NOTES ON HOUSING & PHYSICAL PLANNING

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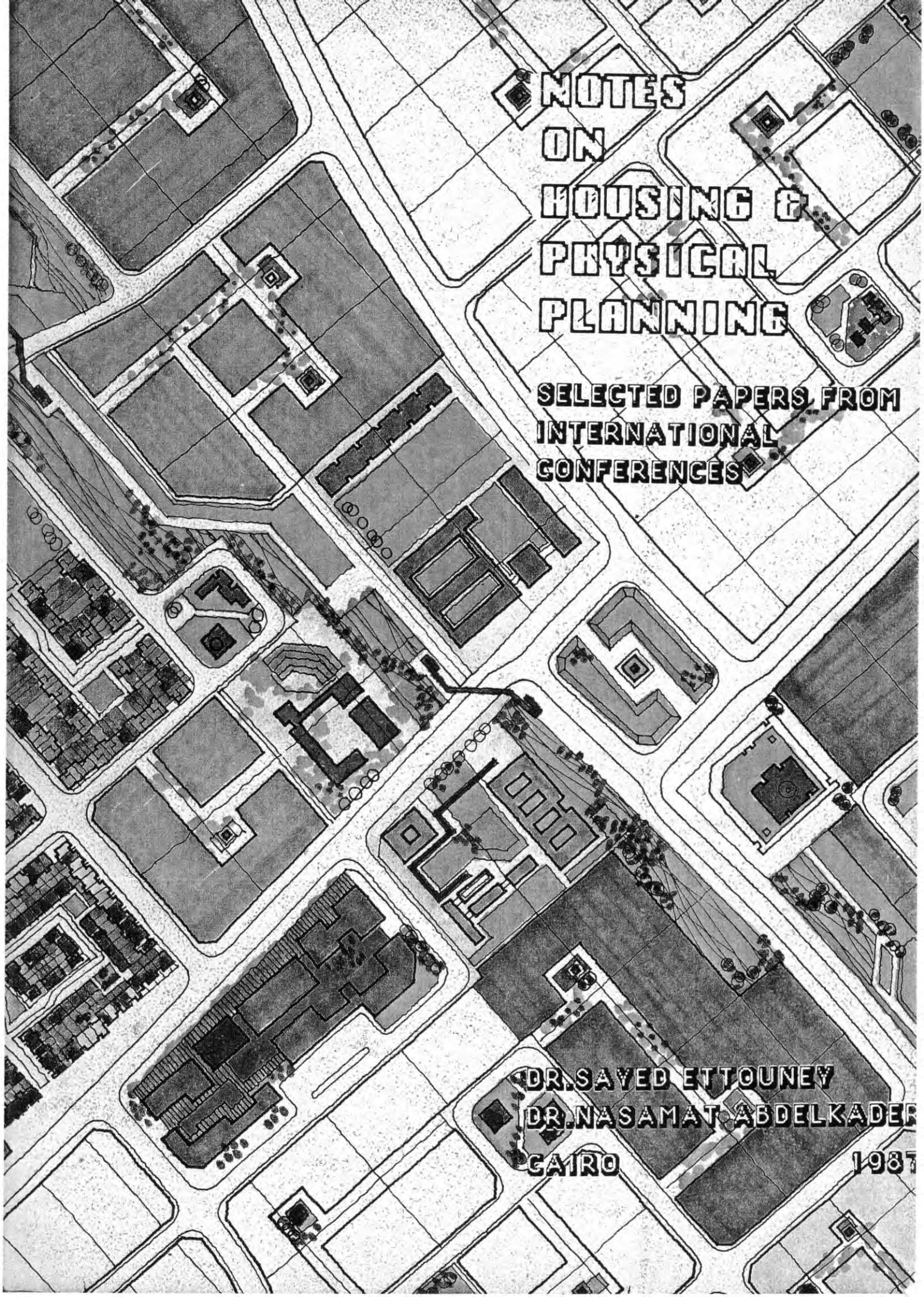

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INTERNATIONAL CONGRESS ON HOUSING
THE IMPACT OF ECONOMY AND TECHNOLOGY
VIENNA,15-19 NOVEMBER 1981

IAHS WORLD CONGRESS ON HOUSING
PLANNING,FINANCING,CONSTRUCTION
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SINGAPORE INSTITUTE OF PLANNERS
SINGAPORE,JULY 1986

IAHS- FIU WORLD CONGRESS ON HOUSING
NEW TRENDS IN HOUSING PROJECTS
EMPHASIZING DEVELOPING COUNTRIES
MIAMI,FLORIDA,DECEMBER,1986

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CONTENTS

INTRODUCTION

PART 1
ON HOUSING UNITS

PART 2
ON SITE PLANNING

PART 3
THE MACRO SETTING & RELATED ISSUES

INTRODUCTION

This work comprises a selection of the authors contributions to international conferences and symposia, during the past five years or so. The idea behind its editing and presentation, to the interested factions in Egypt and Third World countries, evolved and enhanced through three convictions, namely:-

1- To attempt to illustrate the features of the planning and housing contexts in Egypt and to formulate them into a rather comprehensive structure spanning goals & objectives, approaches and methodologies on one hand and determinants,alternatives policies and strategies on the other.

2- To attempt to effectively justify the authors view that: the growing gap between theory and practice in developing nations is not necessarily a permanant feature of the development context and related processes and hence it is possible to bridge and breach it.

3- To allow researchers and scholars together with those involved and interested in housing and physical planning in developing nations to review a sequence of closely related contributions that are scattered in an unlimited number of international publications and proceedings, a fact that makes it rather costly to refer to them separately and collectively in terms of time and effort.

In editing this work many options were possible (i.e. for organization and presentation of its contents) including choronological and sequential assimilation, classification by events and themeatic or contextual levels organization.

The present work is organized themeatically and its structure comprises three consequitive physical levels , namely:

- Housing Units morphology,
- Site Planning,
- Physical and Macro-setting.

The term physical is taken to refer to the environment characterised and dominated by man made features and additions, in mans drive to achieve his birth rights and goals and which extends to span mans habitat, clusters and settlements.

The research notes, studies and papers are classified under these three physical levels in three separate parts.

Part One addresses housing units, typology, variations and features and comprises four closely related sections (papers). The first presents modular patterns for the design of housing projects. It shows the steps taken to formulate a systematic approach to design. An approach that enables the designer to collectively combine industrialization orders and modularity together with design variations and complexities.

The second work critically reviews the various options for developing housing schemes, i.e. land parcellization & plots, mass housing projects and mixtures, with emphasis on the features of housing types in each. It also highlights possibilities of interchangeability during the development phases.

The paper on housing for a new settlement in Sinai, the third in Part 1, proposes alternative designs for expandable houses that could be erected with standard components, to facilitate and enable users participation in the construction activities.

The fourth study in Part 1 discusses the major aspects affecting physical development and effective users participation in the design and implementation of the initial growth stage in one of Egypt's towns.

Part Two includes seven papers covering various aspects of site planning and housing layouts. The first paper in this part, presents a systematic approach for planning housing layouts, through the use of a set of modular patterns representing the recommended routes for the infrastructures and axes for the delineation of physical form and its components. The paper also shows the flexibility of the developed tool and its ability to provide the base for the generation of alternatives and various solutions for housing layouts.

The second paper presents means of analysis of residential districts and allows the understanding of its structure and tissue's components and interrelations.
The suggested approach enables the designer to compare and evaluate the efficiency of layouts' alternatives with special reference to circulation network and infrastructure.

Another tool for the analysis of existing urban tissue is presented in the 3rd paper which allows the recording of plot areas & dimensions, the intervals between successive axes of infrastructure

together with the quantitative features of the buildings and the connective tissues. Means of evaluating the recorded material and developing criteria for the design and planing of new communities are then outlined.

The fourth paper addresses the issue of residential density and calls for tolerant attitudes towards high density living in newly developed communities. It briefly reviews current thoughts on activity and physical density and closely looks into Egyptian planning and building laws & regulations handling of density. The inadequacy of density as a design and environmental quality control tool is further stressed at the closing section of the paper.

The space-between features and the environmental quality of low income housing areas interrelation are briefly highlighted and means of improving the quality of the external environment in residential areas are presented in the fifth paper of the 3nd part.

The following paper looks into climate and urban form and discusses the relative importance of climate as a physical planning determinant. The paper presents the view, that : "the effect of climate depends on the emergence of the third dimension, therefore in structure and urban planning processes, climatic considerations are of a rather limited effect and its influence and role positively increases with the presence of three dimensional decisions in site planning & urban design".

The last paper in this part reviews the complex issue of low cost housing aesthetics and visual qualities. It points out potentialities and limitations of current practices and graphically illustrates the design criteria for facades aethetics.

The Third part shifts to the larger context and physical setting, it comprises five studies and research papers dealing with development and planning contexts and related concepts, rationales and approaches.

The first paper reviews the role of architects and planners in the development process and re-examines the complex interrelation between the designers & community. The paper highlights current thoughts on comprehensive development with emphasis on physical

aspects of development and means of rephrasing the designer's roles in the development drive with special reference to housing.

The following paper briefly reviews urban housing context in Egypt, it highlights endeavours, promising conceptions and actions , seeking solutions to the problem of housing low income families. The paper falls into a sequence of five notes on the problem, outlining its boundaries and pinpointing contextually aware solutions and strategies to surmount it.

The third paper in this part critically reviews the concept, context and features of urban conservation which provides an important tool in the physical development of existing cities. It outlines problem areas and limitations on: the process application and implementation of conservation policies with special reference to older housing areas. Means of appropriating urban conservation processes in those areas are then presented in the form of an open guidelines checklist.

The fourth work in this part turns to the problem of urban form generation for new communities and suggests a modified approach for plan formulation in urban form generation rationales namely: "to enhance the sequential and synthesizing nature of the generative process with emphasis on the evolution of alternative forms rather than on sieving, selection and elimination of options".

The closing theme which the fifth paper in Part 3 undertakes is, architectural & urban character for existing and new communities with emphasis on the latter.
The paper falls into an introduction and three related sections reviewing the features of physical character and means of securing a distinct character for newly developed communities.

The above brief review of the contents of the present work clearly indicates the extents of its range and spectrum which are in turn the collective product of the components, thoughts, views, suggested tools and approaches it comprises.
The rational framework and the continuous stream of conceptions & convictions this work presents were developed through the academic work, applied research and practice undertaken by the authors in the realms of architecture, housing & physical planning during the past two decades or so, and which is reasonably registered in the present selection of published work , dating back to the last

quarter of that period.

The sustained integration between theory and practice, thoughts and application attempted and maintained by the authors throughout their career (professional and academic) is basically what made the present work possible with the context limitations and constraints in mind.

Cairo May 8th, 1987.

PART 1
ON HOUSING UNITS

PART 1 PAPER 1

IAHS- FIU WORLD CONGRESS ON HOUSING
NEW TRENDS IN HOUSING PROJECTS
EMPHASIZING DEVELOPING COUNTRIES
MIAMI,FLORIDA,DECEMBER,1986

A MODULAR PATTERN FOR THE DESIGN OF HOUSING PROJECTS

DR. NASAMAT ABDELKADER

A MODULAR PATTERN FOR THE DESIGN OF HOUSING PROJECTS

Dr. Nasamat Abdel Kader
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ABSTRACT

Industrialized techniques of construction have been introduced to the Egyptian context during the last decade. Accordingly a new approach to the design of housing projects seems to be highly needed. Such an approach would help the designer to take into consideration the constraints of industrialization, mainly calling for standardization and modular coordination, and yet allow the generation of various dwelling designs. The objective of the present paper is to show the steps that have been undertaken in order to reach a systematic approach to design.

INTRODUCTION

Since the SAR group had an already established systematic approach to design, it has been decided that the adaptation of the SAR approach to the Egyptian context would be most helpfull. In order to achieve such an adaptation, the following steps have been undertaken and will be briefly discussed in the present paper:

1- An analysis of plans and configurations of some housing types used in existing housing projects. The analysis allowed identifying the similarities and differences between dwellings.

2- The design of a modular pattern allowing the regeneration of analysed housing types without negleting the constraints of industrialization.

3- A demonstration showing the use of the proposed modular pattern for the design of housing types.

ANALYSIS OF PLANS AND CONFIGURATIONS OF EXISTING HOUSING TYPES

The SAR method is based on the determination of so-called "zones" where certain specified functional spaces are located, and "margins" which separate these "zones", thus allowing maximum/minimum

variations in the dimensions of the functional spaces. The structure of such zones can be traced by means of a methodical analysis of existing plans. For instance, figure (1) shows the analysis of two types of traditional plans commonly used in Egyptian housing projects. A closer look to the analysed plans helps identifying some common features between them, for instance,

1- The depth of the building is occupied by two parallel rows of functional spaces, or, using the "SAR" language two α zones. This is due to the fact that, according to Egyptian by-laws, all functional spaces, including kitchens and bathrooms, should be naturally lit and ventilated.

2- The Areas of dwellings vary from one design to the other.

3- The areas of functional spaces also vary and probably reflect some socio-economic standards of the users. However, a kind of relationship between the dimensions of the functional spaces and the total depth of the buildings seems to be respected, i.e. when the dimensions of the spaces are relatively small, the total depth of the building is less than when the same spaces are larger. The total depth is usually more than double the width of the rooms parallel to the facade.

4- The orientation of the facades could vary leading to buildings with two perpendicular facades.

Accordingly, if any modular pattern of "zones" and "margins" is to be suggested, it should satisfy the following criteria:

1- It should allow getting functional spaces of different dimensions directed to different strata of the society depending on the variations of the socio-economic conditions.

2- It should allow having dwellings of different areas directed to different users.

3- It should provide the possibility of suggesting various internal design for dwellings of the same area.

4- It should allow the redistribution of areas of dwellings within time if some demographic changes call for that level of flexibility.

5- It should allow the generation of different housing types: row houses, walk-ups, towers, etc.

6- It should allow the provision of different building configurations: T shape, L shape, H shape, etc. . .

7- It should allow a flexibility in the arrangement of external layouts.

THE PROPOSED MODULAR PATTERN

It is beleived that the modular pattern should reflect the configuration of the building. Accordingly, the total depth of a building should be easily retraceable on such a pattern, which means that the 2 α "zones" should be well expressed as well as the margins separating and surrounding those zones.

The analysis of traditional designs showed that the two α zones are not equal in depth. The α zone for services (kitchens and

bathrooms) is much smaller and could be half the α zone for other functional spaces (bedrooms and living rooms).Such an assymetry is logical but would complicate any suggested modular pattern. For the sake of simplicity, and in order to provide unequal α zones, it has been decided to suggest first a zone distribution offering 2 equal α zones as shown in figure (2) then subdivide one of the α zones into a smaller α zone for services and a second margin adjascent to the middle margin separating the α zones. The proposed zone distribution is subdivided into "sectors" and the "supports" or the permanent elements in the building are located on the boundaries of those sectors occupying the whole depth of the α zones. Each sector could be designed differently and would provide different combinations of functional spaces as shown in figure (3).

If the pre-established zone distribution is drawn in a repetitive way (i.e. alternative bands of zones and margins), a linear pattern is obtained. Such a pattern would allow having a layout of linear buildings. Such buildings could be shifted to each other causing variations in their total configuration and creating different spines. The one directional modular pattern would act as a guide regulating shiftings between buildings.

However, in most of the layouts, a one directional modular pattern is not enough. There is a need to have a two directional modular pattern to allow switching the directions and configurations of buildings. In order to reach such a two directional pattern, there were a need to find out a relationship between the spans of the sectors (perpendicular to the zone distribution) and the total depth of the building. It has been noticed that, if the same zone distribution previously established is drawn in the perpendicular direction as well, the following dimensional relationships could be achieved:

1- The span of a sector could be equal to an α zone and a margin.
2- The total depth of the building consisting of 2 α zones and 3 margins would be more than double the spans of the sectors which coincides with the finding of the previous analysis.

Accordingly, such a two directional tartan grid, as shown on figure (2), could be most usefull for the generation of dirrerent building configurations and layouts.

Up till now, only the shape and proportions of the modular pattern have been discussed not its dimensions. As mentioned earlier, this pattern should help generating various sizes of functional spaces for users of different socio-economic conditions. Accordingly, it is beleived that this modular pattern should be a strechable pattern that could have different dimensions. For instance, as shown in figure (2);

1- The sector span could be equal to 3.60, the zones and margins being equal to 2,40 and 1.20 (2.40 + 1.20 = 3.60).
2- The sector span could be equal to 3.90, the zones and margins being equal to 2.70 and 1.20 (2.70 + 1.20 = 3.90).
3- The sector span could be equal to 4.20, the zones and margins being equal to 3.00 and 1.20 (3.00 + 1.2) =

4.20).

4- Or any other combination of dimensions.

Thus, the possibility to change the dimensions of the modular pattern gives a flexibility in having apartments of different areas attributed to different sectors of the society.

In order to show the potentialities of the proposed modular pattern and its capacity to generate various housing types, building configurations and layout, two examples will be discussed next with an emphasis on the levels of internal and external flexibility provided

GENERATION OF DIFFERENT HOUSING TYPES USING THE PROPOSED MODULAR PATTERN

The following two housing types have been selected to serve as examples:

A- a walk-up (4 stories high) having a staircase serving two apartments on each floor level. It is an adaptation of the traditional example previously analysed in figure (1).

B- A tower having a vertical core of circulation serving four apartments on each floor level.

For each example, the flollowing points will be discussed:

1- The internal flexibility i.e.
   - The possibility to have various areas of dwellings,
   - The possibility to have different mixes and percentages of dwellings having different areas.,
   - The possibility to have different internal designs for dwellings of same area.

2- The external flexibility, i,e the possibility to achieve variations in the building configuration leading to the variety of external layouts.

TYPE "A" : A WALK-UP WITH A STAIR ACCESS SERVING TWO APARTMENTS

Internal flexibility: Figure (4) shows that for a determined distance between the stairs (equal to five structural modules in this particular example), It is possible to have apartments of different areas (ranging between 30 m^2 and 120m^2 for the given example) with fixed location for the kitchen and bathroom. Thus, even for two subsequent floors, the areas of two apartments could vary without disturbing the location of the technical part (kitchen and bathroom). Such a possibility gives the opportunity to have different mixes of large and small apartments. Moreover, the possibility to increase or decrease the percentage of apartments of a certain area could be achieved by the variation of the distance between the vertical cores of circulation: for instance,

1- If the distance between the stairs is equal to three structural modules, the areas of dwellings could range between 30m^2 and 60m^2.

2- If the distance between the stairs is equal to four structural modules, the areas of dwellings could range between 30m^2 and 90m^2.

3- If the distance between the stairs is equal to five structural modules, the areas of dwellings could range between 30m^2 and 120m^2 and so forth.

This example shows only the variations in areas in case a 3.60 structural module is used. Other variations in areas would be achieved in case a 3.90, 4.20 or 4.50 structural modules are used. Different options for the design of internal spaces could be suggested as well.

External Flexibility: Figure (4) shows that the same housing type could create a spine having different configuration. It also shows the possibility to switch the direction of the spine 90° creating a corner, thus allowing the urban designer a great flexibility for the arrangement of the layout. As mentioned in the description of the modular pattern, the variations in the configuration of the spine is happening according to certain rules. For instance, in case the 3.60 module is used, any shifting in the building line will be equal to 3.60 in order to follow the pre-extablished structure of the modular pattern.

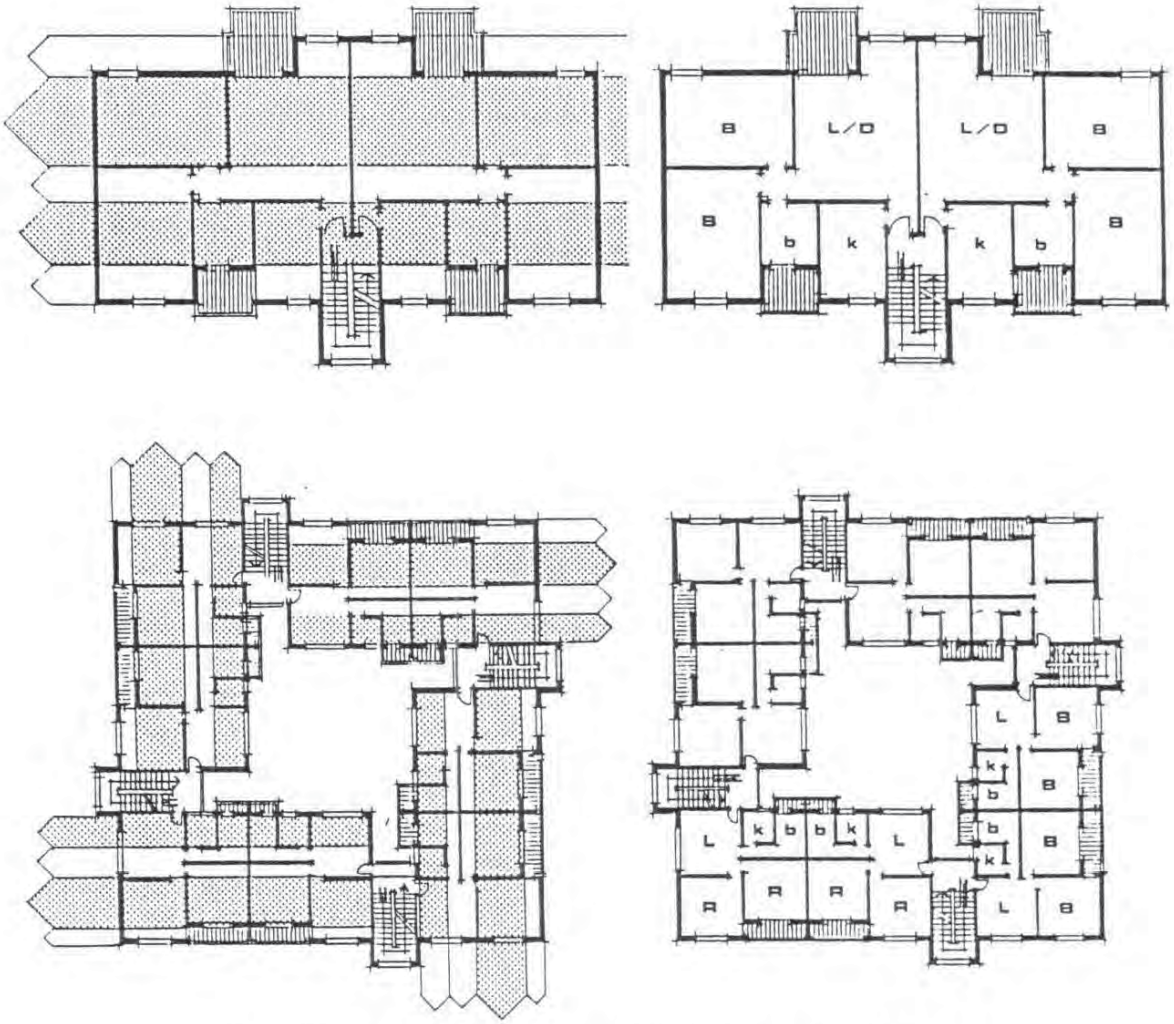


Fig.(1): Analysis of traditional designs

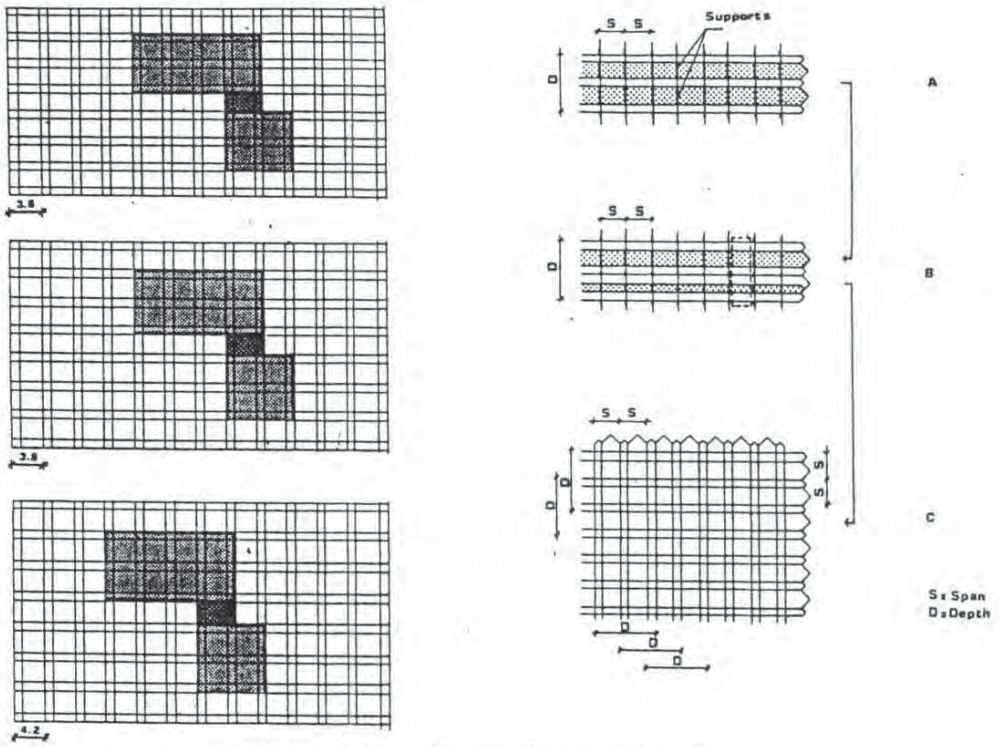


Fig. (2): Zone distribution

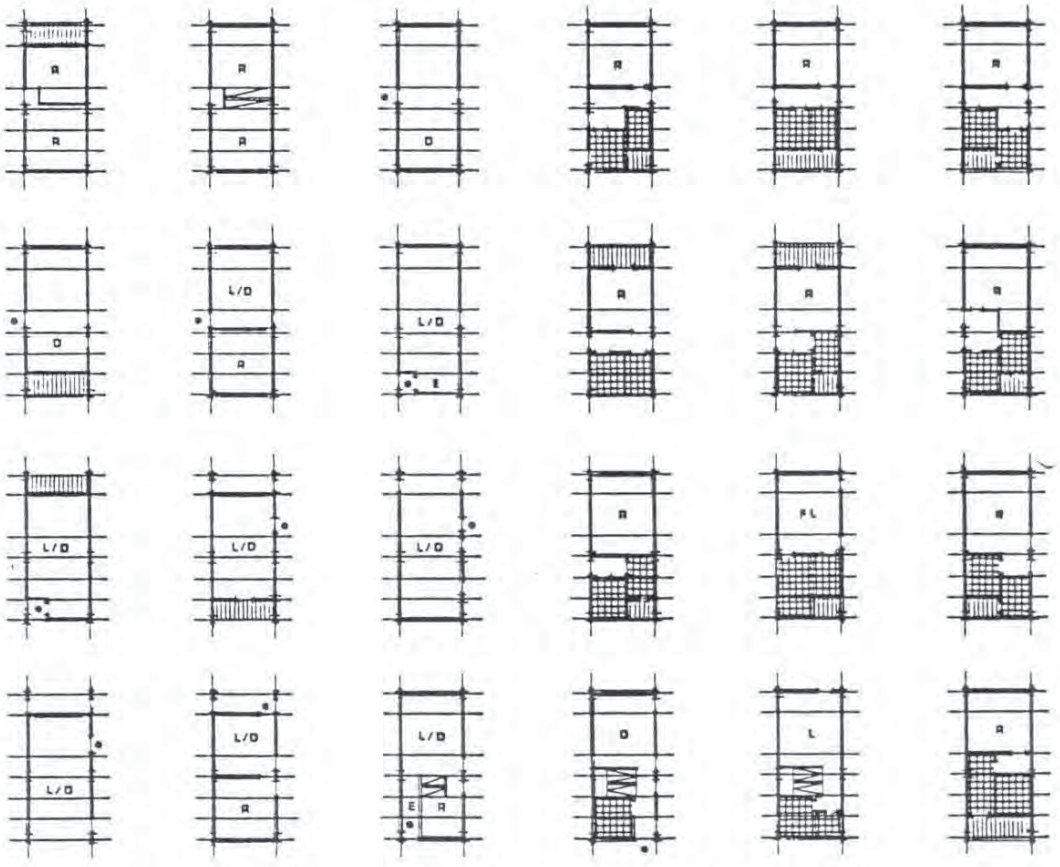
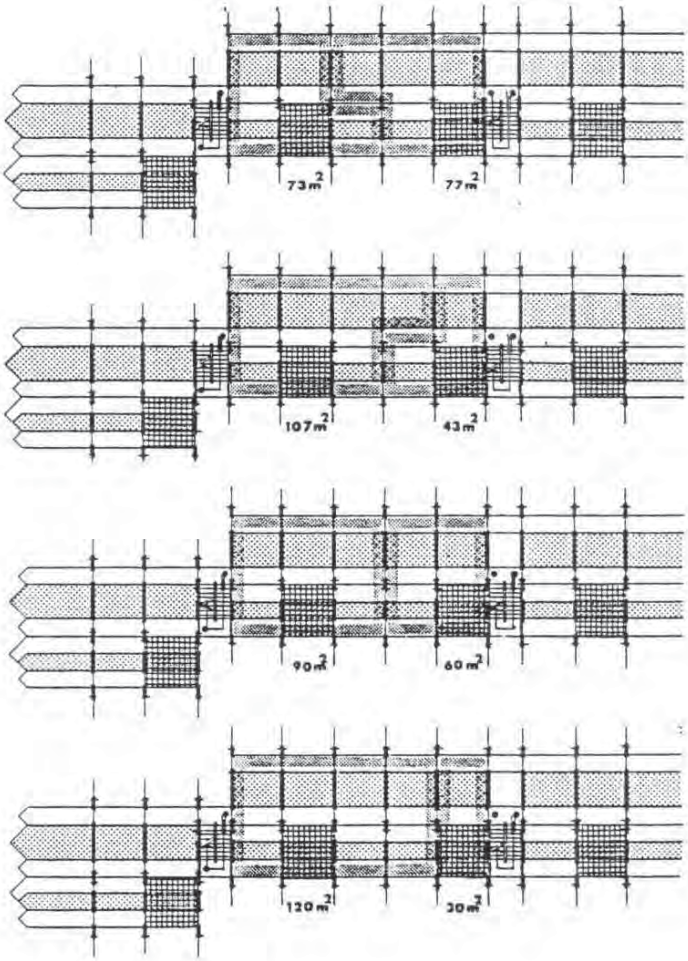
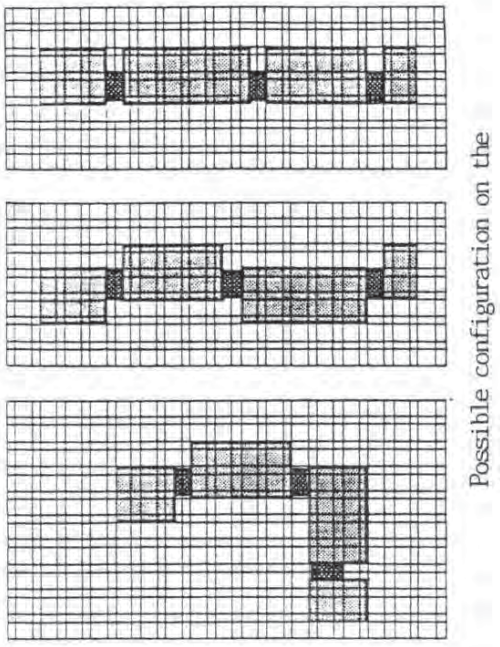


Fig. (3): Alternative designs for the sectors.



