To the Graduate Council:

I am submitting herewith a thesis written by Henry Walela Musangi entitled "Weaving: Redesigning the Post Colonial Town Through African Cultural Traditions." I have examined the final paper copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Architecture, with a major in Architecture.

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WEAVING
REDESIGNING THE POST-COLONIAL TOWN THROUGH AFRICAN CULTURAL TRADITIONS

A Thesis
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Henry Walela Musangi
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Dedication

To my parents Richard and Regina Musangi, who made it possible for me to come this far by modeling hard work, public service and the importance of a good education. I am very grateful.

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Abstract

"They [Africans] look upon their native arts and crafts primarily as the 'locus' of their national consciousness. In spite of a violent urge for the new, for progress and for high living standards, more and more of their valuable, innate culture and customs now are being reflected upon in new light, finding their voice in the form of a new, healthy and surprisingly expressive art."

"The 'new' is cleansed from any cliché imitating a style.
The 'new' does not evolve from cheap modernism.
The 'new' functions according to the climate and the situation.
The 'new' proves to have an understandable symbolism adapted to the people.
The 'new' is vitalized by an elementary simplicity."

-Swiss architect ***Justus Dahinden***

This thesis aims at defining and justifying the principles that fuse African pre-colonial (traditional) architectural themes with the literal and metaphorical lessons observed in the craft of weaving.

African traditional architecture refers to the building traditions that have been held on the continent since pre-colonial times. Being a vast continent, its cultures, climate and geography are inherently diverse. All these factors have led to a variety of architectural principles and characteristics. Bernard Rudofsky in *Architecture Without Architects*, points out that vernacular architecture bears significance due to the fact that it is not based on any prevailing fashion or trend. Instead, it has through the years been perfected and sustained (Rudofsky. *Architecture Without Architects,* 1965.p. 1). Prevailing ideas about African architecture often bring up thoughts of hurriedly erected cylindrical structures with grass thatch as roofing. It is also questioned if such structures constitute architecture; that is, buildings thought through and put up with the aid of a trained professional in that field.

In my research, I examined this architecture while extracting and outlining key themes that are characteristic of vernacular architecture in different parts of the world and more specifically in Kenya. These lessons include design and construction principles such as materiality and decoration, climatic influences, the measure and representation of space, plus form and *parti*. I specifically applied my research to the urban situation in Nakuru, Kenya. All the lessons learned were combined and used to redesign a very active quarter of the town, thus racially and economically better weaving it into the overall fabric of the town.

The result should be a strong, yet simple, modern and distinctly African architecture that is free from cliché, bearing a symbolism that is adapted to and understood by the people.

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Chapter I
The Place of Dust
Making a Colonial Town



FIGURE I - 1: Map of Kenya

The Mombasa to Uganda railway reached Nakuru in 1900. The area remained a mere railway outpost until January 1904 when the commissioner of the Protectorate, Sir Charles Eliot proclaimed it a township. Nakuru's location 160km northwest of the country's capital Nairobi [figure I - 1] and sandwiched position between two natural features, namely the extinct volcanic feature *Menengai Crater* to the north, and the highly ecologically sensitive *Lake Nakuru National Park* [south], famous for its flamingoes, bird species and game, would force the city to expand in a lineal manner along the railway and highway corridor. Neither northern nor southern expansion would be feasible.

The name "Nakuru" is derived from the Maasai word meaning "the place of dust". The loose volcanic soil and lake soda that is characteristic of this geologically sensitive region, results in dust storms during the dry season.

Historical Roots to the Existing Spatial Structure and Current Conditions

At its inception, Nakuru Township's footprint was a circle with a radius of one mile from the entrance to the railway station. Before long, Nakuru became the headquarters of the Northern Railway District marking the start of its functional importance as a transportation center. Andy Wachtel, noting this founding, points out that unlike many western urban centers, Nakuru was not founded as an industrial type city purely or transitionally. It grew to be somewhat industrial, but is better characterized as a "colonial town" founded to serve a "settler vanguard".

That formative experience is still very visible in the town's character (1978. *Towards a Model of Urbanism in an African City: The Dual Focus Career of Formal Sector Workers in Nakuru Kenya.* p.27).

Nakuru's growth into colonial prominence certainly has at its center the arrival of Scottish aristocrat Hugh Cholmondeley Third Baron Delamere, in 1903. Lord Delamere had visited East Africa earlier and finally decided to settle in the Nakuru region to undertake a vision of grand commercial agriculture and stock-raising. The then commissioner of the Protectorate, Sir Charles Eliot granted Delamere 100,000 acres to the west of Nakuru. Such practice was legitimized at Westminster through the passing of the *Crown Lands Ordinance* that declared both native and unoccupied land property of the British Crown. Africans right to land ownership was taken away, and they were subject to dispossession and relocation into "Native Reserves/ Locations" at the whim of the crown (Wachtel, 1978, p.64). That action almost immediately sparked off a large inflow of English and Boer settlers looking for opportunities, most fleeing the Boer War in South Africa. By the end of the first decade of the twentieth century, Nakuru had established its farming reputation as well as becoming a stock sale center. A number of shops were opened by the Indian residents of the town, and the Indian Bazaar became the main business center (Wachtel, 1978, p.36-37).

As the settler community grew, so did the township. In 1913 its boundaries were expanded to cover 10 square miles, triple the original footprint. With the population rising, racially segregated neighborhoods also arose. In 1927, the *Feetham Report*, which advanced Nairobi's urban status, also granted Nakuru a second rank of township, thus allowing it to be run by its own municipal board (Wachtel, 1978, p.42). By 1936, Nakuru had a Main Street known as Donald Street (today Kenyatta Avenue)[figure A-1]. It was mainly lined with single story, false fronted double story structures that merged with the Indian Bazaar at its eastern termination.

European settlement on the slopes of the extinct volcano *Menengai* also took place at this time resulting in a racially layered character to the town whereby natives lived closest to the lake on the southern edge, Asians between and below the railway line, and Europeans to the north of the slopes. The start of World War II brought business and life in the town center to a stagnation. However, an aerodrome was constructed to support the war in an area on the eastern outskirts adding 200 Europeans to the town's population (Wachtel, 1978, p.48).

The combination of the segregating Crown Lands Ordinance and Native Lands Trust, would greatly affect the shape of Nakuru. Both laws led to the establishment of native locations where, as Wachtel points out, "segregation was practiced in the supposed interests of better administration or public health" (1978, p.54). Urban segregation was thus justified to be a necessity due to the incivility and resulting unsanitary culture of both lower class Indians and natives. In truth, it served to effect control. In 1914, Nakuru township was divided into six quarters being: the government officers quarters, the Indian Bazaar, European business quarter, European residential quarter, Indian 'coolies' lines, and African lines (Wachtel, 1978, p.57).

Africans were typically low-income laborers working for Europeans. Many lived in servant's quarters within their European master's compounds or in the contained labor lines within the African quarter. The houses, or "landhies", consisted of tiny 100-120 square foot rooms shared by many, and thus no place for family life. Anthony O'Connor, in his book *The African City*, pictures the situation stating that,

> Each [city] consisted of two largely separate communities, with social interaction between them near the minimum. For most of the Europeans they were spacious cities designed for people like themselves into which an uncomfortably number of Africans had

> intruded. For most Africans they were places where the great majority were like themselves, living in crowded conditions and commuting to some part of the foreigners city for employment (1983, p. 33-37).

The settler's determination to advance their sole interests and primacy within the township was further advanced when in 1923, the Nakuru Township Association was formed. It advocated, among other things, restricting Asians from buying land (Wachtel, 1978, p.74).

The 1950's marked the development of Nakuru's western industrial area. The Central Business District also underwent a re-planning and growth westward. It was during this time that the new railway station was built on the eastern edge of town. It was prominent and boasted a hexagonal clock tower on axis with Donald Street [figure I-2 & A-4]. Wachtel expounds on the stations symbolism, stating that "the murals inside, which portray the railroads role in the opening of the country and an idealized image of the relationship between the pioneering settlers and the noble indigents, remain vivid reminders in the post-independence period of this mythic vision of an imperial destiny" (1978, p.85-86). Wachtel further explains that the 1961 municipal market [figure I-3], constructed down slope, and in juxtaposition to the railway station and opposite the old Indian Bazaar, represented a new partnership between the races (1978, p.87).



FIGURE I - 2: New Nakuru Railway Station

Contemporary Implications of Colonial Planning



FIGURE I - 3: Nakuru Market Entrance

Formal European colonial rule in Africa would dwindle as the 1960's ended, representing a administration that lasted less than a century, but can be shown to still have geographical and social implications to this day. Prominent British settlements like Nakuru gazetted the best lands for white settlers while Africans were confined to "Native Locations/Reserves." The "space economy"

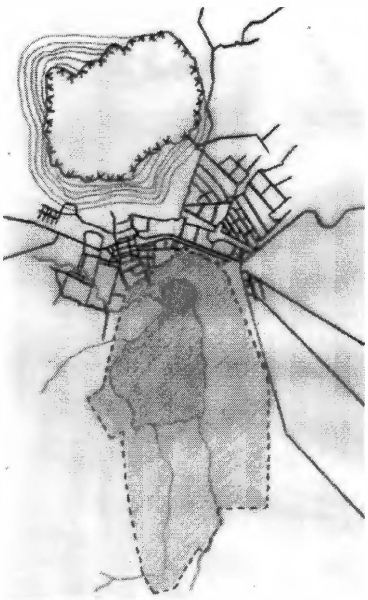


FIGURE I - 4: Nakuru Geographical Structure

was therefore dictated by the colonial authorities (Myers, 2003, p.4). Native locations were planned to be compartmentalized and thus controllable regions. They had, on a macro scale, an inside and an outside with limited entrance and exit provisions on the urban grid, making them less tied into the overall urban fabric (Myers, 2003, p.46).

As earlier pointed out, colonial urban order, in terms of spatiality, architecture, landscape and design features, served deliberate political purposes, particularly, as British planner Eric Dutton put it, for the "cultivation of public opinion on the spot." The colonialists intent was two fold, namely, the acceptance of British rule, and second, as some kind of goodwill (Myers, 2003, p.7-8).

The segmentation of the township into racially defined quarters served to contain. Traditional African spatial orders were far less rigidly enframed than those the British instituted. Nakuru, sandwiched between two bounding natural features [figure I-4] is a contained town on the macro-urban scale, while its native locations were a micro-urban containment due to the fact that a large number of Africans were squeezed into single room housing with clear internal-external demarcation. This was very opposite to African domestic order, whereby the exterior blended with the interior and settlement was never crowded, but always juxtaposed to a vast exterior environment. Edward Soja in a piece titled "The Geography of Modernization: A Radical Reappraisal", points out that pre-colonial cultures in Kenya had a noted affection for rural life, and that urban nucleated settlement was largely shunned. Colonial urbanization superimposed a very new system of settlement over East Africa, and its broad outlines are solid and evident in today's urban structures (Obudho, 1979, p.37-38).

Chapter II
The Persistence of Disorder
Reweaving an Urban Fabric

As previously discussed, the segmented city was designed to control; so that an individual could, as stated by Garth Myers, "observe and survey the city as a means of abstracting and objectifying the built environment." Myers further expounds that "the often well-surveilled central spaces of observation served to distance traditionally rural Africans from the communal, "fused" conceptions of space with which they approached the city, seemingly making the rational, western planning approach to urban space normalized in their eyes (Myers, 1978, p.9). These strategies thus served to separate the "container" (colonial/colonizing power) and the "contained" (African community).

Currently approximately 360,000 people live within the Nakuru Municipal boundaries. Unfortunately, due to the physical and geological constraints of the region, the town has not expanded enough to cater for its current population. Economic constraints (typical of municipal bodies in Kenya) and lack of proper planning have resulted in characteristically chaotic physio-spatial conditions in some sections of downtown Nakuru, most evidently at the town's main bus park and retail market quarter [figure A-2 & A-3]. The current retail market was constructed and opened in 1961. It currently has between 100-200 stalls where vendors sell a variety of agricultural produce. Due to dire economic conditions many people from the surrounding farming communities are dependent on the market to sell their produce for income. A lack of adequate stall space has driven several vendors to patch themselves and their produce on city sidewalks.

Nakuru, being located along the East African railway line, and the Trans-African Highway (A-104), is also a major transportation hub. The current Public Service Vehicle [PSV] park, is

poorly planned and is thus a jumble of several vehicles trying to inch themselves past each other.

The urban condition that is evident in Nakuru today is one of disorder, marked by a particular lack of architectural coherence or finesse. On examining the figure-ground of Nakuru Municipality [figure II-1], one sees a few coherent factors such as a regular grid, parallelism, and in certain pockets, proximity. However, on stepping into the actual town, those factors are immediately cancelled due to the lack of legibility, architectural continuity or character. The town is particularly lacking in aesthetic character due to cheap finishes that are applied (or not applied all together) to hurriedly constructed buildings. Façades and overall building volumes lack any common rhythm or pattern. Each building is a case of mono-utilitarian design; that is, they take their own functionality into consideration "without any common objective of creating a city" (Von Miess, p.47).

Observing the wild nature of Nakuru's Central Business District, particularly the area that is the focus of this thesis, one notices the prevalence of improvisation, salvaged materiality,

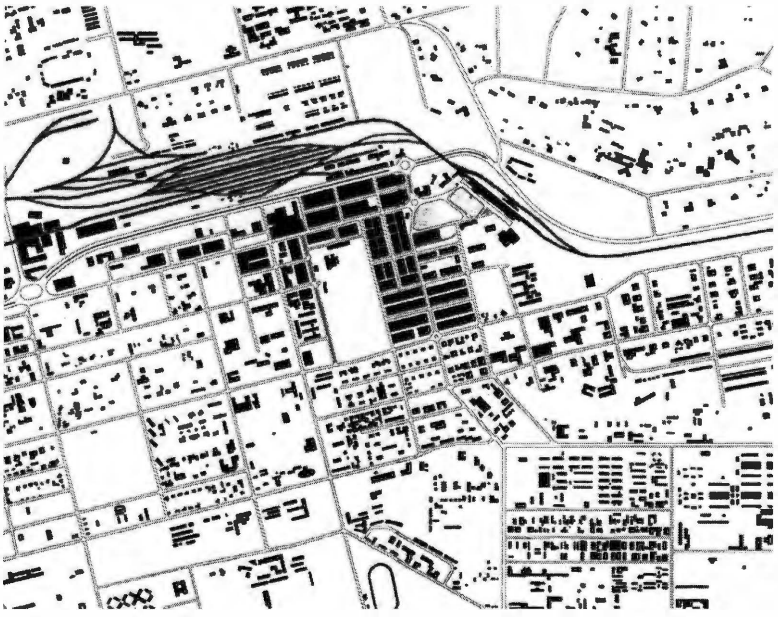


FIGURE II - 1: Nakuru Figure-Ground

naïve/illegal settlements, and poor recreations of western urbanity. Mohammed Arkoun in his introduction to Brian Taylor's *Reading the Contemporary African City*, points out that architects and planners need to reinterpret their policies and plans, basing them anew on ancient (thus proven) conditions of existence, reworking forms of solidarity, and intensifying adaptive activities:

> Reading an urban space means reflecting in a new and radical way about the relationships – undeniable but not yet clarified – between the configuration of the physical environment in which a community lives and the aesthetic, ethical symbolic universe in which the imaginative life of this community organizes and asserts itself (Arkoun, 1983, p.xvii).

