TENEMENTS: DWELLINGS FOR THE URBAN POOR
Comparative Study Illustrating 28 Cases in Developing Countries

By

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Chairman, Department Committee for Graduate Studies

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Submitted to the Department of Architecture at the Massachusetts Institute of Technology on February 9, 1981, in partial fulfillment of the requirements for the degree of Master of Architecture in Advanced Studies.

ABSTRACT

Tenements are significant systems that provide habitation to the poor in most of the urban areas of the developing countries.

Yet, tenements are practically ignored if not prohibited by the public sector and consequently banned from any public housing program.

This study, which is the first attempt to consider tenements as a viable option, describes, compares, analyzes and evaluates diverse tenement situations in twenty-eight case studies from twelve cities, in seven developing countries. It attempts to focus attention on a housing system that with a few improvements can provide an acceptable/appropriate shelter for a substantial sector of the income groups that otherwise have no better alternatives.

In terms of evaluations, the goal of this study is to single out the critical aspects of tenements that can be/should be improved in order to meet adequate health, sanitary and social requirements.

Thesis Supervisor: HORACIO CAMINOS
Title: Professor of Architecture, M.I.T.

ISAM ALIMAM

TENEMENTS:

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November 26, 1979

DEDICATION

TO MY MOTHER, MY SISTER, THE MEMORY OF MY FATHER
AND TO THOSE WHO SUFFER STRUGGLING FOR SHELTER.

FOREWORD

Tenements are significant systems that provide habitation to the poor in most of the urban areas of the developing countries.
Yet, tenements are practically ignored if not prohibited by the public sector and consequently banned from any public housing programs.
This study, which is the first attempt to consider tenements as a viable option, describes, compares, analyzes and evaluates diverse tenement situations in twenty-eight case studies from twelve cities, in seven developing countries. It attempts to focus attention on a housing system that with a few improvements can provide an acceptable/appropriate shelter for a substantial sector of the income groups that otherwise have no better alternatives.
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HORACIO CAMINOS
Professor of Architecture, M.I.T.

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CONTENTS

PREFACE

CONTENT: This study identifies tenements as viable transitory systems that provide shelter for the most needy, low-income population in most of the rapidly growing urban areas in the developing countries. It describes, compares, analyzes, and evaluates diverse tenement situations in twenty-eight case studies from twelve cities, inseven developing countries.

In terms of proposals and recommendations, it represents two action/approaches. The first one, which is mainly the concern of politicians and administrators, implies tentative/general policy, program and operational mechanism, demonstrating an alternative to government policies and programs in regard to the development/supply of tenements. The second, which is mainly the concern of programmers and designers, implies planning, development and design considerations/criteria/indicators to improve the physical, social, sanitary and health conditions/products and to provide a yardstick for design decisions.

In short, this work includes the following:

A: General introduction to the urbanization process in the developing, "industrializing" countries, and the housing market with particular reference to dwellings for the low income population, specifically the tenements.

B: Tenement definition and types.

C: The twenty-eight case studies: observations, graphical and statistical documentation, comparison, analysis, and conclusions.

D: Recommendations and proposals, which include: policy, program, operational mechanism, criteria and strategy.

PURPOSE/OBJECTIVES: This study attempts to:

A: Identify tenements as significant transitory habitation for the most needy sector of the population: the poor in most of the rapidly growing urban areas in developing countries.

B: Compare, analyze, and evaluate a representative cross section of tenements in twenty-eight case studies and organize the information in a comparative format to facilitate easy reference.

C: Identify the prevailing basic problems as well as the critical aspects of tenements that can be/should be improved in order to meet acceptable social, health and sanitary requirements.

D: Suggest tentative recommendations in order to improve the conditions of existing tenements and/or to increas the tenement supply (when needed).

APPLICATION: The study is intended as a reference for:

A: Understanding the existing tenement system and its prevailing conditions/problems.

B: The formulation of urban housing policy that recognizes and incorporates the tenement as a feasible system that provides transitory habitation/lodging to the poor in most of the rapidly growing urban areas in developing countries.

DATA: The frame of reference of this work is derived from field surveys carried out by the author during eh summer of 1978, for the five case studies in Baghdad, Iraq. And from the information/data obtained from twenty-three previous case studies of the Urban Settlement Design Program (U.S.D.P.), Massachusetts Institute of Technology (M.I.T.), for the rest of the case studies.

The documentation of the case study information is based on a modification of the format prepared in the U.S.D.P. under the direction of Professor Horacio Caminos.

Data includes:

- URBAN AREA: location, origin, layout, land use circulation, and population.
- LOCALITY: utilities, services, and community facilities.
- TENEMENT: land/lot, developmen, type, location, and physical characteristics.
- DWELLING UNIT.
- USER.

INTRODUCTION

URBANIZATION IN DEVELOPING COUNTRIES: an overview *

In 1950, approximately 20% of the population of the developing countries lived in urban areas. In 1975 this proportion was 31%. A conservative estimate for the year 2000 suggests at least 45%.

The increased urbanization of the developing world is expected in the process of economic development. But what is alarming are the gross inefficiencies and inequities that characterize these urbanization processes: the rapidly deteriorating living conditions, and the decaying urban environments which surround the majority of the population; the huge urban agglomerations of people who live in over-crowded and unsanitary slums; the congestion and pollution of the environment; the accelerated population growth (particularly among the lower income groups/urban poor); the severe/acute shortage of urban dwelling units.

HOUSING AND URBAN GROWTH:

The considerable importance of housing to the urban and national economy contrasts sharply with urban dwelling conditions and public policies that prevail in most of the developing countries. For the majority of the urban population, housing is usually costly in relation to income and the quality of available dwellings. Cramped, overcrowded, and unsanitary environments are the ordinary conditions of lower income population, which debilitate the capacity to perform and reduce national productivity.

Settlers in illegal developments and squatter settlements constantly face the threat of eviction as well as scarcity of utilities and services. Often, under the banner of slum clearance, urban renewal and gentrification schemes/programs, the low income population groups are moved to higher-quality dwellings located far from income-earning opportunities and required to pay what they cannot afford.

If standards of living are to rise commensuratively with the rapid/accelerated urbanization, the much denser concentration of urban population over the coming decades will require that far greater attention be given to the provision of housing and other urban services. However, the provision of more shelters, as demanded, can not be the only response to this dilemma. As these shelters are provided, it is imperative that they be within the financial reach of the growing population of the urban poor.

This is the immediate problem that faces policy makers in developing countries. However, it has been realized that most of the conventional urban development policies, programs and modern practices have failed to cope with the problem. The results are waste of land and services, with costs far exceeding the capacity of the poor. Moreover, little or no consideration is made to the fact that the transitory population may be still living, to a certain extent, according to their original rural customs, and have not yet adapted to the urban situation.

A significant part of the problem, however, arises from a misunderstanding of the causes of the "housing crisis" that makes housing conditions in most countries appear worse than they really are. In a very few countries that have properly responded to housing problems, solutions are geared to employment needs and purchasing power of the low-income urban population. Building codes, regulations, and "standards" are realistic, so that the poor can afford the dwellings provided. Location is convenient and gives dwellers access to jobs and social services. But governments more frequently tend to promote unrealistically high "standards" of housing for the poor, so that default and delinquency in rental payments are common, transport to work is costly and housing built for the poor is raided by middle-income groups whose demand for housing also remains unsatisfied. Slum demolition and removal make matters worse by destroying existing housing stock. Unrealistically high standards for new dwelling con-

* References:
1. Orville, F. and Grimes, Jr. HOUSING FOR LOW INCOME URBAN FAMILIES.
2. Linn, Johannes F. WORLD BANK STAFF WORKING PAPER No. 342, July 1979.
3. Beier, G., Churchill, A., Cohen, M., and Renaud, B. WORLD BANK STAFF WORKING PAPER No. 209, July 1975.

struction and the refusal to accept existing relatively lower quality dwellings, even as interim solution, make it all the more difficult to meet the investment needs of rapid urban population growth.
Although inappropriate housing standards form the principal barrier, other imperfections also contribute to widening the gap between housing demand and supply for the urban poor. Zoning and building code restrictions, when effective, tend to inhibit mixed land uses and thereby restrict the growth of housing adjacent to employment centers. Housing finance institutions typically are embryonic, and the limited resources available often go first to middle or upper income groups, at interest rates representing explicit or implicit subsidies. Other scarce resources are also used to provide high-cost subsidized housing to a small fraction of the population. These policies have in common a piece-meal approach to housing problems rather than a concentrated effort in which housing, land use regulations, public utilities and services, and employment are coordinated.

OPTIONS FOR THE URBAN POOR :

1. No shelter/street sleeping: when climate and authorities are clement.*
2. Tenements
3. Squatter settlements/illegal developments: when no sanction, of public authorities.
4. "Site and services" projects: when officially sponsored.
5. Public housing projects: when provided, sponsored and usually subsidized by the public sector.

The availability of these options depend primarily on the economic capacity of the country; on the resources available for housing (particularly for low-income urban dwellings); on their affordability; on the financial capability of the low income population; and on public policies and housing programs.
Some of these options/alternatives require the public sector to play an important role, as in the "sites and services" and the public housing projects. In others, as tenements and squatter settlements, people help themselves to procure shelter, not only without the support/sponsorship of the public sector, but often against sanctions and obstacles of public authorities.

TENEMENTS : a viable option

Among other possible option, tenements are considered as a significant system to provide habitation for large sectors of the poor and/or the transient population in most of the rapidly growing urban areas of the developing countries. The percent of population lodged in tenements with respect to the total population of an urban area may reach 84% as in Goa, India; 70% as in Kampala, Uganda; 36% as in Nairobi, Kenya; 32% as in Baghdad, Iraq; 23% as in Mexico City, Mexico and in Cuernavaca, Mexico.
The reasons are:

1. Less is required from the public sector.
2. The tenement is an appropriate system as a short term lodging for the transient populations newly immigrated from rural areas and not yet adapted to the urban life.
3. The development costs are made lower because of the high density, and the larger number of people using each facility which are the case in the tenements.
4. The importance of tenements increases as the public authorities eliminate other options by the prohibition of squatting, and actions against illegal settlements in some countries such as Iraq.

Yet tenements are practically ignored if not prohibited by the public sector and of course banned from any public housing program. This study, by illustrating a few tenements around the developing world, attempts to focus the attention on an urban dwelling system that, with a few improvements, can provide adequate shelter for a substantial sector of the income group populations that, otherwise could not afford better alternatives.

**A street sleeper is a mobile squatter without a house. If climate and authorities are clement, the street sleeper continues bedding down in the streets until he can find a better cover and the means to pay for it. For example, in Calcutta, some 600,000 people sleep in the streets. In Bombay about 1 in each 66 persons is homeless, while another 77,000 people live under stairways, in cattle sheds, on landings, or in similar spaces. Street sleeping permits no family life, no privacy, no relief or escape from difficult climatic conditions, and no decent means for disposing of human waste. It is the lowest form of urban life.*

Reference:
Abrams, Charles, MAN'S STRUGGLE FOR SHELTER IN AN URBANIZING WORLD.

WHAT ARE TENEMENTS ?

DEFINITION :

A dwelling type of several room units contained in a building/shelter, which shares the use of the parcel of land (on which they are built), the open space, the circulation areas and sometimes the common sanitary facilities (kitchen, shower, toilet, laundry, etc.) if availabe . Rented to an individual tenant, a group, or a family, usually of the low income population in large urban areas (mostly transitional population of rural immigrants and/or unskilled laborers).
Characterized by simple tenure possibilities/arrangements, as well as close proximity/accessability to large variety, marginal, low or no skill employment opportunities. Usually implies center cities/urban areas. Tenure can be short or long term. Short term, when the tenement is a transitional shelter that complies with two functions, acculturation and temporary accommodation. Long term, when the tenant fails to improve economically or there are no adequate housing alternatives.

(Definition by the author)

TYPES :

Tenements have been classified into four categories based on the tenement ORIGIN, SIZE, the available SANITARY FACILITIES as well as on the tenant's PERMANANENCY/MOBILITY.

A_ ORIGIN :

The origin of the tenement building and its initial use which is either initially (expressly) built as tenements or a dwelling of other type that has been converted into tenement. This usually occurs when the owner's socio-economic level changes and/or extra dwelling units are demanded.

initial :
1. Organized around courtyard(s)
2. Grouped units/rooms.
3. Row units/rooms.

converted :
4. Single family house.
5. Public housing project.
6. Apartments.
7. Subletting of room(s).

B_ SIZE

The size of the tenement in terms of the number of dwelling units it contains. Three types are considered:

1. Small (less than 10 dwelling units).
2. Medium (10-20 dwelling units).
3. Large (more than 20 dwelling units).

C_ SANITARY FACILITIES

The availability and the mode of utilization of the tenement's sanitary facilities: showers and toilets (kitchen/cooking space is usually contained in the dwelling unit). Three types are considered:

1. No sanitary facilities (except kitchen/cooking space)
2. Shared (communal) sanitary facilities.
3. Individually provided (self-sufficient units).

D_ PERMANENCY

The degree of permanency/the tenant's mobility has been observed as two types:

1. Short term occupancy, rapid (dynamic) tenant mobility.
2. Long term occupancy, slow (static) tenant mobility.

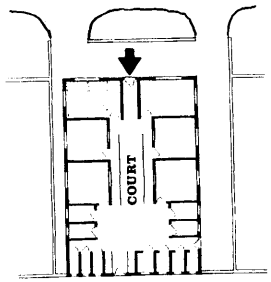
In the two pages that follow the types are schematically illustrated with selected examples from the case studies.

TYPES

A1 ORIGIN: INITIAL

Built around courtyards

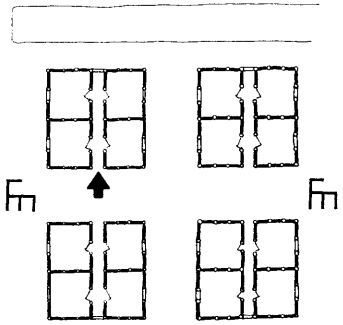
CASE STUDY N°. 20: EASTLEIGH, Nairobi, Kenya
See also case studies N°. 2, 3, 8, 21, 27, and 28.



several dwelling units/rooms that are grouped around a common open space: courtyard/patio. In many cases, the communal sanitary facilities are grouped at one side/end of this open space and are directly accessable from there.
This is the conventional (classic) tenement proto-type most likely to be found in Latin America (namely, Mexico) as well as some African countries (such as Kenya).

Grouped units

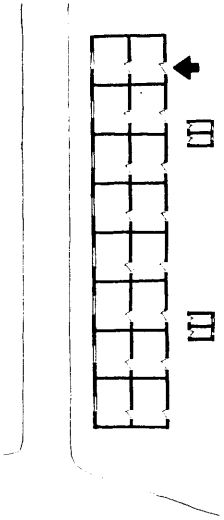
CASE STUDY N°. 14: KARIOBANGI, Nairobi, Kenya
See also case studies N°. 12, 13, 17, 19, and 23.



Several dwelling units/rooms (4-8) that are grouped under one structure. Sometimes they share a common corridor.
This tenement prototype is very common in Africa (namely, Kenya).

Row units (Chawl)

CASE STUDY N°. 15: MAKONGENI, Nairobi, Kenya
See also case studies N°. 1, 9, 16, and 24.



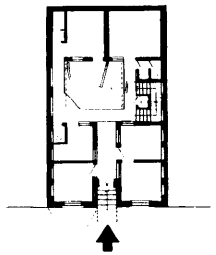
CHAWL:
In local Indian languages means "a passage", "a corridor" or "a lobby".
Also a popular generic term referring specifically to a housing system of rows of dwelling units/rooms, introduced for industrial workers (initially, single males) in major industrial cities in India, such as Bombay, during the late 18th century. Introduction of local rent controls and utility requirements in recent building by-laws discourage futher development of this type of dwelling.
(See glossary)

Row(s) of dwelling units/rooms, usually contains a cooking space but share the available sanitary facilities (showers, toilets, etc.) which if provided are usually grouped for communal use. They can be single or multi-storied (up to 5). This tenement prototype is very common in India, especially in major industrial cities such as Bombay.

A2 ORIGIN: CONVERTED

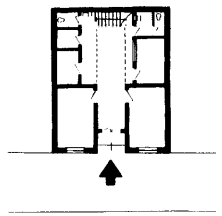
Single family houses

CASE STUDY N°.5: AL-BATTAWEEN, Baghdad, Iraq.
See also case studies N°. 4, 10a, 10b, 22, 25, and 26.



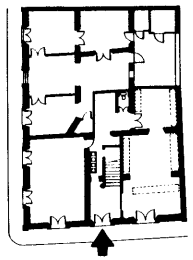
Public housing project

CASE STUDY N°.6: CAMP AL-ARMAN, Baghdad, Iraq.



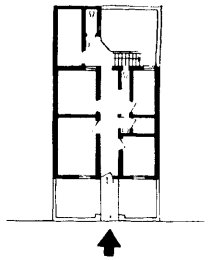
Apartments

CASE STUDY N°. 11: VIEJO SAN JUAN, San Juan, Puerto Rico.



Subletting of room/s

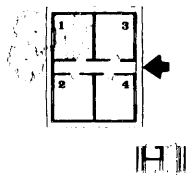
CASE STUDY N°. 7: AL-ISKAN, Baghdad, Iraq.



B SIZE

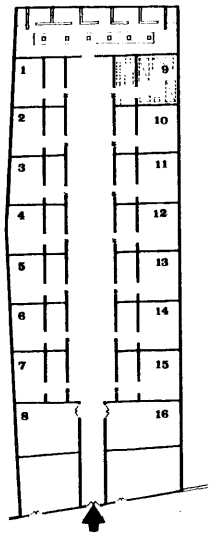
Small: less than 10 dwelling units

CASE STUDY N°. 14: KARIOBANGI, Nairobi, Kenya.
See also case studies N°. 4, 5, 6, 7, 10b, and 11-27.



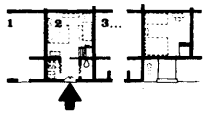
Medium: 10-20 dwelling units

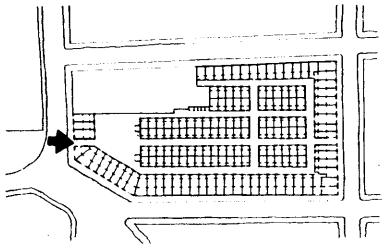
CASE STUDY N°. 28: MARIA AUXILODORA, Colima, Mexico.
See also case studies N° 8 and 10a.



Large: more than 20 dwelling units

CASE STUDY N°.2: LA FLORIDA, Mexico City, Mexico.
See also case studies N°. 1, 3, and 9.



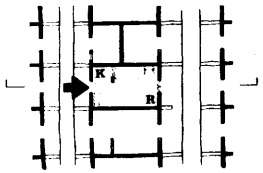


157 dwelling units

C SANITARY FACILITIES

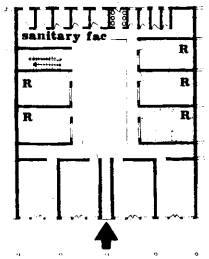
None

CASE STUDY N°. 24: BHILVAS, Rajkot, India.
See also case studies N°. 12, 13, 19, and 25.



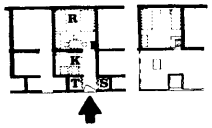
Shared

CASE STUDY N°. 21: RIVER ROAD, Nairobi, Kenya.
See also case studies N°. 1, 4, 5, 7, 8, 10, 11, 14-18, 20-23, and 26-28.



Individually provided

CASE STUDY N°.3: LA CASA BLANCA, Mexico City, Mexico.
See also case studies N°. 2, 6, and 9.



D PERMANENCY

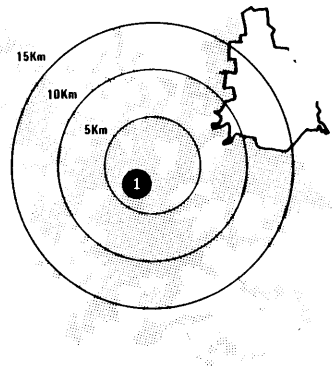
The degree of permanency/the tenant's mobility is a characteristic of the user rather than of the tenement building. It has been found that occupancy can be short or long term.

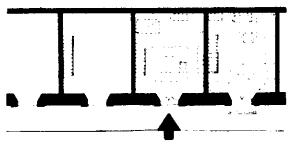
1. SHORT TERM OCCUPANCY:
Rapid (dynamic) tenant mobility. It can be assumed that short term occupancy is when the tenement is a transitional shelter that complies with two functions, acculturation and temporary accommodation until the tenant moves up in the economic ladder, and gains ownership of land/shelter.
As in case studies N°. 10b, 11, 13, 14, and 27.

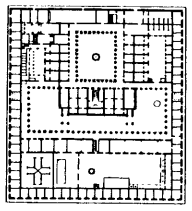
2. LONG TERM OCCUPANCY:
Slow (static) tenant mobility. It can be assumed that long term occupancy is when the tenant fails to improve economically, or when there are inadequate housing alternatives.
As in case studies N°. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10a, 12, 16, 18, 20, 21, and 25.

CASE STUDIES

1 LAS VIZCAINAS
Mexico City, Mexico

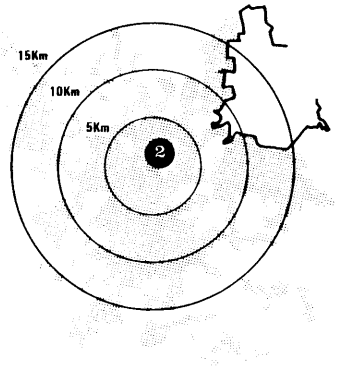


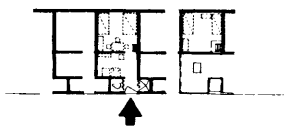


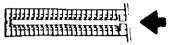


ROW ROOMS ABOVE SHOPS

2 LA FLORIDA
Mexico City, Mexico

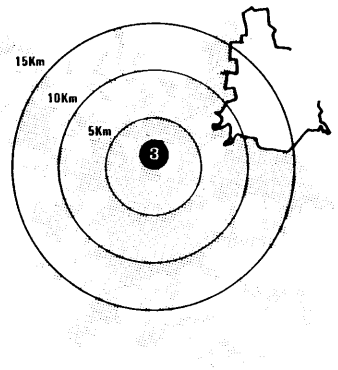


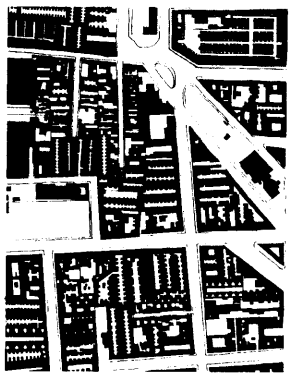


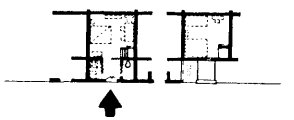


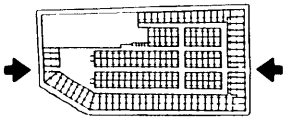
SELF SUFFICIENT ROW UNITS

3 LA CASA BLANCA
Mexico City, Mexico



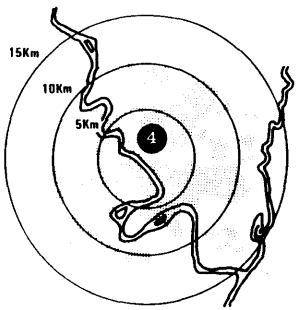


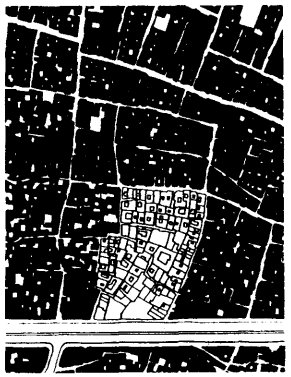


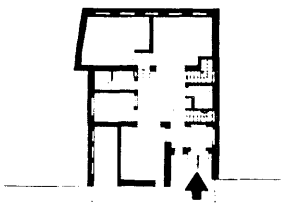


SELF SUFFICIENT ROW UNITS

4 AL KEFAH
Baghdad, Iraq

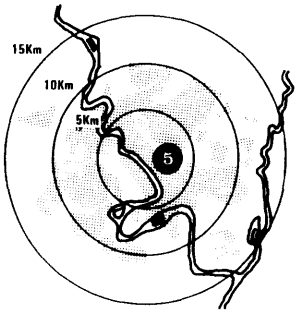


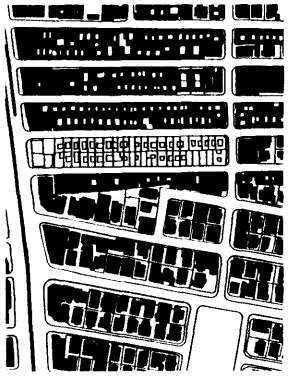


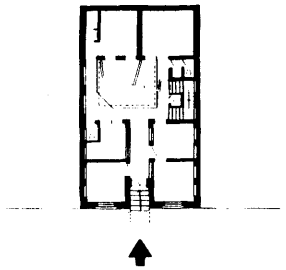


ROOMS IN CONVERTED TRADITIONAL HOUSES

5 AL BATTAWEEN
Baghdad, Iraq

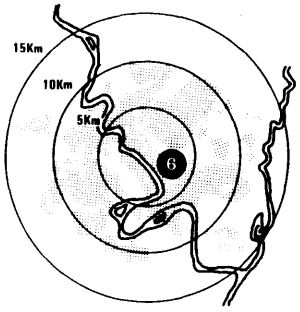


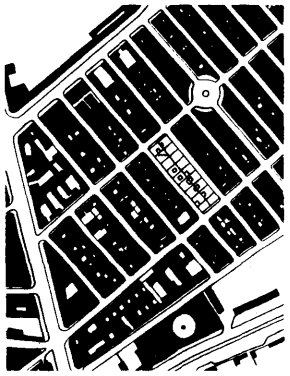


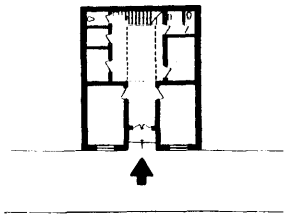


ROOMS IN CONVERTED ROW, EMPLOYER-PROVIDED HOUSES

6 CAMP AL ARMAN
Baghdad, Iraq

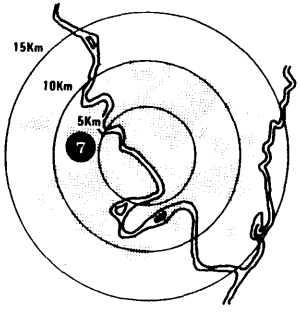


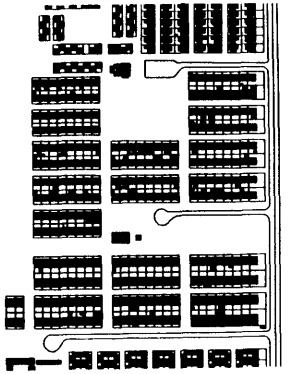


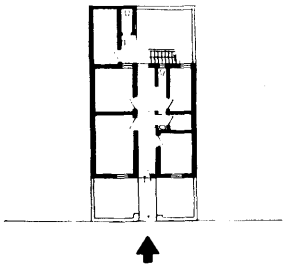


ROOMS IN CONVERTED PUBLIC ROW HOUSES

7 AL ISKAN
Baghdad, Iraq

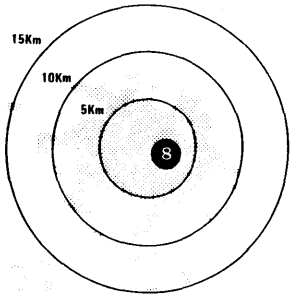


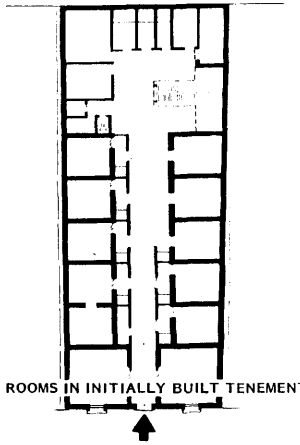




ROOMS IN CONVERTED PUBLIC HOUSING PROJECT

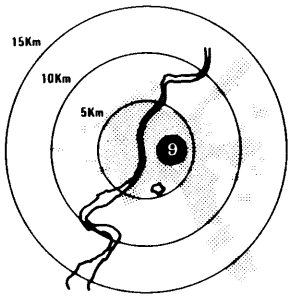
8 SAN JUAN DE DIOS
Guadalajara, Mexico

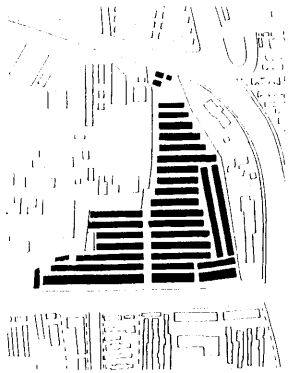


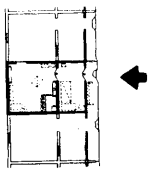


ROOMS IN INITIALLY BUILT TENEMENT

9 RAKHIAL
Ahmedabad, India

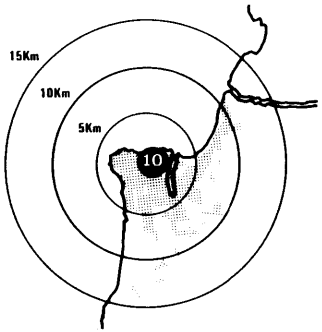


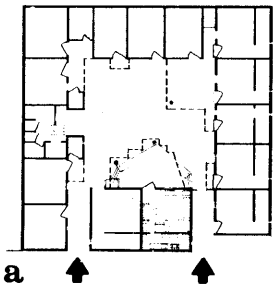




ROW SINGLE ROOM UNITS (CHAWL)

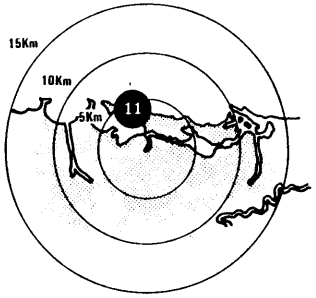
10 MEDAWAR
Beirut, Lebanon

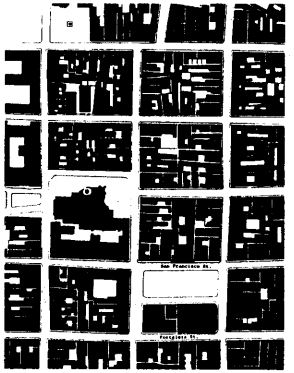


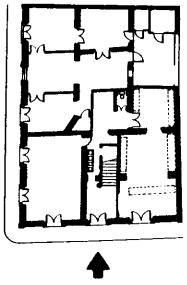


a - ROOMS IN INITIALLY BUILT TENEMENTS
b - ROOMS IN CONVERTED SINGLE FAMILY HOUSES

11 VIEJO SAN JUAN
San Juan, Puerto Rico

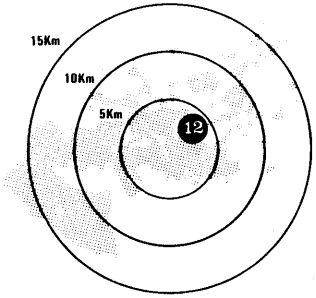


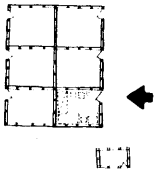




ROOMS IN CONVERTED APARTMENTS

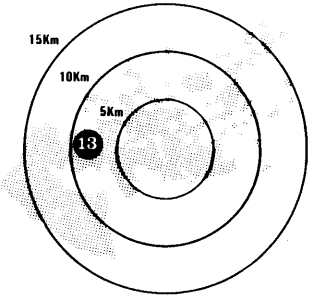
12 NEGI 1
Nairobi, Kenya

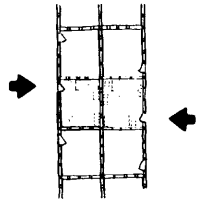




GROUPED, SINGLE-ROOM UNITS

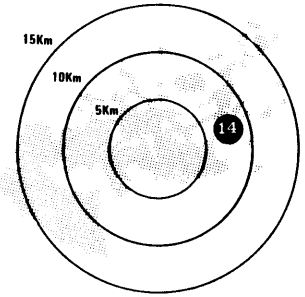
13 KAWANGWARE
Nairobi, Kenya

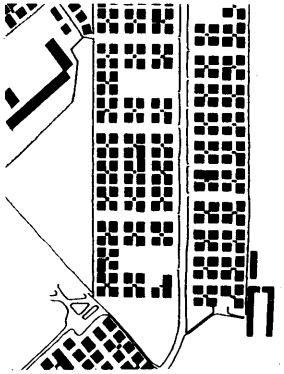


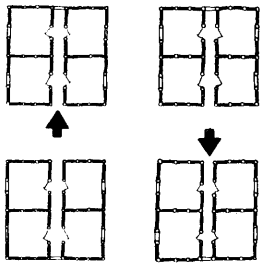


ROW, SINGLE-ROOM UNITS

14 KARIOBAGI
Nairobi, Kenya

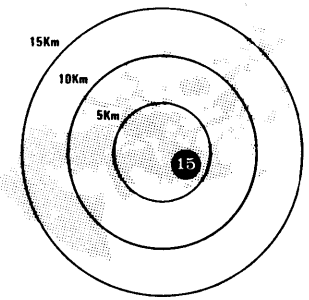


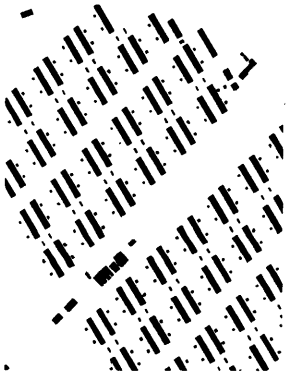


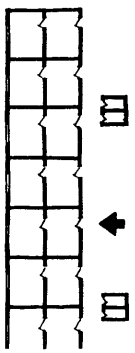


GROUPED, FOUR, SINGLE-ROOM UNITS AROUND CENTRAL CORRIDOR

15 MAKONGENI
Nairobi, Kenya

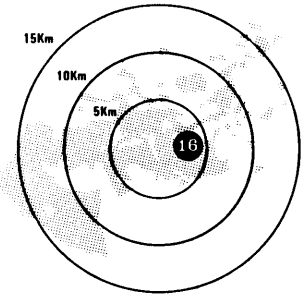


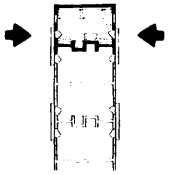




ROW, 8 DOUBLE-ROOM UNITS

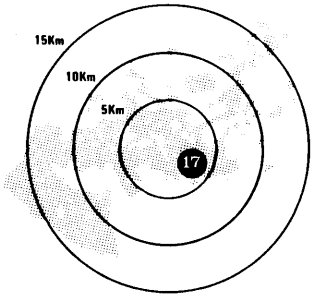
16 BAHATI
Nairobi, Kenya

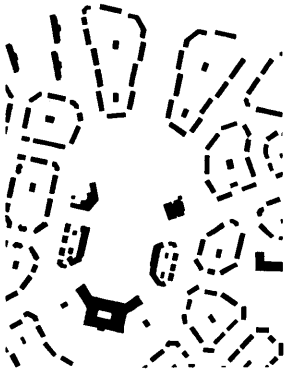


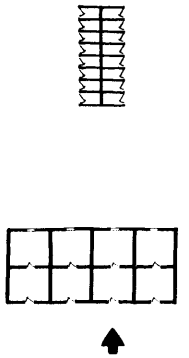


ROW, EIGHT SINGLE-ROOM UNITS

17 KALOLENI
Nairobi, Kenya

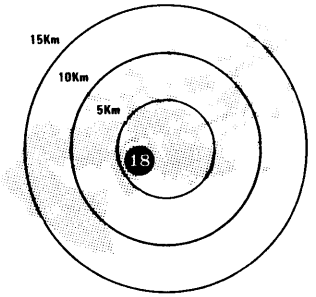


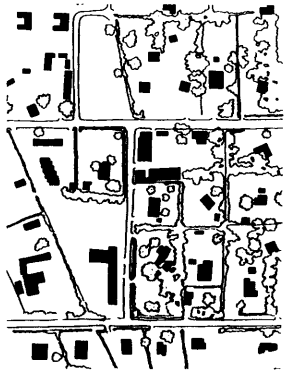


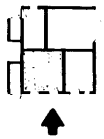


ROW, FOUR DOUBLE-ROOM UNITS

18 UPPER HILL
Nairobi, Kenya

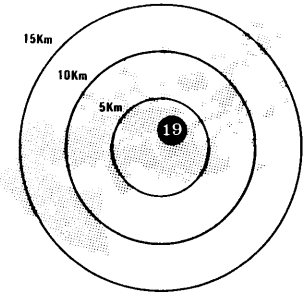


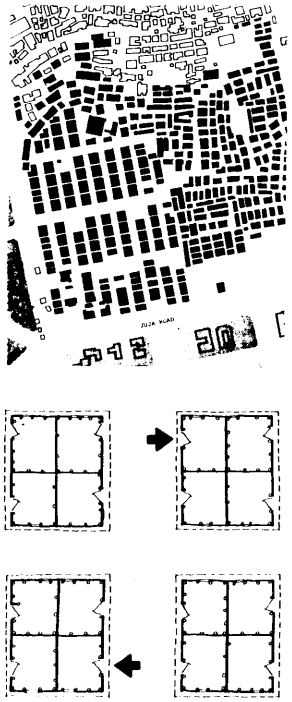




EMPLOYER-PROVIDED UNITS

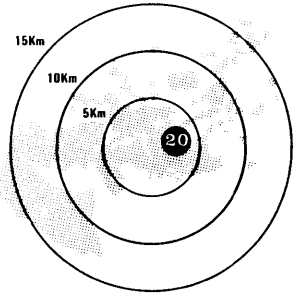
19 VILLAGE 1
Nairobi, Kenya

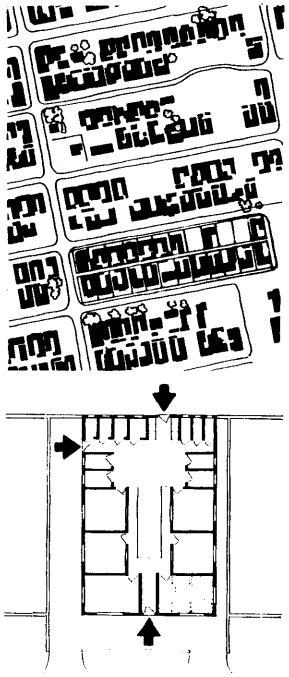




GROUPED, FOUR SINGLE-ROOM UNITS

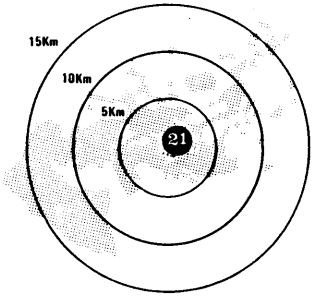
20 EASTLEIGH
Nairobi, Kenya

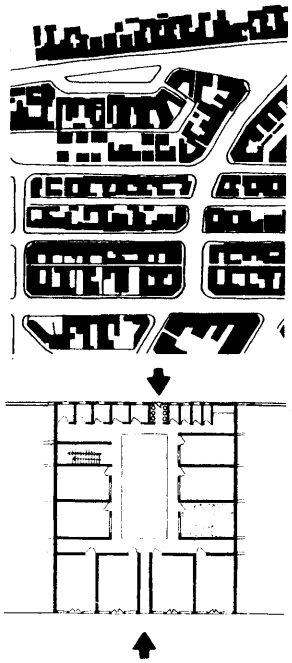




ROOMS IN INITIALLY BUILT, COURTYARD TENEMENTS

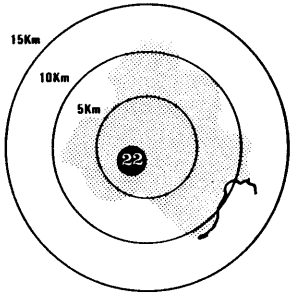
21 RIVER ROAD
Nairobi, Kenya

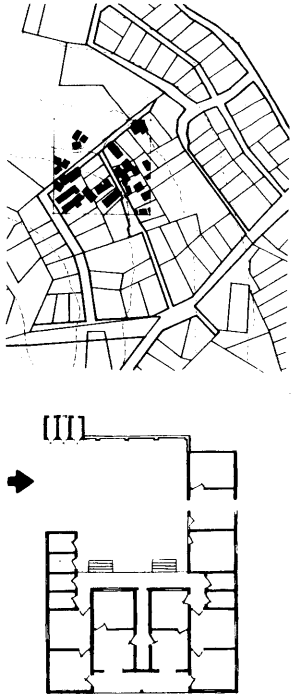




ROOMS IN INITIALLY BUILT, COURTYARD TENEMENT

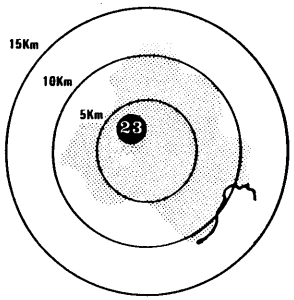
22 KISENYI
Kampala, Uganda

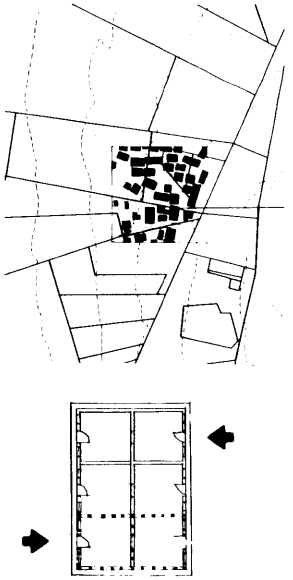




ROOMS IN CONVERTED FAMILY HOUSES

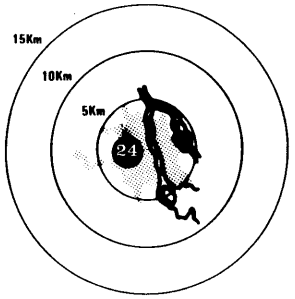
23 MULAGO
Kampala, Uganda

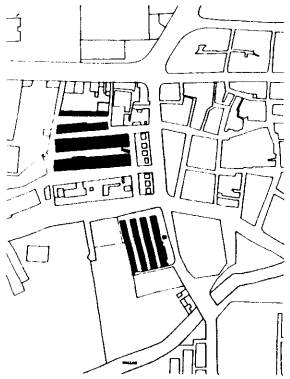


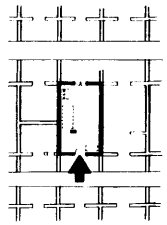


SINGLE-ROOM UNITS

24 BHILVAS
Rajkot, India

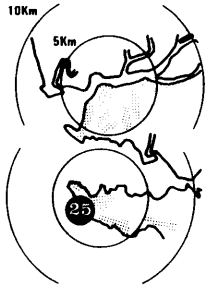


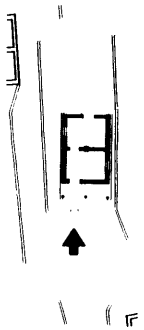




ROW SINGLE ROOM UNITS "CHAWLS"

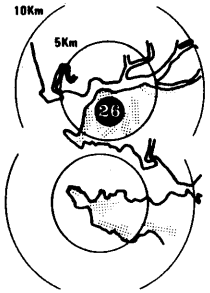
25 SADDA
Goa, India

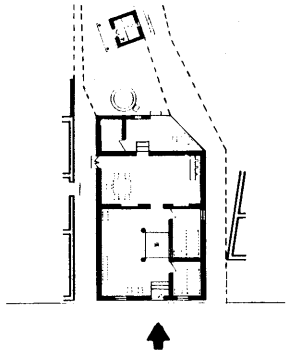




ROOM SUBLETTED IN SQUATTER SETTLEMENTS

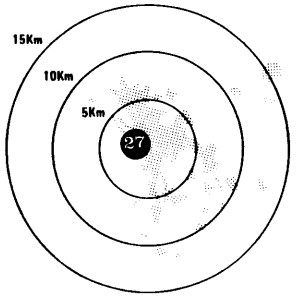
26 FONTAINHAS
Goa, India

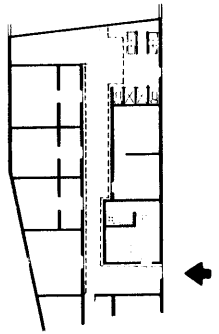




ROOMS IN CONVERTED FAMILY HOUSES

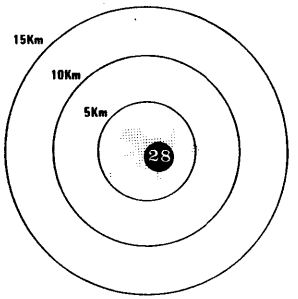
27 CAROLINA
Guernavaca, Mexico

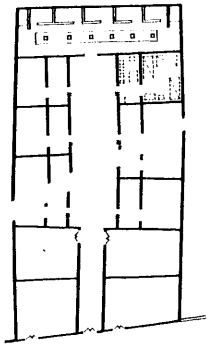




ROOMS IN INITIALLY BUILT, COURTYARD TENEMENTS

28 MARIA AUXILODORA
Colima, Mexico





ROOMS IN INITIALLY BUILT COURTYARD TENEMENTS

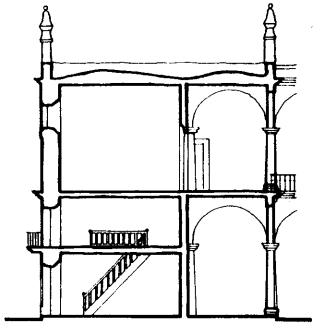
1 LAS VIZCAINAS
Mexico City, Mexico

ROW ROOMS ABOVE SHOPS

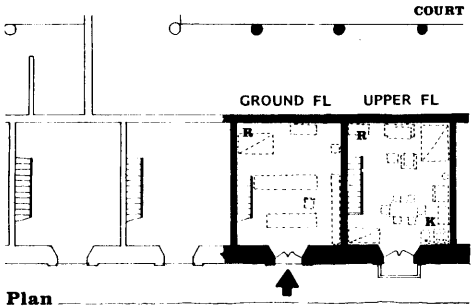
LOCATION: Two kilometers from city center in one of the oldest sectors in the city (15th Century) which provides variety of employment opportunities.
ORIGIN: The primary element of this locality is the school building which was founded in 1734, and has given the name to the locality. Within the building, which occupies a whole block, there are courts, dormitories, classrooms, a chapel, a cemetary, administration rooms, shops, and 120 other different spaces for several activities.
Dwellings, in the form of row single room units above shops called "accesorias", were constructed in the periphery of the school compound to be rented to artisans and small merchants.
LAYOUT: The circulation pattern as well as the land subdivision are typical of a Spanish orthogonal grid, dividing the land into large square and rectangualr blocks. The subdivisions inside the blocks are not so regular. With the exception of the block where Las Vizcainas is located, the sizes of the courtyards are very big and the property is the block itself. Dwellings/shops are located on the periphery of the block.
LAND USE: The area is a dense, heterogeneous conglomeration of offices, commercial activities, as well as low income deteriorating dwellings.
CIRCULATION: The locality has a high intensity of both pedestrian as well as vehicular circulation. It is bounded on two sides by very important and heavy traffic routes and by a subway line as well.
POPULATION: Low income families are usually engaged in comercial activities within the same premises. The settlement has been held by the same families for two (or more) generations, thus the geographical/urban mobility of the tenants is very slow or almost static.
TENEMENT: Rows of shop/dwellings are accessible directly and individually from the street sidewalk. On the first floor many people have a small shop usually combined with some of the dwelling activities, on the upper floor is their dwelling. This arrangement is locally recognized as "taza y plato" (cup and saucer).
Although potable water is supplied, the sanitary facilities (excluding the kitchen) are shared and located outside. No private (or semiprivate) open space is provided. The dwellings are deteriorating because of their age and the controlled rent which discourages maintenance/renovation by the owners who usually live somewhere else.

