.035	.128	-.075	-.065	.022
z3s_Su_In	.082	.105	-.089	-.080	-.052
z3s_Pe_Bu	.017	.125	-.086	-.015	-.018
z3o_Pl_Un	.078	-.019	-.084	.047	.278
z3o_Ap_Re	.075	-.017	-.083	.049	.290
z3o_Co_Dr	.026	-.018	-.071	.127	.127
z3o_Pr_Ug	.027	-.020	-.064	.128	.045
z3o_Pl_Up	.041	-.018	-.053	.087	.062
z3o_At_Un	.022	-.014	-.060	.127	-.005
z3o_Cl_Di	-.019	-.032	-.032	.177	-.040
z3o_Ma_Ba	-.037	-.033	-.012	.185	-.067
z3o_Co_Ba	-.056	-.031	.001	.194	-.046
z3o_In_Bo	-.044	-.028	.007	.160	-.009
z3o_Go_De	-.022	-.027	-.009	.147	.003
z3o_It_No	-.027	.023	.005	.062	.050
z3o_Qu_No	-.042	-.020	.013	.152	-.152
z3o_Sa_Un	-.056	.080	-.049	.116	-.112
z3o_Sm_La	-.052	.102	-.053	.081	-.056
z3o_Ma_Fe	-.070	.083	-.080	.164	.017
z3o_Su_In	-.066	.064	-.061	.157	.011
z3o_Pe_Bu	-.071	.118	-.070	.100	.086
z3b_Pl_Un	.003	-.022	.079	-.040	.265
z3b_Ap_Re	-.004	-.023	.093	-.046	.267
z3b_Co_Dr	-.050	-.023	.116	.006	.152
z3b_Pr_Ug	-.042	-.024	.120	-.005	.107
z3b_Pl_Up	-.034	-.030	.138	-.028	.047
z3b_At_Un	-.036	-.031	.148	-.033	.014
z3b_Cl_Di	-.049	-.040	.149	.007	-.127
z3b_Ma_Ba	-.057	-.043	.137	.043	-.160
z3b_Co_Ba	-.052	-.046	.147	.024	-.155
z3b_In_Bo	-.040	-.033	.157	-.028	-.093
z3b_Go_De	-.024	-.016	.174	-.101	-.046
z3b_Im_No	-.037	.030	.156	-.133	.049
z3b_Qu_No	-.041	.005	.136	-.050	-.102
z3b_Sa_Un	-.050	.096	.083	-.097	.012
z3b_Sm_La	-.038	.111	.001	-.034	.049
z3b_Ma_Fe	-.077	.107	.064	-.051	.091
z3b_Su_In	-.053	.085	.045	-.034	.075
z3b_Pe_Bu	-.054	.112	-.002	-.003	.024

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Source: Author (2010).

APPENDIX XI: ZONE 4 COEFFICIENTS- COMPONENT SCORE COEFFICIENT MATRIX

Variable	Component				
	1	2	3	4	5
z4s_Pl_Un	.086	-.097	-.091	-.042	.278
z4s_Ap_Re	.109	-.087	-.061	-.022	.157
z4s_Co_Dr	.174	-.049	-.093	-.012	.013
z4s_Pr_Ug	.177	-.026	-.095	-.015	-.027
z4s_Pl_Up	.164	-.027	-.045	-.034	-.052
z4s_At_Un	.170	-.003	-.042	-.055	-.079
z4s_Cl_Di	.169	.015	-.033	-.043	-.140
z4s_Ma_Ba	.165	-.007	.003	-.044	-.146
z4s_Co_Ba	.169	-.008	-.002	-.063	-.120
z4s_In_Bo	.169	-.024	-.034	-.060	-.051
z4s_Go_De	.162	-.016	-.044	-.052	-.047
z4s_Im_No	.088	-.047	.032	-.046	.017
z4s_Qu_No	.086	-.096	.019	.046	.000
z4s_Sa_Un	.128	-.088	-.079	.107	-.027
z4s_Sm_La	.087	-.064	-.153	.242	-.074
z4s_Ma_Fe	.075	-.091	-.178	.254	.017
z4s-Su_In	.082	-.061	-.138	.139	.056
z4s_Pe_Bu	.039	-.082	-.077	.115	.106
z4o_Pl_Un	-.060	.088	-.144	-.044	.300
z4o_Ap_Re	-.040	.092	-.119	-.044	.228
z4o_Co_Dr	-.017	.102	-.085	-.040	.117
z4o_Pr_Ug	-.033	.129	-.063	-.041	.064
z4o_Pl_Up	-.033	.153	-.063	-.058	.044
z4o_At_Un	-.015	.148	-.054	-.066	.019
z4o_Cl_Di	-.005	.160	-.046	-.024	-.087
z4o_Ma_Ba	.010	.184	-.042	-.075	-.092
z4o_Co_Ba	.015	.214	-.034	-.078	-.165
z4o_In_Bo	-.014	.209	-.009	-.069	-.155
z4o_Go_De	-.041	.192	.002	-.041	-.131
z4o_Im_No	-.079	.136	-.003	.041	-.069
z4o_Qu_No	-.086	.126	.034	.060	-.121
z4o_Sa_Un	-.083	.096	.003	.050	-.016
z4o_Sm_La	-.066	.066	-.034	.118	-.038
z4o_Ma_Fe	-.108	.061	-.134	.229	.048
z4o_Su_In	-.101	.070	-.132	.150	.126
z4o_Pe_Bu	-.122	.028	-.045	.048	.242
z4b_Pl_Un	-.087	-.108	.090	-.067	.366
z4b_Ap_Re	-.067	-.102	.137	-.073	.264
z4b_Co_Dr	-.022	-.067	.097	-.076	.189
z4b_Pr_Ug	-.012	-.059	.112	-.086	.149
z4b_Pl_Up	.010	-.039	.122	-.068	.037
z4b_At_Un	-.029	-.044	.178	-.060	.018
z4b_Cl_Di	-.010	.006	.149	-.036	-.089
z4b_Ma_Ba	-.003	.006	.173	-.063	-.102
z4b_Co_Ba	-.036	.030	.179	-.076	-.080
z4b_In_Bo	-.059	.008	.179	-.035	-.050
z4b_Go_De	-.046	-.038	.204	-.025	-.046
z4b_Im_No	-.030	-.032	.212	-.032	-.087
z4b_Qu_No	-.070	-.043	.213	.007	-.055
z4b_Sa_Un	-.066	-.071	.205	.099	-.124
z4b_Sm_La	-.110	-.041	.083	.251	-.139
z4b_Ma_Fe	-.060	-.099	.083	.256	-.123
z4b_Su_In	-.068	-.068	.050	.190	-.019
z4b_Pe_Bu	-.071	-.063	.064	.135	.031

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Source: Author (2010).

APPENDIX XII: ALL ZONES COMBINED- ROTATED COMPONENT MATRIX (A)

