URBAN DWELLING ENVIRONMENTS - BEIRUT, LEBANON
CASE STUDIES Mkalles Housing Project

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Signature of Author

Certified by

Accepted by

Department of Architecture, June 1974

Thesis Supervisor

Chairman, Departmental Committee on Graduate Students

NOV 25 1974
URBAN DWELLING ENVIRONMENTS: BEIRUT, LEBANON

Case Studies – Mkalles Housing Project
A VIEW OF THE MEDAWAR LOCALITY  In the background, the garage of the Municipality of Beirut, some city houses and walk-up apartment buildings. In the foreground, the squatter settlement. Little or no physical improvement takes place in these conditions, partly because of their insecurity, partly because of the high and rising population density. Notice the vegetable garden in the bottom right of the picture that has managed to survive.
ACKNOWLEDGEMENTS

The author wishes to acknowledge the support, guidance and cooperation of Professor Horacio Caminos, whose direction was invaluable for the preparation of this work. The author is also indebted to Mr. Reinhard Goethert for his personal assistance and to the members of the class of 1974 and 1975 in the program Urban Settlement Design in Developing Countries at the School of Architecture and Planning, M.I.T. for their cooperation and support.

The Author wishes to express his sincere gratitude to H.E. The President of The Republic of Lebanon, Mr. Su- leiman Frangie for his moral support throughout his term of studies at M.I.T. as well as for the sponsoring and encouragement of the author with said Mkalles Housing Project.

The Author is also indebted to the United States Department of State under its Bureau of Educational and Cultural exchange program for the financial and personal assistance received through a Fulbright Hays Foreign Student award which assisted him in carrying out his higher studies at M.I.T. In particular the author is indebted to the Fulbright Hays committee of the American Embassy in Beirut.

The Author gratefully acknowledges the information and assistance received by the following institutions/officials in Beirut: The Lebanese Ministry of Housing and Cooperatives; The Directorate of Geographical Affairs; The Lebanese Ministry of Plan; The General Directorate of Statistics; The American University of Beirut; Professor Raymond Ghosn, American University of Beirut; Mr. Omar M. Tannir, Director of Cadastre of Mount Lebanon as well as to others who have contributed to this work.

O.A.T.  
Beirut/Cambridge, Summer 1974
PREFACE

CONTENT: This is a study on residential land utilization and identification of dwelling environments for the low income groups based upon the survey and evaluation of two localities selected from the Beirut Metropolitan Area. The case studies provide first-hand material with which basic patterns can be identified in different aspects of the housing process. In addition to this study, a model for Urban low-income housing is presented (see Annex). The model provides different housing options for the low and moderate income groups.

OBJECTIVES: To identify and analyse the physical structure of housing systems; To illustrate the relationships of the settlements in their Urban context; To illustrate the methodology for evaluation and identification of dwelling environments; To stimulate the formulation of more realistic and effective policies regarding low income housing.

APPLICATION: This study offers a reference for understanding and dealing realistically with low income housing, by taking advantage of existing housing and its service infrastructure. It can orient decision makers in optimizing the allocation of financial resources in housing, housing improvement and Urban development. The model presented represents a comprehensive framework for the formulation of housing policies and for the implementation of the physical plan.

DATA: This study is derived from field research carried out by the author during the Summers of 1973-1974 and January 1973 and 1974; complemented by maps, aerial photographs and bibliographic material. The case study analysis is based on a methodology developed in the program Urban Settlement Design in Developing Countries, directed by Professor Horacio Caminos at the Massachusetts Institute of Technology.

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Cover: Aerial view of the City of Beirut (Manoug)
In the background, the compact skyline of Beirut. In the foreground, a view of houses built by the occupants solely by their own efforts and resources. This settlement was built very rapidly with no planning as a result the people live overcrowded with very limited utilities and services. Their only advantage is that they are in control of their dwellings, as a result their homes are better and cheaper than those built by government programs.
INTRODUCTION

The world today is witnessing major trends of global concern: rapid population growth, accelerating industrialization, depletion of nonrenewable resources, widespread malnutrition, housing shortages and many other factors that have unbalanced and are threatening our living environment. The problem is further aggravated because economic and political systems are unstable, social well being is a privilege of a minority usually in power, and the settlement process is largely out of control. The low and very low income sectors of the population are the most affected by the Urbanization process. They constitute the largest majority of the population, particularly in the developing countries and have the most urgent needs in terms of food, health-care, education and shelter. No one has an honest answer or a consequent action that implies any real hope for the 300 million people of Latin America whose number will reach 600 million within 25 years, and who, although desolately poor in the overwhelming majority have the right to a material life, to culture, and to civilization.

A complete change of the man-made environment is in the making marked by a great and ever increasing demand for shelter. Without adequate knowledge of the determining factors, planning the environment is becoming increasingly superficial, irrelevant and in short, impotent to deal with the environmental problems of poverty.

Beirut is an example of a rapidly urbanizing area, where the living conditions and the physical environment are rapidly deteriorating for the majority of the population, this trend is reaching staggering proportions as a consequence of two combined factors: the population is growing at an exponential rate, the highest being the low income sector. The housing supply is inferior to the housing demand for the vast majority of the population, this is being aggravated by the fact
that almost all the housing supplied suits the needs of the very privileged sector of the population. More and more dwellings, land and services need to be provided for the growing population that has less and less capacity to pay for them. As a result, most of the residents in the Metropolitan area live in old or substandard housing with limited services.

Squatting and illegal developments have become two popular forms of settlement because the public and the private sectors are not meeting the growing demand for dwellings and land for the vast majority of the population.

Squatting is a consequence of the struggle for shelter, it is the only alternative to rural migrants and unprivileged immigrants from other countries who come to Beirut to find job opportunities. In Beirut the squatter settlements are, in general terms, small in size, densely populated, scattered around the inner ring of the city (case study: Quarantaine). There are seven squatter settlements in Metropolitan Beirut. Six of them are within the limits of the Beirut Municipal District, not including the large number of Palestinians living in refugee camps in the outskirts of the city. This housing system accommodates approximately five percent of the Metropolitan population.

Illegal developments are defined as a combination of legal ownership of the land and "noncompliance" with government rules for development enacted through zoning ordinances, subdivision regulations or building codes, as is the case of most low-income areas in Beirut. This illegal developments are a result of unrealistic rules. Most planning and building regulations have been adopted directly and uncritically from standards used in economically developed countries like France, England and the U.S.A.
In squatter or illegal settlements, land is occupied, subdivided and soon covered with all shelters and dwellings built by the occupants solely by their own efforts and resources. Utilities and services are neither provided nor anticipated initially. This has become a critical matter. Unplanned Urban sprawl and inefficient use of the land has made the provision of utilities and services both difficult and uneconomical. The resulting alternatives are either to pay high price for the development and improvement, or not to release funds and allow the community to stagnate.

The existing housing stock should incorporate slums and squatter settlements realistically appraised and upgraded. Popular participation (initiative, responsibility, "sweat equity") should be fully utilized. The lowest income sectors should be reached.

It is then clear that technical and professional services and contributions in physical development are badly needed not only in the provision of shelter, but rather in the crucial areas of land utilization, land distribution, provision, maintenance, and operation of utilities and services. Urgent changes are needed in the housing process: FROM the provision of luxurious dwellings, at exuberant prices for the very high income sector resulting in less than ten percent of the population benefited; TOWARDS the provision of land and services, basic dwelling components, at lower costs, for the low and moderate income sectors, resulting in more people benefited. FROM Government efforts spread over small scale problems of a dwelling, TOWARDS Government efforts concentrated on the basic large scale problems of land and infrastructure. FROM eradication or renewal of "inadequate" dwellings, TOWARDS evaluation and upgrading of "inadequate" dwellings.

Ninety five percent of the housing in the Metropolitan area is provided by private and popular sectors. The public sector still approaches the housing demand by supplying dwelling packages, ignoring private and popular efforts and neglecting the possibility to improve the actual low income housing systems. A movement in this direction will undoubtedly have a greater impact and benefit on the population and housing.

This study attempts to identify and evaluate selected low-income dwelling environments in relation to social, economic, cultural and physical factors.

Sources of this study are drawn from field work experiences by the author carried out in Beirut, and academic work in the program "Urban Settlement Design in Developing Countries", School of Architecture and Planning, Massachusetts Institute of Technology. The observations, conditions, concepts, recorded here can easily be recognized in developing countries. A model for Urban low-income housing for Beirut, Lebanon was developed, it was commissioned by H.E. The President of Lebanon, Suleiman Bey Frangie, through the Ministry of Housing and Cooperatives (Beirut, Summer 1973). The project serves as a model for optimum efficiency of low income residential layouts. It illustrates the guidelines derived in the study for physical planning of residential development. The model provides different housing options for the very low, low and moderate income groups, expandable units are emphasized. The model complies with accepted /desirable ranges of population density, circulation area, public and private land utilization percentages (see Annex).

Omar A. Take
Cambridge, Massachusetts
Summer, 1974
BEIRUT, LEBANON

URBAN CONTEXT

1. PRIMARY INFORMATION: Beirut is located at the center of the East Coast of the Mediterranean Sea, latitude 34° north, longitude 35° 30' east. Beirut's latitude is slightly south of Los Angeles, California. It enjoys a Mediterranean climate with warm summers and mild winters. Summer temperatures range between extremes of 30° and 33°C. The annual precipitation averages 150 mm, with exceptions of the months of July, August, and September.

2. HISTORY: The city of Beirut dates back to the 14th century B.C. During the 6th century, Beirut was invaded by armies coming from Mesopotamia and Egypt. Towards 145 B.C., Beirut was united to the Salucide Kingdom of Syria where it played the role of the commercial agent between the east and the west. Beirut was occupied by two Roman legions in 14 B.C. and took the name of "Julius Augustus Prospe- rous Beryte". During the 5th century it became the most Roman village in the region. Beirut was then conquered by the Crusaders in 1101, and by the Ottomans in 1516. Capital of Lebanon after independence in 1943, Beirut has maintained pre-eminence as a center of trade, finance, culture, and industrial development.

3. ECONOMY: Beirut is the focal point for trading activity in the Middle East and acts as an important gold and foreign exchange market. Beirut is also a major center of finance; before 1951 there were only 5 banks in the city, in 1966 there were 93. Lebanon's economy is based on private enterprise with few controls exercised by the Government. Two thirds of the GNP is drawn from services, primarily banking, commerce and tourism. Lebanon depends heavily on transit trade for its existence. During the 1964-1969 period, the increase rate of the GNP was 7% per annum. Except for a few large oil refineries and cement plants, industrial establishments are predominantly small and heavily concentrated in and around Beirut. Major industrial activities include food processing, manufacturing of textiles and other light industrial goods. Beirut is also a publishing center having 50 privately owned political dailies and hundreds of periodicals. Lebanon's literacy rate is about 86 percent the highest in the Arab world and the rate is higher in Beirut. Academic standards of two leading universities (The American University of Beirut and the Saint Joseph University) are among the highest in the Arab world. Beirut is also one of the main centers of learning in the Eastern Mediterranean Area.