LOCALITY SEGMENT PLAN **1:2500**

Elevation



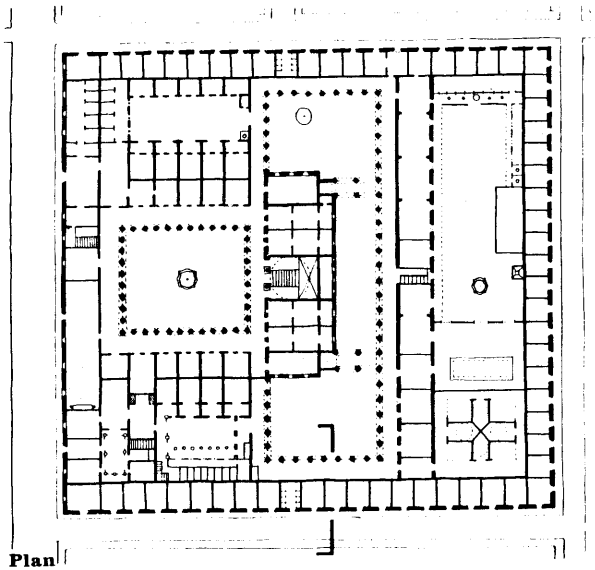
Section



Plan

DWELLING UNIT

0 2 10 20m
1:400



Plan

DWELLING: TENEMENT

Key

- **R** Room (multi-use)
- **K** Kitchen/Cooking Area
- **S** Bathroom/Shower
- **T** Toilet
- **L** Laundry
- **St** Storage

0 20 100m
1:2000

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal ownership
Area (sq.m.): 16625

DWELLING
Type: Row rooms above shops
Location: City center
Utilization: N.A.
Number of Floors: 2
Number of dwelling units: 56
Number of people: 546

Dwelling Units Floor Area (sq.m.):	N.A.	(N.A)
Shared Floor Area (sq.m.):	N.A.	(N.A)
Total Floor Area (sq.m.):	N.A.	(100%)
Open Area (sq.m.):	N.A.	
Lot Coverage (%):	N.A.	
Floor Area (sq.m.)/Lot Area (sq.m.):		N.A.
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		2.7
Floor Area (sq.m.)/Open Area (sq.m.):		N.A.
Percentage of Open Area to Total Floor Area:		N.A.
Density (people/Ha.of dwelling Lot Area):		625.0

Facilities	N	People/Facility
room:	112	5.0
kitchen:	56	10.0
shower:	4	137.0
toilet:	12	46.0

Physical state: Fair

DWELLING UNIT
Type: Two rooms
Tenure: Legal rental
Area (sq.m.): 96
Number of users

married:	2
single:	-
children:	4
total:	6

Area per person (sq.m.): 16.0
Facilities: Kitchen and small shop. Shared outside toilets, and shower.

DWELLING DEVELOPMENT
Mode: Instant
Developer: Private
Builder: Large contractor
Construction type: Masonry/wood
Year of construction: 1734

MATERIALS
Foundation: Cut stone
Floor: Concrete
Wall: Brick/stone
Roof: Wood/Brick

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Family
Place of birth: Mexico City
Education level: Secondary

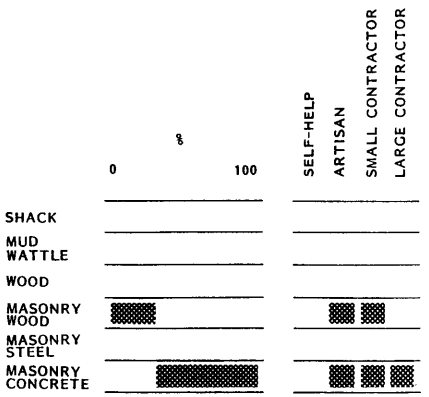
MIGRATION PATTERN
Number of moves: Not known
Rural-urban: Not known
Urban-urban: Not known
Why come to urban area: Employment and education

GENERAL: ECONOMIC
Income group: Low-Moderate
Employment: Private (merchant)
Distance to work: Same premises
Mode of travel: N.A.

DWELLING UNIT PAYMENT
Rent (US$/month): 8.00
Percent of income for rent: 5

CONSTRUCTION TYPES DATA

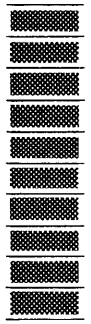
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

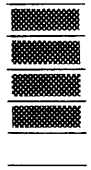
UTILITIES AND SERVICES DATA

related to dwelling locality



COMMUNITY FACILITIES DATA

related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Approximate

CASE STUDY SOURCE:
Bazant, J.; Cortes, J.; Javila, R.; Espinosa, E.
URBAN DWELLING ENVIRONMENTS: MEXICO CITY
1974

2 LA FLORIDA, Mexico City, Mexico

PRIVATE, LOW INCOME, SELF SUFFICIENT ROW UNITS

LOCATION: This area of slum tenements is within a ten minute walk of the main plaza "zocalo" in the center of the city. The location of the tenements, in a major commercial district, gives the tenants access to a variety of casual/marginal employment opportunities.

ORIGIN: Tepito, established in 1840, is the largest second-hand market in Mexico City, which gave its name to the locality.

LAYOUT: The irregular large blocks and many of the land subdivisions were the product of several adjustments, initially by the streams, and later by the requirements of providing piped water and sewage disposal. Tenements are long and narrow (20 x 100 m) with a central common patio (3.5) and fit into the centers of the large blocks.

LAND USE: It is a dense conglomeration, mainly low-income residential area; most of its population lives in tenements. There are also a few small factories, movie theaters, schools, and big markets which provide the main source of employment.

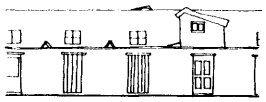
CIRCULATION: There is predominantly light vehicular traffic, but the streets and the sidewalks are heavily used by pedestrians. The sidewalks are usually crowded with many street vendors and petty tradesmen of used merchandise. Moreover, the roofs are also used for internal circulation among tenements in the same block. (This circulation has been initiated by the tenants to add to the security of the private land.)

POPULATION: Low income tradesmen, artisans and workers live here, who come with (some times intially without) their families from throughout Mexico. Most of the tenants have lived here since 1942.

TENEMENT: A long and narrow (3.5 m) common patio is centrally located between two rows of approximately 20-30 apartment-type units. Each unit contains all necessary facilities and is provided with the basic utilities. The central patio is crowded with people, playing children, and animals as well. The roofs are crowded with lines of laundry chicken coops, plant pots, and stored materials. Along the street, small shop/dwelling units are located, as well as the entrance gate.

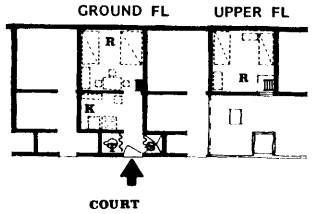
LOCALITY SEGMENT PLAN

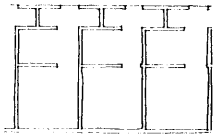
1:2500



Elevation

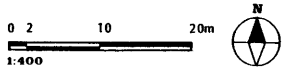
Section





Plan

DWELLING UNIT



Plan

DWELLING: TENEMENT

Key

- **R** Room (multi-use)
- **K** Kitchen/Cooking Area
- **S** Bathroom/Shower
- **T** Toilet
- **L** Laundry
- **St** Storage

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal ownership
Area (sq.m.): 1530

DWELLING
Type: Organized, originally built tenement
Location: City center
Utilization: Multiple
Number of Floors: 2
Number of dwelling units: 46
Number of people: 253

Dwelling Units Floor Area (sq.m.):	1702	(100%)
Shared Floor Area (sq.m.):	0	(0%)
Total Floor Area (sq.m.):	1702	(100%)

Open Area (sq.m.): 375
Lot Coverage (%): 76

Floor Area (sq.m.)/Lot Area (sq.m.):	1.1
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):	1.3
Floor Area (sq.m.)/Open Area (sq.m.):	4.5
Percentage of Open Area to Total Floor Area:	22.0
Density (people/Ha.of dwelling Lot Area):	1654.0

Facilities	N	People/Facility
room:	92	2.8
kitchen:	46	5.5
shower:	46	5.5
toilet:	46	5.5

Physical state: Poor

DWELLING UNIT
Type: Self sufficient apartment; shared internal patio
Tenure: Legal rental
Area (sq.m.): 37
Number of users

married:	2
single:	3
children:	1
total:	6

Area per person (sq.m.): 6.2
Facilities: 1-2 rooms, kitchen, shower and toilet

DWELLING DEVELOPMENT
Mode: Instant
Developer: Private
Builder: Small contractor
Construction type: Masonry/wood
Year of construction: 1909

MATERIALS
Foundation: Cut stone
Floor: Concrete
Wall: Adobe masonry
Roof: Wood/Brick

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Family
Place of birth: Veracruz
Education level: Primary

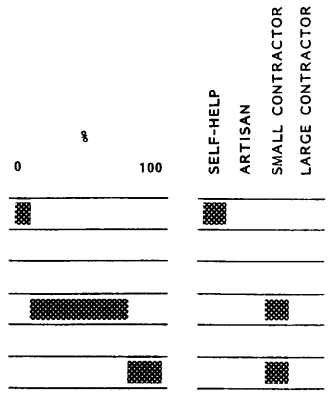
MIGRATION PATTERN
Number of moves: 1
Rural-urban: 1 (1942)
Urban-urban: -
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Low
Employment: Public (white collar)
Distance to work: 5 km
Mode of travel: Public transportation (bus)

DWELLING UNIT PAYMENT
Rent (US$/month): 15.00
Percent of income for rent: 7

CONSTRUCTION TYPES DATA

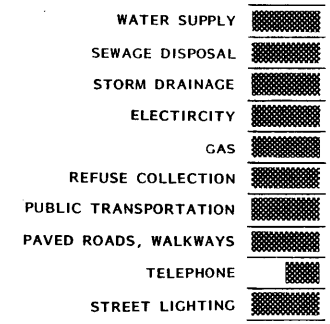
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

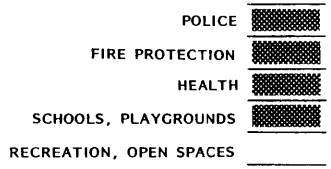
UTILITIES AND SERVICES DATA

related to dwelling locality



COMMUNITY FACILITIES DATA

related to dwelling locality



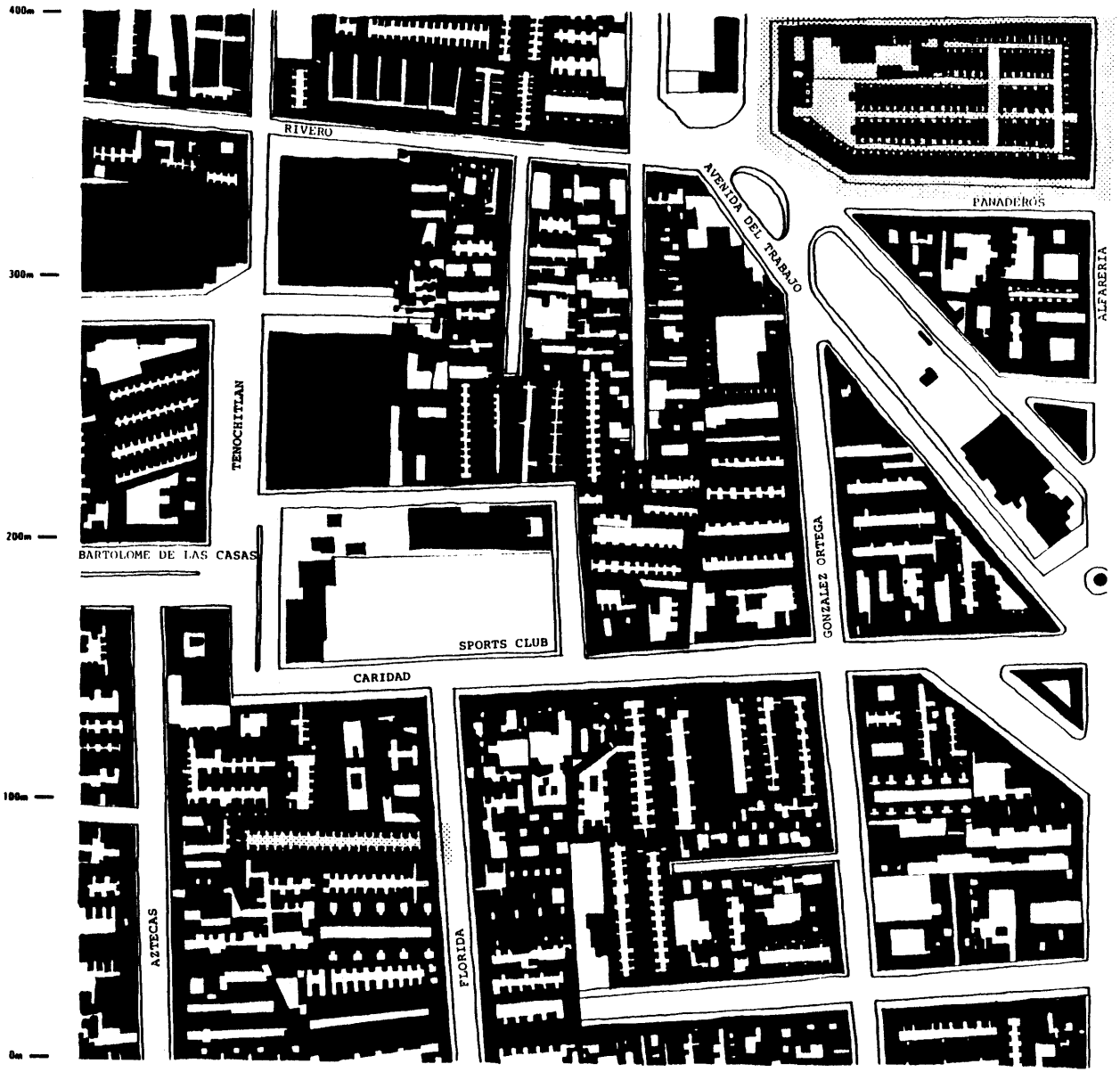
The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Approximate

CASE STUDY SOURCE:
Bazant, J.; Cortes, J.; Javila, R.; Espinosa, E.
URBAN DWELLING ENVIRONMENTS: MEXICO CITY
1974

3 LA CASA BLANCA
Mexico City, Mexico

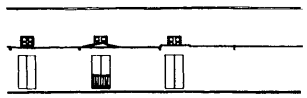
SELF SUFFICIENT ROW UNITS

LOCATION: This area of "vecindades" (slum tenements) is in the center of the city, only a ten minute walk from the main plaza. This location provides access to several unskilled employment opportunities.
ORIGIN: Tepito is the largest second-hand market in the city, which probably was established around 1840. La Casa Blanca is the tenement which the book "The Children of Sanchez" by Oscar Lewis made famous.
LAYOUT: The irregular large blocks as well as many of the interior land sub-divisions were the product of several adjustments, initially by the streams, and later by the requirements of providing piped utilities. This tenement is spread over an entire block which contains four long paved patios (about 5 meters width) and surrounded by the dwelling units.
LAND USE: The area is mainly poor residential with some big markets as well as schools and few small factories.
CIRCULATION: The area has light vehicular traffic and very high pedestrian circulation. The streets and sidewalks are narrow, and most of the time are very crowded with many street vendors and petty tradesmen of used items.
POPULATION: Very densely populated neighborhood of poor tradesmen, artisans and workers. Most of these families have lived here since 1940.
TENEMENT: Row, self sufficient row units, inside courtyards are enclosed by high walls and by rows of shops which supply the basic needs of the tenants. Two narrow inconspicuous gateways open until ten o'clock and anyone coming after hours must pay to have the gate opened. The 157 one-room, windowless units are surrounding and opening onto four long paved courtyards. In the day time stand rough wooden ladders leading to low, flat roofs over the kitchen portion of each unit. These roofs serve many uses and are crowded with lines of laundry, chicken coops, dovecoles, pots of plants, tanks of gas and occasionally TV antennas. In the daytime the courtyards are crowded with people, children and animals (dogs, turkeys, chickens and a few pigs). Children play here because it is safer than the streets. On Sunday nights there is usually an outdoor dance.
Within the west entrance is the public bathhouse, a small garden and an administration office shack.

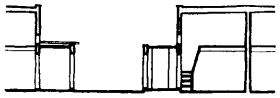


LOCALITY SEGMENT PLAN

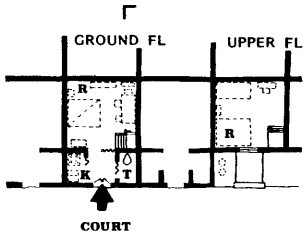
1:2500



Elevation



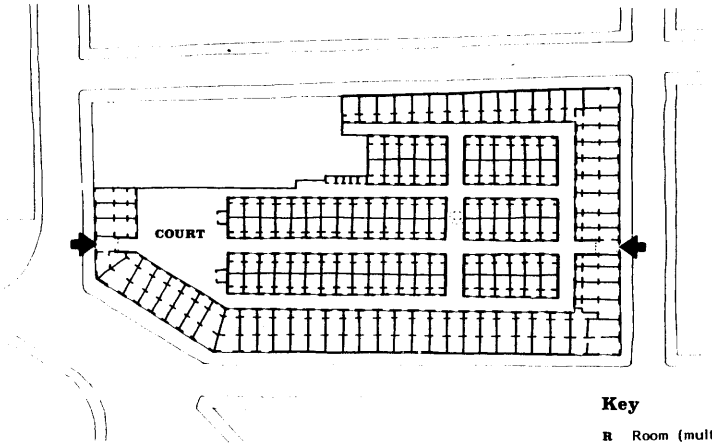
Section



Plan

DWELLING UNIT

0 2 10 20m
1:400



Plan

Key

- R Room (multi-use)
- K Kitchen/Cooking Area
- S Bathroom/Shower
- T Toilet
- L Laundry
- St Storage

0 20 100m
1:2000

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 8940

DWELLING
Type: Organized, originally built tenement
Location: City center
Utilization: Multiple
Number of Floors: 2
Number of dwelling units: 157
Number of people: 864

Dwelling Units Floor Area (sq.m.):	5809	(100%)
Shared Floor Area (sq.m.):	0	(0)
Total Floor Area (sq.m.):	5809	(100%)

Open Area (sq.m.): 2440
Lot Coverage (%): 70

Floor Area (sq.m.)/Lot Area (sq.m.):	0.7
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):	1.3
Floor Area (sq.m.)/Open Area (sq.m.):	2.4
Percentage of Open Area to Total Floor Area:	42.0
Density (people/Ha.of dwelling Lot Area):	966.0

Facilities	N	People/Facility
room:	314	2.8
kitchen:	157	5.5
shower:	157	5.5
toilet:	157	5.5

Physical state: Fair

DWELLING UNIT
Type: Self sufficient apartment; shared internal patio
Tenure: Legal rental
Area (sq.m.): 37
Number of users
married: 2
single: 2
children: 2
total: 6
Area per person (sq.m.): 6.2
Facilities: 1-2 rooms, kitchen, shower and toilet

DWELLING DEVELOPMENT
Mode: Instant
Developer: Private
Builder: Small contractor
Construction type: Brick Masonry/wood
Year of construction: 1920

MATERIALS
Foundation: Cut stone
Floor: Concrete
Wall: Adobe masonry
Roof: Wood/Brick

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Family
Place of birth: Michoacan
Education level: Primary

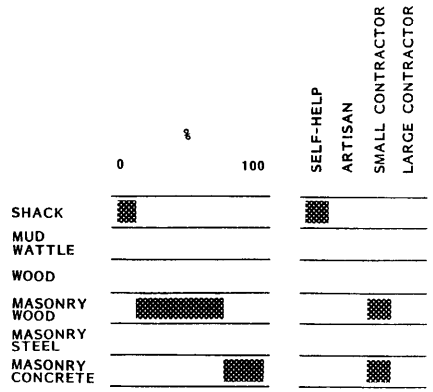
MIGRATION PATTERN
Number of moves: 2
Rural-urban: 1 (1945)
Urban-urban: 1 (1947)
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Low
Employment: Private (merchant)
Distance to work: 1 km
Mode of travel: Walking

DWELLING UNIT PAYMENT
Rent (US$/month): 16.00
Percent of income for rent: 10

CONSTRUCTION TYPES DATA

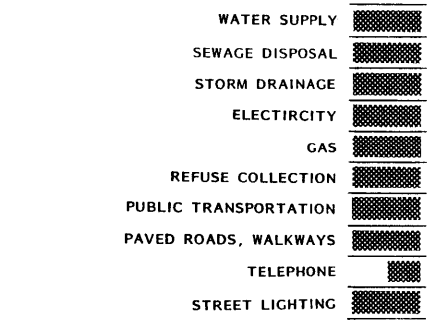
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

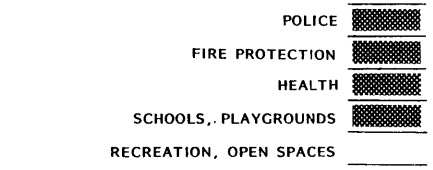
UTILITIES AND SERVICES DATA

related to dwelling locality



COMMUNITY FACILITIES DATA

related to dwelling locality



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Quality of information: Approximate

CASE STUDY SOURCE:
Bazant, J.; Cortes, J.; Javila, R.; Espinosa, E.
URBAN DWELLING ENVIRONMENTS: MEXICO CITY
1974

4 AL KEFAH
Baghdad, Iraq

ROOMS IN CONVERTED TRADITIONAL HOUSES

LOCATION: About 0.5 kilometers from the city center, in one of the oldest areas which represents the traditional urban pattern and dwelling types, close to a variety of casual employment opportunities in and around the city's center.

ORIGIN: This traditional settlement was a residential area for the upper middle income population. Most of the existing old, deteriorating dwellings are being rapidly converted into low and very low income multi-family dwellings, i.e.tenements. As in 1978, 65% of the dwellings in this settlement are tenements providing 92% of the available dwelling units.

LAYOUT: A typical Arab-Muslim traditional urban pattern is the layout with several cul-de-sac alleys, leading to individual dwellings and forming clusters of residential neighborhoods which are very strong in their social ties. The dwellings are typical courtyard houses of Baghdad's traditional style.

LAND USE: The area is mainly residential with commercial, light industry and business concentrations located along Al Kefah Street, Baghdad's most famous industrial street where most of the city's supply of steel doors and windows is manufactured.

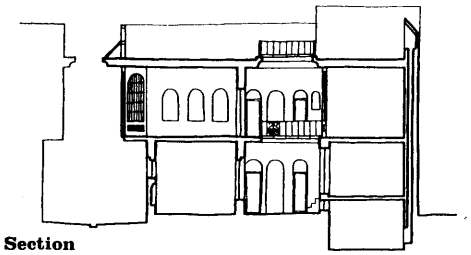
CIRCULATION: Very heavy vehicular and pedestrian traffic is found in the main street (Al Kefah). Several bus routes and private mini-buses serve the area providing an adequate transportation network. The internal alleys are dominated by pedestrians, moreover, many of them are too narrow for vehicular traffic.

POPULATION: The area contains very low income population engaged in services, light industries and small commercial establishments. Most of the tenants are transitional families (newly emigrated from rural areas).

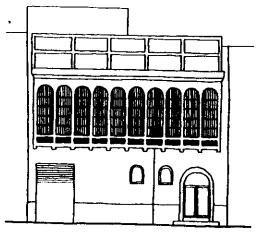
TENEMENTS: Old traditional single family dwellings have been converted into multi-family dwellings. Many of the dwelling facilities (kitchens, showers, and toilets as well as the courtyard) are shared among tenants which causes discomfort and inconvenience due to their high concern for privacy and individuality. The courtyard is mainly used for cooking, raising chicken, storage as well as a safe playground. In this tenement the owner lives in one of the first floor units and is directly responsible for management and maintenance affairs.

LOCALITY SEGMENT PLAN

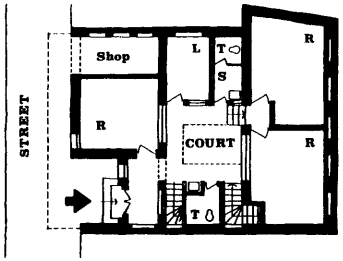
1:2500



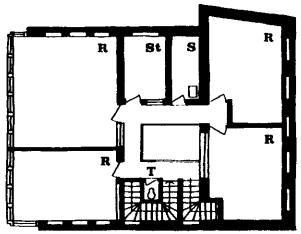
Section



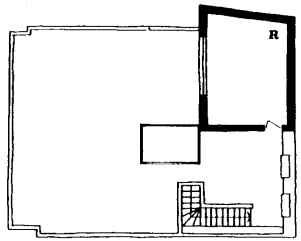
Elevation



GROUND FLOOR



FIRST FLOOR



SECOND FLOOR

Plans

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal ownership
Area (sq.m.): 165

DWELLING
Type: Converted traditional single family house
Location: City center
Utilization: Multiple
Number of Floors: 2-3 with basement
Number of dwelling units: 8
Number of people: 28

Dwelling Units Floor Area (sq.m.):	287	(70%)
Shared Floor Area (sq.m.):	123	(30%)
Total Floor Area (sq.m.):	410	(100%)
Open Area (sq.m.):	6	
Lot Coverage (%):	96	
Floor Area (sq.m.)/Lot Area (sq.m.):		2.3
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		1.8
Floor Area (sq.m.)/Open Area (sq.m.):		68.0
Percentage of Open Area to Total Floor Area:		1.5
Density (people/Ha.of dwelling Lot Area):		1697.0

Facilities	N	People/Facility
room:	9	3.1
kitchen:	2	14.0
shower:	3	9.3
toilet:	3	9.3

Physical state: Poor

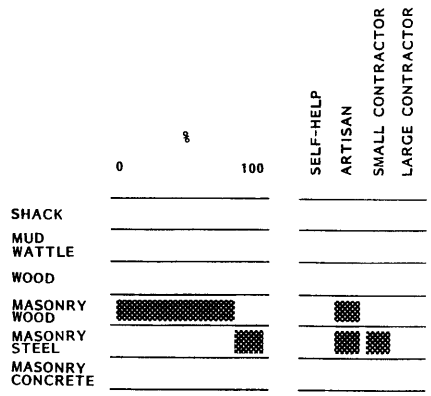
DWELLING UNIT
Type: Room
Tenure: Extra legal rental
Area (sq.m.): 20
Number of users
married: 2
single: 1
children: 2
total: 5
Area per person (sq.m.): 4.0
Facilities: Room; shared kitchen, shower, toilet and patio

DWELLING DEVELOPMENT
Mode: Incremental
Developer: Private
Builder: Artisan
Construction type: Brick masonry/wood
Year of construction: Around 1600

MATERIALS
Foundation: Brick
Floor: Flat brick
Wall: Brick masonry
Roof: Wood/brick

CONSTRUCTION TYPES DATA

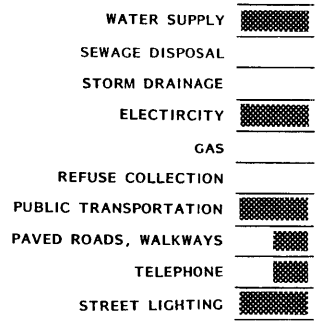
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Accurate

UTILITIES AND SERVICES DATA

related to dwelling locality



Key

- **R** Room (multi-use)
- **K** Kitchen/Cooking Area
- **S** Bathroom/Shower
- **T** Toilet
- **L** Laundry
- **St** Storage

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Family
Place of birth: Najaf (south of Iraq)
Education level: None

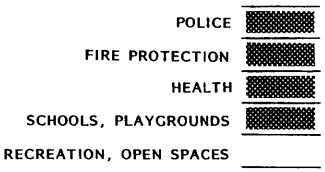
MIGRATION PATTERN
Number of moves: 2
Rural-urban: 1 (1958)
Urban-urban: 1 (1959)
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Very low
Employment: Private (Blue collar: blacksmith)
Distance to work: 0.5 km
Mode of travel: Walking

DWELLING UNIT PAYMENT
Rent (US$/month): 36.00
Percent of income for rent: 12

COMMUNITY FACILITIES DATA

related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Accurate

CASE STUDY SOURCE:
Field survey by the author, 1978

5 AL BATTAWEEN
Baghdad, Iraq

ROOMS IN CONVERTED ROW, EMPLOYER-PROVIDED HOUSES

LOCATION: A commercial district in the city center provides excellent employment opportunities, especially for unskilled laborers.

ORIGIN: These transitional (traditional to modern urban prototype) row houses were developed in the 1930's by one of the oil companies for its employees. Although the influence of a British style can be observed, it represents a modified traditional prototype that maintains the cultural consistancy.

LAYOUT: The long blocks, gridiron urban land pattern permits an economic provision of utilities. Dwellings are row houses, a modification of the traditional courtyard dwelling prototype.

LAND USE: A dense conglomeration of mainly residential row houses, few small printing and commercial establishments, movie theaters, schools, and a big market place are located here. Most of the non residential activities are concentrated along the major spine (Al Saadon) as well as along the internal route (Al Battaneen).

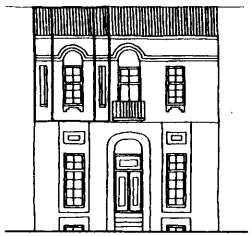
CIRCULATION: High intensity of pedestrian and vehicular traffic is in this locality.

POPULATION: The area has very low income, unskilled newcomers, having as a main priority accessibility to job opportunities.

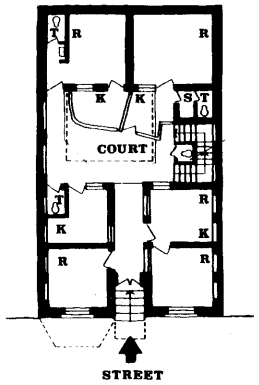
TENEMENTS: When dwellers gain title, most of these, originally single family row houses, were converted (illegally by the owners) into multi-family dwellings. Although the tenants (together with the owners who still live there in most of the cases) have managed to provide themselves with few additional facilities (cooking spaces and toilets). They still share circulation areas and the courtyard.

LOCALITY SEGMENT PLAN

1:2500



Elevation



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal ownership
Area (sq.m.): 170

DWELLING
Type: Converted single family house
Location: City center
Utilization: Multiple
Number of Floors: 3
Number of dwelling units: 9
Number of people: 52

Dwelling Units Floor Area (sq.m.):	265	(78%)
Shared Floor Area (sq.m.):	75	(22%)
Total Floor Area (sq.m.):	340	(100%)

Open Area (sq.m.): 35
Lot Coverage (%): 80

Floor Area (sq.m.)/Lot Area (sq.m.):	2.0
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):	1.0
Floor Area (sq.m.)/Open Area (sq.m.):	9.7
Percentage of Open Area to Total Floor Area:	10.0
Density (people/Ha.of dwelling Lot Area):	3058.0

Facilities	N	People/Facility
room:	12	4.3
kitchen:	4	13.0
shower:	3	17.0
toilet:	6	8.6

Physical state: Fair

DWELLING UNIT
Type: Room
Tenure: Extralegal rental
Area (sq.m.): 18
Number of users
married: 2
single: -
children: 4
total: 6
Area per person (sq.m.): 3.0
Facilities: Room; shared kitchen, shower, toilet, and patio

DWELLING DEVELOPMENT
Mode: Instant
Developer: Public/private
Builder: Large contractor
Construction type: Brick masonry/steel
Year of construction: 1930's

MATERIALS
Foundation: Brick
Floor: Flat brick (farshi)
Wall: Brick masonry
Roof: Steel/brick

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

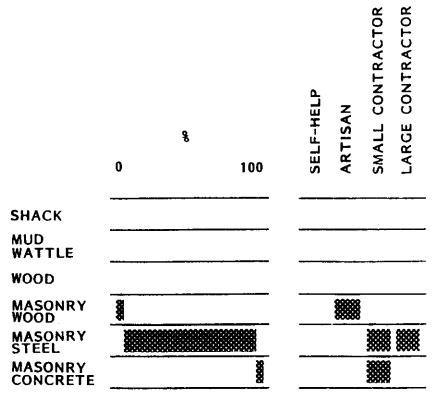
GENERAL: SOCIAL
Type of user: Family
Place of birth: Tal-kief (North of Iraq)
Education level: primary

MIGRATION PATTERN
Number of moves: 3
Rural-urban: 1
Urban-urban: 2
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Low
Employment: Private (waiter)
Distance to work: 1.5 km
Mode of travel: Public transportation (bus)

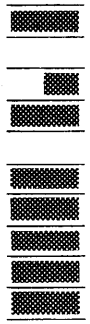
DWELLING UNIT PAYMENT
Rent (US$/month): 36.00
Percent of income for rent: 9

CONSTRUCTION TYPES DATA
related to dwelling locality

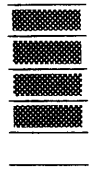


The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Accurate

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Accurate

CASE STUDY SOURCE:
Field survey by the author, 1978

6 CAMP AL ARMAN
Baghdad, Iraq

ROOMS IN CONVERTED PUBLIC ROW HOUSES

LOCATION: It is in a commercial/light industry area in the center of the city, provides a variety of casual employment opportunities.

ORIGIN: This is another example of transitional houses in Baghdad (see Case N°.5: Al-Bataween). The project was developed around the 1940's as an instant public housing project to accommodate Armenian refugees from Turkey who were camping in this area. These row houses initially were utilized as single family dwellings. However in 1978, more that 78% of the existing dwellings contained more than one family (based on field survey; summer 1978).

LAYOUT: Gridiron urban pattern provides uniform land subdivision of almost square lots (10x12 meters), with excessive network length per unit area which substantially increases development costs. Most of these internal courtyard dwellings do not exceed one floor.

LAND USE: This residential locality is being converted rapidly into a major car repair and light industrial area. Many commercial establishments for automobile spare parts and accessories are scattered throughout the area but concentrated along the major spine (Al-Kefah Street).

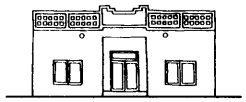
CIRICULATION: The main streets are heavily utilized both by pedestrians and vehicular traffic. Internal streets within the locality are predominantly pedestrian, with light vehicular traffic mainly to the repair or maintenance trades.

POPULATION: The locality houses a mixture of several ethnic, low income groups, the majority of which are descended from the original Armenian settlers. A high percentage of the locality population are skilled and engaged in automobile repair and maintenance as well as other light industrial and commerical activities.

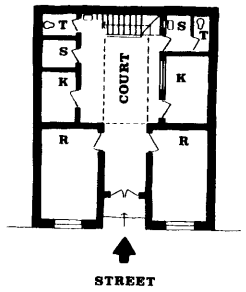
TENEMENTS: When dwellers gained title to the dwellings they started subletting rooms as a source of extra income. Consequently, most of the original single family houses have been converted illegally into multi-family dwellings. New facilities have been added by both tenants and owners to meet the new demands. In most of the tenements they only shared space is open, internal courtyard which is used as a playground and sometimes as an extention for some of the dwelling unit activities (as cooking and washing). In most of the dwellings, the owners are still living there and are directly responsible for the management and maintenance.

LOCALITY SEGMENT PLAN

1:2500



Elevation



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal ownership
Area (sq.m.): 120

DWELLING
Type: Converted public single family house
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 2
Number of people: 6

Dwelling Units Floor Area (sq.m.):	100	(100%)
Shared Floor Area (sq.m.):	0	(0%)
Total Floor Area (sq.m.):	100	(100%)
Open Area (sq.m.):	20	
Lot Coverage (%):	83	
Floor Area (sq.m.)/Lot Area (sq.m.):		0.8
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		1.4
Floor Area (sq.m.)/Open Area (sq.m.):		5.0
Percentage of Open Area to Total Floor Area:		20.0
Density (people/Ha.of dwelling Lot Area):		500.0

Facilities	N	People/Facility
room:	2	3.0
kitchen:	2	3.0
shower:	2	3.0
toilet:	2	3.0

Physical state: Fair

DWELLING UNIT
Type: Room
Tenure: Extra legal rental
Area (sq.m.): 19
Number of users
married: 3
single: 1
children: 2
total: 6
Area per person (sq.m.): 3.2
Facilities: Room,kitchen, shower, toilet and shared patio

DWELLING DEVELOPMENT
Mode: Instant
Developer: Public
Builder: Large contractor
Construction type: Brick masonry/steel
Year of construction: 1945

MATERIALS
Foundation: Brick
Floor: Tile
Wall: Brick masonry
Roof: Steel/Brick

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Family
Place of birth: Turkey
Education level: None

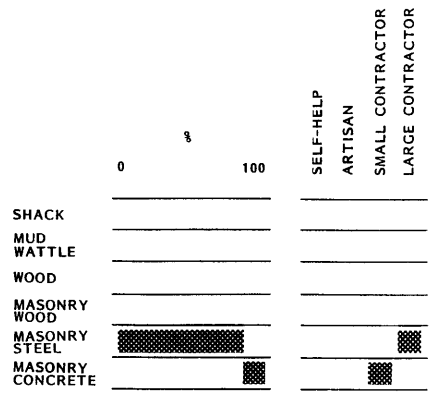
MIGRATION PATTERN
Number of moves: 2
Rural-urban: -
Urban-urban: 2
Why come to urban area: Refuge/employment

GENERAL: ECONOMIC
Income group: Low
Employment: Private (car repair)
Distance to work: 0.2 km
Mode of travel: Walking

DWELLING UNIT PAYMENT
Rent (US$/month): 36.00
Percent of income for rent: 14

CONSTRUCTION TYPES DATA

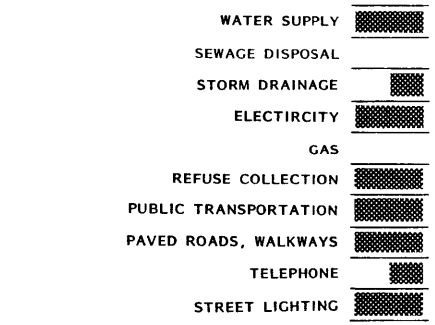
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Accurate

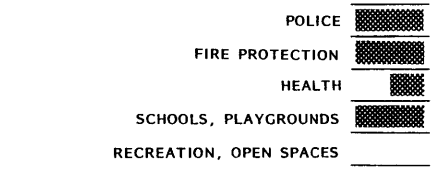
UTILITIES AND SERVICES DATA

related to dwelling locality



COMMUNITY FACILITIES DATA

related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Accurate

CASE STUDY SOURCE:
Field survey by the author, 1978

7 AL ISKAN
Baghdad, Iraq

ROOMS IN CONVERTED PUBLIC HOUSING PROJECT

LOCATION: The locallity is within a large residential development and housing project about 5 km from the city center.

ORIGIN: A five-year housing development plan called "Western Baghdad" was prepared by Doxiadis in 1955. The project included multi-income sectors, one of which was this locality "Aliskan". The project was built instantly in 1956, and the houses were initially occupied by single families. Later many of the houses were converted into multi-family dwellings.

LAYOUT: A grid iron urban pattern provides rectangular (9x18m) lots with excessive circulation and utility network length per unit area. This land subdivision substantially increases development costs.

LAND USE: The area is predominantly residential with a few commercial establishments along the main streets.

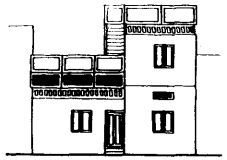
CIRCULATION: Most of the streets are predominantly pedestrian except on major streets where pedestrian and vehicular traffic are mixed. Public transportation is the only means of reaching the downtown employment district.

POPULATION: Very low income families as well as individuals populate the area. Most of them are engaged in simple, unskilled jobs in the public (government) or in the private sectors. Soldiers also live here who are affiliated with the nearby army base.

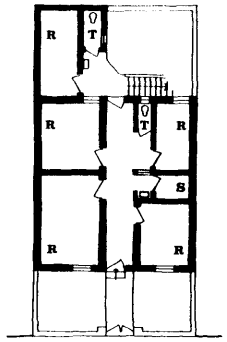
TENEMENT: As a source for extra income, dwellers have been subletting rooms in their dwellings soon after they establish themselves. In many cases this has happened illegally before gaining title to the dwelling or to the land. As the case in 1978, about 65% of the dwellings are being utilized by more than one family (based on field survey). Additional facilities (mainly rooms and toilets) and even sometime entire floors have been and are being built by the owners in order to provide more rooms/units for subletting. In general, the owners are still living there and are directly in charge.

in order to provide more rooms/units for subletting. In general, the owners are still living there and are directly in charge.