Variable	Component				
	1	2	3	4	5
z4o_Co_Dr	**.878**	.091	.159	.065	.001
z4s_Ap_Re	**.868**	.090	.234	.065	.088
z4s_Co_Dr	**.864**	.030	.177	.060	.046
z4o_Ma_Ba	**.862**	.124	.096	.054	.045
z4o_Ap_Re	**.862**	.127	.167	.054	.020
z4b_Pr_Ug	**.861**	.016	.203	.057	-.015
z4s_Ma_Ba	**.860**	.045	.144	.073	-.001
z4b_Go_De	**.859**	.048	.171	.089	-.008
z4s_Go_De	**.858**	.087	.160	.082	.052
z4s_At_Un	**.858**	.055	.133	.065	.014
z4s_Co_Ba	**.856**	.069	.149	.106	-.010
z4o_Pr_Ug	**.856**	.110	.166	.079	.033
z4s_Pr_Ug	**.854**	.034	.142	.077	.070
z4s_Cl_Di	**.852**	.105	.135	.073	-.005
z4b_Co_Dr	**.850**	.039	.180	.046	.010
z4s_In_Bo	**.850**	.077	.175	.067	.045
z4b_At_Un	**.847**	.041	.192	.036	.009
z4b_Pl_Up	**.847**	.032	.216	.101	.027
z4b_In_Bo	**.846**	.030	.176	.071	-.020
z4b_Im_No	**.845**	.011	.193	.132	.051
z4o_Cl_Di	**.843**	.125	.128	.087	.027
z4o_At_Un	**.843**	.146	.130	.062	.008
z4b_Ma_Ba	**.842**	.050	.213	.078	.009
z4s_Im_No	**.839**	.014	.156	.080	.101
z4b_Cl_Di	**.839**	.079	.192	.058	-.034
z4o_Pl_Up	**.837**	.108	.128	.027	.020
z4b_Co_Ba	**.834**	.013	.172	.059	-.023
z4o_Go_De	**.830**	.081	.161	.073	.056
z4o_In_Bo	**.828**	.128	.153	.045	.046
z4s_Qu_No	**.828**	.021	.194	.111	.142
z4s_Pl_Up	**.826**	.027	.176	.058	.025
z4b_Ap_Re	**.821**	.050	.249	.085	.046
z4o_Co_Ba	**.816**	.162	.090	.038	.030
z4o_Im_No	**.809**	.046	.198	.131	.127
z4s_Pe_Bu	**.808**	.043	.162	.099	.152
z4s-Su_In	**.805**	.080	.108	.097	.066
z4b_Qu_No	**.804**	-.010	.218	.176	.071
z4b_Pe_Bu	**.800**	-.007	.184	.119	.065
z4o_Sa_Un	**.797**	.034	.170	.131	.125
z4b_Sa_Un	**.795**	-.061	.180	.198	.107
z4o_Pl_Un	**.793**	.170	.215	.041	.020
z4s_Sa_Un	**.792**	-.005	.204	.097	.145
z4o_Qu_No	**.787**	-.006	.209	.166	.161
z4o_Pe_Bu	**.786**	.050	.243	.129	.191
z4s_Pl_Un	**.784**	.122	.234	.032	.094
z4b_Su_In	**.782**	.000	.136	.164	.093
z4b_Pl_Un	**.754**	.057	.279	.040	.033
z4o_Su_In	**.753**	.101	.141	.159	.106
z4b_Ma_Fe	**.740**	.014	.116	.218	.125
z4o_Ma_Fe	**.739**	.099	.101	.138	.071
z4o_Sm_La	**.728**	.057	.122	.136	.068
z4s_Ma_Fe	**.713**	.041	.072	.091	.039
z4s_Sm_La	**.707**	.083	.081	.128	.009
z4b_Sm_La	**.651**	.033	.082	.183	-.062
z2b_Im_No	**.523**	.043	.313	.212	.120
z2b_Go_De	**.501**	.165	.330	.198	-.002
z2s_Su_In	.313	.080	.233	.256	.051
z3s_Ap_Re	.119	**.883**	.112	.008	-.020
z3s_Pl_Un	.027	**.881**	.112	-.006	-.013
z3s_Pl_Up	.069	**.877**	.031	.052	.038
z3s-Pr_Ug	.082	**.877**	.041	.124	.066
z3o_Pl_Up	.009	**.870**	-.023	.081	.063
z3s_Col_Dr	.131	**.865**	.041	.013	-.007
z3s_At_Un	.041	**.854**	-.002	.088	.083
z3o_Pr_Ug	.026	**.853**	-.026	.126	.069
z3s_Go_De	.100	**.852**	-.002	.112	.091
z3s_In_Bo	.082	**.851**	.017	.123	.094
z3o_Go_De	-.005	**.841**	-.025	.138	.118
z3s_Ma_Ba	-.025	**.841**	-.070	.074	.091
z3o_Ap_Re	.161	**.838**	.077	.001	-.058
z3s_Co_Ba	-.043	**.836**	-.044	.095	.125
z3o_In_Bo	.054	**.833**	-.016	.124	.111

z3o_Co_Dr	.075	**.831**	-.023	.059	.050
z3o_Pl_Un	.060	**.831**	.123	-.014	-.063
z3b_Ap_Re	.247	**.829**	.165	.003	.018
z3b_Pl_Un	.156	**.829**	.174	-.010	.026
z3o_At_Un	-.023	**.827**	-.068	.072	.112
z3b_Pl_Up	.084	**.825**	.129	.085	.105
z3b_Pr_Ug	.136	**.825**	.085	.054	.125
z3b_At_Un	.096	**.823**	.040	.110	.118
z3o_Ma_Ba	-.060	**.809**	-.049	.140	.099
z3o_Co_Ba	-.001	**.806**	-.055	.148	.137
z3b_Co_Dr	.187	**.804**	.085	.084	.112
z3b_Ma_Ba	.000	**.800**	-.016	.097	.127
z3b_Co_Ba	-.015	**.794**	.028	.136	.091
z3s_Cl_Di	-.045	**.794**	-.105	.020	.051
z3o_Cl_Di	-.139	**.785**	-.020	.078	.082
z3b_In_Bo	.063	**.782**	.036	.179	.123
z3b_Cl_Di	.040	**.771**	-.015	.095	.121
z3o_Qu_No	.029	**.770**	-.070	.195	.203
z3b_Go_De	.122	**.762**	.055	.158	.166
z3s_Qu_No	.034	**.759**	-.010	.149	.186
z3o_It_No	.089	**.719**	.018	.140	.247
z3b_Qu_No	.097	**.681**	.028	.057	.255
z3s_Im_No	.189	**.646**	.111	.108	.307
z3b_Im_No	.190	**.561**	.086	.103	.330
z3o_Su_In	.127	**.544**	.041	.009	**.498**
z1s_Ap_Re	.173	.115	**.833**	.063	.038
z1s_Pr_Ug	.181	.089	**.808**	.134	.072
z1s_Pl_Up	.122	.066	**.807**	.130	.080
z1s_Co_Dr	.172	.089	**.802**	.157	.092
z1o_Pl_Un	.241	-.015	**.798**	.034	-.024
z1o_Ap_Re	.351	-.024	**.792**	.055	-.045
z1s_At_Un	.080	.084	**.788**	.042	.029
z1s_Pl_Un	.097	.145	**.786**	.023	.071
z1s_Im_No	.198	-.031	**.775**	.044	.069
z1o_In_Bo	.291	-.001	**.772**	.131	-1.659E-05
z1o_Go_De	.308	.013	**.772**	.113	.027
z1s_Cl_Di	.084	.094	**.760**	.069	-.023
z1s_Qu_No	.152	-.034	**.759**	-.013	.038
z1o_Pl_Up	.270	-.011	**.759**	.032	.052
z1s_Go_De	.215	.000	**.757**	.027	-.037
z1s_In_Bo	.197	.069	**.751**	.033	-.096
z1o_At_Un	.309	.006	**.743**	-.005	.015
z1s_Co_Ba	.118	.047	**.737**	.081	-.098
z1o_Im_No	.302	-.019	**.736**	.089	.009
z1o_Co_Ba	.148	-.035	**.732**	.092	-.009
z1o_Pr_Ug	.290	-.033	**.732**	.127	.074
z1o_Co_Dr	.322	-.061	**.727**	.119	.015
z1b_Pl_Un	.273	.033	**.719**	.035	.040
z1s_Ma_Ba	.064	.120	**.714**	.086	-.056
z1o_Cl_Di	.213	-.004	**.711**	.048	-.032
z1s_Sa_Un	.122	.104	**.693**	.012	-.069
z1o_Ma_Ba	.172	.017	**.691**	.079	-.021
z1o_Qu_No	.291	-.113	**.685**	.151	.048
z1b_Ap_Re	.300	.033	**.680**	.017	.032
z1b_Im_No	.282	-.010	**.679**	.091	.074
z1s_Su_In	.229	-.014	**.676**	.101	.074
z1s_Pe_Bu	.149	-.016	**.675**	.043	.052
z1b_Pr_Ug	.254	.027	**.672**	.026	.051
z1b_Pl_Up	.220	.074	**.667**	.057	.067
z1b_Qu_No	.287	-.001	**.663**	.064	.057
z1b_Co_Dr	.326	.043	**.661**	.029	.052
z1b_Go_De	.334	.003	**.645**	.069	.059
z1o_Su_In	.185	-.098	**.643**	.233	.022
z1b_In_Bo	.303	.016	**.641**	.077	.006
z1b_Co_Ba	.237	.116	**.640**	.031	-.034
z1b_At_Un	.263	.033	**.623**	.099	.091
z1b_Ma_Ba	.263	.087	**.616**	.022	-.009
z1o_Sa_Un	.137	-.139	**.615**	.234	.132
z1b_Cl_Di	.257	.020	**.611**	.064	-.034
z1b_Sa_Un	.288	.041	**.609**	.045	.023
z1s_Ma_Fe	.144	.025	**.606**	.172	.001
z1b_Su_In	.294	.042	**.601**	.017	.010
z1o_Pe_Bu	.181	-.132	**.585**	.158	.118
z1b_Pe_Bu	.252	.032	**.583**	.031	.040
z1o_Ma_Fe	.148	.064	**.484**	.143	-.185
z2b_Pe_Bu	.288	-.045	**.408**	.247	**.400**
z2o_Co_Ba	.144	.397	.146	**.731**	-.110