4. GOVERNMENT: Beirut is the seat of a highly centralized national government. Parliamentary elections are held every four years and the deputies themselves elect the President of the Republic. The Metropolitan area is divided into fourteen municipalities whose authority over urban development is limited to the issue of building licenses and inspections. Authorization for subdivisions are made by the national planning agencies.

5. DEMOGRAPHY: Lebanon is unusual in that emigration has had a significant effect on its population history, as well as on social, cultural and political development. The development of the port of Beirut and the construction of roads and railroads leading to Syria provided a focus for economic development and, consequently, migration within Lebanon. An increasing number of people are abandoning the countryside for the city, generally Beirut, in order to seek a more lucrative livelihood and to participate in the social and cultural advantages of the city. A large proportion of these migrants alternate between the city and countryside on a seasonal, monthly or weekly basis. Despite the efforts to stem this movement, indicators are that the trend towards urbanization will continue. The estimated population of the Beirut Urban Area in 1961 was 1,200,000 assuming a 2.6 percent average annual increase since 1943: nearly 45 percent of the population of Lebanon lives in Beirut. 50 percent of the population of the metropolitan area is under 20 years of age.

6. SOCIO-CULTURAL: The population forms a mosaic of religious communities, comprising four major religious groups: four Christian, two Islamic and the Druze. In addition there are five smaller groups. According to established custom, a balance is maintained among the religious communities in selecting all public officers.

7. SOCIO-ECONOMIC: In 1972 Lebanon's gross national product was estimated at more than U.S. $1.5 billion, or a per-capita income of over U.S. $550. According to the I.B.F.E.D. mission in 1964, half of the population may be classified as low and very low income and half as middle, high and very high. The first half accounts for eighteen percent of the Lebanese GNP.
Housing: About sixty percent of the population are unable to afford the market prices of housing. Over ninety-five percent of the housing in the Metropolitan area is provided by the private and public sectors. The new housing supplied by the private sector can be afforded by less than ten percent of the population followed by an ever increase in land prices. A product of this equity is the presence of squatter settlements and illegal settlements. There are practically no public housing projects, the first of its kind is the Mkalles Housing Project. Nearly fifty-six percent of the residents of Beirut and seventy-four percent of those living in the outskirts of the city live in apartments of less than eighty sq.m. The cheapest subdivision building land is sold at between U.S. $40 and $60 per sq.m in some areas it is as high as U.S. $6000 per sq.m. The minimum standard dwelling costs approximately U.S. $20,000 up to U.S. $200,000 for a luxurious apartment in Beirut. There is no participation of the private sector for low or middle income housing due to: lack of specialized institutions in long term credit; the unwillingness of the government to guarantee private investments; the desire of developers and speculators to make exuberant profits. The city center and inner ring cannot absorb the intense low income housing demand. The natural growth tendencies are towards the periphery, where land is available at lower cost though the topography is not suitable for urban expansion.
URBAN CONTEXT: BEIRUT

INCOMES
LOW
MEDIUM
HIGH

0 5 10 15Km

1:250000

MEDITERRANEAN SEA
9. URBAN GROWTH PATTERN: In 1922 Beirut was a charming port town with 140,000 inhabitants. In 1963 the greater Beirut area accommodated nearly 800,000 people and in 1972 the estimated population was about 1,200,000; nearly 45 percent of the entire population of the Country.

URBAN CONTEXT SOURCES

Land Use Pattern: (approximate) Comprehensive Plan Studies for the City of Beirut, 1970.
Photographs: Manoug, Beirut

URBAN GROWTH PATTERN
A VIEW OF BEIRUT IN THE LATE 1800's

In the background, Mount Lebanon coming too close to the coastline in the East of Beirut. To the left, the Mediterranean sea and the Port of Beirut. Most of the city houses seen in this picture have been replaced by concrete "modern" buildings. This picture was taken by an old professor of the Syrian Protestant College, now, the American University of Beirut; the picture was taken from the campus of the University.

AERIAL VIEW OF BEIRUT 1970

Beirut manifests a great variety of urban settlements; it has a great variety of mixed land use patterns and architectural forms and styles. The street structure and block arrangements are not consistent or uniform. Beirut's planning and urban control have been inspired by Western concepts, its urban growth and structure shows the inadequacy of imported models.
1 MEDAWAR
Beirut

LOCATION: The Medawar locality is situated to the east of Beirut, about 1.5 km from the central business district of the city. It is bounded on the north by the Mediterranean Sea; on the south by the Eastern Entrance of Beirut Avenue; on the east by the Beirut River and on the west by the Port of Beirut.

ORIGINS: Inflated land prices or snob planning and building codes prevent people from housing themselves. They must either continue to live in overcrowded and overpriced slums or they must squat. The Quarantaine is the oldest and largest squatter settlement in Beirut, it occupies a large part of the Medawar locality. It is a transit town, occupying inner-city land of high and rising commercial value. The land previously belonged to a cement factory which moved to the north of the country, the land was later sold to private individuals and institutions. The settlement started by an emigration of people from Turkey, Syria, Palestine and the rural areas of Lebanon. Between 1932 and 1947 there was a progressive increase in the number of immigrants and between 1952 and 1962 there was a constant flow of immigrants from the South of Lebanon due to unstable political conditions. The choice of the Quarantaine is in view of different factors: proximity to workplaces, availability of public schools, efficient public transportation, the presence of the main industrial area of Beirut and the Port of Beirut.
CASE STUDY: MEDAWAR

LAYOUT: The area grew by the accretion of individual or small group decisions, there was no planning. The layout within the squatter settlement consists of private areas (the dwelling structures) and public/circulation areas. Circulation is random and entirely dominated by pedestrians. For the rest of the locality the pattern of the blocks of city houses is a Roman Hispanic layout with few open spaces.

DEMOGRAPHY: The population of the Quarantaine was estimated in 1971 at about 12,600 people living in about 2540 houses (shacks), with an assumed average of 5.5 persons per dwelling. The Lebanese constitute 29.6 percent of the population, the other 70.6 percent are immigrants from Syria, Turkey, Iraq, Palestine and Armenians. The active population of the Quarantaine is only 23 percent, out of which 2.5 percent are women. Nearly all the heads of families are unskilled workers; 24 percent are street vendors; 33 percent work in factories and the Port and the rest are either street porters, municipal workers or legume sellers. Most of them work within the locality.
LAND USE: Privately occupied land accounts for approximately 70 percent of the land surface. Industrial activities are located on the north. Commercial activities are located along pedestrian passageways including a daily open market. The following community facilities are available: four primary public schools, two dispensaries, two churches, a mosque, the quarantine hospital. The squatters have no secure tenure, there is no physical improvement in the settlement, partly because of their insecurity, partly because an increasing proportion of the people rent from original squatters and partly because of the high population density.

LOCALITY LAND USE PATTERN
CIRCULATION: The main access to the locality is the Eastern Entrance of Beirut which acts as a boundary to the south. Streets within the locality are generally accessible to vehicles but very rarely used. Public transportation is very efficient and much used by the residents.
POPULATION: According to a survey in 1971 there were approximately 2,540 households, with a total of 12,600 persons at an average of 5 persons per household. No data is available on the age-sex composition of the whole locality, however a survey was made in 1971 from the squatter settlement. It can be noticed that nearly 60 percent of the population of the Quarantaine are under 20 years of age.

LOCALITY POPULATION DISTRIBUTION
Horizontal: percentages Vertical: ages
Males: M Females: F

LOCALITY ANNUAL INCOME DISTRIBUTION
Horizontal: percentages Vertical: dollars
Source: (approximate) IRFED Report (updated)
INCOMES: The approximate income distribution of the Quarantaine is relatively homogeneous since about 80 percent of the households have annual incomes ranging between $1000 and $2000. The average income would be considered low and the tenants have been excluded or private housing because of their incapacity to pay the market costs.
CASE STUDY: MEDAWARR

LOCALITY

CONSTRUCTION TYPES

- Shack
- Mud/Wattle
- Mud
- Masonry
- Masonry
- Concrete

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

LOCALITY UTILITIES AND SERVICES

- Water Supply
- Sanitary Sewerage
- Storm Drainage
- Electricity
- Gas
- Refuse Collection
- Public Transportation
- Paved Roads, Walkways
- Telephone
- Street Lighting

LOCALITY COMMUNITY FACILITIES

- Police
- Fire Protection
- Health
- Schools, Playgrounds
- Recreation, Open Spaces

The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: None, Limited, Adequate.

Quality of information: Approximate

LOCALITY SEGMENT PLAN

1:2500
ASSOCIATION FOR SOCIAL STUDIES OF THE MIDDLE EAST: MEDEMAH

LOCALITY BLOCK PLAN

LOCALITY BLOCK LAND UTILIZATION DATA

<table>
<thead>
<tr>
<th>DENSITIES:</th>
<th>Total Number</th>
<th>Area Hectares</th>
<th>Density N/Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOTS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DWELLING UNITS</td>
<td>400</td>
<td>0.91</td>
<td>440</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>2200</td>
<td>0.91</td>
<td>2417</td>
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<td>AREAS:</td>
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<td></td>
</tr>
<tr>
<td>PUBLIC (streets, walkways, open spaces)</td>
<td>0.89</td>
<td>48.2</td>
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</tr>
<tr>
<td>SEMI-PUBLIC (open spaces, schools, community centers)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>PRIVATE (dwellings, shops, factories, lots)</td>
<td>0.91</td>
<td>49.5</td>
<td></td>
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<tr>
<td>SEMI-PRIVATE (cluster courts)</td>
<td>0.04</td>
<td>2.3</td>
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<tr>
<td>TOTAL</td>
<td>1.84</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

NETWORK EFFICIENCY

\[ R = \text{network length (circulation)} / \text{areas served (circulation, lots)} \]

\[ A = \text{NA} \]

\[ \text{AVERAGE LOT AREA} = \text{NA} \]

LOCALITY SOURCES

Plan: (accurate) Aerial photograph of Beirut, 1973; Cadastre plan for the City of Beirut.
Land Use Pattern: Directorate of Geo
Plan: (accurate) Plan Cadastre de la Ville de Beirut, 1970.
Circulation Pattern: (approximate) O. Take, 1974.
Segment Plan: (accurate) Plan Cadastre de la Ville de Beirut, 1970.
Block Plan: (accurate) Plan Cadastre de la Ville de Beirut, 1970.
Physical Data: (accurate) 1910
Socio-Economic Data: (approximate) 1910
Photographs: O. Take
CASE STUDY: MEDAWAR (21)

MEDAWAR, Beirut: (left top) the picture shows a family from South Lebanon living in the tenement.
(right top) view of the court of the tenement. The court is used for social gatherings, as a play area for the children, as a place for cooking and other activities. The roof of the rooms is used for drying the daily laundry. Barrels are used for storing water. This tenement can be easily upgraded.
(bottom) a view inside one of the rooms. Notice how well kept and equipped is the room. The walls are well painted, a rug on the floor, a new refrigerator, cigarettes on the table for the guests. This is not a typical dwelling, but in general the rooms are very tidy. This shows the pride the people feel for their homes.