Possible areas of dwellings between two vertical cores of circulation .

Possible increase of the area between two vertical cores of circulation.



Possible configuration on the layout.

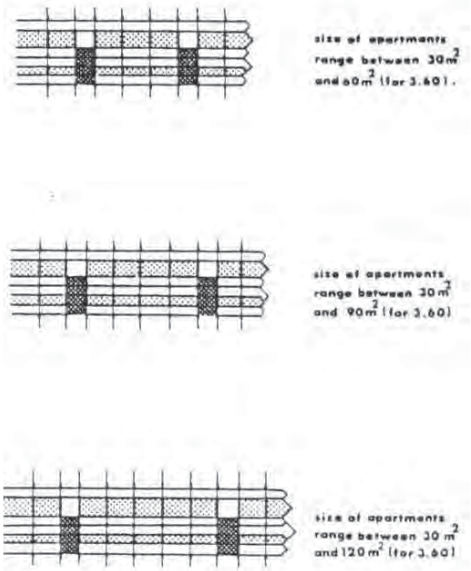
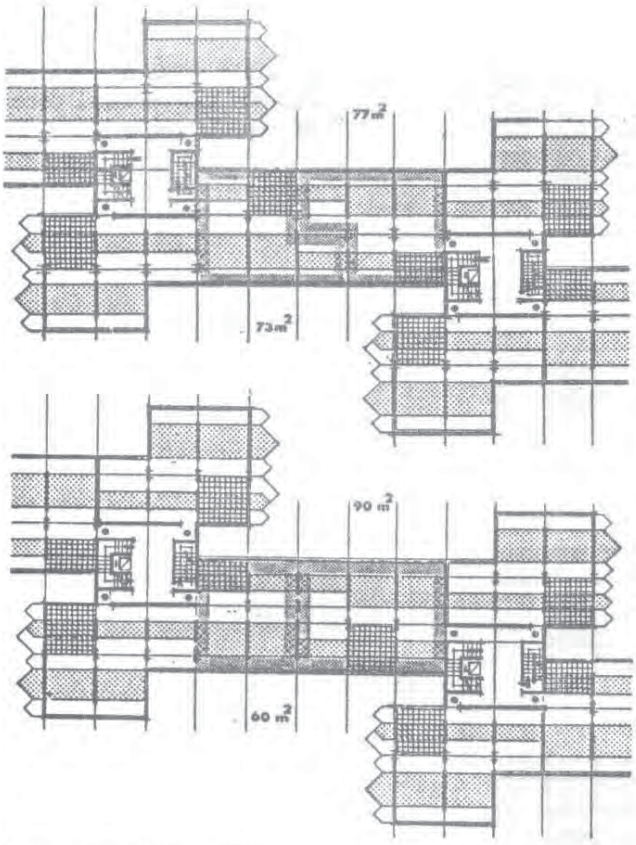
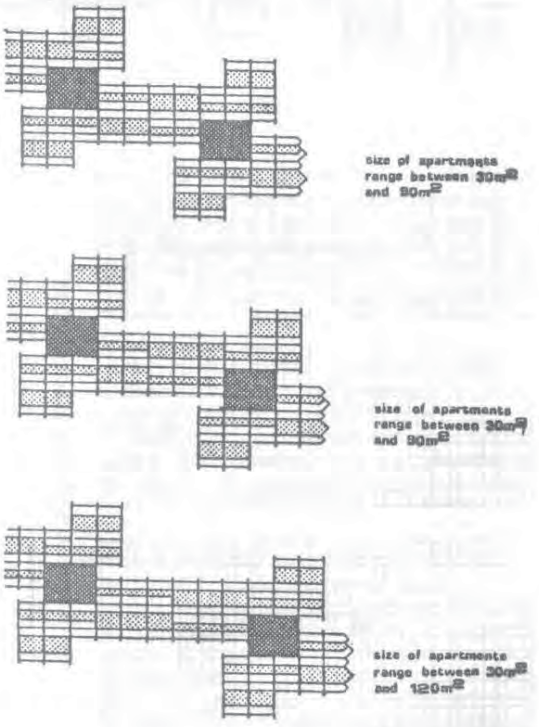


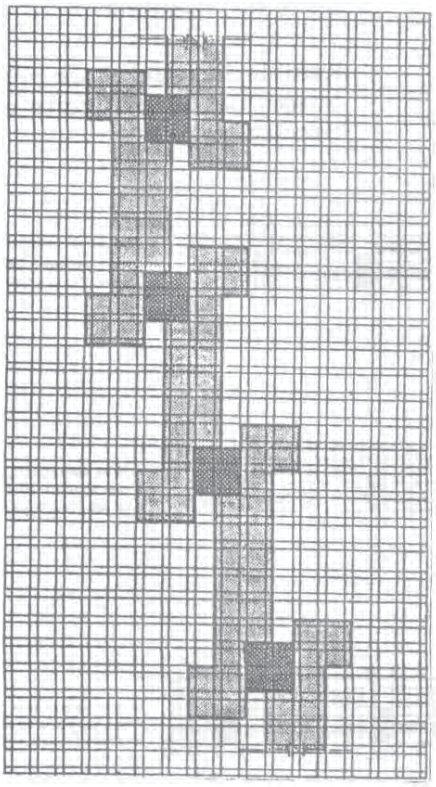
Fig. (4): A walk-up with a stair access serving two apartments



Possible areas of dwellings between two vertical cores of circulation.

Possible increase of the area between two vertical cores of circulation.





Possible cofiguration on the layout.

Fig. (5): A tower with a vertical core serving four apartments.

TYPE "B": A TOWER WITH A VERTICAL CORE SERVING FOUR APARTMENTS

Internal flexibility: as shown on figure (5) the flexibility in dwellings area is only achieved in the distance between the vertical cores of circulation. The end apartments will have fixed areas. Similarly to type (A) the possibility to have different mixes and percentages of apartments of a certain area is achieved by varying the distance between the vertical cores. For each dwelling area, different designs could be suggested.

External Flexibility: Different grouping could be achieved by the use of this type. Interresting variations could also result from having the stairs on the same direction or in opposite directions leading to different building configurations.

CONCLUSION

The analysis of traditional designs according to the SAR method was much helpfull in the identification of the similarities between existing designs. Based on such an analysis, it was possible to develop a modular pattern that could serve as a tool for the designer. It enables him to generate different designs that could be built either traditionally or using the industrialized techniques of construction presently spreading in Egypt.

The proposed modular pattern is designed in such a way as to provide different levels of internal and external flexibility. By internal flexibility it is meant the possibility to have dwellings of different areas directed to different socio-economic levels of the society, the possibility to have different mixes of these dwellings, and to have varied internal designs for dwellings of the same area. By external flexibility it is meant the possibility to have different housing types with different external configurations leading to varied layouts.

In order to show the flexibility of the developed modular pattern it has been used for the redesign of two traditional housing types. The chosen types just served as a mean for the demonstration of the design methodology, the same exercise could be repeated for many other housing types.

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PART 1 PAPER 2

IAHS- FIU WORLD CONGRESS ON HOUSING
NEW TRENDS IN HOUSING PROJECTS
EMPHASIZING DEVELOPING COUNTRIES
MIAMI,FLORIDA,DECEMBER,1986

FLEXIBILITY OF SITE DEVELOPMENT
IN HOUSING PROJECTS

DR. NASAMAT ABDELKADER

FLEXIBILITY OF SITE DEVELOPMENT IN HOUSING PROJECTS

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ABSTRACT

The development of new housing schemes is usually undertaken according to different strategies of action:

- land parcellization could be recommended in a certain scheme, the plots are to be developed by private owners according to pre-established building regulations,
- a whole mass housing project could be developed by the private or public sector, the completed dwellings are available to the user,
- or a mixture of the two strategies

The decision related to the adoption of one strategy or the other is rather difficult and subject to modification during the development process:

- a parcellized land could be developed as a mass housing project,
- or a block reserved to a mass housing scheme could be parcellized and developed by separate owners

INTRODUCTION

The dynamics of the development process call for the existence of an inherent flexibility in the planning of housing layouts.

Such a flexibility should allow switching from one strategy of action to the other without clashing with the main features of the layout especially the location of infrastructure, densities, floor area ratio and so forth.

The present paper discusses the guidelines that ought to be

considered in order to allow such a flexibility in action. This is achieved by an analysis of the features of housing types to be developed on separate plots, the features of housing types to be selected in a mass housing project and, consequently, the common features in the two cases allowing the smooth switch from one strategy to the other.

I. FEATURES OF HOUSING TYPES IN PARCELLIZATION SCHEMES

In parcellization schemes, the suggested areas for plots will probably have an impact on the intervals between lines of infrastructure serving such plots. For instance, in case small plots having an area less than $150m^2$ are to be developed, the intervals between lines of infrastructure will probably be less than in case large plots having an area of about $700\ m^2$ are to be developed. Standards for the recommended routes of infrastructure for plots of different areas have been lately developed (1) and the following intervals have been established.

- in case small plots less than $150m^2$ are required, the intervals between lines of infrastructure could be equal to 36.00m.
- in case medium size plots ranging between $150m^2$ and $450m^2$ are to be provided, the intervals between lines of infrastructure could be equal to 54.00 m,
- in case large size plots ranging between $350m^2$ and $700\ m^2$ are recommended, the intervals between lines of infrastructure could be equal to 72.00m.

The building regulations for the development of separate plots will not be the same for plots of different areas. For instance, if a 50% coverage area is suggested for plots of $700\ m^2$, such a percentage wouldn't be recommended for plots of $150m^2$. The building regulations will vary for plots of different areas and consequently will have an impact on the main features of the housing types to be designed. In order to show such an impact , two cases will be discussed:

1- features of housing types on plots less than $150m^2$
2- features of housing types on plots of $350m^2$ to $700m^2$

In case small plots less than $150m^2$ are to be developed, the depth of such plots will vary between 12,00 and 15.00 meters.

The facades beeing usually narrower than the depths, the building regulations for such plots will probably allow having attached buildings. The percentage of covered area could range between 60% and 70% of plot area. The open spaces (30% to 40%) represent a court located in the back side of the plot. Such regulations will have the following impact on the housing type:

- the depth of the house will range between 8.40m and 10.5 m, which means that a double aspect dwelling could be designed.
- the height of the house will be restricted. The two back to back inner courts will provide a distance ranging between 7.20 and 9.00 meters. Thus buildings two to three stories high could be recommended in order not to overshadow ground floors.

On the other hand, in case large plots of 350 m^2 to 700 m^2 are to be developed, the depth of such plots will vary between 30.00 and 33.00 meters. The suggested coverage for such plots is usually 50% to 60% of the area. In case attached buildings are allowed, the depth of the house will range betwenn 15.00 and 19.80 meters. A 19.80 depth in Egypt is usually not designed as a double aspect dwelling. The Egyptian bylaws call for the natural lighting and ventilation of internal spaces (including kitchens and bathrooms). Thus , a 19.80 depth cannot be occupied by only two functional spaces, each outlooking a facade. In this case, a court or pocket (having a minimum dimension of 3.00 m) is suggested in the mid-distance of the 19.80 depth, and two single aspect dwellings are designed, each outlooking one main facade and an inner facade on the court or pocket. The depth of such a building will then vary between 22.80 and 24.00 m.

The suggested coverage area will then have an impact on the depth and height of the suggested housing types:

- deep buildings will be suggested with small courts and pockets for the natural lighting and ventilation of inner spaces.
- the open spaces representing 40% to 50% of the plot will partly occupy the back side of the plots. Two back to back open spaces will probably range between 15.00 m and 18.00 m. Thus, four to five floors could be suggested.

The same analysis could be repeated for back to back plots of various depths.

II. FEATURES OF HOUSING TYPES IN MASS HOUSING PROJECTS

A similar analytical approach could help in identifying the main features of housing types for mass housing projects. In such projects, the cluster is usually considered as being the basic molecule that governs the layout. Such cluster usually consists of a group of buildings outlooking the smallest open space in the hierarchy of open spaces provided for the scheme. In such a cluster, the minimum total depth consisting of two parallel rows of buildings and the space in between will vary according to two factors:

1- the height of the buildings
2- the depth of the buildings

Impact of The Height Upon The Minimum Depth of The Cluster:

Providing a minimum distance allowing privacy between two rows of buildings, such a distance will remain constant for a certain height of such buildings (one, two, three stories). However in case high rise instead of low rise buildings are considered, such a distance will probably vary in order to prevent the over-shadowing of dwellings at lower floors. This means that the total minimum depth of a cluster consisting of 2 stories buildings will probably be less than a cluster of 12 stories buildings.

Impact of Building Depth Upon The Minimum Dimension of The Cluster:

As mentioned earlier, Egyptian building regulation and bylaws had an impact on the design of housing types. In order to provide

natural lighting and ventilation for all functional spaces in the dwelling, two categories of housing types emerged:

1- the narrow housing types
2- the deep housing types

By narrow housing types it is meant dwellings having two aspects. The stairaccess serving two apartments on each floor level is a typical example of such narrow types. The total depth of the dwelling (consisting of two rows of functional spaces) would vary between 7.20 and 12.00m. Other examples of narrow buildings are: row houses, gallery types...

By deep housing types it is meant dwellings having a single aspect The stairaccess serving four dwellings on each floor level is a typical example. In fact, as an abstraction, a deep building could be considered as two narrow buildings linked to each other through the vertical core of circulation and separated by the minimum allowable distance for inner courts or pockets for the natural lighting and ventilation of functional spaces (3.00 m in Egyptian bylaws). The total depth of deep bruilding would then vary between 21.00 and 27.00 meters. Other examples of deep buildings are court houses.

In case only narrow buildings are used in a cluster, the minimum depth of such a cluster will probably be less than the minimum depth of a cluster using a mixture of narrow and deep buildings or a cluster consisting only of deep buildings.

III. FLEXIBILITY OF SITE DEVELOPMENT

The previous analysis showed that:

- In parcellization schemes, the areas of the plots, the intervals between the lines of infrastructure have an impact on the building regulations suggested for the plots. Such regulations would lead to some recommended characteristics of the housing types in terms of their depth and height.
- In mass housing schemes, the depth and height of the housing types have an impact on the minimum depth of the cluster and consequently on the distance between the lines of infrastructure serving such a cluster.

Such a relationship between the intervals of lines of infrastructure and the suggested height and depth of housing types could serve as a key to the possible change in strategies of development. It means that, in case a parcellization scheme is converted to a mass housing project, the housing types selected for the project and forming the clusters should be within the preset regulations for plots development in order to get advantage of the predesigned infrastructure. It also means that, in case a site reserved for a mass housing project is parcellized, the building regulations for the suggested plots should allow the best use of the previously studied routes of infrastructure and create at the end of the development the same clustering effect forseen for the mass housing project.

Accordingly, if a relationship is established for the intervals

between lines of infrastructure and the recommended depths and heights of housing types, the planner and designer could easily switch from one strategy of development to the other.

Based on the previous analysis, the following guidelines could be suggested:

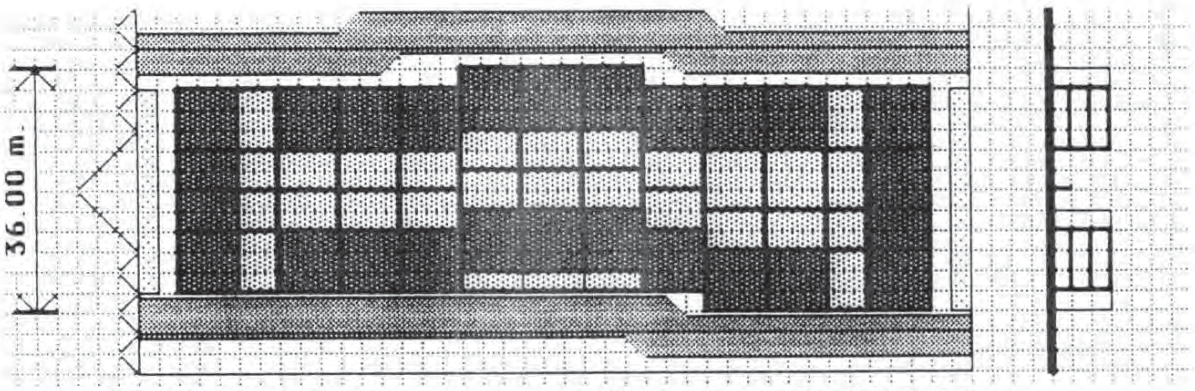
1- In case the intervals between lines of infrastructure are equal to 36.00 m:
   - In parcellization schemes, 60% to 70% of the plot could be built , buildings are of the narrow type, their height should not exceed two to three floors.
   - In mass housing schemes, narrow buildings are recommended (row houses, town houses, stairaccess serving two apartments) their height should not exceed two to three floors.

2- In case the interval between lines of infrastructure are equal to 54.00m
   - In parcellization schemes, 55% to 65% of the plot could be built. Buildings are of the narrow type their height should not exceed four to five floors.
   - In mass housing projects, two cases are possible:
     - narrow buildings are used, height not exceeding four to five floors,
     - a mixture of narrow and deep buildings could be used, height not exceeding four to five floors.

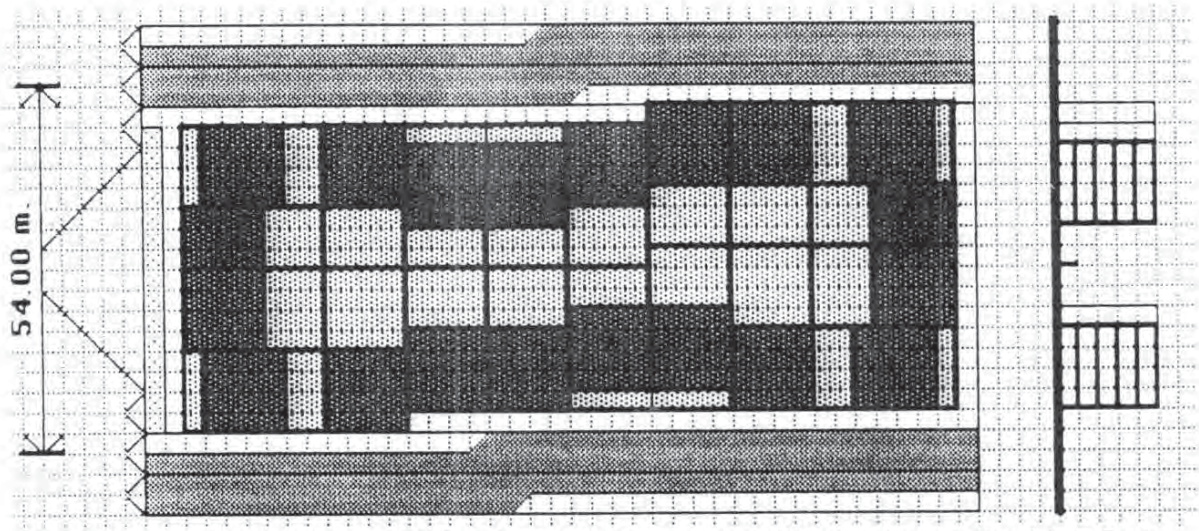
3- In case the intervals between lines of infrastructure are equal to 72.00 m:
   - in parcellisation schemes, 50% to 60% of the plot could be built. Buildings are of the deep type, their height should not exceed four to five floors.
   - in mass housing projects, deep buildings are recommended (a stairaccess serving four dwellings is an example). Their height should not exceed four to five floors.

CONCLUSION

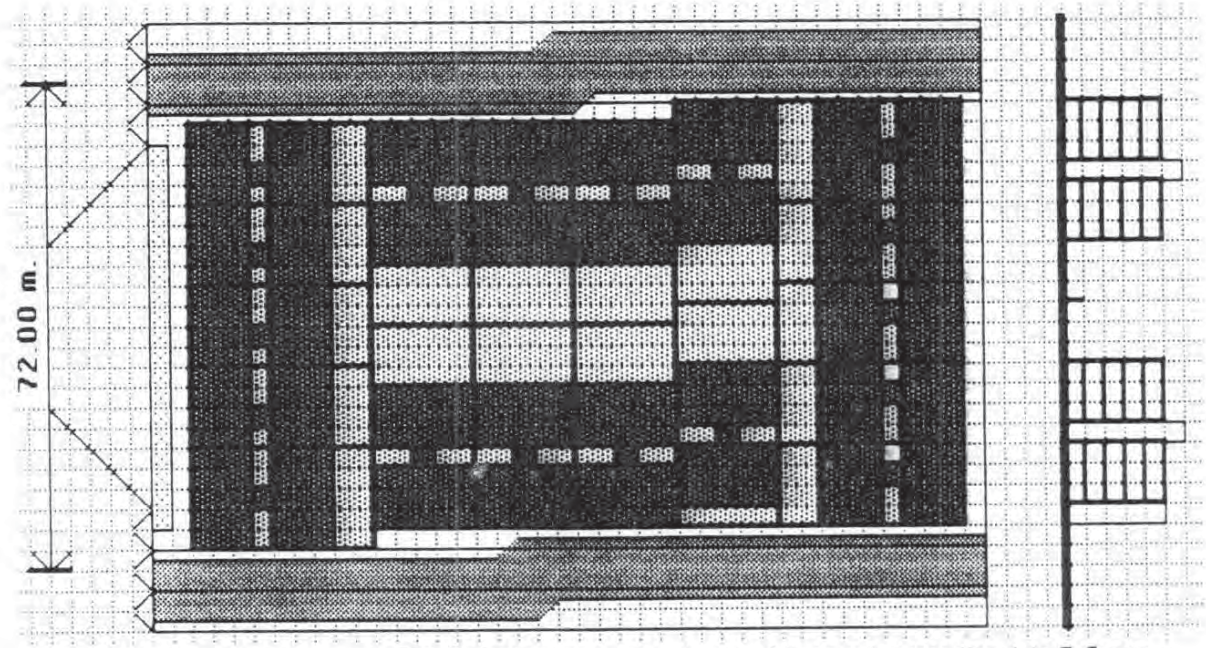
A change in the strategies of development for housing projects could always occur. A parcellization scheme could be developed as a mass housing project and vice versa. The switch from one strategy of development to the other could be done smoothly in case well studied guidelines are given to the designer and planner. The present paper is a trial in this direction. It helps recognizing the common features of the housing types for parcellization schemes and for mass housing projects. Such common features are mainly related to the heights and depths of the housing types on one hand and to the intervals between lines of infrastructure on the other hand.



Areas of plots less than 150 sq.meters : narrow buildings not exceeding 2 to 3 floors

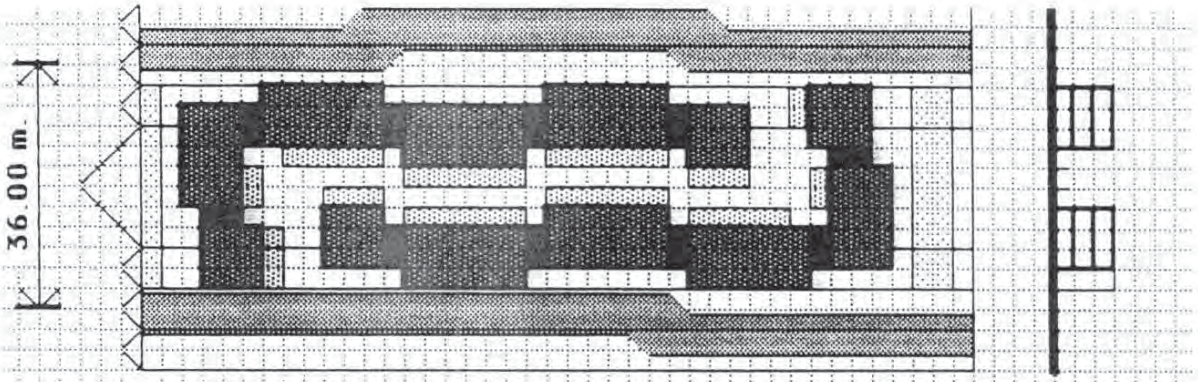


Areas of plots ranging between 150 & 450 sq.meters : narrow buildings not exceeding 4 to 5 floors.

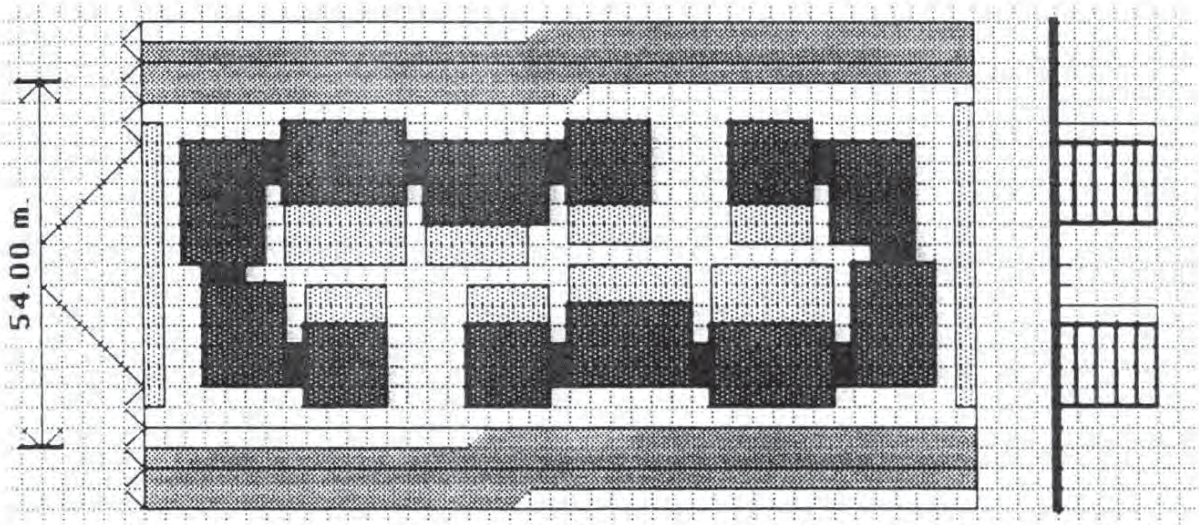


Areas of plots ranging between 350 & 700 sq.meters : deep buildings not exceeding 4 to 5 floors.