z2o_At_Un	.208	.302	.152	**.725**	-.079
z2o_Ma_Ba	.131	.414	.105	**.712**	-.094
z2o_Cl_Di	.117	.334	.005	**.709**	-.071
z2o_In_Bo	.261	.284	.264	**.707**	.007
z2o_Go_De	.326	.217	.222	**.670**	.074
z2o_Pr_Ug	.301	.313	.131	**.669**	-.030
z2o_Sa_Un	.251	.081	.113	**.665**	.161
z2o_Pl_Up	.242	.325	.169	**.659**	.005
z2o_Sm_La	.285	.075	.084	**.623**	.107
z2o_Co_Dr	.328	.309	.151	**.620**	-.094
z2o_Su_In	.335	.129	.099	**.582**	.122
z2o_Ma_Fe	.269	.148	.058	**.573**	.054
z2o_Ap_Re	.350	.394	.247	**.532**	-.184
z2o_Pl_Un	.256	**.402**	.294	**.520**	-.183
z2o_Pe_Bu	.323	-.110	.172	**.513**	.358
z2o_Qu_No	**.407**	.140	.198	**.502**	.046
z2o_Im_No	**.445**	.108	.271	**.491**	.140
z2s_Sm_La	.369	-.013	.219	.391	.148
z2b_Sa_Un	.319	.017	.273	.372	.218
z3s_Pe_Bu	.092	**.408**	.031	.010	**.722**
z3o_Pe_Bu	.102	**.414**	.091	.030	**.715**
z3s_Sm_La	.196	**.441**	.060	-.027	**.714**
z3s_Ma_Fe	.175	**.462**	-.007	-.049	**.710**
z3b_Sm_La	.165	**.416**	.055	-.019	**.685**
z3b_Ma_Fe	.193	**.456**	.055	.002	**.677**
z3b_Pe_Bu	.121	**.451**	-.010	-.071	**.676**
z3o_Sm_La	.113	**.423**	-.012	.056	**.668**
z3s_Sa_Un	.175	**.413**	.058	.050	**.657**
z3b_Sa_Un	.218	**.444**	.061	-.018	**.637**
z3o_Ma_Fe	.121	**.516**	-.006	-.013	**.591**
z3o_Sa_Un	.117	**.449**	.003	.084	**.587**
z3s_Su_In	.136	**.541**	.037	.029	**.568**
z3b_Su_In	.168	**.521**	.070	-.021	**.562**
z2b_Ma_Ba	.329	.217	.267	.207	-.087
z2b_Cl_Di	.323	.265	.195	.196	-.105
z2b_Pl_Up	.353	.285	.287	.170	-.027
z2b_At_Un	.379	.227	.243	.205	-.081
z2b_Co_Ba	.338	.257	.296	.217	-.101
z2b_Pr_Ug	**.500**	.202	.284	.178	.026
z2b_Co_Dr	**.529**	.182	.240	.246	.046
z2b_Ap_Re	**.478**	.191	.322	.283	.003
z2b_In_Bo	**.456**	.188	.348	.205	-.064
z2b_Pl_Un	.341	.229	.357	.270	-.012
z2s_At_Un	.369	.181	.187	.229	-.057
z2s_Pr_Ug	**.439**	.191	.235	.267	-.006
z2s_Pl_Up	**.412**	.214	.227	.209	.008
z2s_Co_Dr	**.474**	.237	.207	.258	.017
z2s_In_Bo	.330	.220	.242	.301	-.015
z2s_Ap_Re	**.446**	.354	.276	.260	-.110
z2s_Ma_Ba	.185	.246	.075	**.423**	.010
z2s_Cl_Di	.168	.216	.082	.363	.045
z2s_Pl_Un	.329	.328	.362	.265	-.068
z2s_Co_Ba	.214	.292	.102	**.426**	-.023
z1o_Sm_La	.018	-.070	**.467**	.181	-.159
z1s_Sm_La	.055	.016	**.485**	.075	-.151
z2s_Qu_No	.335	.039	.238	.267	.030
z2s_Sa_Un	.310	.044	.253	.347	.131
z2s_Ma_Fe	.294	-.005	.172	.307	.142
z2s_Im_No	**.408**	-.059	.313	.245	.193
z2s_Go_De	.390	.123	.276	.335	.036
z1b_Ma_Fe	.186	.258	**.442**	.123	-.180
z1b_Sm_La	.050	.258	**.404**	.134	-.324
z2b_Suf_In	.300	.162	.334	.199	.107
z2b_Ma_Fe	.343	.177	.388	.094	.204
z2s_Pe_Bu	.260	-.029	.187	.262	.224
z2b_Qu_No	**.437**	.101	.319	.205	.012
z2b_Sm_La	.263	.038	.240	.270	.127

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 17 iterations.

Source: Author (2010).

APPENDIX XIII: ALL ZONES COMBINED- COMPONENT SCORE COEFFICIENT MATRIX

Variable	Component				
	1	2	3	4	5
z1s_Pl_Un	-.008	.001	.051	-.001	.008
z1s_Ap_Re	-.007	-.001	.058	.004	.004
z1s_Co_Dr	-.006	-.007	.059	.027	.017
z1s_Pr_Ug	-.005	-.007	.054	.026	.022
z1s_Pl_Up	-.007	-.011	.047	.025	.030
z1s_At_Un	-.008	-.007	.041	.002	.013
z1s_Cl_Di	-.006	.001	.036	.009	.001
z1s_Ma_Ba	-.002	.005	.036	.006	-.015
z1s_Co_Ba	-.002	.006	.042	-.001	-.037
z1s_In_Bo	-.005	.008	.043	-.018	-.041
z1s_Go_De	-.005	.005	.044	-.021	-.027
z1s_Im_No	-.007	-.003	.047	-.020	-.001
z1s_Qu_No	-.006	-.005	.042	-.030	.013
z1s_Sa_Un	-.005	.003	.032	-.028	.005
z1s_Sm_La	.001	.010	.018	-.028	-.016
z1s_Ma_Fe	-.003	.012	.022	-.022	-.015
z1s_Su_In	-.003	-.003	.029	-.017	.009
z1s_Pe_Bu	-.003	.008	.029	-.025	-.018
z1o_Pl_Un	-.004	.003	.048	.004	-.005
z1o_Ap_Re	.001	.004	.048	.005	-.018
z1o_Co_Dr	-.002	.002	.044	.007	-.012
z1o_Pr_Ug	-.004	-.002	.041	.012	.006
z1o_Pl_Up	-.004	-.006	.042	-.003	.025
z1o_At_Un	-.001	-.001	.034	-.016	.008
z1o_Cl_Di	-.004	.003	.027	-.012	-.013
z1o_Ma_Ba	-.007	.005	.027	-.006	-.008
z1o_Co_Ba	-.008	.004	.031	-.005	-.009
z1o_In_Bo	-.003	.001	.039	.012	.005
z1o_Go_De	-.003	.005	.038	.004	-.003
z1o_Im_No	-.001	.011	.034	-.014	-.023
z1o_Qu_No	-.004	-.004	.020	-.004	.012
z1o_Sa_Un	-.010	-.015	.010	.011	.047
z1o_Sm_La	-.003	.001	-.002	-.004	-.006
z1o_Ma_Fe	-.001	.016	-.001	-.022	-.052
z1o_Su_In	-.006	-.005	.009	.009	.013
z1o_Pe_Bu	-.003	.003	.011	.002	-.005
z1b_Pl_Un	-.005	-.001	.022	-.005	.003
z1b_Ap_Re	-.003	.003	.018	-.012	-.013
z1b_Co_Dr	-.001	.003	.017	-.021	-.015
z1b_Pr_Ug	-.006	.002	.015	-.014	-.011
z1b_Pl_Up	-.008	.005	.019	-.006	-.010
z1b_At_Un	-.007	-.003	.014	.019	.012
z1b_Cl_Di	-.006	-.003	.011	.000	-.003
z1b_Ma_Ba	-.005	-.003	.012	-.002	.003
z1b_Co_Ba	-.007	.007	.010	-.008	-.018
z1b_In_Bo	-.007	-.005	.012	.013	.012
z1b_Go_De	-.004	-.005	.012	.011	.013
z1b_Im_No	-.007	-.003	.022	.012	.005
z1b_Qu_No	-.006	-.006	.015	-.007	.022
z1b_Sa_Un	-.006	-.002	.013	-.018	.023
z1b_Sm_La	-.005	.010	.007	-.008	-.021
z1b_Ma_Fe	-.002	.009	.008	.000	-.020
z1b_Su_In	-.001	-.006	.012	-.008	.019
z1b_Pe_Bu	-.001	.004	.010	-.010	-.003
z2s_Pl_Un	-.007	.004	.006	-.005	-.004
z2s_Ap_Re	-.001	.007	-.004	-.019	-.019
z2s_Co_Dr	-.003	-.009	-.003	-.026	.023
z2s_Pr_Ug	-.005	-.007	-.006	-.024	.007
z2s_Pl_Up	-.002	-.006	-.005	-.021	.014
z2s_At_Un	-.004	-.004	-.008	-.035	.004
z2s_Cl_Di	-.011	-.004	-.005	-.001	.014
z2s_Ma_Ba	-.012	-.011	-.007	.011	.023
z2s_Co_Ba	-.010	-.005	-.005	.009	.005
z2s_In_Bo	-.005	.000	.000	-.015	-.012
z2s_Go_De	-.004	-.001	.004	-.001	-.006
z2s_Im_No	-.004	-.006	-.001	-.016	-.001
z2s_Qu_No	-.003	.011	.001	-.024	-.036
z2s_Sa_Un	-.007	-.002	-.002	.000	.000
z2s_Sm_La	-.005	-.016	-.012	.023	.029
z2s_Ma_Fe	-.006	-.003	-.017	-.006	-.002
z2s_Su_In	-.004	-.002	-.021	-.023	-.014
z2s_Pe_Bu	-.001	-.001	-.010	-.008	-.002