This thesis proposes a solution to Nakuru's urban and architectural disorder by seeking to establish an architectural identity at the point where the town's commercial center was birthed. African architectural values are subtly hidden in the current disorder, but are better gleaned from traditional settlement patterns and other African aesthetics.

The historical containment of the Market – Public Service Vehicle site requires that the urban fabric be re-weaved. The improvisations that are evident in local constructions and modifications are telling. The African urban majority remains reliant on local customs in the production and organization of space (Myers, p.17 & 161). This thesis investigates and provides an architectural outlet for the resourcefulness of the people, while at the same time ensuring that it does not get out of control leading to a persistence of disorder.

Planning Initiative

The site is located on the eastern edge of the central business district. It is bordered by a 1950's railway station, a police

station, several commercial buildings and a poorly maintained open space (Lions Park) [figure II-2].

Broad Program Proposals: Character and Relationships

1. New linkages to the site in order to ease the currently crowded single northern entry [figure II-3].
2. Redesign of the PSV Park with ordered circulation that will as conveniently as possible tie into the town and nation's transportation fabric.
3. New public utilities such as sanitation or rest areas.
4. New retail facilities that will tie into both the current retail market and the new PSV Park.
5. A new/redesigned open space within or next to the PSV-market facilities.
6. An overall iconic urban initiative, drawn from traditional space planning principles, that will give the site a new prominence in keeping with its strategic location at the eastern entrance into the CBD.

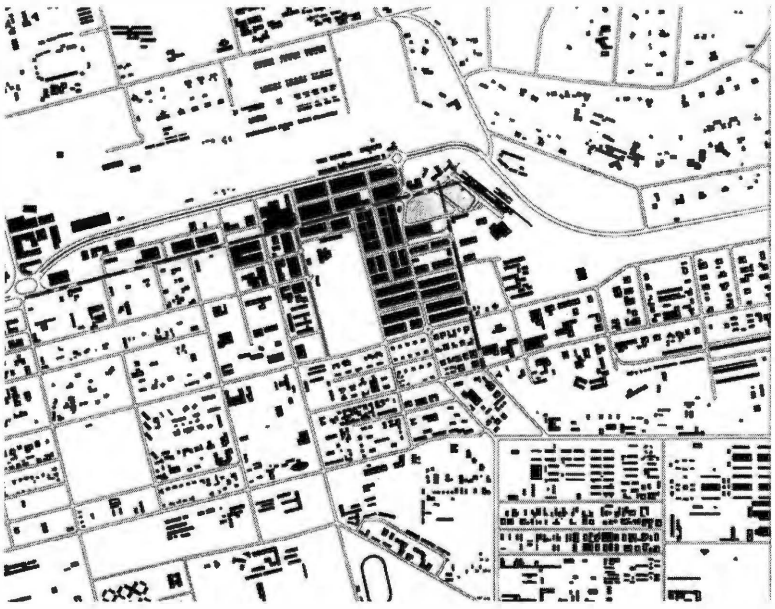


FIGURE II - 2: Nakuru Lions Park & Axialities

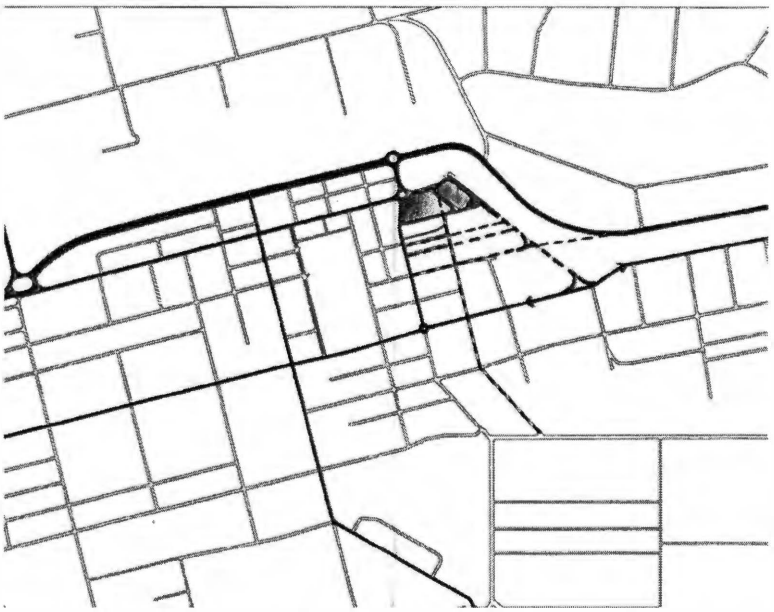


FIGURE II - 3: Nakuru Potential Road Linkages

Chapter III
Architecture for the Developing World
An Authentic Modern Vernacular

There has been the common desire in architectural circles in developing nations, to equate progress with western building types. The rise of interest in regionalist and contextual issues is evidence of the growing realization that the developing world has to learn to draw equally on its own architectural traditions and adapt them to modern needs of shelter, and as is often the case, basic survival.

Turkish architect, historian and architectural critic Suha Ozkan, in a paper titled *"A Pluralist Alternative"*, decries the fact that the architectural elite has ignored the role of individuals and societies in determining their own environment. He points out that traditional processes and patterns often resulted in suitable, albeit imperfect, culturally rich and harmonious built environments. Unfortunately, today's architectural profession has relegated this cultural sensitivity to the anthropologist alone. As Secretary General of the *Aga Khan Trust for Culture* and an expert in vernacular form and emergency housing, Ozkan argues against the seemingly endless debates about modernism's value and rightfully encourages architects to abandon non-substantive semantics and rhetoric, and turn to the needs of the homeless and less endowed (Steel, *Architecture for a Changing World.* p. 36).

In his book *Modern Architecture Since 1900*, historian and critic William Curtis, adds to the discussion by decrying the fact that peasant vernaculars are often associated with primitiveness and backwardness. He points out the earlier stated fact that the insensitive planting of modern architecture in the developing world, without respect to traditions, values and climates, made many realize the importance of the preservation of national and rural traditions (Curtis, *Modern Architecture Since 1900*. p. 568). "As

always, architectural value would reside in the convincing synthesis of the practical, the aesthetic and the symbolic, and in the creation of a unity in harmony with the setting. Vernacular structures could provide some clues for achieving these ends by revealing age-old patterns of adaptation" (Curtis, p. 571). A major challenge in developing architecture for the developing world is the establishment of an architectural language suitable and sensitive to both modern and traditional tasks.

The Danger of Kitsch

Hassan Uddin Khan, an architectural critic, in an article published in the book Criticism in Architecture titled "*Meaning in Tradition: Today, an Approach to Architectural Criticism*", caution that a particular architecture can be easily mistaken to simply be it's imagery and craft. That is, the literal application of design elements and technologies. He therefore warns that buildings are more than how they appear or are produced (Khan, qtd. in Powell, *Criticism in Architecture*. p. 57). Historian William Curtis further states the danger thus,

> A building that fitted some passing prescription, that illustrated values noisily, proclaimed as 'Islamic', 'Indian', 'nationalist', 'communist', (or whatever), was not necessarily architecture of lasting quality. Indeed, too facile an acceptance of conventional iconography could lead quickly to kitsch.... What was needed was a blend of the local and the universal, which avoided the limitations of each and led to forms of lasting symbolic resonance. Skin-deep modernism and glib traditionalism were evils to be avoided in every part of the world (p. 587).

Lessons from the Vernacular

Good design stems from an understanding and sensitivity to the ecology of the particular site or region, and a cultural relevance

to people and their daily rituals. Architecture that has existed in such a context for years most certainly has been adapted in the best way possible to accommodate these factors and therefore carries the lessons a modern designer would need in order to similarly adapt any new building to a people.

Today's developing world is faced with the need to develop or be left behind in an increasingly global society. Every aspect of society that would foster national existence such as education, health and industry are tied into the larger global economy, which is largely western and technologically advanced. Third World nations have and continue to experience the inroads of imported technology, which doesn't imply the extinction of traditional values. Instead, these advancements offer architecture the challenge of fusing technology and tradition. It would be inaccurate to assume that technology allows only for a western expression, while denying regional and cultural forms of architectural expression, argues Khan.

The *Aga Khan Award* for architecture rewards architects and lay builders in the developing world who have succeeded in fusing the two. The nominated buildings, being in developing countries where resources are few, income low and population high, are often very simple and of affordable construction. They are rarely constructed with much government aid or management, but manage to capture and utilize the simple vitality, skill and ingenuity found in the building traditions of poor communities.

The character of the nominated buildings for the award, offers several lessons. First, the projects display a strong expression of the importance of the larger natural and urban environment. Secondly, they are rarely isolated, but engage and dialog with their natural and social contexts. The projects also typically use an appropriate technology and strive to avoid inappropriate, imported or even industry-driven imposed technologies. This kind of resourcefulness with local materials has benefits being an increased



FIGURE III - 1: Canopy at Kahere Eila Poultry Farming School
Heikkinen + Komonen Architects

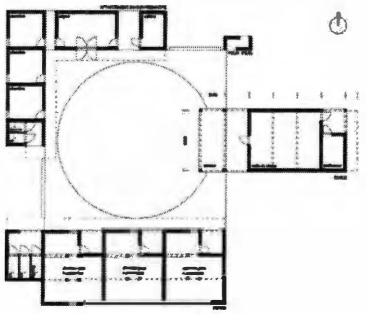


FIGURE III - 2: Plan of Kahere Poultry Farming School
Heikkinen + Komonen Architects

harmony with the natural context and the social and economic realities of the beneficiaries. The projects are always sustainable, replicable and display an effortless blending of systems and function. Last, the projects display an ingenious translation of forms and techniques drawn from indigenous prototypes without resulting in kitsch (Steele, p. 12, 22, 32). This is the kind of 'new' architecture Swiss architect Justus Dahinden spoke of, that is vitalized by its elementary simplicity and free from any cliché imitating a style.

Among the recipients of the award in 2001 was the Kahere Ela Poultry Farming School [figure III-1] in Guinea by the Finish architects Heikkinen + Komonen. The traditional cylindrical structures in the neighborhood of the site were typically grouped around an open space that was used for a variety of social and domestic activities. The new complex for the farming school required three main areas: a classroom, student quarters, and teacher's quarters. Tradition was respected by grouping them around a central courtyard and large tree that would serve as an outdoor gathering area [figure III-2]. The plan was based on a 1.2 meter grid that lent simplicity but formal grace to the architecture. All the primary construction materials came from local sources, and included stabilized heat-collecting earth blocks, wood-frame technology, and simple metal roof trusses. The complex displays a simple and clear form that combines traditional planning relationships of Guinean culture with Nordic timber construction sophistication.

Chapter IV
Lessons From Precedent
Geoffrey Bawa and the Sri Lankan Aesthetic

"Consult the Genius of the Place in all;
That tells the Waters or to rise, or fall;"
Of the Use of Riches, Alexander Pope (Pope 1985)

Geoffrey Bawa and the Adaptation of Sinhalese Architecture

Sinhalese classical architecture developed from AD 100 to about AD 1200. It bears some characteristics drawn from Indian archetypes but is mostly of Sri Lankan origin. It is particularly noted for its brilliant response to environmental influences, especially topography and water. The builders often chose dramatically rocky sites and came up with a geomorphic architecture that consisted of naturalistic compositions of buildings, boulders, winding staircases, caves and narrow passageways. The builders manipulated water into formal pools or channels or left it in natural streams. Courtyards were also characteristic of Sinhalese buildings, and apart from the advantage of natural ventilation, they provided an enhanced dialog between interior and exterior space (Robson, p. 34).



FIGURE IV - 1: House by Geoffrey Bawa, Sri Lanka
David Robson

Sri Lankan architect Geoffrey Bawa incorporated most of these features in his architecture. He was sensitive to the need for natural ventilation and also included natural features such as rocks, water, and trees. Interior versus exterior barriers were very subtle, broken down through the inclusion of courtyards and verandahs in most of his architecture. Landscape invaded the interior [figure IV-1]. He, like the Sinhalese, used brick, timber, clay roofing tiles and plaster wall finishes which were all inexpensive and appropriate construction materials native to the region. Bawa also kept the traditional orthogonal layout while providing a few surprise asymmetries that added interest to the whole.

Bawa was not very theoretical. A rare idea of his philosophy comes from an article in the *Times of Ceylon Annual* (1968) titled "A Way of Building":

> "I have always found it difficult to write about architecture, particularly my own. There has been so much dogma and theory put forward over the centuries... that one is hesitant in stating a new set of rules... But there are rules, some old and strong ones. The first is that a building must, at the very least, satisfy the needs that give it birth... The second is that it must be in accord with the ambience of is place... And there is one more, a technical rule: there must be a knowledgeable and true use of materials."

On the importance of and his adaptation of the distinct Sri Lankan roof aesthetic, he continued:

> "One unchanging element is the roof – protective, emphatic and all-important – governing the aesthetic whatever the period, whatever the place. Often a building is only a roof, columns and floors – the roof dominant, shielding, giving the contentment of shelter. Ubiquitous, pervasively present, the scale or pattern shaped by the building beneath. The roof, its shape, texture and proportion is the strongest visual factor" (Robson, p. 60-61).