**PHYSICAL DATA**

(related to dwelling and land)

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<th>DWELLING UNIT</th>
<th>ROOM</th>
<th>area (sq m):</th>
<th>TENURE:</th>
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<td>type:</td>
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<tr>
<td>user’s ethnic origin:</td>
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<tr>
<td>place of birth:</td>
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<tr>
<td>education level:</td>
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<td></td>
</tr>
<tr>
<td>NUMBER OF USERS</td>
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<td>single:</td>
</tr>
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<td></td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>children: 4</td>
<td>total: 8</td>
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<tr>
<td>DWELLING LOCATION:</td>
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<td></td>
</tr>
<tr>
<td>number of floors:</td>
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<td></td>
</tr>
<tr>
<td>physical state:</td>
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<td></td>
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<tr>
<td>Dwellng DEVELOPMENT</td>
<td>INCENTRAL</td>
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<tr>
<td>mode:</td>
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<td>builder:</td>
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</tr>
<tr>
<td>year of construction:</td>
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<td>MATERIALS</td>
<td>CONCRETE</td>
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<tr>
<td>foundation:</td>
<td>CONCRETE</td>
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<td></td>
</tr>
<tr>
<td>floors:</td>
<td>POURED CONCRETE SLAB</td>
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<td></td>
</tr>
<tr>
<td>walls:</td>
<td>CONCRETE BLOCKS</td>
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<td></td>
</tr>
<tr>
<td>roof:</td>
<td>POURED REINFORCED CONCRETE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dwelling FACILITIES</td>
<td></td>
<td>WC: 2 (SHARED)</td>
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</tr>
<tr>
<td>shower:</td>
<td>2 (SHARED)</td>
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<td></td>
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<tr>
<td>kitchen:</td>
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<td></td>
</tr>
<tr>
<td>rooms:</td>
<td>14</td>
<td></td>
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</tr>
<tr>
<td>other:</td>
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**SOCIO-ECONOMIC DATA**

(related to user)

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<th>SOCIAL</th>
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<td>user’s income group:</td>
<td>LOW</td>
</tr>
<tr>
<td>employment:</td>
<td>TRUCK DRIVER</td>
</tr>
<tr>
<td>distance to work:</td>
<td>5KM</td>
</tr>
<tr>
<td>mode of travel:</td>
<td>TRUCK</td>
</tr>
<tr>
<td>why came to urban area:</td>
<td>DURING SUMMER</td>
</tr>
<tr>
<td>MIGRATION PATTERN</td>
<td></td>
</tr>
<tr>
<td>rural - urban:</td>
<td>2</td>
</tr>
<tr>
<td>urban - rural:</td>
<td>1</td>
</tr>
<tr>
<td>why came to urban area:</td>
<td>1965</td>
</tr>
<tr>
<td>why came to urban area:</td>
<td>DURING SUMMER</td>
</tr>
<tr>
<td>EMPLOYMENT</td>
<td></td>
</tr>
<tr>
<td>COSTS</td>
<td></td>
</tr>
<tr>
<td>rent/mortgage:</td>
<td>L.L. 2000</td>
</tr>
<tr>
<td>land - market value:</td>
<td>L.L. 2,500,000/HA</td>
</tr>
<tr>
<td>Dwelling UNIT Payments</td>
<td></td>
</tr>
<tr>
<td>rent/mortgage:</td>
<td>PRIVATE</td>
</tr>
<tr>
<td>% income for rent/mortgage:</td>
<td>20%</td>
</tr>
</tbody>
</table>
**Physical Data**

- **Dwelling Unit**
  - Type: Shanty
  - Area (sq m): 36
  - Tenure: Extralegal Rental

- **Land/Lot**
  - Utilization: Private
  - Area (sq m): 20
  - Tenure: Extralegal Rental

- **Dwelling**
  - Location: Periphery
  - Type: Semi-Detached
  - Number of floors: 2
  - Utilization: Single
  - Physical State: Bad

- **Dwelling Development**
  - Mode: Incremental
  - Developer: Popular Sector
  - Builder: Self-Help
  - Construction Type: Shack
  - Year of Construction: 1959

- **Materials**
  - Foundation: None
  - Floors: Poured concrete slab
  - Walls: Poles, cardboard, corrugated iron sheets
  - Roof: Wood joists with corrugated iron sheets

- **Dwelling Facilities**
  - WC: 1
  - Shower: 1
  - Kitchen: 1
  - Rooms: 2
  - Other: -

**Socio-Economic Data**

- **General**
  - Social
    - User's ethnic origin: Syrian
    - Place of birth: Damascus
    - Education level: Primary

- **Number of Users**
  - Married: 2
  - Single: 1
  - Children: 4
  - Total: 7

- **Migration Pattern**
  - Number of moves: 4
  - Urban - Rural: During Summer
  - Why came to urban area: Employment

- **General: Economic**
  - User's income group: Low
  - Employment: Artisan
  - Distance to work: 4 km
  - Mode of travel: Public Transportation

- **Costs**
  - Dwelling unit: L.L. 1000
  - Land - Market Value: L.L. 2,500,000/ha

- **Dwelling Unit Payments**
  - Finance: Self-Financed
  - Rent/Mortgage: L.L. 10/month
  - % Income for Rent/Mortgage: 4%

**Typical Dwelling**

---

**Key**

- L: Living Room
- D: Dining/Eating Area
- BR: Bedroom
- K: Kitchen/Cooking Area
- T: Toilet/Bathroom
- L: Laundry
- C: Closet
- S: Storage
- R: Room (multi-use)
VIEW OF A ROW OF SHANTIES  Three storey shanties are common in the Quarantaine squatter settlement. Notice the ingenuity of the people to build three story huts out of materials of little or no value like cheap wood, galvanized iron sheets. The roads are not paved but yet they are kept clean, these streets could be greatly improved. There is a strong sense of community in the Quarantaine.
**PHYSICAL DATA**  
(related to dwelling and land)

<table>
<thead>
<tr>
<th>DWELLING UNIT</th>
<th>TYPE</th>
<th>ROOM</th>
<th>TENURE</th>
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<tbody>
<tr>
<td>Area (sq m)</td>
<td>25</td>
<td>LEGAL RENTAL</td>
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<tr>
<td>Land/lot Utilization</td>
<td>PRIVATE</td>
<td></td>
<td></td>
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<tr>
<td>Area (sq m)</td>
<td>121</td>
<td>LEGAL RENTAL</td>
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</tr>
<tr>
<td>Dwelling Location</td>
<td>PERIPHERAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>SEMI-DETACHED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of floors</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utilization</td>
<td>MULTI-PURPOSE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical State</td>
<td>BAD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DWELLING DEVELOPMENT**

| Mode | INCORPORAL | POPULAR SECTOR |
| Developer | SELF-Help | MASONRY/WOOD |
| Builder | LOW | |
| Construction Type | MASONRY/WOOD | |
| Year of Construction | 1950 | |

**MATERIALS**

| Foundation | NON | |
| Floors | POURED CONCRETE SLAB | |
| Walls | CONCRETE BLOCKS | |
| Roof | WOOD JOISTS WITH CORRUGATED IRON SHEETS | |

**DWELLING FACILITIES**

| WC | 1 (SHARED) | |
| Shower | 1 (SHARED) | |
| Kitchen | 2 | |
| Rooms | 4 | |
| Other | COURTYARD | |

**SOCIO-ECONOMIC DATA**  
(related to user)

<table>
<thead>
<tr>
<th>GENERAL: SOCIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>User's ethnic origin</td>
</tr>
<tr>
<td>Place of birth</td>
</tr>
<tr>
<td>Education level</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NUMBER OF USERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Single</td>
</tr>
<tr>
<td>Children</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**MIGRATION PATTERN**

<table>
<thead>
<tr>
<th>Number of Moves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural - Urban</td>
</tr>
<tr>
<td>Urban - Rural</td>
</tr>
<tr>
<td>Urban - Urban</td>
</tr>
<tr>
<td>Why came to urban area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GENERAL: ECONOMIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>User's income group</td>
</tr>
<tr>
<td>Employment</td>
</tr>
<tr>
<td>Distance to work</td>
</tr>
<tr>
<td>Mode of Travel</td>
</tr>
</tbody>
</table>

**COSTS**

| Dwelling Unit | L.L. 400 | |
| Land - Market Value | L.L. 2,500,000 | |

**DWELLING UNIT PAYMENTS**

| Financing | SELF-FINANCED | |
| Rent/mortgage | L.L. 42/MONTH | |
| % Income for rent/mortgage | 15% | |

---

**TYPICAL DWELLING**

*Diagram showing the layout of a typical dwelling.*
A VIEW OF THE QUARANTAIN SQUATTER SETTLEMENT In the background, the Eastern entrance of Beirut. In the foreground, the semi-rural squatter settlements occupying inner-city land of high and rising commercial value. Notice their huts made out of concrete block walls and galvanized iron sheets roofs. The settlement is located approximately two kilometers from the center of Beirut.
LOCATION: The municipality of Borj Hammoud is located on the eastern border of the city of Beirut, within the 2.5 to 5 km inner-ring. It is mainly a low-income settlement with boundaries on the north: the Mediterranean sea; on the south and east: the municipalities of Sin-el-fil and Jdaide el-bouchriye; on the west: the Beirut river.

ORIGINS: Before 1948 Borj Hammoud was a suburb of Beirut with a semi-rural population. It has been occupied since 1948 by a relatively stable Armenian community who, like all other Armenians, followed a movement of emigration, after wars and political crisis. The Armenian population constitute around 25 percent of the population of the Beirut metropolitan area.
The street pattern is irregular in some areas, determined by footpaths and narrow canals that existed in the past. The area built after 1950 was subdivided into rectangular blocks with commercial streets running perpendicular to a main access road. The blocks of single-family houses and walk-ups are long with the short sides facing the main traffic streets. The system ensures a maximum flow along the latter accentuated by the very high population density, determines the sites for commercial activities. The individually and haphazardly determined individual plots vary between one hundred and several hundred square meters. The total area of 177 hectares mushroomed from a suburb of 40,000 people in 1948 to Lebanon's largest town with a population of over 100,000 people, with a density of over 1600 persons per hectare.
LAND USE: The land-use is mainly residential with a great amount of commercial activity. Most of the houses and apartment buildings have shops on the ground floors, consequently most dwellings have shopping facilities, however sketchy, located a few minutes walk away. The commercial activities are concentrated along four streets running perpendicular to the main access road (New Tripoly Road). There is a main industrial zone located between the Eastern Entrance of Beirut Avenue and the Mediterranean sea. The following community facilities are found in the locality: six primary and secondary schools, five churches, a mosque, two police stations, houses for blind and elderly, and a football stadium. Little or no physical improvement takes place partly because of the little maintenance provided by the municipality and the people and partly because of the high and rising population density.
Circulation: There is a high intensity of vehicular movement in the locality, generated through the eastern entrance of Beirut, which serves as vicinal and thru-traffic: it divides the area into a residential and commercial zone and a main industrial area. Pedestrian movement is concentrated along the main commercial streets, served by public transport. There are still a number of pathways and narrow clusters in different areas.
In 1971 there were approximately 22,280 households, with a total of 111,400 persons at an average of 5 persons per household. No data is available on the age-sex composition of the locality, however the age-sex pyramid of the outskirts of Beirut applies to the locality since the population is more or less homogeneous and contains the majority of the population of the outskirts of Beirut. The population is young, 52.7 percent are under twenty years of age.