z2o_Pl_Un	-.003	.008	.003	.076	-.025
z2o_Ap_Re	.000	.005	-.002	.074	-.018
z2o_Co_Dr	-.003	-.007	-.007	.075	.004
z2o_Pr_Ug	-.008	-.012	-.008	.091	.023
z2o_Pl_Up	-.010	-.013	-.004	.096	.031
z2o_At_Un	-.006	-.004	-.005	.113	-.011
z2o_Cl_Di	-.004	.002	-.008	.120	-.013
z2o_Ma_Ba	-.005	.010	-.003	.113	-.030
z2o_Co_Ba	-.006	.007	.002	.121	-.028
z2o_In_Bo	-.005	-.004	.015	.123	-.004
z2o_Go_De	-.003	-.013	.009	.111	.014
z2o_Im_No	-.001	-.005	.011	.060	-.009
z2o_Qu_No	.002	.005	.003	.057	-.038
z2o_Sa_Un	-.005	-.015	-.009	.103	.022
z2o_Sm_La	-.006	-.019	-.017	.096	.028
z2o_Ma_Fe	-.005	-.010	-.008	.080	.004
z2o_Su_In	-.007	-.020	-.013	.078	.032
z2o_Pe_Bu	-.005	-.026	-.008	.086	.049
z2b_Pl_Un	-.012	-.009	.004	.016	.011
z2b_Ap_Re	-.007	-.011	-.001	.011	.014
z2b_Co_Dr	-.004	-.013	-.004	-.004	.021
z2b_Pr_Ug	-.003	-.009	-.005	-.014	.020
z2b_Pl_Up	-.007	-.008	-.012	-.011	.029
z2b_At_Un	-.005	-.006	-.014	-.013	.004
z2b_Cl_Di	-.007	-.004	-.016	-.025	.015
z2b_Ma_Ba	-.009	-.007	-.007	-.016	.019
z2b_Co_Ba	-.006	-.003	-.001	-.006	.007
z2b_In_Bo	-.002	-.001	-.007	-.011	-.002
z2b_Go_De	.003	.000	-.006	-.008	-.008
z2b_Im_No	.004	-.002	-.007	-.002	-.007
z2b_Qu_No	-.003	.000	-.008	-.016	-.008
z2b_Sa_Un	-.010	-.009	-.009	.019	.021
z2b_Sm_La	-.004	.001	-.008	.003	-.001
z2b_Ma_Fe	-.004	.007	.001	-.034	-.007
z2b_Suf_In	-.005	.004	.002	-.016	-.015
z2b_Pe_Bu	-.010	-.009	.009	.010	.032
z3s_Pl_Un	.000	.043	.004	-.021	-.024
z3s_Ap_Re	.002	.045	.001	-.023	-.032
z3s_Col_Dr	.003	.042	-.002	-.028	-.025
z3s-Pr_Ug	-.001	.040	-.001	-.008	-.017
z3s_Pl_Up	.001	.039	.004	-.012	-.015
z3s_At_Un	.001	.040	-.001	-.003	-.018
z3s_Cl_Di	.001	.036	-.004	-.016	-.026
z3s_Ma_Ba	.000	.041	-.002	-.014	-.023
z3s_Co_Ba	-.001	.040	-.002	-.012	-.017
z3s_In_Bo	.003	.042	-.001	.000	-.022
z3s_Go_De	.003	.039	-.001	-.001	-.017
z3s_Im_No	.001	.024	.006	.007	.024
z3s_Qu_No	-.002	.032	-.005	-.005	-.002
z3s_Sa_Un	-.006	-.008	.001	.001	.117
z3s_Sm_La	-.009	-.010	.001	-.011	.129
z3s_Ma_Fe	-.006	-.006	-.005	-.011	.126
z3s_Su_In	-.005	.004	-.006	.008	.093
z3s_Pe_Bu	-.009	-.001	-.003	-.005	.098
z3o_Pl_Un	.002	.040	.009	-.015	-.024
z3o_Ap_Re	.005	.041	.003	-.020	-.029
z3o_Co_Dr	.000	.037	-.003	-.020	-.020
z3o_Pr_Ug	-.002	.037	-.002	-.007	-.014
z3o_Pl_Up	-.001	.040	-.005	-.005	-.018
z3o_At_Un	-.003	.035	-.003	-.020	-.008
z3o_Cl_Di	-.003	.028	.009	-.010	-.019
z3o_Ma_Ba	-.001	.032	.006	-.006	-.031
z3o_Co_Ba	.001	.030	-.001	-.012	-.028
z3o_In_Bo	.003	.030	-.002	-.012	-.029
z3o_Go_De	.000	.030	-.004	-.002	-.021
z3o_It_No	.002	.021	-.002	.007	.001
z3o_Qu_No	.000	.023	-.006	.010	-.014
z3o_Sa_Un	.000	-.009	.002	.016	.080
z3o_Sm_La	-.002	-.015	-.004	.013	.103
z3o_Ma_Fe	-.003	-.003	.001	-.015	.073
z3o_Su_In	-.001	.000	.001	-.007	.051
z3o_Pe_Bu	-.007	-.005	.004	.003	.085
z3b_Pl_Un	.001	.031	.003	-.019	-.021
z3b_Ap_Re	.004	.031	.002	-.020	-.026
z3b_Co_Dr	.000	.025	.000	-.013	-.015
z3b_Pr_Ug	-.002	.029	.001	-.015	-.019
z3b_Pl_Up	-.002	.032	.004	-.010	-.024