LOCALITY SEGMENT PLAN



Elevation



Plan

STREET

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 160

DWELLING
Type: Converted public single family house
Location: Inner ring
Utilization: Multiple
Number of Floors: 2
Number of dwelling units: 3
Number of people: 12

Dwelling Units Floor Area (sq.m.):	120	(80%)
Shared Floor Area (sq.m.):	30	(20%)
Total Floor Area (sq.m.):	150	(100%)

Open Area (sq.m.): 50
Lot Coverage (%): 69
Floor Area (sq.m.)/Lot Area (sq.m.): 0.9
Floor Area (sq.m.)/Exposed Wall Area (sq.m.): 1.5
Floor Area (sq.m.)/Open Area (sq.m.): 3.0
Percentage of Open Area to Total Floor Area: 33.0
Density (people/Ha.of dwelling Lot Area): 750.0

Facilities	N	People/Facility
room:	5	2.4
kitchen:	2	6.0
shower:	1	12.0
toilet:	2	6.0

Physical state: Poor

DWELLING UNIT
Type: Room
Tenure: Extralegal rental
Area (sq.m.): 14
Number of users
married: -
single: 2
children: -
total: 2
Area per person (sq.m.): 7.0
Facilities: Room; shared kitchen, shower, toilet

DWELLING DEVELOPMENT
Mode: Instant
Developer: Public
Builder: Large contractor
Construction type: Masonry/steel
Year of construction: 1956

MATERIALS
Foundation: Brick
Floor: Concrete
Wall: Brick/concrete block masonry
Roof: Steel/brick

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

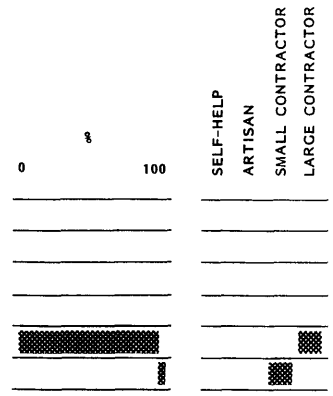
GENERAL: SOCIAL
Type of user: Roommates
Place of birth: Amara (south of Iraq)
Education level: None

MIGRATION PATTERN
Number of moves: 3
Rural-urban: 1
Urban-urban: 2
Why come to urban area: Military service

GENERAL: ECONOMIC
Income group: Very low
Employment: Public (soldier)
Distance to work: 2 km
Mode of travel: Public transportation (bus)/bicycle

DWELLING UNIT PAYMENT
Rent (US$/month): 18.00
Percent of income for rent: 20

CONSTRUCTION TYPES DATA
related to dwelling locality



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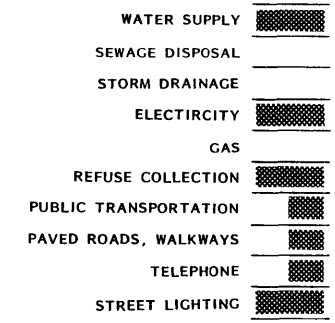
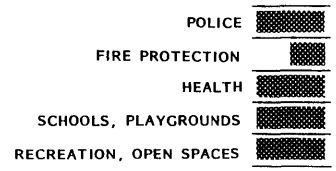
Quality of information: Accurate

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Accurate

CASE STUDY SOURCE:
Field survey by the author, 1978.

8 SAN JUAN DE DIOS
Guadalajara, Mexico

ROOMS IN INITIALLY BUILT TENEMENT

LOCATION: This area is adjacent to the central commercial district and the regional marketplace. This location provides various employment opportunities which have attracted marginal, unskilled population from throughout the region.

ORIGIN: The very low income community started to develop in the 17th Century. They developed an informal market "tainguis" which soon became the city's main market for the low income and a regional fruit/vegetable trade center. The availability of community facilities and services as well as multiple sources of employment accentuated the housing demand which was met mostly in the form of tenement rooms.

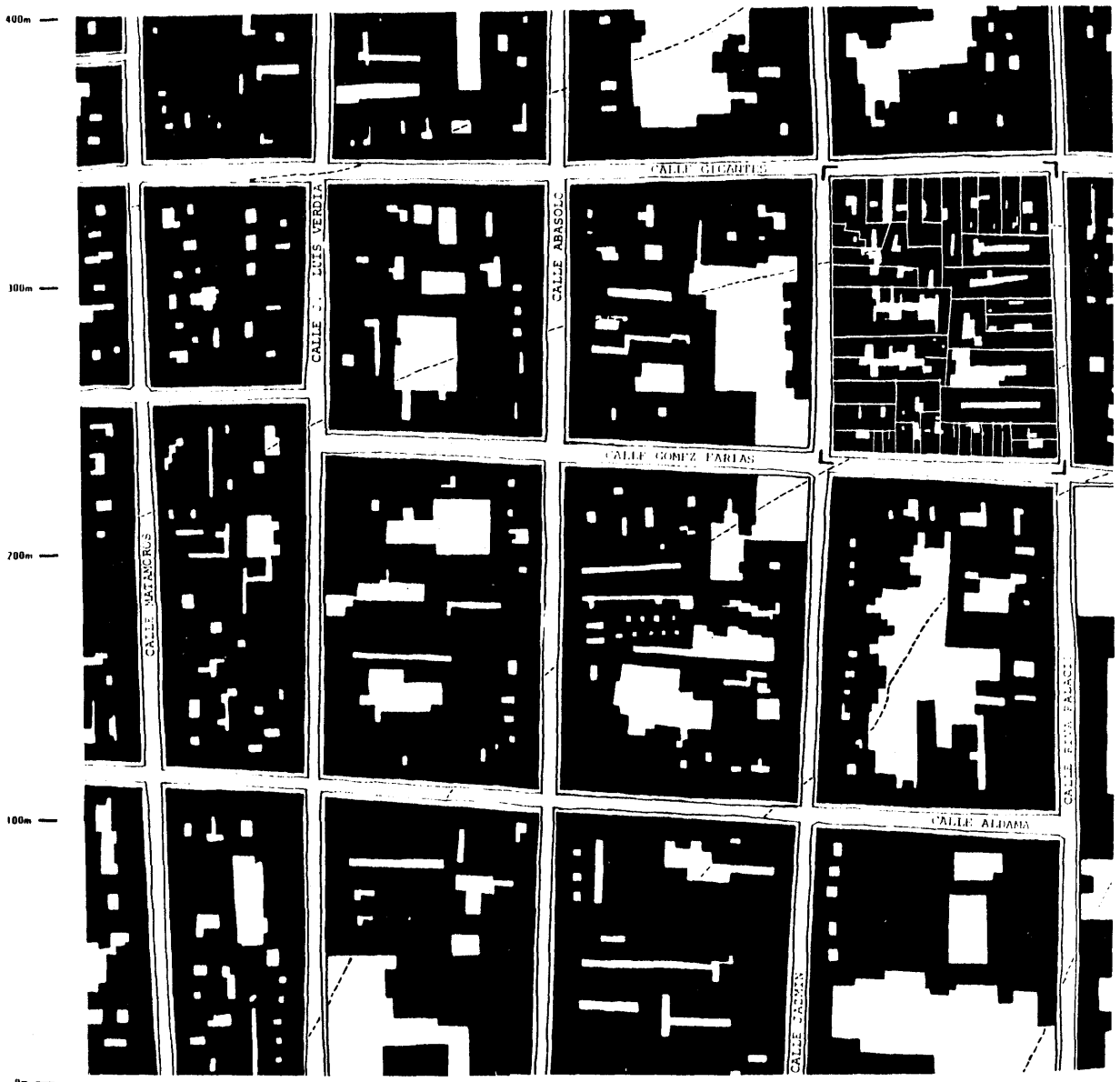
LAYOUT: It is a typical Roman Spanish urban grid with 12m wide streets. Land coverage is quite high and there are only few open spaces. The original land subdivision has been altered and most of the lots have been resubdivided into relatively small sizes in order to increase the number of lots. Tenements are long and narrow in proportion (14 x 30 45m), and their characteristic long courts can be clearly seen in the urban fabric.

LAND USE: It is the most heterogeneous area in the city, with a variety of commercial and light industrial enterprises are scattered throughout the locality. Tenements, apartment houses and single family dwellings encompass the rest of the area. There is a lack of open recreational spaces and community facilities.

CIRCULATION: All streets are paved and are accessable for both vehicles and pedestrians. Most of the internal streets are used as children's playgrounds or as an extension of the private(dwelling) areas, due the absence of vehicular traffic.

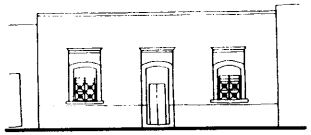
POPULATION: The population is composed of low and very low income families as well as individuals attracted by the various available unskilled employment opportunities.

TENEMENTS: The majority are expressly built as tenements with central internal courtyards surrounded by single room units (which include kitchens). The communal facilities (showers, laundries and toilets) are grouped in the end of the court a way from the street side.

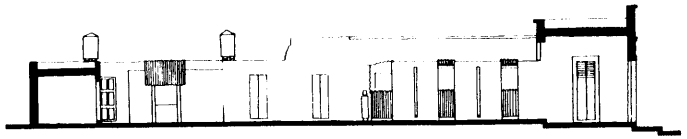


LOCALITY SEGMENT PLAN

1:2500



Elevation



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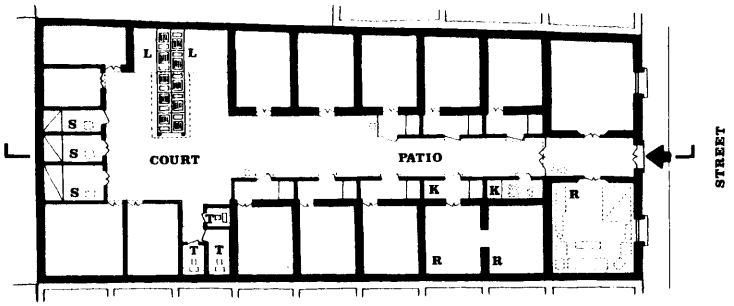


Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 450

DWELLING
Type: Organized, originally built tenement
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 13
Number of people: 65

Dwelling Units Floor Area (sq.m.):	308	(90%)
Shared Floor Area (sq.m.):	34	(10%)
Total Floor Area (sq.m.):	342	(100%)
Open Area (sq.m.): 108		
Lot Coverage (%): 76		
Floor Area (sq.m.)/Lot Area (sq.m.):		0.8
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		1.7
Floor Area (sq.m.)/Open Area (sq.m.):		3.2
Percentage of Open Area to Total Floor Area:		32.0
Density (people/Ha.of dwelling Lot Area):		1444.0

Facilities	N	People/Facility
room:	16	4.0
kitchen:	9	7.2
shower:	3	22.0
toilet:	3	22.0

Physical state: Fair

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 20
Number of users
married: 4
single: -
children: 1
total: 5
Area per person (sq.m.): 4.0
Facilities: Room and kitchen; grouped communal sanitary units

DWELLING DEVELOPMENT
Mode: Incremental
Developer: Private
Builder: Small contractor
Construction type: Adobe, Brick masonry/wood
Year of construction: 1941

MATERIALS
Foundation: Stone
Floor: Cement tile
Wall: Adobe/brick masonry
Roof: Wood/brick vaults

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

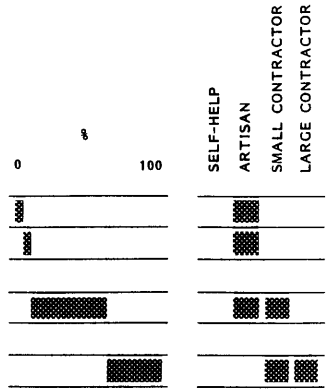
GENERAL: SOCIAL
Type of user: Family
Place of birth: North Guadalajuara
Education level: Primary

MIGRATION PATTERN
Number of moves: 2
Rural-urban: 1 (1950)
Urban-urban: 1 (1960)
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Very low
Employment: Public (watch man)
Distance to work: 5 km
Mode of travel: Public transportation (bus)

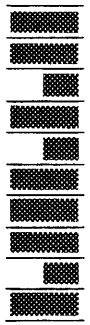
DWELLING UNIT PAYMENT
Rent (US$/month): 15.00
Percent of income for rent: 30

CONSTRUCTION TYPES DATA
related to dwelling locality

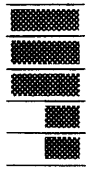


The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Approximate

CASE STUDY SOURCE:
Ramirez, C.
URBAN CASE STUDIES: GUADALAJARA, MEXICO
1978.

9 RAKHIAL
Ahmedabad, India

ROW SINGLE ROOM UNITS (CHAWL*)

LOCATION: It is an industrial area about 5 kilometers from the city center. This location provides an excellent opportunity for employment for most of the dwellers.

ORIGIN: During the expansion of the textile industry in the 1930's, this part of the city was rapidly developing as a major industrial district. A housing system popularly known as "chawl"* was introduced for industrial workers. This type of dwelling is generally a tenement in the form of rows of single room units.

LAYOUT: The layout involves irregular land subdivision and street pattern as well as haphazard location of industries with interspersed residential areas. It is an indication of the unplanned growth of the locality. Large lots for industry and small lots for residential development are found throughout the area.

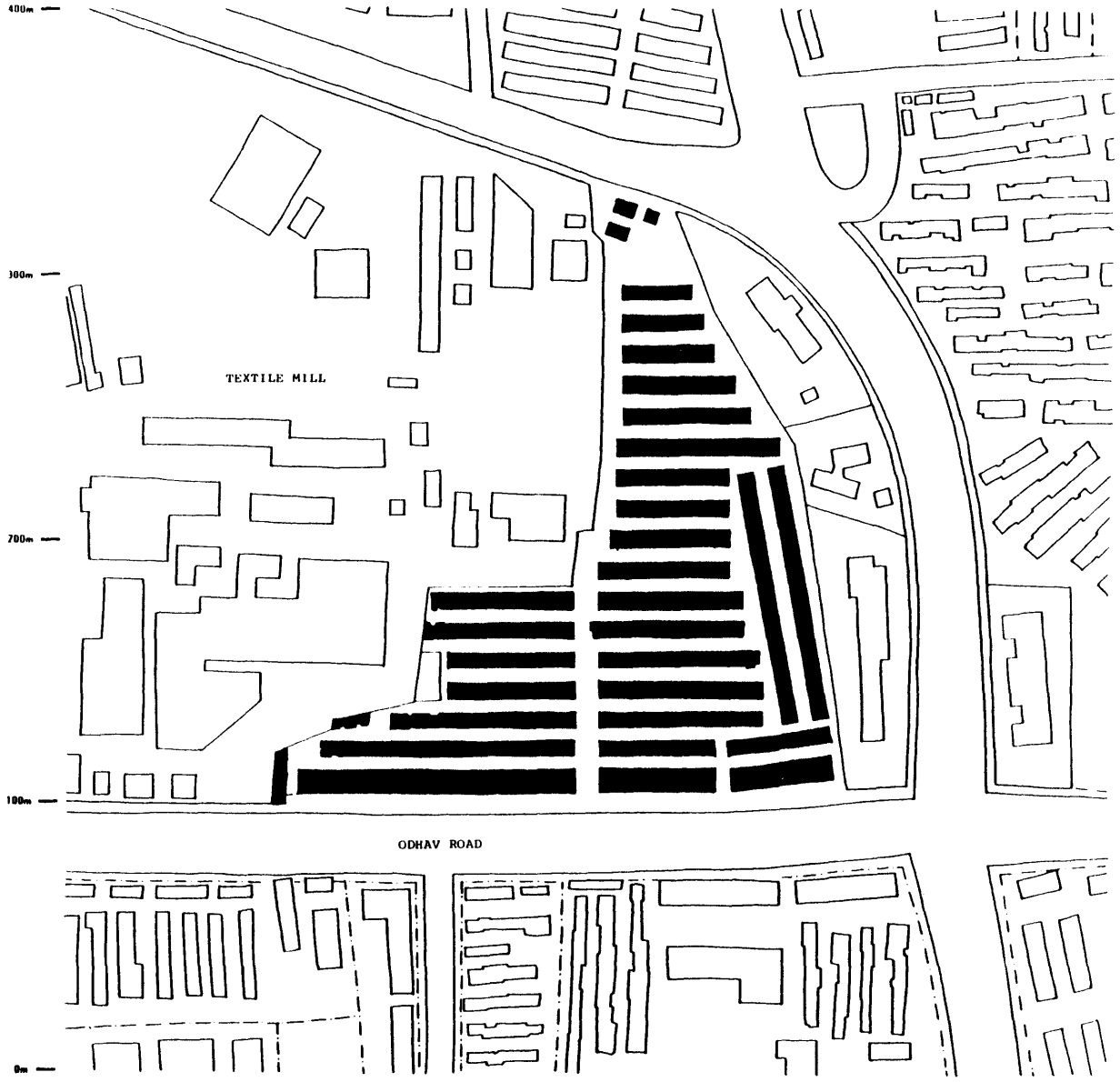
LAND USE: Several industrial establishments, mainly textile, are scattered throughout the dominating residential area.

CIRCULATION: There is a heavy vehicular traffic pattern along the only major spine (Odhav Road) which connects the settlement with the city center. Other streets are dominated by pedestrians and bicycles.

POPULATION: The majority of the population are urban poor and rural migrants belonging to low and very low income strata. There are some casual laborers and also some self employed, but the working population is primarily employed in industries.

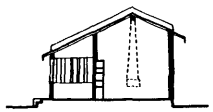
TENEMENT: There are rows of (9-15) single-room dwelling units "chawls"* . Most of the chawls were developed as rental units on land leased for 99 years. The dwelling unit usually is a single room, a cooking space and a verandah (porch) the front of which has been converted (by tenants) in most of the units into an additional unit. Also a toilet has been added to many units, otherwise tenants have to use inadequate communal facilities provided separately. Over-crowded dwellings and hot, dry climate force tenants to spend most of their time outside, in open passages "chawls"* into which most of the dwelling activities are extended (cooking, washing, playing, etc.).

*See Glossary

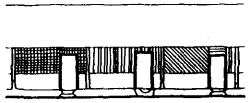


LOCALITY SEGMENT PLAN

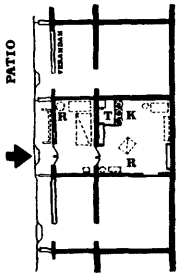
1:2500



Section



Elevation



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400
N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 270-360

DWELLING
Type: Row of one room units (chawls)
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 9-12
Number of people: 54-72
Dwelling Units Floor Area (sq.m.): 243-324 (100%)
Shared Floor Area (sq.m.): 0- 0 (0%)
Total Floor Area (sq.m.): 243-324 (100%)
Open Area (sq.m.): 4
Lot Coverage (%): 87
Floor Area (sq.m.)/Lot Area (sq.m.): 0.9
Floor Area (sq.m.)/Exposed Wall Area (sq.m.): 1.0
Floor Area (sq.m.)/Open Area (sq.m.): 6.5
Percentage of Open Area to Total Floor Area: 15.0
Density (people/Ha.of dwelling Lot Area): 2000.0

Facilities	N	People/Facility
room:	18-24	3.0
kitchen:	9-12	6.0
shower:	1	60.0
toilet:	9-12	6.0

Physical state:

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 27
Number of users
married: 2
single: -
children: 4
total: 6
Area per person (sq.m.): 4.5
Facilities: Two rooms, kitchen and toilet

DWELLING DEVELOPMENT
Mode: Instant
Developer: Private
Builder: Small contractor
Construction type: Masonry
Year of construction: 1940

MATERIALS
Foundation: Brick
Floor: Concrete
Wall: Brick
Roof: Metal sheets

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Family
Place of birth: Maharashtra
Education level: None

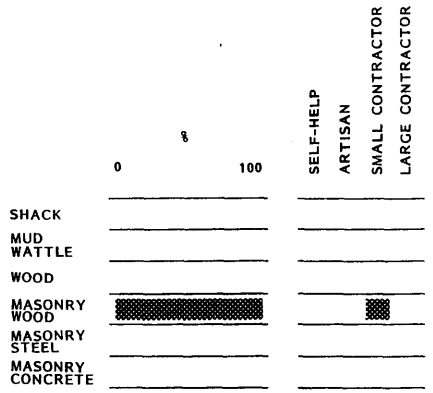
MIGRATION PATTERN
Number of moves: None
Rural-urban: N.A.
Urban-urban: N.A.
Why come to urban area: N.A.

GENERAL: ECONOMIC
Income group: Low
Employment: Industrial worker
Distance to work: 0.5 km
Mode of travel: Walking/bicycle

DWELLING UNIT PAYMENT
Rent (US$/month): 2.50
Percent of income for rent: 7

CONSTRUCTION TYPES DATA

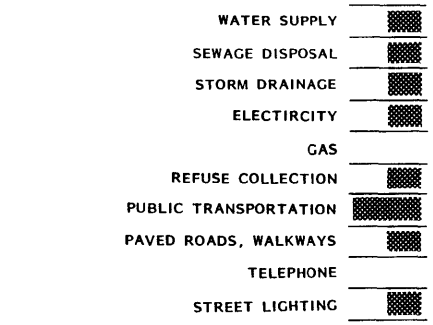
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

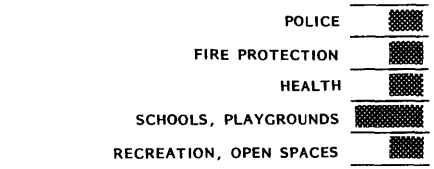
UTILITIES AND SERVICES DATA

related to dwelling locality



COMMUNITY FACILITIES DATA

related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Approximate

CASE STUDY SOURCE:
Chavda, A.; Chavda, V.
RURAL/URBAN DWELLING ENVIRONMENTS: GUJARAT STATE, INDIA. 1975

10 MEDAWAR a Beirut, Lebanon

ROOMS IN INITIALLY BUILT TENEMENTS

LOCATION: This locality is situated about 1.5 kilo meters from the central business district of the city. It is also close to the main industrial area and the port. This location provides a variety of employment opportunities, which attracted immigrants since 1932 from throughout the country, as well as from adjacent countries.

ORIGIN: The land previously belonged to a cement factory which moved to the north of the country and was later sold to private individuals and institutions. This oldest and largest squatter settlement in Beirut started by progressive immigration from urban as well as rural areas throughout Lebanon.

LAYOUT: The layout represents unplanned growth by the accretion of individual or small groups over the years. Street patterns and land subdivision are random.

LAND USE: The settlement is predominantly residen tial with several industrial establishments concentrated in the north and commercial activities scattered through out the area especially along heavy pedestrian routes. Also, there are few schools, dispensaries, churches, a mosque and a hospital.

CIRCULATION: Although the streets within the set tlement are generally accessible to vehicles, they are dominated and heavily used by pedestrians. An effi cient public transportation system serves the settlement and is used intensively by the residents.

POPULATION: Low income, unskilled workers are en gaged in simple, marginal employments. Most of them work within the locality in the various industrial es tablishments, in the port as street vendors, municipal workers, porters, etc. Only 30% of the population of this settlement are Lebanese, the other 70% are immi grants from Syria, Turkey, Iran, and Palestine, as well as many Armenians.

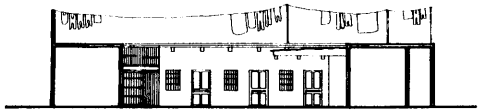
TENEMENTS: Two forms of tenements are found in this settlement:

a rooms in initially built tenements:

These tenements were constructed on relatively large lots (20x21m) as in the surveyed sample, which has a large central common courtyard (10x11m) surrounded by 14 single room dwelling units, some of them having kitchen facilities. The sanitary facilities (shower, toilets, etc.) are grouped and shared by all the ten ants. The courtyard is used for social gatherings, as well as a children's play area and as an extension for most of the dwelling activities (cooking, washing, etc.). The roof is used for drying the laundry and for storage. In general, the dwelling units are re markably well kept and well maintained.

LOCALITY SEGMENT PLAN

1:2500



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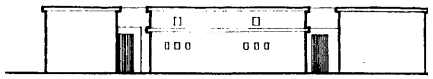
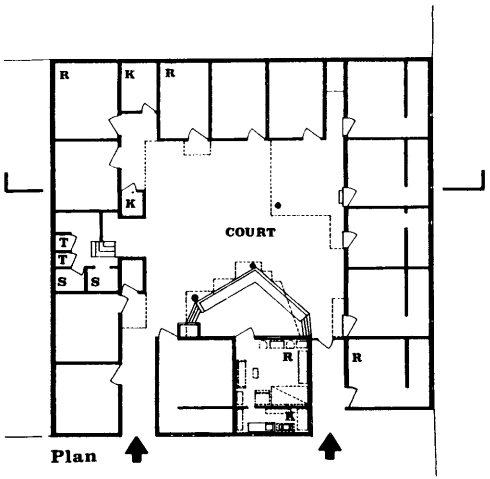


Elevation



Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

DWELLING: TENEMENT

0 2 10 20m
1:400

N

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 420

DWELLING
Type: Organized, originally built tenement
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 14
Number of people: 112

Dwelling Units Floor Area (sq.m.):	290	(95%)
Shared Floor Area (sq.m.):	15	(5%)
Total Floor Area (sq.m.):	305	(100%)
Open Area (sq.m.):	115	
Lot Coverage (%):	73	
Floor Area (sq.m.)/Lot Area (sq.m.):		0.7
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		0.6
Floor Area (sq.m.)/Open Area (sq.m.):		2.7
Percentage of Open Area to Total Floor Area:		38.0
Density (people/Ha.of dwelling Lot Area):		2667.0

Facilities	N	People/Facility
room:	14	8.0
kitchen:	10	11.0
shower:	2	56.0
toilet:	2	56.0

Physical state: Fair

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 22
Number of users
married: 2
single: 2
children: 4
total: 8
Area per person (sq.m.): 2.8
Facilities: Room and kitchen; shared shower and toilet

DWELLING DEVELOPMENT
Mode: Incremental
Developer: Private
Builder: Artisan
Construction type: Concrete block masonry/concrete
Year of construction: 1952

MATERIALS
Foundation: Concrete
Floor: Concrete
Wall: Concrete block masonry
Roof: Concrete

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Family
Place of birth: Southern Lebanon
Education level: Not known

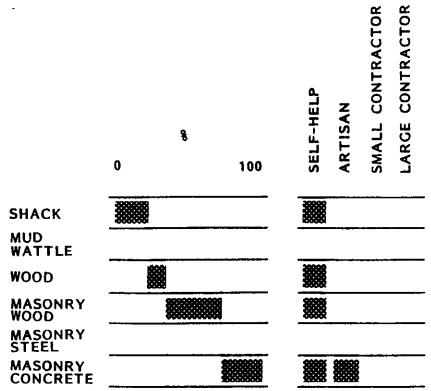
MIGRATION PATTERN
Number of moves: 2
Rural-urban: 1
Urban-urban: 1 (1965)
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Low
Employment: Private (truck driver)
Distance to work: 5 km
Mode of travel: Driving

DWELLING UNIT PAYMENT
Rent (US$/month): 23.00
Percent of income for rent: 20

CONSTRUCTION TYPES DATA

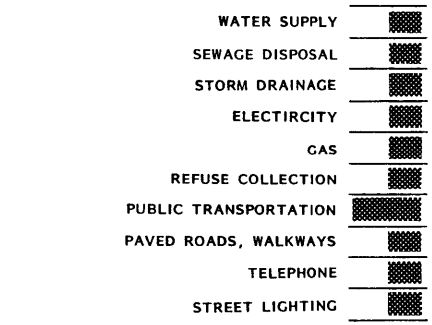
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

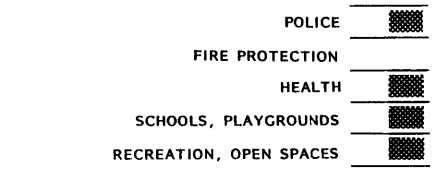
UTILITIES AND SERVICES DATA

related to dwelling locality



COMMUNITY FACILITIES DATA

related to dwelling locality



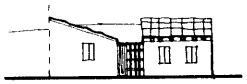
The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Approximate

CASE STUDY SOURCE:
Take, O.
URBAN DWELLING ENVIRONMENTS, BIERUT, LEBANON. 1974

10 MEDAWAR b
Beirut, Lebanon

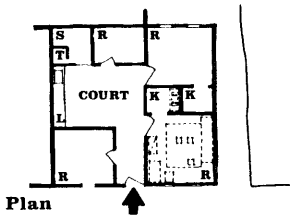
ROOMS IN CONVERTED SINGLE FAMILY HOUSES

b rooms in converted single family houses:
The lots on which these houses were built are smaller (9x9m) with an internal courtyard (about 5x4m) which is used for activites very similar to those of the previous sample (a).



Section

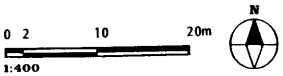
Elevation



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage



DWELLING: TENEMENT

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 77

DWELLING
Type: Converted single family house
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 4
Number of people: 30

Dwelling Units Floor Area (sq.m.):	45	(90%)
Shared Floor Area (sq.m.):	5	(10%)
Total Floor Area (sq.m.):	50	(100%)
Open Area (sq.m.):	27	
Lot Coverage (%):	65	
Floor Area (sq.m.)/Lot Area (sq.m.):		0.7
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		0.6
Floor Area (sq.m.)/Open Area (sq.m.):		1.9
Percentage of Open Area to Total Floor Area:		54.0
Density (people/Ha.of dwelling Lot Area):		3896.0

Facilities	N	People/Facility
room:	4	7.5
kitchen:	2	15.0
shower:	1	30.0
toilet:	1	30.0

Physical state: Poor

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 20
Number of users
married: 2
single: 1
children: 5
total: 8
Area per person (sq.m.): 2.5
Facilities: Room and kitchen; shared shower and toilet

DWELLING DEVELOPMENT
Mode: Incremental
Developer: Popular
Builder: Self-help
Construction type: Concrete block masonry/wood
Year of construction: 1950

MATERIALS
Foundation: None
Floor: Concrete
Wall: Concrete block masonry
Roof: Wood/metal sheets

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Family
Place of birth: Southern Lebanon
Education level: Primary

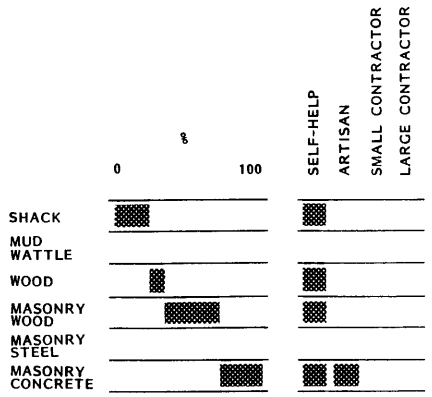
MIGRATION PATTERN
Number of moves: 3
Rural-urban: 1 (1955)
Urban-urban: 2 (1965,1967)
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Low
Employment: Public (street vendor)
Distance to work: 3 km
Mode of travel: walking

DWELLING UNIT PAYMENT
Rent (US$/month): 20.00
Percent of income for rent: 15

CONSTRUCTION TYPES DATA

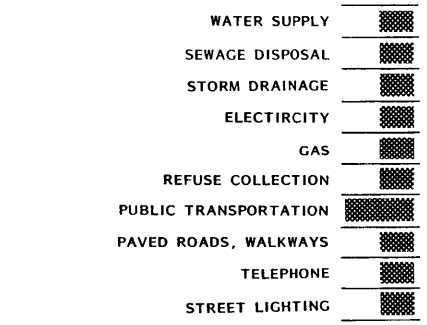
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

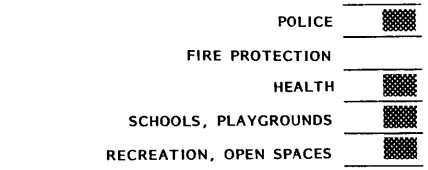
UTILITIES AND SERVICES DATA

related to dwelling locality



COMMUNITY FACILITIES DATA

related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Approximate

CASE STUDY SOURCE:
Take, O.
URBAN DWELLING ENVIRONMENTS, BEIRUT, LEBANON. 1974

11 VIEJO SAN JUAN
San Juan, Puerto Rico

ROOMS IN CONVERTED APARTMENTS

LOCATION: The locality is in the historical sector of the island, about 8 kilometers from the new city center. Multiple employment opportunities are close/easily accessible to the locality.

ORIGIN: It is the initially settled part of the city which was founded in 1521. The settlement reached saturation in the 17th Century. During that time, it was rapidly changing and lots were subdivided many times, but it was not until the 19th Century that it acquired the character it retains today. During the depression, many of the middle/upper class population left the city, and, consequently, the lower income population moved into the left dwellings and converted most of them into tenements. Deterioration continued until the early 1960's when preservation and restoration was begun and attracted people of higher incomes.

LAYOUT: A grid of approximately 60x60 meter blocks which has been corrupted in several areas due to the progressive land and tenement development as a result of need rather than definite codes.

LAND USE: It is a heterogeneous settlement; it is mainly residential with a large number of institutional, cultural, and commercial establishments.

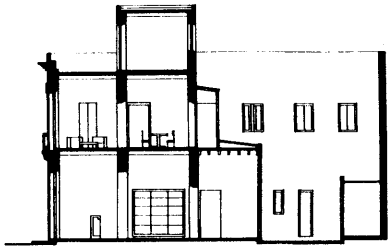
CIRCULATION: There are several major commercial/institutional streets within the settlement as well as various pedestrian alleys and stair stepped streets, "escalinatas".

POPULATION: There is a great disparity between the middle/high income people who are now moving in, and the lower income inhabitants who lived there since the depression (when most of them moved in). The majority of the lower income population are engaged in marginal/casual employment throughout the city.

TENEMENT: The majority (if not all) of the tenements are converted old apartments, Sanitary facilities (kitchens, showers, toilets, etc.) are very limited and shared among the tenants. There is usually an interior court primarily for lighting and ventilation. Also, many tenements include small shops and some times small workshops.

LOCALITY SEGMENT PLAN

1:2500



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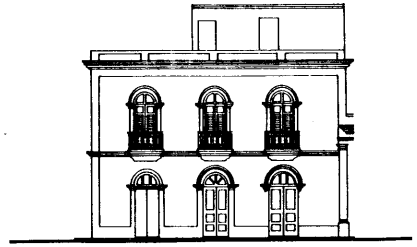
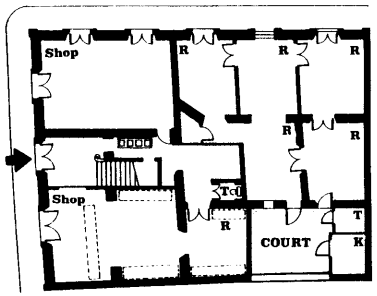
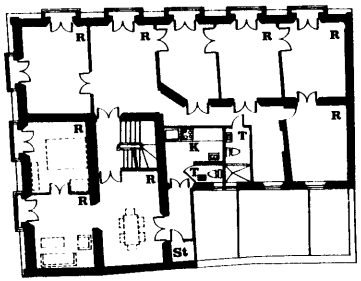


Elevation



GROUND FLOOR



UPPER FLOOR

Plans

Key

- **R** Room (multi-use)
- **K** Kitchen/Cooking Area
- **S** Bathroom/Shower
- **T** Toilet
- **L** Laundry
- **St** Storage

0 2 10 20m

1:400

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 243

DWELLING
Type: Converted apartments
Location: City center
Utilization: Multiple
Number of Floors: 2
Number of dwelling units: 7
Number of people: 21

Dwelling Units Floor Area (sq.m.):	370	(85%)
Shared Floor Area (sq.m.):	66	(15%)
Total Floor Area (sq.m.):	436	(100%)
Open Area (sq.m.):	16	
Lot Coverage (%):	93	
Floor Area (sq.m.)/Lot Area (sq.m.):		1.8
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		1.0
Floor Area (sq.m.)/Open Area (sq.m.):		27.0
Percentage of Open Area to Total Floor Area:		4.0
Density (people/Ha.of dwelling Lot Area):		864.0

Facilities	N	People/Facility
room:	15	1.4
kitchen:	2	10.5
shower:	0	N.A.
toilet:	4	5.3

Physical state: Poor

DWELLING UNIT
Type: Three rooms
Tenure: Legal rental
Area (sq.m.): 50
Number of users
married: not known
single: not known
children: not known
total: 4
Area per person (sq.m.): 12.5
Facilities: Three rooms; shared kitchen and toilet

DWELLING DEVELOPMENT
Mode: Incremental
Developer: Private
Builder: Small contractor/artisan
Construction type: Masonry/wood
Year of construction: Before 1940

MATERIALS
Foundation: Not known
Floor: Wood
Wall: Brick masonry
Roof: Wood/Brick

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Not known
Place of birth: Not known
Education level: Primary

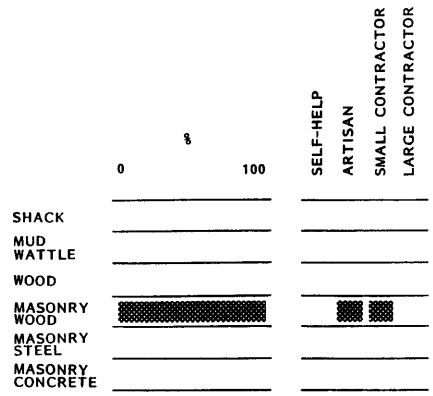
MIGRATION PATTERN
Number of moves: Not known
Rural-urban: Not known
Urban-urban: Not known
Why come to urban area: Not known

GENERAL: ECONOMIC
Income group: Very low/low
Employment: Private (self-employed)
Distance to work: Same premises
Mode of travel: N.A.

DWELLING UNIT PAYMENT
Rent (US$/month): 47.00
Percent of income for rent: 18

CONSTRUCTION TYPES DATA

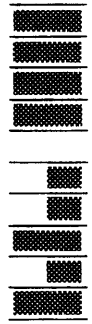
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Tentative

UTILITIES AND SERVICES DATA

related to dwelling locality



COMMUNITY FACILITIES DATA

related to dwelling locality

The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Tentative

CASE STUDY SOURCE:
Rodrigues, L.
RESIDENTIAL TYPOLOGICAL STUDIES, SAN JUAN, PUERTO RICO. 1978

12 NEGI 1, Mathare Valley Nairobi, Kenya

GROUPED, SINGLE-ROOM UNITS

LOCATION: It is about 5 kilometers from the central business district, along a previously unoccupied, narrow river valley.

ORIGIN: Negi 1 is one of the nine villages that make up the Mathare Valley settlement. Initially settled in 1939 when the illegal development began, this squatter settlement grew rapidly after independence, in 1963. It soon became a primary source of shelter for the low income population.

LAYOUT: Unplanned and uncontrolled growth resulted in not being legally or formally distributed and organized into lots. However, there does exist a certain "definition" and personal control of the dwelling land and land that is adjacent to the dwellings.

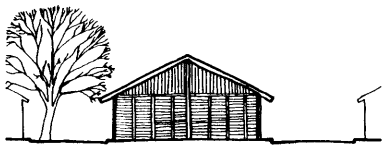
LAND USE: About 50% of the open space is still utilized for agriculture. The rest is mainly residential with small commercial activities clustered in stalls (usually in front of the dwellings).

CIRCULATION: The only vehicular access to the village is a single track with two cul-de-sac branches. The rest are pedestrian footpaths leading to the dwellings.

POPULATION: The very low, low and moderately low income groups live in the village where self-employment is predominate: tailoring, cobblery, light (small scale) industries, and illegal brewing. Within the company housing, wage earning is predominant: casual laborers, servants, masons, carpenters and mechanics employed in the city center.

TENEMENTS: Most are an adaptation of traditional mud and wattle dwellings. 4-6 room single-room dwelling units are arranged back to back (barracks) or around a central passage (swahili houses). The open space between the dwellings is generally eroded and is used for varied outdoor activities: cooking, washing, playing, etc., due to the limited individual area provided in the dwelling unit. The squatter villages have built toilets and showers on a self-help basis. The company houses are being provided with communal pit-latrines and showers.

LOCALITY SEGMENT PLAN 1:2500



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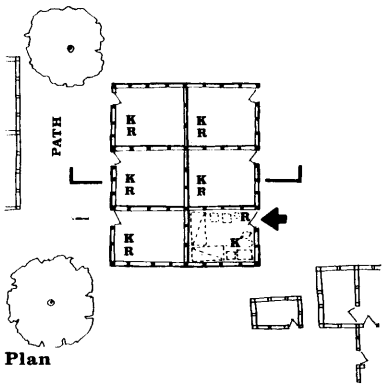


Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 72

DWELLING
Type: Six, one-room units, grouped under one struct.
Location: Inner ring
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 6
Number of people: 24

Dwelling Units Floor Area (sq.m.):	72	(100%)
Shared Floor Area (sq.m.):	0	(0%)
Total Floor Area (sq.m.):	72	(100%)
Open Area (sq.m.):	0	
Lot Coverage (%):	100	
Floor Area (sq.m.)/Lot Area (sq.m.):		1.0
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		0.8
Floor Area (sq.m.)/Open Area (sq.m.):		N.A.
Percentage of Open Area to Total Floor Area:		N.A.
Density (people/Ha.of dwelling Lot Area):		3333.0

Facilities	N	People/Facility
room:	6	4.0
kitchen:	6	4.0
shower:	0	N.A.
toilet:	0	N.A.

Physical state: Fair

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 12
Number of users
married: 2
single: -
children: 2
total: 4
Area per person (sq.m.): 3.0
Facilities: Room with kitchen. No sanitary facilities

DWELLING DEVELOPMENT
Mode: Incremental
Developer: Private
Builder: Small contractor
Construction type: Wood
Year of construction: 1969

MATERIALS
Foundation: Rammed stone
Floor: Compacted earts
Wall: Wood
Roof: Wood/metal sheets

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

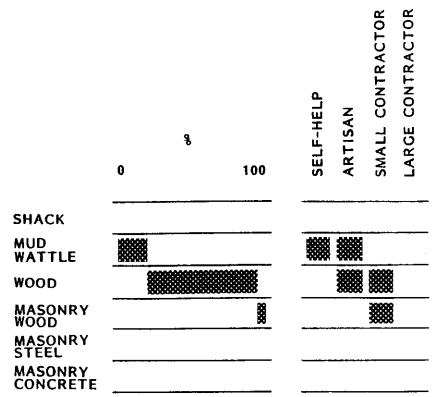
GENERAL: SOCIAL
Type of user: Family
Place of birth: Kiambu
Education level: Primary

MIGRATION PATTERN
Number of moves: 2
Rural-urban: 1 (1965)
Urban-urban: 1 (1969)
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Low
Employment: Private (self employed - retailer)
Distance to work: 2 km
Mode of travel: Walking

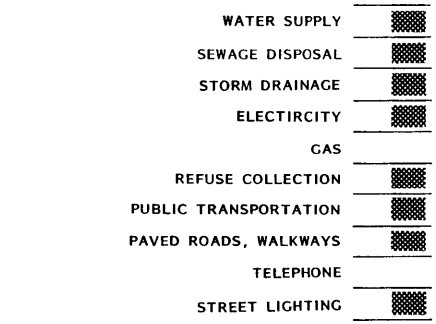
DWELLING UNIT PAYMENT
Rent (US$/month): 17.00
Percent of income for rent: 25

CONSTRUCTION TYPES DATA
related to dwelling locality

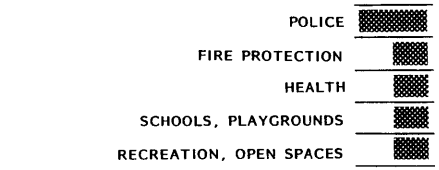


The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Accurate

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Accurate

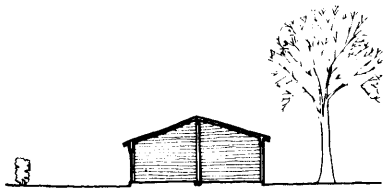
CASE STUDY SOURCE:
Gattoni, G.; Patel, P.
RESIDENTIAL AND LAND UTILIZATION, NAIROBI, KENYA. 1973

13 KAWANGWARE
Nairobi, Kenya

ROW, SINGLE-ROOM UNITS

LOCATION: It is in the southeastern part of Dagoretti, about 10 kilometers from the city center.
ORIGIN: The development of townships and satellite villages in 1957, the extension of the city boundary to include Dagoretti in 1963, and the implementation of new building by-laws in 1970 have encouraged rapid growth of this semi-rural settlement over the last 10 years.
LAYOUT: Unplanned growth with irregular street patterns. Most of the tenements are U-shaped and parallel row units.
LAND USE: It is mostly a residential area with a local market and some small shops within the dwellings.
CIRCULATION: Predominantly pedestrian with vehicular access on the periphery and a bus route as well.
POPULATION: The very low and low income users have been unable to support their families at even subsistence levels, and many have been forced to sell land to speculative middle and high income builders. Employment is primarily casual in the city with a few self-employed who derive their income from small-scale, light industries, tailoring and hawking. The local market and some small shops provide other limited employment sources. Subsistence farming is a prime source of foodstuffs.
TENEMENT: Row, single room dwelling units either linear or U-shaped. Traditional rural mud and wattle huts and stone two-story tenements are also found along the main road. The open space around the dwellings is used for socializing, cooking, laundering, maintaining domestic animals, etc., due to the very limited dwelling unit area which cannot accommodate all the daily activities easily.