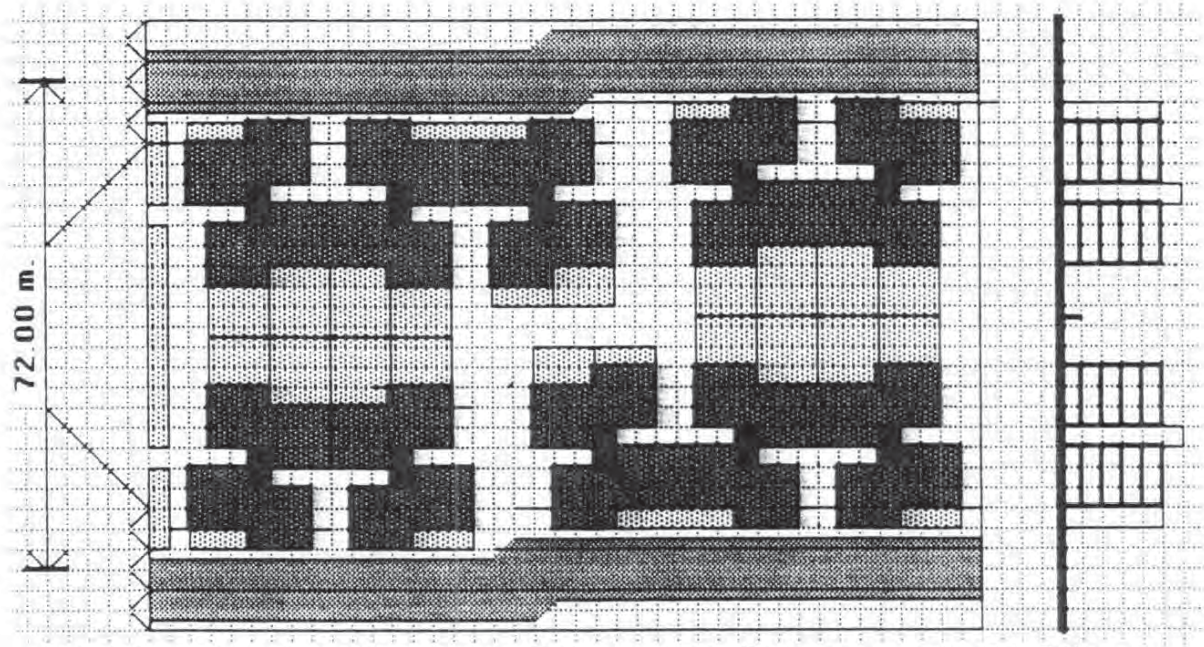
Fig.(1) Recommended depths and heights of buildings in parcellisation schemes .



Intervals between lines of infrastructure = 36.00 m. : narrow buildings not exceeding 2 to 3 floors.



Intervals between lines of infrastructure = 54.00 m. : narrow buildings not exceeding 4 to 5 floors.



Intervals between lines of infrastructure = 72.00 m. : deep buildings not exceeding 4 to 5 floors.

Fig.(2):Recommended depths and heights of buildings in mass housing schemes.

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INTERNATIONAL CONGRESS ON HOUSING
THE IMPACT OF ECONOMY AND TECHNOLOGY
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HOUSING FOR A NEW SETTLEMENT IN SINAI

DR. NASAMAT ABDELKADER

PART 1 PAPER 3

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HOUSING FOR A NEW SETTLEMENT IN SINAI

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ABSTRACT

New settlements in desertic areas are encouraged by the Egyptian Government in order to increase the area of agriculture land. It is believed that the inhabitants of such a settlement will participate in the construction and expansion of their houses. Such an attitude seems to be in harmony with the pattern of life in rural areas where people do have the time to participate in the construction activity. In order to assure such a participation, it is recommended to provide small standard components easy to erect instead of just providing the traditional building materials. Based on the discussion of design criteria, the present paper proposes alternative designs for expandable houses that could be erected with standard components.

INTRODUCTION

The present policy of the Egyptian Government tends to direct the newly graduated university students to work in the development of desertic areas in order to increase the area of agriculture land. In order to implement such a policy, pilot projects are to be started soon in five different areas. The one considered in this paper is located in Sinai on the East Bank of Suez Canal. 3000 acres of land will be given to 200 university graduates, each having 15 acres. The population of the new settlement will consist of the university graduates coming from Urban areas as well as farmers coming from rural areas. What would be the main features of the housing scheme for such a population ? This is in fact the main objective of the present paper.

It is believed that the design of the housing units and housing groups for such a population will be affected by certain political, technical, economic and socio-cultural factors. Those factors anf their impact on the design will be discussed in this study.

BASIC CRITERIA OF DESIGN

From The Political Point of View:

It is believed that it is not possible to offer a large house either to the farmer or to the graduate. Such a large house would be:

First, too expensive for them and beyond their affordability to pay,

Second, too large for the average size of the families at the beginning of their migration.

Perhaps, it would be better to give them the concept of a house that could be expanded within time according to the needs and resources of the family. In this case, the inhabitants of the new settlement will participate in the construction and expansion of their houses. Such an attitude seems to be in harmony with the pattern of life in rural areas where people do have the time to participate in the construction activity.

From The Technical Point of View:

In order to assure the participation of the user in the expansion of his house, it is recommended to offer him small standard components easy to erect instead of just providing the traditional building materials. Such small elements could be a system of beams and hollow blocks for the slabs, or a system of small hollowed slabs, or any other elements that could be easily handled with (or even without) simple equipment.

In order to take advantage of the suggested simplified method of construction, it is recommended to offer a variety of designs that respect the same structural module either for the farmer or the graduate house.

From the Economic Point of View:

In order to minimize the cost of the infrastructure of these houses [electricity, water, sewage, etc...] it would be recommended to build them on narrow and deep plots. Such plots should in the same time have an area that is sufficient to build the house and provide a private vegetable garden for the user.

From The Socio-cultural point of view:

It is not recommended to propose one single design for the farmer house or the graduate house. A variety of alternatives would allow a better personalization of the housing unit and the surrounding environment.

All recommended variations of design should take into consideration the socio-cultural pattern of the graduate or the farmer life. They should allow the vatious levels of privacy needed to undertake the daily activities.

From the Environment Point of View:

In order to have an appealing image of the village at its early stages and in order to protect its general environment, it is recommended to start building all housing spaces outlooking the streets; the expansion of the house would happen inwards in the back garden.

Based on these criteria, various housing types have been designed as will be discussed hereafter.

MAIN FEATURES OF THE HOUSING TYPES

Housing Types for Farmers and Technicians:

General Characteristics of the House:

Those houses are mostly directed to people originally coming from old rural areas. The analysis of the traditional houses in such areas enabled the recognition of some common features that should be respected in the new designs. For instance:

- The housing spaces outlooking the streets are always reserved for the entrance and the reception room (Mandara). They are never used for bedrooms or services (kitchen and bathroom).

- The bedrooms and service core are always on the inside having their openings on an inner court.

- The inner court is always provided in these houses not only for the ventilation of inner spaces but also to be used as a functional space in which many of the daily activities of the house wife are taking place such as food preparation and laundry washing. Accordingly, this court is usually in direct relationship with the kitchen and bathroom.

- The roof is always accessible with a stair usually located in the inner court. The roof is used for many purposes such as storing grain, hanging laundry, piling dry wood, etc.

Based on these features and on the previously analysed and identified set of criteria, it has been decided to chose the U shape for the design of the farmer and technician house. This U shape helps creating the prescribed inner court. The houses are built on plots of about 300 m^2 to 380 m^2 having a facade of 8.40 and a depth ranging between 36.00 and 45.00. Each plot would allow building a house of about 100 m^2 and leaving a vegetable garden of about 200 m^2 to 280 m^2. The plot is outlooking two parallel paths : one is reserved for pedestrians and the main entrances of the houses, the second is reserved to vehicles and domestic animals specially in case the barns are located within each plot because usually the traditional farmer insists to keep his animals in his house.

As for the design of the houses, the structural spans have been standardized in order to be able to use standard components for erection. The facade of the plot allows building two structural spans 4.20 each. In spite of that standardization, three different concepts, each generating 6 different

designs, have been suggested. The farmer or technician could choose any of the 18 designs and built it with the same standard components.

- In the first conceptual design, a strong relationship is established between the service core (kitchen and bathroom) and the inner court. The 6 alternative designs mainly vary in the details related to the location of the stairs leading to the roof and the shape and proportion of the entrance.

- In the second conceptual design, as shown on figure (1), the location of the service core allows a strong relationship between the kitchen, the inner court and the vegetable garden in the back. Different alternative designs are suggested within that concept.

- In the third conceptual design, the location of the service core allows a strong relationship between the kitchen and the vegetable garden. Again, different alternative designs are generated within the same concept.

The 18 designs have been evaluated in order to select two of them to be built as prototypes at the early stages of the village. The chosen designs have the service core in connection with the back garden in order to be able to use the back street for the infrastructure (water, sewage,...etc.) and keep the front street clean for the pedestrians. The chosen designs provide in front of the house an open space that could be used for social meetings. The area of the ground floor after completion is about 82 m^2; a second floor could be added in case the family is largely extended. Figure (2) shows one of the selected designs.

Different Stages of the House Expandability

Various alternatives could be suggested regarding what should be given to the user at the beginning and what could be left to be completed in a later stage. For instance:

- First option: Only the entrance and reception room are built at the beginning in order to control the environment of the street. The service core is also completed but the rest of the spaces are left to the user to be built later on.

- Second option: This option is much similar to the first one but adds a closed bedroom to the user in order to give a better incentive for the migration to the new settlement.

- Third option: In this option it is recommended to complete the roof of the ground floor and to finish only the entrance, the reception room and the service core.

It is believed that the third option has many advantages: first, it assures the realization of the prestudied U shape; it helps the rapid expandability of the house because it is much easier for the user to build a wall than to erect a roof.

Housing Types for the Graduate:

General Characteristics of the House:

The type of daily activities for a graduate family coming from an urban area would probably differ from the activities of farmers originally coming from

rural areas. For instance, the concept of an inner court in the house is not needed once there is a private garden for the outdoor living. Accordingly, a different housing type is needed for the graduate, this housing type is a kind of attached town houses two stories high. Two examples of this house have been designed, one of them could be built on the same plot of the farmer house having a facade of 10.80. Both designs are respecting the same structural module used for the farmer house and could be erected by the same standard components.

The first type consists of a ground floor having a living area, two bedrooms, a kitchen and a bathroom outlooking the back garden and a staircase leading to the first floor. The area of each floor is about 100 m^2 as shown in figure (3).

The second type consists, also of a ground floor having a living area, two bedrooms, a kitchen and a bathroom outlooking the back garden and a staircase leading to the first floor. However, the staircase is not in the middle of the house as in the first type. It is located near the entrance so that in case the owner would like to rent the upper floor to a separate family he could do it without risking his own privacy. The area of each floor is about 100 m^2.

Different Stages of House Expandability:

It is believed that the minimum house to be provided to the graduate should consist at least of a living room, a closed bedroom and a service core. Accordingly, and in order to protect the image of the street as previously suggested, the ground floor could be built without the second bedroom outlooking the backgarden; this room could be completed in a later stage.

MATERIALS AND METHODS OF CONSTRUCTION

As for the building materials to be used, the investigations showed the existance of stone quarries near the site that could provide the meterial for bearing walls. In the same time, a new factory on the East Bank of Suez Canal will start producing shale bricks within six months. This factory will equally produce other small components from the shaly material: such as T section reinforced beams and special hollow blocks for the roof as well as reinforced columns.

According to this information, the vertical load bearing elements for the houses could be:

- Bearing walls built with stones or shale bricks.
- Prefabricated columns on equal spans.

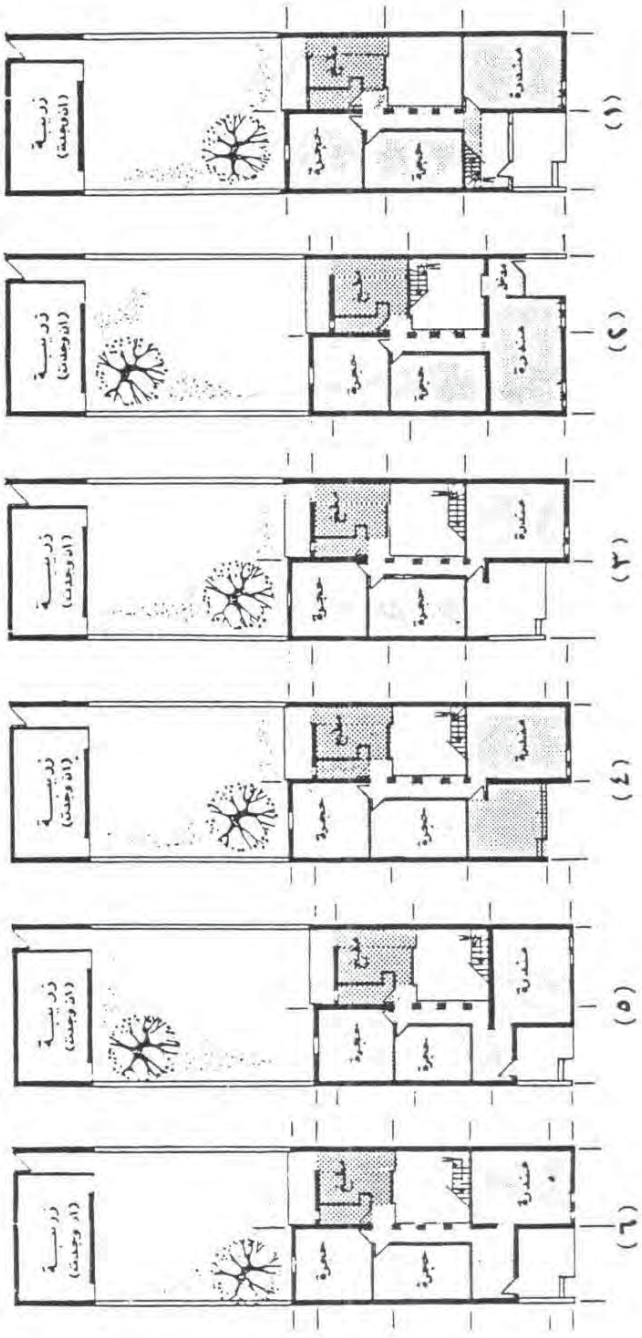
The horizontal bearing elements could be:

- Prefabricated beams with hollow shale blocks in between as shown on figure (4).
- Small hollowed concrete slabs.

As for the non bearing facades of the houses, they will be built either with stone or with shale bricks. In both cases, the facades will be left without plastering. Accordingly, as shown in figure (5), the elevations of the houses express the idea of using exposed materials. The lintels for doors and windows are prefabricated concrete elements designed to span the opening and be left without any plastering.

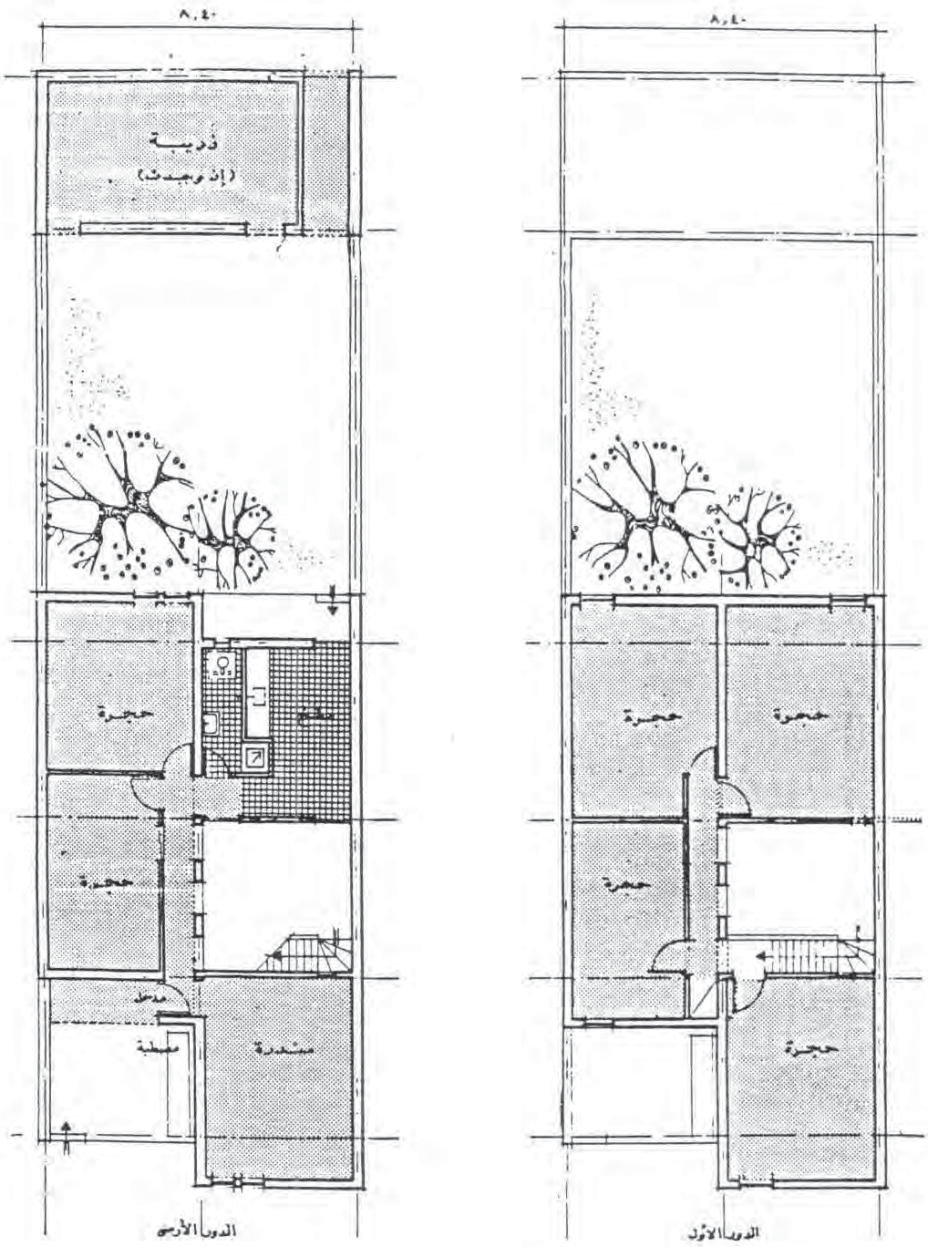
CONCLUSION

The study just showed some possible design variations. Many others could be suggested respecting same modules and using same building elements.



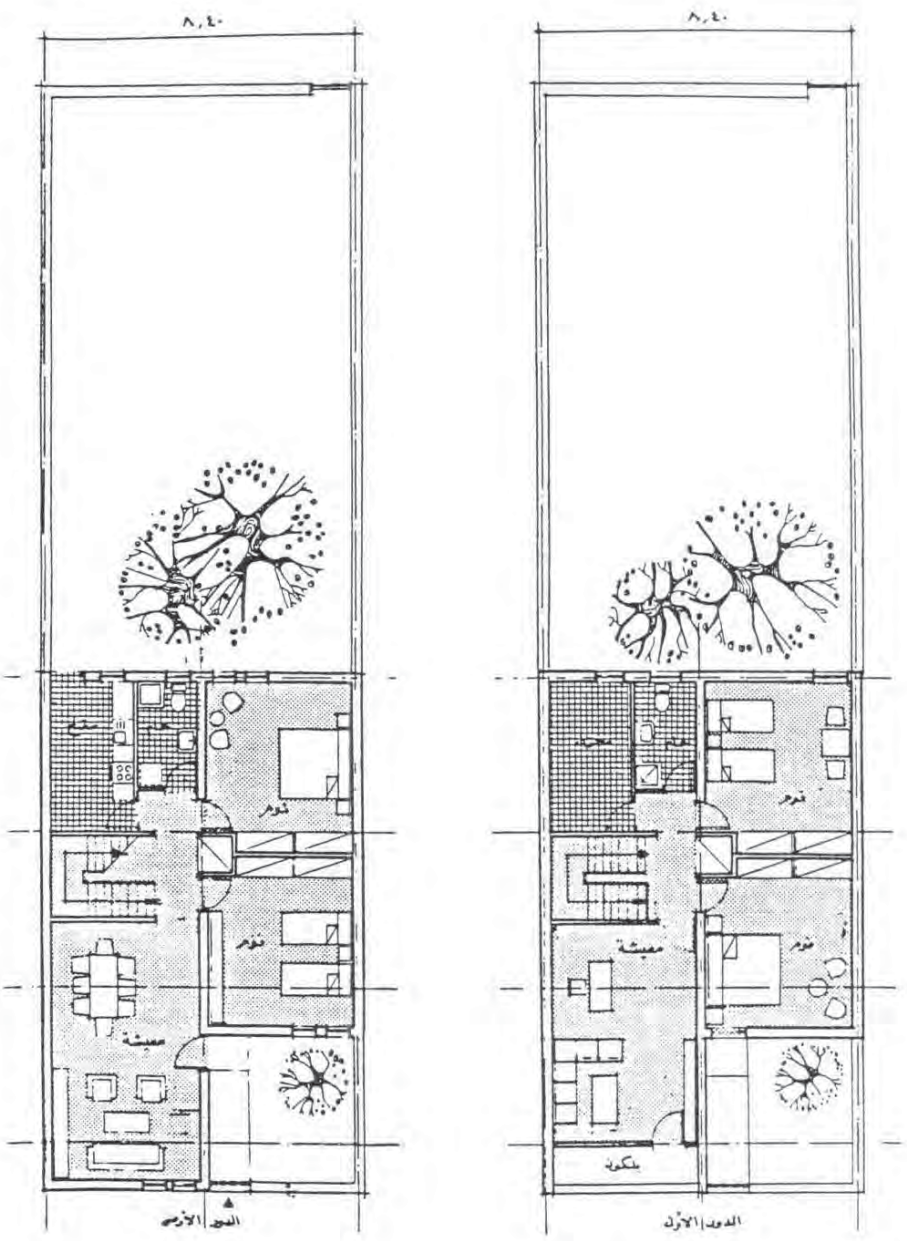
شكل (٢) البديل الثاني لمسكن الفلاح والعامل ومجموعة الحلول الممكن تحقيقها

FIG. (1)
Second Conceptual Design For The Farmer House



شكل (٤) النموذج الأول لبيت الفلاح والعامل

FIG (2)
First Prototype Of The Farmer House



شكل (١١) النموذج الأول لبيت الخريج

FIG (3)
First Prototype Of The Graduate House

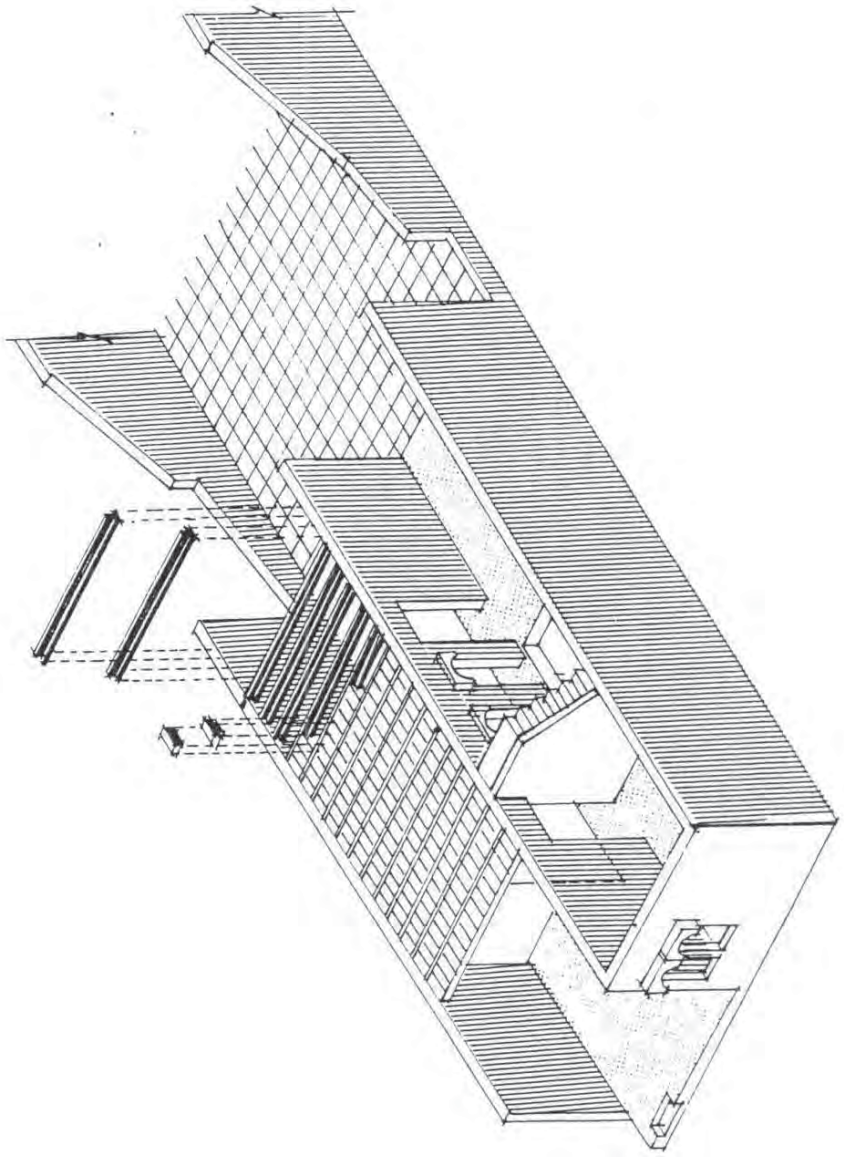


FIG (4)
Use Of Bearing Walls, Prefabricated Beams and Hollow Blocks

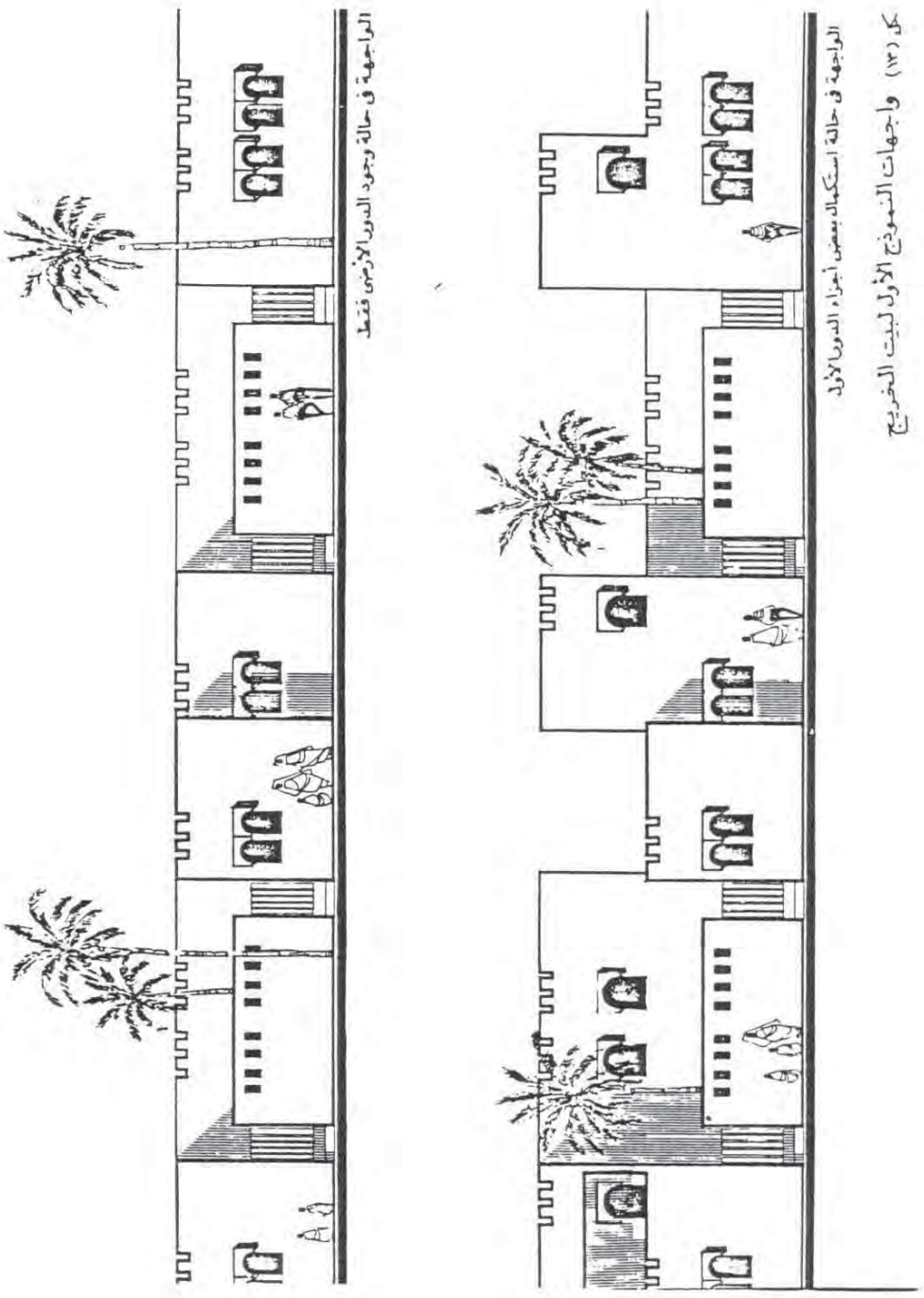


FIG (5)
Suggested Elevations

PART 1 PAPER 4

IAHS WORLD CONGRESS ON HOUSING
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USERS PARTICIPATION IN LOW COS HOUSING - A CASE STUDY

DR. NASAMAT ABDELKADER

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USERS PARTICIPATION IN LOW COST HOUSING

A CASE STUDY

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ABSTRACT

El-Obour City is one of the planned new towns expanding around Cairo. The city is 25 km northeast of Cairo Center. Some 15000 persons are presently employed in the industrial area 2 to 5 km of El-Obour City. The majority of these workers commute from Cairo. It is believed that housing for these workers will provide the nucleous for the first district to be developed in El-Obour City. The objective of the present report is to discuss the main directions that could have an impact on the design of the residential areas for this district.