LOCALITY POPULATION DISTRIBUTION
horizontal: percentages vertical: ages
males: M females: F
Source: (approximate) L'Enquette par Sondage sur
La Population Active au Liban, November 1970

LOCALITY ANNUAL INCOME DISTRIBUTION
horizontal: percentages vertical: dollars
Source: (approximate) I.R.F.E.D. Report (updated)

INCOMES: The estimated average for 1974 household income was about $20000 per year.
CASE STUDY: BORJ HAMMoud

LOCALITY CONSTRUCTION TYPES

- Shack
- Mud/Wattle
- Wood
- Masonry Wood
- Masonry
- Concrete

The chart above (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

LOCALITY UTILITIES AND SERVICES

- Water Supply
- Sanitary Sewerage
- Storm Drainage
- Electricity
- Gas
- Refuse Collection
- Public Transportation
- Paved Roads, Walkways
- Telephone
- Street Lighting

LOCALITY COMMUNITY FACILITIES

- Police
- Fire Protection
- Health
- Schools, Playgrounds
- Recreation, Open Spaces

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

Quality of information: Approximate

SELECTED BLOCK

LOCALITY SEGMENT PLAN

1:2500
LOCALITY BLOCK LAND UTILIZATION DATA

<table>
<thead>
<tr>
<th></th>
<th>Total Number</th>
<th>Area Hectares</th>
<th>Density N/Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOTS</td>
<td>18</td>
<td>.2916</td>
<td>61.73</td>
</tr>
<tr>
<td>DWELLING UNITS</td>
<td>72</td>
<td>.2916</td>
<td>247.00</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>470</td>
<td>.2916</td>
<td>1610.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Hectares</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBLIC (streets, walkways, open spaces)</td>
<td>.1026</td>
<td>35.0%</td>
</tr>
<tr>
<td>SEMI-PUBLIC (open spaces, schools, community centers)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PRIVATE (dwelling, shops, factories, lots)</td>
<td>.1890</td>
<td>65.0%</td>
</tr>
<tr>
<td>SEMI-PRIVATE (cluster courts)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>TOTAL</td>
<td>.2916</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

NETWORK EFFICIENCY

\[ R = \frac{\text{network length (circulation)}}{\text{areas served (circulation, lots)}} \]

AVERAGE LOT AREA

\[ = \frac{463 \text{ m}^2}{162} \]

LOCALITY BLOCK: The land subdivision of this block is typical not only of Burj Hamood but of large areas of Beirut. A series of lots, varying in size and shape. Since the original subdivision was meant for housing construction, the predominant land use is residential. Streets in most cases are narrow (10m). Notice the high percentage of land for circulation, and the high population density resulting from the homogeneous and compact dwelling construction. The dwellings are built neglecting any building code and regulations. The overcrowding is a result of lack of anticipation or planning by the local authorities.
LOCALITY BLOCK LAND UTILIZATION

LAND UTILIZATION DIAGRAMS

PATTERN
Public: streets/walkways
Semi-Public: playgrounds
Semi-Private: cluster courts
Private: lots
Dwellings

PERCENTAGES
Streets/Walkways 35.0%
Playgrounds -
Cluster Courts -
Dwellings/Lots 65.0%

DENSITY
Persons/Hectare 1610
20 Persons
TYPICAL DWELLING

SECTION

ELEVATION

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
Type: HOUSE
area (sq m): 200
tenure: LEGAL RENTAL/OWNERSHIP

LAND/LOT
utilization: PRIVATE
area (sq m): 100
tenure: OWNERSHIP

DWELLING
location: INNER RING
type: ROOM/GROUPED
number of floors: 2
utilization: MULTIPLE/SINGLE
physical state: FAIR

DWELLING DEVELOPMENT
mode: INCREMENTAL
developer: ARTISAN
builder: CONCRETE
construction type: CONCRETE
year of construction: 1956

MATERIALS
foundation: POURED REINFORCED CONCRETE
floors: CONCRETE BLOCKS
walls: CONCRETE
roof: POURED REINFORCED CONCRETE

DWELLING FACILITIES
WC: 3 (1 SHARED)
shower: 2 (1 SHARED)
kitchen: 2 (1 SHARED)
rooms: 9 (5 ON FIRST FLOOR)
other: TERRACE ON FIRST FLOOR

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: ARMENIAN
place of birth: TURKEY
education level: PRIMARY

NUMBER OF USERS
married: 2
single: 1
children: 4
total: 7

MIGRATION PATTERN
number of moves: 3
rural - urban: 1944, 1950, 1956
urban - urban: -
urban - rural: -
why came to urban area: POLITICAL REASONS

GENERAL: ECONOMIC
user's income group: LOW MIDDLE
employment: TAILOR
distance to work: 2 KM
mode of travel: PUBLIC TRANSPORTATION

COSTS
dwelling unit: L.L. 20,000
land - market value: L.L. 800,000/HA

DWELLING UNIT PAYMENTS
financing: SELF FINANCED
rent/mortgage: L.L. 25/MONTH (ROOMS ON G. FLOOR) 
% income for rent/mortgage: 10%
CASE STUDY: BORJ HAMMOUR (35)

**PHYSICAL DATA**

(related to dwelling and land)

**DWELLING UNIT**
- type: HOUSE
- area (sq m): 127
- tenure: LOCAL RENTAL/OWNERSHIP

**LAND/LOT**
- utilization: PRIVATE
- area (sq m): 100
- tenure: OWNERSHIP

**DWELLING**
- location: INNER RING
- type: ROOM/GROUPE
- number of floors: 2
- utilization: MULTIPLE
- physical state: FAIR

**DWELLING DEVELOPMENT**
- mode: INCREMENTAL
- developer: PRIVATE SECTOR
- builder: ARTISAN
- construction type: CONCRETE
- year of construction: 1954

**MATERIALS**
- foundation: CONCRETE
- walls: POURED REINFORCED CONCRETE
- floors: CONCRETE BLOCKS
- roof: POURED REINFORCED CONCRETE

**DWELLING FACILITIES**
- wc: 3
- shower: 2
- kitchen: 1
- rooms: 3
- other: SHOP

**SOCIO-ECONOMIC DATA**

(related to user)

**GENERAL: SOCIAL**
- user's ethnic origin: ARMENIAN
- place of birth: BEIRUT
- education level: PRIMARY

**NUMBER OF USERS**
- married: 2
- single: -
- children: 3
- total: 5

**MIGRATION PATTERN**
- number of moves: 3
- urban - rural: -
- why came to urban area: POLITICAL REASONS

**GENERAL: ECONOMIC**
- user's income group: LOW MIDDLE
- employment: ARTISAN
- distance to work: 1.5 KM
- mode of travel: WALKING

**COSTS**
- dwelling unit: L.L. 12,700
- land - market value: L.L. 800,000/HA

**DWELLING UNIT PAYMENTS**
- financing: SELF FINANCED
- rent/mortgage: L.L. 100/MONTH
- % income for rent/mortgage: 20%

**ELEVATION**

**SECTION**

**PLAN**

**STREET**

**KEY**
- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry
- C Closet
- S Storage
- R Room (multi-use)

**TYPICAL DWELLING**

1:200
**PHYSICAL DATA**

**DWELLING UNIT**
- type: HOUSE
- area (sq m): 72
- tenure: Le

**LAND/LOT**
- utilization: PRIVATE
- area (sq m): 42.5
- tenure: OWNERSHIP

**DWELLING**
- location: INNER RING
- type: ROM/GROUPED
- number of floors: 2
- utilization: MULTIPLE
- physical state: Fair

**DWELLING DEVELOPMENT**
- mode: INCREMENTAL
- developer: PRIVATE SECTOR
- builder: ARTISAN
- construction type: CONCRETE
- year of construction: 1953

**MATERIALS**
- foundation: PILED REINFORCED CONCRETE SLAB
- walls: CONCRETE BLOCKS
- roof: PILED REINFORCED CONCRETE SLAB

**DWELLING FACILITIES**
- WC: 1
- shower: 2
- kitchen: 2
- rooms: 2
- other: -

**SOCIO-ECONOMIC DATA**

**GENERAL: SOCIAL**
- user's ethnic origin: ARMENIAN
- place of birth: TURKEY
- education level: PRIMARY

**NUMBER OF USERS**
- married: 2
- single: 2
- children: 3
- total: 7

**MIGRATION PATTERN**
- number of moves: 3
- rural - urban: 1944, 1950, 1953
- urban - rural: -
- why came to urban area: POLITICAL REASONS

**GENERAL: ECONOMIC**
- user's income group: LOW MIDDLE
- employment: ARTISAN
- distance to work: 2 KM
- mode of travel: PUBLIC TRANSPORTATION

**COSTS**
- dwelling unit: L.L. 7250
- land - market value: L.L. 800,000/HA
- DWELLING UNIT PAYMENTS
  - financing: SELF FINANCED
  - rent/mortgage: L.L. 25/MONTH (FIRST FLOOR)
  - % income for rent/mortgage: 10%

**PLAN**

**KEY**
- LR: Living Room
- D: Dining/Eating Area
- BR: Bedroom
- K: Kitchen/Cooking Area
- T: Toilet/Bathroom
- L: Laundry
- C: Closet
- N: Storage
- R: Room (multi-use)

**TYPICAL DWELLING**

1:200
CASE STUDY: BORJ HAMMOUD (37)

VIEW OF A STREET OF ROW HOUSES  This is a typical case of illegal settlements where the houses do not comply with building codes and regulations. The plots are small, narrow and deep, sometimes built hundred percent. Notice how all the houses have been built progressively. The roofs have columns ready for future expansion, the roofs are used as recreation spaces for children, for the laundry etc. Notice the narrow streets and the very high density of population occupying this area, one of the highest in the world.
This is a standard public housing project sponsored by the municipality of Borj Hammoud. It consists of thirteen walk-ups, five to six storey high, containing 710 apartments. All the apartments have the same area of 82 sq.m, the access to the apartments is from a common staircase. The degree of proximity of the buildings as can be seen from the locality segment air photograph, implies a very distinct impersonal relationship between neighbours for lack of privacy, to the point that the users are refusing to pay the monthly payments, one of the interviewed families has refused to pay for the last two years and apparently the public authorities are unable to control the situation.