LOCALITY SEGMENT PLAN 1:2500



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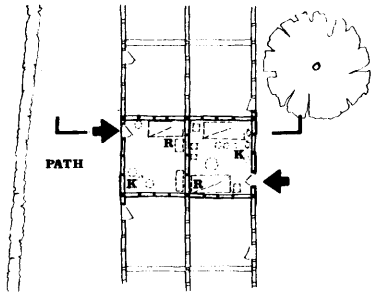


Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 216*

DWELLING
Type: (8-16) one-room units grouped under one struct.
Location: Periphery
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 8 (or 16)
Number of people: 32

Dwelling Units Floor Area (sq.m.):	216	(100%)
Shared Floor Area (sq.m.):	0	(0%)
Total Floor Area (sq.m.):	216	(100%)
Open Area (sq.m.): 0		
Lot Coverage (%): 100		
Floor Area (sq.m.)/Lot Area (sq.m.):		1.0
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		1.8
Floor Area (sq.m.)/Open Area (sq.m.):		N.A.
Percentage of Open Area to Total Floor Area:		N.A.
Density (people/Ha.of dwelling Lot Area):		1482.0

Facilities	N	People/Facility
room:	8	4.0
kitchen:	8	4.0
shower:	0	N.A.
toilet:	0	N.A.

Physical state: Fair

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 18
Number of users
married: 1 male (family in rural area)
single: -
children: -
total: 1
Area per person (sq.m.): 18
Facilities: Room with kitchen. No sanitary facilities.

DWELLING DEVELOPMENT
Mode: Incremental
Developer: Private
Builder: Artisan
Construction type: Wood
Year of construction: 1964

MATERIALS
Foundation: Rammed stone footings
Floor: Compacted earth
Wall: Wood
Roof: Wood/metal sheets

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

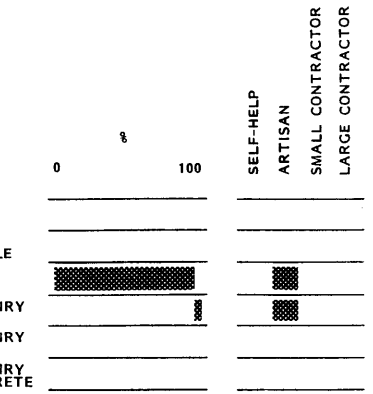
GENERAL: SOCIAL
Type of user: Married man (family in rural area)
Place of birth: Limuru
Education level: Primary

MIGRATION PATTERN
Number of moves: 1
Rural-urban: 1 (1971)
Urban-urban: -
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Low
Employment: Private (self-employed shop owner)
Distance to work: Same premises
Mode of travel: N.A.

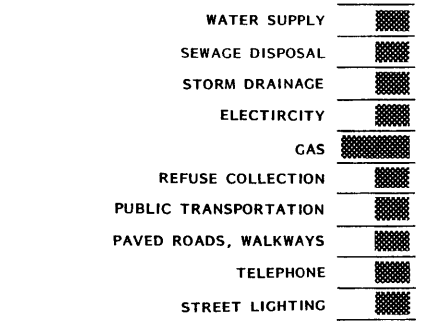
DWELLING UNIT PAYMENT
Rent (US$/month): 8.50
Percent of income for rent: 15

CONSTRUCTION TYPES DATA
related to dwelling locality

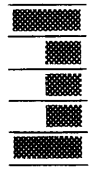


The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Accurate

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Accurate

CASE STUDY SOURCE:
Caminos, H.; Goethert, R;
DWELLING AND LAND URBANIZATION IN DEVELOPING COUNTRIES: CASE STUDY IN NAIROBI, KENYA. 1973

14 KARIOBANGI
Nairobi, Kenya

GROUPED, FOUR, SINGLE-ROOM UNITS AROUND CENTRAL CORRIDOR

LOCATION: The settlement is about 7 kilometers from the central business district, which is a source of multiple employment opportunities.

ORIGIN: As an attempt to solve the illegal housing squatting problems in Nairobi, this second site-and-services project was developed in 1964. 723 lots, each 167 sq.m. were allocated to low income people on 10-15 year leases. About 88% of the original owners sold the lots to absentee African landlords, who developed the existing mud-and-wattle dwellings and sublet them as speculative tenements.

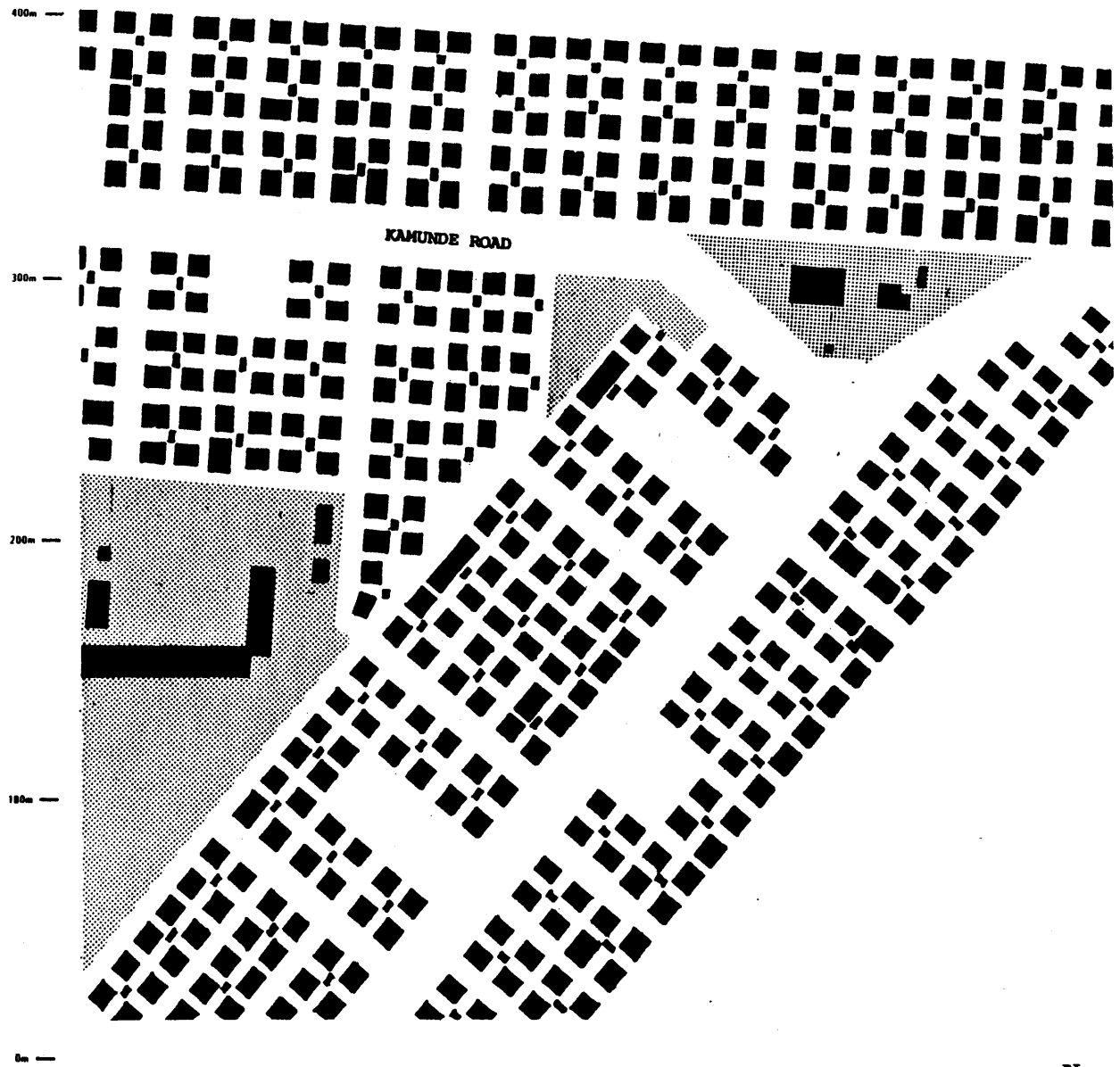
LAYOUT: Blocks of lots are determined by the utilities network and are laid out uniformly on both sides of a loop access road. It was conceived to have an average size, square lot for each dwelling. In practice, the lots were not divided and the nature of the open space has been changed to functions of circulation and minimal control.

LAND USE: A residential development limited from the south-west by agricultural land. Few shops and small-scale light industrial establishments are scattered throughout the settlement.

CIRCULATION: Single vehicular loop street connects the locality with the outer ring where a bus route detours with several stops. All lots are served by pedestrian walkways, inaccessible to vehicles in most cases.

POPULATION: Moderately low income people presently occupy the project instead of the planned very low income families. Employment is primary in the commercial/small-scale light industrial enterprises within the locality, in the nearby industrial areas, and also in the city center.

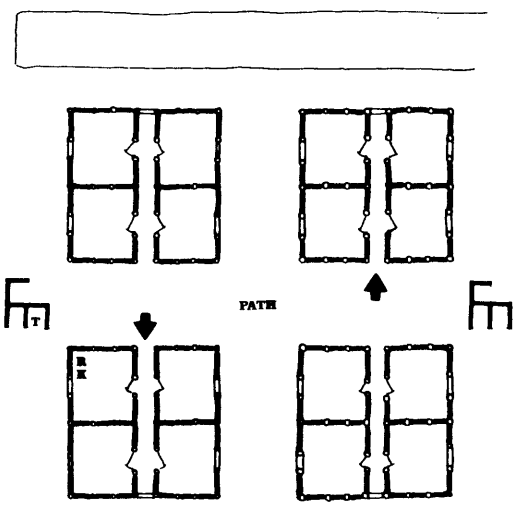
TENEMENTS: Four single-room dwelling units are grouped on both sides of a central passage. Sanitary facilities are grouped in several service blocks outside the dwellings for communal use. The dwelling unit area is remarkably too small to accommodate all of the tenants' daily activities (as cooking, socializing, playing, storing, maintaining domestic animals, etc.). Therefore, most of these activities are extended to the communal open space outside their dwellings.



LOCALITY SEGMENT PLAN

1:2500

Section



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400
N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 65

DWELLING
Type: Four, one-room units, grouped under one struct.
Location: Inner ring
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 4
Number of people: 16

Dwelling Units Floor Area (sq.m.):	56	(86%)
Shared Floor Area (sq.m.):	9	(14%)
Total Floor Area (sq.m.):	65	(100%)
Open Area (sq.m.):	0	
Lot Coverage (%):	100	
Floor Area (sq.m.)/Lot Area (sq.m.):		1.0
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		1.8
Floor Area (sq.m.)/Open Area (sq.m.):		N.A.
Percentage of Open Area to Total Floor Area:		N.A.
Density (people/Ha.of dwelling Lot Area):		2462.0

Facilities	N	People/Facility
room:	4	4.0
kitchen:	4	4.0
shower:	0	N.A.
toilet:	1	16.0

Physical state: Fair

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 14
Number of users
married: 2
single: -
children: 4
total: 6
Area per person (sq.m.): 3.5
Facilities: Room with kitchen; outside, shared toilet

DWELLING DEVELOPMENT
Mode: Incremental
Developer: Private
Builder: Artisan/small contractor
Construction type: Mud-wattle, masonry/wood
Year of construction: 1963

MATERIALS
Foundation: Concrete footing
Floor: Compacted earth/concrete
Wall: Mud-wattle, stone, concrete
Roof: Wood/metal sheets

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

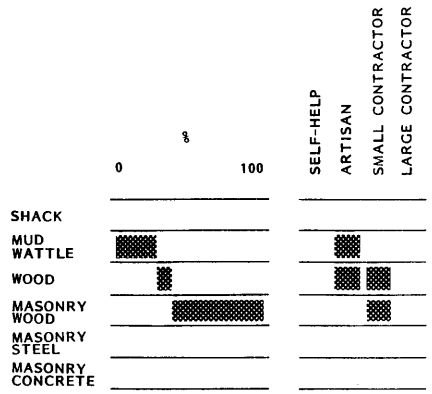
GENERAL: SOCIAL
Type of user: Family
Place of birth: Xiambu
Education level: None

MIGRATION PATTERN
Number of moves: 2
Rural-urban: 1 (1963)
Urban-urban: 1 (1965)
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Moderately low
Employment: Private (self employed - merchant)
Distance to work: 2 km
Mode of travel: Walking

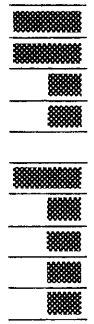
DWELLING UNIT PAYMENT
Rent (US$/month): 15.00
Percent of income for rent: 10

CONSTRUCTION TYPES DATA
related to dwelling locality

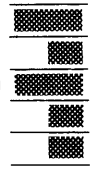


The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Accurate

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Accurate

CASE STUDY SOURCE:
Gattoni, G; Patel, P.
RESIDENTIAL LAND UTILIZATION,
NAIROBI, KENYA. 1973

15 MAKONGENI
Nairobi, Kenya

ROW, EIGHT DOUBLE-ROOM UNITS

LOCATION: It is in Eastlands, 3 kilometers from the central business district - the multi-source of employment opportunities.

ORIGIN: In 1949, when the master plan for a "Garden City" in Africa was prepared, this settlement was planned to accommodate all the African workers of Nairobi. It was among the earlier public housing projects to be built in Eastlands.

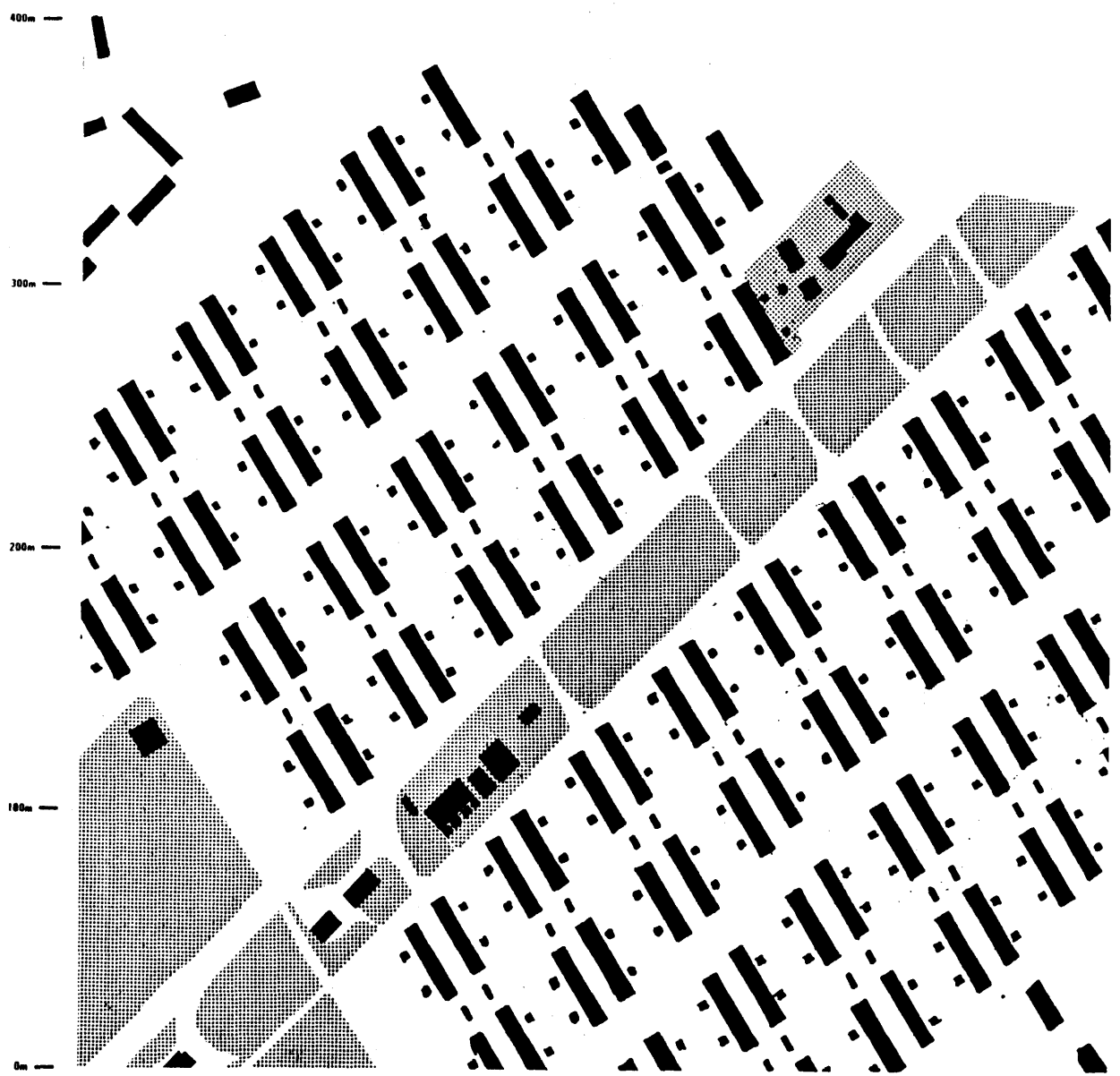
LAYOUT: It is a gridiron of 40 m x 100 m blocks. The area is not subdivided into lots, therefore the open space outside the dwellings became public circulation area with very little control.

LAND USE: Almost 71% of the area is taken for uncontrolled public open space and circulation. The rest is residential with few small commercial establishments.

CIRCULATION: A central street connects the internal street network to a major road which is served by a bus route. All streets are accessible to vehicular traffic, but are predominantly pedestrians.

POPULATION: Predominantly low income, African workers engaged in small commercial enterprises within the locality, in the nearby industrial area, and in the city center.

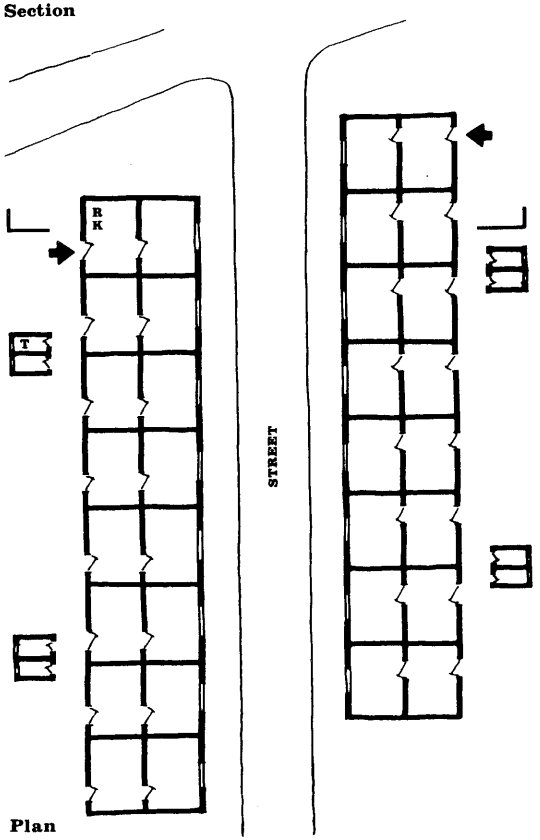
TENEMENTS: Row double-room dwelling units, each eight are grouped under one structure. Toilets are provided outside separately for communal use. Some of the tenants' daily activities (cooking, playing, washing, etc.) are extended to the outside open space, not only because of the limited dwelling unit area, but because of the hot climate.



LOCALITY SEGMENT PLAN

1:2500

Section



Plan

Key

- **R** Room (multi-use)
- **K** Kitchen/Cooking Area
- **S** Bathroom/Shower
- **T** Toilet
- **L** Laundry
- **St** Storage

0 2 10 20m

1:400

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Not known
Area (sq.m.): 200

DWELLING
Type: Eight, two-room units, grouped under one struc.
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 8
Number of people: 32

Dwelling Units Floor Area (sq.m.):	192	(96%)
Shared Floor Area (sq.m.):	8	(4%)
Total Floor Area (sq.m.):	200	(100%)
Open Area (sq.m.):	0	
Lot Coverage (%):	100	
Floor Area (sq.m.)/Lot Area (sq.m.):		1.0
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		1.0
Floor Area (sq.m.)/Open Area (sq.m.):		N.A.
Percentage of Open Area to Total Floor Area:		1600.0

Density (people/Ha.of dwelling Lot Area):

Facilities	N	People/Facility
room:	8	4.0
kitchen:	-	-
shower:	-	-
toilet:	4	8.0 (outside)

Physical state: Not known

DWELLING UNIT
Type: Two rooms
Tenure: Legal rental
Area (sq.m.): 24
Number of users
- married: not known
- single: not known
- children: not known
- total: 4

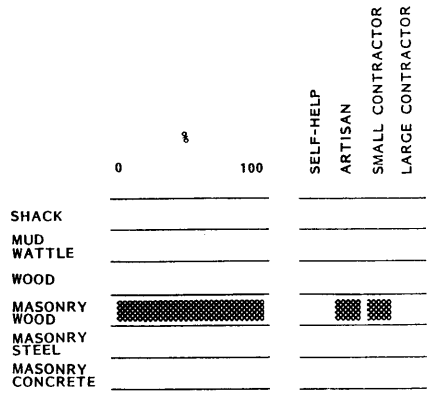
Area per person (sq.m.): 6.0
Facilities: Two rooms, outside, shared toilets

DWELLING DEVELOPMENT
Mode: Instant
Developer: Public
Builder: Not known
Construction type: Masonry/wood
Year of construction: Not known

MATERIALS
Foundation: Not known
Floor: Not known
Wall: Masonry
Roof: Wood

CONSTRUCTION TYPES DATA

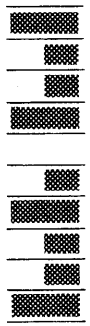
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Tentative

UTILITIES AND SERVICES DATA

related to dwelling locality



SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: not known
Place of birth: not known
Education level: not known

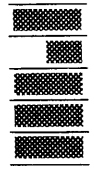
MIGRATION PATTERN
Number of moves: not known
Rural-urban: not known
Urban-urban: not known
Why come to urban area: not known

GENERAL: ECONOMIC
Income group: Low
Employment: not known
Distance to work: not known
Mode of travel: not known

DWELLING UNIT PAYMENT
Rent (US$/month): not known
Percent of income for rent: not known

COMMUNITY FACILITIES DATA

related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Tentative

CASE STUDY SOURCE:
Cattoni, G.; Patel, P.
RESIDENTIAL LAND UTILIZATION,
NAIROBI, KENYA. 1973

16 BAHATI
Nairobi, Kenya

ROW, EIGHT SINGLE-ROOM UNITS

LOCATION: It is in Eastlands, about 5 kilometers from the city center, a multiple source of employment opportunities.

ORIGIN: It was developed in 1953 by the colonial administration to provide housing for African laborers in Eastlands, which was planned to be a residential zone according to the master plan that was prepared to create a "Garden City" in East Africa.

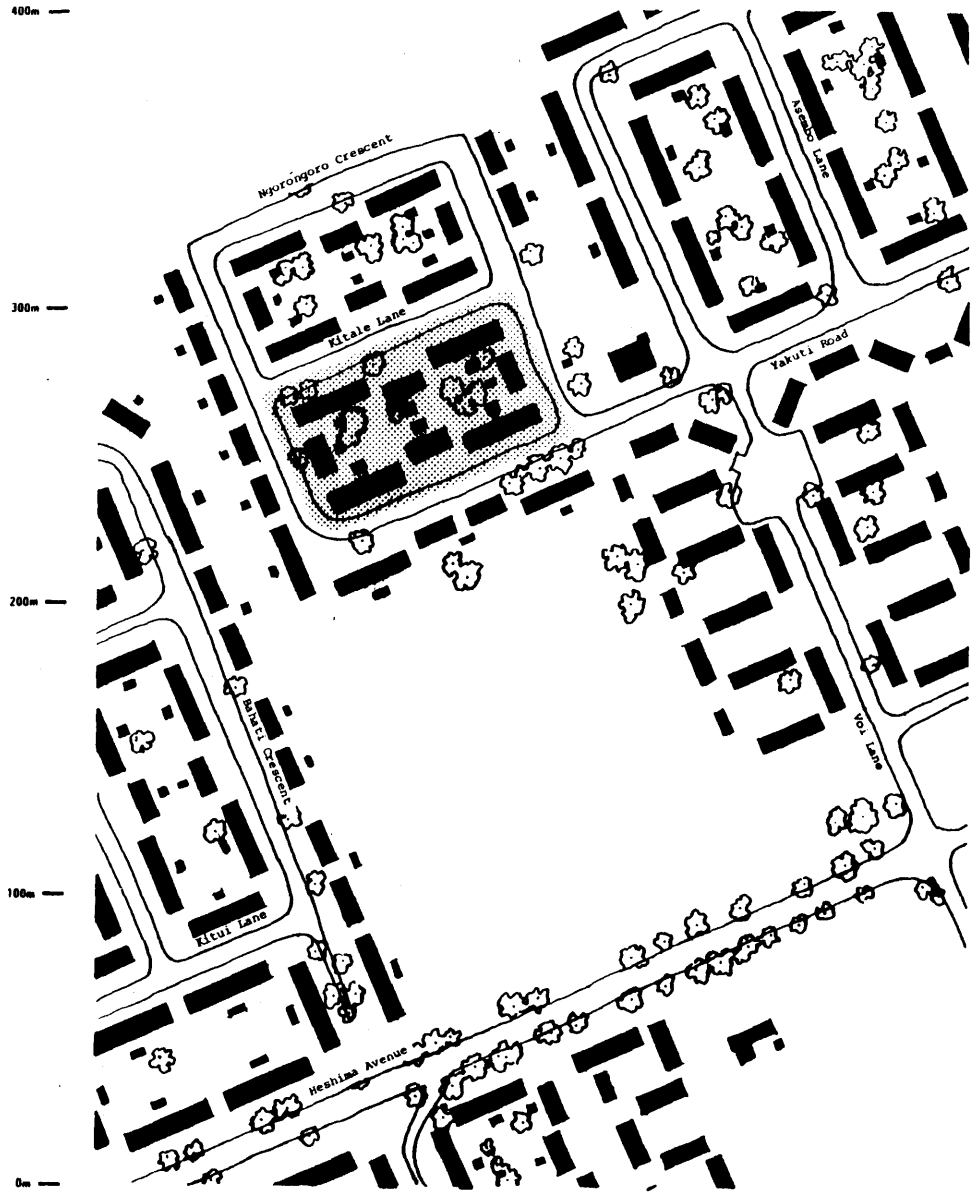
LAYOUT: Combination of formal blocks and free standing dwellings.

LAND USE: Predominantly residential with few commercial shops, small-scale light industrial and business establishments scattered throughout the locality.

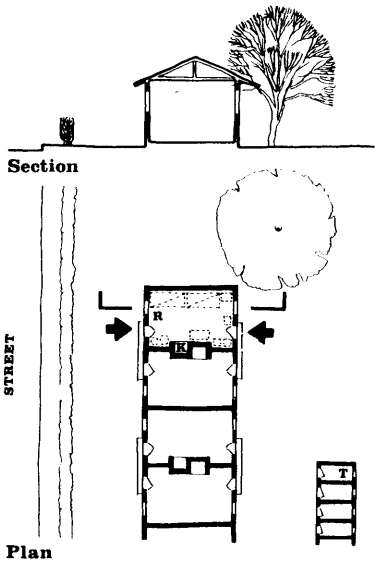
CIRCULATION: The paved vehicular streets are dominated by pedestrian traffic.

POPULATION: The low income users, mostly rural immigrants, often sub-rent their single-room dwelling units. Most are employed as laborers working in nearby offices, in workshops, with the railways, at the city council and other public institutions. Some are self-employed and are engaged in small-scale industries, commercial establishments and businesses within the locality.

TENEMENTS: The dwellings are a degraded version of the 19th century industrial row housing. This single room row unit type is unfavorably viewed as reminiscent of colonial "labor lines". However, these units have provided shelter for a large proportion of the people migrating from the rural areas, but with the result of overcrowding and high density. Each 4 or 8 unit group has a small communal open area which is used for varied activities: cooking, socializing, playing, etc. Sanitary facilities (showers and toilets) are provided separately for communal use, but are poorly maintained.



LOCALITY SEGMENT PLAN **1:2500**



Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 152

DWELLING
Type: Row rooms, each 8 are grouped under one struc.
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 8
Number of people: 32
Dwelling Units Floor Area (sq.m.): 137 (90%)
Shared Floor Area (sq.m.): 15 (10%)
Total Floor Area (sq.m.): 152 (100%)
Open Area (sq.m.): 0
Lot Coverage (%): 100
Floor Area (sq.m.)/Lot Area (sq.m.): 1.0
Floor Area (sq.m.)/Exposed Wall Area (sq.m.): 1.5
Floor Area (sq.m.)/Open Area (sq.m.): N.A.
Percentage of Open Area to Total Floor Area: N.A.
Density (people/Ha.of dwelling Lot Area): 2105.0

Facilities	N	People/Facility	
room:	8	4.0	
kitchen:	8	4.0	
shower:	0	N.A.	
toilet:	8	4.0	(outside)

Physical state: Fair

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 19
Number of users
married: -
single: 2 (1 male, 1 female)
children: 9
total: 11
Area per person (sq.m.): 1.7
Facilities: Room with kitchen; outside shower and toilet

DWELLING DEVELOPMENT
Mode: Instant
Developer: Public
Builder: Large contractor
Construction type: Masonry/wood
Year of construction: 1953

MATERIALS
Foundation: Concrete
Floor: Concrete
Wall: Masonry
Roof: Wood

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

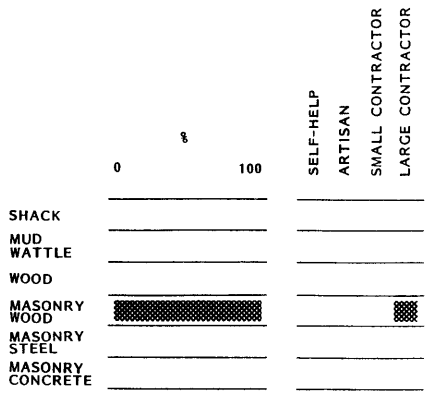
GENERAL: SOCIAL
Type of user: Family
Place of birth: Muranga
Education level: None

MIGRATION PATTERN
Number of moves: 1
Rural-urban: 1 (1954)
Urban-urban: -
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Low
Employment: Private (self employed - butcher)
Distance to work: 4 km
Mode of travel: Public transportation (bus)

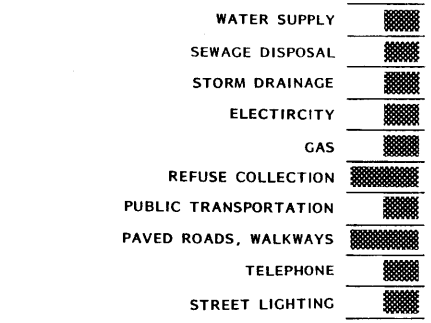
DWELLING UNIT PAYMENT
Rent (US$/month): 5.60
Percent of income for rent: 16

CONSTRUCTION TYPES DATA
related to dwelling locality

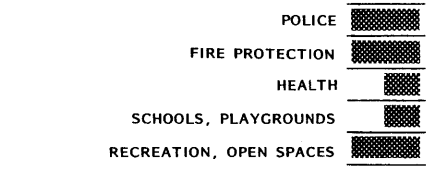


The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Accurate

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality



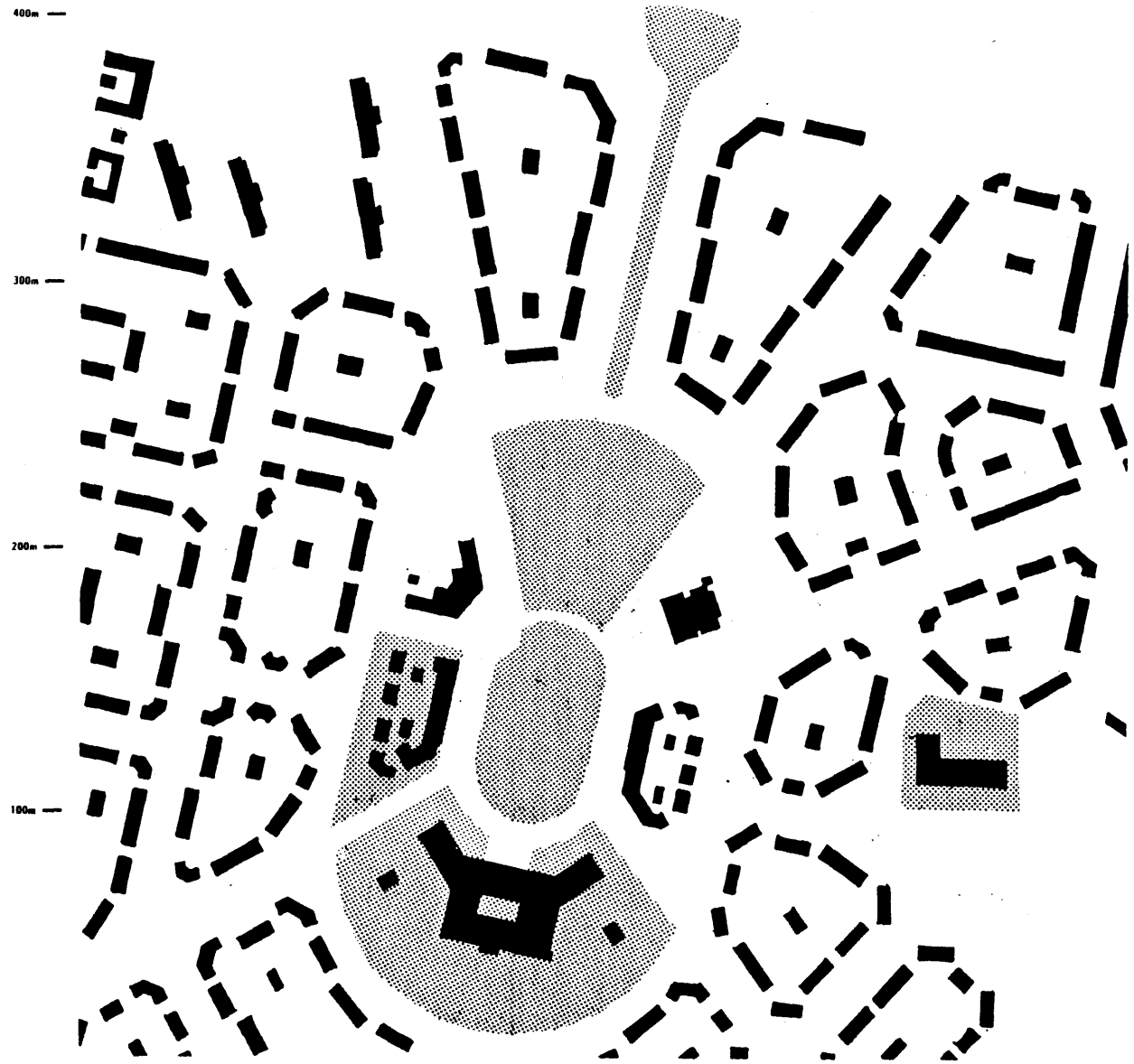
The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Accurate

CASE STUDY SOURCE:
Caminos, H.; Goethert, R.; Chana, Tara
LAND URBANIZATION IN DEVELOPING COUNTRIES, CASE STUDY IN NAIROBI, KENYA. 1973

17 KALOLENI
Nairobi, Kenya

ROW, FOUR DOUBLE-ROOM UNITS

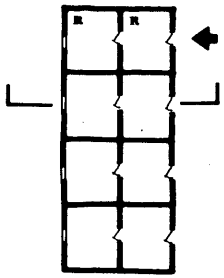
LOCATION: It is in Eastlands, about 3 kilometers from the city center, a multiple source of employments.
ORIGIN: Kaloleni was among the earlier public housing projects for the low income sector built by Nairobi City Council in Eastlands.
LAYOUT: It is a typical radial layout, clearly influenced by the "Garden City" concept (see also case No. 15). Since the area is not subdivided into private lots, the large open area around the dwellings is being utilized as public circulation which lacks individual (personal) control.
LAND USE: Only a small portion of this residential area is occupied by the dwelling structures, more than 75% is public open area utilized for circulation. Also there are some community facilities, commercial and small-scale industrial establishments.
CIRCULATION: The central main street connects the radial network to the major road which is served by a bus route. Pedestrian circulation dominates the streets as well as paths accross the open spaces.
POPULATION: Predominantly low income African workers who are engaged in the available commercial/industrial enterprises within the locality, in the nearby industrial area, as well as in the city center, make up the population of the area.
TENEMENTS: Rows of 2-4 double-room units, grouped around a communal facility block (showers and toilets). Some of the tenants' daily activities (such as cooking, socializing, playing, etc.) are extended to the open space outside the dwellings, not only because of limited, overcrowded dwelling unit area, but also due to the hot climate.

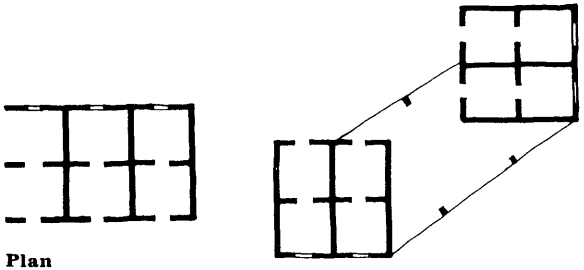


LOCALITY SEGMENT PLAN

1:2500

Section





Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Not known
Area (sq.m.): 84

DWELLING
Type: Four, two-room units, grouped under one struc.
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 4
Number of people: 16

Dwelling Units Floor Area (sq.m.):	84	(100%)
Shared Floor Area (sq.m.):	0	(0%)
Total Floor Area (sq.m.):	84	(100%)
Open Area (sq.m.):	0	
Lot Coverage (%):	100	
Floor Area (sq.m.)/Lot Area (sq.m.):		1.0
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		0.8
Floor Area (sq.m.)/Open Area (sq.m.):		N.A.
Percentage of Open Area to Total Floor Area:		N.A.
Density (people/Ha.of dwelling Lot Area):		1904.0

Facilities	N	People/Facility
room:	8	2.0
kitchen:	0	N.A.
shower:	4	4.0
toilet:	4	4.0

Physical state: Not known

DWELLING UNIT
Type: Two rooms
Tenure: Legal rental
Area (sq.m.): 21
Number of users
married: not known
single: not known
children: not known
total: 4
Area per person (sq.m.): 5.3
Facilities: Two rooms; outside communal showers, and toilets

DWELLING DEVELOPMENT
Mode: Not known
Developer: Not known
Builder: Not known
Construction type: Masonry/wood
Year of construction: Not known

MATERIALS
Foundation: Not known
Floor: Not known
Wall: Masonry
Roof: Wood

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

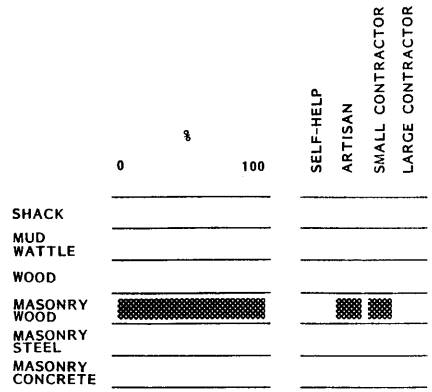
GENERAL: SOCIAL
Type of user: Not known
Place of birth: Not known
Education level: Not known

MIGRATION PATTERN
Number of moves: Not known
Rural-urban: Not known
Urban-urban: Not known
Why come to urban area: Not known

GENERAL: ECONOMIC
Income group: Low
Employment: Not known
Distance to work: Not known
Mode of travel: Not known

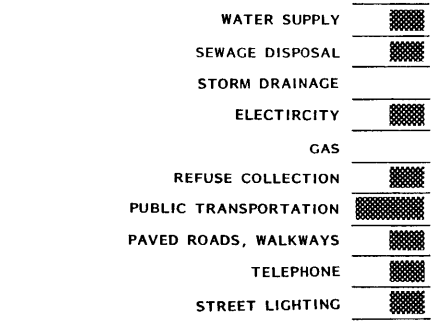
DWELLING UNIT PAYMENT
Rent (US$/month): Not known
Percent of income for rent: Not known

CONSTRUCTION TYPES DATA
related to dwelling locality

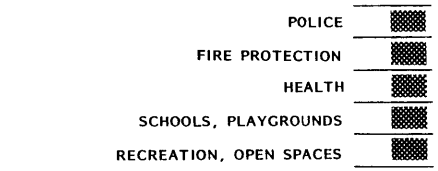


The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Tentative

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Tentative

CASE STUDY SOURCE:
Gattoni, G.; Patel, P.
RESIDENTIAL LAND UTILIZATION:
NAIROBI, KENYA. 1973

18 UPPER HILL
Nairobi, Kenya

EMPLOYER-PROVIDED UNITS

LOCATION: It is located in upper Nairobi about 3 kilometers west of the city.

ORIGIN: The area was part of the European residential zone of the "Garden City" plan in 1947. Building codes of the city stipulated that employer-provided servants quarters must be offered. The present population in employer-provided housing in Nairobi is about 25,000 to 30,000 (1972).

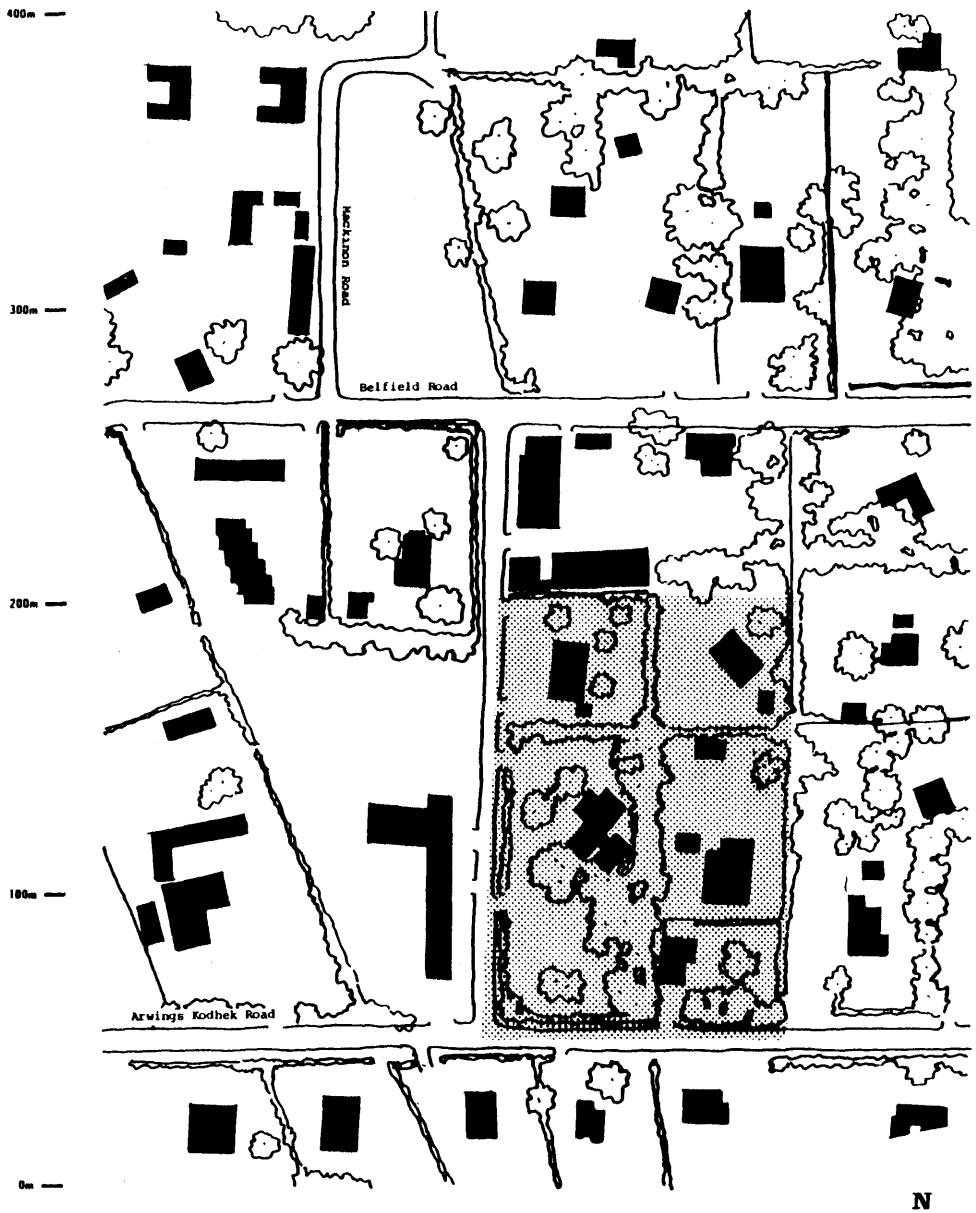
LAYOUT: This model is obsolete in urban areas, but still proliferates in some automobile-dominated suburbia.