INTRODUCTION

The housing scheme for the first district is directed to low income settlers that should be accommodated in El-Obour City without relying on heavy government subsidies. Thus, if users would prefer to invest in their own houses, they should get the opportunity to participate in the development process with guidance and help from the development agency.

It is believed that in order to allow such a participation, the following aspects should be taken into consideration:

1- The Economic Aspect
2- The Organizational Aspect
3- The Technical Aspect
4- The Environmental Aspect
5- The Social Aspect

Each of these aspects is briefly discussed next in order to understand its implications on the design process for the first community.

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THE ECONOMIC ASPECT

The possibility to reduce the government subsidies could be easily understood when the various phases of a development scheme are clearly identified. Such phases could be:

- The provision of the necessary infrastructure
- The erection of the main bearing elements of the housing unit
- The internal and external finishing of the units.

Each of these phases could be achieved according to an incremental process.

In order to reduce the government subsidies, it is preferable to limit its role to the execution of phases that need to be done by a large body such as the provision of the infrastructure. As for the subsequent phases of development, they could be financed by the users according to different scenarios; for instance:

- In case small plots are provided, the government financial contribution at the early stages of development could either be limited to the provision of the infrastructure or extended to the erection of a basic core of a limited area.

- In case flats are provided, the government financial contribution at the early stages will probably be larger than in case of small plots since the government will have to give the infrastructure as well as the bearing skeleton of the buildings.

The economic study presented by Wheaton, W.C., at Core Housing Seminar (1), recommends the provision of long-term mortage financing at realistic interest rates. The study shows that users are ready to invest in the expansion of their dwellings and such investment is usually much higher than what is expected from people with limited income. The informal sector in Cairo is a very good example of this situation. However, the organizational mechanism of the process needs to be understood to assure the active participation of the users.

THE ORGANIZATIONAL ASPECT

In order to allow users participation in the development process, it is necessary to understand the existing organizational process that is governing the informal Housing in Cairo. The Dames and Moore/ABT/GOHBR study (2) undertaken in 1981 helped identifying:

- The sources of finance for the process
- The sources of labour
- The sources of materials and components

The study showed that the user is not usually building with his own hands and prefers to hire small contractors and unskilled labourers to do the job. The same remark was indicated by Wheaton, W.C., (1). According to him, in a growing country like Egypt with little unemployment, it is quite common for low income settlers to have two jobs (a morning and an evening one); in such a case, the user will not have the time to participate physically in the building process.

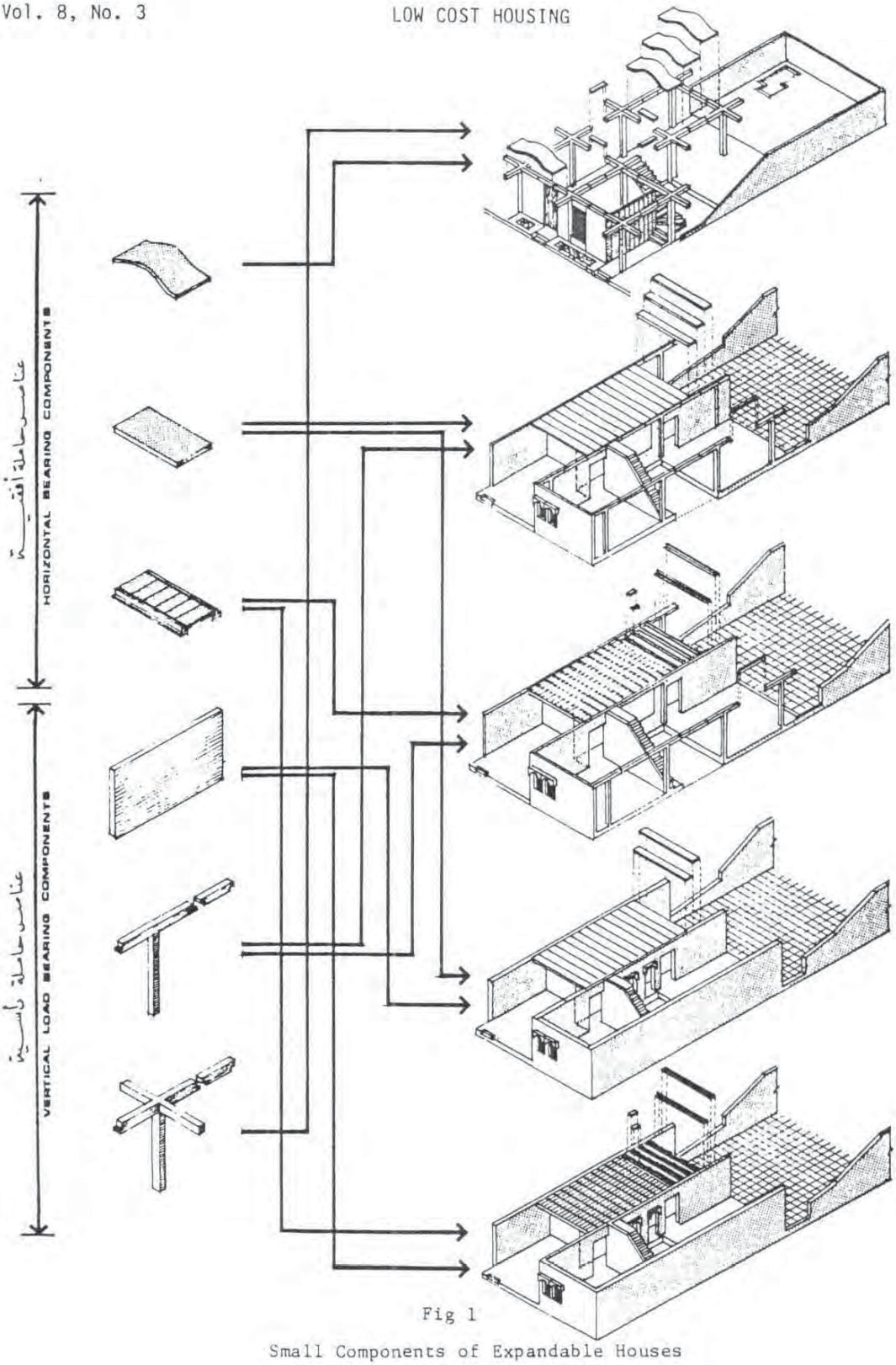


Fig 1
Small Components of Expandable Houses

The Dames and Moore/ABT/GOHBR study (2) showed the size of operations undertaken in the informal sector [most of the time just adding one room] which are in harmony with the capacity of the small contractors in this sector and with the amounts of savings of the settlers.

The understanding of the organizational process in the informal sector shows the improtance of the creation of a body that would play the same role for the development of the new settlement. Such a body could help the users on two levels:

- On the design level: the body could provide the users with a catalogue of alternative solutions for the plots or flats with precise information on the cost of achieving such designs in different phases The body could as well enlighten the user on the various sources of finance that could help him building his housing unit.

- On the execution level: the body could help the users and the small contractors to get the necessary material and components. It could even give higher services to the small contractors by allowing them to hire some equipment to help achieving the work in a better way.

However, if the expandibility process is accomplished in a traditional way as for the informal sector, there is a risk to create messy sites that destroy the image of such a new settlement. This point leads to the discussion of the technical aspect of the process.

THE TECHNICAL ASPECT

In order to encourage the expandability process with as little damage as possible for the existing building and without creating messy sites, it is recommended to provide some standard small components instead of just providing the traditional building materials. Such small components could be a system of beams and hollow blocks, a system of flat or vaulted slabs or any other components that could be easily handled with (or even without) simple equipment, (see figure 1):

- In case houses on separate plots are to be built, components should allow spanning some acceptable room sizes. Structural modules of 3.60, 3.90, or 4.20 could be recommended. Plot sizes will probably be a multiple of such modules and the smallest plot could have a facade of 5.40 [3.60 + 1.80] or 7.20 [3.60 x 2].

- In case flats are to be provided, the load bearing structure could be erected first and the internal subdivision of the flats and the closing of the facades could be achieved by the users according to an incremental process. Standard small components for the partitions and the facades could be provided to the users and small contractors to minimize the risk of a messy image all around the project. (see figure 3).

However, the provision of standard prefabricated components is not the only measure that should be taken to protect the general image of the growing settlement. This leads to the discussions of the environmental aspect of the process.

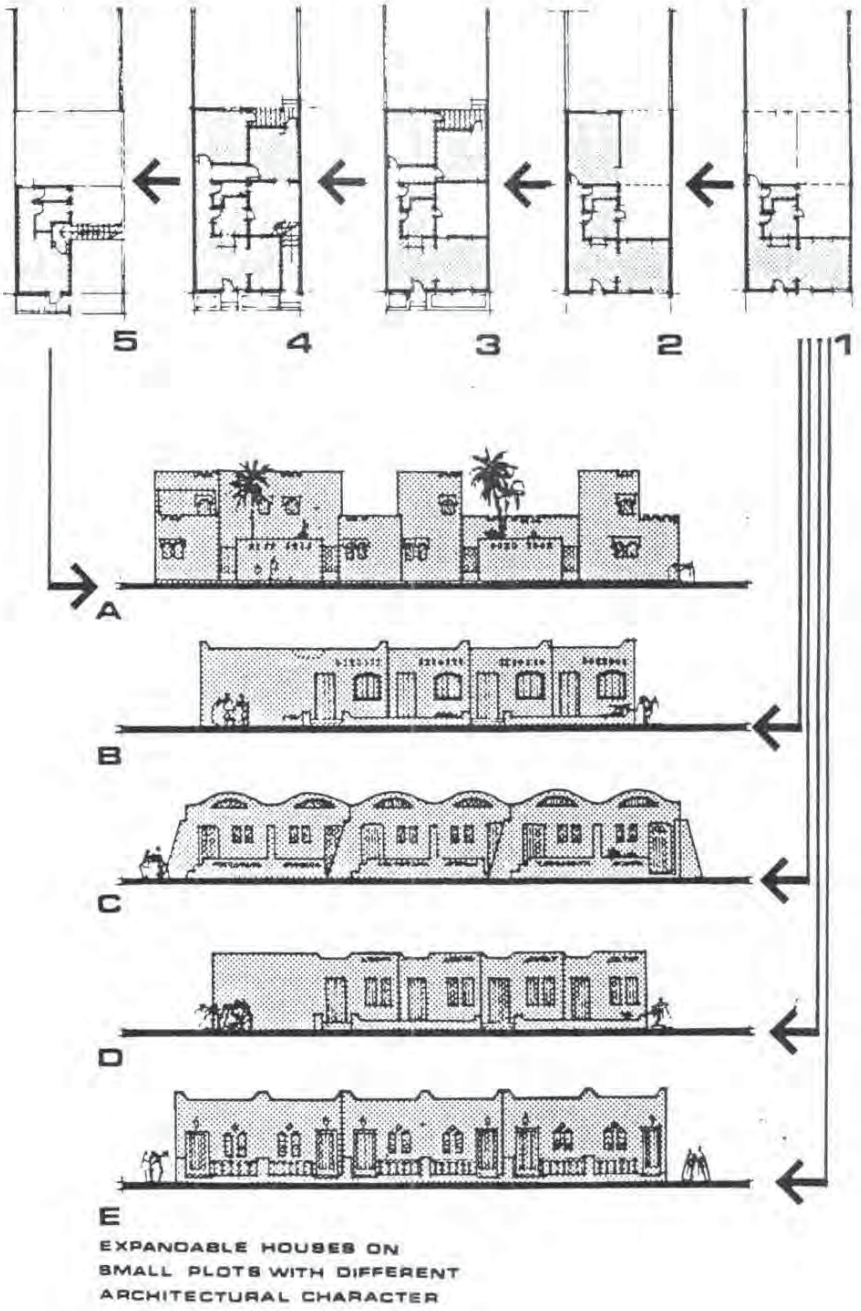
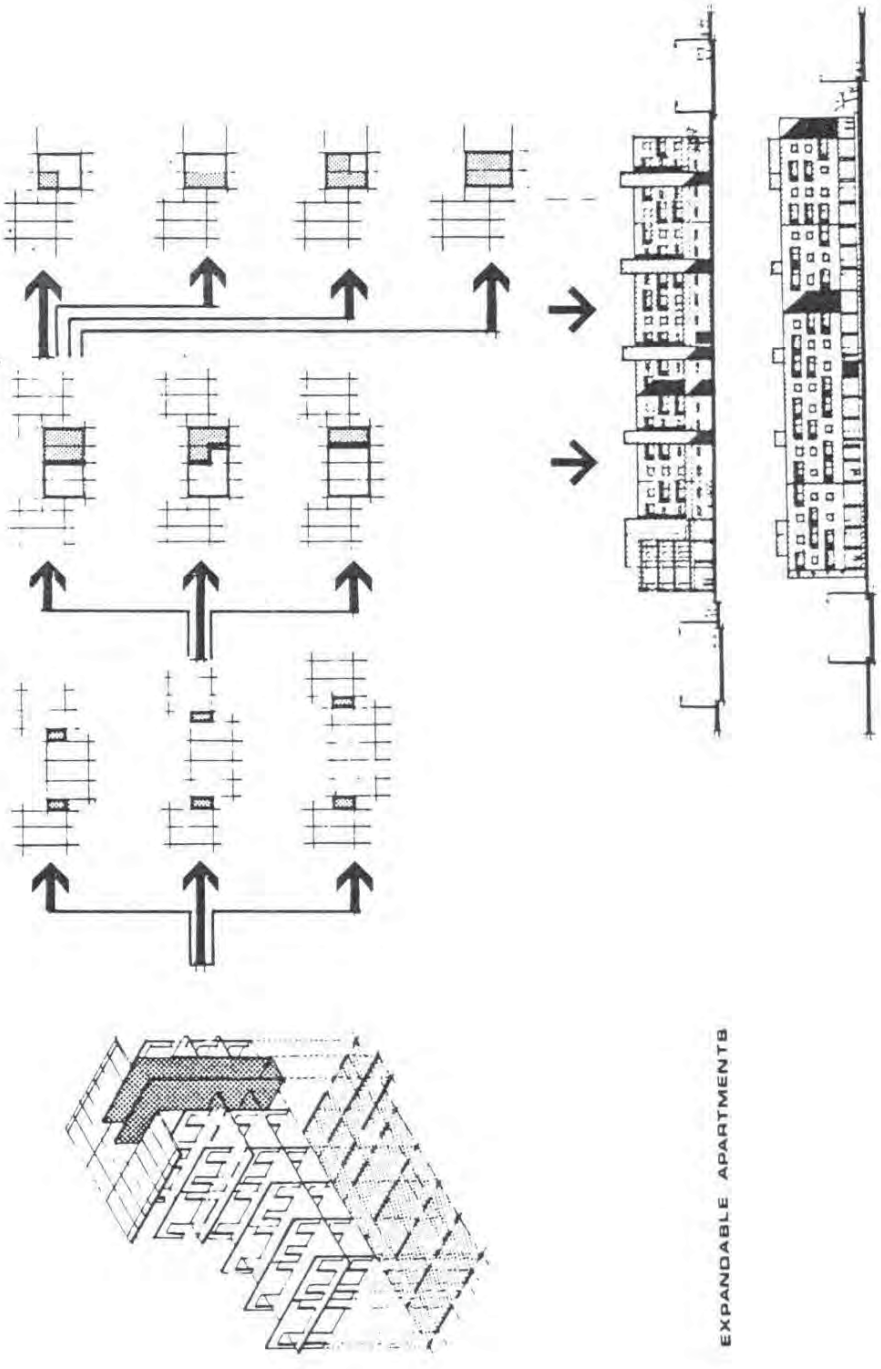


Fig 2.

Expandable Houses



EXPANDABLE APARTMENTS

THE ENVIRONMENTAL ASPECT

An appealing image of the growing settlement could be achieved in case the following measures are considered:

- In case small plots are provided, it is recommended to start building all housing spaces outlooking the streets. The expansion of the house could happen inwards in the backyard of the plot [see figure 2].

- In case flats are provided, the buildings could either have completely finished facades from the beginning [which increases the initial cost of the flat] or could be left to be finished by the user with standard components that assure the harmony of the complex.

- On the layout level, the environmental quality of the settlement could be assured in case public open spaces are minimized and private open spaces are maximized.

THE SOCIAL ASPECT

The diversity of users needs has to be reflected on the designs to be suggested to them. Variety of designs is crucial for such users in order to insure their personality. Accordingly, it is recommended in such a project to develop a catalogue of alternative solutions either for the plots or for the flats of similar areas.

CONCLUSION

It is believed that the design and planning of housing for the first community should minimize the government subsidies by encouraging users participation in the development process. Such a participation could be very active in case an organizational process is established allowing the users to take the appropriate decision at both the design and execution levels. The concept of an expandable house or flat could give an appealing image of the settlement at its early stages of development in case some measures are considered such as:

- The provision of standard components assuring a better quality of the buildings.

- The firm control of the first phases of the development outlooking the streets.

- The assurance of a large variety of options giving an appealing architectural character.

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PART 2
ON SITE PLANNING

PART 2 PAPER 5

IAHS WORLD CONGRESS ON HOUSING
NEW METHODS OF CONCTRUCTION AND FINANCING
CHILE, MARCH 1985

A SYSTEMATIC APPROACH FOR PLANNING HOUSING LAYOUTS

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A SYSTEMATIC APPROACH FOR PLANNING HOUSING LAYOUTS

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ABSTRACT

In the last decade, the Ministry of Development and state for Housing and land Reclamation in Egypt was encouraging the development of new communities. Such a trend urged the elaboration of a systematic approach for the planning of housing layouts. The studied approach provided a tool helping to recognize and recommend the best routes to be followed by the infrastructure in order to serve housing plots of specific surface areas. This tool consists of a set of modular patterns representing the recommended routes for the infrastructure of the plots.

Three categories of modular patterns have been developed:

- the first one is used in case small plots less than 150m^2 are required, (intervals between lines of infrastructure are equal to 36.00 m).
- the second one is used in case medium size plots ranging between 150m^2 and 450m^2 are to be provided, (intervals between lines of infrastructure are equal to 54.00m).
- the third one is used in case large size plots ranging between 350m^2 and 700m^2 are required, (intervals between lines of infrastructure are equal to 72.00m).

The objective of the present paper is to show the flexbility of the developed tool and its ability to generate a large variety of alternative solutions for housing layouts.

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INTRODUCTION

A modular pattern for planning and design is believed to be helpful in achieving the following objectives:

- to assure that the road network determined at the level of the community will provide areas of land that can generate meaningful sizes of blocks for housing and services so that these blocks can be subdivided later into meaningful housing plots;
- to allow the design of standard layouts for various housing categories, thus facilitating the calculation of densities, required facilities, and their implications upon cost;
- to allow interchangeability between various housing layouts for different housing categories (if desired).

If is believed that the modular pattern which will be used at different stages of planning should be composed of a hierarchy of modules allowing a large range of variation in its dimensions at the upper level, and smaller ranges at lower. At the same time, the proposed modules should be dimensionally interrelated in order to keep a dimensional coherence allowing the easy transition from the macro to the micro levels of the hierarchy.

Determination of the various ranges of dimensional variations which should be present in the proposed modules necessitates a dimensional analysis of the various components used in planning (roads, service facilities, blocks, plots, etc...).

It appears that three levels of modules are needed:

- the first level of modules will help to determine the road network and community structure. It will probably be influenced by the frequency of road intersections;
- the second level of modules will help to identify the boundaries of housing blocks and service facilities. It could be determined by the dimensional analysis of blocks and areas allocated for services;
- the third level of modules that used to determine plot sizes, will be influenced by the dimensions of functional spaces in the dwelling (living rooms, bed rooms, etc...).

DIMENSIONAL ANALYSIS OF THE VARIOUS COMPONENTS OF PLANNING

An extensive dimensional analysis has been undertaken and the results of this analysis will be summarized in this paper:

- first level of modules (for the determination of road network and community structure). The analysis showed that the frequency of road intersections is an important determinent for the modules to be proposed for that level. The obtained data showed that such intersections could occur every 100 to 200 meters for local streets, 400 to 800 meters for collectors and so forth. Accordingly, a module of about a 100 meters could satisfy these intervals.

- second level of modules (for determination of boundaries for housing blocks and service facilities). The determination of the ranges of dimensional variations needed at the second level necessitated an analysis of various sizes of housing blocks and service facilities. It has been noticed that the depth of housing blocks consisting of rows of back plots would vary depending on the areas of provided plots. This is due to the fact that whatever are the areas of the plots, the proportions of their facades to their depths were usually ranging between 1:1.5 to 1:2.5. Accordingly, the depth of two back to back plots of large size is probably higher than the depth of two back to back plots of a smaller size. It has been noticed that variations in block depths were taking the average values of 40,- 50,- 60,- 70,- 80,- meters. Based on such an information, it was usefull to suggest smaller modules for this second level, such modules could be equal to half or third of the larger module (the 100 meter module).

- third level of modules (for determination of plot sizes) It is believed that the smaller the area of the plot the more critical are its dimensions. It is also believed that for such small plots variations in dimensions are only meaningfull if they allow variations in suggested architectural designs. It has been found that such variations should allow the addition of a new housing space (a kitchen, a room, etc...). A module of 3.00 meter was believed to be convenient for suggesting plots of different dimensions and different areas. This same module could equally be used for the determination of road widths.

THE PROPOSED MODULAR PATTERN

Based on the dimensional analysis given above, the following set of modules has been proposed:

- first level of modules, helpful in determining road network and community structure : M = 108.00m.

- second level of modules, necessary for the determination M=36.00 or 54.00 or 72.00 meters.

- third level of modules, necessary for the determination of plot sizes and road widths: M= 3.00 meters.

A dimensional coherence prevails between all levels of modules: 108.00 = 2 x 54.00 = 3 x 36.00; 2 x 108.00 = 3 x 72.00, moreover, 36.00, 54.00, 72.00, 108.00 are multiple of 3.00.

In addition to that dimensional coherence that allows the easy switching from one module to the other, it has been noticed that the 36.00, 54.00 and 72.00 modules allow large variations in plot sizes as shown in table (1) (proportions of plot dimensions, front to depth, ranging between 1:1.5 up to 1:2.5):

- center lines at 36.00 represent recommended routes for infrastructure serving plots of areas less than $150m^2$,
- center lines at 54.00 represent recommended routes for infrastructure serving plots ranging between $150m^2$ and $450m^2$.
- center lines at 72.00 represent recommended routes for infrastructure serving plots ranging between $350m^2$ and $700m^2$.

As shown on figure (1), alternative bands are superimposed over the selected module: the 36.00, 54.00 or 72.00. Those bands represent the suggested zones for the plots as well as the suggested zones for the roads serving the plots. The zones are separated by margins that could be either added to the plot zone or the road zone. The proposed modular pattern allows a great flexbility depthes and plots of different sizes.

Figure (2) and (3) show different applications using the proposed modular pattern in the planning and designs of a neighbourhood at the 6 of October City. Four different road patterns have been suggested for the same neighbourhood in order to pint out the flexibility of using the suggested tool.

CONCLUSION

The tool discussed in the present paper offered the designer a systematic approach for planning housing layouts. The use of the proposed tool in real projects prooved its flexibility in suggesting a large variety of options. However, their is a need to extend the information related to the different suggested modules in order to understand the impact of their use upon the cost of infrastructure. Such an impact is presently the subject of a new undergoing research project at Cairo University.

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Depth of plot (m) / Width of plot (m)	Module = 36.00 m			Module = 54.00 m			Module = 72.00 m		
	9	12	15	18	21	24	27	30	33
6	54	72	90						
9	-	108	135	162	189	216			
12				216	252	288	324	360	
15					315	360	405	450	495
18						432	486	540	594
21								630	693

TABLE 1
AREAS OF HOUSING PLOTS

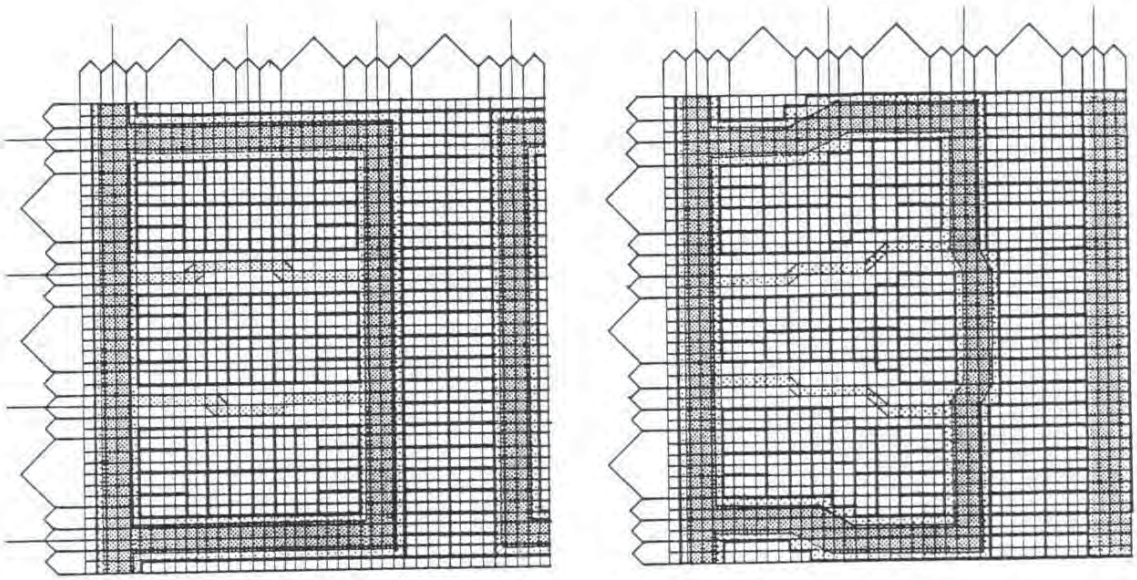

FIG. 1
RECOMMENDED ROUTES FOR THE INFRASTRUCTURE SERVING PLOTS LESS THAN 150m^2

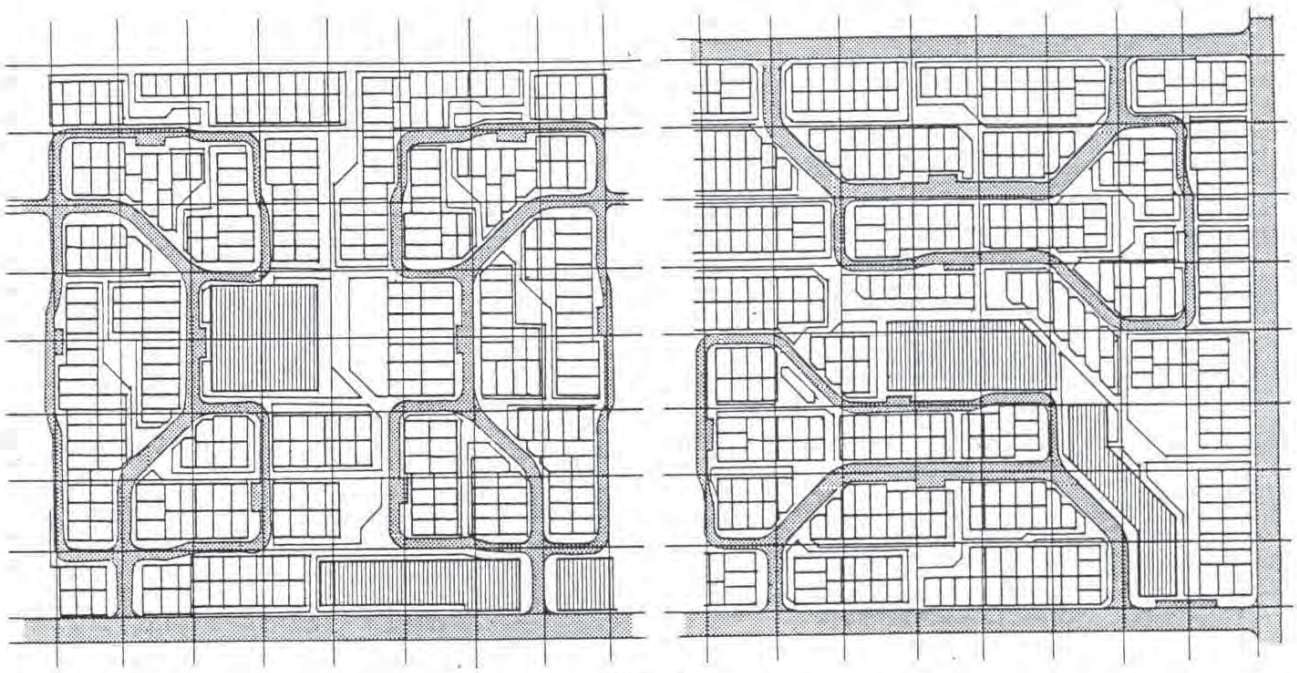

FIG. 2

THE PROPOSED MODULAR PATTERN USED IN THE PLANNING AND DESIGN OF A NEIGHBOURHOOD.