Bawa also sought to frame views, particularly to the landscape, which he celebrated. He did this by bringing the landscape right up to the building and then into the building within courtyards [figure IV-1].

The Sri Lankan Parliament at Kotte, 1979-1982

Austin Woodeson, who was the chief architect of the Ceylon Public Works Department, built Sri Lankas original parliament in 1929 in the Anglo-Paladian style. The building faced the Indian

Ocean and its façade bore double height Ionic Columns. It was also loaded with British meaning.

In 1978, Sri Lanka's new president decreed that a new parliament be built at Kotte, about 10 km inland from Colombo, the country's original capital. Bawa was invited by the president to design the new complex. On viewing the site, Bawa proposed that the area be flooded to create a 120-hectare lake while leaving a high knoll where the buildings would stand. As in his other designs, Bawa made the main parti an experiential and controlled sequence of events. The tent-like roofs of the pavilions were bold and drew on the Sri Lankan temple aesthetic. The layout was symmetrical with the main pavilion on the main axis, but lesser pavilions placed asymmetrically. The layout of the pavilions also served to create a series of out door spaces [figure IV-2 & IV-3](Robson, p. 148).

The roofs with their characteristic variated pitch were an abstraction of traditional Kandyan roofs. However, instead of clay tiles, Bawa used copper thus lending them the thinness of a tent. Beneath the roofs, the layout was an abstracted modernist plan based on a 6x6meter grid. The materiality of the interior is straightforward Sri Lankan, consisting of terrazzo or clay tiled floors, off-white walls, and dark timber furniture.

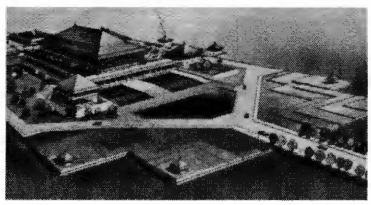


FIGURE IV - 2: Illustration of Sri Lanka Parliamentary Complex
David Robson

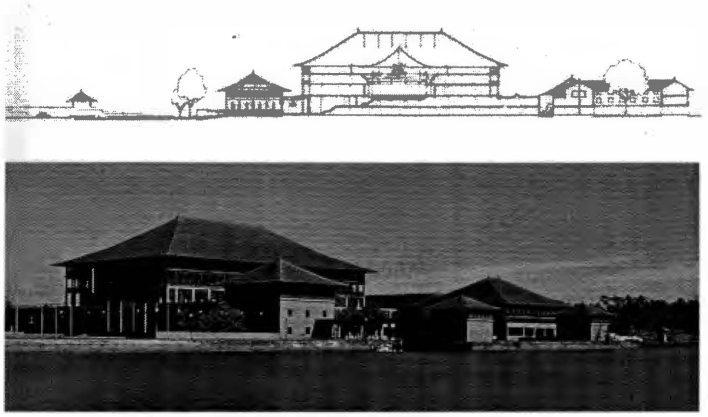


FIGURE IV - 3: Cross Section and Elevation of Sri Lankan Parliamentary Complex
David Robson

Timber was used extensively in the construction of the roofs.

David Robson describes Bawa as being very intuitive and mistrustful of theory. He states that Bawa avoided trying to justify his designs, insisting that architecture had to be experienced directly to be understood. " He doubted that buildings could be ascribed specific meanings; their true significance would be established in the minds of their users and would develop thorough time." Robson speculating on why this may have been so states that, " It may be that his [Bawa's] lawyers training had left him suspicious of the humbug that permeates so much of what poses for architectural discourse" (Robson, p. 261).

Bawa was also instinctively sensitive to bio-climatic factors in order to maintain optimum human comfort. Cross and stack ventilation as well as solar protection were important features of his buildings. To achieve these, Bawa designed courtyards, verandahs, pergolas, water pools, and wide overhangs. Thermal massing provided protection from solar gain. The heavy clay tiles and roofing construction was cool, waterproof and structurally sound. The materials used in construction were mostly local, usually consisting of brick, timber, clay products and plaster.

Bawa managed to avoid meaningless decoration. Earlier in his career, his buildings were whitewashed cubic forms typical of tropical modernism. Eventually, Bawa incorporated the local aesthetic through the incorporation of colors and textures of the local environment (Robson, p. 262).

Chapter V
Anthropology of the Built Environment
Designing for a Culture?

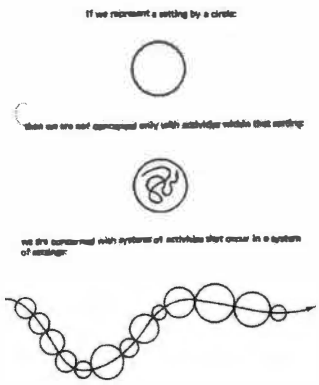


FIGURE V - 1: Single Activity Setting vs. System of Activities & Settings
Amos Rapoport

University of Wisconsin-Madison architecture professor Amos Rapoport has written extensively on the relationship between culture (expressed human behavior) and the built environment, providing some seminal studies on the cultural aspects of architecture and its use (Rapoport, *House Form and Culture*; also Kent ed., *Domestic Architecture and the Use of Space*). His studies are important in understanding why specific cultures adopt a particular manner of architecture at a specific time and how it fits into the value system of that culture.

Professor Rapoport's studies show that a close study of a cultures way of life will yield cues that are reflected in its architectural organization. It is extremely hard to broadly "design for a culture". However, the knowledge of specific lower-level social cues and expressions makes the task more feasible. Towards this end, Rapoport examines how activities are carried out, associated into *systems* and what the *meaning* of activities are in indigenous societies. This understanding is critical in the development of any architecture for the developing world due to the fact that any attempt to improve the quality of life in a cultural setting will call for building forms, patterns and systems that enhance and sustain the lives of the users. Rapoport cautions that observing a single activity cannot satisfy the analysis of a cultural setting. One must look into the interrelated systems of activities because the traditional home setting was so conceived. Systems of activities also occur in systems of settings (space and time) [figure V-1](Kent, p. 10).

Rapoport points out that the built environment can be organized within four concepts: **space, time, meaning** and **communication.** The relation of systems is the communicative

aspect. Time refers to the temporal components of the systems; tempos (number of activities per unit time), rhythms (periodicity of activities) and cycles (lifetime, annual, seasonal, festivals, workdays or weekends, day or night etc.) (Kent, p.15).

In the case of the market at Nakuru, the design of the adjacent Lions Park is such that it could allow for periodic market activity when civic gatherings do not require the space of the park.

Defining Activity

Rapoport defines activities as "direct expressions of lifestyle and ultimately culture" (Kent, p. 11). Activities have four aspects, being (1) the nature of the activities (instrumental aspects; the activity itself) (2) how the activities are carried out (3) how they associate into systems and (4) their latent meaning. Activity systems are always organized into space and time and therefore we must note that architecture works as a system. That is, people do not act in a single building, but in a system of buildings, outdoor spaces, settlements and regions. An understanding of indigenous architectural life is an understanding of a larger cultural landscape.

Defining Setting

"A setting is a milieu which defines a situation, reminds occupants of the appropriate rules and hence of the ongoing behaviors appropriate to the situation defined by the setting, thereby making co-action [playing the same role in a setting] possible" (Kent, p. 12). Settings and their boundaries are culturally defined (often cognitively), and so are the rules regarding behavior within a setting. Their temporal qualities also vary from culture to culture. A setting, Rapoport explains, carries several hints (mnemonics) which together define a situation, reminding those who enter of a number of appropriate rules and behavior. The setting will have the appropriate props for specific behavior and activity. There must be identifiable

cultural patterns in order to avoid confusion. Should variation of any cues be necessary, it must be done within a cultural order. This is the challenge for the modern architect working in a cultural context.

> "In this connection it is useful to conceptualize the environment as consisting of fixed-feature elements (buildings, floors, walls, etc.), semi-fixed-feature elements ("furnishings" of all sorts), and non-fixed-feature elements (people and their activities and behavior). Settings guide behavior (i.e. the non-fixed-feature elements) not only, or even principally, through the fixed feature elements of architecture but through semi-fixed-feature elements which provide essential cues; other people present and *their* activities and behaviors are also most important cues" (Kent, p.13)

Rapoport gives the example of an empty piece of land that would become an open market in some cultures. It is temporally minimally organized for the known activity 'market'. Semi-fixed feature elements such as awnings, carts and displays then provide further cues towards that activity. However, for some period during a typical week, these features will disappear and the open space becomes playground, dance ground, meeting ground etc. Occasionally, no physical cues are used where situations are so well known and activities highly routine that appropriate behavior is automatically expected. Knowledge of cultural mnemonics can be a great asset to the architect wishing to combine spatial functions and thus provide a more economical program. Thus a change of any cue can change the function of a space from one use to another. This can either be advantageous or detrimental.

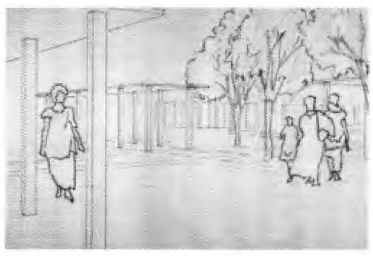


FIGURE V - 2: Market Activity at Lions Park Facing Main Market Building

In the current project, the canopies at the eastern end of Lions Park [figure V-2 & V-3], together with the benches and paths in the park, serve as fixed feature elements. Their mnemonic value is enhanced when the space is occupied by people gathering for a civic assembly or vendors displaying their produce on a trading day.

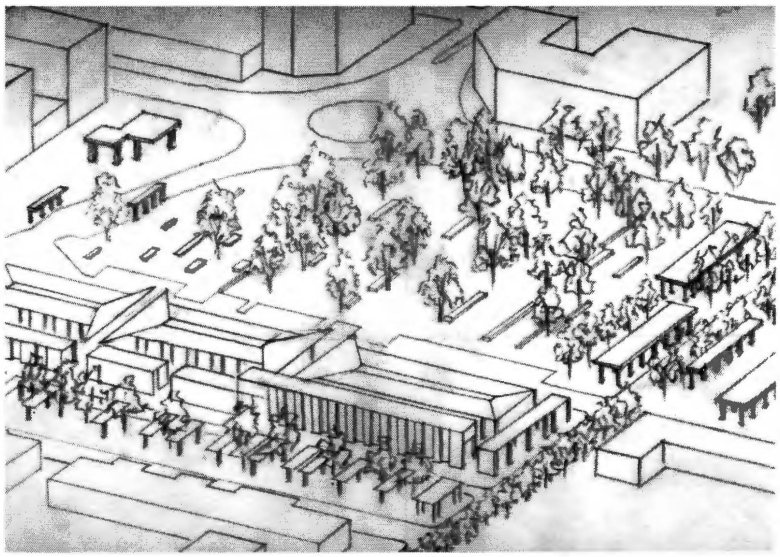


FIGURE V - 3: Aerial Perspective Sketch of Redeveloped Nakuru Market and Lions Park

Culture and Built Form

Built form is one aspect of culture. Rapoport points out that it is hard to relate culture to built form, but much more feasible to relate built form to specific aspects of a culture such as religion or status hierarchies. Culture exists and needs to have a multi-sensory outlet which is often its effects and products, architecture not being the least. "Culture exists by definition: it is a conceptual summary shorthand (and proposed explanation) for particular conjunctions of a great variety of human phenomena" (Kent, p. 10). Rapoport argues that we do not see culture - only its effects and products. A study of lifestyle is very useful in investigating the cultural aspects that affect built form, and thus the enviro-cultural work of Amos Rapoport is a great resource.

The relationship between activities and architecture is mediated by culture. Architecture encloses behavior and as a consequence, behavior or activities shape architecture. A knowledge and understanding of this fact will help the architect realize that his actions either foster or distort activities (Kent, p. 11).

Conceived in 1990 and opened in 1998, the *Jean-Marie Tjibaou Cultural Center* in Noumea, New Caledonia by Renzo Piano Building Workshop was envisioned to be a place where Kanak identity and culture would be displayed, learned and celebrated [figure V-4]. Funded by the French government, the complex consists of ten "houses" of varying sizes that contain specific programs.

A Tool & Symbol

The complex is organized into three 'villages', each with certain functions [figure V-5]. They are firstly, the facilities for Kanak identity housing Kanak and south Pacific art collections and a reception hall. The second village houses the multimedia library and a contemporary art collection.

The third village has a place of remembrance celebrating Kanak leader Jean-Marie Tjibaou, lecture and meeting halls. The complex is connected by a series of pathways, the main one being the Kanak pathway. Piano was careful to incorporate a number of outdoor spaces into the plan of the complex. The anthropological intentions in this layout were not random but arose from an understanding of Kanak behavior circuits and systems of settings. As illustrated in Figure V-6, a person may need to visit a series of settings in some sequence. Rapoport provides the examples of an American doing errands, an Indonesians visiting family and Australian Aborigines on a walkabout. The nature of the settings varies, as well as the order in which they are visited.



FIGURE V - 4: JMT Center
Renzo Piano Building Workshop

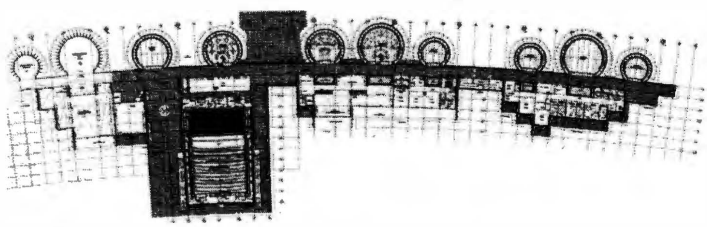


FIGURE V - 5: JMT Center Plan
Renzo Piano Building Workshop

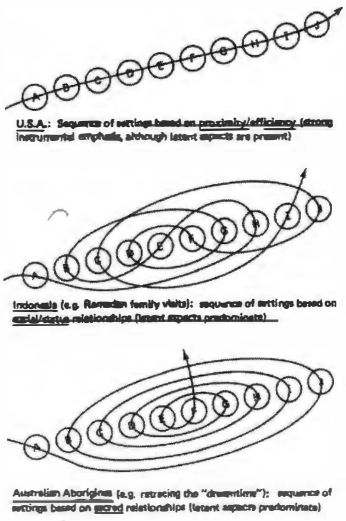


FIGURE V - 6: Hypothetical System of Settings in Different Cultures
Amos Rapoport

Further variation consists in the reason for which they are visited, the boundaries around the settings and how they are communicated, who is involved or excluded, what activities take place at each setting, and how long the circuit takes (Rapoport, p.14). Thus, contrasted from the American model, the *JMT Center* is a vast complex of settings, each with a specific function and less related proximally than latently. The aim of the arrangement was to create a village imagery that has the houses linked via paths and interspersed with public spaces and the very prevalent greenery characteristic of the region. The earth and plants are very important rhythmical characteristics of the daily life of the Kanak people.