The materials used for the construction of the buildings are deteriorating very rapidly, and the situation is being aggravated by the fact that neither the municipality nor the people are maintaining the place. This is partly because there is no definition of the property neither control on the environment. The sense of identity that the people had in their shacks before they were forced to move to this project, has been completely lost as has the community life. The Armenian people call the squatter settlements "camps", they have called this project "camp" trad.

**KEY**
- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry
- C Closet
- S Storage
- R Room (multi-use)

**1:200**
VIEW OF THE CAMP TRAD HOUSING PROJECT The picture shows the environment of this project. The buildings have been built very close to each other creating a very high density of population. The buildings contain 710 families in one bedroom apartments. The occupants have no way of expanding their dwellings, they live overcrowded. During the survey cases were found where children were married and had to go back to the squatter settlements they originally came from, this situation is commonly found in most projects of this kind, due mainly to their inability to expand their homes. In previous pages it was seen how the inhabitants of Borj Hammoud expand their houses in time according to their needs, this project does not satisfy their expectations. In this case the value lies in the product rather than in its uselessness. The sponsorship, construction and management of their homes have been decided by few individuals who have avoided the real issues of authority and autonomy by convincing themselves that the poor are congenitally ignorant, incompetent, and feckless, an absurd notion in any context and impossible to maintain in the face of the housing achievements of the urban poor in areas like Borj Hammoud and other cities.

### SOCIAL ECONOMIC DATA (related to user)

<table>
<thead>
<tr>
<th><strong>GENERAL: SOCIAL</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>user's ethnic origin:</td>
<td>ZAIRE, LEBANON</td>
</tr>
<tr>
<td>place of birth:</td>
<td>ZAIRE, LEBANON</td>
</tr>
<tr>
<td>education level:</td>
<td>PRIMARY</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>NUMBER OF USERS</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>married:</td>
<td>2</td>
</tr>
<tr>
<td>single:</td>
<td>5</td>
</tr>
<tr>
<td>children:</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>MIGRATION PATTERN</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>number of moves:</td>
<td>4</td>
</tr>
<tr>
<td>urban - rural: 1960, 1966, 1969</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>why came to urban area?</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EMPLOYMENT</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>GENERAL: ECONOMIC</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>user's income group:</td>
<td>LOW</td>
</tr>
<tr>
<td>employment:</td>
<td>CRAFTSMAN</td>
</tr>
<tr>
<td>distance to work:</td>
<td>1 KM</td>
</tr>
<tr>
<td>mode of travel:</td>
<td>WALKING</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th><strong>COST</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>dwelling unit:</td>
<td>L.L. 10,000</td>
</tr>
<tr>
<td>land - market value:</td>
<td>L.L. 2,000,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>DWELLING UNIT PAYMENTS</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>financing: COMMERCIAL</td>
<td></td>
</tr>
<tr>
<td>rent/mortgage: L.L.50/MONTH</td>
<td></td>
</tr>
<tr>
<td>% income for rent/mortgage: 15%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PHYSICAL DATA</strong> (related to dwelling and land)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DWELLING UNIT</strong> type: APARTMENT</td>
<td></td>
</tr>
<tr>
<td>area (sq m): 62</td>
<td></td>
</tr>
<tr>
<td>tenure: OWNERSHIP</td>
<td></td>
</tr>
<tr>
<td><strong>LAND/LOT</strong> area (sq m): 16,800</td>
<td></td>
</tr>
<tr>
<td>tenure: OWNERSHIP</td>
<td></td>
</tr>
<tr>
<td><strong>DWELLING</strong> location: WALK-UP</td>
<td></td>
</tr>
<tr>
<td>type: INNER RING</td>
<td></td>
</tr>
<tr>
<td>number of floors: 5 - 6</td>
<td></td>
</tr>
<tr>
<td><strong>DWELLING DEVELOPMENT</strong></td>
<td></td>
</tr>
<tr>
<td>mode: PUBLIC SECTOR</td>
<td></td>
</tr>
<tr>
<td>developer: LARGE CONTRACTOR</td>
<td></td>
</tr>
<tr>
<td>builder: CONCRETE</td>
<td></td>
</tr>
<tr>
<td>physical state: GOOD</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>MATERIALS</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>foundation: CONCRETE</td>
<td></td>
</tr>
<tr>
<td>floors: POURED CONCRETE SLAB</td>
<td></td>
</tr>
<tr>
<td>walls: FRAME, CONCRETE BLOCK INFILL</td>
<td></td>
</tr>
<tr>
<td>roof: POURED REINFORCED CONCRETE</td>
<td></td>
</tr>
<tr>
<td><strong>DWELLING FACILITIES</strong></td>
<td></td>
</tr>
<tr>
<td>wc: 1</td>
<td></td>
</tr>
<tr>
<td>shower: 1</td>
<td></td>
</tr>
<tr>
<td>kitchen: 1</td>
<td></td>
</tr>
<tr>
<td>rooms: 3</td>
<td></td>
</tr>
<tr>
<td>other: TERRACE</td>
<td></td>
</tr>
</tbody>
</table>

### LOCAL SOURCES

- Block Plan: (approximate) Field Survey 0. Take, Beirut, 1973.
- Block Land Utilization: (approximate) 1972
- Socio-Economic Data: (approximate) 1974
- General Information: Studies by the Lebanese School of Social Formation; L'Enquete par Sondage sur la Population Active au Liban, 1971; other publications.
DWELLING ENVIRONMENTS

UNIT TYPE: Four types of dwelling units are considered:

- High-Rise: dwelling units grouped in five or more stories with stairs and lifts for vertical circulation.
- Semi-Detached: two dwelling units sharing a common wall or semi-detached complex.
- Detached: individual dwelling unit, separated from others.
- Attached: dwelling units sharing a common wall.

SWITCHING TYPE: The physical arrangement of the dwelling unit:

- Single: a group of individuals or families inhabiting a dwelling.
- Multiple: a single individual or family inhabiting a dwelling.
- Semi-Detached: two dwelling units sharing a common wall. Detached: individual dwelling unit, separated from others. Attached: dwelling units sharing a common wall.

SWITCHING DENSITY: The number of dwellings, dwelling units, people or families per unit hectare. Gross density is the density of an overall area (ex. including lots, streets). Net density is the density of selected, discrete portions of an area (ex. including only lots).

SWITCHING FLOORS: The following number are considered:

- One story: generally associated with single-family dwellings.
- Two stories: generally associated with multiple-family dwellings.

SWITCHING UNIT AREA: The dwelling unit area (2) is the built-up, covered area of a dwelling unit.

SWITCHING UNIT COST: The initial amount of money paid for the dwelling unit or the present monetary equivalent for replacing the dwelling unit.

SWITCHING DEVELOPMENT MODE: Two modes are considered:

- Incremental: the construction of the Dwelling and the development of the local infrastructure is carried out in stages, often starting with simple provisional structures and undeveloped land. This may entail some transitional accommodation in existing informal buildings and temporary housing units.
- Instantaneous: the formal development procedure in which all structures and services are completed before occupation.

GLOSSARY

Definitions of terms which are generally understood and essential to the presentation/understanding of the text are included in the Glossary.

The criteria for the preparation of the definitions have been as follows:

Second Preference: definitions from technical dictionaries.
Third Preference: definitions from the authors, when existing definitions did not satisfactorily correspond with what was intended.

Definitions of terms which are generally understood and not essential to the presentation/understanding of the text are included in the Glossary.

Definitions of terms which are generally understood and not essential to the presentation/understanding of the text are included in the Glossary.

Definitions of terms which are generally understood and not essential to the presentation/understanding of the text are included in the Glossary.

Definitions of terms which are generally understood and not essential to the presentation/understanding of the text are included in the Glossary.
BIBLIOGRAPHY

PUBLIC TRANSPORTATION: that segment of urban transportation which is available to the public without restriction. As public transport, it may also be regulated as to its operation, charges, and profits (Abrams, 1971).

SETTLEMENT: occupation by settlers to establish a residence or colony.

SUBSISTENCE INCOME: average amount of money required for the purchase of food and fuel for an average family of 5 people to survive (1971/year in Nairobi, 1972).

TENURE: two situations of tenure of the dwelling units and/or the lot/land are considered: legal - having formal status derived from law, extralegal - not registered or sanctioned by law.

FOUR TYPES OF TENURE ARE CONSIDERED:
- Rental: where the user pays a fee (daily, weekly, monthly) for the use of the dwelling unit and/or the lot/land.
- Lease: where the user pays a fee for long term use (generally for a year) for a dwelling unit and/or the lot/land from the owner (an individual, a public agency, or a private organization). No case of lease is shown in Tyrolia.
- Ownership: where the users hold in fee simple the dwelling unit and/or the lot/land which the unit occupies.
- Employment: where all the users are provided a dwelling unit by an employer in exchange for services, i.e., a live-in servant. Only one case is shown in the case studies.

LAND TENURE: THE RIGHT OF OWNERSHIP; where the exclusive right of control is held and for what period of time.

LAND UTILIZATION: PHYSICAL CONTROL: the physical, legal, and/or social means of directing, regulating, and coordinating the use and maintenance of land by the users/owners.

LAND UTILIZATION: RESPONSIBILITY: the quality/state of being morally/legally responsible for the use and maintenance of land by the users/owners.

METHODOLOGY: the quality of being or becoming socially recognized to cause or take on urban characteristics.

QUALITY OF HOUSING: the quality of accommodation in the drawings, charts and descriptions have been qualified in the following manner:
- Adequate: when taken from reliable or actual sources.
- Approximate: when deducted from different and/or not completely reliable sources.
- Tentative: when based on rough estimates of limited sources.

QUALITY OF SERVICES, FACILITIES AND UTILITIES: 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 services are available in an area or locality.

METRIC SYSTEM EQUIVALENTS:
- Linear measure:
  - 1 centimeter = 0.39 inches
  - 1 kilometer = 3,281 feet
- Area units:
  - 1 square meter = 10.76 square feet
  - 1 hectare = 2.47 acres
  - 1 square kilometer = 0.39 square mile
- Volume:
  - 1 cubic meter = 1.31 cubic yards
  - 1 cubic centimeter = 0.06 cubic inches

DOLLAR EQUIVALENTS:
- 1 U.S. dollar = 750 Lebanese Livres (January 1974)

REFERENCE ABREVIATIONS:
- I.R.E.D. Institut International de Recherche et de Formation en Urbanisme
- E.N.D. Institut International de Recherche et de Formation en Urbanisme
- U.N. Department of Public Information
- U.C. Bureau of the Census

CASE STUDY
Each Case Study is represented at four scales:

LOCALITY:
- A locality is defined as a relatively self-contained residential area. In general, it is contained within physical boundaries.
- All the localities differ in size and shape. A segment of the area has been taken from each locality for purposes of comparison. The size of each segment is 400 by 400 meters or a six minute walk.
- Each locality is segmented into typical non-residential blocks. The blocks are bounded on all sides by circulation so that the circulation of air to area served may be compared.
- A typical self-contained unit for an individual, a family or a group in each locality segment.
HORACIO CAMINOS  REINHARD GOETHERT  OMAR TAKE

MKALLES HOUSING PROJECT
BEIRUT URBAN AREA
A VIEW FROM MKALLES, THE SITE OF THE PROJECT
In the background, the compact skyline of Beirut.
In the foreground, the semi-rural squatter settlements occupying the site. Notice their vegetable gardens and huts made out of galvanized iron sheets. The site is located approximately 6 kilometers from the center of Beirut.
MODEL OF MKALLES HOUSING PROJECT AND VICINITY  The site slopes from south to north and is bounded on the east side by the deep valley shown in the foreground. The following structures can be identified: Rows of walk-up apartments along the streets, row houses in the center of the blocks, school and the open space of a playground, squatter settlements on the right, existing one story public housing on the left.