z3b_At_Un	-.001	.030	-.001	-.002	-.021
z3b_Cl_Di	-.001	.024	-.001	-.007	-.016
z3b_Ma_Ba	-.002	.027	-.001	-.015	-.021
z3b_Co_Ba	-.002	.029	.007	-.005	-.030
z3b_In_Bo	.000	.028	.001	.007	-.026
z3b_Go_De	.000	.026	-.002	.004	-.014
z3b_Im_No	.001	.021	-.002	-.004	-.006
z3b_Qu_No	.001	.022	.000	-.012	-.005
z3b_Sa_Un	-.002	-.007	.005	-.001	.084
z3b_Sm_La	-.007	-.015	.003	-.001	.122
z3b_Ma_Fe	-.005	-.011	.005	.002	.099
z3b_Su_In	-.007	-.003	.001	-.006	.077
z3b_Pe_Bu	-.004	-.003	-.005	-.023	.080
z4s_Pl_Un	.024	.000	-.002	-.001	.016
z4s_Ap_Re	.026	-.001	-.001	.001	.010
z4s_Co_Dr	.027	-.002	-.005	-.006	-.004
z4s_Pr_Ug	.028	-.002	-.008	.003	-.005
z4s_Pl_Up	.028	.000	-.007	-.005	-.013
z4s_At_Un	.031	.002	-.007	-.005	-.017
z4s_Cl_Di	.033	.005	-.001	-.004	-.022
z4s_Ma_Ba	.032	.007	-.003	-.008	-.031
z4s_Co_Ba	.032	.005	-.002	.010	-.028
z4s_In_Bo	.031	.004	-.001	.000	-.017
z4s_Go_De	.031	.003	-.001	.001	-.012
z4s_Im_No	.026	-.003	-.006	-.008	.010
z4s_Qu_No	.025	-.003	-.005	.003	.016
z4s_Sa_Un	.024	-.007	-.003	.003	.015
z4s_Sm_La	.026	.005	-.004	.003	-.007
z4s_Ma_Fe	.025	.012	-.003	-.010	-.031
z4s-Su_In	.028	.004	-.009	-.008	-.013
z4s_Pe_Bu	.024	-.003	-.005	.002	.013
z4o_Pl_Un	.024	.006	-.004	-.015	-.015
z4o_Ap_Re	.026	.004	-.007	-.020	-.015
z4o_Co_Dr	.027	.003	-.005	-.015	-.022
z4o_Pr_Ug	.025	.001	-.004	-.009	-.014
z4o_Pl_Up	.027	-.001	-.004	-.016	-.012
z4o_At_Un	.026	-.001	-.004	-.004	-.009
z4o_Cl_Di	.027	.000	-.004	.002	-.015
z4o_Ma_Ba	.027	-.001	-.009	-.005	-.009
z4o_Co_Ba	.026	.004	-.001	-.017	-.021
z4o_In_Bo	.024	.004	-.001	-.023	-.020
z4o_Go_De	.024	.000	-.005	-.011	-.014
z4o_Im_No	.022	.000	-.001	.004	-.008
z4o_Qu_No	.020	-.003	-.003	.006	.007
z4o_Sa_Un	.021	-.001	-.008	-.004	.001
z4o_Sm_La	.020	-.003	-.011	.004	.022
z4o_Ma_Fe	.022	.002	-.006	-.010	-.002
z4o_Su_In	.020	-.005	-.006	.011	.016
z4o_Pe_Bu	.018	-.009	-.005	.015	.031
z4b_Pl_Un	.022	-.004	-.007	-.017	.019
z4b_Ap_Re	.023	-.002	-.008	-.017	.009
z4b_Co_Dr	.026	-.001	-.009	-.030	-.003
z4b_Pr_Ug	.027	-.002	-.008	-.022	-.002
z4b_Pl_Up	.026	.000	-.007	-.009	-.005
z4b_At_Un	.027	.004	-.006	-.029	-.015
z4b_Cl_Di	.027	.008	-.005	-.024	-.030
z4b_Ma_Ba	.027	.000	-.004	-.010	-.005
z4b_Co_Ba	.028	-.003	-.005	-.014	-.002
z4b_In_Bo	.027	-.001	-.012	-.023	-.007
z4b_Go_De	.028	.002	-.010	-.017	-.015
z4b_Im_No	.026	-.005	-.006	-.003	.007
z4b_Qu_No	.023	-.003	-.007	.008	.008
z4b_Sa_Un	.022	-.007	-.013	.011	.016
z4b_Sm_La	.026	.005	-.008	.002	-.017
z4b_Ma_Fe	.024	.002	-.005	.014	-.007
z4b_Su_In	.025	.001	-.006	.012	-.002
z4b_Pe_Bu	.026	.005	.000	.007	-.020

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
Source: Author (2010).

APPENDIX XIV: FACTOR ANALYSIS MODEL

Mathematically, factor analysis is similar to multiple regression analysis, in that each variable is expressed as a linear combination of underlying factors (Malhotra, 2004). The amount of variance a variable shares with all other variables included in the analysis is referred to as the communality. The covariation among the variables is described in terms of a smaller number of common factors plus a unique factor for each variable. If the variables are standardized, the factor model may be represented as:

$$X_i=A_{i1}F_1+A_{i2}F_2+A_{i3}F_3+\ldots+A_{im}F_m+V_iU_i$$

where,

X_i=ith standardised variable

A_{ij}=standardised multiple regression coefficient of variable i on common factor j

F=common factor

V_i=standardised regression coefficient of variable i on unique factor i

U_i=The unique factor for variable i

m=number of common factors

As shown by Malhotra (2004), the unique factors are uncorrelated with each other and with the common factors. The common factors themselves can be expressed as linear combinations of the observed variables:

$$F_i=W_{i1}X_1+W_{i2}X_2+W_{i3}X_3+\ldots+W_{ik}X_k$$

where,

F_i=estimate of the ith factor

W_i=weight or factor score coefficient

$_K$=number of variables

Weights or factor scores can be selected so that the first factor explains the largest portion of the total variance. The second set of weights can be selected so that the second factor accounts for most of the residual variance, subject to being uncorrelated with the first factor. This principle could be applied to selecting additional weights for the additional factors. Thus, factors can be estimated so that their factor scores, unlike the values in the original variables, are not correlated. Furthermore, the first factor accounts for the highest variance in the data, the second factor the second highest and so on.

Conducting Factor Analysis

Exploratory factor analysis is a statistical technique that is used to reduce data to a smaller set of summary variables and to explore the underlining theoretical structure of the phenomena. Exploratory factor analysis is used to identify the structure of the relationship between the variable and the respondent. Exploratory factor analysis can be performed by using the following two methods:

1. R-type factor analysis: In exploratory factor analysis, when factors are calculated from the correlation matrix, then it is called R-type factor analysis.
2. Q-type factor analysis: In exploratory factor analysis, when factors are calculated from the individual respondent, then it said to be Q-type factor analysis.

There are two methods for driving factor in exploratory factor analysis. These two methods are as follows:

1. Principle component factor analysis method: In exploratory factor analysis, this method is used when we need to drive the minimum number of factors and explain the maximum portion of variance in the original variable.

2. Common factor analysis: In exploratory factor analysis, this method is used when the researchers do not know the nature of the factor to be extracted and the common error variance.

There are seven basic steps to performing an Exploratory Factor Analysis *(Summary from DeCoster, 1998)*

1. **Collect measurements.** You need to measure your variables on the same (or matched) experimental units.
2. **Obtain the correlation matrix.** You need to obtain the correlations (or covariances) between each of your variables.
3. **Select the number of factors for inclusion.** Sometimes you have a specific hypothesis that will determine the number factors you will include, while other times you simply want your final model to account for as much of the covariance in your data with as few factors as possible. If you have *k* measures, then you can at most extract *k* factors. There are a number of methods to determine the optimal number of factors by examining your data. The *Kaiser criterion* states that you should use a number of factors equal to the number of the eigenvalues of the correlation matrix that are greater than one. The *Scree test* states that you should plot the eigenvalues of the correlation matrix in descending order, and then use a number of factors equal to the number of eigenvalues that occur prior to the last major drop in eigenvalue magnitude.
4. **Extract your initial set of factors.** You must submit your correlations or covariances into a computer program to extract your factors. This step is too complex to reasonably be done by hand. There are a number of different extraction methods,

including maximum likelihood, principal component, and principal axis extraction. The best method is generally maximum likelihood extraction, unless you seriously lack multivariate normality in your measures.

5. **Rotate your factors to a final solution.** For any given set of correlations and number of factors there are actually an infinite number of ways that you can define your factors and still account for the same amount of covariance in your measures. Some of these definitions, however, are easier to interpret theoretically than others. By rotating your factors, you attempt to find a factor solution that is equal to that obtained in the initial extraction but which has the simplest interpretation. There are many different types of rotation, but they all try make your factors each highly responsive to a small subset of your items (as opposed to being moderately responsive to a broad set). There are two major categories of rotations, *orthogonal rotations*, which produce uncorrelated factors, and *oblique rotations*, which produce correlated factors. The best orthogonal rotation is widely believed to be Varimax. Oblique rotations are less distinguishable, with the three most commonly used being Direct Quartimin, Promax, and Harris-Kaiser Orthoblique.
6. **Interpret your factor structure.** Each of your measures will be linearly related to each of your factors. The strength of this relationship is contained in the respective *factor loading*, produced by your rotation. This loading can be interpreted as a standardized regression coefficient, regressing the factor on the measures. You define a factor by considering the possible theoretical constructs that could be responsible for the observed pattern of positive and negative loadings. To ease interpretation you have the option of multiplying all of the loadings for a given factor by

-1. This essentially reverses the scale of the factor, allowing you, for example, to turn an *unfriendliness* factor into a *friendliness* factor.

7. **Construct factor scores for further analysis.** If you wish to perform additional analyses using the factors as variables you will need to construct factor scores. The score for a given factor is a linear combination of all of the measures, weighted by the corresponding factor loading. Sometimes factor scores are idealized, assigning a value of 1 to strongly positive loadings, a value of -1 to strongly negative loadings, and a value of 0 to intermediate loadings. These factor scores can then be used in analyses just like any other variable, although you should remember that they will be strongly collinear with the measures used to generate them.