Settlement as the embodiment of the ideal environment is further suggested in the long history of western ideal cities. The program of the complex houses an auditorium, amphitheater, administrative areas, research and conference facilities, library, and studios for music, dance and art.

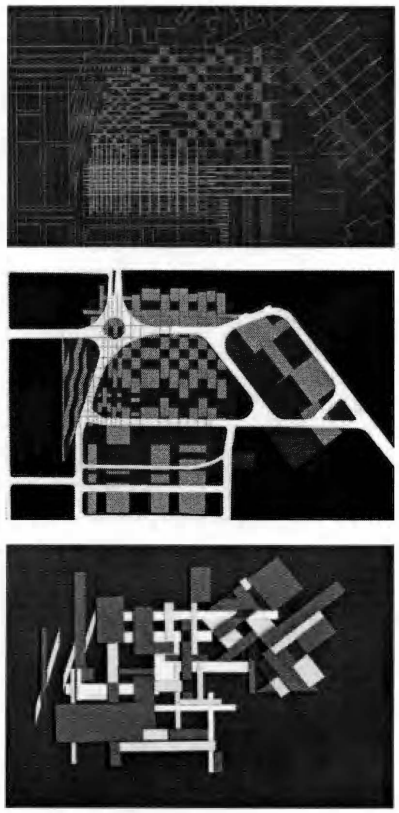


FIGURE V - 7: Design Generators; Graphic Exercise 1 - 3

In establishing the sequence that would direct ones relation to a system of settings, I used the traditional craft of weaving. Three graphic exercises were executed [figure V-7], the first and second representing the sites current congested condition and need for entanglement/easement/opening. The third exercise has a three dimensional character and represents the proposed solutions, a reweaving of elements on the site to better relate to each other and the larger urban grid. The graphic exercises when scanned were used as underlays in AutoCAD™ in order to place and order the site program [figure V-8 & V-9].

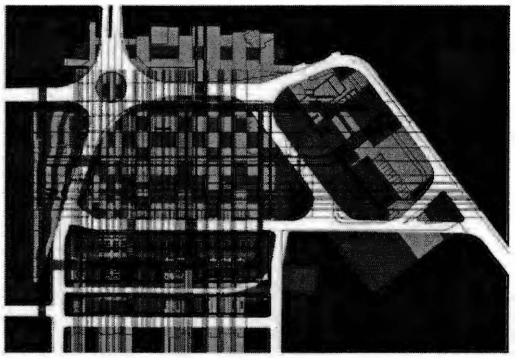


FIGURE V - 8: Design Generation from Graphic Exercise 2

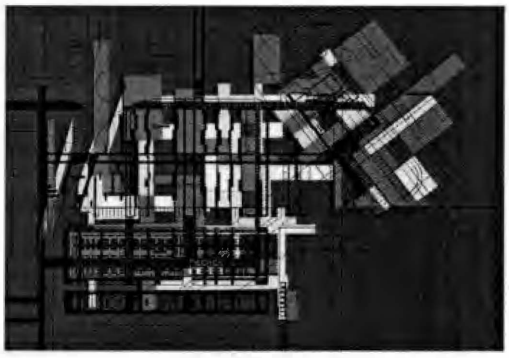


FIGURE V - 9: Design Generation from Graphic Exercise 3

Thus a system of activities and settings arose as follows.

The highly active civic space that is Lions Park was reworked to become a space that would allow for a multiplicity of uses. North-South oriented benches and interweaving paths make it a more comfortable green space. Periodic market activity could also take place on those benches and paths, whereby small-quantity vendors would be allowed to display their produce for sale.

At the eastern edge of the park are two canopied stands that form a continuity of the Jacaranda tree-lined shopping street that runs south up to Nakuru Nursing Home [figure V-10]. This continuity is also woven through the main market complex and represents a better acknowledgement and fusion of the southern quarter of Nakuru that is mainly composed of low-income African residents, to the rest of the town.

The new transportation center represents a weaving of the national, regional and local context. The site is on the edge of the Trans African Highway (A-104).

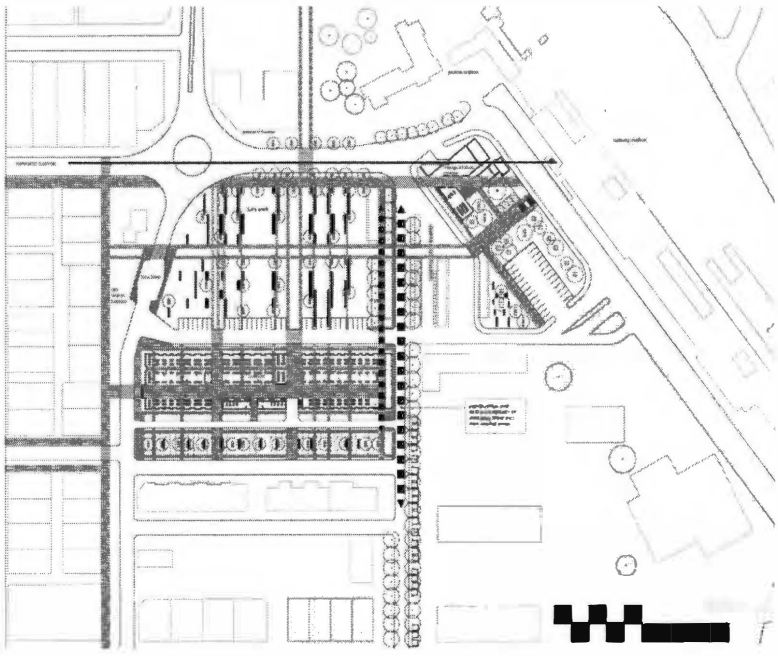


FIGURE V - 10: Site Redevelopment with Connnections, Continuities and Axialities

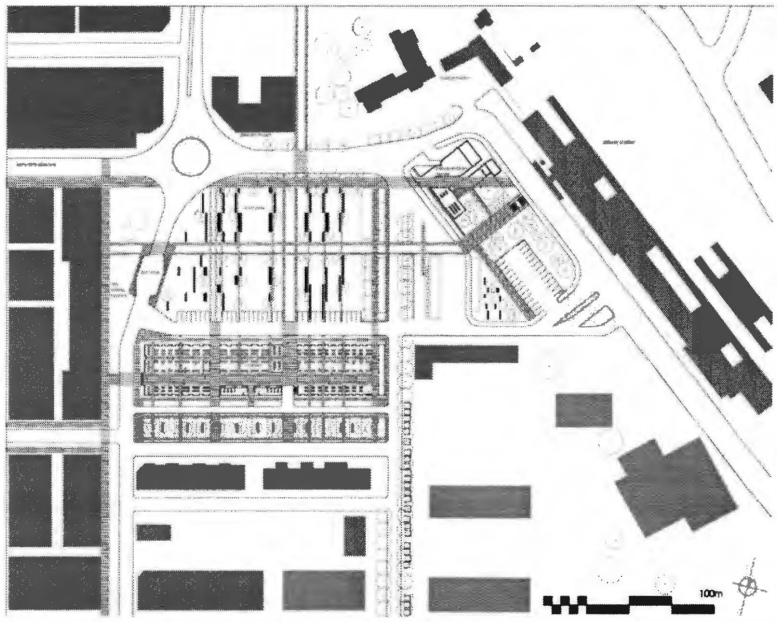


FIGURE V - 11: Site Redevelopment

The center is placed in juxtaposition to the colonially-planned Railway Station [figure V-11] and serves as a center for road transportation. The building maximizes traditional planning that sees exterior effects as being beneficial. Circulation is through, within and around the building, which actually consists of three strategically-paced structures, enhancing the village settlement metaphor. Its main axis is designed to be in alignment with Kenyatta Avenue, a contemporary response to the similar axiality of the railway station's clock tower [figure V-10].

Chapter VI
African Traditional Architecture
The Appraisal and Meaning of Space

The drama that is the exterior environment in Africa, has affected indigenous architecture in that a contrast was created between the concentrated and super-efficient enclosure of the typical African dwelling, against the vast scale of the landscape.

Author Labelle Prussin states that,

> In the desert environment where encampments sit precariously in profile against the sky on the uninterrupted boundless infinity of the horizontal line, the continuous, often curved, building surface strengthens the sense of isolation. Beauty lies in the opposition, the polarity between the intensity and concentration of interior space and the boundless infinity of exterior space (Prussin, Labelle. *African Nomadic Architecture: Space, Place and Gender,* 1995. p. 191-192).

Both interior and exterior effects were purposeful. The containment of the interior was so efficient as to be irreducible. It was thus also a manageable, protected or movable territoriality [figure VI-1]. The exterior, on the other hand, presented an infinite beauty (even in harsh environments) that could not be replicated adequately. Thus, effort was made to ensure an organic transition from inside to outside and vice versa, whereby exterior spaces were valued as much as interior spaces. This differs from western tradition whereby sheltered space brings focus to a central activity, or the colonial practice of creating bound and controlled native locations.

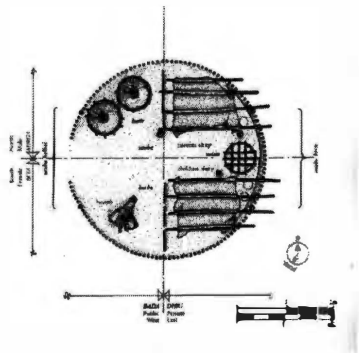


FIGURE VI - 1: Gabra Tent Plan
Labelle Prussin

Prussin further states that human beings typically experience space through movement and the boundaries of space. We order our spatial environment through a system of directionality that involves coordinates related to time and features

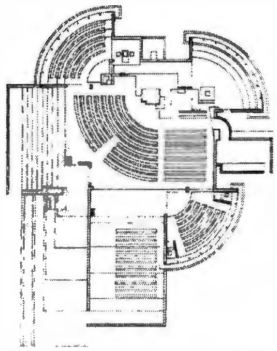


FIGURE VI - 2: Mityana Shrine Floor Plan
Justus Dahinden

of the larger natural environmental such as the sun, moon, and even wind direction. By contrast African cultures, she states, use a "hodological" (from the Greek *hodos* = path) system to orient themselves. In other words, they do not orient themselves in space according to the physically measurable cardinal directions, but along *paths* or *directions* in response to topographical features in the environment (Prussin, p. 34-35). The presence of numerous geological features and its effects on architecture and settlement should provide valuable implications to exterior and interior architecture.

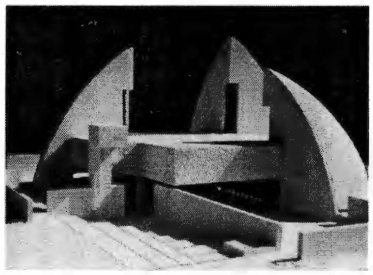


FIGURE VI - 3: Mityana Shrine Model
Justus Dahinden

Udo Kulterman further expounds on the interior – exterior space principle. He points out the fact that the African dwelling was a place only occasionally occupied each day in order to provide protection against harsh climate and other dangers such as wild life. It also served as a place for overnight rest in most cultures. "Space existed only by virtue of human occupancy", Prussin states. The boundaries of today's architecture such as walls and doors hardly existed within traditional structures. In their place, spaces were delineated based on human behavior, thus cooking areas, sleeping spaces and so much more. The awareness of these boundaries was part of the traditional aesthetic [figure VI-1]. This fact presents lessons on how a larger space can be designed without solid boundaries but still provide differentiated spaces through what Justus Dahinden termed "creative multiplicity" [figure VI-2, VI-3, VI-4] (Dahinden, p. 100).



FIGURE VI - 4: Mityana Shrine Exterior
Justus Dahinden

Kulterman explains, however, that ones day-to-day occupation, social life, and other observances took place outside and thus important edifices were designed to provide exterior effects and thus strengthen community (Kulterman, p. 5-6).

Susan Denyer, in her book African Traditional Architecture: A Historical and Geographical Perspective, states that the very construction process was an important social occasion in African

society. Building was always a highly cooperative venture, often shortening construction to a day, while the materials had been gathered for weeks preceding. Few materials ere used and that fact further required that the construction be elaborate (Denyer. *African Traditional Architecture: A Historical and Geographical Perspective*, 1978. p.92).

The enhanced market and transportation quarter in Nakuru takes these principles into consideration. Tropical climate in the region allows for an average temperature of twenty-five degrees Celsius (77 F) almost all year round. Therefore exterior spaces can be designed to serve several functional purposes, such as the periodic market at Lions Park. A strong directionality in the planning is also intentional, Particularly in response to the small enterprise shopping street, Kenyatta Avenue and the entrance to the railway station [figure VI-5]. This path system aims at orienting one to

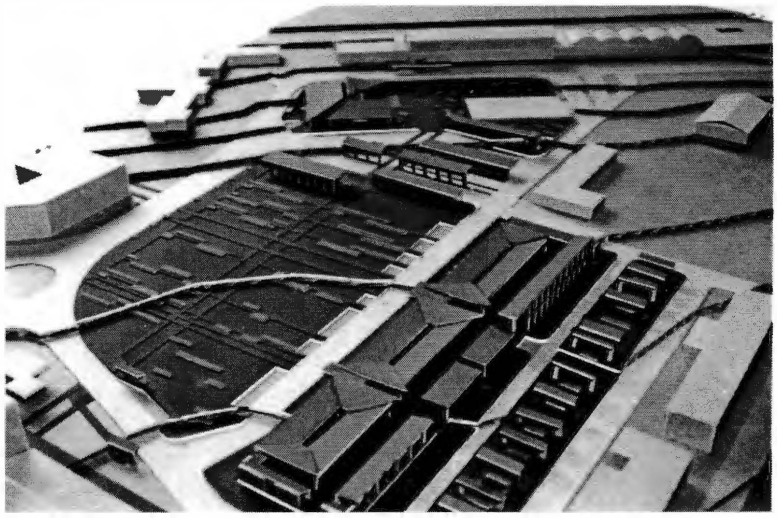


FIGURE VI - 5: Nakuru Site Model

Chapter VII
Materiality and Decoration

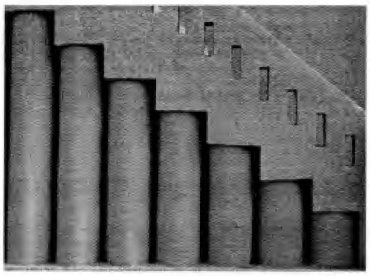


FIGURE VII - 1: Adobe Wall Detail
Nnamdi Elleh

The choice of materials in most African cultures was always linked to the locale. The locale dictated the availability of a certain construction material, and then due to climate, dictated how those materials should be assembled. Over the years most cultures perfected these two factors and developed elaborate systems of ensuring comfort within man-made structures. Passive cooling strategies are an example of this.