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ACKNOWLEDGEMENTS

Photographs: Nishan Bichajian; cover: Omar Take. Drawings: Omar Take, Bulent Tokman, Jairo Milan, Nimish Patel. A parallel development of alternative proposals (not included) were carried out by members of the Urban Settlement Design Program: Jairo Milan (Colombia); Ali Shuaibi (Saudi Arabia); Mohammed Al-Hussayen (Saudi Arabia); Chakorn Phisuthikul (Thailand); Nimish Patel (India); Jan Bazant (Mexico); Bulent Tokman (Turkey). A lecture on the socio-economic structure of low income families in Beirut was given at M.I.T. by Dr. Samir Khalaf, Chairman of the Department of Sociology at the American University of Beirut. The following people/officials participated in the presentations in Beirut, January 1974, and contributed with recommendations: H.E. Dr. Albert Mukheiber, Minister of State and former Minister of Housing and Cooperatives; H.E. Dr. Butrus Deeb, Director General of the Presidential Palace; H.E. Dr. Fuad Bizry, Advisor to the President for Public Works; Dr. Samuel Kirkwood, President of the American University of Beirut; Professor Raymond Ghosn, Dean of the School of Engineering and Architecture, A.U.B.; Architect Assem Salaam, Member of the Housing Counsel and Associate Professor, A.U.B.; Mr. Maruan Mohsen, Ministry of Housing and Cooperatives; Mr. Omar Tannir, Director of Cadastre of Mount Lebanon. The following people offered assistance and advise: H.E. Dr. Butrus Deeb, H.E. Dr. Carlos Khoury, Mr. Hekmat Khodr, Professor Raymond Ghosn and Mr. Omar Tannir. The authors are deeply grateful to the people and institutions mentioned here as well as to others who have contributed to this work.

H.C., R.G., O.T. Beirut/Cambridge, Summer 1974

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Cover: A family from South Lebanon living in Quarantaine, Beirut.
INTRODUCTION

This is a preliminary design for the development of a residential community in the municipality of Mkalles, in the Beirut Metropolitan Area.

The design is primarily intended as a basis for the preparation of final development plans and working drawings.

The following were the main steps on the design of the project:

- Surveys and identification of dwelling environments in Beirut for the low income groups were completed by Omar Take as part of his graduate work in the program Urban Settlement Design in Developing Countries, School of Architecture and Planning, M.I.T. (Beirut-Cambridge, Fall 1972 - Spring 1973).

- The Mkalles Housing Project was commissioned by H.E. The President of Lebanon, Suleiman Bey Frangie, by presidential decree, through the Ministry of Housing and Cooperatives (Beirut, Summer 1973).

- A preliminary design was prepared by the staff and graduate members of the program U.S.D.D.C. at M.I.T. (Cambridge, Fall 1973). The design was presented to H.E. The Minister of Housing and Cooperatives, Mr. Michel Sassin, as well as to other officials of the Ministry by Omar Take at the American University of Beirut in January 1974. A second presentation was made at the Presidential Palace at the request of H.E. President Frangie in the presence of his advisors. These presentations permitted a review of the project and recommendations by the government officials (see acknowledgements).

- An additional socio-economic spot survey of the families living in the Mkalles area was completed by Omar Take (Beirut, January 1974).
Walk-up apartments bordering the deep valley, the primary school over Tal el Mir.

- The design and the model contained in this report were prepared by the staff and graduate members of the program U.S.D.I.D.C. at M.I.T. (Beirut - Cambridge, Spring 1974). It will be eventually presented in Beirut for review.

The project represents a comprehensive framework for the formulation of housing policies and for the implementation of the physical plan, yet there is still much to be done and the final decisions can only be taken by local people. Further development of the project will be mainly carried out in Beirut.

The Mkalles Housing Project incorporates the following distinct characteristics:

- In LAND SUBDIVISION: provision of "condominium" or "clusters" ownership, with relatively large plots, to maximize private/collective initiative, responsibility, participation and to minimize government costs in implementation, maintenance and operation.

- In HOUSING: provision of dwellings that can be easily expanded to permit flexibility in their use, to absorb growth of the family needs and to minimize initial investment cost by the users and the government.

The Mkalles Housing Project is intended to be used as a pilot project for urban low income housing by the new Ministry of Housing and Cooperatives of Lebanon in addition to being a specific proposal for the development of the Mkalles site.

Horacio Caminos
Reinhard Goethert
Omar Take

Cambridge, Massachusetts
Summer, 1974
The Mkalles Housing Project is located in the Beirut Urban Area, 6 km south-east of the city center.

**Area of the site:** 13.2 hectares

**Approximate population:** 6860 Lebanese from the low and moderate low income groups

**Number of dwelling units:** 1248 apartments and houses

**Number of small shops:** 161 including artisan shops

**Supporting facilities:** primary school, day care nursery, kindergarten, playground, dispensery/social center, auditorium, movie theater

**Approximate density:** 520 people/hectare

At the present time part of the site is occupied by a squatter settlement of approximately 500 dwellings and 2500 people (Lebanese and Syrian). The project contemplates the relocation of most of these people.

All costs in U.S. Dollars

1 U.S. Dollar = 2.5 Lebanese Pounds

### BASIC DATA

- **Dwellings**
  - Number of units: $n$
  - Basic areas: $A_{basic}$
  - Expansion areas: $A_{expansion}$

<table>
<thead>
<tr>
<th>Dwellings</th>
<th>57</th>
<th>164</th>
<th>9,348</th>
<th>-</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>73</td>
<td>178</td>
<td>12,994</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>76</td>
<td>125</td>
<td>9,500</td>
<td>13</td>
<td>1,625</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>125</td>
<td>9,500</td>
<td>32</td>
<td>4,000</td>
<td></td>
</tr>
<tr>
<td>93</td>
<td>225</td>
<td>20,925</td>
<td>28</td>
<td>6,300</td>
<td></td>
</tr>
<tr>
<td>93</td>
<td>225</td>
<td>20,925</td>
<td>46</td>
<td>10,350</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>106</td>
<td>8,480</td>
<td>43</td>
<td>4,558</td>
<td></td>
</tr>
<tr>
<td>94</td>
<td>100</td>
<td>9,400</td>
<td>78</td>
<td>7,800</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1248</td>
<td>101,072</td>
<td>34,633</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Shops**
  - Number of units: $n$
  - Basic areas: $A_{basic}$
  - Expansion areas: $A_{expansion}$

<table>
<thead>
<tr>
<th>Shops</th>
<th>57</th>
<th>64</th>
<th>3,648</th>
<th>7,081</th>
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</thead>
<tbody>
<tr>
<td>73</td>
<td>97</td>
<td>7,081</td>
<td>10,729</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>161</td>
<td>10,729</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Access Stairs**
  - Number of units: $n$
  - Basic areas: $A_{basic}$
  - Expansion areas: $A_{expansion}$

<table>
<thead>
<tr>
<th>Access Stairs</th>
<th>10,941</th>
</tr>
</thead>
</table>

### APPROXIMATE COST

- **Dwellings**
  - Basic areas: $101,072 m^2$ at $70/m^2$
  - Expansion areas: $34,633 m^2$

<table>
<thead>
<tr>
<th>Dwellings</th>
<th>101,072 m^2 at $70/m^2</th>
<th>$7,075,040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shops</td>
<td>10,729 m^2 at $70/m^2</td>
<td>$751,030</td>
</tr>
<tr>
<td>Stairs</td>
<td>10,941 m^2 at $70/m^2</td>
<td>$765,870</td>
</tr>
<tr>
<td>Land Development/Community Facilities</td>
<td><strong>$2,863,980</strong> (estimated at 1/3 cost of dwellings)</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL** $11,455,920

The cost estimate assumes that only basic units will be built. These units are expandable from $101,072 m^2$ to an additional area of $34,633 m^2$, an increase of 34.2% over the total initial area.
THE SITE

The site of the Mkalles Housing Project has the following characteristics:

LOCATION
- The site is located in the municipality of Mkalles, in the Beirut Urban Area, approximately 6 km south-east of the city center and the centers of employment. The site lies in a residential and industrial area.

APPROACHES/ACCESS
- Main route of approach is the Beit Meri Road which leads to the city center (north-west), to other industrial areas (north) and to the mountains (east). The Beit Meri Road is 300m from the site and accessible through narrow streets.

TRANSPORTATION
- The nearest public bus service is approximately 30 minutes walking distance. Village buses and service taxis offer limited service to the city center along the Beit Meri Road.

SIZE/SHAPE
- Gross area of the site: 13.2 hectares.
- Triangular shape

TOPOGRAPHY/NATURAL FEATURES/SOIL
- The site overlooks the city of Beirut at an altitude of 125m. The site is irregular with slopes varying from 6% to 60%, with an average slope 12.5%. The site contains a prominent hill. The surface is devoid of vegetation and limited to sandy, rocky surfaces. Soil dumpings covering large portions of the site need to be removed. The soil is composed of clay, sand and gravel, with a deep rocky substrata. Limestone outcroppings are also found in several areas.

BOUNDARIES
- On the east: a deep valley with steep sides provides a natural barrier. On the south and west: existing developments of light industries and vacant land mesh with the site. On the north: a private Greek school and a squatter settlement mesh with the site.

ZONING RESTRICTIONS/REGULATIONS
- The site is zoned for residential and commercial purposes. Allowed ground coverage of the site 50%. Coefficient of land exploitation 1.65. Maximum height of buildings 17m.

EXISTING STRUCTURES
- Part of the site is occupied by a squatter settlement of approximately 500 dwellings and 2500 people (Lebanese and Syrian). A socio-economic spot survey was taken in January 1974 to identify the population.

OTHER FACTORS
- Views: the site enjoys a commanding view of the surroundings. Smoke, odors, dirt: none at the moment. Flooding: site well drained. Hazards: boundaries on east side should be fenced to prevent accidents.

LAND TENURE/LAND COST
- All the land in the site is owned by the government.
- The land is valued at approximately $32/m².

INFRASTRUCTURE/COMMUNITY FACILITIES
- No utilities exist on the site. All utilities are available from the surrounding areas. Limited commercial facilities exist along the Beit Meri Road and small shops are found in the squatter settlement.