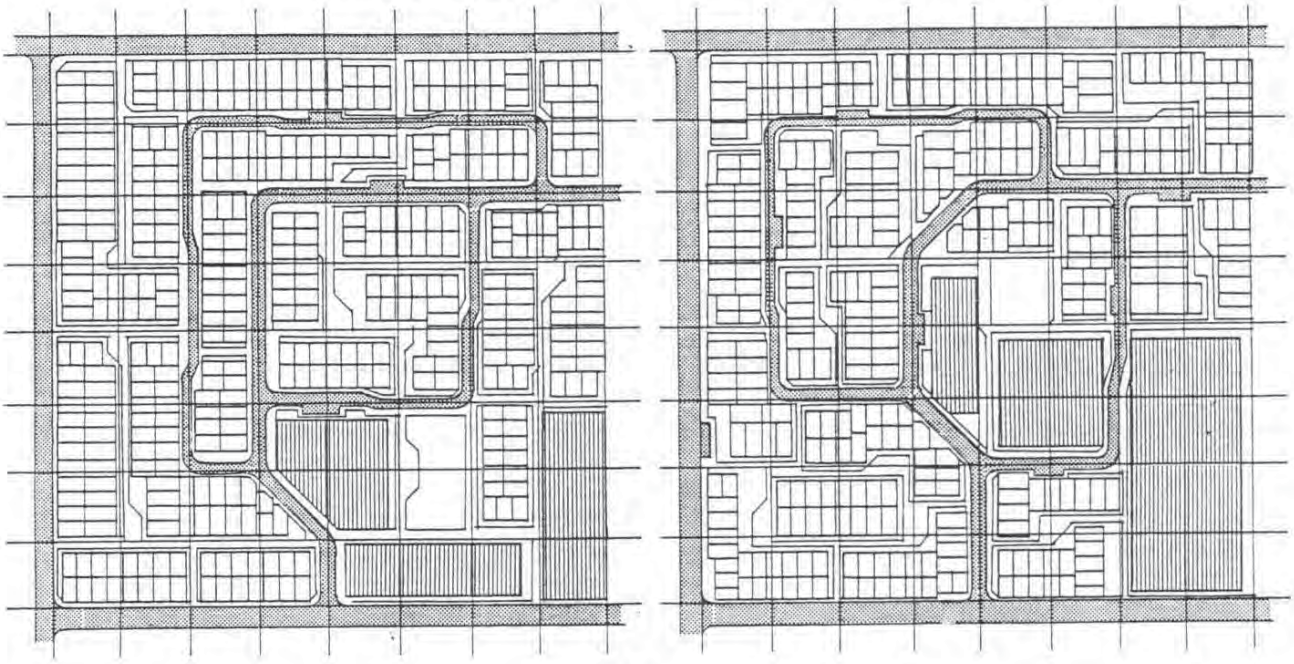

FIG. 3

THE SAME MODULAR PATTERN USED FOR THE GENERATION OF TWO OTHER ALTERNATIVE LAYOUTS

3. Housing and LandSubdivision, 6 of October City, first Stage Plan, Ministry of Development and State for Housing and Land Reclamation, General Organization for physicl Planning GOPP, fourth report, August 1980.

4. Planning of a New Community near Meadi, sakr Koreich, Cairo Governorate, October 1980.

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PART 2 PAPER 6

INTERNATIONAL CONGRESS ON HOUSING
LOW COST HOUSING FOR DEVELOPING
COUNTRIES
ROORKEE,INDIA,NOVEMBER 1984

BASIC PLANNING UNITS FOR HOUSING LAYOUTS

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Low Cost Housing for Cairo's 16 Million Inhabitants.

SYNOPSIS Residential low income neighbourhoods are usually planned a satisfy a set of criteria, mainly functional, social, and environmental. However, the economic aspect related to the cost of infrastructure is usually neglected on the assumption that it is influenced by residential densities and the topograhy of site. Accordingly calculation of its cost is not taken into consideration in the initial stages of design. But, for the same density if infrastructive routes follow a certain pattern in relation to housing layouts, cost could be minimized. On the same basis, the selection of the most appropriate economic infrastructure network, to be used for a given community, is enormously facilitated.

Introduction

The ever increasing magnetic draw of cairo's centralised institutions, cultural, educational amenities, and medical care facilities, still far outweighs the noisy conjested streets and its housing shortage. The capital still exercises a continous pull for drawing rural population within its urban scene.

Unluckily Cairo still grows informally to the North and to the South along the Nile Valley, occupying the rich agricultural land of the delta, as near as possible to existing communities. People occupy land informally where infrastructure facilities are available in adjacent sites, or could be easily supplied.

One of the major goals of the Egyptian New Development plan is the establishment of new communties on desert land. The government's policy for housing low income inhabitants has been outlined. It declares its responsibility to lie mainly in providing infrastructure facilities for areas designated for future urban growth. Accordinly the cost of infrastructure, mainly roads, water, and sewage, for newly developed communities on desert land in one of the main issues at the moment. A research study has been carried out, in the faculty of Engineering, Cairo University, to acertain and define the relationship between a residential layout and the cost of its infrastructure. (Shafie et al., 1984).

Infrastructure Network Hierarchy: Methodology. A hypothetical 70 acres neighbourhood, square in shape, [340mx 340m],surrounded by roads, having a population of 10.000 inhabitants was selected. This size was chosen as it forms the community necessary to suit the new Egyptian educational system for basic elementary school. The students represent 18 to 20% of Egyptian population. Thus the gross density is 140 persons per acre, which is a standard usual density [Shafie, 1983] adopted in new Egyptian desert towns.

The square was chosen as an appropriate form, i.e. least length of periphery enclosing a certain area. A hypothetical modular grid, approximately 54m was applied on the plan. The reason for choosing the 54m module is that it is quite flexible and can generate a lot of different solutions. [Abdel Kader, 1987].

Network breakdown

The neighbourhood was divided into several sections or clusters of housing groups. Each cluster of "Hara", rectangular

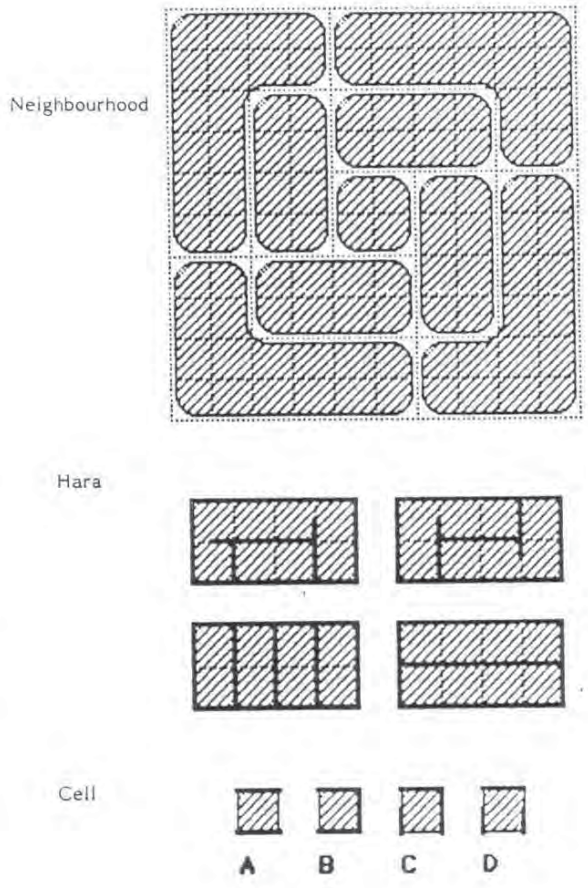

Fig. 1 Infrastructure Network breakdown Hierarchy

Drawing is schematic: not to scale

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in shape, 108m' x 216m., represents 250 families, i.e. 1000 to 1200 persons. The "Hara" is an Egyptian terminology for a closely integrated and homogenous community, whose inhabitants have well defined characteristics and strong social ties. It is a known Egyptian characteristic of old Cairo residential areas. The shape of the hypothetical "Hara" can take several alternatives, i.e. the relation between roads and residential plots. The "Hara" was further devided into several parts which are called "Cells", each cell is 54m x 54m, i.e. the selected unit grid. This cell provides a large spectrum of choice for plots. Previous studies and surveys, [Abdel Kader, 1980,1981]. indicated that the affordability to pay of the upperlow and middle income categories, allow them to own plots of areas ranging between 150-300 m² [Abdel Kader, 1982]. The area of the cell fulfills the previous requirements, it can even accommodate plots for low income inhabitants, 130 m² [Shafie, 1980].

Compilation Procedure

The cell could be served by an infrastructure network whose routes run along two parallel sides, [Option A], or it can completely surround three sides, [Option B] or it can partly surround the cell from three sides, [Option C and D]. Figure 1.

Infrastructure cost for sewer, water, and roads was calculated for each of these options. It was assumed that the max. coverage of the plot by buildings would be 50% and the number of floors would not exceed 4 floors. The land was assumed flat.

For sewer calculation a range of cost was compiled. The diam. of pipes was assumed 7" for the cell options and Hara alternatives, [that is the min. allowed]. The cost per/m² varied, [min. and max]. The cost of manholes was also taken into consideration. The same was calculated for water network and the necessary values. For road networks two road classes were chosen; local road 12m in width, collector roads 15m in width. Also pavement, curb, and road surfaces materials were assumed according to Egyptian standards, and the cost calculated per m² of plot.

Analysis

It was evident that the continous length of 7" pipes is a governing factor for cost, because trenching becomes more expensive, with the increase of slope, than the actual pipe cost.

Certain cell options are less costly than others, A, D. while the most expensive was C, for sewer and water installation, and option B for roads. Table 1. Alternatives 1.2 abd 4 are the least expensive for sewer, and water networks, while alternative 2 is the least expensive for road network. Never the less alternative 1 and 4 and in expensive also. On the otherhand alternative 3 clearly indicates a costly road pattern solution although it is commonly used. Table 2.

Conclusion

The relationship between a residential layout and its infrastructure network routes, has a direct bearing on cost, i.e. cost of intrastructure per m² of sold plots.

One of the main governing factors for reducing sewer cost is to minimize the continuous length of the 7" pipes, as it costs rises with the depth of excavations. Thus taking two sites containing the same area, and having the same plot dimensions, and the same density, the cost of one may be 25% less than the other depending on the layout pattern.

TABLE 1

Data \ Options	A		B		C		D	
SEWER NETWORK:								
1. Length of pipes	54		81		81		54	
2. No. of manholes	2		2.75		3.5		2	
3. Cost of pipes/m²	0.56	1.48	0.83	2.22	0.83	2.22	0.56	1.48
4. Cost of M.Hs/m²	0.42	0.89	0.57	1.22	0.73	1.55	0.42	0.89
5. Total cost/m²	0.98	2.37	1.40	3.44	1.56	3.77	0.98	2.37
WATER NETWORK:								
1. Length of pipes	54		81		81		54	
2. No. of valves	0	1.5	1.0	2.0	1.5	2.0	0.0	1.5
3. Cost of pipes/m²	0.28	0.42	0.42	0.63	0.42	0.63	0.28	0.24
4. Cost of valve/m²	0.00	0.07	0.05	0.14	0.08	0.14	0.00	0.07
5. Total cost/m²	0.28	0.49	0.47	0.77	0.50	0.77	0.28	0.49
ROADS:								
Area of roads/m² of plot	0.29	0.33	0.45	0.55	0.33	0.45	0.29	0.32
Cost of roads/m² of plot	1.95	2.52	3.05	4.10	2.38	3.37	1.95	2.34

Design and calculations of sewer and water networks was carried out by both Prof. Dr. I. EL HATTAB, and ASS. Prof. Dr. M. SAADAWI, Faculty of Engineering Cairo University.

Design and calculation of roads networks was carried out by Ass. Prof. Dr. M.S. NOUR ELDIN, Faculty of Engineering Cairo University.

TABLE 2

Alternatives / Data	1	2	3	4
SEWER NETWORK:				
- Length of pipes	553.5	553.5	553.5	499.5
- No of manholes	19.5	19.5	18.5	17.5
- Cost of pipes	16051.5	16051.5	16051.5	14485.5
- cost of M.Hs	7215.0	7215.0	6845.0	6475.0
- Total cost/m²	0.9967	0.9967	0.9815	0.8985
WATER NETWORK:				
- Length of pipes	594	594	648	540
- No of valves	9.5	9.5	11	5
- Cost of pipes	8910-13365	8910-13365	9720-14580	8100-12150
- Cost of valves	1425-1900	1425-1900	1650-2200	750-1000
- Total cost/m²	0.443-0.654	0.443-0.654	0.487-0.719	0.379-0.564
ROADS:				
- Area of roads/m² of plot	0.41	0.40	0.50	0.41
- Cost of roads/m² of plot	2.95	2.88	3.96	2.93

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layout pattern.

If the site has a natural slope the cost could be further minimized. Also by increasing the number of cells served by option A or C and minimizing those of D the cost of road and water network per m^2 of land would be greatly reduced. The max cost of total infrastructure network for option B is nearly three times as the min cost of total infrastructure network for either option A or D.

Figure 2. Optimization of cost for all types of infrastructure networks, for an infinite number of layout solution is the ultimate goal. This can be easily accomplished now by a computer program using the same methodology. This is contemplated in phase 2 of the research project.

The ultimate objective is to present the government policy maker with a different approach and another dimension for the evaluation of housing projects of new communities, while providing the planner with a certain criteria to test the appropriateness of his residental layouts viz-a viz infrastructure cost, from the early design stage.

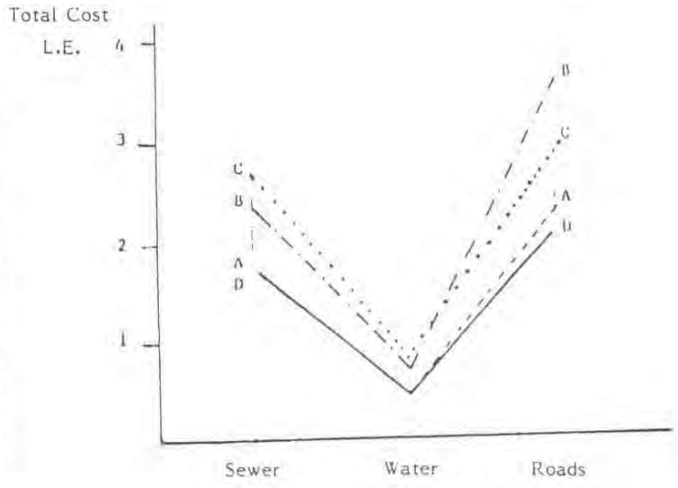

Figure 2. Analysis of total cost/m^2 of all options A,B,C,D

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PART 2 PAPER 7

INTERNATIONAL CONVENTION ON URBAN PLANNING,HOUSING AND DESIGN
SINGAPORE INSTITUTE OF PLANNERS
SINGAPORE,JULY 1986

AN APPROACH FOR THE ANALYSIS OF THE URBAN TISSUE

DR. NASAMAT ABDELKADER

AN APPROACH FOR THE ANALYSIS OF THE URBAN TISSUE

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ABSTRACT

It is beleived that norms and standards governing the planning and design of new housing areas should derive from the analysis of existing settlements. Such an analysis would give indications about the basic components of the Urban tissue. Afterwards, realistic criteria of planning and design could be deduced and used for new housing areas. The present paper is presenting an approach for the analysis of existing urban tissues. The approach helps to recognize the sizes of housing plots in existing settlements, the intervals between lines of infrastracture, the characteristics of buildings erected on the plots and hence the features of the urban tissue. This information leads as well to the identification of floor area ratio and housing densities. A critical evaluation of the analysed information is undertaken and criteria for the design and planning of new settlements are suggested . The analytical approach will be demonstrated through a case study.

INTRODUCTION

In the planning and design of new housing settlements, many questions are aroused such as: what net densities should be reached? What plot areas should be made available to the users? How such plots will be developed? What is the percentage of the built area on each plot and what should be the building regulations? What would be the features of the final obtained tissue? Such questions and many others, need more information about the existing settlement in order to be answered. The approach presented in this paper is a step in this direction. It has been already adopted in many cases where new settlements were to be developed in areas adjascent to existing settlements.

INFORMATION ABOUT EXISTING SETTLEMENTS.

A representative sample of the existing settlement is first selected. It is usually taken from three to four different housing areas. Maps and visits to the site help identifying the following information:

- The areas of housing plots
- The built area on each plot and the configuration of the building.
- Height and conditions of buildings
- Areas of dwellings within the building
- Materials and methods of construction used.

The collected information is then analysed quantitavely and qualitavely.

QUANTITATIVE ANALYSIS.

A compilation of available plot areas is undertaken and the results are drawn on a histogram showing the average plot areas. Such an information about plot areas is in a way indicative of the affordability to pay of the users living in existing settlement. Any suggested parcelization scheme for new adjascent settlements should take such an information into consideration in order to provide plots that can be owned and built by th users.
Other indicative calculations using the same data allow recognising the floor area ratios and housing densities in existing settlement.

QUALITATIVE ANALYSIS.

In order to recognize the characteristics of the existing tissue, a graphic analysis is undertaken. This analysis points out the location of open and built spaces in the urban tissue, using the vocabulary already developed by the SAR group, making a distinction between three types of "zones" in the tissue:

- The "O" zone, reserved to open spaces
- The "B" zone, reserved to built areas
- The "OB" zone, representing margins between the "O" zones and the "B" zones, such margins could be either built or left as open spaces.

Starting from such a simple terminology, the analysed areas are drawn with the necessary details showing the plots and the outline of the buildings. A break down of the drawn tissue into "O" zones, "B" zones and "OB" zones is undertaken and a clear picture of the complex is thus available to the analyst.

The obtained graphic representation is consequently compared to a kind of a simplified reference classifying the different types of tissues into three categories:

1- the point tissue
2- the linear tissue
3- the orthogonal tissue

By point tissue, it is meant a tissue where the buildings on each housing plot are completely detached from adjascent buildings on adjascent plots. In such a tissue, many walls are exposed to the weather. The shadows overcast by the buildings are not continuous andthe open spaces are open to the free air movement.

By linear tissue, it is meant a tissue where buildings are attached forming continuous bars. In this case, less walls are exposed

to the weather and the shadows overcast by the buildings are more continuous. The linear buildings could create by their relationships a kind of inner courts where the climate is less hostile than in exposed open spaces.

By orthogonal tissue, it is meant a tissue where buildings represent a continuous net on the housing block and where outer spaces appear as closed courts in the built mass.
In such a tissue, less walls are exposed to the weather and the climate of the courts is much more different from unprotected open spaces.

The selection of one type of tissue or the other is not dependant on the floor area ratio or housing density to be achieved. Such factors are easily fullfilled within the different types of tissue. The factors having a real impact on the selection process are of a much more subtle nature. They are mainly political, economic, socio-cultural and environmental. For instance, the use of the point tissue could reflect a high sense of individuality while

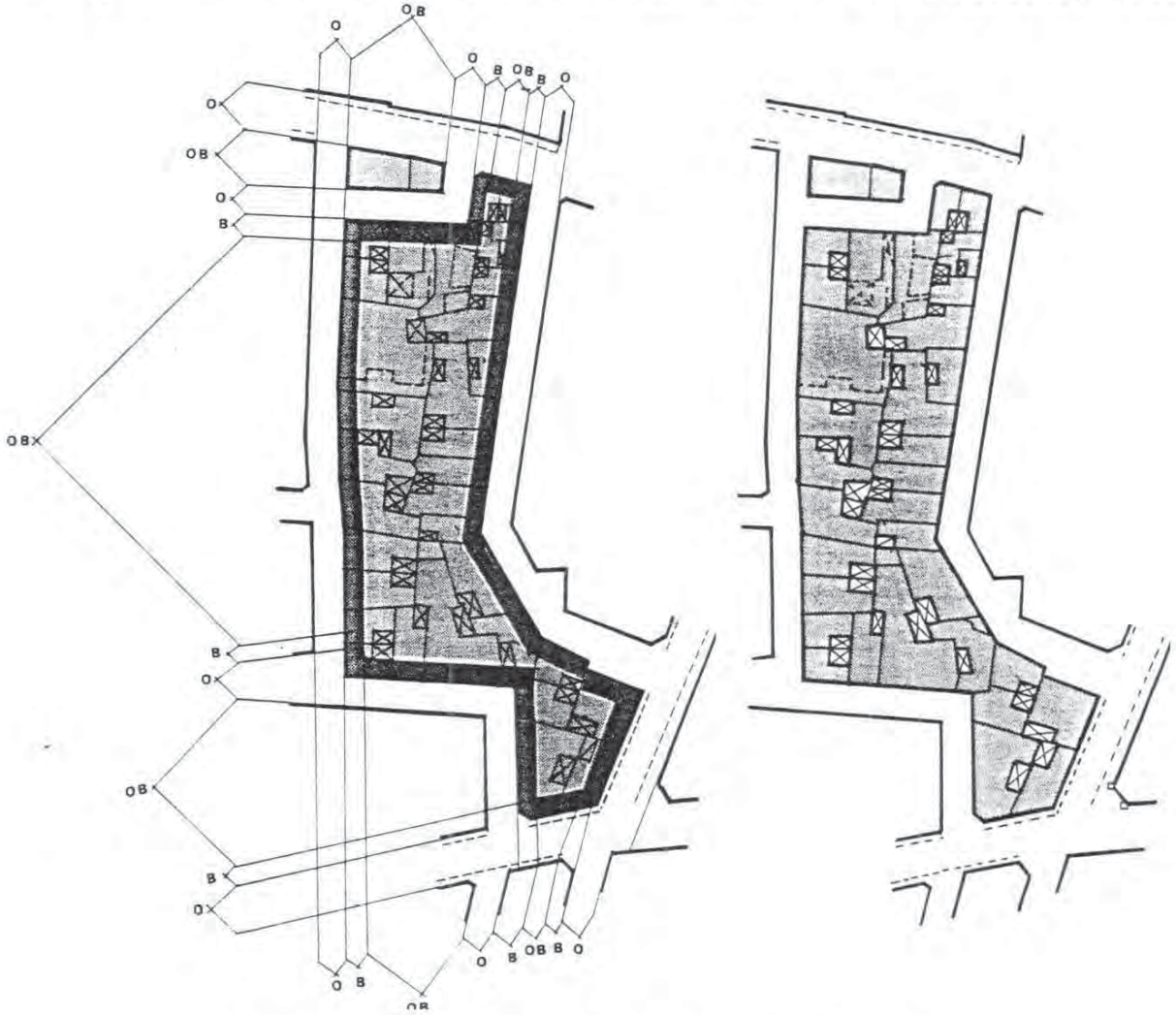

Fig. 1 Analysis of the tissue (case A).

in the orthogonal tissue, such an individuality is less expressed specially when different neighbours are outlooking inner courts. A deeper study of the factors leading to the adoption of one tissue instead of the other would be interresting. However, the recognition of the type of tissue used in existing settlements is extremely valuable for designers and planners of new settlements since existing tissues represent well established norms accepted by the users who lived in the existing context. As shown in figure [3] , the graphic analysis of existing layouts is compared to the preidentified types of tissues. Such a comparison points out the type of tissue accepted by the community.

IMPACT OF THE ANALYSIS UPON NEW DEVELOPMENTS,

The next step would be a critique of the existing tissue in order to recognize its advantages as well as its drawbacks. Such a critique would allow emphasizing the advantages and finding ways to overcome the drawbacks when the same tissue is used for a new settlement.

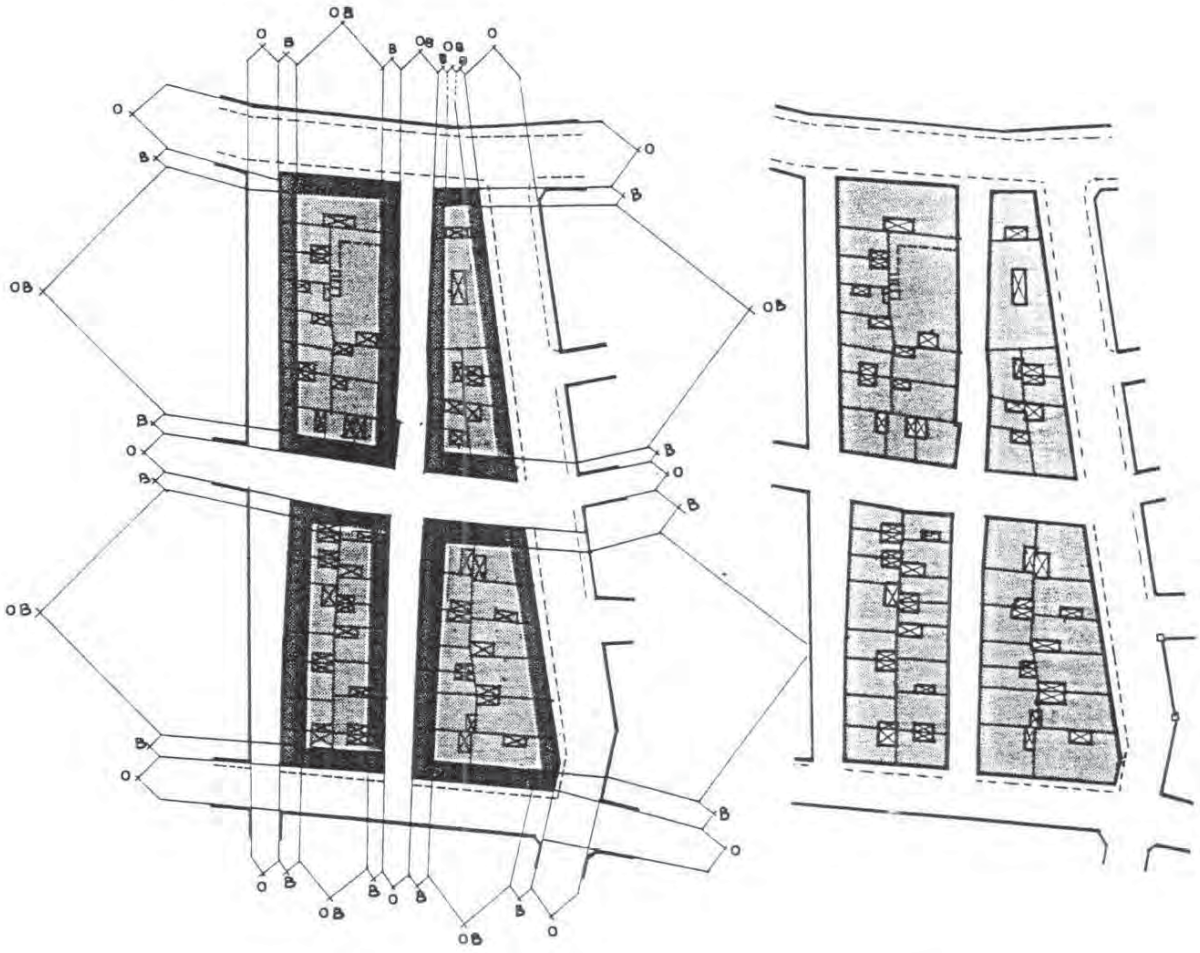

Fig. 2 Analysis of the tissue (case B).

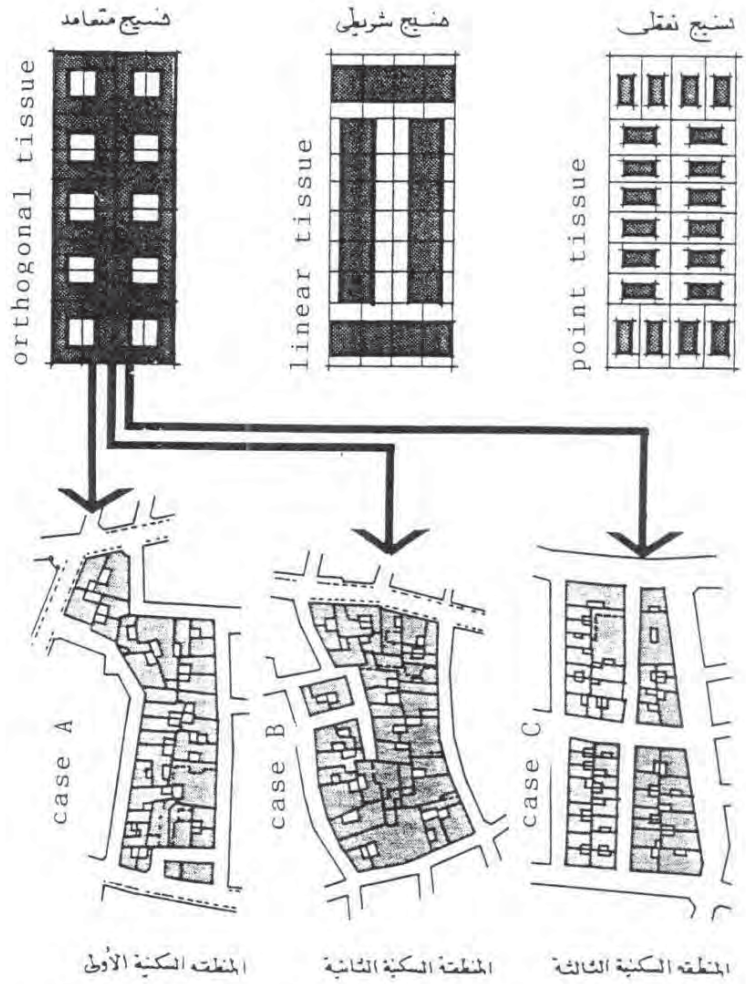

Fig. 3 Types of tissues as reference for comparison.