Decorative effects were rarely random. They usually consisted of a type of aesthetic that was hundreds of years old and characteristic of the specific people group (Denyer, p. 116-122). They were applied while taking into consideration climatic factors such as shade and using texture and relief to bring them into full effect [figure VII-1]. Susan Denyer offers the two examples of lightly incised lines used on buildings in lands where the sun was often clear, while bolder and deeper lines were used in forested areas in order have greater relief effect. The location of decoration was specific, in that it served on structures (or regions of a structure) of social, directional and structural importance. Thus, a series of decorations would mark a homestead entrance, granary, ceremonial building, or location of structural bearing.

A contemporary architecture in the developing world can be achieved while using local materials and techniques. The architect needs to strive at fulfilling the building's function while also reacting favorably to the climatic conditions of the region. Sensitivity to the appropriateness of materiality is not something that has arisen with an understanding of regionalism. The protagonists of the international style also proposed the use of the best *available* materials [in their case glass and steel], in the best way possible.

Maxwell Fry and Jane Drew, famous for their modern buildings in West Africa, provide a good guide regarding materiality and the means for building:

> "What are most suitable and economical, whether adapted to local skills and traditions, or breaking from them and establishing new skills and future traditions; what resist best the ravages of climate or insect life or promote conditions of health and well being; what are of local interest only but should resist the leveling effect of unspecific thought and action; what though more costly now possesses properties that make them inevitably indispensable" (Maxwell, p. 25).

The unfinished character of the cases of the *JMT Center,* New Caledonia, reflects the craftsmanship that goes into Kanak house building [figure VII-2]. Piano states its intention thus:

> "It dawned on me that one of the fundamental elements of Kanak architecture is the very construction process: 'building the house' is every bit as important as 'the finished house'. From this, I began to develop the concept of a permanent 'building work site', or rather of a place which would suggest an unfinished house-building project (www.adck.nc)."

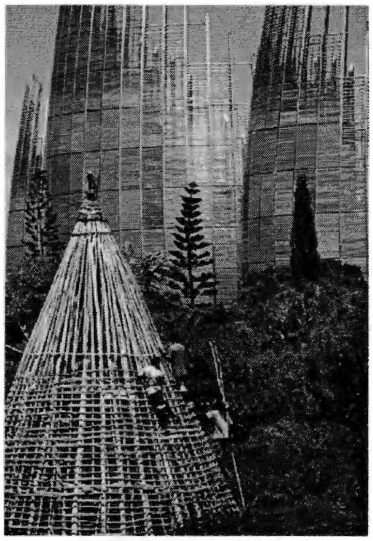


FIGURE VII - 2: Caledonian Construction Detail
Renzo Piano Building Workshop

The current project utilizes the most common buildings materials in Kenya. The walls are built of quarried stone blocks. In order to ease the sense of containment and to enhance the climatic breathability of the market, a series of *mushrabiya* screen walls form part of the aesthetic, whose intent is also to abstractly mimic a woven surface [figure VII-3 & VII-4; A-10 to A-15].

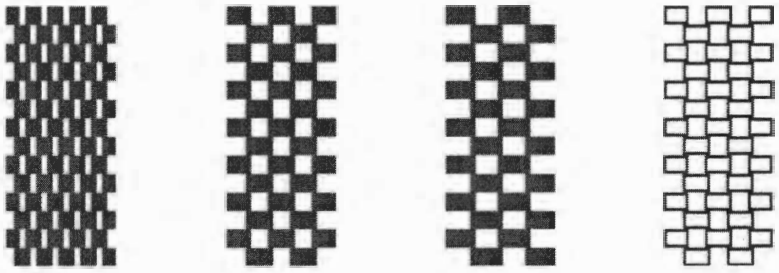


FIGURE VII - 3: Nakuru Market Screen Wall Language

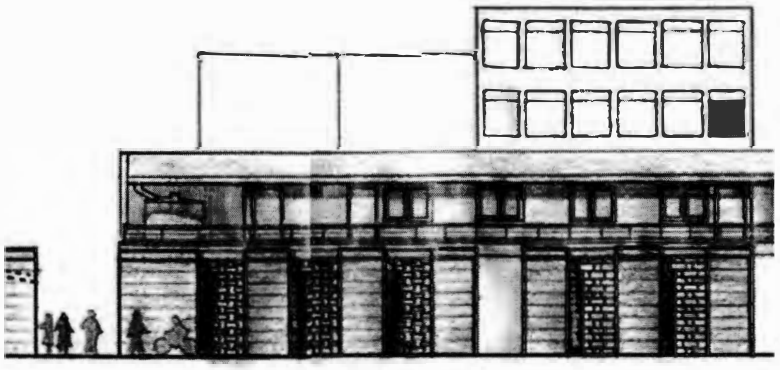


FIGURE VII - 4: Nakuru Market Partial North Elevation

Chapter VIII
Climatic Factors Influencing Tropical Architecture

There are a number of important components of the tropical climate, which the architect has to take into consideration. They are temperature, humidity,, wind, sunlight, precipitation and landscape. Landscape characteristics have important bearing on the preceding components. The climate of tropical regions has a significant effect on the cultural life of its inhabitants, and thus on its architecture. Social values vary from culture to culture, and therefore the architect needs to have some understanding of how to best foster the preservation of these through the built environment. The architect's task is to weigh the intent of the building in terms of its life span and the availability of construction materials. In considering this, the architect has to take into consideration the implications of climate on people and buildings.

Good tropical architecture aims at reflecting away, baffling, intercepting, or absorbing extreme heat or light in order to maintain a comfortable and thus livable interior. Roofs are always the most direct exposure to the elements and therefore their design has traditionally been given special attention. They should be designed to minimize heat transmission into the building.

Four main principles apply in excluding solar heat from buildings:

1. *Shading*: Prevent direct sunshine from reaching components of the building that have direct contact with the interior.

2. *Reflectivity*: Provide a reflective top surface finish in order to deter the absorption radiant heat by the

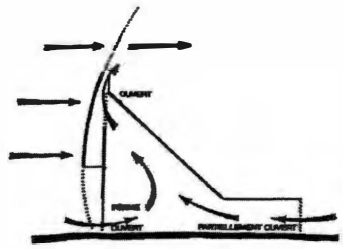


FIGURE VIII - 1: JMT Center Passive Cooling
Renzo Piano Building Workshop



FIGURE VIII - 2: JMT Center Cases
Renzo Piano Building Workshop

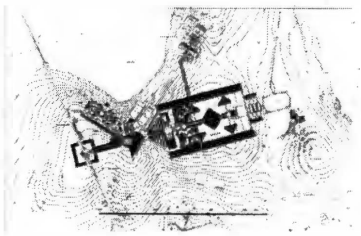


FIGURE VIII - 3: Ngaoundere University Site Plan
Aga Khan Development Network

building.

3. *Ventilation*: Make provision for the movement of air across the interior of the building, and within materials in order to prevent the collection of hot air.
4. *Thermal Capacity*: Use materials that do not store heat from the sun.

The *JMT Center*, New Caledonia reflects an effective merging of technology and tradition. Traditional materials were primary in the construction, and so were traditionally important agents such as wind, light, and vegetation [figure VIII-1]. Prevailing winds provide natural cross-ventilation. Piano planned the buildings to reflect the airiness and transparency that was characteristic of the indigenous house skeleton. The cases [figure VIII-2] are constructed of *iroko* wood, an African rot-resistant timber that in time takes on a silver patina that would then be in harmony with the trunks of the surrounding coconut palms. Stainless steel is also extensively used.

> "Given a certain climate, the availability of certain materials, and the constrains and capabilities of a given level of technology, what finally decides the form of a dwelling, and moulds the spaces and their relationships, is the vision that people have of the ideal life... Buildings and settlements are the visible expression of the relative importance attached to different aspects of life and the varying ways of perceiving reality (Rapoport, p.47)."

Ngoundere University in Cameroon is another example of contemporary architecture that adapts passive-cooling strategies from traditional architecture. The campus is located on a rectangular plot of land. A pedestrian axis runs the length of the complex of buildings, linking them to the vehicular drop-off point contained within a plaza at the western end of the complex [figure VIII-3]. The university buildings were designed around a series of plazas, a model that came from the layout of north Cameroon Sare villages. All the buildings have double-layer pyramidal roofs that allow

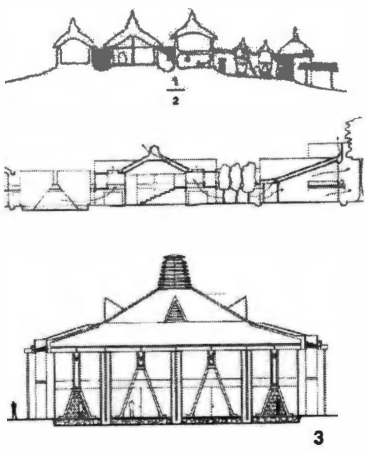


FIGURE VIII - 4: Ngaoundere University
Language and Passive Cooling
Aga Khan Development Network

breezes to seep through along the roof slope and exhaust out of large roof vents at the crowns [figure VIII-4]. The new market at Nakuru utilizes the alignment of screen walls to allow for a cooling cross breeze [figure VIII-5].

Cleveland Salmon, in his book *Architectural Design For Tropical Regions*, provides an excellent summary of the effects of climate on building design (Table V-1).

Table V-1: Effects of Climate on Building Design (Source: Salmon, p. 110-114)

Floor Slab	
Temperature	Slab-on-grade good for heat exchange
Humidity	No effect
Wind	No effect
Sunlight	No effect
Rainfall	Caution in flood prone areas Elevated slab suitable for such circumstances.
Landscape	Step slab with slope in order to avoid the expense of excavation or filling
Walls	
Temperature	Heavy construction provides thermal mass and thus steady internal temperature.
Humidity	Should have strategic openings to foster cross ventilation
Wind	Orient towards breezes and provide strategic openings
Sunlight	Construct to minimize solar gain. Orient long sides north-south for limited sun exposure
Rainfall	Protect the wall base from erosion due to the splash back of rainwater from the roof.
Landscape	No effect
Openings	
Temperature	Orient north-south to limit direct sunlight. Provide vertical louvers o east and west orientations
Humidity	Orient to catch breezes and allow free air movement
Wind	Design to obtain maximum air movement from prevailing breezes
Sunlight	North-south orientation to minimize glare
Rainfall	Little effect
Landscape	As all above
Roof	
Temperature	Provide reflective upper surface. Heavy construction provides thermal mass
Humidity	Design to allow free air movement
Wind	Allow free air movement through roof openings if practical
Sunlight	Reflective without causing glare
Rainfall	Collect rainfall runoff
Landscape	No effect

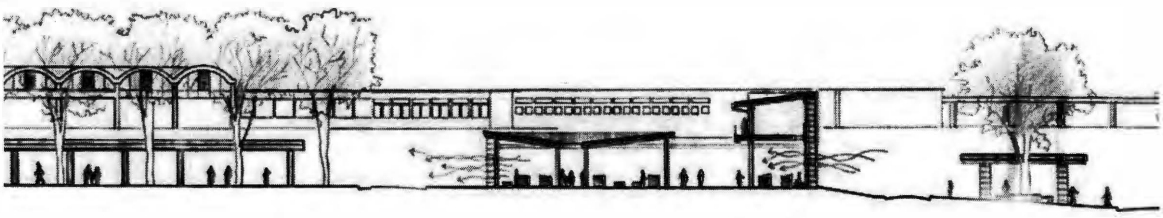


FIGURE VIII - 5: Nakuru Market Passive Cooling

Chapter IX
Woven Spaces
A Socially and Economically Viable Marketplace

Nakuru's economy is largely driven by the informal sector. Being located at the heart of Kenya's farming community; many farmers choose to sell their produce in the town in order to earn a living. As earlier mentioned, the towns infrastructure cannot support the volume of traders who wish to sell their produce.

As part of this thesis project, my goal has been to design the necessary infrastructure that would be economically feasible to construct.

At the onset, the proposed redevelopment seeks to decongest the transportation-market quarter. Key towards this is the reorganization of the public transportation patterns by providing them a new location away from the busy Mburu Gichua Road at the western side of the site [figure IX-1].

The placement of the transportation center downhill from the colonial railway station compliments the older structure by acknowledging the importance of public transportation in developing countries like Kenya. The town's most prominent open space. Lions Park is also an important part of this scheme. It is largely and often used for important public meetings. It unfortunately remains seriously under maintained.

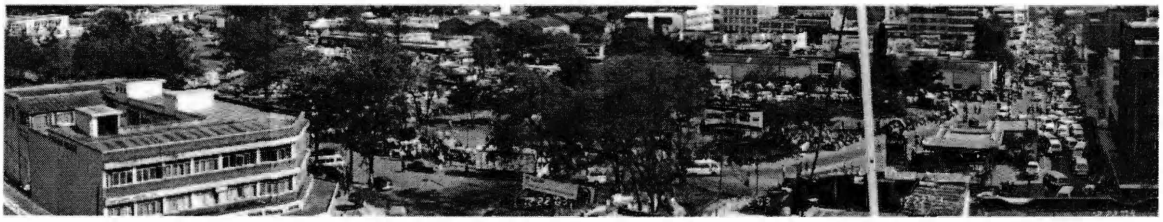


Figure IX-1: Lions Park Existing Site Panoramic

The scheme proposes a multiplicity of uses/functions for the Lions Park, a principle of traditional space planning and use. Drawn literally from the weaving aesthetic, a variation of concrete and weather-resistant timber benches [figure IX-3, A-6 & A-7] are placed in the park to serve the combined function as seats and display areas for produce.