The air photograph of the site (opposite page) illustrates some of the characteristics mentioned above.
PLAN OF SITE
THE PROJECT

The policies/goals that are proposed for the Mkalles Housing Project are as follows:

PRIMARY USE: RESIDENTIAL COMMUNITY
- The primary use of the site will be a residential community for 6860 people at full development. Public facilities will include: primary school for 1200 children, day-care nurseries, kindergartens, auditorium, playground, dispensary, police station. Facilities developed by the private sector will include: churches, mosques, a souk, artisan shops, movie theater.

TARGET INCOME GROUPS: LEBANESE LOW INCOME
- The development will aim at a community with Lebanese low income groups:

<table>
<thead>
<tr>
<th>PEOPLE PER INCOME GROUPS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>family annual income</td>
<td></td>
</tr>
<tr>
<td>From:</td>
<td></td>
</tr>
<tr>
<td>$1200</td>
<td>$2000 $3200 $4800</td>
</tr>
<tr>
<td>Site area</td>
<td>1397</td>
</tr>
<tr>
<td>Quarantaine</td>
<td>397</td>
</tr>
<tr>
<td>Other areas</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>2888</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1397</td>
</tr>
<tr>
<td></td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>2079</td>
</tr>
<tr>
<td></td>
<td>2579</td>
</tr>
<tr>
<td></td>
<td>6864</td>
</tr>
</tbody>
</table>

TENURE: CONDOMINIUM OWNERSHIP
- The development will offer condominium ownership with expandable apartments and houses.

INTENSITIES OF LAND USE: MEDIUM DENSITY
- The densities planned for the site range from 300 to 600 people per hectare.

FINANCING GROUPS: PUBLIC WITH LIMITED PRIVATE
- The size of the project and its prototype nature will demand primarily public financing. Private investment will be encouraged as a model for future housing.

CIRCULATION: PREDOMINANTLY PEDESTRIAN
- Pedestrians and vehicles will be mixed in the public streets, but pedestrians will dominate over vehicles. Control of traffic frequency, character and speed are mainly established by the street layout and use.

UTILITIES: CONNECTION TO EXISTING SYSTEMS
- All utility systems will be interconnected into the existing Beirut Urban Area networks.
- Water: connection into Jal El-Deeb.
- Sewerage/storm drainage: connection into planned system for Mkalles.
- Electricity: connection into Beirut Urban Area network.

DEVELOPMENT MODE: INSTANT AND/OR INCREMENTAL
- The primary infrastructure networks (water, sewers, electricity, streets, street lighting) will be initially developed.
- The dwellings, community facilities, and secondary infrastructure will be instantly or incrementally developed.

KEY OF PLAN OF PROJECT (opposite page)
A apartments/expandable apartments
H houses/expandable houses
C cluster courts
S primary school
AU auditorium
P playground

Note: shops are located along Souk and Main Streets
CIRCULATION AND COMMERCIAL AREAS  The two main arteries of circulation can be identified: Souk Street (running horizontally) which is bordered by arcades with shops; Main Street (running vertically in the center) which is the main spine of circulation and provides access to most of the apartments, houses, and school, playground and souk.
CORNER SHOPS  View of corner at the south end of the Main Street. Two small squares provide public space for daily gatherings and outdoor commercial activities. The buildings around are from four to five stories high, with shops at ground level and apartments on the floors above.
All these facilities shown are grouped in the center of the site over Tal el Mir (The Prince's Hill). The location is dominant, with good views and easily accessible from any point of the community.
CLUSTERS (AHIA') The picture shows a series of lot clusters, each containing a semi-private interior court (SEHAT) bounded by row houses and walk-up apartments. This interior court provides access to the dwellings and is the place for outdoor social activities of the families living in the cluster.
A CLUSTER is composed of:
APARTMENTS/EXPANDABLE APARTMENTS
HOUSES/EXPANDABLE HOUSES
CLUSTER COURTS
(See Land Subdivision page 16)

KEY

PRIVATE AREAS (dwellings)
SEMI-PRIVATE AREAS (cluster courts)
SEMI-PUBLIC AREAS (playgrounds)
PUBLIC AREAS (streets, walkways)

PUBLIC - streets, walkways
- steep slope areas
SEMI-PUBLIC - school, playground, open areas
recreation, community facilities
PRIVATE/SEMI-PRIVATE - residential, commercial areas

<table>
<thead>
<tr>
<th>Category</th>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Areas</td>
<td>3.192 Ha.</td>
<td>24.0%</td>
</tr>
<tr>
<td>Semi-Private Areas</td>
<td>0.533 Ha.</td>
<td>4.0%</td>
</tr>
<tr>
<td>Semi-Public Areas</td>
<td>1.852 Ha.</td>
<td>14.0%</td>
</tr>
<tr>
<td>Private/Semi-Private</td>
<td>7.623 Ha.</td>
<td>58.0%</td>
</tr>
<tr>
<td>Total Gross Area</td>
<td>13.200 Ha.</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Contours and cluster court elevations are indicated in meters.
The land subdivision proposed for the Mkalles Project is based on the following policies:

Minimization of: public land for circulation and lengths of infrastructure per area served (electricity, water, sewerage networks, street lights, police protection, garbage collection). The results are savings for the government in construction, maintenance and operation.

Maximization of: private (users) responsibility, initiative, participation. The results are social and economic benefits.

These policies lead to a type of land subdivision called "condominiums" or "clusters", where dwellings are grouped around a common court that serves as an access space as well as a semi-private open space. This court is owned in condominium by the owners of the dwellings, which control, share the use and the responsibility for the maintenance of the court.

Condominium is a system of direct ownership of a single unit in a multi-unit structure. 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 share of the common areas and the underlying ground.

But most important, clusters (AHIA') and courts (SEHAT) belong to the Lebanese culture; they provide an environment for neighborhood associations and social propensity; they facilitate outdoor activities under the mild climate of Beirut.

The housing proposed for the Mkalles Project have the following characteristics:

- There are two basic types of dwelling units: walk-up apartments and houses.
- The ground floor of the buildings facing public streets can be alternatively used as dwellings or shops.
- The majority of dwelling units are basic shells that can be internally completed and expanded. The advantage of this system is that it provides flexibility and minimizes the initial investment by the users as well as the total investment by the government.
- The apartment units have a maximum of 8 families sharing the same facilities (stairs, terrace) to facilitate control and responsibility in the use and maintenance.
- Several dwelling options are available to different income groups: apartments, expandable apartments, houses, expandable houses of different areas.
- The type of tenure is condominium ownership in all the dwellings.

In the following pages, further aspects concerning dwellings are illustrated: construction, development, options, incomes, types.
DWELLING CONSTRUCTION

Dwelling design and construction system have the following characteristics:

- Building height: 2 to 5 floors for maximum land utilization within the Building Code restrictions. Main reasons are cost of land, the difficult topography of the site, saving on foundations and most important an adequate population density.

- Reinforced concrete frame construction: columns, bearing walls, beams, floor and roof slabs. The span ranges from 2.20m (staircases) to 6.60m (slabs).

- Minimum number of simple foundations.

- Minimum number of retaining walls. In most of the cases retaining walls and bearing walls are combined.

- Minimum public circulation (streets) and two basic directions for buildings: parallel or perpendicular to contours.

- Maximum cross ventilation and adequate orientation for dwellings.

Foundations: alternatives: a) reinforced concrete footings for columns, retaining walls, bearing walls; b) reinforced concrete slab on grade for partitions.

Retaining walls: reinforced concrete 2.40m, 3.00m high.

Bearing walls: alternatives: a) reinforced concrete, minimum width 20cm; b) concrete blocks 20cm with reinforced concrete columns, poured in block perforations; c) concrete blocks 20cm, with tie beams above.

Non-bearing walls: exterior, 20cm concrete blocks; interior, 10cm concrete blocks.

Floor slabs: alternatives: a) reinforced concrete, houdi block slab poured in situ; b) wood floor in case of expansions.

- Roof slabs: reinforced concrete houdi slab poured in situ.
- Balcony: same as slabs.
- Bathroom: shower, lavatory, arabic water closet, ventilation duct.
- Kitchen: sink, ventilation duct.
- Stairs: reinforced concrete or wood.
- Doors: wood, for entrance, shower, water closet, 1 room.
- Windows: casement or sliding windows, wood or wood and metal.
- Lightwell covers: translucent corrugated plastic sheets.
- Walls/floor finish: exposed concrete floor, exposed walls painted.
- Sewage/water: connections, fixtures, reserve water tank on terrace.
- Garbage chute: access from each dwelling unit.
- Electricity: conduits, outlets.

DWELLING PROGRESSIVE DEVELOPMENT

- First phase includes the basic shell described in construction system. It will be provided by the government and built by contractor.

- Second phase includes some elements added and paid by the owner for occupation of the dwelling: partitions, doors, closets, etc.

- Third phase includes more elements added and paid by the owner for expansion of the dwelling: interior partitions, floors, doors, closets, lightwell cover, interior stairs.
The following table illustrates the different dwelling options available in terms of types, area, number of rooms, capacity for expansion and costs. Unit construction costs, unit land costs are estimated on actual market values.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>AREA (m²)</th>
<th>NO of ROOMS</th>
<th>NO of FLOORS</th>
<th>CONSTRUCTION COST $70/m²</th>
<th>LAND COST (1) $11/m² of const.</th>
<th>LAND COST (2) $8/m² of const.</th>
<th>INFRASTRUCTURE COST @ 1/3 of construction</th>
<th>DWELLING UNIT COST TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>APARTMENT</td>
<td>57m²</td>
<td>2</td>
<td>1</td>
<td>$3,990</td>
<td>$627</td>
<td>$456</td>
<td>$1,330</td>
<td>$6,403</td>
</tr>
<tr>
<td>APARTMENT</td>
<td>73m²</td>
<td>3</td>
<td>1</td>
<td>$5,110</td>
<td>$803</td>
<td>$584</td>
<td>$1,703</td>
<td>$8,200</td>
</tr>
<tr>
<td>APARTMENT expandable to</td>
<td>89m²</td>
<td>3</td>
<td>2</td>
<td>$5,320</td>
<td>$836</td>
<td>$608</td>
<td>$1,773</td>
<td>$8,538</td>
</tr>
<tr>
<td>APARTMENT</td>
<td>76m²</td>
<td>3</td>
<td>2</td>
<td>$5,320</td>
<td>$836</td>
<td>$608</td>
<td>$1,773</td>
<td>$8,538</td>
</tr>
<tr>
<td>APARTMENT expandable to</td>
<td>108m²</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APARTMENT</td>
<td>93m²</td>
<td>4</td>
<td>2</td>
<td>$6,510</td>
<td>$1,023</td>
<td>$744</td>
<td>$2,170</td>
<td>$10,447</td>
</tr>
<tr>
<td>APARTMENT expandable to</td>
<td>121m²</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APARTMENT</td>
<td>93m²</td>
<td>3</td>
<td>2</td>
<td>$6,510</td>
<td>$1,023</td>
<td>$744</td>
<td>$2,170</td>
<td>$10,447</td>
</tr>
<tr>
<td>APARTMENT expandable to</td>
<td>139m²</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HOUSE</td>
<td>80m²</td>
<td>3</td>
<td>2</td>
<td>$5,600</td>
<td>$880</td>
<td>$640</td>
<td>$1,867</td>
<td>$8,987</td>
</tr>
<tr>
<td>HOUSE expandable to</td>
<td>123m²</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HOUSE</td>
<td>94m²</td>
<td>4</td>
<td>3</td>
<td>$6,580</td>
<td>$1,034</td>
<td>$752</td>
<td>$2,193</td>
<td>$10,559</td>
</tr>
<tr>
<td>HOUSE expandable to</td>
<td>172m²</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) land cost assigned by government
(2) additional cost to reach market value
The following table illustrates a suggested distribution of the dwelling options among different income groups, their annual family budget and the annual subsidy needed for each dwelling option. Land value and infrastructure are assumed subsidized for all income groups.