LAND USE: Predominantly residential with few small commercial establishments (shops) scattered throughout the locality along the main streets.

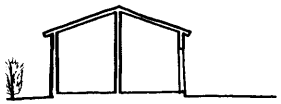
CIRCULATION: Vehicular access possible, however tenants walk or at the most bike to their daily needs.

POPULATION: Low income domestic servants and gardeners who are working for the dwelling owner comprise most of the population. Most of them have been in the city for a relatively long time, but many still have their families in the rural areas and send a large percentage of their income to them. Those who have migrated into the city with their families live in the older public housing estates, like Bahati (case study n°. 16) and Shauri Moyo.

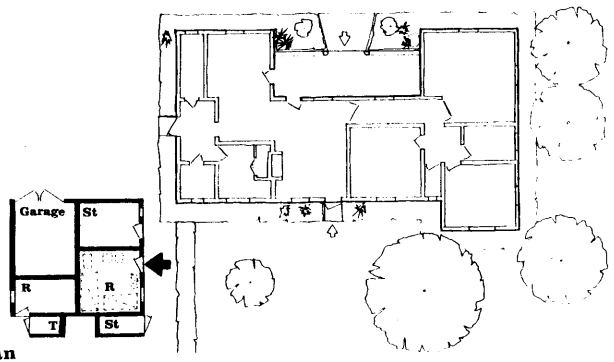
TENEMENTS: Most of the employer-provided housing is self-contained, separated single-story dwelling units. The units are usually located at the rear of the lot away from the employer's house. A fence is sometimes used. In some instances, the dwelling has been converted into a complete unit and sublet to middle income individuals.



LOCALITY SEGMENT PLAN 1:2500



Section



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal ownership
Area (sq.m.): 43

DWELLING
Type: Provided, two one-room units
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 2
Number of people: 2

Dwelling Units Floor Area (sq.m.):	43	(100%)
Shared Floor Area (sq.m.):	0	(0%)
Total Floor Area (sq.m.):	43	(100%)

Open Area (sq.m.): 0
Lot Coverage (%): N.A.

Floor Area (sq.m.)/Lot Area (sq.m.):	1.0
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):	1.8
Floor Area (sq.m.)/Open Area (sq.m.):	N.A.
Percentage of Open Area to Total Floor Area:	N.A.
Density (people/Ha.of dwelling Lot Area):	465.0

Facilities	N	People/Facility
room:	2	1.0
kitchen:	0	N.A.
shower:	0	N.A.
toilet:	1	2.0

Physical state: Good

DWELLING UNIT
Type: Room
Tenure: Provided
Area (sq.m.): 24
Number of users
married: 1 (Family in rural area)
single: -
children: -
total: 1
Area per person (sq.m.): 24.0
Facilities: Room and shared toilet

DWELLING DEVELOPMENT
Mode: Instant
Developer: Private
Builder: Small contractor
Construction type: Masonry/wood
Year of construction: 1955

MATERIALS
Foundation: Concrete
Floor: Concrete
Wall: Stone masonry
Roof: "Manglore" tiles

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

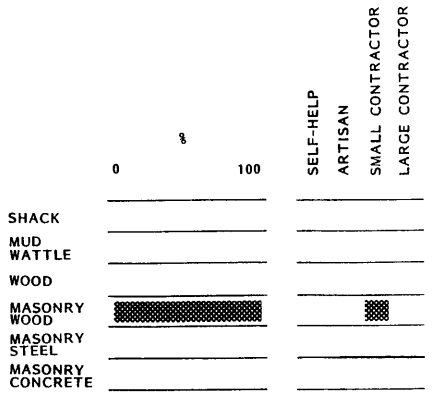
GENERAL: SOCIAL
Type of user: Individual tenant
Place of birth: Kawangware (Dagoretti)
Education level: Primary

MIGRATION PATTERN
Number of moves: 1
Rural-urban: 1 (1969)
Urban-urban: -
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Low
Employment: Resident Housemaid (Aya)
Distance to work: Same premises
Mode of travel: N.A.

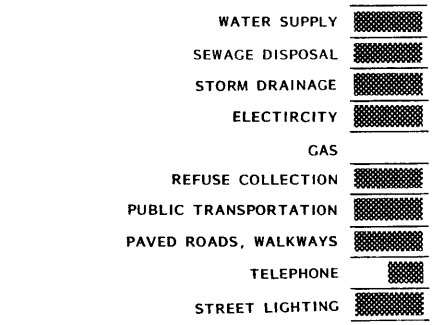
DWELLING UNIT PAYMENT
Rent (US$/month): N.A.
Percent of income for rent: N.A.

CONSTRUCTION TYPES DATA
related to dwelling locality

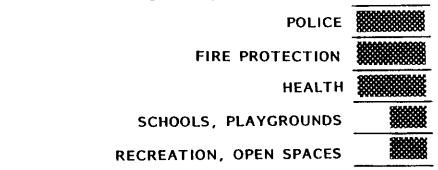


The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Accurate

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Accurate

CASE STUDY SOURCE:
Caminos, H.; Goethert, R.; Chana, Tara
LAND URBANIZATION IN DEVELOPING COUNTRIES, CASE STUDY IN NAIROBI, KENYA. 1973

19 VILLAGE 1, Mathare Valley Nairobi, Kenya

GROUPED, FOUR SINGLE-ROOM UNITS

LOCATION: The village is located about 3 kilometers from the central business district which provides a variety of employment opportunities.

ORIGIN: In 1965 local resident's associations or "companies" began to form in Mathare to purchase land from Asian owners and to develop new dwellings that filled the vacant land. In 1970 the local authorities halted their activities and decided to acquire all the land with the intention of providing piped utilities and services and leasing it back to the companies.

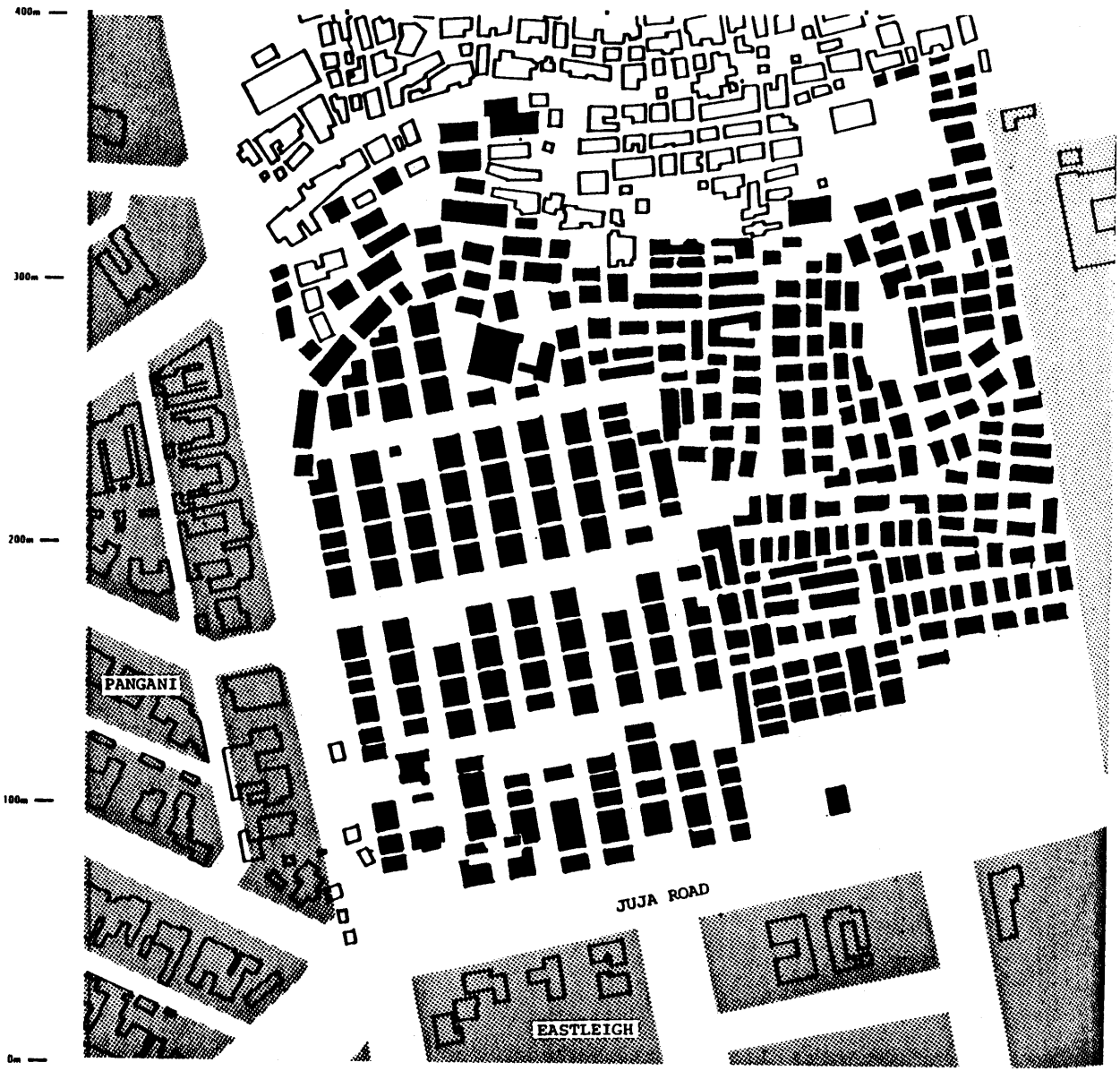
LAYOUT: The eastern half is disorderly developed contrasting the other (western) half. The area is not subdivided into lots, all open space is public and serves both as circulation and as an extension for many of the dwelling activities.

LAND USE: Predominantly residential with few commercial activities along the main streets.

CIRCULATION: There is only one vehicular cul-de-sac as the main access to this settlement. While the rest of the area is served only by pedestrian paths, there is a bus route which connects the settlement with the city public transport network.

POPULATION: Low income workers or casual laborers are mostly engaged in small scale commercial/light industrial establishments within the locality, in the nearby industrial areas as well as in the city center.

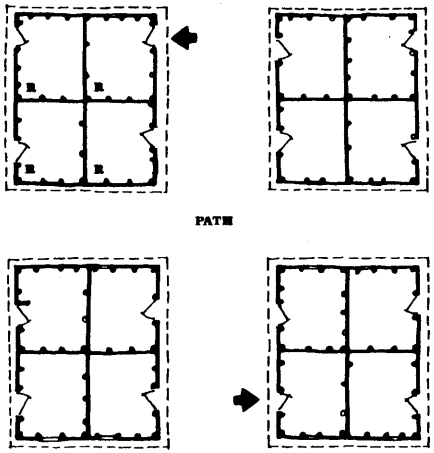
TENEMENT: Each dwelling contains four single-room units which are rented separately. Sanitary facilities have not been provided. Because of the fact that the over-crowded dwelling units are too small to accommodate all the daily activities, in addition to the hot climate, most of the tenants daily activities (cooking, socializing, playing, etc.) are extended to outside the units in the surrounding "public" open space.



LOCALITY SEGMENT PLAN

1:2500

Section



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 70*

DWELLING
Type: Four, one room units grouped under one struct.
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 4
Number of people: 18

Dwelling Units Floor Area (sq.m.):	70	(100%)
Shared Floor Area (sq.m.):	0	(0%)
Total Floor Area (sq.m.):	70	(100%)
Open Area (sq.m.):	0	
Lot Coverage (%):	100	
Floor Area (sq.m.)/Lot Area (sq.m.):		1.0
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		0.8
Floor Area (sq.m.)/Open Area (sq.m.):		N.A.
Percentage of Open Area to Total Floor Area:		N.A.
Density (people/Ha.of dwelling Lot Area):		2571.0

Facilities	N	People/Facility
room:	4	4.5
kitchen:	0	N.A.
shower:	0	N.A.
toilet:	0	N.A.

Physical state: Not known

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 17
Number of users

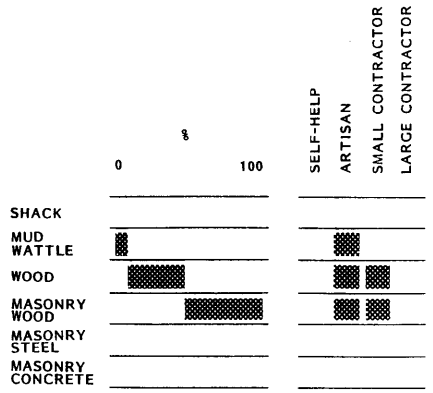
married:	not known
single:	not known
children:	not known
total:	4

Area per person (sq.m.): 4.2
Facilities: Room (no sanitary facilities)

DWELLING DEVELOPMENT
Mode: Not known
Developer: Not known
Builder: Not known
Construction type: Not known
Year of construction: Not known

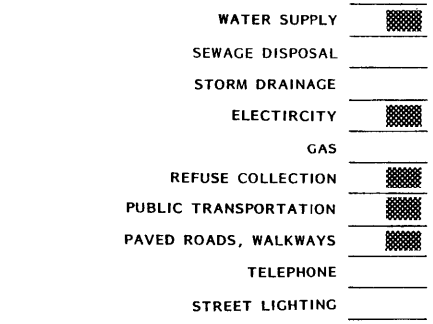
MATERIALS
Foundation: Not known
Floor: Not known
Wall: Not known
Roof: Not known

CONSTRUCTION TYPES DATA
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Tentative

UTILITIES AND SERVICES DATA
related to dwelling locality



SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

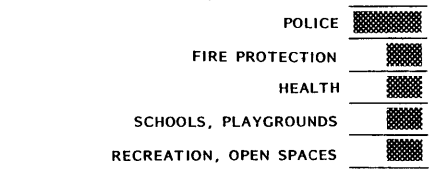
GENERAL: SOCIAL
Type of user: Not known
Place of birth: Not known
Education level: Not known

MIGRATION PATTERN
Number of moves: Not known
Rural-urban: Not known
Urban-urban: Not known
Why come to urban area: Not known

GENERAL: ECONOMIC
Income group: Low
Employment: Not known
Distance to work: Not known
Mode of travel: Not known

DWELLING UNIT PAYMENT
Rent (US$/month): Not known
Percent of income for rent: Not known

COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Tentative

CASE STUDY SOURCE:
Gattoni, G.; Patel, P.
RESIDENTIAL LAND UTILIZATION,
NAIROBI, KENYA. 1973

20 EASTLEIGH
Nairobi, Kenya

ROOMS IN INITIALLY BUILT, COURTYARD TENEMENTS

LOCATION: The city center, the primary source of employment opportunities, is about 3 kilometers from this settlement.

ORIGIN: Eastleigh was developed as a residential area for moderately low income Asian families during the colonial period (early 1900's). With the departure of many low income Asians at independence, many low and middle income Africans moved into these dwellings which were converted into one (or two) room units with shared facilities.

LAYOUT: The blocks of this gridiron urban pattern have an average dimension of 70 m x 230 m and are subdivided into lots of an average size of 15 m x 19 m. The tenements, in addition to their internal open space (courtyards), are surrounded from three sides with stretches of open areas separating adjacent tenements.

LAND USE: Predominantly residential with some shops and few small workshops scattered throughout the settlement.

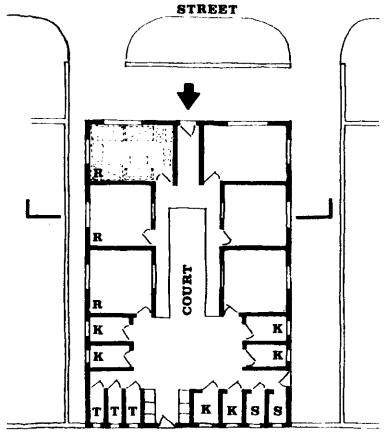
CIRCULATION: Vehicular access is possible, however the traffic is predominantly pedestrian. Tenants usually walk, bike or take a bus for their daily needs.

POPULATION: The moderately low and middle income users are mainly wage-employed in the city center working as drivers, clerks, and messengers. Others are self-employed in small corner shops, restaurants, bars as well as bicycle and shoe repair shops.

TENEMENTS: The six single-room units and the communal sanitary facilities (showers and toilets) are arranged around an internal courtyard. The dwelling units are relatively small and over crowded, therefore many of the tenants' daily activities (cooking, socializing, playing, etc.) are extended to the common internal courtyard. Presently a lot of these tenements are owned by absentee, high income African landlords.

LOCALITY SEGMENT PLAN **1:2500**

Section



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 285

DWELLING
Type: Organized, originally built tenement
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 6
Number of people: 90

Dwelling Units Floor Area (sq.m.):	88	(70%)
Shared Floor Area (sq.m.):	38	(30%)
Total Floor Area (sq.m.):	126	(100%)
Open Area (sq.m.):	159	
Lot Coverage (%):	44	
Floor Area (sq.m.)/Lot Area (sq.m.):		0.4
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		0.5
Floor Area (sq.m.)/Open Area (sq.m.):		0.8
Percentage of Open Area to Total Floor Area:		126.0
Density (people/Ha.of dwelling Lot Area):		3158.0

Facilities	N	People/Facility
room:	6	15.0
kitchen:	6	15.0
shower:	2	45.0
toilet:	3	30.0

Physical state: Fair

DWELLING UNIT
Type: Room with outside, separated kitchen
Tenure: Legal rental
Area (sq.m.): 15
Number of users
married: 2
single: 1
children: 12
total: 15
Area per person (sq.m.): 1.0
Facilities: Room, kitchen; shared shower and toilet

DWELLING DEVELOPMENT
Mode: Instant
Developer: Private
Builder: Small contractor
Construction type: Masonry/wood
Year of construction: 1945

MATERIALS
Foundation: Concrete
Floor: Concrete
Wall: Stone Masonry
Roof: Wood/metal sheets

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

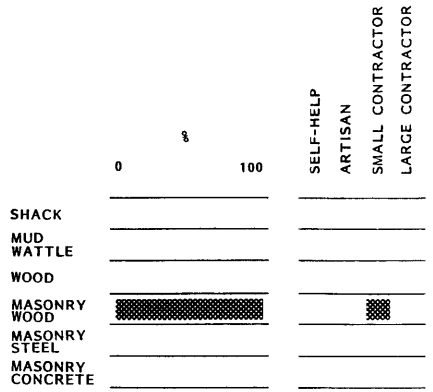
GENERAL: SOCIAL
Type of user: Large family
Place of birth: Nairobi
Education level: Primary

MIGRATION PATTERN
Number of moves: None
Rural-urban: -
Urban-urban: -
Why come to urban area: N.A.

GENERAL: ECONOMIC
Income group: Low
Employment: Private (driver)
Distance to work: 5 km
Mode of travel: Public transportation (bus)

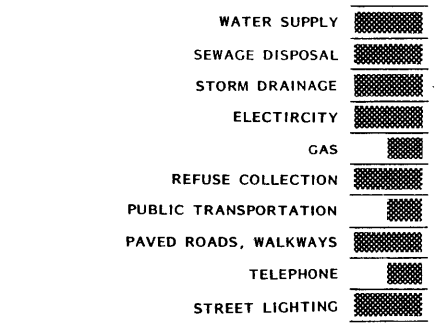
DWELLING UNIT PAYMENT
Rent (US$/month): 40.50
Percent of income for rent: 65

CONSTRUCTION TYPES DATA
related to dwelling locality

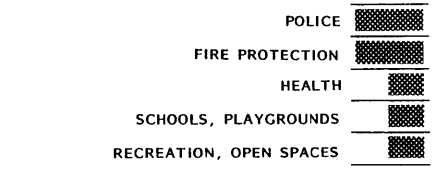


The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Accurate

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Accurate

CASE STUDY SOURCE:
Caminos, H.; Goethert, R.; Chana, Tara
LAND URBANIZATION IN DEVELOPING COUNTRIES, CASE STUDY IN NAIROBI, KENYA. 1973

21 RIVER ROAD
Nairobi, Kenya

ROOMS IN INITIALLY BUILT, COURTYARD TENEMENT

LOCATION: It is in the center of the city, the primary source of varied job opportunities.

ORIGIN: Initially developed in the early 1900's by Asians who migrated from India as railway workers. Asian families of moderately low income continued to live in the area until independence, when most of them migrated to other countries. Africans in the low and middle income groups then moved into these tenements.

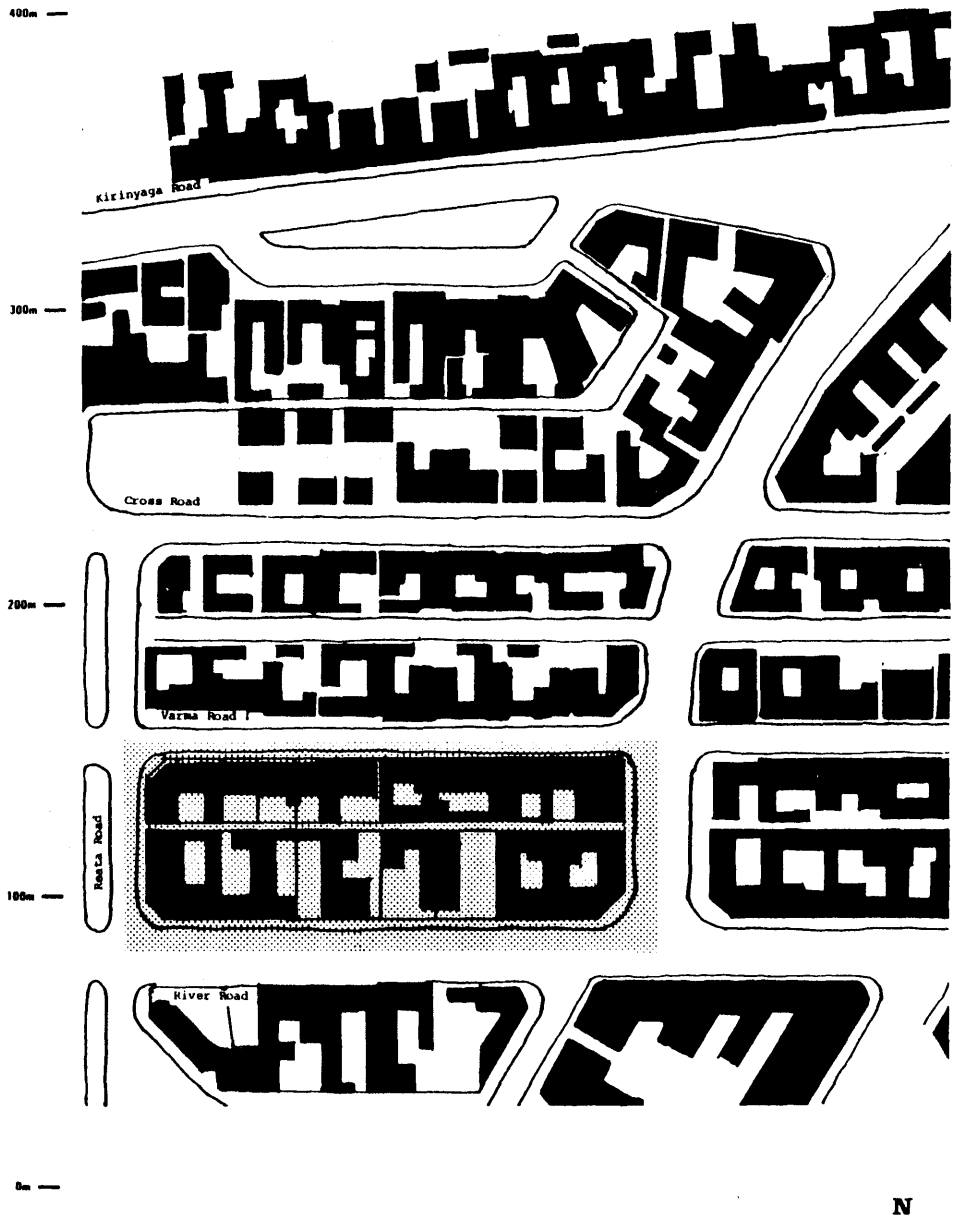
LAYOUT: The blocks of this gridiron urban pattern have average dimensions of 70 m x 175 m and are subdivided into lots of an average size of 15 m x 18 m. The tenement building occupies the whole lot leaving only an internal open courtyard of an average size of 6 m x 11 m.

LAND USE: Mixed use, small shop commercial spine predominantly Asian with tenements above.

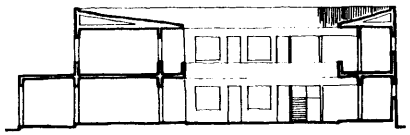
CIRCULATION: Vehicular access is possible, however the traffic is predominantly pedestrian. Tenants usually walk, bike or take a bus for their daily needs.

POPULATION: The tenants are in the low and middle income groups and are mainly wage-employed in the city center. Others are self-employed in the city shops, restaurants, bars, and repair workshops as well as some small scale light industrial establishments along the Nairobi River.

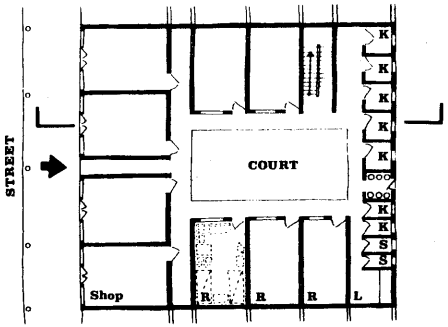
TENEMENTS: These initially built, courtyard type tenements are two (or three) storied with shops on the ground floor facing the street. Open galleries provide access to the units in the upper floors. The grouped communal facilities are located at the end of the courtyard and are often overcrowded and badly maintained. Many of the daily activities of the tenants (as cooking, socializing, playing, etc.) are extended outside of the single-room, crowded dwelling units and performed in the courtyard. Most of these tenements are still largely owned by absentee high income Asians. Tenements in this settlement also function as transient lodging for new immigrants in search for employment.



LOCALITY SEGMENT PLAN 1:2500



Section



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 262

DWELLING
Type: Organized, originally built tenement
Location: City center
Utilization: Multiple
Number of Floors: 2
Number of dwelling units: 12
Number of people: 40
Dwelling Units Floor Area (sq.m.): 303 (75%)
Shared Floor Area (sq.m.): 101 (25%)
Total Floor Area (sq.m.): 404 (100%)
Open Area (sq.m.): 60
Lot Coverage (%): 77
Floor Area (sq.m.)/Lot Area (sq.m.): 1.5
Floor Area (sq.m.)/Exposed Wall Area (sq.m.): 0.9
Floor Area (sq.m.)/Open Area (sq.m.): 7.0
Percentage of Open Area to Total Floor Area: 15.0
Density (people/Ha.of dwelling Lot Area): 1526.6

Facilities	N	People/Facility
room:	14	3.0
kitchen:	12	3.3
shower:	4	10.0
toilet:	4	10.0

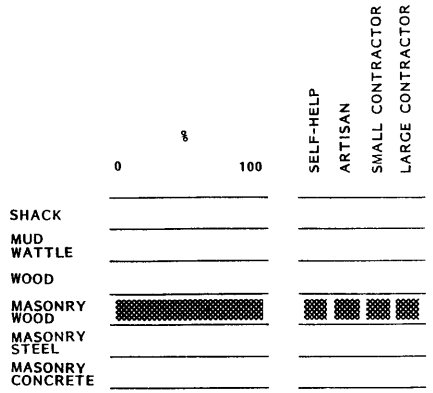
Physical state: Fair

DWELLING UNIT
Type: Room with outside, separated kitchen
Tenure: Legal rental
Area (sq.m.): 15
Number of users
married: 1 (female)
single: -
children: 2
total: 3
Area per person (sq.m.): 5.0
Facilities: Room (or 2 rooms), kitchen, shared shower and toilet

DWELLING DEVELOPMENT
Mode: Instant
Developer: Private
Builder: Small contractor
Construction type: Masonry/wood
Year of construction: 1938

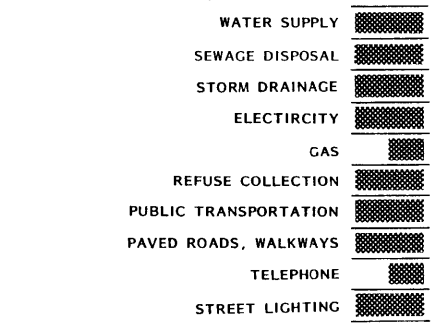
MATERIALS
Foundation: Concrete
Floor: Concrete
Wall: Stone/masonry
Roof: Wood/metal sheets

CONSTRUCTION TYPES DATA
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Accurate

UTILITIES AND SERVICES DATA
related to dwelling locality



SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

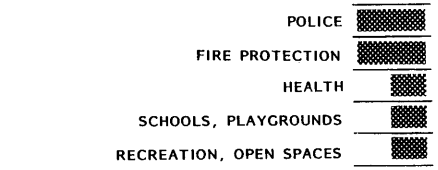
GENERAL: SOCIAL
Type of user: Family
Place of birth: Nairobi (Asians)
Education level: None

MIGRATION PATTERN
Number of moves: 1
Rural-urban: -
Urban-urban: 1 (1967)
Why come to urban area: N.A.

GENERAL: ECONOMIC
Income group: Low
Employment: Private (self-employed food vendor)
Distance to work: 2 km
Mode of travel: Walking

DWELLING UNIT PAYMENT
Rent (US$/month): 21.00
Percent of income for rent: 30

COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Accurate

CASE STUDY SOURCE:
Caminos, H.; Goethert, R.; Chana, Tara
LAND URBANIZATION IN DEVELOPING COUNTRIES, CASE STUDY IN NAIROBI, KENYA. 1973

22 KISENYI
Kampala, Uganda

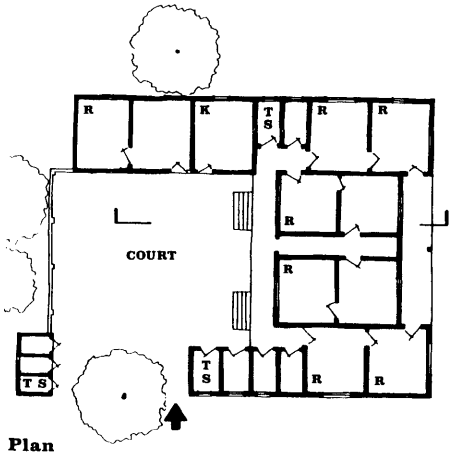
ROOMS IN CONVERTED FAMILY HOUSES

LOCATION: It is in the city center, the multiple source of employment opportunities.
ORIGIN: Most of Kisenyi was reclaimed by drainage from a swamp along Nakivubo River before 1900.
LAYOUT: The settlement is unplanned and was a result of an uncontrolled growth. The existing circulation pattern has been developed from natural footpaths cuttting across private properties. The land has been subdivided by individual landlords as they wished without any central plan or professional guidance and with no considerations for future public access or utility networks.
LAND USE: It is a predominantly residential area with a variety of commercial activities occupying 17% of the locality area. Also, a small portion of this area, about 3%, is utilized for agriculture. These percentages, however, do not reveal the multi-functional nature of the locality, because almost every dwelling contains a home-industry or a commercial establishment.
CIRCULATION: The locality is bounded by main vehicular routes. The majority of the internal lanes, although accessible by vehicles, are unpaved pedestrian dominated paths.
POPULATION: Kisenyi has a large percentage of adult employable population. Most of them are rural immigrants who initially have come alone seeking employment. Later, their families joined them (in many cases only to work for a short time and return to the countryside). The majority of the working population are engaged with unskilled, short-term marginal jobs in the city center, or affiliated with small industrial enterprises throughout the locality. Such activities as bicycle repairing, wood workshops, metal repairs, shoe making and repairs, watch repairs, and car repairs are found along the main streets.
TENEMENTS: Originally most of those dwellings were large single/extended family houses. Presently the majority of them have been converted into tenements. In many cases additional facilities have been added, mainly showers and toilets. Most of the dwellings contain an internal courtyard into which many activities are taking place (cooking, socializing, playing, etc.). Almost every dwelling has a home-industry or small shop. Many units are rented by women who are primarily engaged in selling of food, beer, etc.

LOCALITY SEGMENT PLAN

1:2500

Section



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal Ownership
Area (sq.m.): 336

DWELLING
Type: Originally built tenement
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 5
Number of people: 35

Dwelling Units Floor Area (sq.m.):	169	(83%)
Shared Floor Area (sq.m.):	35	(17%)
Total Floor Area (sq.m.):	204	(100%)
Open Area (sq.m.):	132	
Lot Coverage (%):	61	
Floor Area (sq.m.)/Lot Area (sq.m.):		0.6
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		0.7
Floor Area (sq.m.)/Open Area (sq.m.):		1.6
Percentage of Open Area to Total Floor Area:		65.0
Density (people/Ha.of dwelling Lot Area):		1042.6

Facilities	N	People/Facility
room:	10	3.5
kitchen:	1	35.0
shower:	9	3.8
toilet:	9	3.8

Physical state: Good

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 25
Number of users
married: not known
single: not known
children: not known
total: 7
Area per person (sq.m.): 3.7
Facilities: Room; shared kitchen, shower and toilet

DWELLING DEVELOPMENT
Mode: Incremental
Developer: Private
Builder: Artisan
Construction type: Masonry/wood
Year of construction: 1966

MATERIALS
Foundation: Concrete
Floor: Cement screed
Wall: Concrete block masonry
Roof: Metal sheets

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

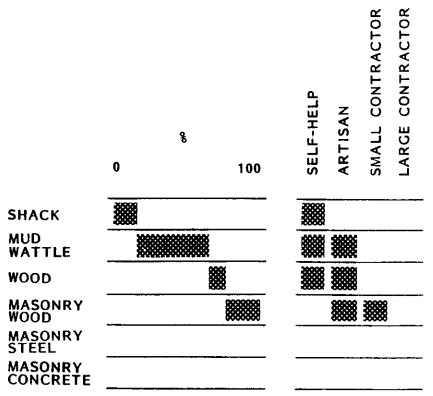
GENERAL: SOCIAL
Type of user: Large family
Place of birth: Kampala
Education level: Primary

MIGRATION PATTERN
Number of moves: not known
Rural-urban: not known
Urban-urban: not known
Why come to urban area: not known

GENERAL: ECONOMIC
Income group: Not known
Employment: Not known
Distance to work: 1.2 km
Mode of travel: walking

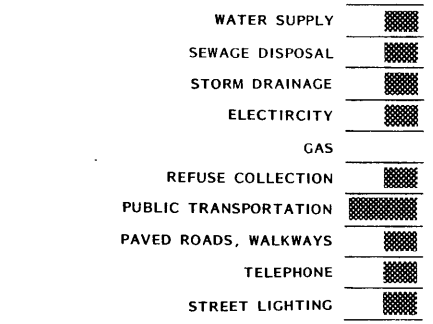
DWELLING UNIT PAYMENT
Rent (US$/month): Not known
Percent of income for rent: Not known

CONSTRUCTION TYPES DATA
related to dwelling locality

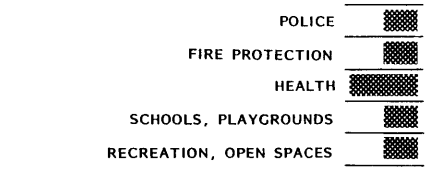


The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Tentative

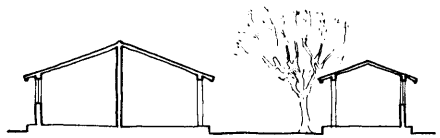
CASE STUDY SOURCE:
Mulumba, Stanley S.
URBANIZATION IN DEVELOPING COUNTRIES, A CASE STUDY, KAMPALA, UGANDA: AN ELEMENTARY SURVEY OF LAND AND DWELLING ENVIRONMENTS. 1974

23 MULAGO
Kampala, Uganda

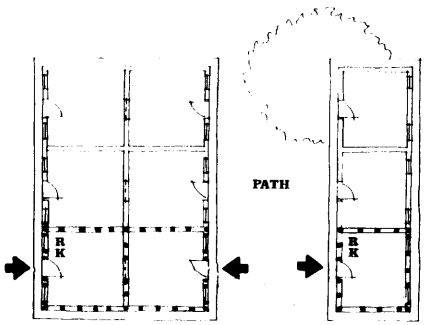
ROW, SINGLE-ROOM UNITS

LOCATION: It is located on a flat-topped hill, about 5 kilometers west of the city center.
ORIGIN: One of the hills frequently settled by the ancient kings of Buganda. Around the early 19th century it became the main center of second homes or "town houses" of rural chiefs who came occasionally to Kampala. As the hill settlement quickly developed, the chiefs were forced to move out by the growing community of immigrant laborers that occupies the western slopes of the hill today.
LAYOUT: Unplanned settlement which was a result of an uncontrolled growth. The existing pattern has been determined by the natural irregular footpaths as the settlement developed from a rural type open pattern to a dense conglomeration of buildings erected without coordination or control. The setting of the dwellings bears no relationship to lot sizes or shapes. As many as ten or more dwellings may be scattered or packed on one lot in various orientations and configurations.
LAND USE: It is a predominantly residential area with a variety of commercial and small scale, light industrial activities scattered throughout the locality.
CIRCULATION: The dusty murram-finished streets are generally accessible and moderately used by vehicular traffic. Primary pedestrian routes are often invaded by motorists, handcarts and even cows.
POPULATION: Generally low income groups, 50% of them are in the employable age.
TENEMENTS: 3-6 single-room units are arranged back to back in rows, surrounded by public open space. Sanitary facilities (showers, toilets, etc.) are not provided. The majority of the dwellings contain commercial and small scale light industrial activities which flow, with many other household activities, out of the dwellings into the streets and the public open spaces surrounding the dwellings to intermingle with the children's playing areas, garbage dumps, and areas of animal husbandry. Those tenements, in general, provide short-term lodging spaces mostly to patients and their attendants. They have been referred to as a "bedroom community".

LOCALITY SEGMENT PLAN **1:2500**



Section



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 140

DWELLING
Type: Six, one-room units, grouped under one struc.
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 6
Number of people: 12

Dwelling Units Floor Area (sq.m.):	117	(100%)
Shared Floor Area (sq.m.):	0	(0%)
Total Floor Area (sq.m.):	117	(100%)
Open Area (sq.m.):	23	
Lot Coverage (%):	84	
Floor Area (sq.m.)/Lot Area (sq.m.):		0.8
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		2.7
Floor Area (sq.m.)/Open Area (sq.m.):		5.0
Percentage of Open Area to Total Floor Area:		20.0
Density (people/Ha.of dwelling Lot Area):		857.2

Facilities	N	People/Facility
room:	6	2.0
kitchen:	6	2.0
shower:	0	N.A.
toilet:	0	N.A.

Physical state: Fair

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 18
Number of users
married: not known
single: not known
children: not known
total: 2
Area per person (sq.m.): 9.0
Facilities: Room with kitchen. No shower or toilet

DWELLING DEVELOPMENT
Mode: Instant
Developer: Private
Builder: Artisan
Construction type: Mud and wattle
Year of construction: Not known

MATERIALS
Foundation: Wooden posts
Floor: Concrete screed on Hardcore
Wall: Mud and wattle
Roof: Metal sheets

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

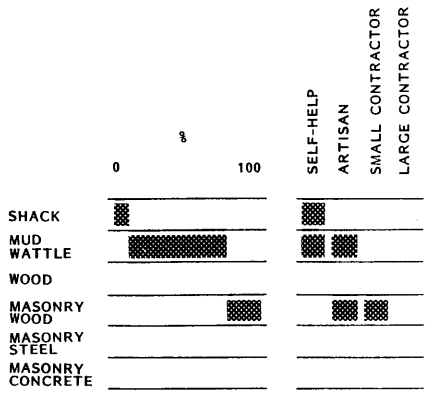
GENERAL: SOCIAL
Type of user: Not known
Place of birth: Kampala
Education level: None

MIGRATION PATTERN
Number of moves: Not known
Rural-urban: Not known
Urban-urban: Not known
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Low
Employment: Private (self-employed)
Distance to work: Not known
Mode of travel: Not known

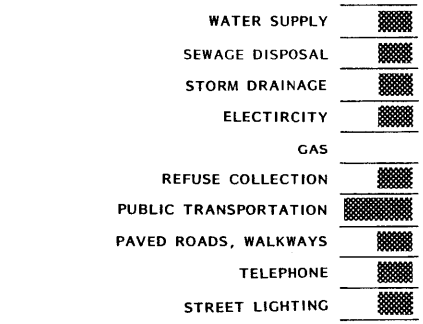
DWELLING UNIT PAYMENT
Rent (US$/month): Not known
Percent of income for rent: Not known

CONSTRUCTION TYPES DATA
related to dwelling locality

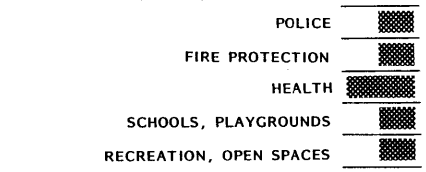


The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Tentative

CASE STUDY SOURCE:
Mulumba, Stanley S.
URBANIZATION IN DEVELOPING COUNTRIES, A CASE STUDY, KAMPALA,UGANDA: AN ELEMENTARY SURVEY OF LAND AND DWELLING ENVIRONMENTS.1974

24 BHILVAS
Rajkot, India

ROW SINGLE ROOM UNITS "CHAWLS"

LOCATION: It is situated in the Civil Station "Sadar" area, about 2 kilometers from the city center, the primary source of various employment opportunities.

ORIGIN: The establishment of a British civil station in 1822 increased migration from the nearby areas. Most of the immigrants worked as domestic or office servants (peons) for the British officers residing in the civil station area. By 1875, many squatter settlements had been developed. As a result of the constant demand for housing, the officers were forced to construct single-room row dwellings known as "chawls" (see glossary).

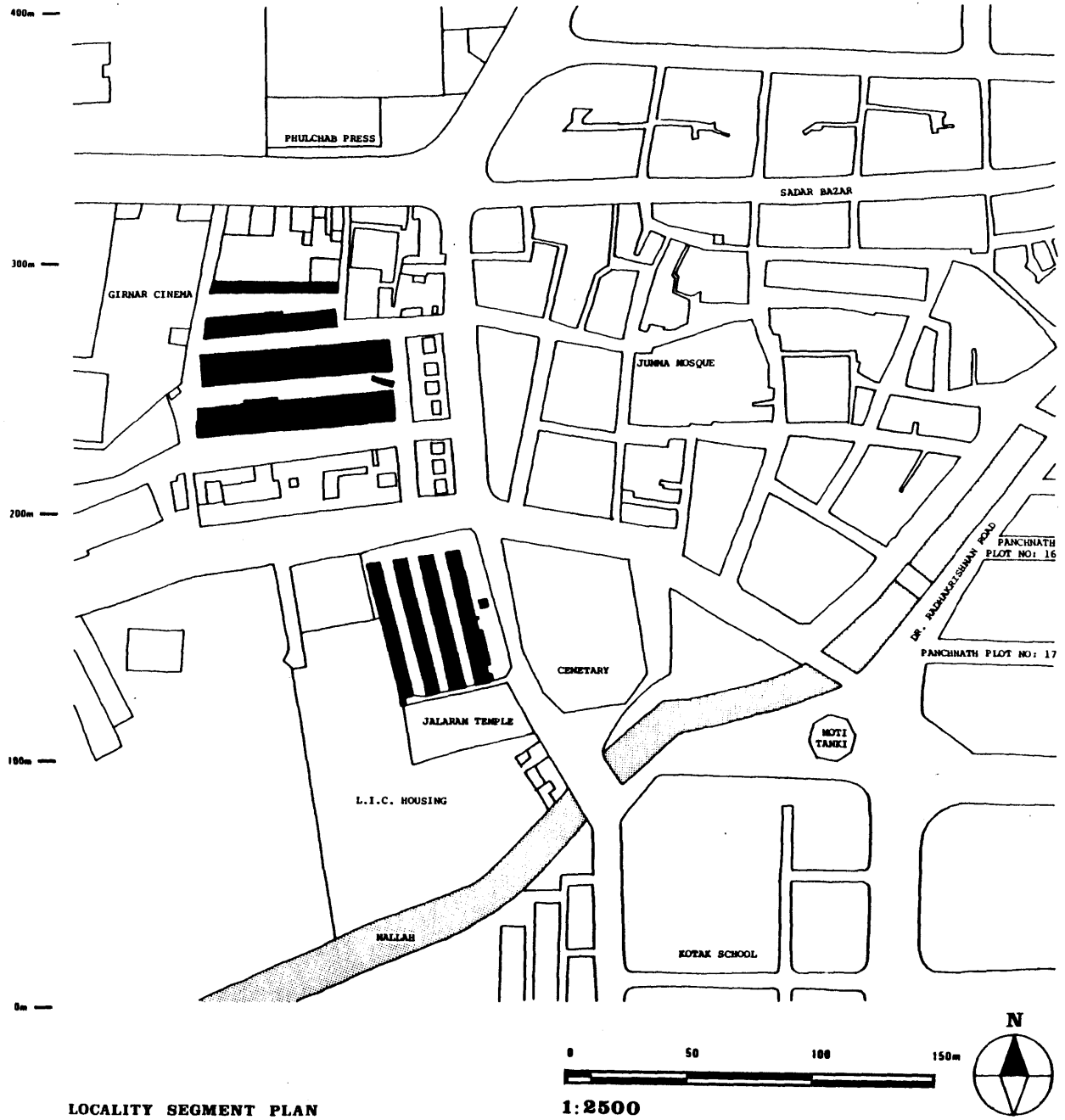
LAYOUT: Irregular urban pattern and land subdivision which is a result of the uncontrolled, unplanned growth of the locality. Dwellings are rows of single-room units.