Produce shall be sold on the site during periodic markets, but the park shall remain a place of rest or public meetings for the larger portion of the week.

The canopies on the eastern edge [figure IX-2 & A-9] serve a dual purpose that is also in keeping with the traditional space planning principle of multiplicity of uses. First, they are pavilions for speakers or entertainers during public gatherings. Second they are a covered market place during periodic markets, and while in that function, result in the continuation and acknowledgement of the shopping street that runs down East Road to the southern quarter of Nakuru Municipality.

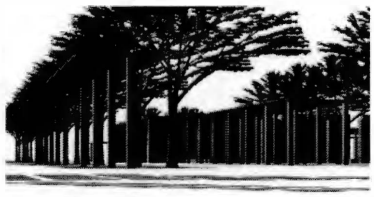


Figure IX-2: Lions Park Canopies

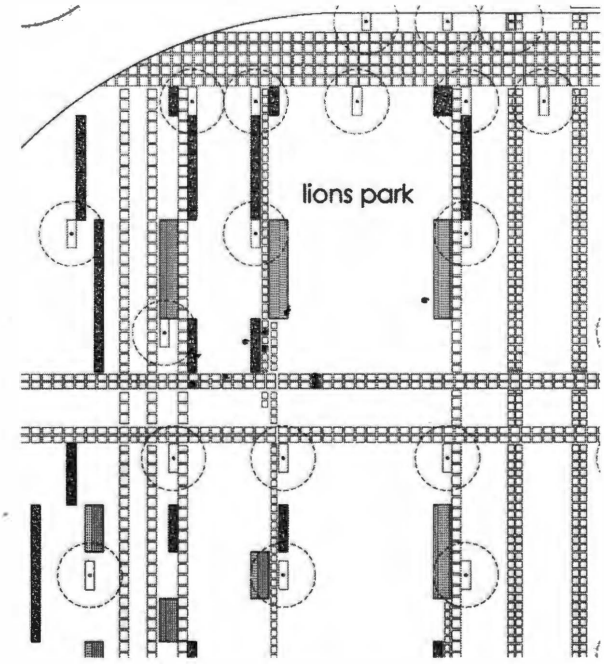


Figure IX-3: Lions Park Bench Plan

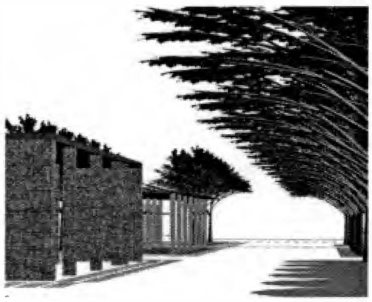


Figure IX-4: Market Building at Shopping Street

The prominence and importance of this street is also acknowledged by the extended market that abuts it [figure IX-4], in that pedestrian traffic is invited to weave into and trough the main market building as they move in a north-south (or vise-versa) direction. This weaving [figure A-5] has several provisions in the design. Openings are placed at several points along the length of the market building and continued in direct axis into the canopied market place south of the main market building [figure A-8].



Figure IX-5: Market Improvised Stands

The internal culture of the main market building remains relatively similar to the previous structure with a few changes. The previous structure had a lot of modifications that were made by the vendors. The most prominent was the construction of wooden produce stands [figure IX-5] in opposition to the concrete stands that came were built in place originally. This is done apparently due to the lack of adequate display space for the volume of produce traded.

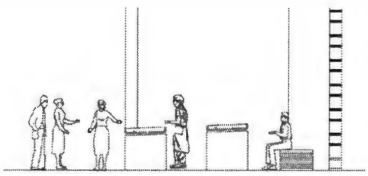


Figure IX-6: Profile of New Market Stands

In acknowledging this, all the new stands are made of wood, and similarly angled slightly to better face the customer [figure IX-6]. They are also doubled, widened significantly, movable and spaced to allow both the display of a much larger volume of produce and easy movement between stands [figure IX-7; A-16 to A-19]. The gaps between stands will allow for infill of new stands in the future should it be found necessary.

The market also has an administration, and due to the need for the most vending space, the administrative spaces are placed on an upper level at the eastern wing of the building [figure IX-8]. The administrative spaces include a market fee office, meeting hall for vendors and administrators, market association office, municipal administration office, toilet and rain water collection room [figure A-18]. The collection room was deemed necessary due to the frequent water shortages that plague Nakuru.

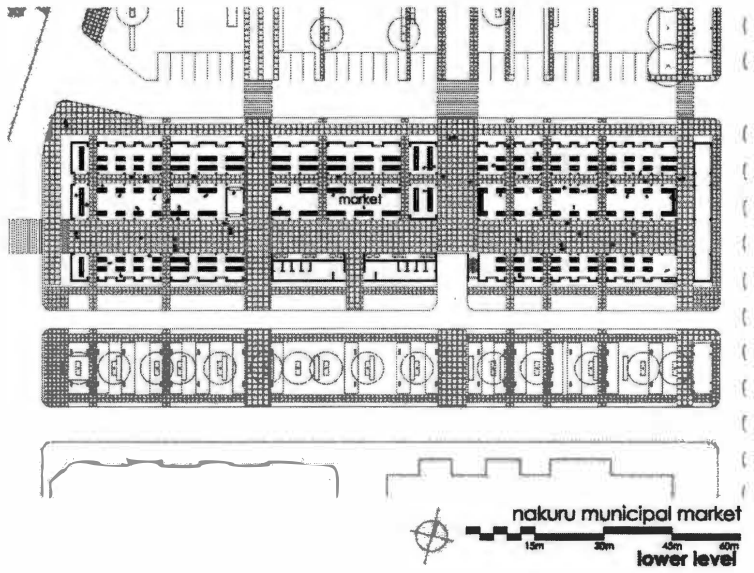


Figure IX-7: Market Ground Level Plan with Stand Configuration

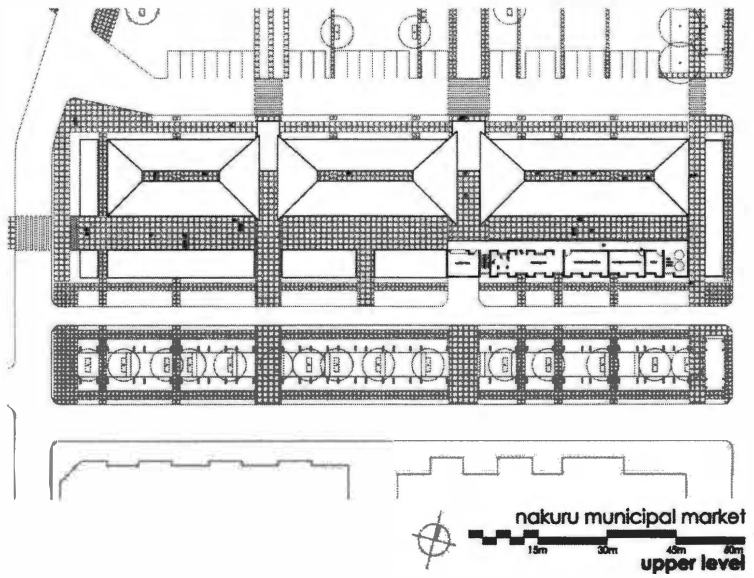


Figure IX-8: Market Upper Level Plan

It was also a wish of the vendors to have water for processing produce as told to me by Mr. John Ochieng (one of the market's original occupants) during an interview from which I learned a lot about the history of the town and market (Ochieng, 2003).

The building is constructed of local materials from the ground up. The main material is quarried stone that also serves as a good heat absorber and therefore helps to regulate the temperature within. The regular screen walls depressed and in shadow allows for cool cross-breezes, taking advantage of Nakuru's south-north winds. The roof utilizes clay tile that is also a better thermal mass than iron sheets. Concrete slabs serve as paving.

Overall, I hope the scheme serves as a model towards the potential redevelopment and significance that Nakuru holds [figure A-20].

Nakuru has an active population. Its placement as a park-edge town makes its future highly sensitive towards the ecosystem that surrounds it. Kenya's economic reality as a developing country in which the larger majority of the population lives on less than one dollar a day also means that planning and redevelopment has to be done in the most economically viable manner. The least energy use, plus the incorporation of locally produced materials and skill will have to be primary. Attention and acknowledgment of the town's culture, particularly that of the African majority, plus Asian and European residents, will also serve towards reestablishing the towns prominence as one of the finest urban centers in East Africa.