This process is cited from: DeCoster, J. (1998). Overview of Factor Analysis*. Retrieved July, 20, 2010 from http://www.stat-help.com/notes.html*

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Appendix XV: The Venice Charter

INTERNATIONAL CHARTER FOR THE CONSERVATION AND RESTORATION OF MONUMENTS AND SITES

(THE VENICE CHARTER)

[Preamble]

Imbued with a message from the past, the historic monuments of generations of people remain to the present day as living witnesses of their age-old traditions. People are becoming more and more conscious of the unity of human values and regard ancient monuments as a common heritage. The common responsibility to safeguard them for future generations is recognized. It is our duty to hand them on in the full richness of their authenticity.It is essential that the principles guiding the preservation and restoration of ancient buildings should be agreed and be laid down on an international basis, with each country being responsible for applying the plan within the framework of its own culture and traditions.

By defining these basic principles for the first time, the Athens Charter of 1931 contributed towards the development of an extensive international movement which has assumed concrete form in national documents, in the work of ICOM and UNESCO and in the establishment by the latter of the International Centre for the Study of the Preservation and the Restoration of Cultural Property. Increasing awareness and critical study have been brought to bear on problems which have continually become more complex and varied; now the time has come to examine the Charter afresh in order to make a thorough study of the principles involved and to enlarge its scope in a new document.Accordingly, the IInd International Congress of Architects and Technicians of Historic Monuments, which met in Venice from May 25th to 31st 1964, approved the following text:

DEFINITIONS

ARTICLE 1. The concept of a historic monument embraces not only the single architectural work but also the urban or rural setting in which is found the evidence of a particular civilization, a significant development or an historic event. This applies not only to great works of art but also to more modest works of the past which have acquired cultural significance with the passing of time.

ARTICLE 2. The conservation and restoration of monuments must have recourse to all the sciences and techniques which can contribute to the study and safeguarding of the architectural heritage.

AIM

ARTICLE 3. The intention in conserving and restoring monuments is to safeguard them no less as works of art than as historical evidence.

CONSERVATION

ARTICLE 4. It is essential to the conservation of monuments that they be maintained on a permanent basis.

ARTICLE 5. The conservation of monuments is always facilitated by making use of them for some socially useful purpose. Such use is therefore desirable but it must not change the lay-out or decoration of the building. It is within these limits only that modifications demanded by a change of function should be envisaged and may be permitted.

ARTICLE 6. The conservation of a monument implies preserving a setting which is not out of scale. Wherever the traditional setting exists, it must be kept. No new construction, demolition or modification which would alter the relations of mass and color must be allowed.

ARTICLE 7. A monument is inseparable from the history to which it bears witness and from the setting in which it occurs. The moving of all or part of a monument cannot be allowed except where the safeguarding of that monument demands it or where it is justified by national or international interest of paramount importance.

ARTICLE 8. Items of sculpture, painting or decoration which form an integral part of a monument may only be removed from it if this is the sole means of ensuring their preservation.

RESTORATION

ARTICLE 9. The process of restoration is a highly specialized operation. Its aim is to preserve and reveal the aesthetic and historic value of the monument and is based on respect for original material and authentic documents. It must stop at the point where conjecture begins, and in this case moreover any extra work which is indispensable must be distinct from the architectural composition and must bear a contemporary stamp. The restoration in any case must be preceded and followed by an archaeological and historical study of the monument.

ARTICLE 10. Where traditional techniques prove inadequate, the consolidation of a monument can be achieved by the use of any modem technique for conservation and construction, the efficacy of which has been shown by scientific data and proved by experience.

ARTICLE 11. The valid contributions of all periods to the building of a monument must be respected, since unity of style is not the aim of a restoration. When a building includes the superimposed work of different periods, the revealing of the underlying state can only be justified in exceptional circumstances and when what is removed is of little interest and the material which is brought to light is of great historical, archaeological or aesthetic value, and its state of preservation good enough to justify the action. Evaluation of the importance of the elements involved and the decision as to what may be destroyed cannot rest solely on the individual in charge of the work.

ARTICLE 12. Replacements of missing parts must integrate harmoniously with the whole, but at the same time must be distinguishable from the original so that restoration does not falsify the artistic or historic evidence.

ARTICLE 13. Additions cannot be allowed except in so far as they do not detract from the interesting parts of the building, its traditional setting, the balance of its composition and its relation with its surroundings.

HISTORIC SITES

ARTICLE 14. The sites of monuments must be the object of special care in order to safeguard their integrity and ensure that they are cleared and presented in a seemly manner. The work of conservation and restoration carried out in such places should be inspired by the principles set forth in the foregoing articles.

EXCAVATIONS

ARTICLE 15. Excavations should be carried out in accordance with scientific standards and the recommendation defining international principles to be applied in the case of archaeological excavation adopted by UNESCO in 1956.

Ruins must be maintained and measures necessary for the permanent conservation and protection of architectural features and of objects discovered must be taken. Furthermore, every means must be taken to facilitate the understanding of the monument and to reveal it without ever distorting its meaning.

All reconstruction work should however be ruled out "a priori." Only anastylosis, that is to say, the reassembling of existing but dismembered parts can be permitted. The material used for integration should always be recognizable and its use should be the least that will ensure the conservation of a monument and the reinstatement of its form.

PUBLICATION

ARTICLE 16. In all works of preservation, restoration or excavation, there should always be a precise documentation in the form of analytical and critical reports, illustrated with drawings and photographs. Every stage of the work of clearing, consolidation, rearrangement and integration, as well as technical and formal features identified during the course of the work, should be included. This record should be placed in the archives of a public institution and made available to research workers. It is recommended that the report should be published.

Source: http://www.icomos.org/venice_charter.html Accessed 01 October 2010 at 0425 hrs

APPENDIX XVI: THE BURRA CHARTER

THE AUSTRALIA ICOMOS CHARTER FOR THE CONSERVATION OF PLACES OF CULTURAL SIGNIFICANCE

(THE BURRA CHARTER)

Preamble

Having regard to the International Charter for the Conservation and Restoration of Monuments and Sites (Venice 1966), and the Resolutions of 5th General Assembly of ICOMOS (Moscow 1976), the following Charter has been adopted by Australia ICOMOS.

Definitions

Article 1
For the purpose of this Charter:

1.1 Place means site, area, building or other work, group of buildings or other works together with pertinent contents and surroundings.

1.2 Cultural significance means aesthetic, historic, scientific or social value for past, present or future generations.

1.3 Fabric means all the physical material of the place.

1.4 Conservation means all the processes of looking after a place so as to retain its cultural significance. It includes maintenance and may according to circumstances include preservation, restoration, reconstruction and adaption and will be commonly a combination of more than one of these.

1.5 Maintenance means the continuous protective care of the fabric, contents and setting of a place, and is to be distinguished from repair. Repair involves restoration or reconstruction and it should be treated accordingly.

1.6 Preservation means maintaining the fabric of a place in its existing state and retarding deterioration.

1.7 Restoration means returning the EXISTING fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

1.8 Reconstruction means returning a place as nearly as possible to a known state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction which are outside the scope of this Charter.

1.9 Adaption means modifying a place to suit proposed compatible uses.

1.10 Compatible use means a use which involves no change to the culturally significant fabric, changes which are substantially reversible, or changes which require a minimal impact.

Conservation principles

Article 2

The aim of conservation is to retain or recover the cultural significance of a place and must include provision for its security, its maintenance and its future.

Article 3

Conservation is based on a respect for the existing fabric and should involve the least possible physical intervention. It should not distort the evidence provided by the fabric.

Article 4

Conservation should make use of all the disciplines which can contribute to the study and safeguarding of a place. Techniques employed should be traditional but in some circumstances they may be modern ones for which a firm scientific basis exists and which have been supported by a body of experience.

Article 5

Conservation of a place should take into consideration all aspects of its cultural significance without unwarranted emphasis on any one at the expense of others.

Article 6

The conservation policy appropriate to a place must first be determined by an understanding of its cultural significance and its physical condition.

Article 7

The conservation policy will determine which uses are compatible.

Article 8

Conservation requires the maintenance of an appropriate visual setting, e.g. form, scale, colour, texture and materials. No new construction, demolition or modification which would adversely affect the settings which adversely affect appreciation or enjoyment of the place should be excluded.

Article 9

A building or work should remain in its historical location. The moving of all or part of a building or work is unacceptable unless this is the sole means of ensuring its survival.