LAND USE: Bhilvas is predominantly residential with some commercial establishments scattered throughout the locality, especially along main streets. There is also some religious and entertainment buildings.

CIRCULATION: A major street passes through the chawl area. Most of the streets are dominated by pedestrians as well as bicycles. The locality is well connected to the city center by a bus route.

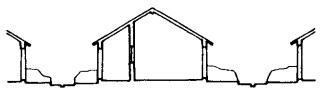
POPULATION: The majority of the tenants are very low income immigrants. Roughly 26% of the household heads are employed in the government while 26% are casual workers and the remaining population is either self-employed or unemployed.

TENEMENTS: The single-room units are grouped in rows stretched between two parallel open circulation passages. Each unit is exposed and has access to two different passages on two opposite sides. Most of the units contain a small kitchen/cooking space. Potable water taps and toilets are very limited and are provided outside for communal use. For 260 dwellings (1400 people) there are only 30 communal water taps and 8 communal toilets and no showers or bathrooms. The dwelling units are small and overcrowded so that most of the household activities are performed outside the units in the crowded common open space (as cooking, preparing, washing, socializing, playing, and raising domestic animals). Most of the dwellings are poorly maintained, deteriorating, and considered as uninhabitable.



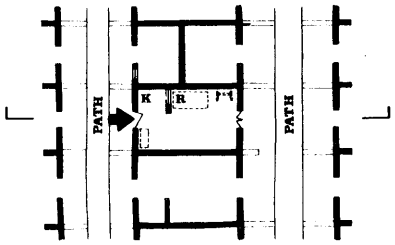
LOCALITY SEGMENT PLAN

1:2500



Section

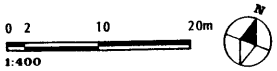
Elevation



Plan

Key

- **R** Room (multi-use)
- **K** Kitchen/Cooking Area
- **S** Bathroom/Shower
- **T** Toilet
- **L** Laundry
- **St** Storage



DWELLING: TENEMENT

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-private
Tenure: Legal rental
Area (sq.m.): 612

DWELLING
Type: Row of one room units (chawls)
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 18 (in each row)
Number of people: 144

Dwelling Units Floor Area (sq.m.):	360	(100%)
Shared Floor Area (sq.m.):	0	(0%)
Total Floor Area (sq.m.):	360	(100%)

Open Area (sq.m.): 252
Lot Coverage (%): 60.0
Floor Area (sq.m.)/Lot Area (sq.m.): 0.6
Floor Area (sq.m.)/Exposed Wall Area (sq.m.): 1.3
Floor Area (sq.m.)/Open Area (sq.m.): 1.4
Percentage of Open Area to Total Floor Area: 70.0
Density (people/Ha.of dwelling Lot Area): 2352.9

Facilities	N	People/Facility
room:	18	8.0
kitchen:	18	8.0
shower:	0	N.A.
toilet:	1	160.0 (1 for 20 families)

Physical state: Poor

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 20.0
Number of users

married:	2
single:	-
children:	6
total:	8

Area per person (sq.m.): 2.5
Facilities: Room with kitchen; No shower or toilet

DWELLING DEVELOPMENT
Mode: Instant
Developer: Private
Builder: Small Contractor
Construction type: Brick masonry
Year of construction: 1920

MATERIALS
Foundation: Brick
Floor: Cement plaster
Wall: Brick and mud brick masonry
Roof: Tiles

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Family
Place of birth: Rajasthan
Education level: Secondary

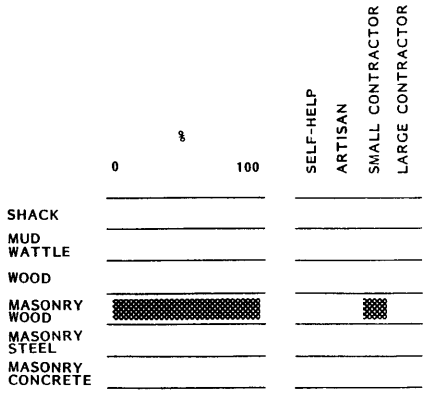
MIGRATION PATTERN
Number of moves: 1
Rural-urban: 1
Urban-urban: 0
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Very low
Employment: Private (domestic service)
Distance to work: 0.5 km
Mode of travel: Walking

DWELLING UNIT PAYMENT
Rent (US$/month): 2.50
Percent of income for rent: 10

CONSTRUCTION TYPES DATA

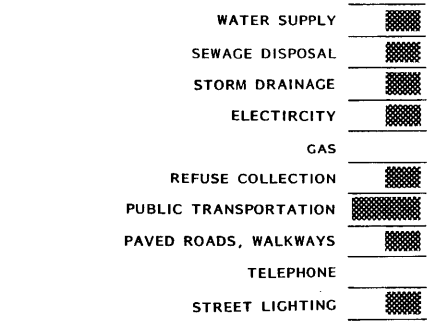
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

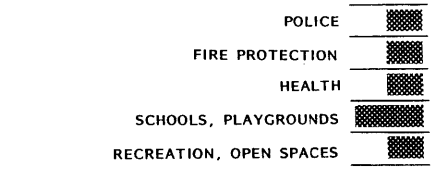
UTILITIES AND SERVICES DATA

related to dwelling locality



COMMUNITY FACILITIES DATA

related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Approximate

CASE STUDY SOURCE:
Gami, Bahrat
URBAN SETTLEMENTS IN INTERMEDIATE CITIES, GUJARAT STATE, INDIA: Includes case studies and upgrading project in Rajkot. 1979

25 SADDA
Goa, India

ROOMS SUBLETTED IN SQUATTER SETTLEMENT

LOCATION: This locality is situated midway between Vasco city center and Marmagoa Harbor, both providing a variety of employment opportunties to the great majority of the residents and it is within 3 kilometers from the locality.

ORIGIN: Until 1960, Sada was one of a few small sporadic nodal developments in the vicinity of the harbor and the city center. After independence of Goa, the expansion of secondary and tertiary sectors and consequent expansion of port facilities resulted in the influx of population from neighboring states who either have provided their own dwellings (shacks) or rented rooms.

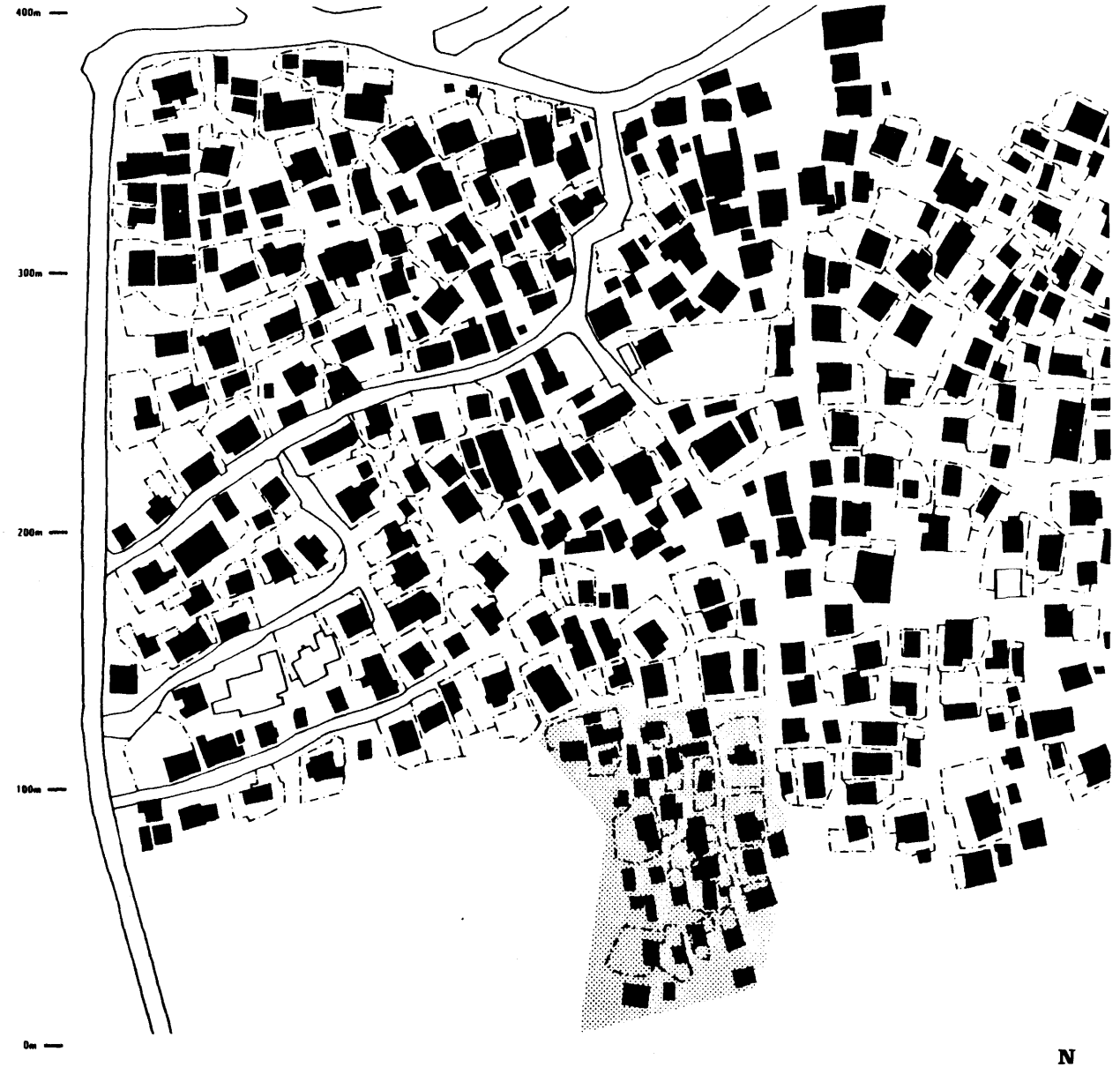
LAYOUT: Unplanned development which is typical of most of other squatter settlements. Dwellings are grouped in clusters bounded by circulation routes.

LAND USE: This locality is a predominantly residential one with a minimum of circulation area and no area for public facilities. Small shops and workshops have been developed through tenants' initiatives and appear sporadically on the site.

CIRCULATION: Light vehicular traffic, but high intensity of pedestrian circulation which dominate almost all routes. The circulation pattern is not organized on a hierarchical basis; however, it provides a range of alternatives which overlap to create a varied and complex spacial structure.

POPULATION: Most of the predominantly very low and low income settlers are engaged in unskilled marginal employment in the harbor and in the city center.

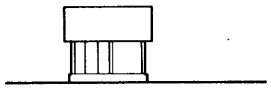
TENEMENTS: In this squatter settlement, the tenements are single-room units in a two (or more) room dwellings. Neither kitchen (cooking space) nor sanitary facilities (shower and toilet) are provided. Sometimes one of the dwelling rooms is converted (usually by the tenant) into a small shop/workshop. The dwelling units are overcroweded, and are not big enough to accommodate (comfortably) all of the tenants' activities. Therefore many of the household activities (such as cooking, playing, socializing, etc.) flow out of the dwellings into the outside open areas.



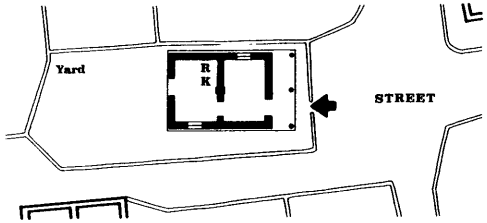
LOCALITY SEGMENT PLAN

1:2500

Section



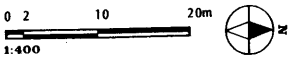
Elevation



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage



DWELLING: TENEMENT

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 90.0

DWELLING
Type: Rooms
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 2
Number of people: 10

Dwelling Units Floor Area (sq.m.):	25	(100%)
Shared Floor Area (sq.m.):	0	(0%)
Total Floor Area (sq.m.):	25	(100%)

Open Area (sq.m.): 65
Lot Coverage (%):28

Floor Area (sq.m.)/Lot Area (sq.m.):	0.3
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):	0.8
Floor Area (sq.m.)/Open Area (sq.m.):	0.4
Percentage of Open Area to Total Floor Area:	260.0
Density (people/Ha.of dwelling Lot Area):	1111.1

Facilities	N	People/Facility
room:	2	5.0
kitchen:	2	5.0
shower:	0	N.A.
toilet:	0	N.A.

Physical state: Poor

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 10.0
Number of users

married:	2
single:	2
children:	1
total:	5

Area per person (sq.m.): 2.0
Facilities: Room with kitchen

DWELLING DEVELOPMENT
Mode: Incremental
Developer: Popular
Builder: Self-help
Construction type: Masonry/wood
Year of construction: 1960

MATERIALS
Foundation: Laterite stone
Floor: Mud
Wall: Masonry/mud
Roof: Wood/tiles

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Family
Place of birth: Goa
Education level: Primary

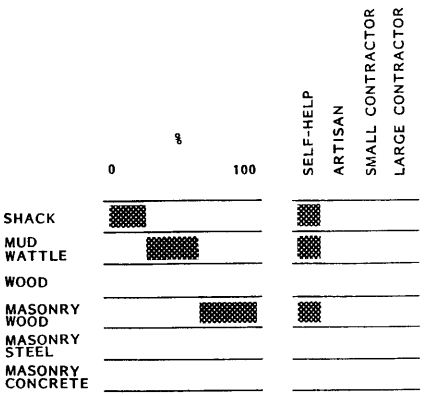
MIGRATION PATTERN
Number of moves: 1
Rural-urban: 1
Urban-urban: 0
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Very low/low
Employment: Private (blue collar)
Distance to work: 4 km
Mode of travel: Walking

DWELLING UNIT PAYMENT
Rent (US$/month): Not known
Percent of income for rent: 20

CONSTRUCTION TYPES DATA

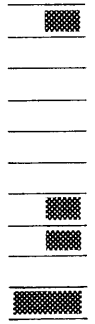
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

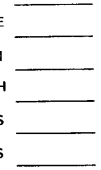
UTILITIES AND SERVICES DATA

related to dwelling locality



COMMUNITY FACILITIES DATA

related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Approximate

CASE STUDY SOURCE:
Kamat, Ravindra
URBAN DWELLING ENVIRONMENTS: GOA, INDIA.
1976

26 FONTAINHAS
Goa, India

ROOMS IN CONVERTED FAMILY HOUSES

LOCATION: Fontainhas is situated adjacent to the central business district and to Panaji which provides a variety of employment opportunities to the majority of residents.

ORIGIN: The locality was developed along with Panaji and it comprises the oldest part of the urban area. After Panaji had gained importance as a city, Fontainhas began to grow by accretion. The locality is confined to one area due to topographical constraints and a high priority given to agriculture which has prevented the conversion of adjacent agricultural land into urban land subdivisions. Fontainhas, however, has grown to an extremely high density.

LAYOUT: The two states of growth are reflected in the locality layout patterns. Its older (northern) part interlocks with the oldest part of Panaji with a gridiron pattern. These are dense compact units of an extremely high density. As the locality grew by accretion, the physical and nonphysical constraints led to the "string-like" pattern of development, characterized by large, multi-family dwellings.

LAND USE: Predominantly residential dweller initiated sporadic commercial establishments at nodal points make up the land use.

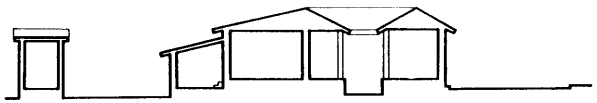
CIRCULATION: The major route, that runs the length of the locality, forms a spine for various commercial activities and also for piped utilities and services. The circulation made within the locality is mainly pedestrian with vehicular access.

POPULATION: Early settlers were upper/middle class with business/trade interests. This convenient location and relatively low-land values attracts lower income groups who now dominate the locality. Most of the working population are engaged in unskilled marginal employments in the harbor and in the city center.

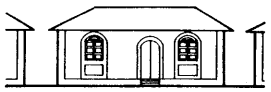
TENEMENTS: Large, single-story, detached houses in the traditional pattern converted into multi-family dwellings by subleting of rooms. Due to the high room occupancy and the very limited area of the individual single-room units, most of the daily activities are extended to the common (living) room as well as to the outside open space which is collectively shared among the tenants together with the available facilities (kitchen, shower and toilet).

LOCALITY SEGMENT PLAN

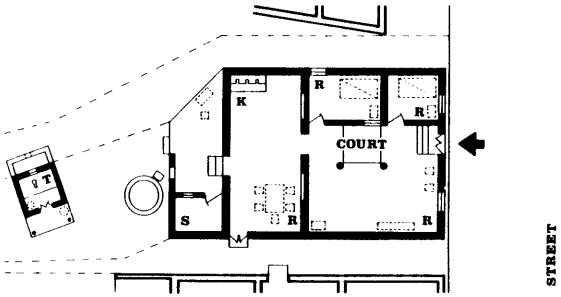
1:2500



Section



Elevation



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

DWELLING: TENEMENT

0 2 10 20m
1:400
N

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 117

DWELLING
Type: Converted family house
Location: City center
Utilization:Multiple
Number of Floors: 1
Number of dwelling units: 3
Number of people: 9

Dwelling Units Floor Area (sq.m.):	20	(30%)
Shared Floor Area (sq.m.):	45	(70%)
Total Floor Area (sq.m.):	65	(100%)
Open Area (sq.m.):	52	
Lot Coverage (%):	56	
Floor Area (sq.m.)/Lot Area (sq.m.):		0.6
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		0.5
Floor Area (sq.m.)/Open Area (sq.m.):		1.3
Percentage of Open Area to Total Floor Area:		80.0
Density (people/Ha.of dwelling Lot Area):		769.2

Facilities	N	People/Facility
room:	4	2.3
kitchen:	1	9.0
shower:	1	9.0
toilet:	1	9.0

Physical state: Fair

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 8
Number of users
married: 2
single: -
children: 1
total: 3
Area per person (sq.m.): 2.7
Facilities:Room, shared kitchen, shower and toilet

DWELLING DEVELOPMENT
Mode: Instant
Developer: Private
Builder: Artisan
Construction type: Masonry/wood
Year of construction: 1930

MATERIALS
Foundation: Brick/concrete
Floor: Cement
Wall: Brick masonry
Roof: Wood/tiles

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Family
Place of birth: Panaji
Education level: University

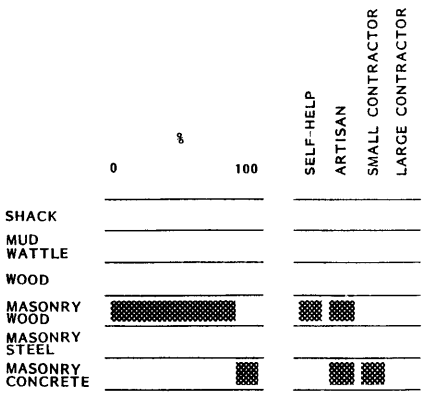
MIGRATION PATTERN
Number of moves: Not known
Rural-urban: Not known
Urban-urban: Not known
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Moderately low
Employment: Public
Distance to work: 3 km
Mode of travel: Scooter/bicycle

DWELLING UNIT PAYMENT
Rent (US$/month): Not known
Percent of income for rent: 25

CONSTRUCTION TYPES DATA

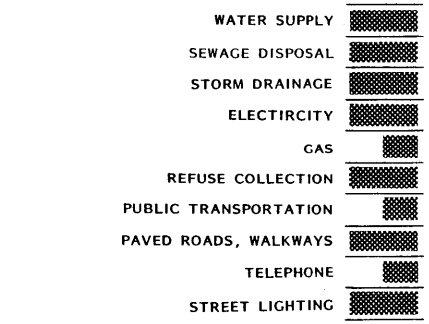
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

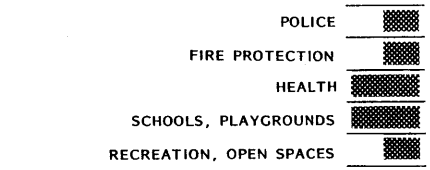
UTILITIES AND SERVICES DATA

related to dwelling locality



COMMUNITY FACILITIES DATA

related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Approximate

CASE STUDY SOURCE:
Kamat, Ravindra
URBAN DWELLING ENVIRONMENTS: GOA, INDIA.
1976

27 CAROLINA
Guernavaca, Mexico

ROOMS IN INITIALLY BUILT, COURTYARD TENEMENTS

LOCATION: Carolina is situated 2 kilometers from the city center which is the main source of variety of employment opportunities.

ORIGIN: In 1920, people who had fled or had been evacuated to Mexico City during the revolution were settled in this locality. It was the site of a sugar cane hacienda until the city was captured and the haciendas were broken up. The largely low income population organized into a union of settlers and paid for the land and titles.

LAYOUT: Primarily, the layout is determined by the topography. The upper part is flat enough to allow an approximation of the grid layout following the Spanish colonial pattern. As the value of the land increased, lots were subdivided and semi-private streets were created to serve internal lots.

LAND USE: This predominantly residential area is one of the most dense localities in the city. A variety of commercial activities are concentrated along the main streets that converge on the neighborhood market. There are also small shops and workshops scattered throughout the settlement.

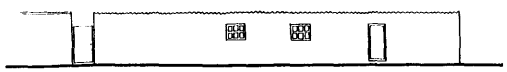
CIRCULATION: Vehicular routes which are heavily used by pedestrians make up the circulation. The locality is well served by a public transportation (bus) route.

POPULATION: This settlement houses very low and low income population who are generally engaged in low skilled jobs in the city center or in the industrial zone in the outskirts.

TENEMENTS: The irregularly shaped tenements contain a central narrow patio, on both sides of which 5-10 dwelling units are distributed. Each unit contains one room and a small kitchen. The communal sanitary facilities (showers, toilets, etc.) are grouped at one end of the common patio, away from the entrance side. Although the open, internal patio is relatively narrow, it accommodates many of the household activities (as cooking, socializing, playing, etc. and even maintaining domestic animals) due to the limited dwelling unit area and the overcrowded situation.

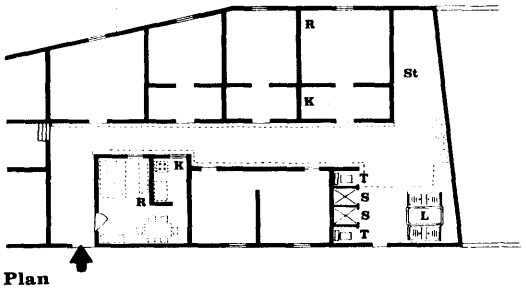
LOCALITY SEGMENT PLAN

1:2500



Elevation

Section



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

N

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)

related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-private
Tenure: Legal ownership
Area (sq.m.): 236

DWELLING
Type: Organized, originally built tenement
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 6
Number of people: 18

Dwelling Units Floor Area (sq.m.):	131	(84%)
Shared Floor Area (sq.m.):	25	(16%)
Total Floor Area (sq.m.):	156	(100%)
Open Area (sq.m.):	80	
Lot Coverage (%):	66	
Floor Area (sq.m.)/Lot Area (sq.m.):		0.4
Floor Area (sq.m.)/Exposed Wall Area (sq.m.):		0.9
Floor Area (sq.m.)/Open Area (sq.m.):		2.0
Percentage of Open Area to Total Floor Area:		51.0
Density (people/Ha.of dwelling Lot Area):		762.7

Facilities	N	People/Facility
room:	6	3.0
kitchen:	6	3.0
shower:	2	9.0
toilet:	2	9.0

Physical state: Fair

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 25
Number of users
married: 2
single: -
children: 1
total: 3
Area per person (sq.m.): 8.3
Facilities: Room, kitchen; shared shower and toilet

DWELLING DEVELOPMENT
Mode: Incremental
Developer: Private
Builder: Artisan
Construction type: Brick masonry/wood
Year of construction: 1960

MATERIALS
Foundation: Stone
Floor: Concrete
Wall: Brick Masonry
Roof: Wood/Asbestos sheets

SOCIO-ECONOMIC DATA (sample survey)

related to dwelling unit user

GENERAL: SOCIAL
Type of user: Family
Place of birth: Guerrero
Education level: Primary

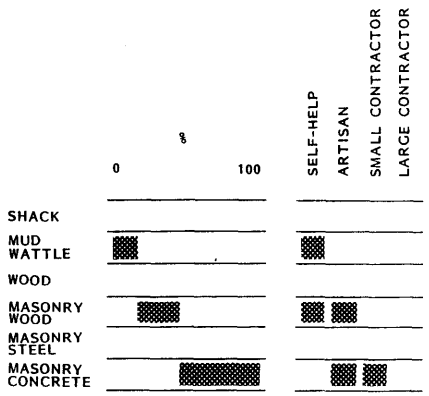
MIGRATION PATTERN
Number of moves: 2
Rural-urban: 1 (1973)
Urban-urban: 1 (1974)
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Low
Employment: Private (self employed electrician)
Distance to work: 2 km
Mode of travel: Walking

DWELLING UNIT PAYMENT
Rent (US$/month): 18.00
Percent of income for rent: 15

CONSTRUCTION TYPES DATA

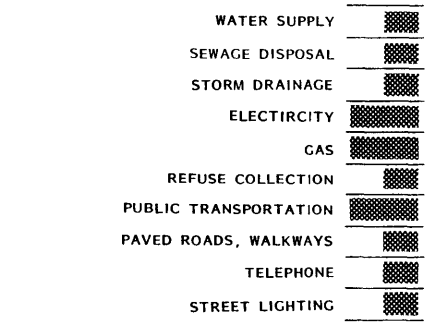
related to dwelling locality



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

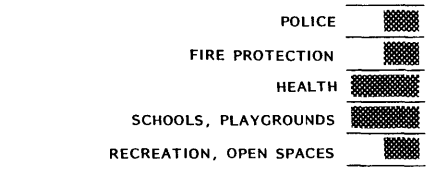
UTILITIES AND SERVICES DATA

related to dwelling locality



COMMUNITY FACILITIES DATA

related to dwelling locality



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Approximate

CASE STUDY SOURCE:
Chavez, Roberto L.
URBAN DWELLING ENVIRONMENTS: CUERNAVACA, MEXICO 1976

28 MARIA AUXILODORA
Colima, Mexico

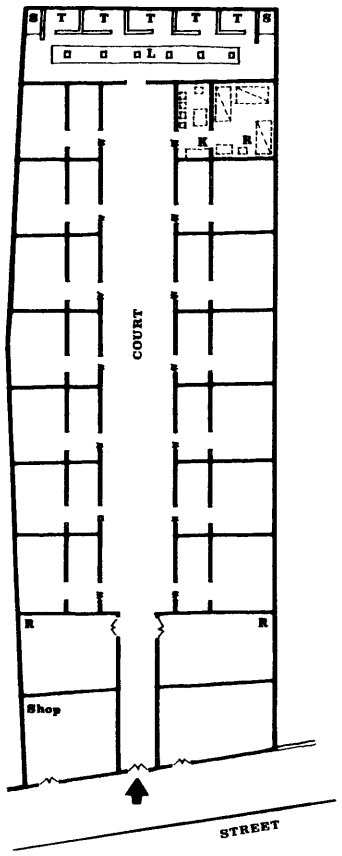
ROOMS IN INITIALLY BUILT COURTYARD TENEMENTS

LOCATION: It is in the main commercial district in the center of the city.
ORIGIN: The oldest part where the city was founded.
LAYOUT: The urban development was based upon the traditional square blocks, with some variations to adapt to the topography. The area is crossed by streams that have constrained the irregular blocks. The blocks have been internally subdivided and building masses were generally located in the block periphery, leaving the center open.
LAND USE: Predominantly residential combined with some commercial activities and light-industrial establishments scattered throughout the locality.
CIRCULATION: Most of the streets are heavily used by pedestrians and by the rapidly increasing vehicular traffic as well.
POPULATION: Low income workers who are engaged in services, industry and agriculture. This locality holds one of the higher percentages of service workers, among the low income localities.
TENEMENT: Typical courtyard tenements contain (16-20) dwelling units located on both sides of the internal courtyard. Each unit contains one room and small kitchen. The communal sanitary facilities (showers and toilets) are located at one end of the court, away from the entrance. Two small shops are located on the street side and usually run by the people living in the tenement (seldom by absentees). Many of the daily household activities (laundering, socializing, playing, etc.) are extended outside the small and crowded units into the common courtyard.

LOCALITY SEGMENT PLAN

1:2500

Section



Plan

Key

R Room (multi-use)
K Kitchen/Cooking Area
S Bathroom/Shower
T Toilet
L Laundry
St Storage

0 2 10 20m
1:400

DWELLING: TENEMENT

PHYSICAL DATA (sample survey)
related to land, dwelling and dwelling unit

LAND/LOT
Utilization: Semi-Private
Tenure: Legal rental
Area (sq.m.): 575

DWELLING
Type: Organized, originally built, tenement
Location: City center
Utilization: Multiple
Number of Floors: 1
Number of dwelling units: 16
Number of people: 112
Dwelling Units Floor Area (sq.m.): 449 (97%)
Shared Floor Area (sq.m.): 14 (3%)
Total Floor Area (sq.m.): 463 (100%)
Open Area (sq.m.): 112
Lot Coverage (%): 80
Floor Area (sq.m.)/Lot Area (sq.m.): 0.8
Floor Area (sq.m.)/Exposed Wall Area (sq.m.): 2.2
Floor Area (sq.m.)/Open Area (sq.m.): 4.0
Percentage of Open Area to Total Floor Area: 24.0
Density (people/Ha.of dwelling Lot Area): 1947.8

Facilities	N	People/Facility
room:	16	7.0
kitchen:	16	7.0
shower:	2	56.0
toilet:	5	22.4

Physical state: Fair

DWELLING UNIT
Type: Room
Tenure: Legal rental
Area (sq.m.): 20.0
Number of users
married: 2
single: -
children: 5
total: 7
Area per person (sq.m.): 2.9
Facilities: Room, kitchen; shared shower and toilet

DWELLING DEVELOPMENT
Mode: Instant
Developer: Private
Builder: Artisan
Construction type: Masonry/wood
Year of construction: 1960

MATERIALS
Foundation: Stone
Floor: Cement tile
Wall: Brick masonry
Roof: Wood/tiles

SOCIO-ECONOMIC DATA (sample survey)
related to dwelling unit user

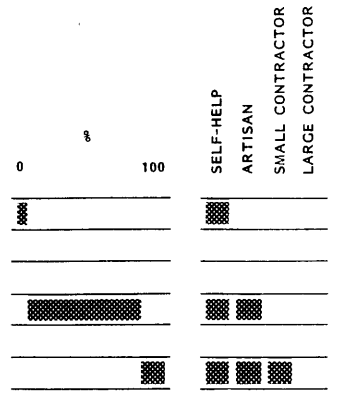
GENERAL: SOCIAL
Type of user: Family
Place of birth: Cuauhtemoc, Colima
Education level: Primary

MIGRATION PATTERN
Number of moves: 1
Rural-urban: -
Urban-urban: 1
Why come to urban area: Employment

GENERAL: ECONOMIC
Income group: Low
Employment: Private
Distance to work: 3 km
Mode of travel: Walking

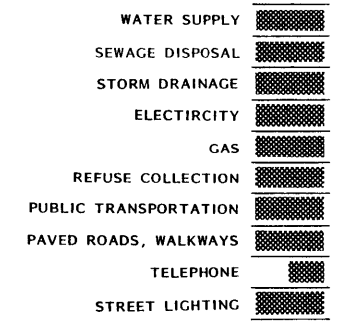
DWELLING UNIT PAYMENT
Rent (US$/month): 14.00
Percent of income for rent: 6

CONSTRUCTION TYPES DATA
related to dwelling locality

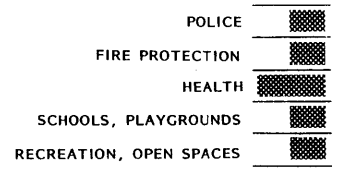


The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.
Quality of information: Approximate

UTILITIES AND SERVICES DATA
related to dwelling locality



COMMUNITY FACILITIES DATA
related to dwelling locality

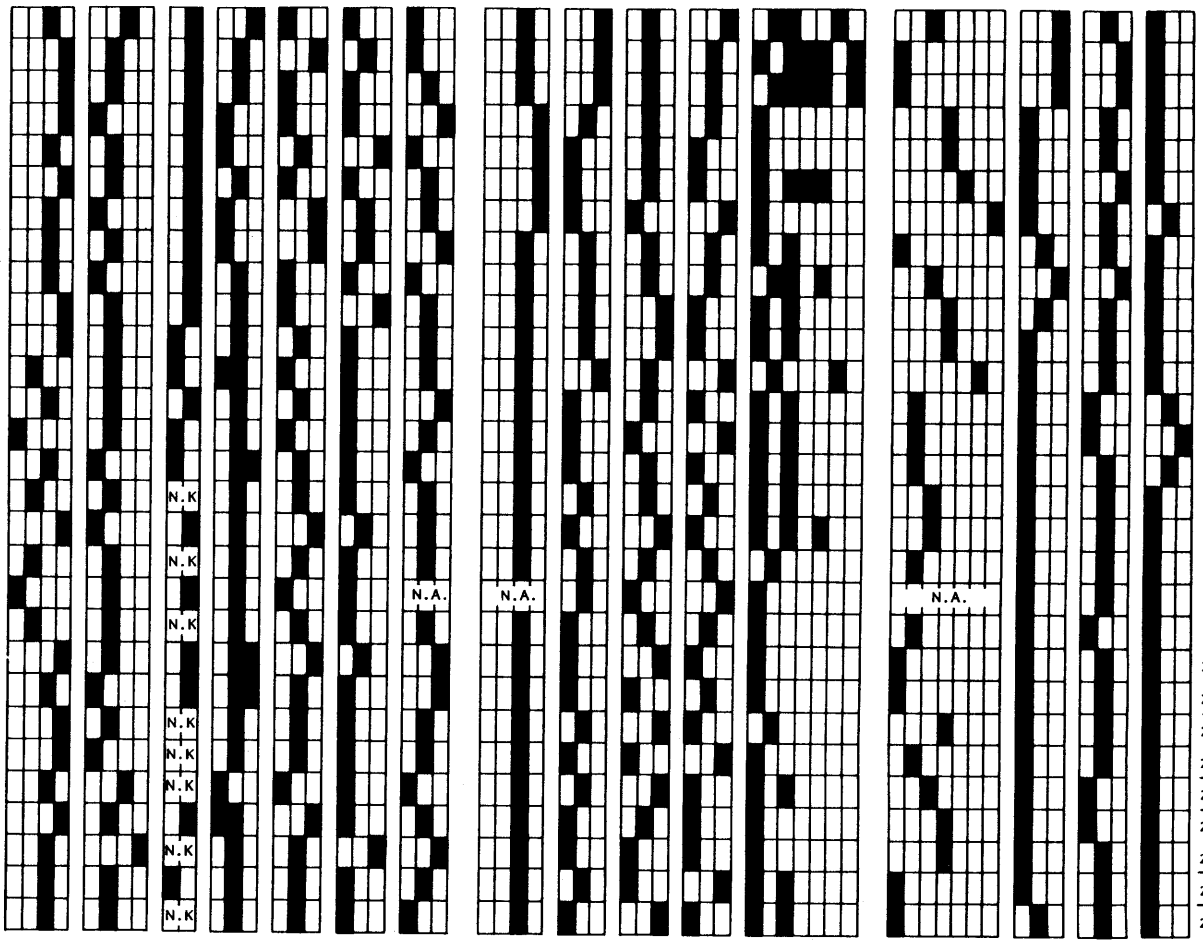


The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.
Quality of information: Approximate

CASE STUDY SOURCE:
Cardenas, Francisco Javier
URBAN DWELLING ENVIRONMENTS: COLIMA, MEXICO.

COMPARATIVE ANALYSIS CHART I

CASE STUDY NUMBER	CITY AND COUNTRY	CITY POPULATION (millions)	CASE STUDY LOCALITY	% OF POPULATION PER CATEGORY
1	Mexico City, Mexico	8.60	LAS VIZCAINAS	
2			LA FLORIDA, Tepito	23
3			LA CASA BLANCA, Tepito	
4	Baghdad, Iraq	3.00	AL-KEFAH	
5			AL-BATTAWEEN	32
6			CAMP AL-ARMAN	
7			AL-ISKAN	
8	Guadalajara, Mexico	2.00	SAN JUAN DE DIOS	17
9	Ahmedabad, India	1.60	RAKHIAL	20
10	Beirut, Lebanon	1.20	MEDAWAR (a)	—
			(b)	
11	San Juan, Puerto Rico	1.00	VIEJO SAN JUAN	—
12	Nairobi, Kenya	0.51	NEGI 1, Mathare Valley	
13			KAWANGWARE	
14			KARIOBANGI	
15			MAKONGENI	
16			BAHATI	
17			KALOLENI	36
18			UPPER HILL	
19			VILLAGE 1, Mathare Valley	
20			EASTLEIGH	
21			RIVER ROAD	
22	Kampala, Uganda	0.35	KISENYI	70
23			MULAGO	
24	Rajkot, India	0.30	BHILVAS	05
25	Goa, India	0.20	SADDA	84
26			FONTAINHAS	
27	Cuernavaca, Mexico	0.16	CAROLINA	23
28	Colima, Mexico	0.10	MARIA AUXILODORA	06

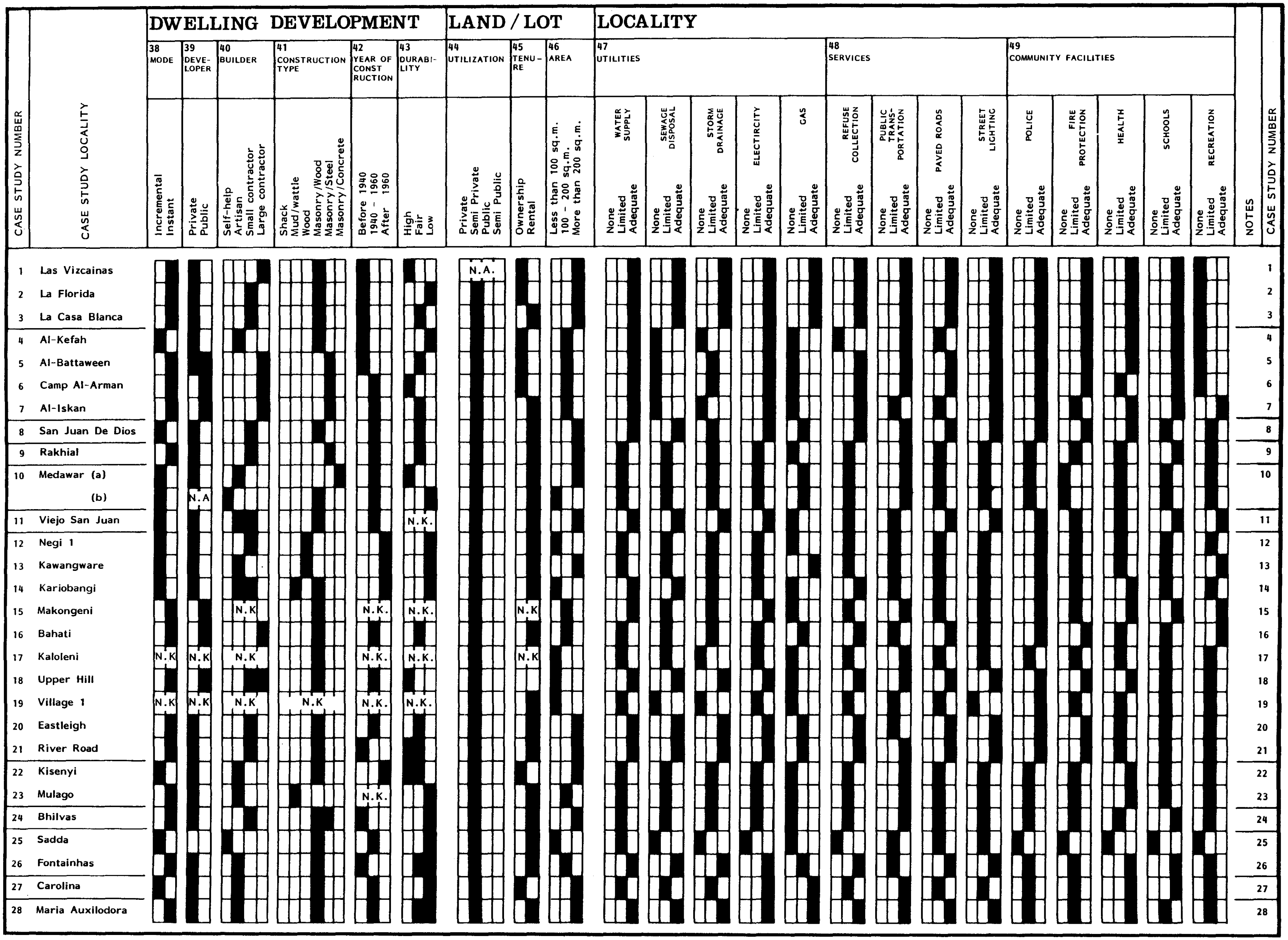


COMPARATIVE ANALYSIS CHART II

DWELLING: TENEMENT

CASE STUDY NUMBER	22 UTILIZATION	23 NO. OF FLOORS	24 NO. OF UNITS	25 NO. OF PEOPLE	26 UNITS AREA	27 SHARED AREA	28 TOTAL FLOOR AREA	29 OPEN AREA	30 LOT COVERAGE	31 T.F.A./ LOT AREA	32 T.F.A./ EXPOSED AREA	33 T.F.A./ OPEN AREA	34 % OPEN TO F.A.R.	35 DENSITY P/Ha	36 FACILITIES ROOM(R) R/D.U.	ROOM(R) P/R	KITCHEN(K) K/D.U.	KITCHEN(K) P/K	SHOWER(S) S/D.U.	SHOWER(S) P/S	TOILET(T) T/D.U.	TOILET(T) P/T	37 PHYSICAL STATE	NOTES	CASE STUDY LOCALITY	CASE STUDY NUMBER
	Single Multiple	1 2 3 or more	Less than 5 5 - 10 11 - 15 16 - 20 More than 20	Less than 20 20 - 60 More than 60	Less than 70% 70% - 90% More than 90%	Less than 10% 10% - 30% More than 30%	Less than 100 sq.m. 100 - 200 sq.m. More than 200 sq.m.	Less than 30 sq.m. 30 - 100 sq.m. More than 100 sq.m.	Less than 70% 70% - 90% More than 90%	Less than 1 1 - 2 More than 2	Less than 1 1 - 2 More than 2	Less than 3 3 - 10 More than 10	Less than 30% 30% - 70% More than 70%	Less than 1000 1000 - 2000 More than 2000	Less than 2.00 2.00 More than 2.00	Less than 3 3 - 6 More than 6	Less than 0.5 Between 0.5 and 1.0 1.0	Less than 5 5 - 10 More than 10	Less than 0.5 Between 0.5 and 1.0 1.0	Less than 5 5 - 10 More than 10	Less than 0.5 Between 0.5 and 1.0 1.0	Less than 10 10 - 20 More than 20	Poor Fair Good			
1					N.A.	N.A.	N.A.	N.A.	N.A.	N.A.		N.A.	N.A.												Las Vizcainas	1
2																									La Florida	2
3																									La Casa Blanca	3
4																									Al-Kefah	4
5																									Al-Battaween	5
6																									Camp Al-Arman	6
7																									Al-Iskan	7
8																									San Juan De Dios	8
9																			N.A.						Rakhial	9
10																									Medawar (a) (b)	10
11																			NONE	N.A.					Viejo San Juan	11
12								NONE				N.A.	N.A.						NONE	N.K.	NONE	N.K.			Negi 1	12
13								NONE				N.A.	N.A.						NONE	N.K.		N.K.			Kawangware	13
14								NONE				N.A.	N.A.						NONE	N.A.					Kariobangi	14
15								NONE				N.A.	N.A.						NONE	N.A.			N.K.		Makongeni	15
16								NONE				N.A.	N.A.						NONE	N.A.					Bahati	16
17								NONE				N.A.	N.A.				NONE	N.A.					N.K.		Kaloleni	17
18								NONE	N.A.			N.A.	N.A.				NONE	N.A.	NONE	N.A.					Upper Hill	18
19								NONE				N.A.	N.A.				NONE	N.A.	NONE	N.A.		N.A.	N.K.		Village 1	19
20																									Eastleigh	20
21																									River Road	21
22																									Kisenyi	22
23																			NONE	N.A.	NONE	N.A.			Mulago	23
24																			NONE	N.A.	N.K.				Bhilvas	24
25																	NONE	N.A.	NONE	N.A.	NONE	N.A.			Sadda	25
26																									Fontainhas	26
27																									Carolina	27
28																									Maria Auxilodora	28