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Appendix



Figure A-1: Kenyatta Avenue, Nakuru



Figure A-2: Northern Exterior of Existing Market Building



Figure A-3: Wholesale Market Vendors



Figure A-4: Panorama of Existing Railway Station

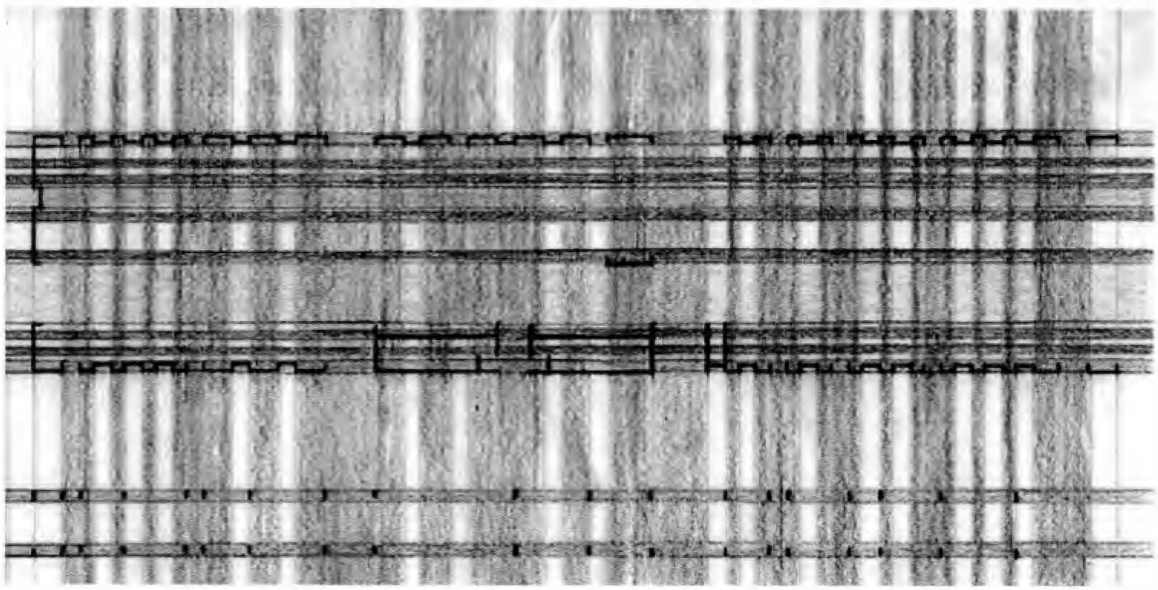


Figure A-5: Weaving Language of New Market Building

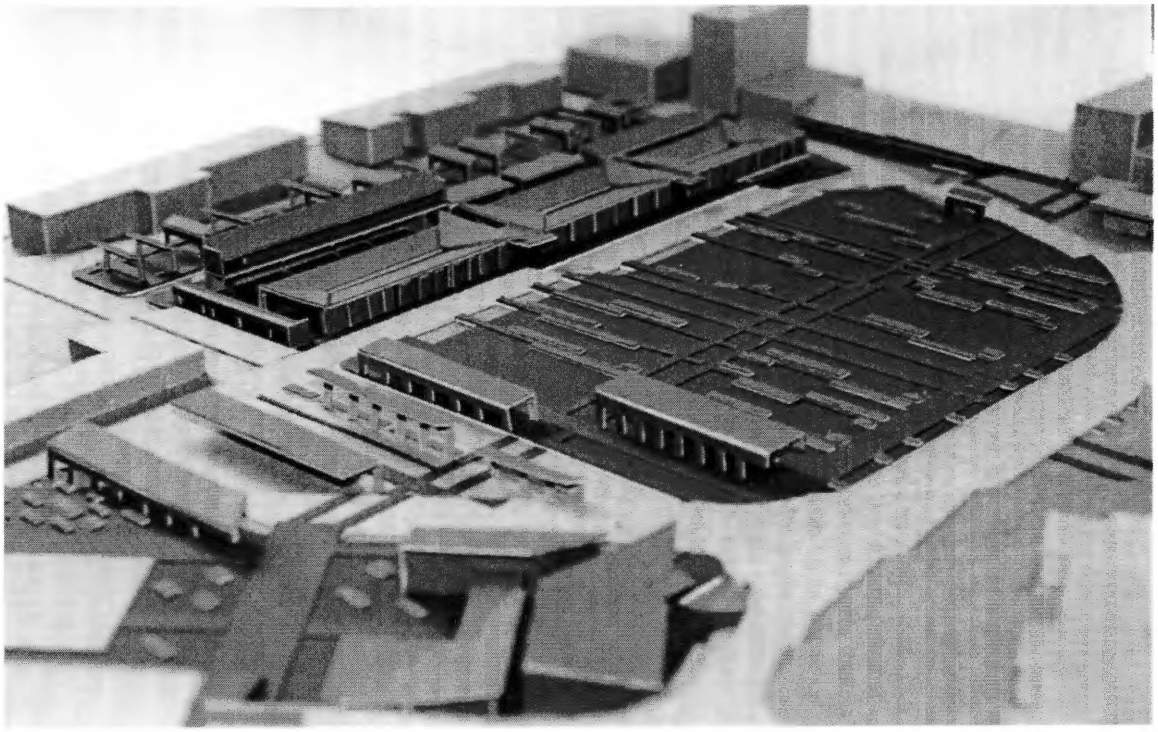


Figure A-6: Model with View from North-East

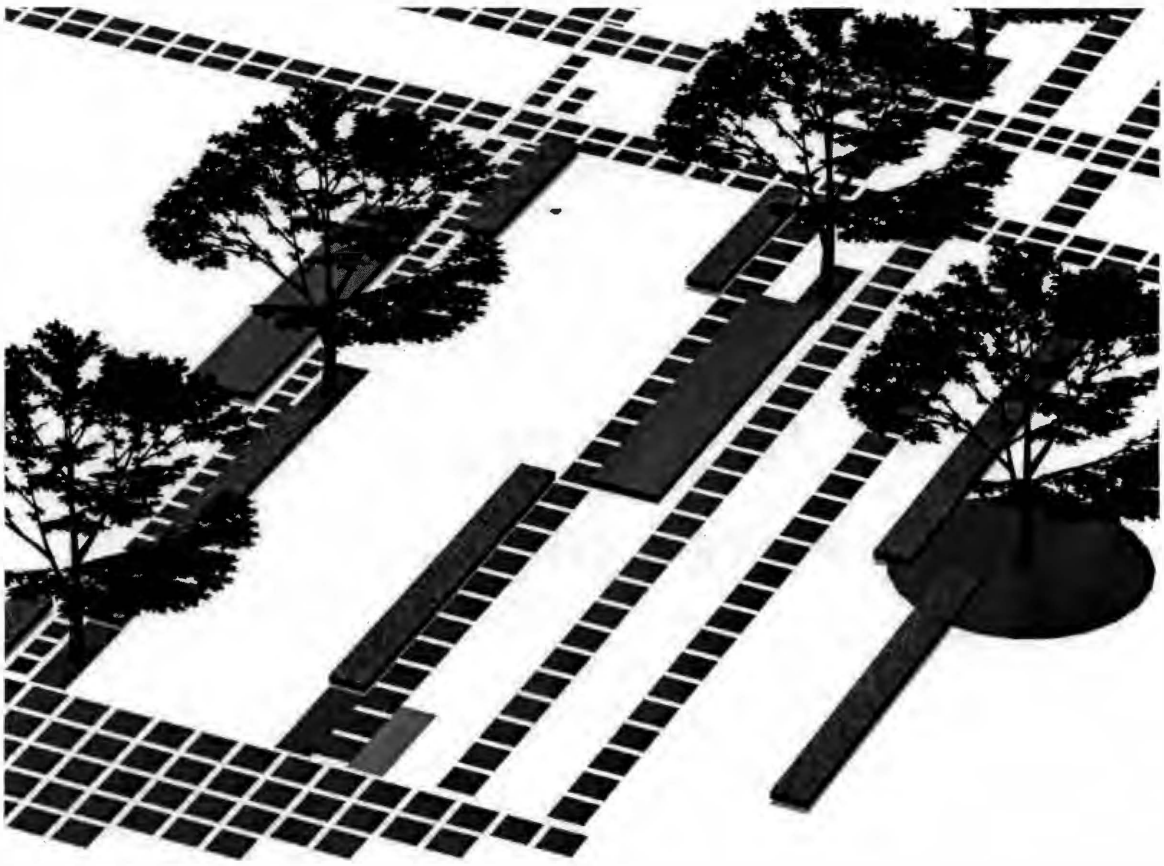


Figure A-7: Lions Park Close Aerial Perspective

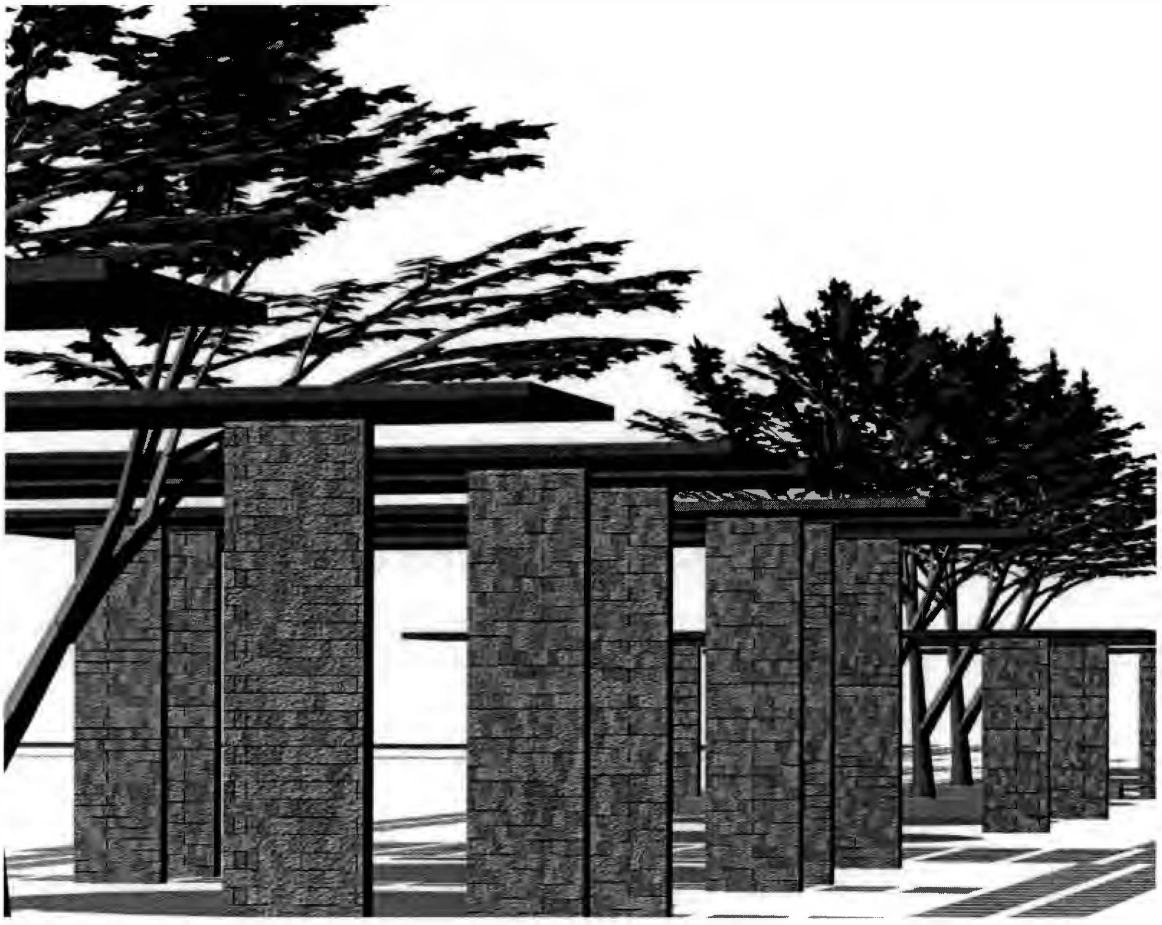


Figure A-8: Vending Canopies South of New Market Building



Figure A-9: Transportation Center Drop-Off Facing South

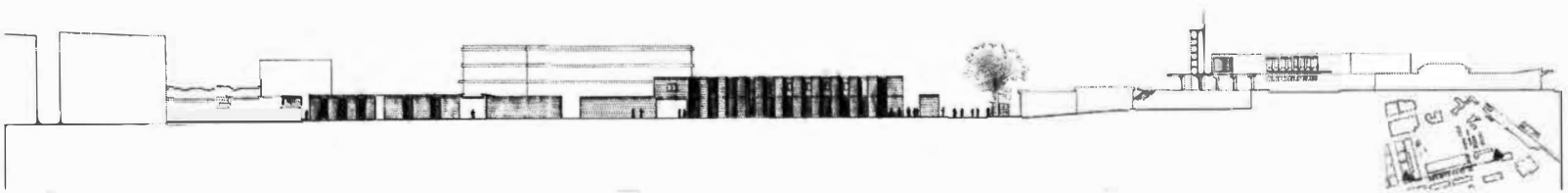


Figure A-10: Market and Context South Elevation

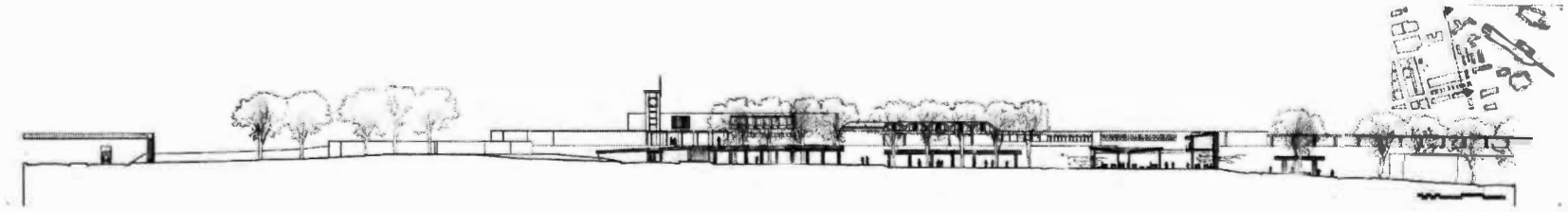