Article 10

The removal of contents which form part of the cultural significance of the place is unacceptable unless it is the sole means of ensuring their security and preservation. Such contents must be returned should changed circumstances make this practicable.

Conservation processes

PRESERVATION

Article 11

Preservation is appropriate where the existing state of the fabric itself constitutes evidence of specific cultural significance, or where insufficient evidence is available to allow other conservation processes to be carried out.

Article 12

Preservation is limited to the protection, maintenance and where necessary, the stabilisation of the existing fabric but without the distortion of its cultural significance.

RESTORATION

Article 13

Restoration is appropriate only if there is sufficient evidence of an earlier state of the fabric and only if returning the fabric to that state recovers the cultural significance of the place.

Article 14

Restoration should reveal anew culturally significant aspects of the place. It is based on respect for all the physical, documentary and other evidence and stops at the point where conjecture begins.

Article 15

Restoration is limited to the reassembling of displaced components or removal of accretions in accordance with Article 16.

Article 16

The contributions of all periods to the place must be respected. If a place includes the fabric of different periods, revealing the fabric of one period at the expense of another can only be justified when what is removed is of slight cultural significance and the fabric which is to be revealed is of much greater cultural significance.

RECONSTRUCTION

Article 17

Reconstruction is appropriate where a place is incomplete through damage or alteration and where it is necessary for its survival, or where it recovers the cultural significance of the place as a whole.

Article 18

Reconstruction is limited to the completion of a depleted entity and should not constitute the majority of the fabric of a place.

Article 19

Reconstruction is limited to the reproduction of fabric, the form of which is known from physical and/or documentary evidence. It should be identifiable on close inspection as being new work.

ADAPTION

Article 20

Adaption is acceptable where the conservation of the place cannot otherwise be achieved, and where the adaption does not substantially detract from its cultural significance.

Article 21

Adaption must be limited to that which is essential to a use for the place, determined in accordance with Articles 6 and 7.

Article 22

Fabric of cultural significance unavoidably removed in the process of adaption must be kept safely to enable its future reinstatement.

Conservation practice

Article 23

Work on a place must be preceded by professionally prepared studies of the physical, documentary and other evidence, and the existing fabric recorded before any disturbance of the place.

Article 24

Study of a place by any disturbance of the fabric or by archaeological excavation should be undertaken where necessary to provide data essential for decisions on the conservation of the place and/or to secure evidence about to be lost or made inaccessible through necessary conservation or other unavoidable action. Investigation of a place for any other reason which requires physical disturbance and which adds substantially to a scientific body of knowledge may be permitted, provided that it is consistent with the conservation policy for the place.

Article 25

A written statement of conservation policy must be professionally prepared setting out the cultural significance, physical condition and proposed conservation process together with justification and supporting evidence, including photographs, drawings and all appropriate samples.

Article 26

The organisation and individuals responsible for policy decisions must be named and specific responsibility taken for each such decision.

Article 27

Appropriate professional direction and supervision must be maintained at all stages of the work and a log kept of new evidence and additional decisions recorded as in Article 25 above.

Article 28

The records required by Articles 23, 25, 26 and 27 should be placed in a permanent archive and made publicly available.

Article 29

The items referred to in Article 10 and Article 22 should be professionally catalogued and protected.

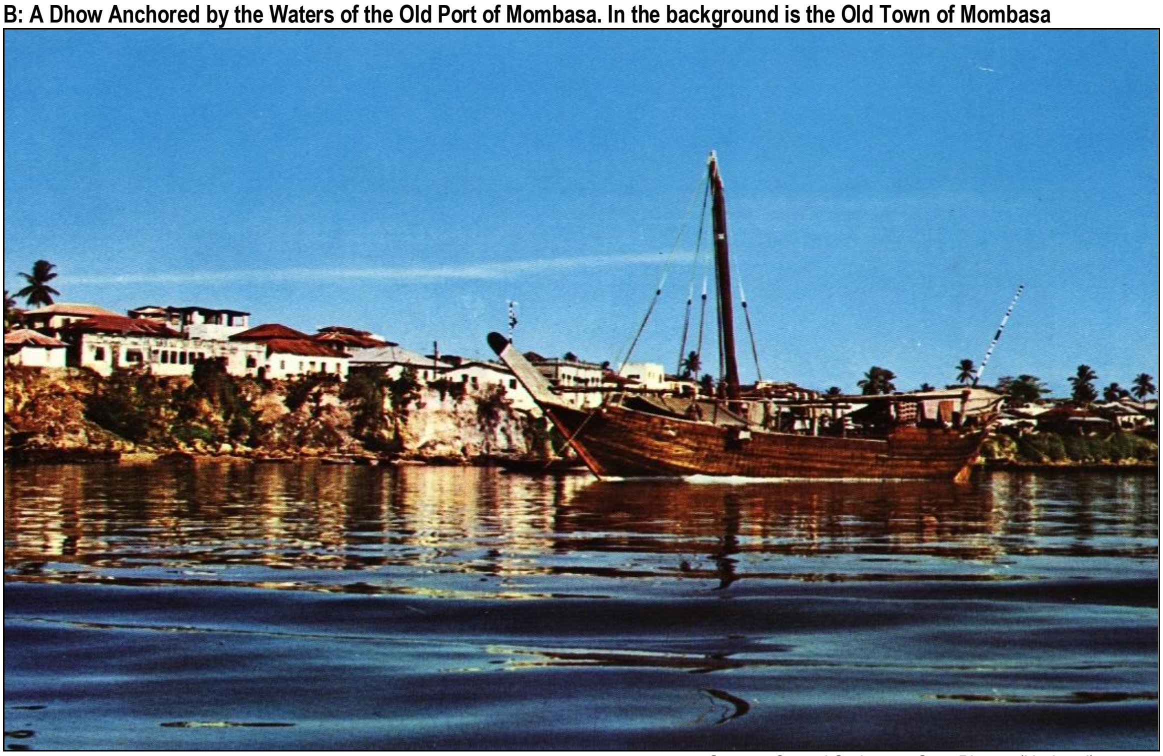
Source: http://www.icomos.org/burra_charter.html Accessed 01 October 2010 at 0425 hrs

APPENDIX XVII: PRE1982 POST CARD PHOTOGRAPHS OF OLD TOWN OF MOMBASA

A: A Panoramic View of Dhows by the Old Port of Mombasa

Source: Crystal Springs, 7 Star, Picture (Undated).

B: A Dhow Anchored by the Waters of the Old Port of Mombasa. In the background is the Old Town of Mombasa



Source: Crystal Springs, 7 Star, Picture (Undated).

C: Dhows at the Old Port of Mombasa

Source: Crystal Springs, 7 Star, Picture (Undated).

APPENDIX XVIII: SPECIFIC DESIGN GUIDELINES

1. General Streetscape Context

It is important that alterations, new additions or new buildings are *good neighbours* and are in keeping with the character of the street and locality. Understanding this context helps when designing new buildings or alterations. The basic principles to be observed are:

i. The scale, height, bulk and proportions of the traditional buildings in the street should be maintained.

ii. Extensions should not overwhelm the original buildings. It may necessitate that two separate buildings with a linkage be created, as this retains the integrity of the original.

iii. The front facades of the buildings in the conservation area should not be altered. Additions are best to the rear.

iv. The floor levels should be kept similar to adjoining buildings.

v. Replica copies of heritage buildings should be avoided for infill development, but follow proportions and scale.

vi. New building and extensions should be kept simple. An amalgam of features from different eras, or the addition of historic features to new buildings should be eschewed since they do not allow the various transformations of a typology to take place. In any case, they represent false authenticity. Attempts must be made to incorporate the true vernacular, not the so called pseudo-vernacular, which lacks local characteristics.

2. Rehabilitation and Alterations

Materials: Match the original as closely as possible.

Most of the older buildings in the Old Town of Mombasa are built of coral blocks or rags for the walls. Newer ones have utilised cement blocks or reinforced concrete. Importantly, missing or deteriorated materials should be replaced with recycled or new materials which match the original as closely as possible with regard to type, style, shape, texture, composition, size of units, placement and detailing. Imitation materials are inappropriate. It is important to use the right materials to maintain integrity and character of heritage buildings and streetscapes. Imitation or synthetic materials such as aluminum or vinyl siding, imitation stone or plastic are inappropriate for use in Old Town of Mombasa. So are the now common steel casement windows.

Openings: Keep the eyes of the building open.