For instance, as shown in figure [3], the analysis pointed out that the orthogonal tissue is mostly used in existing settlement, The critique showed that the present condition of the tissue has the following advantages and disadvantages:

advantages:

- less external walls are exposed to the climate
- continuous mass of buildings create more shadows
- expensive external walls are minimized
- accepted social interactions are favoured

disadvantages:

- dimensions and proportions of inner courts do not provide enough ventilation for inner spaces
- small courts do not allow the sun to enter the inner spaces.
- small courts do not allow privacy between neighbours

A modifications of the dimensions and proportions of inner courts would help reaching a successfull pattern for the orthogonal tissue.

PART 2 PAPER 8

IAHS WORLD CONGRESS ON HOUSING
NEW METHODS OF CONCTRUCTION AND FINANCING
CHILE, MARCH 1985

RESIDENTIAL DENSITY, AN ILLUSIVE DESIGN AND DEVELOPMENT CONTROL TOOL

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RESIDENTIAL DENSITY, AN ILLUSIVE DESIGN AND DEVELOPMENT CONTROL TOOL, WITH REFERENCE TO EGYPTIAN EXPERIENCE.

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ABSTRACT

Tolerant attitudes towards high density living is urgently needed in Egyptian existing and new communities developments. This paper briefly reviews current thoughts on activity and physical density and closely looks into Egyptian planning and building laws and regulations' handling of density.
A comparative analysis of seven selected housing developments is presented to highlight the inadequacy of density as a design and quality control tool - A view further stressed in the conclusions.

1. Introduction

Density, Physical and/or activity of residential areas is generally accepted as a reasonably true measure of the intensity of use and human activity as well as a direct indicator of the level of urbanity and landuse economic viability. It is also regarded as an effective tool in the physical planning process, both as; means of development control and a design criterion - hence an important factor in shaping, organizing and evaluating residential localities (1) (2).

The two types of density refer to closely related aspects of man made environments' characteristics.
The Physical Density reflects the intensity of built areas in a given locale and is expressed as a ratio of the total built area to the net site area (Floor Area Ratio, F.A.R) or to the sum of site area and a percentage of the area of surrounding roads (Floor Space Index = F.S.I.).
Activity Density on the other hand refers to the concentration of human activities within a defined area, either directly in terms of the number of people & families or indirectly in terms of rooms and bedspaces per unit area (acre, hectare).
Activity density is conveniently used in various contexts and levels of

planning; net and gross residential density, neighbourhood, district & town density. Activity density figures tend to be falsely precise and misleading due to the uses included or excluded in the calculations of the reference areas (a serious limitation on comparison and deductions).

It is generally accepted that density has a decisive effect on built form, fixed relations between typical densities and housing types is another rarely challenged view, (eg. low density is synonymous to single family housing and high densities to high rise development (3).

Another dogma is that, relating density to environmental quality. A fixed belief in post industrial revolution and 20th century planning is that high density imply slums overcrowded and degenerate environments as it is closely related to narrower spacing and space between, poor daylighting and less sun penetration and over provision of shadows. There is also the basic superficially discourse relating high density living to low socio-economic groups (4) (5).

In brief, density is used in planning practice with unjustified certainity to secure efficient building and landuse, to controll environmental standards and comfort requirements and to combat urban sprawl.

The non linear nature of density (with its exponential denominator, i.e. area) is difficult to appreciate and intuitively evaluate. Further more density decisions are related to questionable criteria as regard access, walking distance, definition of privacy; and nature, location and standards of open spaces in residential areas (5).

In other words the critical relation between density and landuse decisions and conceptions (eg. spacing, plot dimensions and coverage) are not fully understood and rarely addressed.

The use and application of density in residential area developments in Egypt may provide an interesting setting for further investigation of the conception real value or the validity of density as a development control tool.

Egypt a country with an acute population and urbane distribution and concentration problems; where cities and developments are conveniently concentrated in the narrow and fertile Nile valley and its delta, (presenting less than 4% of the countrys total area). This concentration and location of settlements in the middle of agricultural land resulted in a natural and tolerant attitude towards high densities and compact grouping; which, needles to say, is environmentally wise and economically viable, as sprowl means encroachment of limited and invaluable agricultural land on one hand and exposure to the arid extremes of the predominant desert climate.

The building and planning bye laws and regulations and formal institutions views on density were less sensitive to environmental and contextual determinents. They rejected traditional practices and adopted western approaches and views on density and development control (2) (7).

This was further accentuated in the recently enforced planning law and clearly shown in newly developed towns where low densities were adopted as means of achieving better environmental quality (a shared objective of the legislator, the planners and politicians).

This paper briefly reviews facets of density in residential area developments in Egypt, in two brief sections:

Section 2: Highlights the handling of the Egyptian building and planning laws and regulations of the question of residential activity and physical density.

Section 3: comprises a selected sample of recent housing projects in Egypt, and a comparative analysis of their features with special reference to density.

The two sections collectively provide grounds for the views expressed in the concluding section on: the illusive nature of density as a quality control tool, and the promise of low rise high density living.

2. Residential Density - (physical and Activity) in the Egyptian Building and planning laws and Regulations.

Till the mid seventies the Egyptian building bye laws and regulations did not employ density (physical/ Activity) as a direct development control tool. The intensity of development and landuse was indirectly controlled through the following measures:

1. Minimum area allocated for roads, circulation, and open spaces in newly parcellized residential sites, (1/3 of total site area).
2. Maximum permissible height of buildings; as a function of the roads' width over looked by each facade; (height 1.5. width).
3. Maximum built bulk; i.e. built volume as a function of site area according to the site location; (a maximum of 21 times the site area).
4. Minimum dimensions and areas of internal open courts for lighting and ventilation purposes.

In 1976 a new building law and statutory regulations (law no 106) was introduced, published and most of its articles implemented by local government housing control departments (9). In the new Regulations, physical density is directly used as a development control tool, irregard of the landuse or building function. The regulations fixed maximum floor area ratios (F.A.R.) in relation to the width of the roads surrounding development lands/plots, as follows:

F.A.R.	width of surrounding roads (metres)
2	12 and less
2.5	12 - 15
3	15 - 20
3.5	20 - 25
4	25 and more

averaging methods for calculating F.A.R. for plots surrounded by roads of various width were also included.

Furthermore the new regulations fixed the maximum permissible height as a function of road width (1.5 times) with 30 m. as a ceiling.
The regulation also tightened the requirements for natural ventilation and lighting and increased the minimum dimensions of internal courts.

Floor area ratios articles were however relaxed and a transition period for their implementation was introduced and renewed till the present time, due to effective local resistence of landowners and developers (supported by local government councils).

The floor area ratio is conveniently practiced as a control tool in newly developed suburban sites and new communities.

The physical planning law and its statutory implementation regulations that was published and enforced, in 1982, directly addressed the question of activity density together with physical density (10).

Gross maximum development densities for existing and new communities were fixed as: 150 person/acre and 100 person/acre respectively.

The difference is justified on the grounds that most existing settlements are located in valuable agricultural land where as new settlements are located in desert sites.

The P.P. law also changed the figures for floor area ratio and distinguished between existing and new settlements as follows:

Area	max F.A.R.
1. existing towns:	
central areas	5
other areas	4
2. New communities	2

The law further reduced the height - width ratio to 1.25, and fixed maximum height to 30 metres.

It also emphasized and defined open space standards, minimum width of roads, block sizes and plot dimensions and proportions and reintroduced the minimum ratio of roads and open spaces in newly developed sites, (1/3 of the site total area).

3. Selected Recent Housing Developments in Egypt - Comparative Analysis .

This section comprises a brief analysis of selected recent housing projects in Egypt, that were designed during past five years. The selected seven projects reasonably represent typical housing developments in existing and new Egyptian communities.

The projects comprise Government, Co operative and public sector housing schemes for: low, middle and upper middle income groups.

The selected projects' layouts and basic data are briefly and separately presented, Figures 1 - 7 show the brief profiles of the selected housing projects.

The basic data for each scheme includes: location, income groups, site and total built areas, plot ratio, no of units, population, activity density , ground coverage, percentage of open spaces and circulation and minimum spacing range together with the number of storeys and type of housing units. The comparative analysis of the selected schemes as regard the interelation between density: activity and physical - and the form, features and environmental quality (for the various income groups and housing supply agencies) is summarized in table 1.

The form and three dimensional organization of layouts is collectively illustrated by the site plan and information regarding ground coverage, no of storeys and housing types.

Environmental quality is reflected in terms of minimum spacing between blocks and amount of open spaces.

Inspite of the wide range of activity density (144 ppa - 650) and plot ratios (0.6 - 4.2). The environmental quality parameters are closely comparable, minimum spacing is similar in most layouts averaging 12 - 15 metres and the percentage of open spaces is of the order of 60 - 80 ./. of the site area.

The variety of densities were all achieved, with the exception of the mixed development example Fig. 7, through low rise walk ups 3 - 6 storeys.

The examples clearly illustrate how little can be read through density, as regard the qualitative and quantitative features of the built environments in residential areas. The arguments extend for the relation between densities and the configuration of the built environment; as the same house types resulted in a wide range of densities, floor coverage and height variety.

High density living, three and four fold that suggested by government planning authority formal reports ( ) resulted in acceptable space between and external environments as well as economically viable developments.

4. Conclusions

Physical and activity densities are mere indicators of the features and configuration of residential area built environments . Density versus built form architypical relation could be easily challenged by skilled designers. The effectiveness of density as a quality and development control tool is questionable; as it needs further control parameters and design guidelines, to play such a role, including: Spacing, height, open spaces and parking area standards, floor coverage, circulation, and in some events community facilities provisions.

High density living is a must for Egyptian existing and new communities. For existing cities, intensive use of urban land is inevitable; to combat sprawl sna encroachment of the surrounding agricultural land; to improve accessibility and to reduce the need for private transportation.
New developments on the other hand are directly exposed to arid desert environments that calls for compact planning, minimum circulation and open spaces and reduced exposure to the hostile environment, or in other words high density living.

A tolerant attitude towards higher residential density (of the order of 400 - 600 person per acre)is urgently needed, this should not be difficult once the illusive nom linear nature of density is realised. A nature that cannot be intutively appreciated. It requires a through understanding of the delicate relation between density parameters on one hand and landuse and spatial organisation decisions on the other hand . Not altogether an ipossible endeavour.

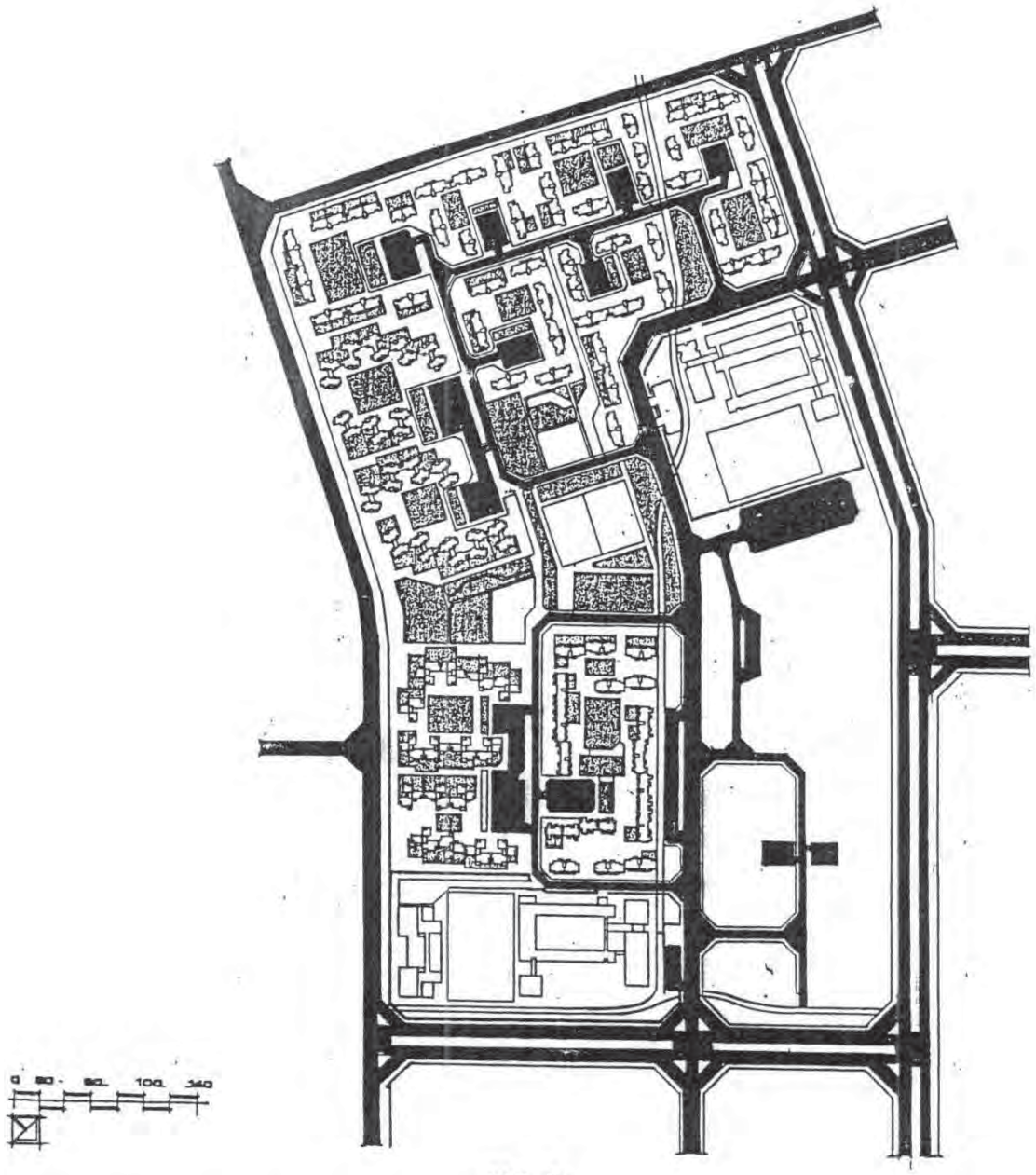

FIG 1.

New Amerigya City, 1st District, Neighbourhood 9, N.W.Coast, Egypt (11).

Income groups:	low, Middle and upper middle	
site area	139000sq.m.	13.9 ha
total built area	90732 sq.m.	
plot ratio	0.65	
No. of units	1126 unit	
population	5000 person	
net density (average	144 ppa	360pp ha
Ground Coverage	22683 sq.m	
Open Spaces and circulation	84./.	
minimum spacing	15 - 20 meters	
No. of storeys	4	
housing types	walk ups direct access	

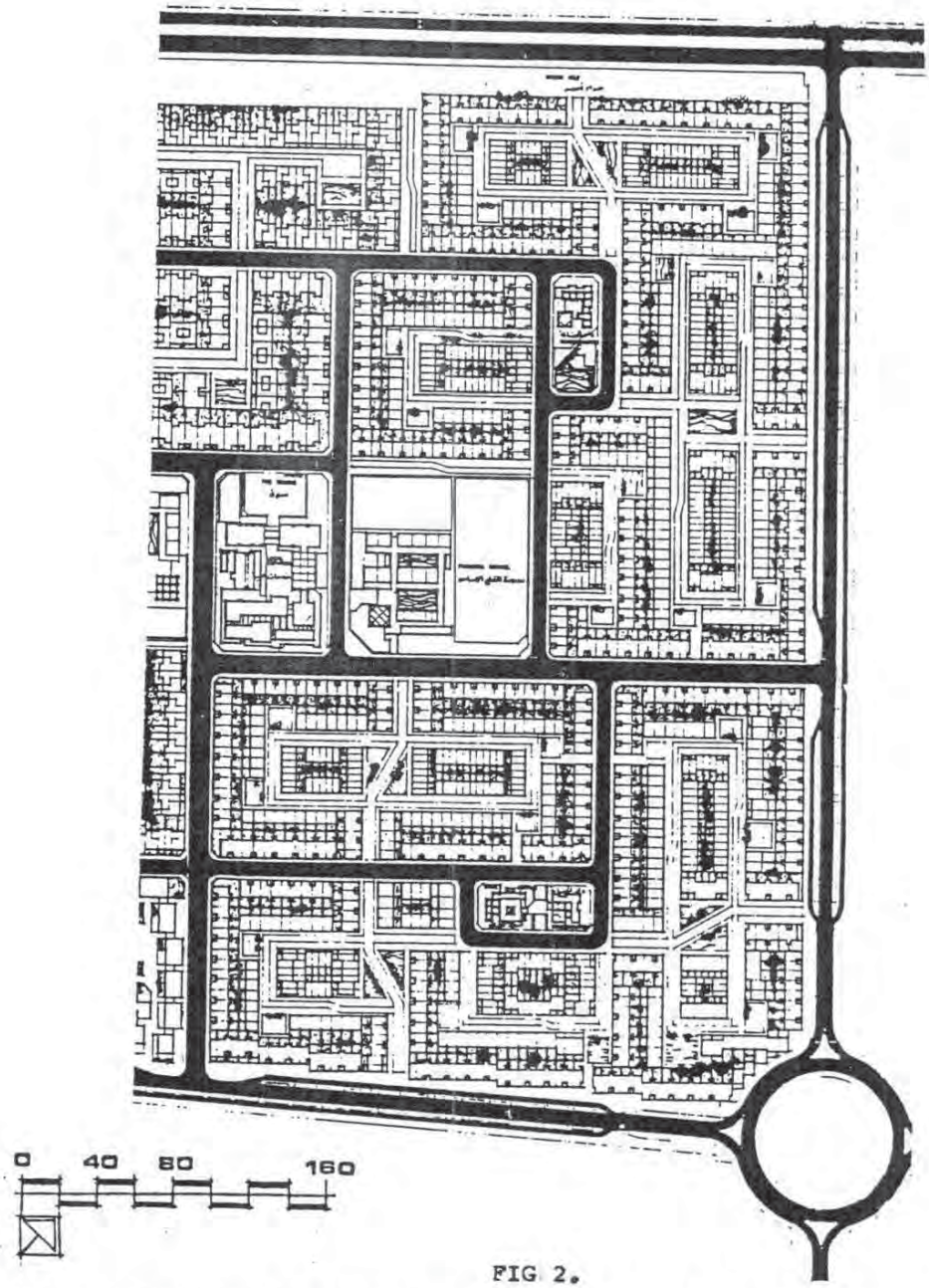

FIG 2.

El Obour New City, 1st District, Local area design competition, Egypt (12).

Income group Low and economic housing.

site area	228000 sq.m.	22.8 ha
total built area	204020 sq.m.	
plot ratio	0.9	
No, of units	2627 unit	
population	13135 person	
Density (Residential)	230 ppa	576 pp ha
Ground Coverage	81608 sq.m	
Open spaces and circulation	64./.	
minimum spacing	9 - 12 m.	
no. of storeys	2 - 3 storeys	
type of development	single family housing/raw-terrace, and walk ups direct access.	

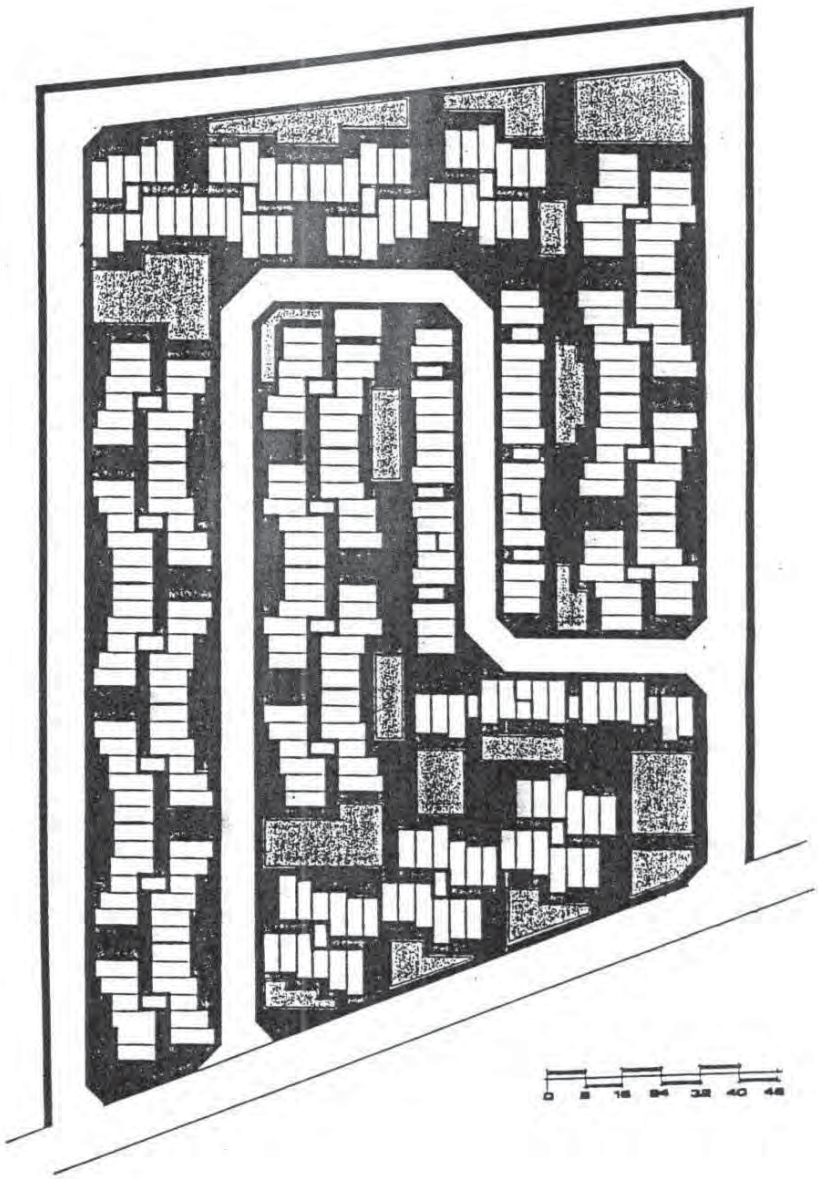

FIG 3.

El Berkah Housing cooperative, Heliopolis, Cairo, Egypt. (13).

Income group low and economic housing		
site area	26576 sq.m	2.65 ha
total built area	47338 sq.m	
plot ratio	1.78	
No. of units	516 unit	
population	2580 person	
density	388 ppa	970 pp ha
Ground Coverage	7890 sq.m	
open spaces and circulation	70./.	
minimum spacing	10 - 12 m	
No. of storeys	6 storeys	
type of development	direct access walk ups	

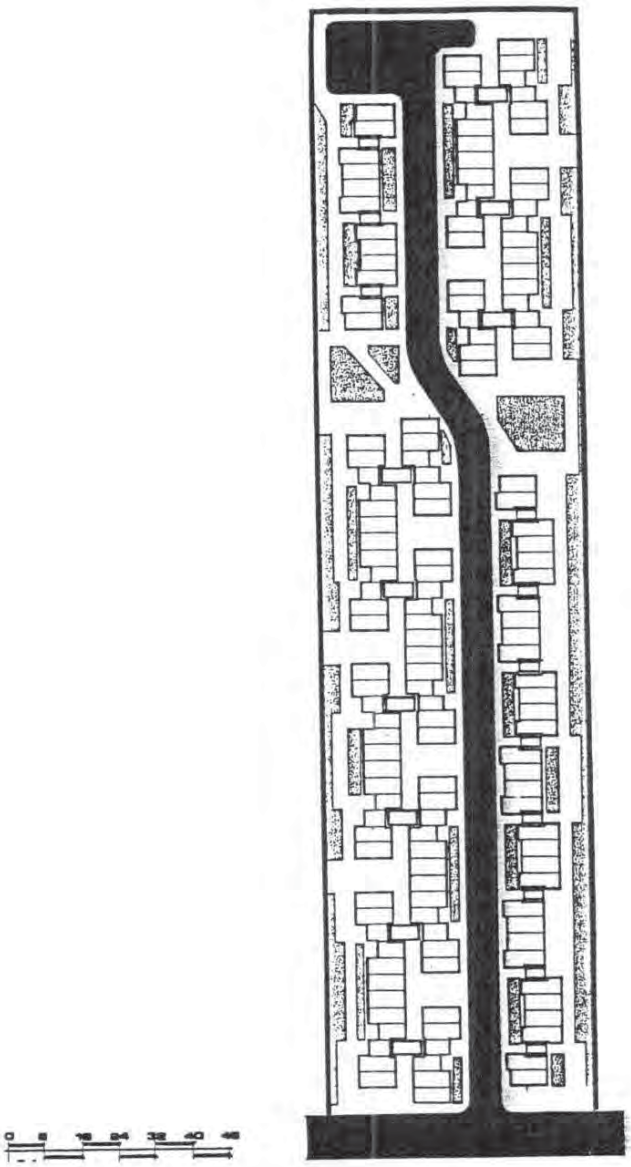

FIG 4.

El Saaf, Railways Drivers Co.Op., Gizah, Egypt ((14).

Income group:	economic housing	
site area	14210 sq.m	
total built	27363 sq.m	
plot ratio	1.9	
No. of units	348 units	
population	1740 person	
density	500 ppa	1243 pp ha
ground coverage	4560	
open spaces & circulation	69 ./.	
minimum spacing	12 - 15	
no. of storeys	6 storey walk ups	
housing types	direct access	

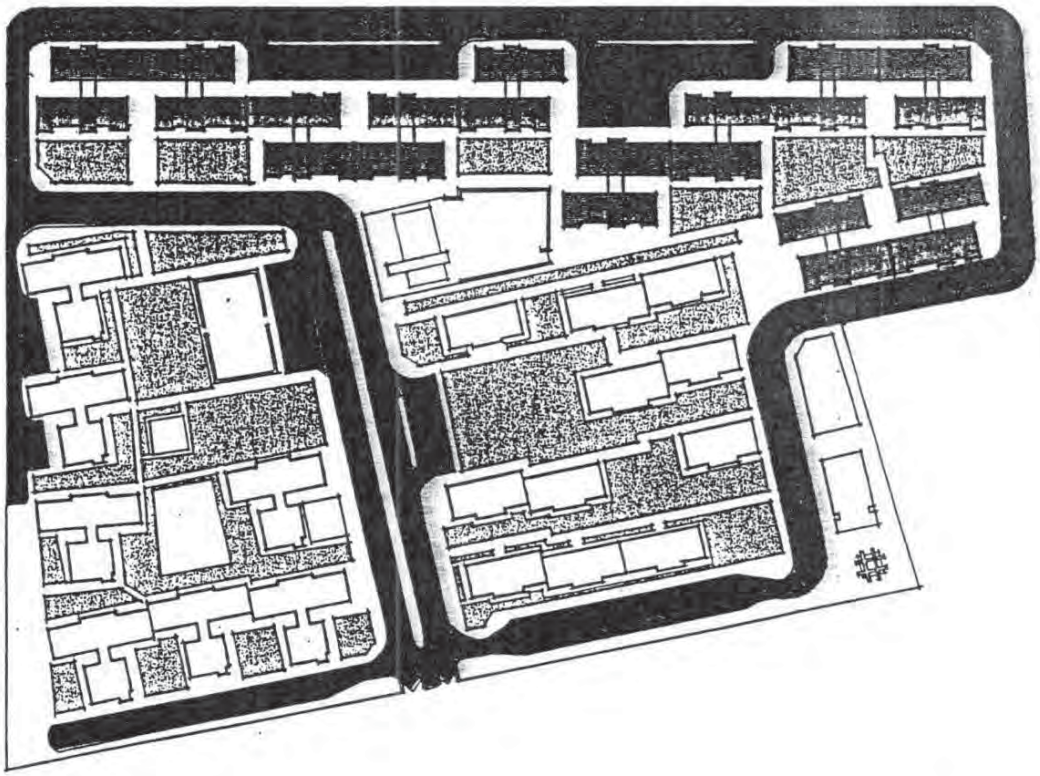

FIG 5.

Cairo University staff residences: El Maboussem (2nd stage). Giza Egypt (15).