<table>
<thead>
<tr>
<th>ANNUAL FAMILY INCOME</th>
<th>$1200</th>
<th>$2000</th>
<th>$3200</th>
<th>$4800</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUDGET:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing:</td>
<td>$240</td>
<td>$400</td>
<td>$640</td>
<td>$960</td>
</tr>
<tr>
<td>Transportation:</td>
<td>$ 40</td>
<td>$ 40</td>
<td>$ 60</td>
<td>$ 60</td>
</tr>
<tr>
<td>Food/Clothing:</td>
<td>$658</td>
<td>$1090</td>
<td>$1885</td>
<td>$2740</td>
</tr>
<tr>
<td>Health/Education:</td>
<td>$100</td>
<td>$ 100</td>
<td>$ 200</td>
<td>$ 400</td>
</tr>
<tr>
<td>Utilities:</td>
<td>$130</td>
<td>$ 150</td>
<td>$ 180</td>
<td>$ 60</td>
</tr>
<tr>
<td>Municipal Tax:</td>
<td>$ 12</td>
<td>$ 20</td>
<td>$ 35</td>
<td>$ 60</td>
</tr>
<tr>
<td>Miscellaneous:</td>
<td>$ 20</td>
<td>$ 200</td>
<td>$ 200</td>
<td>$ 400</td>
</tr>
<tr>
<td></td>
<td>20.0%</td>
<td>2.0%</td>
<td>1.9%</td>
<td>1.3%</td>
</tr>
<tr>
<td></td>
<td>3.3%</td>
<td>5.0%</td>
<td>6.2%</td>
<td>8.3%</td>
</tr>
<tr>
<td></td>
<td>54.8%</td>
<td>54.5%</td>
<td>58.9%</td>
<td>56.9%</td>
</tr>
<tr>
<td></td>
<td>8.3%</td>
<td>7.5%</td>
<td>5.7%</td>
<td>6.3%</td>
</tr>
<tr>
<td></td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.1%</td>
<td>1.3%</td>
</tr>
<tr>
<td></td>
<td>1.8%</td>
<td>10.0%</td>
<td>6.2%</td>
<td>8.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DWELLING OPTIONS</th>
<th>$57M²</th>
<th>$73M²</th>
<th>$76M²</th>
<th>$57M²</th>
<th>$73M²</th>
<th>$76M²</th>
<th>$76M²</th>
<th>$93M²</th>
<th>$80M²</th>
<th>$93M²</th>
<th>$80M²</th>
<th>$94M²</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTUAL COST/YR(1):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 yr. loan:</td>
<td>$471</td>
<td>$604</td>
<td>$628</td>
<td>$471</td>
<td>$604</td>
<td>$628</td>
<td>$768</td>
<td>$939</td>
<td>$808</td>
<td>$1114</td>
<td>$958</td>
<td>$1126</td>
</tr>
<tr>
<td>15 yr. loan:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 yr. loan:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL SUBSIDY</th>
<th>$231</th>
<th>$364</th>
<th>$388</th>
<th>$71</th>
<th>$204</th>
<th>$228</th>
<th>$128</th>
<th>$299</th>
<th>$168</th>
<th>$154</th>
<th>-$2</th>
<th>$166</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional land cost:</td>
<td>$29</td>
<td>$ 37</td>
<td>$ 39</td>
<td>$34</td>
<td>$ 43</td>
<td>$ 45</td>
<td>$ 55</td>
<td>$ 67</td>
<td>$ 58</td>
<td>$ 79</td>
<td>$ 68</td>
<td>$ 80</td>
</tr>
<tr>
<td>Infrastructure:</td>
<td>$85</td>
<td>$109</td>
<td>$114</td>
<td>$97</td>
<td>$126</td>
<td>$130</td>
<td>$158</td>
<td>$193</td>
<td>$167</td>
<td>$230</td>
<td>$199</td>
<td>$234</td>
</tr>
<tr>
<td>Interest difference(2):</td>
<td>$61</td>
<td>$ 79</td>
<td>$ 80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) based on 4% government loan
(2) difference between 4% government loan and 2.5% family payment
amounts preceded with (-) can be applied to reduce subsidies by government
Mkalles Housing Project

DWELLING UNIT: 57m² - 2 ROOMS - 1 FLOOR

- Type: APARTMENT
- Tenure: OWNERSHIP
- Land/lot area: VARIES
- Development mode: INSTANT

76m² - 3 ROOMS - 2 FLOORS

APARTMENT EXPANDABLE TO 89m², 4 ROOMS
OWNERSHIP
VARIES
PROGRESSIVE

(Ceiling height is 2.20m, limiting a second floor expansion to 2/3 of the first floor area.)

KEY
R room
K kitchen
B balcony
O opening
(E) expansion

1:200

STRUCTURAL FRAME PLAN

BASEMENT PLAN

FLOOR PLAN

57m² APARTMENT
Mkalles Housing Project

ENTRANCE ELEVATION

BALCONY ELEVATION

SECTION A-A

FIRST FLOOR PLAN

SECOND FLOOR PLAN

76 m² APARTMENT EXPANDABLE TO 89 m² - 4 ROOMS
**Mkalles Housing Project**

**DWELLING UNIT:**  57m² - 2 ROOMS - 1 FLOOR

- **Type:** APARTMENT
- **Tenure:** OWNERSHIP
- **Land/lot area:** VARIES
- **Development mode:** INSTANT

*(Same as 57m² apartment on page 20.)*

---

**76m² - 3 ROOMS - 2 FLOORS**

- **Type:** APARTMENT EXPANDABLE TO 108m², 4 ROOMS
- **Tenure:** OWNERSHIP
- **Land/lot area:** VARIES
- **Development mode:** PROGRESSIVE

*(Ceiling height is 2.80m, allowing a second floor expansion equal to the first floor area.)*

---

**KEY**

- **R** room
- **K** kitchen
- **B** balcony
- **O** opening
- **(E)** expansion

---

**STRUCTURAL FRAME PLAN**

**BASEMENT PLAN**

**FLOOR PLAN**

**57m² APARTMENT** *(Same as apartment on page 20.)*
Mkalles Housing Project

Entrance Elevation

Balcony Elevation

Section A-A

First Floor Plan

Second Floor Plan

76m² Apartment expandable to 108m² - 4 Rooms
**Mkalles Housing Project**

**DWELLING UNIT:**

- **Type:** APARTMENT
- **Tenure:** OWNERSHIP
- **Land/lot area:** VARIES
- **Development mode:** INSTANT

**73 m² - 3 ROOMS - 1 FLOOR**

- 1.80 + 4.20 + 4.80 + 4.20 + 1.80

**93 m² - 4 ROOMS - 2 FLOORS**

- APARTMENT EXPANDABLE TO 121 m², 6 ROOMS
- OWNERSHIP VARIES
- PROGRESSIVE

(Ceiling height is 2.20 m, limiting a second floor expansion to 2/3 of the first floor area.)

**KEY**

- **R** room
- **K** kitchen
- **B** balcony
- **O** opening
- **(E)** expansion

**BASEMENT PLAN**

**STRUCTURAL FRAME PLAN**

**FLOOR PLAN**

**73 m² APARTMENT**
93m² APARTMENT EXPANDABLE TO 121m² - 6 ROOMS
**Mkalles Housing Project**

**DWELLING UNIT:**

- **Type:** APARTMENT
- **Tenure:** OWNERSHIP
- **Land/lot area:** VARIES
- **Development mode:** INSTANT

**73 m² - 3 ROOMS - 1 FLOOR**

- Same as 73 m² apartment on page 24.

**93 m² - 3 ROOMS - 2 FLOORS**

- APARTMENT EXPANDABLE TO 139 m², 6 ROOMS
- OWNERSHIP
- VARIES
- PROGRESSIVE

(Ceiling height is 2.80m, allowing a second floor expansion equal to the first floor area.)

**KEY**

- R room
- K kitchen
- B balcony
- O opening
- (E) expansion

**STRUCTURAL FRAME PLAN**

**BASEMENT PLAN**

**FLOOR PLAN**

**73 m² APARTMENT** (Same as apartment on page 24.)
Mkalles Housing Project

ENTRANCE ELEVATION

FIRST FLOOR PLAN

SECOND FLOOR PLAN

93m² APARTMENT EXPANDABLE TO 139m² - 6 ROOMS
MKalles Housing Project

DWELLING UNIT: $80_m^2$ - 3 ROOMS - 2 FLOORS
Type: HOUSE EXPANDABLE TO $123_m^2$, 5 ROOMS
Tenure: OWNERSHIP
Land/lot area: $68_m^2$
Development mode: PROGRESSIVE

$94_m^2$ - 4 ROOMS - 3 FLOORS
HOUSE EXPANDABLE TO $172_m^2$, 7 ROOMS
OWNERSHIP
$68_m^2$
PROGRESSIVE
(Same house as $80_m^2$, but with one additional floor.)

KEY
R room
K kitchen
B balcony
O opening
(E) expansion

1:200

STRUCTURAL FRAME PLAN

FIRST FLOOR PLAN

$80_m^2$ HOUSE EXPANDABLE TO $123_m$ - 5 ROOMS
Mkalles Housing Project

DWELLING UNIT:  
**80m² - 3 ROOMS - 2 FLOORS**
- Type: HOUSE EXPANDABLE TO 123m², 5 ROOMS
- Tenure: OWNERSHIP
- Land/lot area: 68m²
- Development mode: PROGRESSIVE

**94m² - 4 ROOMS - 3 FLOORS**
- HOUSE EXPANDABLE TO 172m², 7 ROOMS
- Tenure: OWNERSHIP
- Land/lot area: 68m²
- Development mode: PROGRESSIVE

(Same house as 80m², but with one additional floor.)

**KEY**
- R room
- K kitchen
- B balcony
- O opening
- (E) expansion

**STRUCTURAL FRAME PLAN**

80m² HOUSE EXPANDABLE TO 123m² - 5 ROOMS
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