Figure A-11: Market and Context North-South Section



Figure A-12: Market and Context East elevation Along East Road

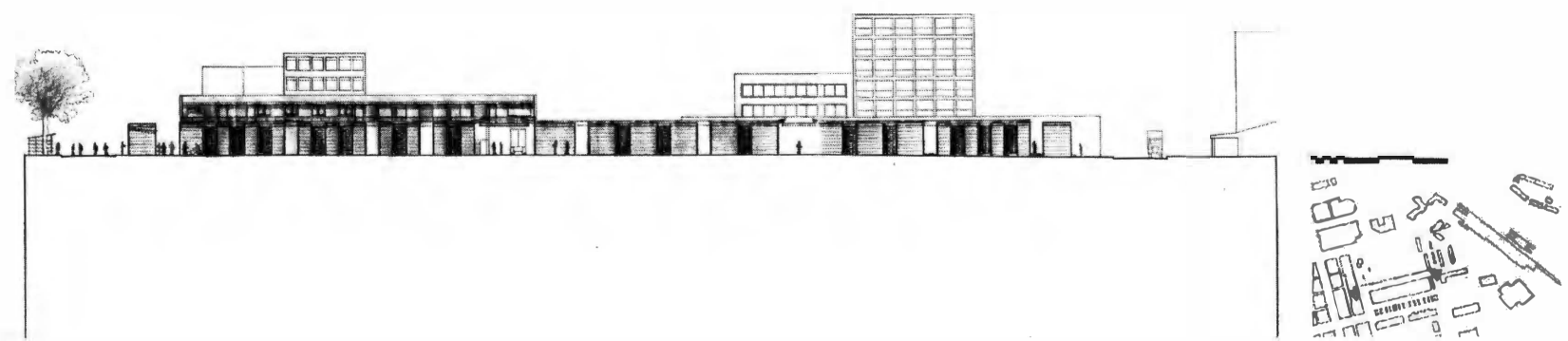


Figure A-13: Market and Context North Elevation

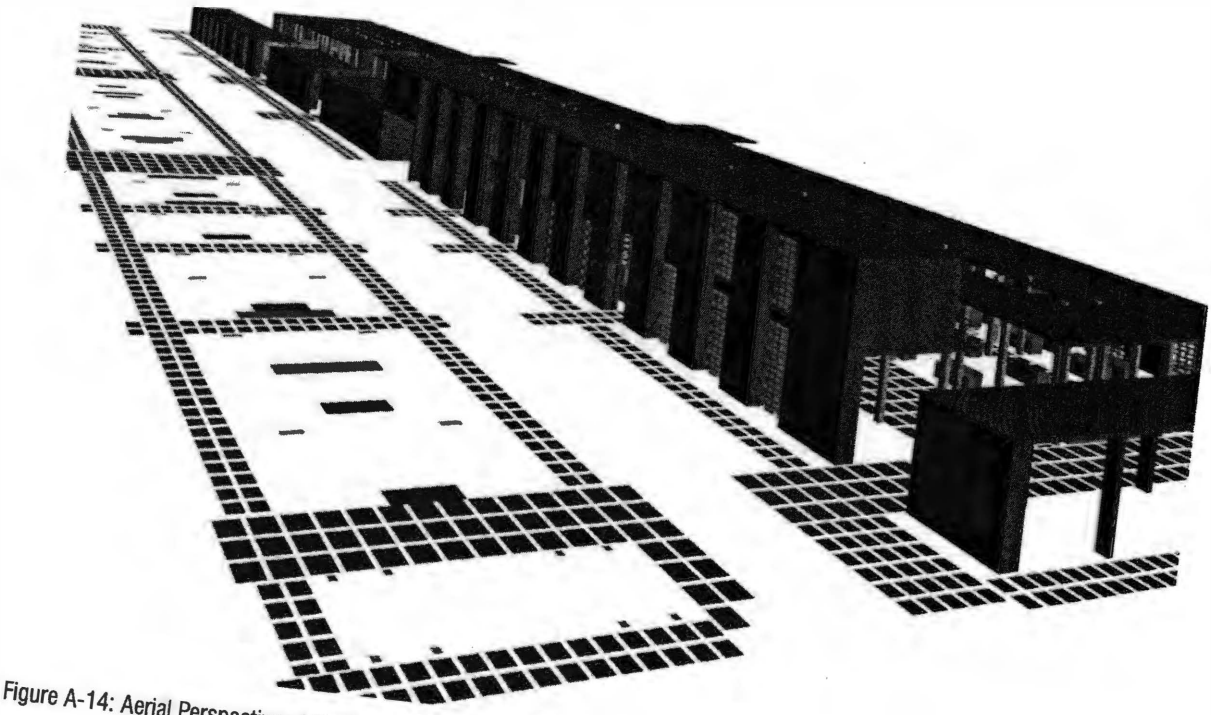


Figure A-14: Aerial Perspective of New Market Building



Figure A-15: Close Perspective at South-East of New Market Building

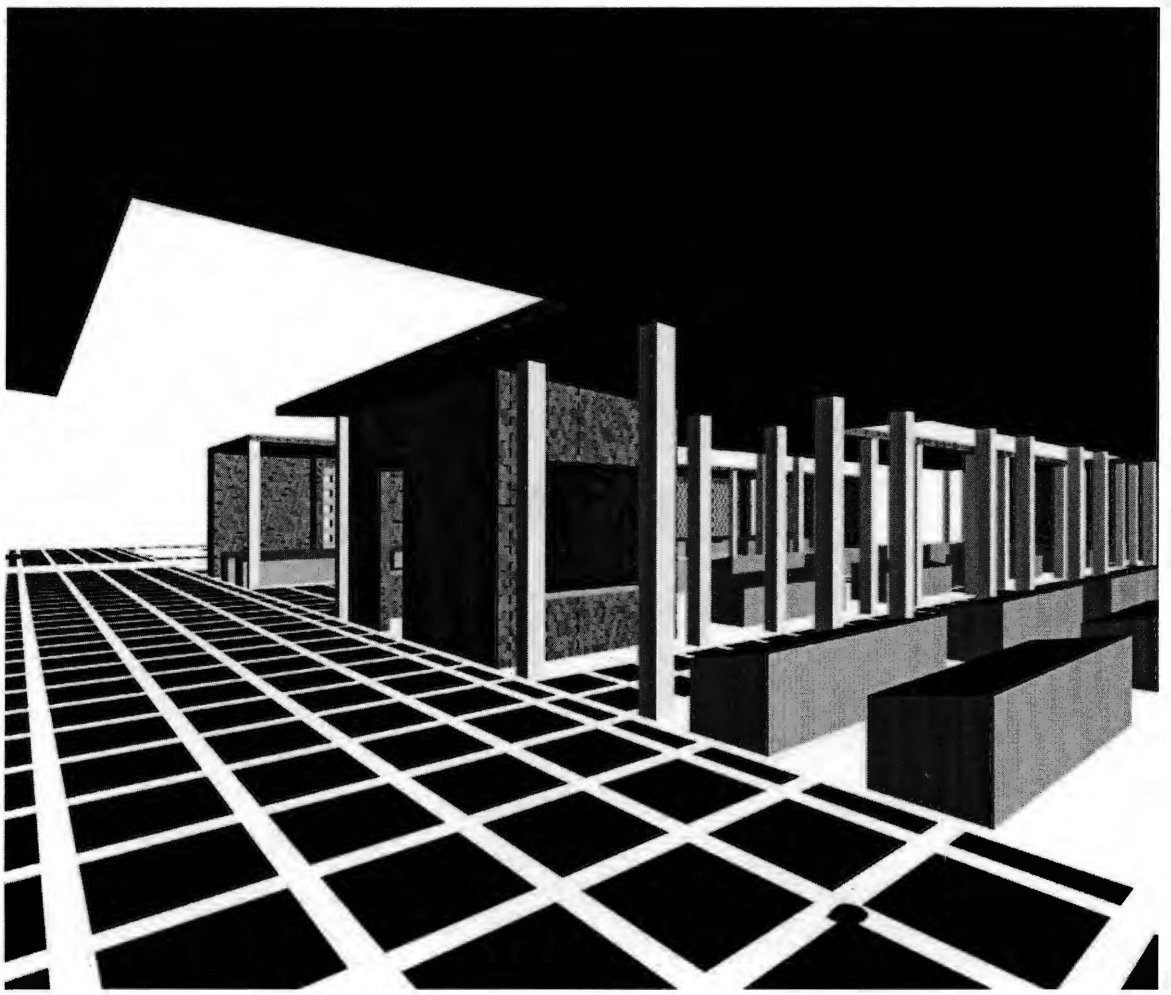


Figure A-16: Market Interior at North-West Entrance

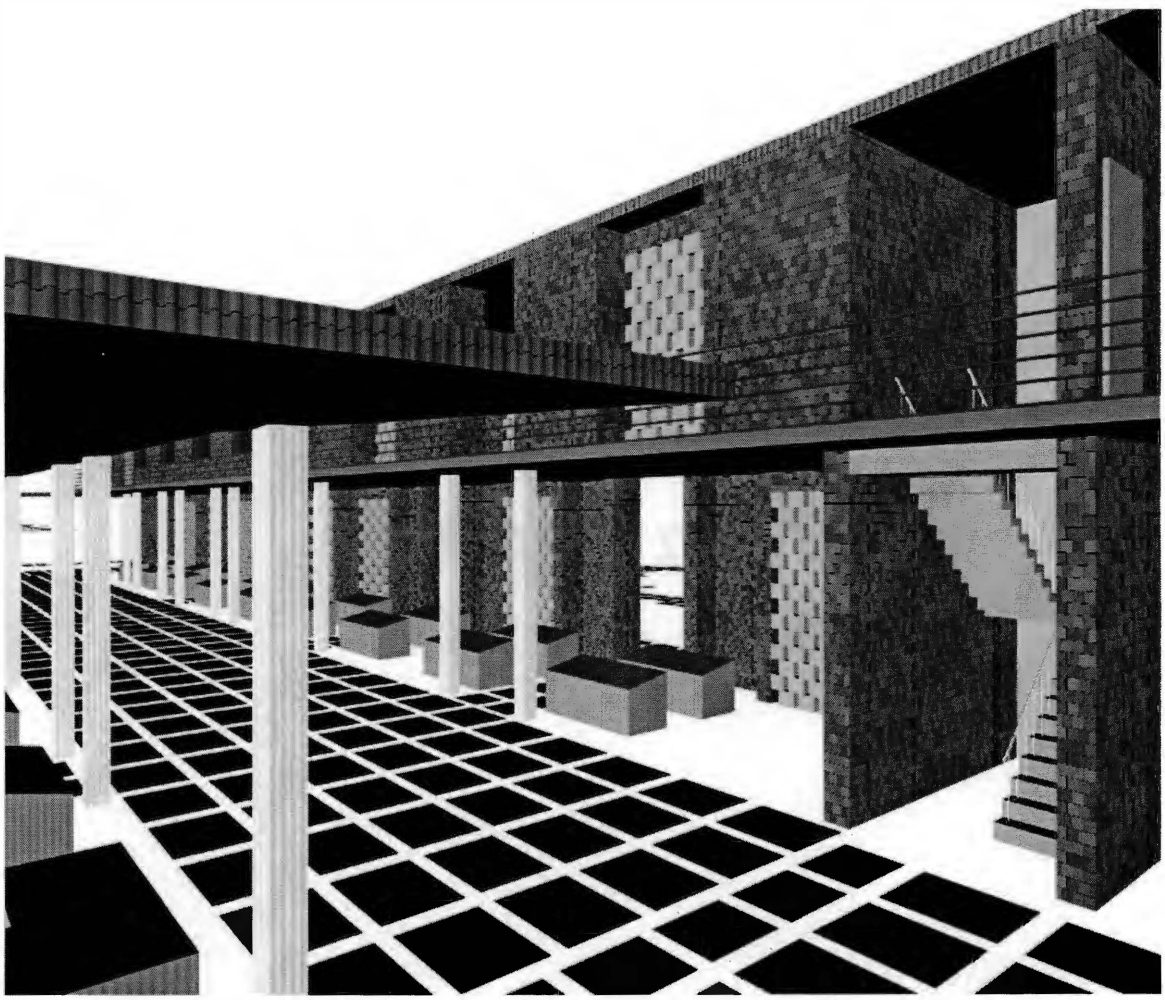


Figure A-17: Market Interior Facing Stairs

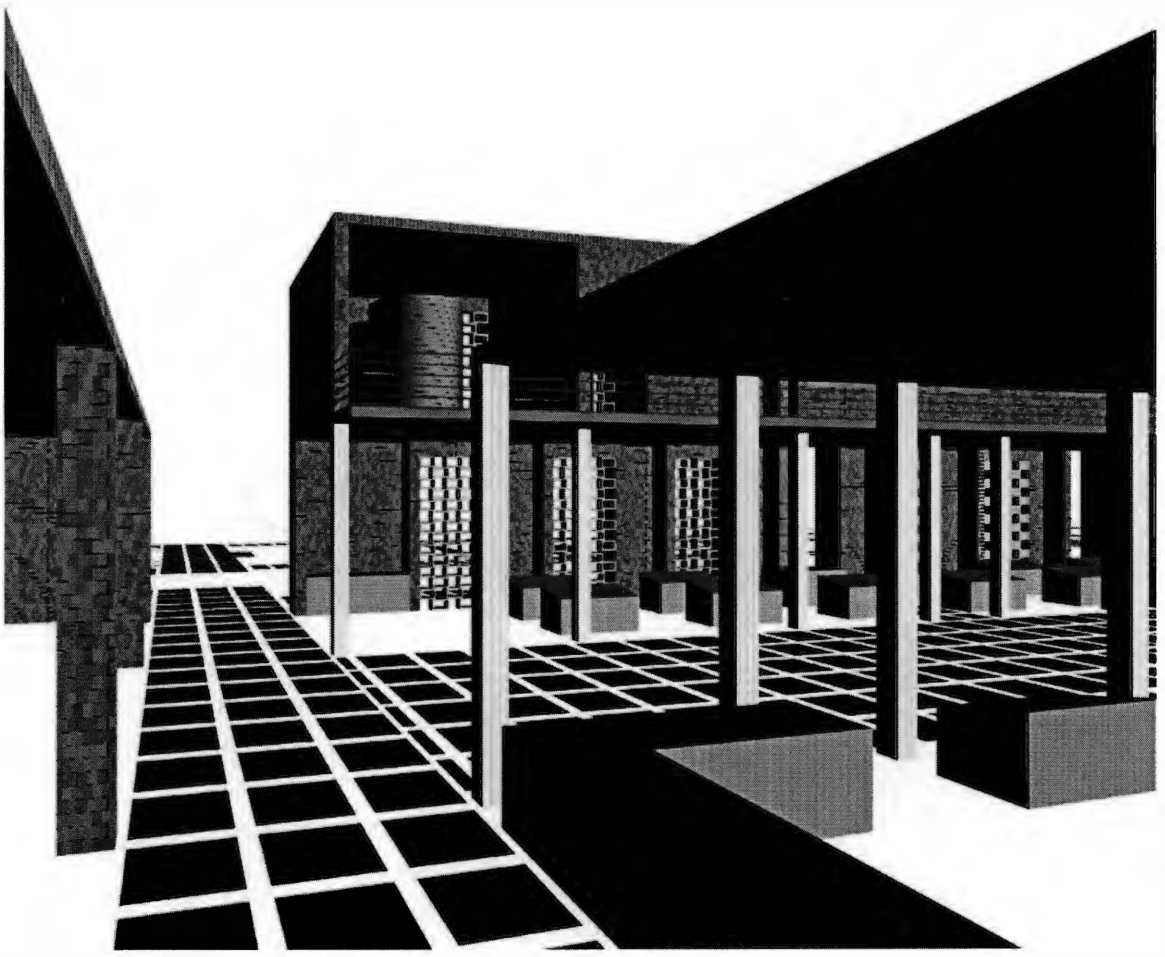


Figure A-18: Market Interior Facing Rain Water Collection Units

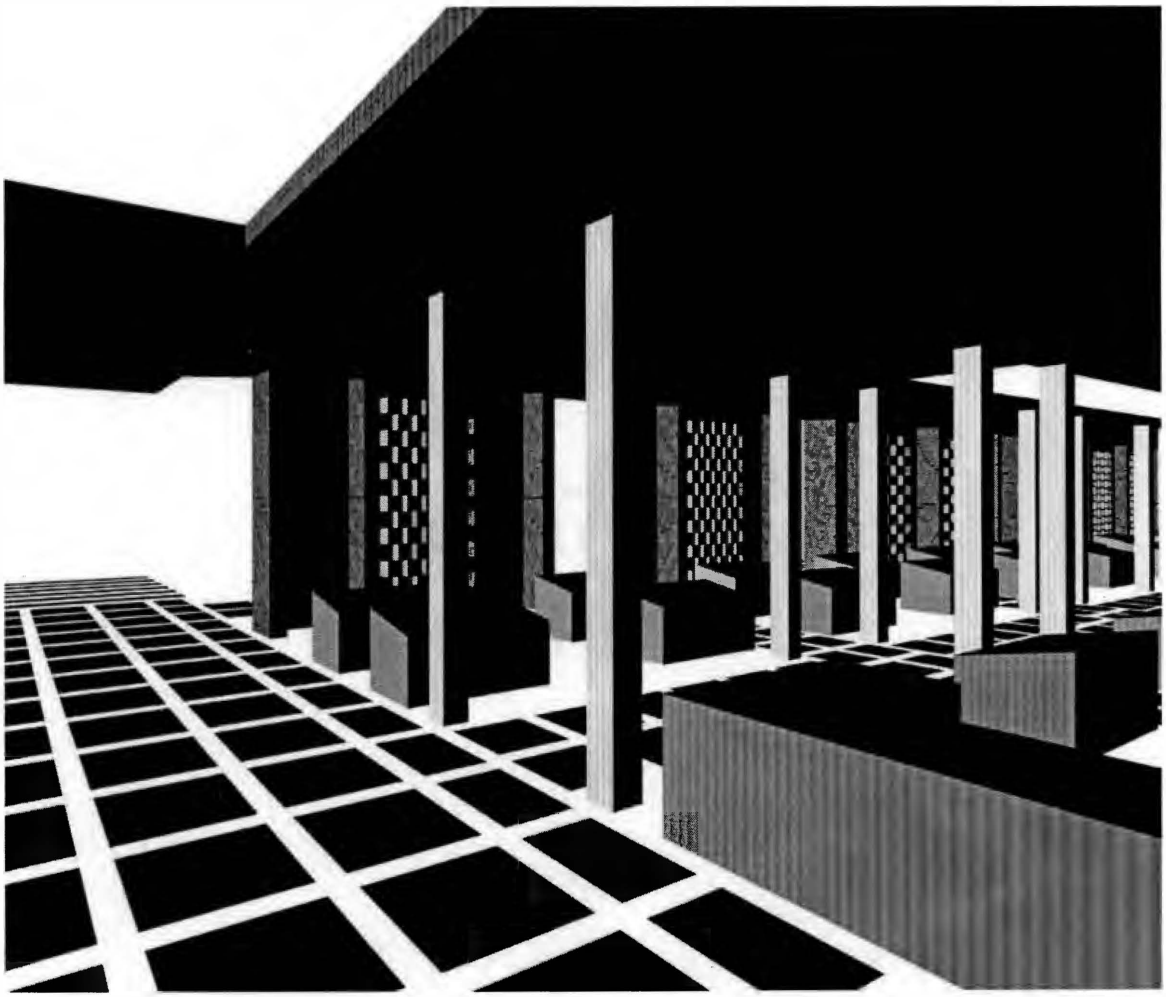


Figure A-19: Market Interior Facing North



Figure A-20: Nakuru Figure-Ground with Redevelopment

Vita

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