COMPARATIVE ANALYSIS CHART III



DWELLING UNIT DATA

CASE STUDY NUMBER	CITY AND COUNTRY	CASE STUDY LOCALITY	AREA(sq.m.)	Nº. OF ROOMS	Nº. OF USERS				AREA/PERSON
					Married	Single	Children	Total	
1	Mexico City, Mexico	LAS VIZCAINAS	96.0	2	2	0	4	6	16.0
2		LA FLORIDA	37.0	1	2	3	1	6	6.2
3		LA CASA BLANCA	37.0	2	2	2	2	6	6.2
4	Baghdad, Iraq	AL-KEFAH	20.0	1	2	1	2	5	4.0
5		AL-BATTAWEEN	18.0	1	2	0	4	6	3.0
6		CAMP AL-ARMAN	19.0	1	3	1	2	6	3.2
7		AL-ISKAN	14.0	1	0	2	0	2	7.0
8	Guadalajara, Mexico	SAN JUAN DE DIOS	20.0	1	4	0	1	5	4.0
9	Ahmedabad, India	RAKHIAL	27.0	2	2	0	4	6	4.5
10	Beirut, Lebanon	MEDAWAR (a)	22.0	1	2	2	4	8	2.8
		(b)	20.0	1	2	1	5	8	2.5
11	San Juan, Puerto Rico	VIEJO SAN JUAN	50.0	3	N.K.	N.K.	N.K.	4	12.5
12	Nairobi, Kenya	NEGI 1	12.0	1	2	0	2	4	3.0
13		KAWANGWARE	18.0	1	1	0	0	1	18.0
14		KARIOBANGI	14.0	1	2	0	4	6	3.5
15		MAKONGENI	24.0	2	N.K.	N.K.	N.K.	4	6.0
16		BAHATI	19.0	1	0	2	9	11	1.7
17		KALOLENI	21.0	2	N.K.	N.K.	N.K.	4	5.3
18		UPPER HILL	24.0	1	1	0	0	1	24.0
19		VILLAGE 1	17.0	1	N.K.	N.K.	N.K.	4	4.2
20		EASTLEIGH	15.0	1	2	1	12	15	1.0
21		RIVER ROAD	15.0	1	1	-	2	3	5.0
22	Kampala, Uganda	KISENYI	25.0	1	N.K.	N.K.	N.K.	7	3.7
23		MULAGO	18.0	1	N.K.	N.K.	N.K.	2	9.0
24	Rajkot, India	BHILVAS	20.0	1	2	0	6	8	2.5
25	Goa, India	SADDA	10.0	1	2	2	1	5	2.0
26		FONTAINHAS	8.0	1	2	0	1	3	2.7
27	Cuernavaca, Mexico	CAROLINA	25.0	1	2	0	1	3	8.3
28	Colima, Mexico	MARIA AUXILODORA	20.0	1	2	0	5	7	2.9

DWELLING (TENEMENT) DATA

CASE STUDY NUMBER	CITY AND COUNTRY	CITY POPULATION (millions)	CASE STUDY LOCALITY	N°. OF FLOORS	N°. OF UNITS	N°. OF PEOPLE	AREA (sq.m.)							LOT COVERAGE	TOTAL FLOOR AREA/ LOT AREA (F.A.R.)	TOTAL FLOOR AREA/ EXPOSED WALL AREA	TOTAL FLOOR AREA/ OPEN AREA	% OPEN AREA/ TOTAL FLOOR AREA	DENSITY P/Ha (of lot area)	CASE STUDY NUMBER
							INDIVIDUAL (Total DwellingUnits)	% OF INDIVIDUAL TO TOTAL FLOOR	SHARED	% OF SHARED TO TOTAL FLOOR	TOTAL FLOOR (T.F.A.)	OPEN	LOT								
1	Mexico City, Mexico	8.60	LAS VIZCAINAS	2	56	546	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	16625	N.A.	N.A.	2.7	N.A.	N.A.	625	1
2			LA FLORIDA, TIPITO	2	46	253	1702	100%	0	0%	1702	375	1530	70%	1.1	1.3	4.5	22.0%	1654	2
3			LA CASA BLANCA, TIPITO	2	157	864	5809	100%	0	0%	5809	2440	8940	76%	0.7	1.3	2.4	42.0%	966	3
4	Baghdad, Iraq	3.00	AL-KEFAH	3.5	8	28	287	70%	123	30%	410	6	165	96%	2.3	1.8	68.0	1.5%	1697	4
5			AL-BATTAWEEN	3	9	52	265	78%	75	22%	340	35	170	80%	2.0	1.0	9.7	10.0%	3058	5
6			CAMP AL-ARMAN	1	2	6	100	100%	0	0%	100	20	120	83%	0.8	1.4	5.0	20.0%	500	6
7			AL-ISKAN	2	3	12	120	80%	30	20%	150	50	160	69%	0.9	1.5	3.0	33.0%	750	7
8	Guadalajara, Mexico	2.00	SAN JUAN DE DIOS	1	13	65	308	90%	34	10%	342	108	450	76%	0.8	1.7	3.2	32.0%	1444	8
9	Ahmedabad, India	1.60	RAKHIAL	1	9	54	243	100%	0	0%	243	4	30	87%	0.9	1.0	6.5	15.0%	2000	9
10	Beirut, Lebanon	1.20	MEDAWAR (a)	1	14	112	290	95%	15	5%	305	115	420	73%	0.7	0.6	2.7	38.0%	2667	10
			(b)	1	4	30	45	90%	5	10%	50	27	77	65%	0.7	0.6	1.9	54.0%	3896	
11	San Juan, Puerto Rico	1.00	VIEJO SAN JUAN	2	7	21	370	85%	66	15%	436	116	243	93%	1.8	1.0	27.0	4.0%	864	11
12	Nairobi, Kenya	0.51	NEGI 1, MATHARE VALLEY	1	6	24	72	100%	0	0%	72	0	72	100%	1.0	0.8	N.A.	N.A.	3333	12
13			KAWANGWARE	1	8	32	216	100%	0	0%	216	0	216	100%	1.0	1.8	N.A.	N.A.	1482	13
14			KARIOBANGI	1	4	16	56	86%	9	14%	65	0	65	100%	1.0	0.7	N.A.	N.A.	2462	14
15			MAKONGENI	1	8	32	192	96%	8	4%	200	0	200	100%	1.0	1.0	N.A.	N.A.	1600	15
16			BAHATI	1	8	32	137	90%	15	10%	152	0	152	100%	1.0	1.5	N.A.	N.A.	2105	16
17			KALOLENI	1	4	16	84	100%	0	0%	84	0	84	100%	1.0	0.8	N.A.	N.A.	1904	17
18			UPPER HILL	1	2	2	43	100%	0	0%	43	0	43	N.A.	1.0	0.8	N.A.	N.A.	465	18
19			VILLAGE 1, MATHARE VALLEY	1	4	18	70	100%	0	0%	70	0	70	100%	1.0	0.8	N.A.	N.A.	2571	19
20			EASTLEIGH	1	6	90	88	70%	38	30%	126	159	285	44%	0.4	0.5	0.8	126.0%	3158	20
21			RIVER ROAD	2	12	40	303	75%	101	25%	404	60	262	77%	1.5	0.9	7.0	15.0%	1527	21
22	Kampala, Uganda	0.35	KISENYI	1	5	35	169	83%	35	17%	204	132	336	61%	0.6	0.7	1.6	65.0%	1042	22
23			MULAGO	1	6	12	117	100%	0	0%	117	23	140	84%	0.8	2.7	5.0	20.0%	857	23
24	Rajkot, India	0.30	BHILVAS	1	18	144	360	100%	0	0%	360	252	612	60%	0.6	1.3	1.4	70.0%	2353	24
25	Goa, India	0.20	SADDA	1	2	10	25	100%	0	0%	25	65	90	28%	0.3	0.8	0.4	260.0%	1111	25
26			FONTAINHAS	1	3	9	20	30%	45	70%	65	52	117	56%	0.6	0.5	1.3	80.0%	769	26
27	Cuernavaca, Mexico	0.16	CAROLINA	1	6	18	131	84%	25	16%	156	80	236	66%	0.4	0.9	2.0	51.0%	763	27
28	Colima, Mexico	0.10	MARIA AUXILODORA	1	16	112	449	97%	14	3%	463	112	575	80%	0.8	2.2	4.0	24.0%	1948	28

DWELLING (TENEMENT) FACILITY DATA

CASE STUDY NUMBER	CITY AND COUNTRY	CITY POPULATION (millions)	CASE STUDY LOCALITY	NUMBER OF DWELLING UNITS (D.U.)	NUMBER OF PEOPLE (P)	ROOM (R)			KITCHEN (K)			SHOWER (S)			TOILET (T)			CASE STUDY NUMBER
						Number	Rooms per Dwelling Unit (R/DU)	People per Room (P/R)	Number	Kitchens per Dwelling Unit (K/DU)	People per Kitchen (P/K)	Number	Showers per Dwelling Unit (S/DU)	People per Shower (P/S)	Number	Toilets per Dwelling Unit (T/DU)	People per Toilet (P/T)	
1	Mexico City, Mexico	8.60	LAS VIZCAINAS	56	546	112	2.0	5.0	56	1.0	10.0	4	0.1	137.0	12	0.2	46.0	1
2			LA FLORIDA, TIPITO	46	253	92	1.2	2.8	46	1.0	5.5	46	1.0	5.5	46	1.0	5.5	2
3			LA CASA BLANCA, TIPITO	157	864	314	2.0	2.8	157	1.0	5.5	157	1.0	5.5	157	1.0	5.5	3
4	Baghdad, Iraq	3.00	AL-KEFAH	8	28	9	1.1	3.1	2	0.3	14.0	3	0.4	9.3	3	0.4	9.3	4
5			AL-BATTAWEEN	9	52	12	1.3	4.3	4	0.4	13.0	3	0.3	17.0	6	0.7	8.6	5
6			CAMP AL-ARMAN	2	6	2	1.0	3.0	2	1.0	3.0	2	1.0	3.0	2	1.0	3.0	6
7			AL-ISKAN	3	12	5	1.7	2.4	2	0.7	6.0	1	0.3	12.0	2	0.7	6.0	7
8	Guadalajara, Mexico	2.00	SAN JUAN DE DIOS	13	65	16	1.2	4.0	9	0.7	7.2	3	0.2	22.0	3	0.2	22.0	8
9	Ahmedabad, India	1.60	RAKHIAL	9	54	18	2.0	3.0	9	1.0	6.0	N.K.	N.K.	60.0	9	1.0	6.0	9
10	Beirut, Lebanon	1.20	MEDAWAR (a)	14	112	14	1.0	8.0	10	0.7	11.0	2	0.1	65.0	2	0.2	5.6	10
			(b)	4	30	4	1.0	7.5	2	0.5	15.0	1	0.3	30.0	1	0.3	30.0	
11	San Juan, Puerto Rico	1.00	VIEJO SAN JUAN	7	21	15	2.1	1.4	2	0.3	10.5	0	-	-	4	0.6	5.3	11
12	Nairobi, Kenya	0.51	NEGI 1, MATHARE VALLEY	6	24	6	1.0	4.0	6	1.0	4.0	0	-	-	0	-	-	12
13			KAWANGWARE	8	32	8	1.0	4.0	8	1.0	4.0	0	-	-	0	-	-	13
14			KARIOBANGI	4	16	4	1.0	4.0	4	1.0	4.0	0	-	-	0	0.3	16.0	14
15			MAKONGENI	8	32	8	1.0	4.0	8	1.0	4.0	0	-	-	4	0.5	18.0	15
16			BAHATI	8	32	8	1.0	4.0	8	1.0	4.0	0	-	-	8	1.0	4.0	16
17			KALOLENI	4	16	8	2.0	2.0	0	-	-	4	1.0	4.0	4	1.0	4.0	17
18			UPPER HILL	2	2	2	1.0	1.0	0	-	-	0	-	-	1	0.5	2.0	18
19			VILLAGE 1, MATHARE VALLEY	4	18	4	1.0	4.5	0	-	-	0	-	-	0	-	-	19
20			EASTLEIGH	6	90	6	1.0	15.0	6	1.0	15.0	2	0.3	4.5	3	0.5	30.0	20
21			RIVER ROAD	12	40	14	1.2	3.0	12	1.0	3.3	4	0.3	10.0	4	0.3	10.0	21
22	Kampala, Uganda	0.35	KISENYI	5	35	10	2.0	3.5	1	0.2	35.0	9	1.8	3.8	9	1.8	3.8	22
23			MULAGO	6	12	6	1.0	2.0	6	1.0	2.0	0	-	-	0	0	0	23
24	Rajkot, India	0.30	BHILVAS	18	144	18	1.0	8.0	18	1.0	8.0	0	-	-	N.K.	N.K.	160.0	24
25	Goa, India	0.20	SADDA	2	10	2	1.0	5.0	0	-	-	0	-	-	0	0	0	25
26			FONTAINHAS	3	9	4	1.3	2.3	1	0.3	9.0	1	0.3	9.0	1	0.3	9.0	26
27	Cuernavaca, Mexico	0.16	CAROLINA	6	18	6	1.0	3.0	6	1.0	3.0	2	0.3	9.0	2	0.3	9.0	27
28	Colima, Mexico	0.10	MARIA AUXILODORA	16	112	16	1.0	7.0	16	1.0	7.0	2	0.1	56.0	5	0.3	22.0	28

CONCLUSIONS

1. SIGNIFICANCE

Tenements provide transitory habitation for a significant percentage of the low income population in the rapidly growing urban areas in the developing countries.

Despite the many problems, as mentioned in section (6), the tenement system still exists and remains popular. Some reasons are:

- Lack of other options. The high cost/rent of urban dwellings (due to increasing demand and severe shortage in supply) makes tenements the only option that the low income population can afford.
- Premium location: close/accessible to variety of employment opportunities. This implies proximity to city centers and major commercial/industrial districts.
- Relatively low/moderate rents: high density leads to lower rent per capita.
- Short term rent/tenure possibilities with simple/easy procedures.

The percentages of population lodged in tenement systems in the cities considered in this study are as follows:

City, Country	% of population lodged in tenements
Mexico City, Mexico	23%
Baghdad, Iraq	32%
Guadalajara, Mexico	17%
Ahmedabad, India	20%
Beirut, Lebanon	(not known)
San Juan, Puerto Rico	(not known)
Nairobi, Kenya	36%
Kampala, Uganda	70%
Rajkot, India	5%
Goa, India	84%
Cuernavaca, Mexico	23%
Colima, Mexico	6%

2. FUNCTION

Tenements serve the following functions:

- Acculturation: short term, transitory lodging for new immigrants.
- Shelters/dwellings for the low income population.
- Small-scale: home industry, commercial shops (primarily run by tenants) in some tenements.

3. USER/TENANT

-INCOME GROUP: Very low (21% of the case studies) and low (65% of the case studies) income population. Also, transient population recently immigrated from rural areas, or sometimes from smaller/less urbanized areas, in search of employment.

-EMPLOYMENT: Tenants are usually engaged in marginal/casual employments that require no minimum skills training such as: manual work, unskilled construction work, street vending, peddling, etc.

-TYPE: As observed from the case studies, tenants consist of: individuals (7%); group (14%) families (42%) and/or combinations of more than one type (37%).

-EDUCATION: The education level of the majority (65%) of the case studies is below secondary school while 24% of the tenants have received no formal education.

-MODE OF TRAVEL: Tenants usually do not use transportation for their daily trips to work. As observed from the case studies, 73% of the tenants walk to work.

-RENTS: It is observed that about 80% of the tenants spend less than 20% of their income for rent.

4. DWELLING UNIT TENURE

-TYPE: By definition is rental. However, 14% of the case studies indicate an extra-legal rental situation. The fact is, the tenement system is either not recognized legally by the government, and/or the owner(s) have rented/sublet the rooms before gaining title.

-PERMANENCY: It has been found that tenure can be SHORT or LONG term. It can be assumed that short term tenure exists when the tenement is a transitional shelter serving two functions:

acculturation and temporary accommodations until the tenants move up the economic ladder, and gain ownership of land/shelter. It can be assumed that long term tenure exists when the tenants fail to improve economically, or where there are inadequate housing alternatives.

5. OWNER

Most of the tenements are still largely owned by absentee landlords, upper-middle/high income individuals, but very seldom by cooperatives, companies or organizations.

6. PREVAILING BASIC PROBLEMS

(In general)

-Tenements are practically ignored/not recognized, if not prohibited by the public sector (the government) in most countries. Therefore, they are not supported and are excluded from public housing programs.

-Although "housing standards" is a controversial and sometimes an arbitrary issue, tenements' physical conditions are far below the acceptable/average levels of the urban dwellings of the same environment.

The following observations may be made:

a. overcrowded conditions and lack of individual dwelling unit areas.
   45% of the case studies have less than 4 sq. m. per person. 69% have densities over 1000 people/hectare of dwelling lot area. Moreover, 31% of the densities are over 2000 p/Ha)

b. lack of open space.

c. inadequate sanitary facilities: showers and toilets. As observed, 39% of the case study tenements have more than 10 people for each shower. 37% of the cases have more than 10 people for each toilet.

-Lack of privacy: in the dwelling (tenement), it is a result of large number of tenants using limited communal facilities and open space. In the dwelling unit, it is a result of the limited number of rooms and the multi-user occupancy.
As observed, about 80% of the studied tenements have single room dwelling units. While 51% of the dwelling units are occupied by more than one user (combination of individuals and families).

-Ambiguity of responsibility among tenants, particularly in the use of the communal/shared facilities and open space.

(Specifically in Baghdad)

-Lack of self-identity of the dwelling units.

-Lack of appropriate management and control.

-Lack of maintenance. As observed, only 8% of the case studies can be considered to be in well-maintained condition, while 31% are considered poorly maintained and perhaps uninhabitable.

-Lack of appropriate agreements that guide and regulate the relationship between the owners and the tenants in terms of obligations and responsibilities.

RECOMMENDATIONS / PROPOSALS

This study has focused on a dwelling system that provides shelter for a substantial sector of the low income population that, otherwise, does not have and can not afford better or other alternatives. It is intended to encourage public support by suggesting housing policies and programs that consider tenement as a feasible alternative for the needy urban poor. A wide range of representative tenement case studies have been selected, illustrating diverse environmental conditions in different developing countries. The purpose is to identify the critical aspects of tenements that should be improved to meet acceptable levels of social, health, and sanitary requirements.

Based on the limited number of case studies, it is not feasible or even possible to generalize one set of specific norms or regulations, which could be applicable in upgrading existing tenements and/or in proposing new models and designs.

However, within the scope of this study, tentative suggestions have been made. It should be made clear that these general recommendations are abstract and tentative without the necessary adjustments and modifications with careful consideration of the political, economic, social, cultural, and ecological constraints of a specific urban situation. In other words, these recommended actions can neither be considered as "prescriptions" or "recipes", nor can be literally or directly applied.

1. Suggest a general and responsible POLICY that recognizes, encourages, and incorporates the tenement system as part of an overall urban housing policy.
2. Provide a tentative PROGRAM to:
   A. Improve the quality and condition of the existing tenements: Upgrading, Maintenance, and Management.
   B. Increase the tenement supply (when necessary): by conversion of other dwellings into tenements, or construction of new tenements.
3. Propose a simplified operational MECHANISM to carry out the tenement development programs which involve the following ACTORS:
   A. The tenement cooperatives (private sector)
   B. The tenement sponsoring establishments/units (public sector)
4. Provide a simplified set of planning/design and/or development considerations: CRITERIA for upgrading and/or assisting in the design of the tenements.
5. Suggest a preliminary STRATEGY for implementing the tenement development programs.

1. POLICY

The formulation of policies should be very simple, clear, and limited only to basics. Otherwise, complicated and detailed rules may jeopardize the implementation, because of the usually limited resources in terms of budgets, personnel...etc. of rapidly growing urban areas. It is advisable and strongly recommended to keep the bureaucratic machinery at a minimum.

Policies are suggested in five categories: Political, Legal, Economic, Socio-cultural, and General/Normative.

1.1 POLITICAL

- Identify and recognize tenements as a transitory system that provides habitation for the poor in most of the urban areas in developing countries.
- Raise public recognition/awareness of the significant/viable role of tenements in the urban housing market, particularly for the low income population.
- Gain government support and perhaps sponsorship (if needed) for tenement programs.
- Include tenement systems in public housing programs/projects.
- Encourage/support the private sector/developers to upgrade existing tenements, to convert dwellings into tenements, and to build new tenements, as needed.
- Establish/encourage the establishment of tenement cooperatives and offer necessary support, if needed.
- Assure users' (tenants') participation/input in the development programs, specifically in managing tenements.

1.2 LEGAL

- Legalize the tenement system.
- Establish simplified mechanisms to control the rent of the dwelling units in tenements.
- Encourage formalization of agreements between tenants and owner/owners in terms of responsibilities and obligations.
- Establish simplified mechanisms to assure compliance with the criteria set for the upgrading, conversion of other dwellings into tenements, and the design of new tenements, in order to meet acceptable social, health, and sanitary requirements/standards.
- Institutionalize tenement cooperatives as legal establishments.

1.3 ECONOMIC

The following are possible policies, dependent upon specific situations and goals of a particular urban area.

- Sponsor/make funds available to subsidize tenement development programs, namely:
  The upgrading of existing tenements; the conversion of other dwellings into tenements; the construction of new tenements if wanted; as well as tenement maintenance and management.
- Contemplate a lower tax on tenements compared to other types of real estate investments to encourage the development of the tenement system. However, the effects of such action on urban development in general and in housing/tenement supply, in specific, have to be carefully considered within the context of the urban area under consideration.
- Facilitate the establishment of special accounts for tenement cooperatives in the local banks, specialized real estate banks, and lending agencies. Also, determine a simple mechanism/procedure and rules/regulations for utilizing the available funds.
- Establish a simple bonus/point system for developers/owners to encourage the improvement of tenement conditions in general and to encourage the provision of extra/additional facilities: such as rooms, showers, toilets, and open space...etc.
  To implement a bonus/point system, the following tools could be utilized:
  a: tax reduction/incentives/exemptions
  b: reduction of cost/expenses of utilities
  c: offering/providing financial aid in form of grants, direct funds, loans, reducing the interest/financial charges (if any)

1.4 SOCIO-CULTURAL

- Careful consideration has to be given to the social structure and the cultural orientation of the population, in order to achieve a tenement system that is socially appropriate and culturally accept-

able.

- Insure the provision of a sufficient degree of privacy to each dwelling unit, as a defined social unit/entity within the tenement building/community. Also consider the concern of privacy within the dwelling unit itself for different members of the family/group who live there.
- Determine the acceptable number/type of users that can comfortably share the use of certain facilities and the open space in the dwelling unit, in order to reduce/eliminate possible conflict.

1.5 GENERAL/NORMATIVE

- Determine a simple set of norms, regualtions to guide the upgrading, the conversion of other dwellings into tenements, as well as the design of tenements.
- Take the necessary measures/actions to assure the adequate provision of the necessary amenities: Security, Safety, Comfort, Identity...etc., according to the priorities in each urban area.

2. PROGRAM

It has been observed that the development of tenements is primarily being carried out/performed informally by the private sector, mostly by individuals (owners and/or developers) but seldom by groups, societies or companies. Yet, as mentioned before, tenements have been ignored, if not prohibited by the public sector (the government) and have been banned from any public program. The following is a tenement development program which encourages the collaboration between the public and private sectors. The following are suggested:

2.1 ACTIONS

A: Improve the quality and conditions of the existing tenements by:
   1. Upgrading
   2. Maintenance
   3. Management

B: Increase the tenement supply (when necessary) by:
   1. Conversion of other dwellings into tenements
   2. Construction of new tenements

2.2 ACTORS

The following are involved:

A: The public sector: The government establishments and agencies which are directly/indirectly responsible/effective in the implementation of housing programs in general.

B: The private sector:
   1. The users(tenants)
   2. The developer(s)
   3. The owner(s)* (if different from above)

   **(The owner(s) of the tenement building which is to be upgraded, maintained or managed, of the dwelling which is to be converted into tenement, and of the parcel of land on which the tenement is to be built.)*

2.3 ORGANIZATIONAL STRUCTURE/COMPONENTS

The following are suggested:

A: Tenement cooperatives: These are primarily composed of the

tenants. Also the developer(s) and/or the owner(s) (if different) participate in these cooperatives in a modified membership capacity. These cooperatives are considered/assumed to play a key role in the implementation/success of any tenement development program.

B: Sponsoring establishments/units: These are primarily the concern of the public (government) agencies. These establishments together with the cooperatives, are assumed to be responsible to facilitate and assist the tenement development programs, to supervise and control these programs, and to insure meeting appropriate criteria and regulation. It is advisable not to formulate independent establishments for carrying out these duties, but rather to incorporate the new functions and/or formulate specialized units within the existing establishments/agencies, depending on the circumstances, since it is strongly recommended to keep the bureaucratic machinery at a minimum.

3. CRITERIA : Planning/Design/Development Considerations

The following reference guidelines and criteria generally can be applied to the:

A: Upgrading existing tenements

B: Converting other dwellings into tenements

C: Designing new tenements

These criteria are primarily based upon the observations and conclusions drawn from analyzing the 28 case studies of this study.

They represent a reference range to assist the evaluation of existing and/or ndw tenements. They should not be considered as doctrines to be followed strictly, but rather as reference indicators which accept adjustments and modifications tailored to a case context and the needs of individuals.

4.1 LOCATION

Characteristics of tenements location should include:

A: Proximity/accessibility to a variety of short term, marginal/casual employment opportunities that require no/minimum skills and training, such as:

Manual work (such as carrying, moving, loading, unloading of goods), cleaning, unskilled construction work, street vending, peddling.

As observed in the case studies: 86% of the cases are within the city center zone (not further than 2.5 kilometers); in 79% of the cases, people need to commute less than 3.0 kilometers; and 72% walk and do not need any means of transportation.

B: High density and relatively ow land value/rent. (The more dwelling units per hectare the less cost per dwelling unit. And the more user/people per dwelling/dwelling unit, the less rent per user.)

This implies proximity to city centers and major industrial/commercial districts. Thus the distance to work is recommended to be less than 3.0 kilometers, otherwise the public transportation would be essential.

4.2 LOCALITY

Appropriate Sanitary, Helath, Comfort, Convenience, Security, Safety, and Educational requirements/standards/levels should be met in order to provide better living environment and conditions for the tenement users (tenants). Therefore, full consideration is to be given to the provision of utilities, services, and community facilties.

Based on the case study observations, the following are recommended. Indicated next to each item are the percentages of the case studies which are provided with the indicated levels: no provision, limited, adequate.

A: UTILITIES: Provision of utilities are listed according to their relative importance/priority.

	No provision	*Limited*	*Adequate*
Water supply	*0%*	*45%*	*55%*
Electricity	*4%*	*41%*	*55%*
Storm water drainage	*18%*	*51%*	*31%*
Sewage disposal	*21%*	*41%*	*37%*

B: SERVICES: Provision of services are listed according to their relative importance/priority.

	No provision	*Limited*	*Adequate*
Refuse collection	*3%*	*44%*	*48%*
Street lighting	*4%*	*48%*	*48%*
Paved roads/walkways	*0%*	*55%*	*44%*
Public transportation*	*0%*	*34%*	*65%*

* Public transporation has been given lower priority because tenements tend to be located within walking distance to the main source of employment. Therefore, tenants' dependence on transportation is/should be minimal. Moreover, the majority of the tenements are located in/close to the city center where public transportation is often available.

C: COMMUNITY FACILITIES: availability of the following facilities are listed according to their relative importance/priority.

	No provision	*Limited*	*Adequate*
Police	*4%*	*34%*	*62%*
Health	*4%*	*44%*	*51%*
Schools/play grounds	*4%*	*51%*	*44%*
Recreation/open space	*25%*	*58%*	*17%*
Fire Protection*	*11%*	*51%*	*38%*

4.3 LAND/LOT

A: VALUE/COST

A land/lot in a desirable location with a relatively high value/cost, has the potential to be developed for a higher revenue. This increases the rent and attracts speculators and encourages/forces the owners to sell their properties, and/or the tenants to sublet their unit(s), and/or change its utilization/use. Alternatively, a land/lot in a moderate location with lower value/cost will be more appropriate for tenements. However, land/lot location should possess/have enough potential to develop some small-scale commercial/industrial enterprises such as small shops/workshops to provide some job opportunities for the tenants.

B: SUBDIVISION

The development expenses per lot/unit area which include: circulation routes (roads, walkways, utility lanes...etc. should be minimal. The more lots sharing a given circulation and/or utility length, the less the development costs per lot/unit area. This implies a minimum lot frontage/exposition to circualtion routes: narrow and deep lots might have relative width to depth ranges of (1:5 - 1:7) as observed.

* Fire protection is dependent on the nature of the environment under consideration, as well as on the construction type.

4.4 DEVELOPMENT

Development costs should be as low as possible in order to allow moderate rents that can be afforded by the low income population. Small-scale, modest development programs are probably better for implementation. They involve small contractors, imply simple/appropriate/less complicated management and construction technique and technology, require less sophisticated equipment and machinery, and less administrative personnel and technicians. As observed, about 73% of the case studies are built by artisans and small contractors.

In addition, construction materials should be locally available (to reduce cost) and also be durable to produce more permanent structures and reduce the required/necessary maintenance and repairs.

4.5 DWELLING: TENEMENT

A: SIZE: Number of dwelling units/people(tenants).

Size is determined by density/social compatibility and dwelling unit rent/user's (tenant's) affordability.

Small size: less dwelling units/less people is determined by the total development costs/and the planned/required/feasibility dwelling unit rent.

Large size: more dwelling units/people is determined by social compatibility, health, and sanitary requirements as well as administrative and managerial considerations.

As observed, 76% of the tenement case studies are small size developments (less than 10 units).

B: NUMBER OF FLOORS:

Number of floors is determined by the required density, number of units, and the availability of land/lot area.

It is also equally important to consider the type of dwelling which is accepted/preferred and is suitable for the population served. Usually, most of the tenants prefer single-story dwellings with roof that can be utilized for various functions/needs (storing, husbandry, sleeping...etc.).

As observed, 72% of the tenements in the case studies are single storied.

C: DENSITY: Ratio between the population (total number of tenants) of a given tenement and its land/lot area, expressed in People

per Hectare of dwelling (tenement) lot area (P/Ha).
Density is determined by: the available tenement land/lot, the required/planned number of tenants/population to be lodged, and the appropriate dwelling unit area per person. The lower the density, the more area per person, consequently the higher is the cost/rent per capita. The less the population lodged (given the area), the larger is the land/lot area required (given the population).
At the opposite extreme, although very high density reduces costs (rent) per capita, it may put an excessive demand on the facilities, utilities, and services. It may create serious, negative, and destructive social conditions, while a range of density limits compatible with adequate facilities, utilities, and services are/may be possible. It is difficult to determine similar indices for social conditions and constraints. The way to anticipate social and behavioral implications on population densities in a particular urban situation are tentative methods such as personal experience, case studies, evaluations of similar situations/conditions...etc.*
The following are percentages of the denisty range as observed from the case studies.

Denisty	% of case studies
Less than 1000 P/Ha	31.0%
1000-2000 P/Ha	38.0%
More than 2000 P/Ha	31.0%

D: INDIVIDUAL/PRIVATE VS SHARED/COMMUNAL AREAS

The individual/private area is used by/accessible to only one user. This usually implies internal dwelling unit facilities.
The shared/communal area is used by/accessible to all the tenants of one tenement. This implies circulation areas and sanitary facilities (open space is excluded).
Determined by: the available total area, the needed/required privacy versus social control, the determined dwelling unit area per person, and the feasible dwelling unit rent/cost.

* Reference: Horacio Caminos THE URBANIZATION PRIMER

For a given total floor area, increased individual (private) area leads to increased dwelling unit area, larger area per person, perhaps more privacy and comfort, as well as higher rent per dwelling unit. It may also lead to more dwelling units having smaller area. On the other hand, the more the shared area, the more the communal control and interactions.
As observed, 96% of the tenement case studies have individual (private) area of more than 70% of the total floor area.

E: LOT COVERAGE: OPEN VS BUILT-UP AREA

In most of the cases, despite building regulations, land is usually heavily built up at the saturation stage of development to accommodate the increased population without/before going to more expensive multi-story structures. This pressure on the land is difficult to avoid/control, for many reasons: the lack of realistic/practical codes, the lack of government actions and resources for enforcement, the lack of other options offered/available, etc. However, adequate/approapriate land coverage is required, but at the same time, it should create the instruments of control through groups sharing the tenancy and use of the same semi-private open spaces, together with the owner(s).*
The following percentages are observed from the case studies:

Lot coverage (% of lot area)	% of case studies
Less than 70%	30%
70-90%	37%
More than 90%	33%

OPEN SPACE: Courtyards/patios

Determined by the need for external extension of the dwelling units (which are usually small and over-crowded), by the volume/type of outdoor activities which is the primary function of the open space, and the focus of tenement social life. These activities vary according to the socio-cultural background of the population, to the climate, and to the space/facilities available for the dwelling units.

* Reference: Horacio Caminos THE URBANIZATION PRIMER

Open space activities generally include: socializing, playing, cooking. The more open area, the more space is available for outdoor activities, as well as exposure to the outside environment.

BUILT-UP AREA:
Determined by the required number/area of the dwelling unit, and by the needed communal facilities.

A critical balance between the open and built-up area is essential in order to provide adequate open space proportional with the number of users and their needs while considering climatic conditions and economic constraints (construction cost and appropriate rent per unit).

The following percentages observed:

- 90% of the case studies have a total floor area to the exposed wall area ratio of less than 2.
- 90% of the case studies have a total floor area to open area of less than 10.

F: FACILITIES

The number/type of required facilities determined by the following aspects within the context of the environment under consideration.

- Number/type of users/tenants
- Socio-cultural background/orientation resulting in the concerns of privacy and individuality
- The communal/social compatibility, control, and responsibility.
- Sanitary and health requirments
- Ecological and climatic factors
- Economic conditions and constraints

Reduced number of people/user per facility leads to: higher sanitary and health levels/standards, better communal control and responsibility, less social conflict, but higher cost of development which results in higher rent per dwelling unit/capita. Reduced number of dwelling units per facility provides more privacy and convenience.

The following percentages are observed from the case studies:

FACILITY	RATIO	RANGE	% OF CASES
Room:	Room/Dwelling Unit	less than 2	79%
	People/Room	3-6	55%
Kitchen:	Kitchen/Dwelling Unit	1	64%
	People/Kitchen	less than 10	72%
Shower:	Shower/Dwelling Unit	less than 0.5	71%
	People/Shower	less than 5	39%
		5-10	22%
		more than 10	39%
Toilet:	Toilet/Dwelling Unit	less than 0.5	44%
		0.5-1.0	26%
		1.0	30%
	People/Toilet	less than 10	63%

Other facilities such as small shops and/or workshops are sometimes necessary to provide additional source of income for the tenants.

G: DWELLING UNIT

This is the only private/individual space for specific user(s)

- Area:

Small area is determined by the number of users(tenants) and by an adequate area per person. Large area is determined by appropriate rent rates that tenants can afford.
As observed, 48% of the tenement case studies have average dwelling unit area of less than 20 sq. m. while 86% have less than 30 sq. m.

- Number of users:

The larger number of users, the less privacy and the more demand for extra space/room(s) (especially for married couples)/facilities.
As observed, 76% of the tenement case studies have an average of less than 5 users per dwelling unit.

- Area per person (sq.m. per person)

As observed, 45% of the case studies have less than 4, 31% between 4 and 6, and 24% more than 6.

Facilities:

Determined by the type, number, and income of the user.

H: USER/TENANTS

- Careful consideration to be given to the special needs/requirements of the tenants, based upon their family type, income level, education, etc.

As observed, 79% of the case studies spend less than 20% of their income on rent. It is recommended not to exceed this percentage.

4. STRATEGY

STAGE 1: GENERAL, POLITICAL, AND LEGAL
(short term/immediate actions)

A: Achieve the major political and legal objectives of the general policy name:
  1: Identify and recognize the tenement system
  2: Raise the public recognition and awareness of the role of the tenements.
  3: Gain public support and sponsorship.
  4: Legalize the tenement system.
  5: Establish simplifed and appropriate rent control and tenure regulations.

B: Establish the organizations for the tenement programs, namely:
  1: The tenement cooperatives.
  2: Sponsoring establishment/units.

STAGE 2: IMPROVEMENT AND UPGRADING
(Short - intermediate term actions)

A: Determine a specific set of regulations and norms for upgrading, maintenance, and managing the existing tenements (perhaps, also for the design of new tenements) within the context of the urban area under consideration.

B: Start a pioneer/experimental tenement upgrading program(s). The primary objective should be the improvement of the critical aspects of existing physical, social, health, and sanitary conditions.

C: Utilize/obtain feed back information from the upgraded tenements to examine/evaluate the validity and applicability of the proposed mechanisms/regulations and norms. Modify/adjust them when necessary.

D: Expand the upgrading programs.

STAGE 3: INCREASING THE SUPPLY: CONVERSIONS AND NEW CONSTRUCTIONS
(Intermediate - Long term actions)

A: Determine a specific set of regulations and norms for the conversion of other dwellings into tenements and for the design of new tenements (if not previously achieved in Stage 2-A) within the context of the urban area under consideration.

B: Construct experimental tenement projects, under diverse urban/environmental situations.

C: Utilize/obtain feed back information from constructed/finished tenements to examine/evaluate the validity and the applicability of the determined mechanisms, regulations, and norms. Modify/adjust them when necessary.

STAGE 4: INSTITUTIONALIZING POLICY AND PROGRAM(S)
(Long term actions)

A: Implement a public policy and housing program that incorporates the tenement policy, program, and their operational mechanisms.

B: Institutionalize the established organizational structure.
Components of the tenement programs are:
  1: The tenement cooperatives
  2: Sponsoring establishments/units

C: If necessary, expand the provision of new tenements.

GLOSSARY

The glossary contains terms used in the text whether they are or not marked with an asterisk. The criteria for the preparation of the definitions have been as follows:
FIRST PREFERENCE: definitions from Webster's Third New International Dictionary (Merriam-Webster, 1971).
SECOND PREFERENCE: definitions from technical dictionaries, text books, or reference manuals.
THIRD PREFERENCE: definitions from the Urban Settlement Design Program (U.S.D.P.) files or by the author. They are used when existing sources were not quite appropriate/satisfactory.
Words added for specificity and to focus on a particular context are indicated by square brackets. Sources of definitions are indicated in parentheses. (See also BIBLIOGRAPHY).

A

ACCESSES. The pedestrian/vehicular linkages from/to the site to/from existing or planned approaches [urban streets, limited-access highways, public transportation systems, and other systems such as: waterways, airlines, etc.]. (U.S.D.P.)

ACTUAL LAND COST. "[The cost of land is] set solely by the level of demand. The price of land is not a function of any cost conditions; it is set by the users themselves in competition."(Turner, 1971)

AD VALOREM (TAX). A tax based on a property's value; the value taxed by local governments is not always or even usually the market value, but only a valuation for tax purposes. (U.S.D.P.)

(AIRPORT) DISTURBANCE. The act of process of destroying the rest, tranquility, or settled state of [the site by the annoyance of airport noise, vibration, hazards, etc.]. (Merriam-Webster, 1971)

AIRPORT ZONING RESTRICTIONS. The regulation of the height or type of structures in the path of moving aircraft. (Abrams, 1971)

ALL WEATHER (SURFACE COURSE). A temporary surface (such as layered oil, gravel) constructed over the base so that hard surfacing can be easily accomplished at a later date. (U.S.D.P.)

AMENITY. Something that conduces to physical or material comfort or convenience, or which contributes satisfaction rather than money income to its owner. (Merriam-Webster, 1971)

APARTMENT. See DWELLING UNIT TYPE.

APPRAISAL. An estimate and opinion of value, especially by one fitted to judge. (Merriam-Webster, 1971)

APPROACHES. The main routes external to the site (pedestiran/vehicular) by which the site can be reached from other parts of the urban context. (U.S.D.P.)

AQUA PRIVY. An excreta disposal system that consists of a watertight tank with a constant water level. Excrement and urine undergo anaerobic decomposition and the liquids in the tank overflow into soakage or leaching pits to be absorbed by the soil. Initial cost is high, but operating costs are low; however, the tank has to be emptied of the digested sludge at infrequent intervals and the liquid pollutes the soil. This kind of system requires high soil absorption capacity, and large lots for adequate distance between adjacent systems. (U.S.D.P.)

ARTISAN-BUILT. See DWELLING BUILDER.

ASSESSED VALUE. A valuation placed upon property by a public officer or board as a basis for taxation. (Keyes, 1971)

ASSESSMENT. The value of property for the purpose of levying a tax or the amount of the tax levied. (Keyes, 1971)

B

BACKFILL. Earth or other material used to replace material removed during construction, such as in culvert, sewer, and pipeline trenches and behind bridge abutments and retianing walls or between an old structure and a new lining. (DePina, 1972)

BARRIER. [A boundary] (as a topographic feature or a physical or psychological quality) that tends to separate or restrict the free movement [to and from the site]. (Merriam Webster, 1971)

BETTERMENT(TAX). A tax on the increment in value accruing to an owner because of development and improvement work carried out by local authorities. (U.S.D.P.)

BLOCK. A portion of land bounded and served by lines of public streets. (U.S.D.P.)

BOUNDARY. Something [a line or area] that fixes or indicates a limit or extent [of the site]. (Merriam-Webster, 1971)

BUILDING CODE. A body of legislative regulations or by-laws that provide minimum standards to safeguard life or limb, health, property, and public welfare by quality of materials, use and occupancy, location and maintenance of all buildings and structures within the city, and certain equipment specifically regulated therein.(BOCA, 1967)

BUILDING DRAIN. Lowest horizontal piping of the building drainage system receiving discharge from soil, waste, and other drainage pipes. It is connected to the building sewer. (ROTC ST 45-7, 1953)

BUILDING MAIN. Water-supply pipe and fittings from the water main or other source of supply to the first branch of the water-distribution system of a building. (ROTC ST 45-7, 1953)

C

CAPITAL COSTS. See COSTS OF URBANIZATION.

CENTER. See DWELLING LOCATION.