Income group:	middle - uppermiddle	
site area	20561 sq.m	
total built area	26400 sq.m	
plot ratio	1.3	
no. of units	220 housing unit	
population	1100	
net density	220 ppa	550 pp ha
ground coverage	5195 sq.m	
openspaces, walkways, circulation	75 ./.	
minimum spacing range	12 - 18 meters.	
No. of storeys	5 storey walk ups/ direct access	

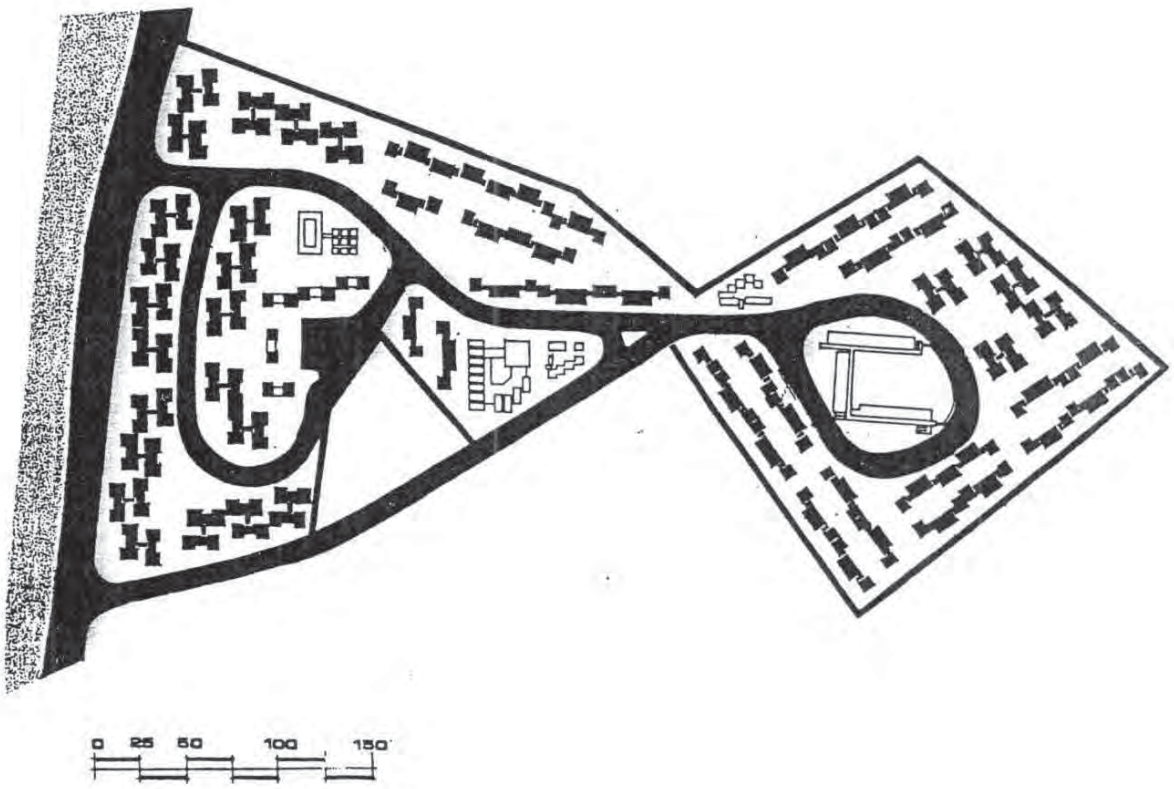

FIG 6.

Limited income families community, Mersa Matrouh. N.W. Coast, Egypt (16).

Income groups: Middle	
site area	89000 sq.m 8.9 ha
total built area	80360 sq.m
plot ratio	0.9
No. of units	1142 units
population	5000
density	270 ppa 674 pp ha
ground coverage	18309 sq.m
open spaces and circulation	80 ./.
spacing	12 - 20 meters
no of storeys	2 storeys, 4 and 5 storeys
types	villas, direct access walk ups

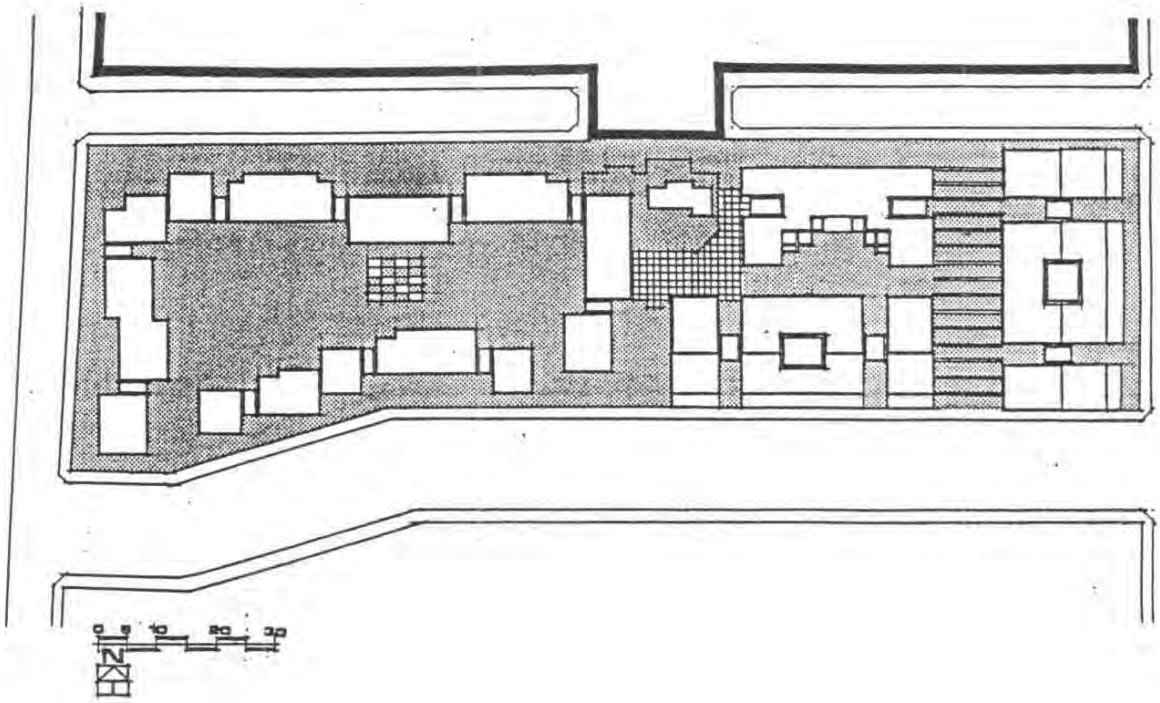

FIG 7.

Mixed Development - El Omraniah west - Gizah, Egypt (17).

Income groups:	middle - upper middle	
site area	8373 sq.m	
total built area	35318 sq.m	
Plot ratio	4.2	
No. of units	265 unit	
population	1300 person	
net density	650 ppa	1625 pp ha
ground coverage	4223 sq.m	percentage
open spaces, walkways	50./.	
minimum spacing range	15 - 21 meters	
no of storeys	6 storey walkups direct access	
	14 storey, high rise blocks	

TABLE 1

Comparative Analysis of Selected Recent Housing Developments, in Egypt.

	Project	plot ratio	density ppa	ground coverage ./.	O.S. ./.	min. spacing metre	no. of storeys	housing types	income group	housing supply
1	N.A.C	0.65	144	16	84	15	4	walk ups	U.M/M/L	Government
2	El Obour	0.9	230	36	64	9/12	2 - 3	Low rise walk ups	L	"
3	El Berkah	1.8	388	30	70	10/12	6	walk ups	L/M	Co.Op
4	El saaf	1.9	500	31	69	12/15	6	walk ups	L/M	"
5	Cairo Univ.	1.3	220	25	75	12/18	5	walk ups	M/U.M	"
6	Matrouh	0.9	270	20	80	12/20	2 - 5	Villas walk ups	M	"
7	Mixed Dev. Giza	4.2	650	50	50	15/21	6 - 14	walk ups High rise	M/U.M	Public sector

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PART 2 PAPER 9

IAHS WORLD CONGRESS ON HOUSING
PLANNING,FINANCING,CONSTRUCTION
MIAMI,FLORIDA,NOVEMBER 1983

THE SPACE-BETWEEN, IN NEWLY DEVELOPED HOUSING AREAS IN EGYPT - A POLEMIC ON ENVIRONMENTAL QUALITY

DR. SAYED ETTOUNEY

THE SPACE BETWEEN , IN NEWLY DEVELOPED HOUSING AREAS, IN EGYPT - A POLEMIC ON ENVIRONMENTAL QUALITY

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ABSTRACT

The Space Between characteristics and the Environmental Quality of low income housing areas, interrelations are briefly highlighted and means of improving the quality of the external environment in housing areas are then presented. Selected examples from newly developed housing areas in Egypt are also included.

Introduction

Housing low income families is a multi faceted problem that becomes among the topmost in the Development objectives priority list. The rapidly expanding gap between housing demand and the limited supply is a common frustration in developing countries.

The corner stone in the various solutions to the housing problem is the minimization of the costs of developing housing areas.

The reduction of costs is a cumulative result of savings on the various aspects of housing development namely: provision of land, parcellization and site planning, infra structure, the house envelope etc.

The house envelope economics and means of reaching optimum design was the subject of extensive work and research, resulting in effective concepts and

approaches to low income housing (eg. site & service, core houses, incremental design etc).

The external environment and the space between, which amounts to some 33% of residential areas or 50% of the saleable residential plots did not enjoy the same concern.

The external space in residential areas typify the housing sites and affects the environmental quality, the character and efficiency of the locale.

Furthermore it reflects on the behaviour of the inhabitants their well being, responsibilities, commitment and pride.
It is however negleted; it envariably comes as an after thought rather than an integral part of housing area development.
The negligence is justified on grounds of costs though the resulting environment costs;more through the negative addition to urban and socio-cultural deterioration, a dear price which the communities pay.

Environmental quality need not be a costly product of the extravagant use of space furniture and fill. It is synonymous with rational planning and committed sensible design.

Interlude I:

The External Housing Environment Related Factors.

The factors affecting the space between in housing areas may be summerized as follows:

- site characteristics & physical interrelations
- density, (physical & activity)
- Environmental aspects
  - daylighting & sunlighting
  - provisions of shadows
  - air movement
  - wind shelter
  - orientation (solar/air)
- privacy, (physical - psychological)
- noise & noise control (acoustic environment)
- views, (outward and inward)
- open spaces (provision standards & hierarchy)
  (landscaping/natural elements)
- accessibility and circulation (man - car)
  - car parks
  - roads
- security : safety - defencibility
- visual form : image elements & character ingredients

Interlude II

Environmental Quality

Environmental quality is collectively the product of:

1. respect to and harmony with the site/locale,
   (eg. topography, slopes, soil conditions, climatic conditions, landscape

families, eco systems).

2. favourable/comfortable environmental conditions
   e.g. sheltered space (from dust/sand storms,rain)
   shadow zones (summer)
   sunny spots (winter)
3. appropriate density and intensity of sue
4. protection from overlooking & freedom to express oneself.
5. freedom from noise penetration
   (acceptable external noise levels)
6. availability of reasonable focal points and open views, landscaping & natural features (variety & contrast)
7. adequate access for service vehicles and cars,
   adequate provisions for cars,
   respect for pedestrians in terms of access and safety.
8. security and safety to suers and the environment.
9. clarity and imageability of the built form
   (a complicated product of the above plus other factors including visual form ingredients and character).

The Cost of Environmental Quality

Environmental quality is the direct result of good design, though good design is rather vague and is as difficult to attain as quality might be.

Good design is the committed endeavour that stems form society's goals and objectives. Thus environmental quality is not absolute, it is directly related to the society and locale in question.

It need not be a costly product of exaggerated use of materials and misapplication of standards.

The following check list (that fluctuates between brief guide lines and synoptic actions) is a first step in Securing Environmental Quality at little or no extra cost.

Environmental Quality. A Check List

1. Respect and Harmony with the Locale is likely to cost less:
   - exploit slopes and topographic features,
   - use available materials and their products,
   - avoid damage to existing eco-systems,
   - use existing vegitation and landscape families rather than destroying them,
   - respect the indicators, diagonosis and recommendations of climatic conditions.
2. Creation of Comfortable Environmental Conditions is only costly in terms of thoughts and mental efforts at the design stage with no extra cost at the execution and implementation stages. Introduction of landscape features, trees, shrubs and shelter belts is likely to be costly, such costs can be greatly reduced through community participation and careful location of these elements in private domains to avoid capital and maintainance cost. Shelter is a product of:
   - carefully proportioned spaces (height/spacing ratios)
   - compact planning

- sensible use of semi enclosures, canopies and barriers
- provision of shadows around buildings, within walkways and gathering areas, careful orientation of buildings, proportions of urban spaces, strategic location of trees.

3. Density

Density is only an indicator and by no means a design objective, high densities may be more expensive in housing development as a result of conjested infrastructure and circulation. Its non linear nature should be kept in mind in the organization of housing areas.
Medieval cities are excellent examples of high density low rize housing-mixed use areas.

Density versus environmental quality, is not an absolute respective relation as the house types, design details, layout, accessibility and distribution of open spaces are likely to determine the relation.

4. Provisions for privacy

Privacy from over looking and acoustic privacy can be achieved by other means than distance. Inward looking design concepts would allow maximum privacy within a compact site. Location & size of openings, use of barriers and landscape feature are among other design tools of securing privacy.

5. Creation of quieter environment

- Keep the car out
- encourage manual solutions to delivery and collection of services
- tolerate extra walking distances
- keep in mind psychological aspects & attitudes to noise
- dont exaggerate minimum standards
- keep cultural variability in mind, eg.noise is synonymous to life in some cultures.

6. Views

- need not be open and panoramic, as it is likely to clash with other environmental requirements
- exploit inward views & use of natural features
- the cleanliness and the appearance of the facades in a housing area provide adequate catching views,

7. Accessibility and Provisions for Cars. (See 5 above)

- dont glorify the car at the expense of humans,
- accept lower road standards,
- accept and design for lower speeds in housing areas,
- apply strict road hierarchy,
- accept concepts of car-man mix (mew courts)

8. Security

Is a non costly product of good design,
- provide for territoriality or clear designation of outdoor spaces, avoid waste and no mans land.
- walkways and urban spaces should be overlooked by adjoining houses,

9. Visual Form

Another non costly product of good design, through the use of local materials, respect to the site and locale, simple overall structure and intricate detailing, variety and contrast, skylines, building lines, intensity of visual events, introduction of natural features etc.

10- The Socio-Cultural Dimension

Understanding and respect of the socio cultural aspects is a very important element in securing external environmental quality and an efficient space between. People are our main concern and not the built environment which is only means of achieving well being to man, and is not an end by itself.

Designs should accept and allow for diversity and cultural variability and exploit the potentialities of community dynamics and encourage it, in order to secure local identity and belonging which in turn are essential to a well kept Space Between in housing areas. This will call for :

- analysis of socio cultural profiles of the users,
- definition of behavioural patterns and variabilities,
- provision of means and mechanisms for community participation.

Interlude III

Four Examples from Two Newly Developed Housing Areas in Egypt.

The four examples illustrated here, present four attempts to organize residential sites, in two Egyptian new cities, New Ameriyah city (40 km to the west of Alexandria) and El Obour new city (25 km to the North East of Cairo).

Figures 1 & 2 show the Ameriyah examples, that were developed a year earlier than El Obour sites, Figures 3 & 4 , (1) (4). They present two categorically different approaches to housing area design and the form of the SPACE BETWEEN.

The Ameriyah examples show two residential clusters of economic housing Fig.1 & middle income housing Fig. 2, comprising four storey apartment blocks grouped around one or more central space, which includes public greens and service court. Private gardens adjoining ground floor flats are used to suggest territoriality and space definition.

The resulting environment is expensive to develop and to maintain. It lacks character and poorly relates to the arid context.

El Obour examples Fig. 3 & 4 on the other hand, which were designed for low income families, show better use of land and reflect and attempt to recreate the traditional Egyptian housing cluster (AL Harah).

Al Harah is a well defined physical area, with controlled access points and internal focal points (community courtyards) where a limited number of families enjoy private domains (a plot and a single (or two) storey private house) and share a sense of belonging and committment,

In El Obour, Al Harah is regenerated and the resulting urban tissue respects the locale and the socio cultural requirements without sacrificing cost effectiveness, and inspite of the compact grouping, maximum privacy is achieved for the individual families and local identity for the community.

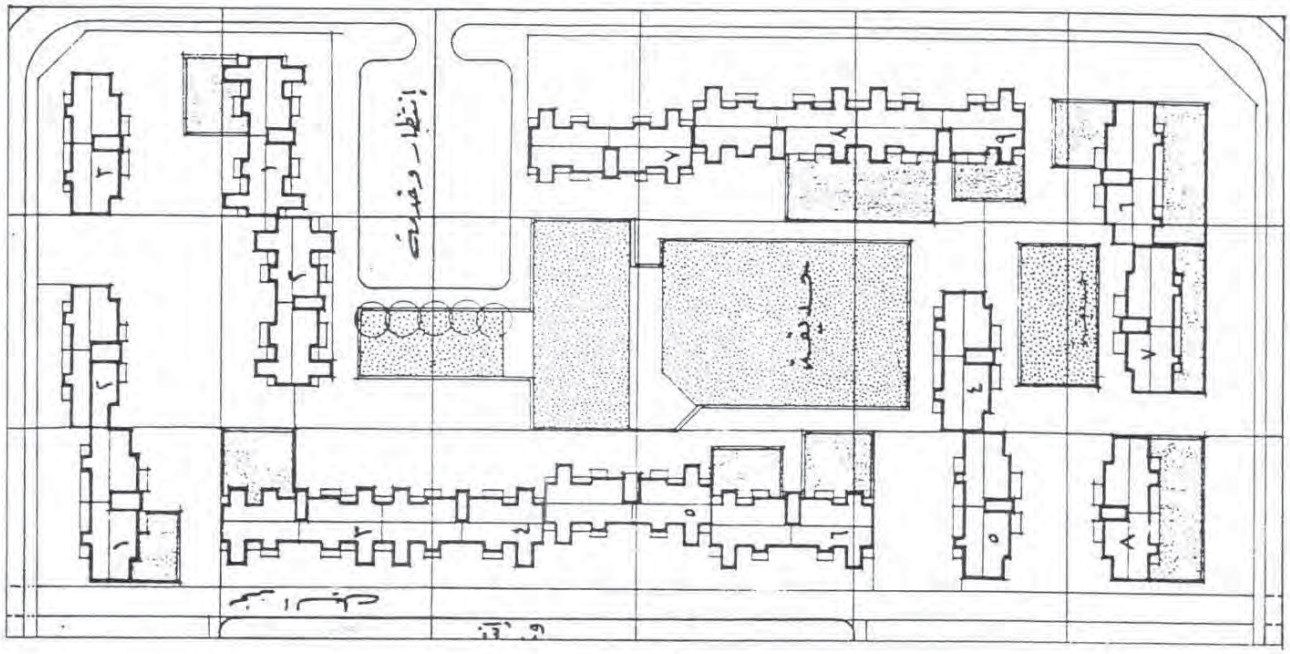

FIG 1

A housing cluster - economic housing, New Ameriyah City, Egypt (4)

Housing units 272 units	Residential Density 209 person/acre
Population 1360 person	Ground coverage 11%
Net Area 6.5 acres	Floor space Index 0.44

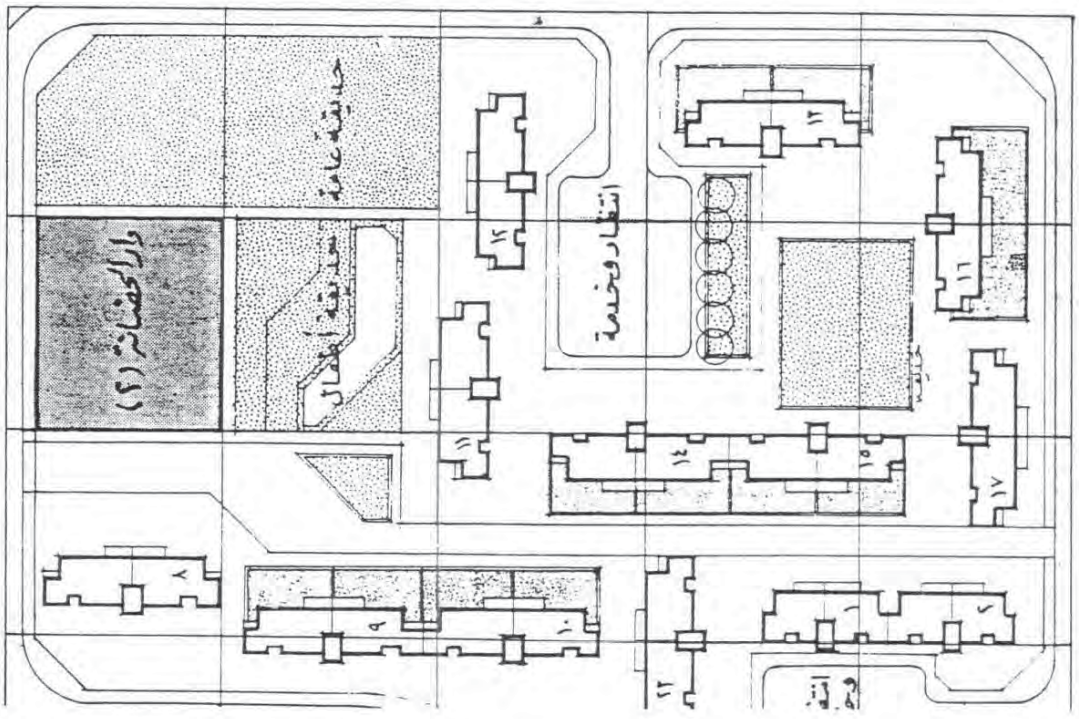

FIG 2

A housing cluster - Middle income housing, New Ameriyah City, Egypt (4)

Housing Units	104 unit	Residential Density 100 person/acre
Population	416 person	Ground coverage 16%
Net Area	4.15 acres	Floor Space Index 0.64

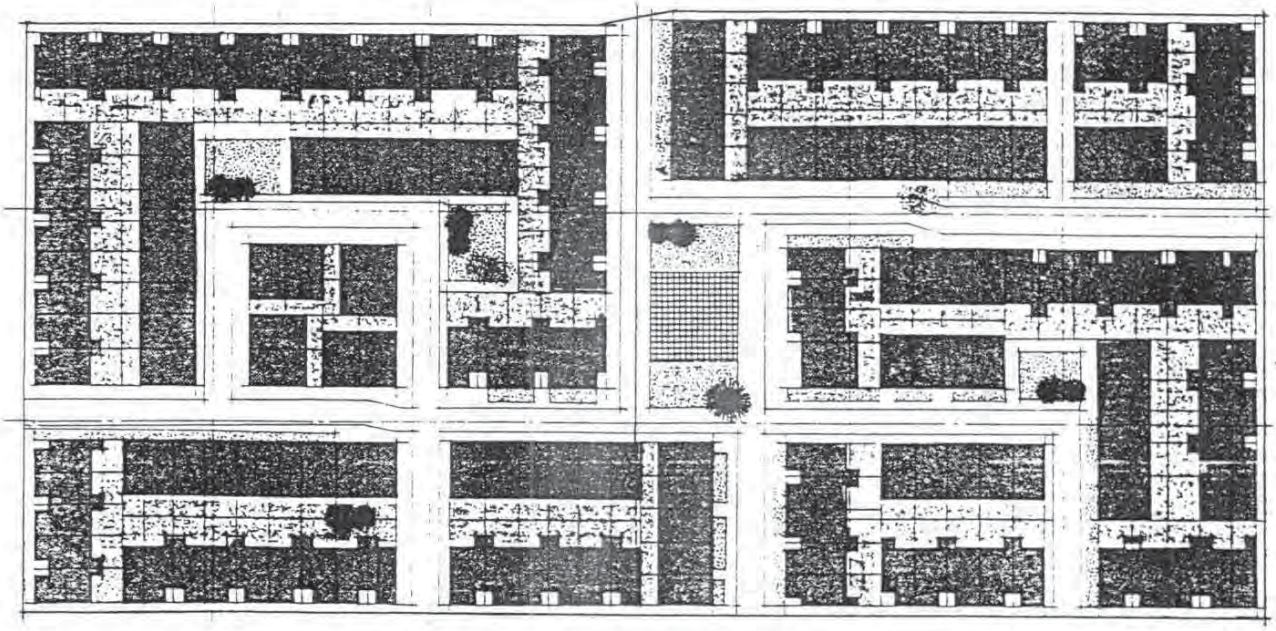

FIG 3

AL HARAH, Residential cluster, El Obour New City, Egypt (1)

Low Income family housing (1 - 2 storeys)
Design module 36 x 36 metres — Residential Density 200 person/acre
House units (plots) 187 units — Ground coverage 48%
Population 1122 person — Floor space Index 0.96
Net Area 5.6 acres

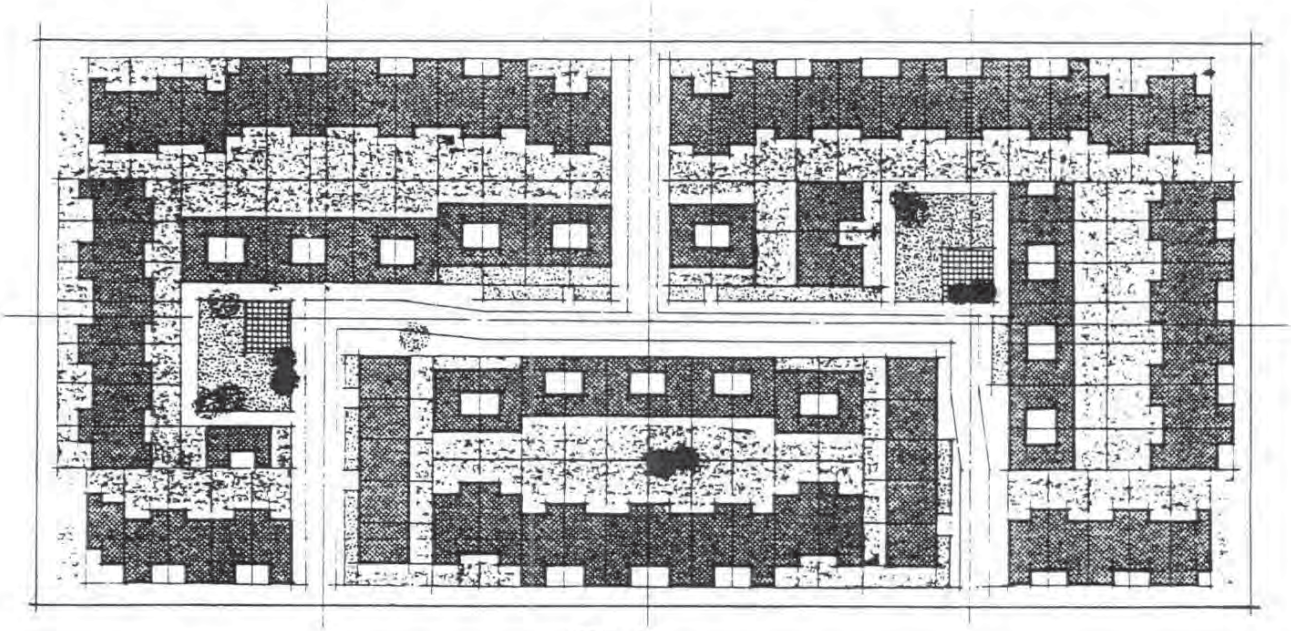

FIG 4

AL HARAH, Residential cluster, El Obour New City, Egypt (1).

Low income family housing (1 - 2 storeys)
Design module 54 x 54 metres
House units (plots) 102 units — Residential Density 146 persons/acre
Population 816 persons — Ground coverage 30%
Net Area 5.6 acres — Floor space Index 0.60

Epilogue

Means of acheiving better quality environments, in low income housing areas at no extra development cost are simply the result of:

- respect to and harmony with the locale,
- critical definition of minimum standards and their real cost,
- open space hierarchial definition
- addressing the question of car-man interrelation
- positive community participation

This simplicity is however only skin deep.

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PART 2 PAPER 10

SYMPOSIUM ON URBAN CLIMATOLOGY
URBAN CLIMATOLOGY IN TROPICAL COUNTRIES
NAIROBI,KENYA,APRIL 1986

ON CLIMATE AND URBAN FORM - NOTES ON THE RELATIVE IMPORTANCE OF CLIMATE AS A PHYSICAL PLANNING DETERMINANT

DR. SAYED ETTOUNEY

SYMPOSIUM ON URBAN CLIMATOLOGY IN TROPICAL COUNTRIES.
NAIROBI - KENYA APRIL 14th - 17th 1986

THEME: THE EFFECT OF CLIMATE ON URBANIZATION IN THE TROPICS.
SUB THEME: CASE STUDIES IN AFRICA, ASIA, THE MIDDLE EAST, AUSTRALIA.

ON CLIMATE AND URBAN FORM - NOTES ON THE RELATIVE IMPORTANCE OF CLIMATE AS A PHYSICAL PLANNING DETERMINANT.

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SUMMARY

Climate is generally accepted as a major force in the set of physical determinants affecting the form and configuration of urban settlements. Climatic design and planning criteria "academically" cover a wide spectrum of aspects including: site selection, urban shapes and patterns, macro orientation, circulation patterns, landuse organization and development regulations.

climatic versus form relations and interactions are relatively easier to follow and analyse in newly developed communities, where planning concepts and design criteria are presented together with the final urban forms.

This paper critically looks at the issue of the relative importance of climate as an urban form determinant, on the various levels of physical planning.

The paper presents and argues the view, that:

" The effect of climate depends on the emergence of the third dimension (height); therefore in structure and urban planning processes, climatic considerations are of a rather limited effect and its influence and role positively increases with the presence of 3 dimensional decisions in site planning, urban design, townscape & landscape studies and projects".

This simply means that for the same proposed urban plan an array of categorically different micro climatic environments can result according to three dimensional organization and site planning decisions.

The discourse is partly supported by a brief look into selected examples of the climate-form interrelations, based on the available literature on the development of new cities in Egypt during the past decade, most of which are desert settlements located outside the tradionally populated Nile valley and its delta.

The paper comprises four sections, namely:

1- Introduction On climate and urban form,

2- Interlude Three examples from Egyptian new desert developments.
3- Discourse On the relative importance of climate in physical development,
4- Conclusions

1- ON CLIMATE AND URBAN FORM - AN INTRODUCTION

In developing new communities, urban forms or settlements land-use plans evolve through a complex process comprising intuitive and rational actions and spanning a sequence of closely related phases. The key phases of the physical planning process includes:

- Definition of goals and objectives,
- Formulation of Development programmes,
- Definition of Planning context,
- Development of alternative solutions to the planning problem i.e. alternative physical plans,
- Evaluation and evolution of alternatives,
- Development of selected plan.