Windows and doors establish the character of the elevation and should not be generally altered in their proportions or details, especially where they are a conspicuous element of design. The strong vertical proportions of windows should be encouraged in rehabilitations and additions. The Lamu, Indian and Zanzibari doors inherent in Old Town of Mombasa should also be promoted. The depth to which window frames are recessed in walls is a varying historical feature of importance and greatly affects the character of a building and this too should be respected.

Roof pitch and form: Maintain the roofline.

Roof pitch has a major impact on the appearance of a building. The historic area has distinctive traditional roof forms including hipped roofs, flat roofs and some gables. Although there are a variety of roof shapes, there is a general consistency of scale, height and bulk.

The existing roofline and architectural features that give a building character such as decorated fascia boards, crenellations, and brackets should be respected. Roofs visible from public places should be coloured to match the original. The roof pitch, proportion and orientation to the street should be compatible with traditional roofs in the surrounding streetscape or precinct, as the case may be.

Ornamentation: Retain the distinctive detailing.

Significant architectural features such as the carved door frames, door centre pieces, carved balcony railings and other ornamental elements should be preserved. These distinctive features help identify and distinguish the buildings within the Old Town of Mombasa. When rehabilitating a building that has already been altered, two approaches are possible: where the design of the original ornamentation can be accessed through photographs, remaining building materials, or identical nearby buildings, the new details should match the original as closely as possible; if it is not possible to determine the design of the original feature, the new should be simple and contemporary in design and should not attempt to create an image of what *might have been*.

Attachments: Avoid uncharacteristic features.

The addition of out of character features should be avoided. If shutters are appropriate, they should be the right size and should meet in the middle of the window. Other outside attachments, such as light fixtures should be simple and modern. They should not call attention to themselves.

Utility Systems: Place them inconspicuously.

Water and electricity meters, antennas, air conditioning units and the like should be inconspicuously placed, avoiding installation on the street façade whenever possible. Poorly thought out introduction of services, such as mains electricity, telephone or water can be detrimental to the structure, appearance and character of a building. Long runs of surface wiring and any external water piping should be avoided unless chasing-in would destroy the historic fabric. New services in historic interiors should not entail alterations to other features such as doors and windows.

Cleaning: Never sand blast.

Sandblasting and aggressive scrubbing, especially of coral walls should never be undertaken. Cleaning must be by the gentlest method possible, otherwise the patina of age would be lost. Gently scrubbing with a natural bristle brush is recommended. Care must also be taken when removing vegetable matter on roofs and walls.

Repointing masonry: Use proper mortar and joint.

Where lime based mortar was used for joints, the Portland-cement based mortar of today should not be used, since the walls will crack. When pointing an existing wall, an attempt should be made to match the lime content, colour and consistency of the existing mortar as much as possible, and further match the type and thickness of the joint.

Water repellent coatings: Avoid if possible.

Most of the buildings in Old Town of Mombasa have survived without the need for water-repellent coatings. Water damage on the buildings is usually the result of failing roofs, of faulty gutters and down pipes, deteriorated mortar etc. and therefore such repellents should be avoided and the actual cause of dampness identified and corrected.

Painting: Repaint if appropriate.

Not all buildings in the Old Town of Mombasa require painting, as they were finished in lime plaster. Oil based paints are not appropriate and always flake off. If necessary, water based paints may be used. The paint colour, where used, should enhance the architectural style and ornamentation. It should always be compatible with the historic area and appropriate for the style of the particular building.

3. New Construction

Materials: Use natural materials when possible.

Materials should be similar in texture, scale, and style to the building materials found in the urban historic district. Depending on the particular precinct, the designer should match the new building to the existing as is practically possible. However, facsimiles of existing developments must be avoided. Building materials must also not be falsified by being made to look older or imitate the traditional materials. Honesty in construction is encouraged.

Scale and Massing: Match the precinct.

The building typologies in Old Town of Mombasa vary according to precincts. The scale and massing of new buildings and its individual elements i.e. windows, doors, roof, ornamentation, should be compatible with the forms found among the existing buildings. The ratio of the wall to surface openings, and of the width and height of windows and doors should be consistent with the adjacent buildings. Glass and curtain walls along the front façade should be avoided, and large, flat walls that are unbroken by openings or setbacks on the front façade should be discouraged.

Height: Consider the surroundings.

New construction should not differ significantly in height from the nearby buildings. A new building should not exceed the height of the tallest abutting building by more than one storey at most. Extreme care must be exercised before this is executed lest the street or precinct is damaged irretrievably. The contours of the building site will also restrict the height of a new building or may permit the construction of a larger building.

Detailing: Do not construct insipid buildings.

The detailing of new buildings should be similar to the detailing found on the other buildings in the precinct.

These can include the following:

i. A hipped, gable or flat roof depending on location
ii. A decorated fascia or crenellated parapet wall, or any other form of decoration at the roofline or gable end.
iii. Carved doors, balconies, ornate detailing at windows, brackets etc.
iv. A veranda with appropriately scaled columns

Setbacks and Orientation: Stay in Line with the Neighbouring Buildings

The setbacks should be consistent with the adjoining development and should not intrude into the streetscape. They should also respect the topographic and the development patterns in the area.

4. Additions

Compatibility: Consider the addition as new construction.

In general, additions to existing buildings should follow the guidelines for new construction in terms of materials, form, scale, height, detailing and siting.

Design: Reference to be made to the architecture of the original building.

Additions should specifically refer to the architecture of the original building, but should not try to duplicate its style or appear to have been built at the same time as the original building. The addition should also be compatible, in a more general way, to the adjacent buildings.

Identity: Do not overpower the original building.

If an addition is to a listed building, the addition should take a respectful *back seat* to it and not overpower the original. An addition may be higher than the original building if the site condition allow, provided that the original building remain dominant.

Connections: To be kept simple

Connections of the additions to the original building should be designed so that they do not detract from either structure. Significant architectural features of the original building should not be destroyed, removed, or obscured by the addition. A *gap* may be used in order to distinguish the old and the new. This can be achieved through the careful placement of the new structure in careful juxtaposition to the historic one, so that a visual break with a shadow is created.

5. Demolitions

Demotions should be ordered only in extreme circumstances due to an unsafe or dangerous condition which constitutes an emergency. Sometimes, when the structure cannot be reused nor a reasonable economic return from the use of all or part of the deteriorated building, demolition may be considered. An inappropriate addition should be considered for demolition, if the demolition will not adversely affect another significant building or its parts, or adversely affect the aesthetic character of the urban historic district. It is to be noted that the destruction of historic buildings is in fact very seldom necessary for reasons of good planning: more often it is the result of neglect, or failure to make imaginative efforts to find new uses for them or to incorporate them in new development. CADA should have a general presumption in favour of retaining the built environment which makes a positive contribution to the character or appearance of the conservation area. Consent for demolitions, except in case of emergencies which constitute a threat to human life, should not be granted unless there are acceptable detailed plans for redevelopment. CADA must satisfy itself that the owner or developer can commence construction immediately the permission is given. This urgency of filling the gap left by demolition is critical, because it will preserve the townscape value. Ugly gaps abound in the Old Town of Mombasa, as a result of demolition far in advance of development.

6. Site Improvements and Alterations

Signs: Avoid Clutter.

Signs should be designed for clarity, legibility and compatibility with the structures on site and in the urban historic district. Their design should be simple and contemporary. Free standing signs should not obstruct views of, and within, the urban historic area. Billboards, rooftop signs and internally illuminated signs should not be permitted. Signs should utilise colour schemes that are effective and readable through the use of contrast.

Parking and paving: Limit the coverage.

Where green spaces exist, e.g. at the Treasury Square and the waterfront garden, this space should not be reduced by additional paving and parking. Better traffic planning and management in the Old Town of Mombasa, must be undertaken as a matter of priority. The areas currently used as parking lots should be sufficiently screened to minimize the view of parked cars, where possible.

Landscaping: Develop a simple and contemporary design.

Landscaping, street lighting, seating and decorative paving are encouraged as a part of rehabilitation and new construction projects. The design of these features should be simple and contemporary. Antiques or historic reproductions are to be discouraged. The healthy and mature trees at the Treasury square and Fort Jesus precinct should be retained, as should other significant features such as the steps at the Old Port and Leven house.

7. Non-Contributing Buildings

Buildings that do not contribute to the distinctive character of the Old Town of Mombasa abound. It is recommended that additions and alterations to these buildings should either be compatible with their own style and character or should cause the building to become more compatible to the totality historic area. The very worse off should be demolished if the demolition will not adversely affect the character of the specific precinct, or the whole urban historic area, as the case may be. Any new construction on the cleared site will be subject to the guidelines for new construction.