CESSPOOL. An underground catch basin that is used where there is no sewer and into which household sewage or other liquid waste is drained to permit leaching of the liquid into the surrounding soil. (Merriam-Webster, 1971)

CHAWL. In local Indian languages means "a passage", a "corridor" or a "lobby". Also a popular generic term referring specifically to a housing system of rows of single-room units, introduced for industrial workers (initially, single males) in major industrial cities in India (as Bombay) during the late 18th Century. Generally, a chawl is a dwelling type which is a tenement in the form of row(s) of single-room units, usually contains a cooking space but share the available, sanitary facilties (showers, toilets, etc.) which if provided are usually grouped for communal use. Most of the chawls were developed as rental units on a long term lease land (e.g. 99 years). Several of the dwelling activities (as cooking, washing, sewing, knitting, playing, storing, and even sleeping) are extended outside the units, into the common patio "chawl". In many cases, additional facilities (mostly toilets, and sometimes rooms) have been added to the dwelling units. Chawls can be single or multi-storied (up to 5). Introduction of local rent controls and utility requirements in recent building by-laws discourage further development of this type of dwellings. (Author)

CIRCULATION. System(s) of movement/passage of people, goods from place to place; streets, walkways, parking areas. (U.S.D.P.)

CLAY. A lusterless colloidal substance, plastic when moist (crystalline grains less than 0.002mm in diameter). (U.S.D.P.)

CLIMATE. The average condition of the weather at a particular place over a period of years as exhibited by temperature, wind, precipitation, sun energy, humidity, etc. (Merriam Webster, 1971)

COLLECTION SYSTEM. The system of pipes in a sewage network, comprised of house service, collection lines, manholes, laterals, mains. (U.S.D.P.)

COLLEGES/UNIVERSITIES. See SCHOOL.

COMMUNITY. The people living in a particular place or region and usually linked by common interests; the region itself; any population cluster. (U.S.D.P.)

COMMUNITY FACILITIES/SERVICES. Facilities/services used in common by a number of people, including schools, health, recreation, police, fire, public transportation, community center, etc. (U.S.D.P.)

COMMUNITY RECREATION FACILITIES. Facilities for activities voluntarily undertaken for pleasure, fun, relaxation, exercise, self-expression, or release from boredom, worry, or tension. (U.S.D.P.)

COMPONENT. A constituent part of the utility network. (U.S.D.P.)

CONCRETE PAVING (PORTLAND CEMENT). A paving slab consisting of water, aggregate and cement in the required proportions, reinforced with a steel mesh. (U.S.D.P.)

CONCOMINIUM. A system of direct ownership of a single unit in a multi-unit whole. The individual owns the unit in much the same manner as if it were a single family dwelling: he holds direct legal title to the unit and a proportionate interest in the common land and areas. Two types of condominiums are recognized: HORIZONTAL: detached, semi-detached, row/grouped dwelling types; VERTICAL: walk-up, high-rise dwelling types. (U.S.D.P.)

CONSERVATION EASEMENT. An easement acquired by the public and designed to open privately owned lands for recreational purposes or to restrict the use of private land in order to preserve open space and protect certain natural resources. (U.S.D.P.)

CONVEYANCE. The transfer of ownership [of land]. (Merriam-Webster, 1971)

COSTS OF URBANIZATION. Include the following: CAPITAL: cost of land and infrastructure; OPERATING: cost of administration, maintenance, etc.; DIRECT: include capital and operating costs; INDIRECT: include environmental and personal effects. (U.S.D.P.)

COURSE. A horizontal layer forming one of series [as of concrete or asphalt in road making]. (Merriam-Webster, 1971)

CURRENT (See: ALTERNATING CURRENT, DIRECT CURRENT). An electric current is a movement of positive or negative electric particles (as electrons) accompanied by such observable effects as the production of heat, of a magnetic field, or of chemical transformation. (Merriam-Webster, 1971)

D

DEPENDENT UNIT. A dwelling unit that shares with other units the use of the available communal sanitary facilities (showers/toilets). (Author)

DEPRECIATION ACCELERATION (TAX). A tax incentive designed to encourage new construction by allowing a faster write-off during the early life of a building. (U.S.D.P.)

DESIGN. 1) The arrangement of elements that make up a work of art, a machine or other man-made object. 2) The process of selecting the means and contriving the elements, steps, and procedures for producing what will adequately satisfy some need. (Merriam-Webster, 1971)

DETACHED DWELLING. An individual dwelling unit, separated from others. (U.S.D.P.)

DEVELOPMENT. Gradual advance or growth through progressive changes; a developed tract of land. (U.S.D.P.)

DEVELOPMENT SIZE. There are two general ranges of size: LARGE: may be independent communities requiring their own utilities, services, and community facilities; SMALL: generally are part of an adjacent urbanization and can use its supporting utilities, services, and community facilities. (U.S.D.P.)

DIRECT COSTS. See COSTS OF URBANIZATION.

DISTANCE. The degree or amount of separation between two points [the site and each other element of the urban context] measured along the shortest path adjoining them [paths of travel]. (Merriam-Webster, 1971)

DISTRIBUTION (STATION). The part of an electric supply system between bulk power sources (as generating stations or transformation station tapped from transmission lines) and the consumers' service switches. (Merriam-Webster, 1971)

DRAINAGE. Interception and removal of groundwater or surface water, by artificial or natural means. (De Pina, 1972)

DUST/DIRT. Fine dry pulverized particles of earth, grit, refuse, waste, litter, etc. (Merriam-Webster, 1971)

DWELLING. The general, global designation of a building/shelter in which people live. A dwelling contains one or more "dwelling units". (U.S.D.P.)

DWELLING BUILDER. Four groups are considered: SELF HELP BUILT: where the dwelling unit is directly built by the user or occupant; ARTISAN-BUILT: where the dwelling unit is totally or partially built by a skilled craftsman hired by the user or occupant; payments can be monetary or an exchange of services; SMALL-CONTRACTOR-BUILT: where the dwelling unit is totally built by a small organization hired by the user, occupant, or developer; "small" contractor being defined by the scale of operations, financially and materially; the scale being limited to the construction of single dwelling units or single complexes; LARGE CONTRACTOR-BUILT: where the dwelling unit is totally built by a large organization hired by a developer; "large" contractor being defined by the scale of operations, financially and materially; the scale reflects a more comprehensive and larger size of operations encompassing the building of large quantities of similar units, or a singularly large complex. (U.S.D.P.)

DWELLING DENSITY. The number of dwellings, dwelling units, people or families per unit [hectare]. Gross density is the density of an overall area (e.g., including lots, streets). Net density is the density of selected, discrete poritons of an area (e.g., including only lots). (U.S.D.P.)

DWELLING DEVELOPER. Three sectors are considered in the supply of dwellings: POPULAR SECTOR: the marginal sector with limited or no access to the formal financial, administrative, legal technical institutions involved in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Popular Sector generally for "self use" and sometimes for profit. PUBLIC SECTOR: the government or non-profit organizations involved in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Public Sector for service (non profit or subsidized housing). PRIVATE SECTOR: the individuals, groups or societies, who have access to the formal financial, administrative, legal, technical institutions in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Private Sector for profit. (U.S.D.P.)

DWELLING DEVELOPMENT MODE. Two modes are considered: PROGRESSIVE: the construction of the dwelling and the development of the local infrastructure to modern standards by stages, often starting with provisional structures and underdeveloped land. This essentially traditional procedure is generally practiced by squatters with de facto security of tenure and an adequate building site. INSTANT: the formal development procedure in which all structures and services are completed before occupation. (U.S.D.P.)

DWELLING FLOORS. The following numbers are considered: ONE: single-story; generally associated with detached, semidetached and row/group dwelling types. TWO: double-story; generally associated with detached, semi-detached and row/group dwelling types. THREE OR MORE: generally associated with walk-up and high-rise dwelling types. (U.S.D.P.)

DWELLING GROUP. The context of the dwelling in its immediate surroundings. (U.S.D.P.)

DWELLING/LAND SYSTEM. A distinct dwelling environment/housing situation characterized by its users as well as by its physical environment. (U.S.D.P.)

DWELLING LOCATION. Three sectors are considered in single-or multi center urban areas. Sectors are identified by position as well as by the density of buildings as follows: CENTER: the area recognized as the business center of the city, generally the most densely built-up sector; INNER RING: the area located between the city center and the urban periphery, generally a densely built-up sector; PERIPHERY: the area located between the inner ring and the rural areas, generally a scatteredly built-up sector. (U.S.D.P.)

DWELLING PHYSICAL STATE. A qualitative evaluation of the physical condition of the dwelling types: room, apartment, house; the shanty unit is not evaluated. BAD: generally poor state of structural stability, weather protection, and maintenance. FAIR: generally acceptable state of structural stability, weather protection, and maintenance with some deviation. GOOD: generally acceptable state of structural stability, weather protection, and maintenance without deviation. (U.S.D.P.)

DWELLING TYPE. The physical arrangement of the dwelling unit: DETACHED: individual dwelling unit, separated from others. SEMIDETACHED: two dwelling units sharing a common wall (duplex). ROW/GROUPED: dwelling units grouped together linearly or in clusters. WALK-UP: dwelling units grouped in two to five stories with stairs for vertical circulation. HIGH-RISE: dwelling units grouped in five or more stories with stairs and lifts for vertical circulation. (U.S.D.P.)

DWELLING UNIT. A self-contained unit in a dwelling for an individual, a family, or a group. (U.S.D.P.)

DWELLING UNIT AREA. The dwelling unit area (m^2) is the built-up, covered area of a dwelling unit. (U.S.D.P.)

DWELLING UNIT TYPE. Four types of dwelling units are considered: ROOM: A SINGLE SPACE usually bounded by partitions and specifically used for living; for example, a living room, a dining room, a bedroom, but not a bath/toilet, kitchen, laundry, or storage room. SEVERAL ROOM UNITS are contained in a building/shelter and share the use of the parcel of land on which they are built (open spaces) as well as common facilities (circulation, toilets, kitchens). APARTMENT: A MULTIPLE SPACE (room/set of rooms with bath, kitchen, etc.) SEVERAL APARTMENT UNITS are contained in a building and share the use of the parcel of land on which they are built (open spaces) as well as some common facilities (circulation). HOUSE: A MULTIPLE SPACE (room/set of rooms with or without bath, kitchen, etc.) ONE HOUSE UNIT is contained in a building/shelter and has the private use of the parcel of land on which it is built (open spaces) as well as the facilities available. SHANTY: A SINGLE OR MULTIPLE SPACE (small, crudely built). ONE SHANTY UNIT is contained in a shelter and shares with other shanties the use of the parcel of land on which they are built (open spaces). (U.S.D.P.)

DWELLING UTILIZATION. The utilization indicates the type of use with respect to the number of inhabitants/families. SINGLE: an individual or family inhabiting a dwelling. MULTIPLE: a group of individuals or families inhabiting a dwelling. (U.S.D.P.)

E

EASEMENT. Servitude: a right in respect of an object (as land owned by one person) in virtue of which the object [land] is subject to a specified use or enjoyment by another person or for the benefit of another thing. (Merriam-Webster, 1971).

EFFICIENCY. Capacity to produce desired results with a minimum expenditure of energy, time, money or materials. (Merriam-Webster, 1971)

EFFLUENT. Outflow or discharge from a sewer or sewage treatment equipment. (DePina, 1972)

ELECTRICAL NETWORK COMPONENTS. It is composed of the following: GENERATION: provides electricity; TRANSMISSION: transports energy to user groups; DISTRIBUTION STATION: divides power among main user groups; SUBSTATION: manipulates power into useful energy levels for consumption; DISTRIBUTION NETWORKS: provides electrical service to user. (U.S.D.P.)

EMBANKMENT (or FILL). A bank of earth, rock, or other material constructed above the natural ground surface. (DePina, 1972)

EROSION. The general process whereby materials of the earth's crust are worn away and removed by natural agencies including weathering, solution, corrosion, and transportation; specifically land destruction and simultaneous removal of particles (as of soil) by running water, waves and currents, moving ice, or wind. (Merriam-Webster, 1971)

EXCRETA. Waste matter eliminated from the body. (U.S.D.P.)

EXISTING STRUCTURE. Something constructed or built (on the site). (U.S.D.P.)

EXPLORATORY BORING. Initial subsurface investigations (borings) done on a grid superimposed on the areas of interest and on areas indicated as limited/restricted/hazardous in the initial survey. (U.S.D.P.)

EXPOSED WALL AREA. The external dwelling/dwelling unit wall surface which is directly exposed to the outside environment (external areas, streets, alleys or internal open spaces, courtyard, patios, passages). (Author)

EXTERIOR CIRCULATION/ACCESSES(SITE PLANNING) The existing and proposed circulation system/accesses outside but affecting the site. These include limited access highways as well as meshing access to the surrounding area. Exterior circulation/accesses are generally given conditions. (U.S.D.P.)

F

FAUCET (also TAP). A fixture for drawing liquid from a pipe, cask, or other vessel. (Merriam-Webster, 1971)

FINANCING. The process of raising or providing funds. SELF-FINANCED: provided by own funds; PRIVATE/PUBLIC FINANCED: provided by loan; PUBLIC SUBSIDIZED: provided by grant or aid. (U.S.D.P.)

FIRE/EXPLOSION HAZARDS. Danger: the state of being exposed to harm; liable to injury, pain, or loss from fire/explosion [at or near the site]. (Merriam-Webster, 1971)

FIRE FLOW. The quantity (in time) of water available for fire-protection purposes in excess of that required for other purposes. (Merriam-Webster, 1971)

FIRE HYDRANT. A water tap to which fire hoses are connected in order to smother fire. (U.S.D.P.)

FIRE PROTECTION. Measures and practices for preventing or reducing injury and loss of life or property by fire. (Merriam-Webster, 1971)

FLEXIBLE PAVEMENT. A pavement structure which maintains intimate contact with and distributes loads to the subgrade and depends upon aggregate interlock, particle friction, and cohesion for stability. (DePina, 1972)

FLOODING. A rising and overflowing of a body of water that covers land not usually under water. (U.S.D.P.)

FLOODWAY FRINGE. The floodplain area landward of the natural floodway which would be innundated by low-velocity flood waters. (U.S.D.P.)

FLOOR AREA RATIO (F.A.R.). The ratio of the total dwelling floor area to the dwelling lot/land area. (Author)

FLUSH TANK TOILET. Toilet with self-closing valve which supplies water directly from pipe. It requires adequate pressure for proper functioning. (U.S.D.P.)

FUMES. Gaseous emissions that are usually odorous and sometimes noxious. (Merriam-Webster, 1971)

G

GAS. A system for supplying natural gas, manufactured gas, or liquefied petroleum gas to the site and individual users. (U.S.D.P.)

GOVERNMENT/MUNICIPAL REGULATIONS. In urban areas, the development of the physical environment is a process usually controlled by a government/municipality through all or some of the following regulations: Master Plan, Zoning Ordinance, Subdivision Regulations, Building Code. (U.S.D.P.)

GRADE. Profile of the center of a roadway, or the invert of a culvert or sewer. (DePina, 1972)

GRAVEL BASE. A paving base consisting of gravel and filler constructed on a prepared subgrade. (U.S.D.P.)

GRAVEL SURFACE ON ASPHALT. A paving surface consisting of coarse and fine aggregates applied in a manner similar to gravel base. (U.S.D.P.)

GRID BLOCKS. The block determined by a convenient public circulation and not by dimensions of lots. In grid blocks some lots have indirect access to public streets. (U.S.D.P.)

GRIDIRON BLOCKS. The blocks determined by the dimensions of the lots. In gridiron blocks all the lots have direct access to public streets. (U.S.D.P.)

GRID LAYOUTS. The urban layouts with grid blocks. (U.S.D.P.)

GRIDIRON LAYOUTS. The urban layouts with gridiron blocks. (U.S.D.P.)

GROUPED. See DWELLING TYPE.

H

HEAD (Static). The height of water above any plane or point of reference. Head in feet = (lb/sq. in x 144)/(Density in lb/cu. ft.) For water at 68°F. (DePina, 1972)

HIGH RISE. Dwelling units grouped in five or more stories with stairs and elevators for vertical circulation. (U.S.D.P.)

HOURDI. A hollow tile used in masonry construction for walls or slabs. (U.S.D.P.)

HOUSE. See DWELLING UNIT TYPE.

HYDRANT. A discharge pipe with valve and spout at which water may be drawn from the mains of waterworks. (Merriam-Webster. 1971)

I

ILLEGAL. That which is contrary to or violating a rule or regulation or something having the force of law. (Merriam-Webster, 1971)

INCOME. The amount (measured in money) of gains from capital or labor. The amount of such gain received by a family per year may be used as an indicator of income groups. (U.S.D.P.)

INCOME GROUPS. A group of people or families within the same range of incomes. (U.S.D.P.)

INCREMENT (TAX). A special tax on the increased value of land, which is due to no labor/expenditure by the owner, but rather to natural causes such as the increase of population, general progress of society, etc. (U.S.D.P.)

INDEPENDENT UNIT. (Also self-sufficient unit). A dwelling unit which contains all the basic/necessary facilities: room(s), kitchen/cooking space, shower, and toilet. (Author)

INDIRECT COST. See COST OF URBANIZATION.

INDIVIDUAL FLOOR AREA. Dwelling floor area which is used/controlled by one user (individual, family or combination); the dwelling unit floor area. (Author)

INFRASTRUCTURE. The underlying foundation or basic framework for utilities and services: streets, sewage; water network; storm drainage, electrical network; public transportation;police and fire protection; refuse collection, health schools, playgrounds, parks, open spaces. (U.S.D.P.)

INLET (CURB, CHANEL). A device to collect surface runoff from streets and discharge it into pipes and basic strom drainage network (U.S.D.P.)

INNER RING. See DWELLING LOCATION.

INSTANT DEVELOPMENT. See DWELLING DEVELOPMENT MODE.

INTERIOR CIRCULATION NETWORK (SITE PLANNING) The pedestrian/vehicular circulation system inside the site. It should be designed based upon the exterior circulation/accesses and land development requirements. (U.S.D.P.)

KINDERGARTEN. See SCHOOL.

L

LAND COST. Price; the amount of money given or set as the amount to be given, as a consideration for the sale of a specific thing [the site]. (Merriam-Webster, 1971)

LAND DEVELOPMENT COSTS. The costs of making raw land ready for development through the provision of utilities, services, accesses, etc. (U.S.D.P.)

LAND LEASE. The renting of land for a term of years for an agreed sum; leases of land may run as long as 99 years. (U.S.D.P.)

LAND-MARKET VALUE. Refers to: 1) the present monetary equivalent to replace the land; 2) the present tax-based value of the land; or 3) the present commercial market value of the land. (U.S.D.P.)

LAND OWNERSHIP. The exclusive right of control and possession of a parcel of land. (U.S.D.P.)

LAND SUBDIVISION. The division of the land in blocks, lots and laying out streets. (U.S.D.P.)

LAND TENANCY. The temporary holding or mode of holding a parcel of land of another. (U.S.D.P.)

LAND TENEURE. See TENURE.

LAND UTILIZATION. A qualification of the land around a dwelling in relation to user, physical controls and responsiblity. PUBLIC (streets, walkways, open spaces): user - anyone/unlimited; physical controls-minimum; responsibility-public sector. SEMIPUBLIC (open spaces, playgrounds, schools):user-limited group of people; physical controls-partial or complete; responsibility-public sector and user. PRIVATE (dwellings, lots): user-owner or tenant or squatter; physical controls-complete; responsiblity-user. SEMIPRIVATE(cluster courts): user-group of owners and/or tenants; physical controls-partial or complete; responsibility-user. (U.S.D.P.)

LAND UTILIZATION: PHYSICAL CONTROLS. The physical/legal means or methods of directing, regulating, and coordinating the use and maintenance of land by the owners/users. (U.S.D.P.)

LAND UTILIZATION: RESPONSIBILITY. The quality/state of being morally/legally responsibility for the use and maintenance of land by the owners/users. (U.S.D.P.)

LAND UTILIZATION: USER(S). The people or the group of people who ordinarily and directly use a piece of land and the facilities it contains. (U.S.D.P.)

LARGE CONTRACTOR BUILT. See DWELLING BUILDER.

LATRINE. A receptacle (as a pit in the earth or a water closet) for use in defecation and urination or a room (as in a barracks or hospital) or enclosure (as in a camp) containing such a receptacle. (Merriam-Webster, 1971)

LAYOUT. The plan or design or arrangement of something that is laid out. (Merriam-Webster, 1971)

LEVELS OF SERVICES. Two levels are considered: MINIMUM, acceptable or possible levels below the standard; STANDARD: levels set up and established by authority, custom, or general consent, as a model, example or rule for the measure of quantity, weight, extent, value or quality. (U.S.D.P.)

LOCALITY. A relatively self-contained residential area/community/neighborhood/settlement within an urban area which may contain one or more dwelling/land systems. (U.S.D.P.)

LOCALITY SEGMENT. A 400m x 400m area taken from and representing the residential character and layout of a locality. (U.S.D.P.)

LOCATION. Situation: the way in which something [the site] is placed in relation to its surroundings [the urban context]. (Merriam-Webster, 1971)

LOT. A measured parcel of land having fixed boundaries and access to public circulation. (U.S.D.P.)

LOT CLUSTER. A group of lots (owned individually) around a semipublic common court (owned in condominium). (U.S.D.P.)

LOT COVERAGE. The ratio of building area to the total lot area. (U.S.D.P.)

LOT PROPORTION. The ratio of lot width to lot depth. (U.S.D.P.)

M

MANHOLE. An access hole sized for a man to enter, particularly in sewer and storm drainage pipe systems for cleaning, maintenance, and inspection. (U.S.D.P.)

MASTER PLAN. A comprehensive, long range plan intended to guide the growth and development of a city, town, or region, expressing official contemplations on the course its transportation, housing, and community facilities should take, and making proposals for industrial settlement, commerce, population distribution, and other aspects of growth and development. It is usually accompanied by drawings, explanatory data, and a prefatory apologia explaining its limitations. Few aspects of the clty-planning process have aroused more controversy than the master plan. Conceptions of what it should be run the gamut from the futurama down to the simple zoning scheme. No master plan can be fulfilled specification by specification in the face of the ever-recurring changes caused by industrialization, population shift, traffic increase, suburbanization, and periodic political undulations. (Abrams, 1972)

MATRIX (OF BASIC REFERENCE MODELS). A set of models of urban layouts arranged in rows and columns. (U.S.D.P.)

MESHING BOUNDARIES. Characterized by continuing, homogeneous land uses or topography, expressed as LINES: property lines, political or municipal divisions, main streets, etc; AREAS: similar residential uses, compatible uses (as parks with residential). (U.S.D.P.)

MICROCLIMATE. The local climate of a given site or habitat varying in size from a tiny crevice to a large land area but being usually characterized by considerable uniformity of climate. (Merriam-Webster, 1971)

MODE OF TRAVEL. Manner of moving from one place (the site) to another (other parts of the urban context). (U.S.D.P.)

MODEL (OF URBAN LAYOUT). A representation of an urban residential area illustrating circulation, land utilization, land subdivision, and utility network of a specific layout and lot. (U.S.D.P.)

MUTUAL OWNERSHIP. Private land ownership shared by two or more persons and their heir under mutual agreement. (U.S.D.P.)

N

NATURAL FEATURES. Prominent objects in or produced by nature. (U.S.D.P.)

NEIGHBORHOOD. A section lived in by neighbors and having distinguishing characteristics. (U.S.D.P.)

NETOWRK EFFICIENCY (LAYOUT EFFICIENCY). The ratio of the length of the network to the area(s) contained within; or tangent to it. (U.S.D.P.)

NOISE. Any sound [affecting the site] that is undesired [such as that produced by: traffic, airports, industry, etc.] (Merriam-Webster, 1971)

O

ODOR. A quality of something that affects sense of smell. (Merriam-Webster, 1971)

OPERATION COST. See COSTS OF URBANIZATION.

OPTIMIZE/OPTIMALIZE. To bring to a peak of economic efficiency, specially by the use of precise analytical methods. (Merriam-Webster, 1971)

P

PARKS. See RECREATION FACILITIES.

PERCENT RENT/MORTGAGE. The fraction of income allocated for dwelling rental or dwelling mortgage payments; expressed as a percentage of total family income. (U.S.D.P.)

PERIPHERY. See DWELLING LCOATION.

PIRATE TAXI. A taxi cab that illegally carries paying passengers over a regular route according to a flexible schedule. (U.S.D.P.)

PIT PRIVY/LATRINE. A simple hole in the ground, usually hand-dug, covered with slab and protective superstructure; for disposal of human excreta. (U.S.D.P.)

PLANNING. The establishment of goals, policies, and procedures for a social or economic unit, i.e. city. (U.S.D.P.)

PLAY FIELDS. See RECREATION FACILITIES.

PLAY GROUNDS. See RECREATION FACILITIES.

PLAY LOTS. See RECREATION FACILITIES.

PLOT/LOT. A measured parcel of land having fixed boundaries and access to public circulation. (U.S.D.P.)

POLE. An upright column to the top of which something is affixed or by which something is supported. (Merriam-Webster, 1971)

POLICE PROTECTION. Police force: a body of trained men and women entrusted by a government with the maintenance of public peace and order, enforcement of laws, prevention and detection of crime. (Merriam-Webster, 1971)

POPULAR SECTOR. See DWELLING DEVELOPER.

POPULATION DENSITY. The ratio between the population of a given area and the area. It is expressed in people per hectare. It can be: GROSS DENSITY: includes any kind of land utilization, residential, circulation, public facilities, etc. NET DENSITY: includes only the residential land and does not include land for other uses. (U.S.D.P.)

POSITION. The point or area in space actually occupied by a physical object [the site]. (Merriam- Webster, 1971)

PRE-SCHOOL. See SCHOOL.

PRIMARY/ELEMENTARY SCHOOL. See SCHOOL.

PRIMER. A small introductory book on a specific subject. (U.S.D.P.)

PRIVATE LAND OWNERSHIP. The absolute teneure of land to a person and his heirs without restriction of time. (U.S.D.P.)

PRIVATE/PUBLIC FINANCED. See FINANCING.

PRIVATE SECTOR. See DWELLING DEVELOPER.

PRIVY. A small, often detached building having a bench with one or more round or oval holes through which the user may defacate or urinate (as into a pit or tub) and ordinarily lacking any means of automatic discharge of the matter deposited. (Merriam-Webster, 1971)

PROGRESSIVE. See DWELLING DEVELOPMENT MODE.

PROJECT. A plan undertaken; a specific plan or design. (U.S.D.P.)

PUBLIC CIRCULATION. The circulation network which is owned, controlled, and maintained by public agencies and is accessible to all members of a community. (U.S.D.P.)

PUBLIC FACILITIES. Facilities such as schools, playgrounds, parks, other facilities accessible to all members of a community which are owned, controlled, and maintained by public agencies. (U.S.D.P.)

PUBLIC SECTOR. See DWELLING DEVELOPER.

PUBLIC SERVICE AND COMMUNITY FACILITIES. Includes: public transportation, police protection, fire protection, refuse collection, health facilities, schools, and playgrounds, recreation and open spaces, other community facilities, business, commercial, small industries, markets. (U.S.D.P.)

PUBLIC SUBSIDIZED. See FINANCING.

PUBLIC SYSTEM (general). A system which is owned and operated by a local governmental authority or by an established public utility company which is controlled and regulated by a governmental authority.(HUD/AID, Minimum Standards, 1966)

PUBLIC UTILITIES. Includes: water supply, sanitary sewage, storm drainage, electricity, street lighting, telephone, circulation networks. (U.S.D.P.)

R

RECREATION FACILITIES. Outdoors facilities provided for recreation and for different age groups as follows: playlots, ages 2-7; playgrounds, ages 6-16; playfields, ages 12-20; parks, all ages. (U.S.D.P.)

REFUSE COLLECTION. The service for collection and disposal of all the solid wastes from a community. (U.S.D.P.)

RESERVOIR. Large-scale storage of water; also functions to control fluctuations in supply and pressure. (U.S.D.P.)

RESIDENTIAL AREA. An area containing the basic needs/requirements for daily life activities: housing, education, recreation, shopping, work. (U.S.D.P.)

RESTRICTIVE ZONE. See FLOODWAY FRINGE.

RIGHT-OF-WAY. A legal right of passage over another person's ground [land], the area of way over which a right-of-way exists such as: a path or thoroughfare which one may lawfully use, the strip of land devoted to or over which is built a public road, the land occupied by a railroad, the land used by a public utility. Rights-of-way may be shared (as streets, pedestrians and automobiles) or esclusive (as rapid transit routes; subways, railroads, etc.) (Merriam-Webster, 1971)

ROOM. See DWELLING UNIT TYPE.

ROW/GROUPED HOUSING. Dwelling units grouped together inearly or in clusters. (U.S.D.P.)

RUNOFF. That part of precipitation carried off from the area upon which it falls. (DePina, 1972)

RUNOFF-RAINFALL RATIO. The percentage (ratio) of storm-water runoff that is not reduced by evaporation, depresssion storage, surface wetting, and percolation; with increased rainfall duration, runoff-rainfall ratios rise increasing runoff flow. (U.S.D.P.)

S

SAND. Loose, distinguishable grains of quartz/feldspar, mica (ranging from 2mm to 0.02mm in diameter). (U.S.D.P.)

SANITARY SEWERAGE. The system of artifical, usually subterranean conduits, to carry off sewage composed of: excreta: waste matter eliminated from the human body; domestic wastes: used water from a home/community containing 0.1% total solids; and some industrial wastes, but not water from ground, surface, or storm. (U.S.D.P.)

SCHOOL. An organized institution of education for different age groups as follows: pre-schools (kindergarten), ages 2-7; primary and elementary schools ages 6-16; secondary schools (junior senior high), ages 12-20; colleges and universities, ages 18-up. (U.S.D.P.)

SECONDARY SCHOOL. See SCHOOL.

SELF-FINANCED. See FINANCING.

SELF-HELP-BUILT. See DWELLING BUILDER.

SELF SUFFICIENT UNIT. See INDEPENDENT UNIT.

SEMIDETACHED DWELLING. Two dwelling units sharing a common wall (duplex) (U.S.D.P.)

SEPTIC TANK. A tank in which the organic solid matter of continuously flowing sewage is deposited until it has been disintegrated by anaerobic bacteria. (Merriam-Webster, 1971)

SERVICE CONNECTION (SEWAGE). The pipes and fittings that connect the individual lots, cluster of lots, or communal's sewage systems with the basic network. (U.S.D.P.)

SERVICE CONNECTION (WATER). The pipe and fittings that connect the street distribution pipe to the individual lots or cluster of lots' plumbing system or storage tank. (U.S.D.P.)

SERVICE DROP. The electrical connection between secondary low tension network and the individual lots or cluster of lots' electric system. (U.S.D.P.)

SERVITUDE. See EASEMENT.

SETTLEMENT. Occupation by settlers to establish a residence or colony. (U.S.D.P.)

SEWAGE. The effluent in a sewer network.(U.S.D.P.)

SEWER. The conduit in a subterranean network used to cary off water and waste matter. (U.S.D.P.)

SEWER BUILDING CONNECTION. The pipe connecting the dwelling with the sewer network. (U.S.D.P.)

SEWERAGE. Sewerage system: the system of sewers in a city, town or locality. (Merriam-Webster, 1971)

SHAPE. For/configuration of the site surface as defined by its perimeter/boundaries. (U.S.D.P.)

SHANTY. See DWEELING UNIT TYPE.

SHARED FLOOR AREA. Dwelling floor area which is used/controlled by all the dwelling users. Usually implies the shared open spaces (courtyards) circulation areas as well as the communal sanitary facilities. (Author)

SHOPPING. (Facilities for) searching for, inspecting, or buying available goods or services. (U.S.D.P.)

SILT. Loose, unconsolidated sedimentary rock particles (ranging from 0.02mm to 0.002mm in diameter). (U.S.D.P.)

SINGLE. See DWELLING UTILIZATION.

SITE. Land (that could be) made suitable for building pruposes by dividing into lots, layout out streets, and providing facilities. (Merriam-Webster, 1971)

SITE AREAS. Two types are considered: GROSS AREA: includes the whole site of the bounded piece of ground. USABLE AREA: includes only the portion of the site that can be fully utilized for buidings, streets, playgrounds, recreation facilities, gardens, or other structures. (U.S.D.P.)

SITE AND SERVICES. The subdivision of urban land and the provision of services for residential use and complementary commercial use. Site and services projects are aimed to improve the housing conditions for the low income groups of the population by providing: a)SITE: the access to a piece of land where people can built their own dwellings; b)SERVICES: the opportunity of access to employment, utilities, services and community facilities, financing and communications. (U.S.D.P.)

SIZE. Physical magnitude or extent (of the site), relative or proportionate dimensions (of the site). (Merriam- Webster, 1971)

SLOPE. Degree or extent of deviation [of the land surface] from the horizontal. (Merriam-Webster, 1971)

SMALL CONTRACTOR BUILT. See DWELLING BUILDER.

SMOKE. The gaseous products of burning carbonaceous materials made visible by the presence of carbon particles. (Merriam-Webster, 1971)

SOAKING PIT. Also referred as leeching or seepage pits, are used for the disposal of settled sewage where the soil is suitable and a public water supply is used. (Salvato, 1958)

SOIL. Soil structure: the arrangement of soil particles in various aggregates differing in shape, size, stability, and degree of adhesion to one another. (Merriam-Webster, 1971)

SOIL INVESTIGATION. It is the process to find the soil structure and other characteristics. It may include the following stages: initial soil survey, exploratory boring, construction boaring. (U.S.D.P.)

SOIL PIPE. The pipe in a dwelling which carries the pipe discharge from water closets. (U.S.D.P.)

SOIL SURVEY(INITIAL). An on-site examination of surface soil conditions and reference to a GENERAL SOIL MAP. It is used to reveal obvious limitations/restrictions/hazards for early planning consideration. (U.S.D.P.)

STACK. The vertical pipe in a dwelling of the soil, waste, or vent-pipe systems. (ROTC ST 85-7, 1953)

STANDARD. 1) Something that is established by authority, custom, or general consent as a model or example to be followed. 2) Something that is set up and established by authority as a rule for the measure of quantity, weight, extent, value or quality. (Merriam-Webster, 1971)

STORM DRAINAGE. Storm sewer: a sewer (system) designed to carry water wastes except sewage (exclusively storm water, surface runoff, or street wash). (Merriam-Webster, 1971)

STREET LIGHTING. Illumination to improve vision at night for security and for the extension of activities. (U.S.D.P.)

SUBDIVISION REGULATIONS. Regualations governing the development of raw land for residential or other purposes. They prescribe standards for the street improvements, lot sizes and layouts, procedures for dedicating private land for public purposes and other requirements. Procedures are also given for filing maps; for receiving the approval of the public engineer, planning commission, and other departments. (Abrams, 1972)

SUBGRADE. The layer of natural soil or fill (compacted soil) upon which the pavement structure including curbs is constructed. (DePina, 1972)

SUBSISTENCE INCOME. The minimum amount of money required for the purchase of food and fuel for an average family to survive. (U.S.D.P.)

SULLAGE. Drainage or refuse especially from a house, farmyard, or street. (Merriam-Webster, 1971)

T

TAP (also FAUCET). A fixture for drawing a liquid from a pipe, cask, or other vessel. (Merriam-Webster, 1971)

TAX EXEMPTION. A grant by a government of immunity from taxes; (a ten-year tax exemption on new housing in New York stimulated new construction in the 1920's; to ease its housing shortage, Turkey granted a ten-year tax exemption on new buildings). (Abrams, 1966)

TAX INCENTIVE. Favorable tax treatment to induce the beneficiary to do something he would not otherwise be likely to do. (U.S.D.P.)

TAX STRUCTURE/TAXATION. The method by which a nation (state, municipality) implements decisions to transfer resources from the private sector to the public sector. (U.S.D.P.)

TELEPHONE. An electrical voice communication network interconnecting all subscribing individuals and transmitting over wires or by other electronic means. (U.S.D.P.)

TENEMENT. A dwelling type of several room units contained in a building/shelter, which shares the use of the parcel of land (on which they are built), the open space, the circulation areas and sometimes the common sanitary facilities (kitchen, shower, toilet, laundry, etc.) if available. Rented to an individual tenant, a group, or a family, usually of the low in-

come population in large urban areas (mostly transitional population of rural immigrants and/or unskilled laborers) characterized by simple tenure arrangements as well as close proximity/accessability to large variety, marginal, low or no skill employment opportunities, usually implies center cities/urban areas. Tenure can be short or long term. Short term: when the tenement is a transitional shelter that complies with two functions, acculturation and temporary accommodation (until the tenant moves up in the economic ladder, and gains ownership of land/shelter). Long term: when the tenant fails to improve economically or there are inadequate housing alternatives. (Author)

TENEMENT TYPES. Tenement types have been categorized on the basis of four considerations: A-ORIGIN: which is either INITIAL (built/organized around courtyard(s), grouped units/rooms, row units/rooms) or CONVERTED (single family houses, public housing projects, apartments, subletting of room(s)). B-SIZE: small (less than 10 units), medium (10-20 units), large(more than 20 units) C-SANITARY FACILITIES: None (except cooking space), shared (showers, toilets, etc.), individually provided (self-sufficient units). D-PERMANENCY/TENANTS' MOBILITY: short term occupancy (dynamic), long term occupancy (static). (Author)

TENURE. The act, right, manner or term of holding land property. Two situations of tenure of the dwelling units and/or the lot/land are considered: LEGAL: having formal status derived from law; EXTRALEGAL: not regulted or sanctioned by law. Four types of tenure are considered: RENTAL: where the users pay a fee (daily, weekly, monthly) for the use of the dwelling unit and/or the lot/land; LEASE: where the users pay a fee for long-term use (generally for a year) for a dwelling unit and/or lot/land from the owner (an individual, a public agency, or a private organization); OWNERSHIP: where the users hold in freehold the dwelling unit and/or the lot/land which the unit occupies; EMPLOYER-PROVIDED: where the users are provided a dwelling unit by an employer in exchange for services, e.g. domestic live-in servants. (U.S.D.P.)

TITLE. The instrument (as a deed) that constitutes a legally just cause of exclusive possession (of land, dwellings, or both). (Merriam-Webster, 1971)

TOPOGRAPHY. The configuration of a [land] surface including its relief and the position of its natural and man-made features. (Merriam-Webster, 1971)

TOTAL FLOOR AREA: The dwelling floor area (all floors) which includes: 1. the total individual area (dwelling unit area); 2. the shared floor areas (open space, circulation areas and communal facilities). (Author)

TRANSFORMER. A device employing the principle of mutual induction to convert variations of current in a primary circuit into variations of voltage and current in a secondary circuit and typcially consisting of two separate coils usually with different numbers of turns on the same closed laminated iron core. (Merriam-Webster, 1971)

TRANSPORATION. Means of conveyance or travel from one place [the site] to another [other parts of the urban context]. (Merriam-Webster, 1971)

U

UNIT. A determinate quantity adopted as a standard of measurement for other quantities of the same kind. (Merriam-Webster, 1971)

URBAN. Of, relating to, characteristic of, or taking place in a city. Constituting or including and centered in a city. (Merriam-Webster, 1971)

URBAN TRANSPORTATION. Means of conveyance of passengers or goods from one place to another along ways, routes of circulation in a metropolitan context. (U.S.D.P.)

URBANIZATION. The quality or state of being or becoming urbanized; to cause to take on urban characteristics. (U.S.D.P.)

USE TAX. The tax on land aimed primarily at enforcing its use or improvement. (U.S.D.P.)

USER INCOME GROUPS. Based upon the subsistence (minimum wage) income per year, five income groups are distinguished: VERY LOW(below subsistence level): the income group with no household income available for housing, services, or transportation; LOW (1 x subsistence level): the income group that can afford no or very limited subsidized housing; MODERATE (3 x subsistence level): the income group that can afford limited housing and rent only with government assistance; HIGH (5 x subsistence level): the income group that can afford housing without subsidy, by cash purchase, through mortgage payments, or by rent; VERY HIGH (10 x subsistence level): the income group that represents the most economically mobile sector of the population. (Turner, 1971)

USUFRUCT. The right to profit from a parcel of land or control of a parcel of land without becoming the owner or formal lessee; legal possession by decree without charge. (U.S.D.P.)

UTILITIES. Include: water supply, sanitary sewerage, storm drainage, electricity, street lighting, gas, telephone. (U.S.D.P.)

UTILITY/SERVICE. The organization and/or infrastructure for meeting the general need (as for water supply, wastewater removal, electricity, etc.) in the public interest. (U.S.D.P.)

V

VALVE. A water supply distribution component which interrupts the supply for maintenance purposes. (U.S.D.P.)

VIEWS. That which is revealed to the vision or can be seen [from the site]. (Merriam-Webster, 1971)

W

WALK-UP. Dwelling units grouped in two to five stories with stairs for vertical circulation. (U.S.D.P.)

WASTE PIPE. A pipe [in a dwelling] which carries water from wash basins, sinks, and similar fixtures. (ROTC ST 45-7, 1953)

WATER SUPPLY. Source, means, or process of supplying water (as for a community) usually involving reservoirs, pipelines, and often the watershed from which the water is ultimately drawn. (Merriam-Webster, 1971)

WATERWORKS. The whole system of reservoirs, channels, mains, and pumping and purifying equipment by which a water supply is obtained and distributed to consumers. (Merriam-Webster, 1971)

Z

ZONING ORDINANCE. The demarcation of a city by ordinance into zones (areas/districts) and the establishment of regulations to govern the use of land and the location, bulk, height, shape, use, population density, and coverage of structures within each zone. (U.S.D.P.)

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ABBREVIATIONS

A	adequate
AP	aqua privy
B	balcony
°C	degree centigrade
cm	centimeter
Com Fac	communal facilities
cub.	cubic
m^3	cubic meter
ea	each
E	existing
(E)	expansion
Exp.W.A.	exposed wall area
F.A.R.	floor area ratio
ft	foot
Ha	hectare
"	inches
Ind Fac	individual facilities
K	kitchen
Km	kilometer
L	limited
MIT	Massachusetts Institute of Technology
m	meter
mxm	meter by meter
N	none
NA-N.A.	not applicable
N°-n°	number
N°/Ha	number per hectare
NK-N.K.	not known
%	percent
P	projected
p	person
p/Ha	person per hectare
p/U	person per unit
PW	public work
R.O.W.	right-of-way
R	room
S	shower
Sh	shop
St	store-storage
sq	square
m^2	square meters
T	toilet
TL	total
U.S.A.	United States of America
$-U.S.$	U.S. dollars
U.S.D.P.	Urban Settlement Design Program
WB	waterborne
W.C.	water closet

UNITS OF MESUREMENTS

LINEAR UNITS

1 millimeter	= 0.039 inches
1 centimeter	= 0.39 inches
1 meter	= 39.37 inches
	= 3.28 feet
	= 1.09 yards
1 kilometer (1000 m)	= 3,280.83 feet
	= 1,093.61 yards
	= 0.621 miles
1 inch	= 25.4 millimeters
	= 2.54 centimeters
	= 0.0254 meters
1 foot	= 0.305 meters
1 yard	= 0.91 meter
1 mile	= 1.609
	= 5,280 feet
	= 1,760 yards

SQUARE UNITS

1 sq. millimeter	= 0.0016 sq. inch
1 sq. centimeter	= 0.16 sq. inch
1 sq. meter	= 1,550 sq. inch
	= 10.76 sq. feet
	= 1.196 sq. yard
1 hectare	= 10,000 sq. meters
	= 2.4711 acres
1 sq. kilometer	= 0.39 sq. mile
	= 247.11 acres
1 sq. inch	= 645.2 sq. millimeters
	= 6.45 sq. centimeters
1 sq. foot	= 0.09 sq. meters
1 sq. yard	= 0.84 sq. meters
1 acre	= 0.405 hectare
1 sq. mile	= 640 acres
	= 258.9 hectares

CUBIC UNITS

1 cub. centimeter	= 0.061 cub. inch
1 cub. meter	= 35.314 cub. feet
	= 1.308 cub. yard

TEMPERATURE UNITS

centigrade (celsius)	= (degrees F -32) x 5/9
fahrenheit	= (degrees C x1.8) + 32

EXPLANATORY NOTES

QUALITY OF INFORMATION

The quality of information given in drawings, charts and descriptions has been qualified in the following manner:

Approximate: when deducted from different and/or not completely reliable sources.

Accurate: when taken from reliable or actual sources.

Tentative: when based upon rough estimations of limited sources.

QUALITY OF SERVICES, FACILITIES, AND UTILITIES

None: when the existence of services, facilities and utilities are unavailable to a locality.

Limited: when the existence of services, facilities and utilities are available to a locality in a limited manner due to proximity.

Adequate: when the existence of services, facilities and utilities are available to a locality.

All income, cost and rent/mortgage data have been expressed in terms of the U.S. equivalent.