The urban form presents a challenge to the physical planner and plays a decisive role in the success or failure of the development rationales, See also Ettouney (1986).

Urban form generation is a complicated process that results from the complex interactions of three major sets of planning determinants, namely:

1- Development Goals and Objectives; national, regional & local.
2- Development Programmes, e.g. target population, labour force and job opportunities, economic base and activities, housing and community facilities requirements and thresholds etc.
3- Physical Context Determinants, the planning setting, the site and the environment, including: existing and surrounding uses, site characteristics, environmental aspects & climate.

The physical context is a major factor in shaping the form of new settlements and in determining its features and physical character. Furthermore it provides the setting for the interactions of the former two sets, i.e. Goals & objectives and development programmes, Yousry & Ettouney (1980), see also Perkins (1978).

The physical context outlines the ranges of actions (or relative freedom) for the physical planner in manipulating and organizing urban form elements, i.e. functions, flow systems & visual form within the locality. The influence of the physical context on urban forms is normally defined at the early stages of the planning process, then it is synthesized into a set of key physical determinants, which in turn, are used as bases for the formulation of planning alternatives as well as criteria for their evaluation.

The main elements of the physical context that affect the urban form and development activities includes:

1- Location factors, spatial interelations, existing and neighbouring landuses, linkages, flow systems and infra-structure.

2- Topography, slopes and inclinations, ridges & watershed lines, storm water gullies etc.
3- Geotechnical aspects, soil & under ground water.
4- Landscape families and natural elements/features.
5- Climatic aspects, thermal environment, wind environment, lighting, precipitation.

The relation between climate, urban forms and the resulting built environment is rather critical because of the direct influence climate exerts on the features and characteristics of both.

The climatic effects (arguably) influence:
1- The choice of location and site selection for new settlements, see also Golany (1980).
2- The shape and spatial patterns of settlements, i.e. its two dimensional configurations, (e.g. linear, concentric, dispersed, concentrated etc..).
3- The macro orientation of the urban mass, major axes directions.
4- The spatial organization of landuses within and around the settlement,
5- Alignment of major vehicular and pedestrian routes,
6- The configurations of urban form boundaries, i.e. the borders between settlements and the surroundings, e.g. desert.
7- Details, forms and location of urban form edges and delineators, e.g. shelter belts, open spaces and green corridors and breeze channels.
8- Major three dimensional related decisions e.g. intensity of uses, heights, densities, spacing, plot ratios etc.

The above form related aspects are directly influenced by climatic determinants. The effects of climate further extends through the closely related phases of urban development i.e. three dimensional planning, see for example Konya (1980). Three dimensional planning links architectural and building activities on one hand and urban planning on the other. It comprises, urban design, townscaping, landscaping site planning and development control.

It marks the phase where the third dimension emerges and the urban scene is prepared to accommodate man made elements;buildings and their accessories.

It is also the stage where climatic impact on the builtscape is felt and the micro climate characterizing the settlement - to be is formulated.

2- INTERLUDE - THREE EXAMPLES FROM EGYPTIAN NEW DESERT DEVELOPMENTS:-

2.1 Introduction

This section comprises a brief portofolio highlighting the features of three Egyptian new desert cities together with selected development projects within their structures. The three selected new cities belong to the 1st and 2nd generations of desert cities, developed and (to be) around Egypt's

two primate cities: Cairo & Alexandria, Fig 2.
The development objectives behind the new desert cities, includes: enhancing national economy, restoring balance to urban structure, solving urbanization problems, solving primate cities urbanization explosion related problems, initiating desert development away from the overcrowded limited Nile valley (4% of Egypt Area).
The present section (besides the Introduction) includes four brief sub sections:
- A note on the climate of Egypt.
- New Ameriyah City.
- 6 October New City
- El Obour New City,

The three synoptic profiles of the selected cities illustrate the key issue of this paper: i.e. the relative importance of climate as a physical planning determinant, hence the format of each comprises; a brief note on the city's basic data, the physical context: climate and topography, the resulting urban form and two selected development projects.

The profiles collectively illustrate:
- the relation between urban form and climate,
- the variety and contrast reflected in the physical (three dimensions) developments in each case and wholly, inspite of the fixed or similar climatic conditions.

The loose fitness between urban forms and climatic conditions on one hand and the horizontally and vertically contrasting examples, in each case and in the three examples(which broadly share the features of the macro climatic context, i.e. the hot dry desert environments) on the other, clearly illustrates the central theme of the paper, which is discussed in section 3.

2.2 A Note on the Climate of Egypt

Egypt is predominantly arid, 92% of the country area is hyper arid and the rest comprises semi arid, coastal deserts, inland and valley deserts etc (2, (1981)), see also Konya (1980). Egypt is located within the maximum solar radiation belt (15° N 30° N). The country's cultivated area the Nile valley and its delta, hardly amounts to 4% of the total area (1 million sq.km) Padco (1983). Three distinct climatic regions can be easily identified within the predominant aridity, namely:
1- The Mediterranean strip, maritime region: along the northern coast and to the south (north of latitude 30° 30' (approximately).
2- The desert region, covering most of the country, south of latitude 29° 30'.
3- The transition region that links the Mediterranean zone and the arid desert region, it mainly comprises the Nile valley and its delta, (fig.1).

The three zones overlap and interact, and their main climatic features are summarized in Table 1, (11, 1960)).
The climate is generally stable and marked by hot dry and sometimes humid summers, warm or relatively cold winters. The prevailing wind directions are north and north west, which moderates the thermal impact of the hot seasons. Strong sand storms

TABLE 1. Egypt's Climatic Regions, Highlights.

Climatic Regions Features	Maritime Region	Desert Region	Transition Region
1- Average annual rainfall (mm).	160 - 200	5 - 10	50
2- Mean monthly temperature ranges, °C.			
- summer	20 - 32	24 - 43	10 - 34
- winter	8 - 27	4 - 32	9 - 21
3- Mean diurnal range °C.	9 - 12	17 - 22	12 - 17
- summer	6	21	14
- winter	9	15	13
4- Prevailing Wind directions			
- Prevailing	N.NW	N.NW	N.W
- Secondary	N	NW	N
5- Mean monthly relative humidity %	50 - 80	10 - 55	40 - 80%
- summer	73	31 - 68	33 - 78
- winter	73	42 - 73	49 - 83

TABLE 2: Thermal Stress Distribution from 37 met. stations, Egypt.

	Day			Night		
Thermal Stress	Hot	Cold	Comfort	Hot	Cold	Comfort
Total number of months	221	93	130	29	238	277
Average number of months	5.97	2.51	3.52	.79	6.43	4.78
Percentage	49.8	20.9	29.3	6.5	53.6	39.9

from the south and the south west prevail for a short period during the spring season (khamaseen).

Thermal stress analysis of the climate of Egypt, based on Mahoney's tables and the data provided from 37 meteorological stations, Salem (1984), indicated that the thermal stress distribution at day and night times throughout the year is as shown in Table 2.

2.3 New Ameriyah City (N.A.C.)

2.3.1 Basic Data
(8, (1977 -78).

Location	40km to the west of Alexandria, on the Alex-Matrouh regional desert road, Fig. 2.
Latitude	31°N longitude 29° 30' altitude 30 - 50 metres (above sea level).
Target Population	500 000
Area	48 sq.km/4780 hectares
Economic Base	mixed: Industry, Services & Tourism

2.3.2 The Physical Context: Topography & Climate.

Figure 4 shows the setting for N.A.C. a longitudunal cross section abstracting the features of the site, as it extends from the Mediterranean to the city's site. The N.A.C. site is flat with a central ridge (+ 80m), marking northern and southern water-sheds, slopes are of the order of 3% inclinations with few sharp gradients in the north (10%).
The climate is typical coastal desert, characterized by high relative humidity, frequent dew formation and relatively small diurnal ranges (8 - 11° C/day). Annual rain fall is of the order of 140 - 180 mm, most of which falls during the winter season. The climatic data for N.A.C. were extrapolated from the analysis of meteorological data of the nearest five stations surrounding the site. Other major features of the projected climate may be summarized as follows:

- Temperature ranges:
  monthly mean max. 18.6 - 30°C
  " " min 7 - 21.5°C
  " " (diurnal) 8.8 - 11.6°C
- Relative Humidity range
  montyly means 66.5 - 74%
- Prevailing wind direction North & North West.

The climatic diagnosis - following mahoneys tables, Koenigsberger (1973), Konya (1980), indicated that the day/night thermal stress around the year will be as follows:

- December to March cold, day & night
- April & November comfortable days & cold nights.
- May & October comfortable, day and night
- June to September hot days, comfortable nights.

The climatic design recommendations included: provision of open spaces for northern breeze penetration (and air movement), North-South orientation, i.e. long axes of blocks east - west, and protection from south westerly sand storms, see also Table 3.

2.3.3 The N.A.C Urban Form & Selected Development Projects.

The master plan of N.A.C was developed in the light of the physical determinants, specially topographic and climatic requirements, Fig 4.

A linear form echoing and harmonizing with the linearity of the elongated setting along the ridge and exploiting northern slopes. The form is oriented north-west, its long axis runs east, west. From a climatic view point the plan combines the following merits:

- maximum exposure to northerly winds,
- provisions for penetration of sea northern breeze, through north-south open space corridors bisecting the city form.
- efficient organization of key landuses to minimize pollution and improve micro climatic conditions, e.g. Industry is located to the south of the city & city park in the north.
- exploitation of agricultural hinter land in the south.

Figures 5 & 6 show two large development projects in N.A.C., the neighbourhoods 8 & 9 to accommodate 16000 population (Pr. Cr. 1 & 2).

2.4 Six of October New City, S.O.N.C.

2.4.1 Basic Data

Location	32 km to the south west of Cairo, on Cairo-Oases regional road.
Latitude	30° N longitude, 30° 45' altitude 180 - 190 metres.
Target Population	350000 - 500000
Area	48sq.km 4800 ha.
Economic Base (G.O.P.P.(1979 - 80)	mixed: Industry, services & Tourism

2.4.2 The Physical Context: Topography & Climate

S.O.N.C. site is strategically located on a plateau 180 - 190m above sea level, a flat site with gentle north & south east facing slopes, averaging 3%. The site is located in the eastern desert in the transition zone influenced by the Nile delta and the Mediterranean in the North East and North respectively. It enjoys open views to the Nile valley & the Pyramides.

The features of the local climate may be summarized as follows:

- Temperature monthly mean ranges:
  - summer 20 - 34°C
  - winter 9 - 20°C
- Diurnal ranges:
  - summer 11.5°C
  - winter 9 °C
- Relative Humidity
  - summer 22 - 71%
  - winter 40 - 42%
- Annual rain fall 24 mm
- Prevailing Wind Directions
  - summer North & North West
  - winter N.West, West & S. West.

The climatic design recommendations called for : exposure of the city mass to north and north westerly winds during the hot season, protection from desert sand stroms (south & south west winds) during March, April & May, careful design of shelter belts and sand barriers, protection of the city against moving sand dunes, exploitation of views axes towards the NE & SE, careful orientation of city mass and major vehicular & pedestrian routes to reduce heat gain, maximization of shadows and minimization of glare.

2.4.3 The Urban Form & Selected Developments

Six October master plan, Fig.7 closely followed the recommendations of the climatic analysis as regard orientation, North exposure, landuse organization, provision of breeze corridors and edge protection against sand storms and moving dunes. Figure 7 shows the master plan of the city and its major elements, the urban mass, the tourist area, the city park and Industrial areas.
Figures 8 & 9 show two examples of 3 dimensional plans, to be developed during the first phase of the city's plan implementations, namely: An experimental residential cluster in the 3rd & 4th districts and the 1st tourist village, the tourist area, (pr.Cr. 3 & 4).

2.5 El Obour New City: O.N.C.

2.5.1 Basic Data
(3, 1980 - 82).

Location	North east of Greater Cairo, on Bilbeis desert road, some 25km from Cairo's centre
Latitude	30°10' longitude 31°25' altitude ° + 100 - 150m.
Target population	240 000
Area	17 sq.km 1700 hectares
Economic Base:	Industry & Services.

2.5.2 The Physical Context: Topography & Climate

El Obour new city enjoys favourable physical environmental conditions, located on a plateau intersected by a number of storm water gullies (valleys), it slopes gently to the North and West, with average inclination 3% sand dunes flank the site from the east and the west and their movement is towards the east and south east, hence present a direct threat to land-uses & development activities.

The climatic conditions for the site were extrapolated from the analysis of data from the nearest three met. stations flanking the site (3,(1980 - 82)). The climatic features may be summerized as follows:-

- Temperature mean ranges:
  - summer 20 - 34.5°C
  - winter 8 - 21 °C
- Diurnal ranges:
  - summer 10 - 6°C
  - winter 14.4 °C

NAC	SONC	ONC		
				Layout
●	●		1	Orientation north and south (long axis east west)
		●	2	Compact courtyard planning
				Spacing
			3	Open spacing for breeze penetratio
●			4	As 3 with wind protection
	●	●	5	Compact lay-out of estates
				Air movement
●			6	Rooms single banked permanent provision for air movement
	●		7	Double banked rooms temporary provision for air movement
		●	8	No air movement requirement
				Openings
			9	Large openings 40-80%
		●	10	Very small openings 10-20%
●	●		11	Medium openings 20-40%
				Walls
●			12	Light walls, short time-lag
	●	●	13	Heavy external and internal walls
				Roofs
●			14	Light, insulated roofs
	●	●	15	Heavy roofs over 8 h time-lag
				Out-door sleeping
		●	16	Space out door required
				Rain protection
			17	Protection from heavy rain necessary

TABLE 3. DETAILED CLIMATIC DESIGN RECOMMENDATIONS FOR:
NEW AMERIYAH CITY, SIX OCTOBER NEW CITY & OBOUR NEW CITY.

- Relative Humidity ranges:
  Summer 25 - 70%
  Winter 34 - 71%
- Prevailing wind directions
  Summer North, North West
  Winter South West
- Average rain fall (annual) 20mm

At the master plan phase no climatic detailed recommendations, were put forward, apart from the protection of the city mass against sand dunes located at the south west, provisions for protection against flash floods and free movement of northern and north westerly breeze.
Detailed analysis of O.N.C site (which falls in the transition climatic sub region, carrying the overlapping influences of maritime, Nile delta and desert climates) carried out at the following phase: The 1st District planning stage, called for: compact planning around enclosed yards and restricted air movement, Abdelkader & Ettouney (1985).

2.5.3 The Urban Form & Selected Developments

Topography, site conditions and environmental factors were considered in formulating development alternatives and O.N.C master plan. Fig 11.A summarizes the features of O.N.C plan, which evolves along a SW - NE axis and avoids sand dunes and respects reclaimed agricultural land and allows free passages for storm water movement and breeze penetration.
Fig 11.B shows the city's master plan characterized by the division of the city mass into independent districts, separated by flow lines and green corridors, the decentralization of services and the segregation of manufacturing industries to the south of the urban mass.

Fig 12 shows the winning-competition entry for the development of one of the local areas of the first district, of O.N.C (4,(1985)). The local area's population is of the order of 20000 and it contains two types of housing developments for low income families, parcellized single family housing and apartment blocks (walk ups). (Pr. Cr. 5).

3- DISCOURSE: ON THE RELATIVE IMPORTANCE OF CLIMATE IN PHYSICAL DEVELOPMENT

An urban form is just an abstract statement that provides scope for endless three dimensional decisions, site plans and town spaces. Which in turn may result in categorically different micro climatic conditions in and around buildings within the same locality covered by the master plan.

This reduces, if not altogether deletes, the macro climatic influence and related macro form decisions as regard: orientation, edge conditions, landuse relations, route alignments and even the location.

In other words the three dimensional phase is likely to over shadows the two dimensional plan making stage, inspite of the overlapping of the two.

The settlement's micro climate is effectively and predominantly shaped by masses, walls and barriers that impede and direct air

store and reflect radiation, cast shadows and allow or prevent natural lighting.

The micro climate of builtscapes is the product of the spatial relations and form characteristics of masses of man made and natural elements in the locality. To reiterate, the three dimensional phase does formulate the micro climates of cities through decisions concerning and covering:

1- Settlement grain and urban tissues, solids versus voids in the city's mass,
2- Heights and plot ratios, physical densities,
3- Intensity of development, activity densities,
4- Landscape decisions.

This determines the basic features of the physical environment namely: heights, volumes, surface areas, spacing and fill. These features are in turn the key determinants of the following ingredients of the climates of "places".

1- Architectural aerodynamics, air flow patterns around buildings, direction, speeds & turbulence intensity.
2- Wind shelter, for buildings and outdoor spaces .
3- Shadow patterns in and around buildings,
4- Insolation and protection of built masses and surfaces from direct and reflected radiation.

The two levels of urban development examples: urban forms and three dimensional projects, presented in section 2, clearly show that:

- urban forms interpretation of the climatic context determinants are general, qualitative and rather loose ended.
- The variety of possible three dimensional developments that exist within the framework of a master plan, or similar climatic contexts. All claiming climatic design awareness and relative respect to physical context requirements.

Detailed three dimensional decisions may thus enhance or clash with earlier urban form climate related features. Therefore, emphasizing detailed and elaborate climatic oriented decisions at the early stages of development i.e. urban form generation, evaluation and selection is likely to prove of no or limited value in shaping the final resulting climate of new cities and their fabric, see also Evans (1980).

4- CONCLUSIONS

Within the framework of any urban form there exists an infinite number of three dimensional configuration possibilities. Each combines distinct physical features and characteristics including builtscapes, heights, spacing, solids versus voids ratios, space furniture and fill. . . etc.

This is also manifested in existing settlements where a variety of urban patterns, tissues and grains are juxstaposed in the same locality or town.
A varitey of three dimensional configurations means a varitey of microcosms and in turn a varitey of micro climates within the same urban boundaries.

This together with the earlier discourse and supporting examples justifies the following reserved conclusions:

1- Climate - inspite of its comprehensive and complex nature- is but one factor in a matrix of forces and pressures affecting the form of settlements and its elements. The efficiency of climatic design is invariably hindered and adversely affected by the requirements and influence of other equally important factors including: economic viability & cost effectiveness, efficient building and landuse, socio cultural, functional and flow systems requirements.

2- Exaggerated precision at the early stages of climatic analysis, diagnosis and recommendations (which is synonymous with urban form generation phase) is likely to prove meaningless or of limited impact on the actual micro climate of built up areas at the later stages of development.

3- Urban design, landscaping and site planning present the critical level of physical development where climatic design and control is relatively effective in partly shaping and influencing external environments and their quality in urban area.

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LIST OF FIGURES

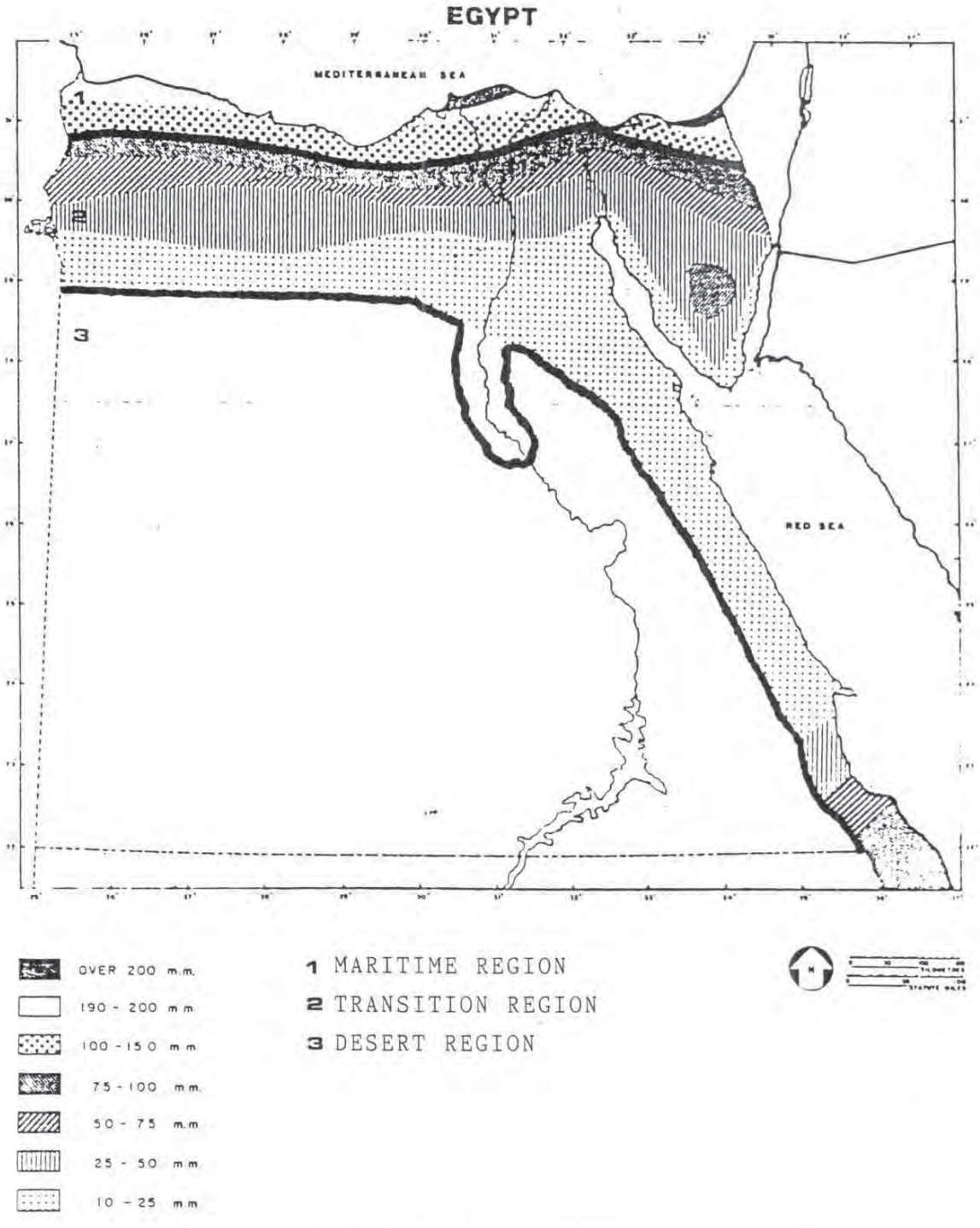

FIG. 1. EGYPT, ANNUAL RAIN FALL & CLIMATIC REGIONS.

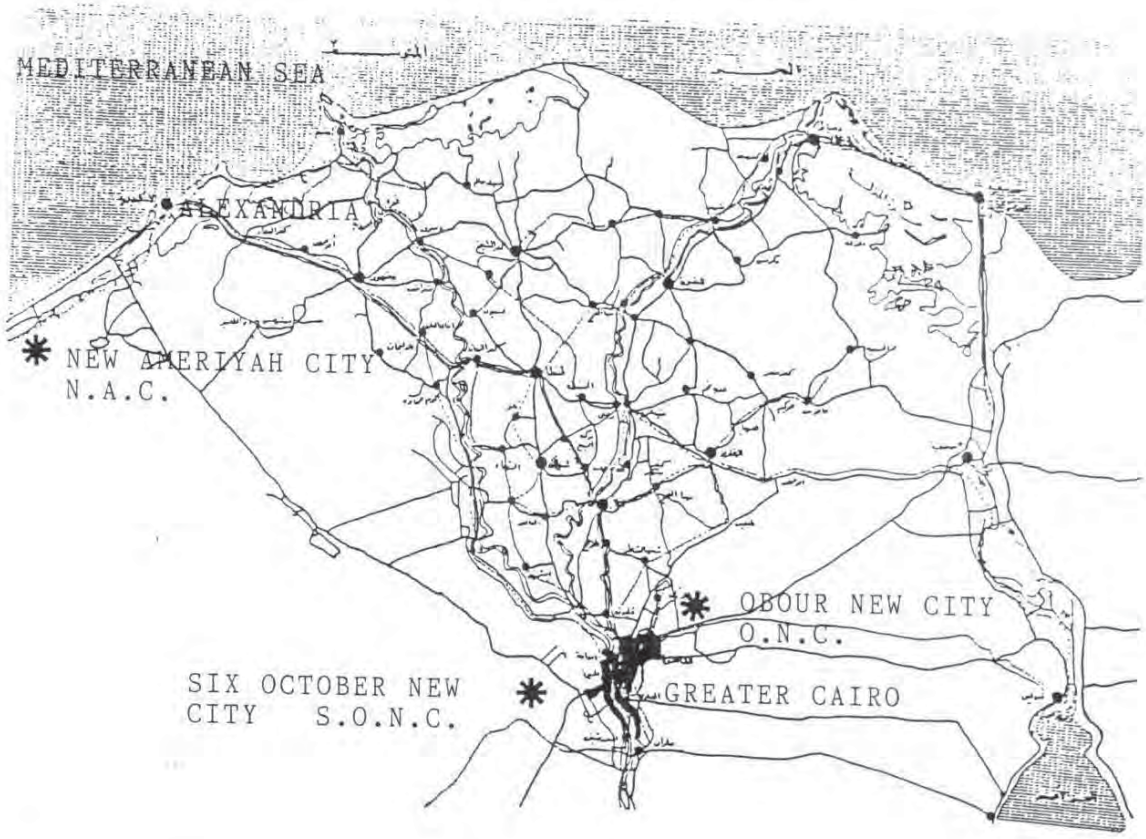

FIG. 2. N.A.C.,S.O.N.C. & O.N.C. - NEW CITIES LOCATIONS,EGYPT.

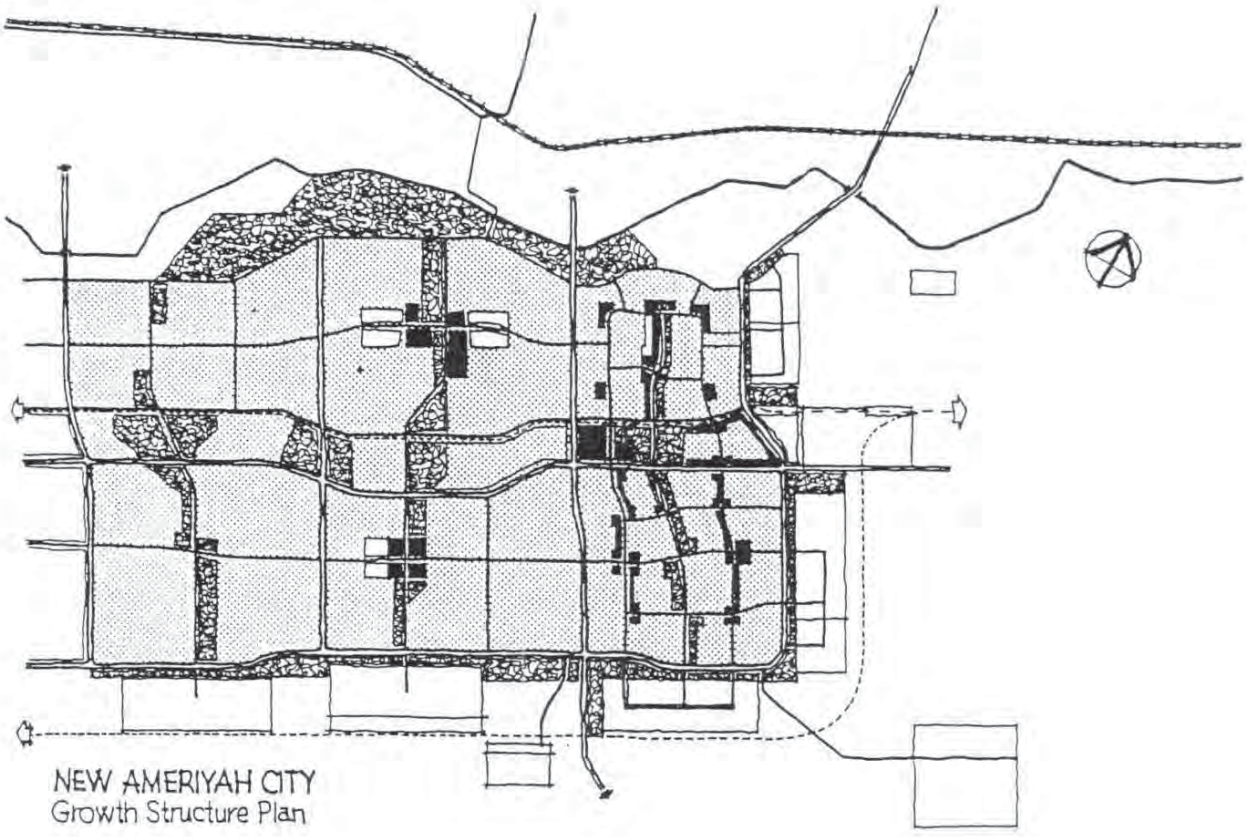

FIG. 3. NEW AMERIYAH CITY MASTER PLAN, EGYPT (8) .

FIG. 4. NEW AMERIYAH CITY ,SCHEMATIC CROSS SECTION,SITE TOPOGRAPHY (8).

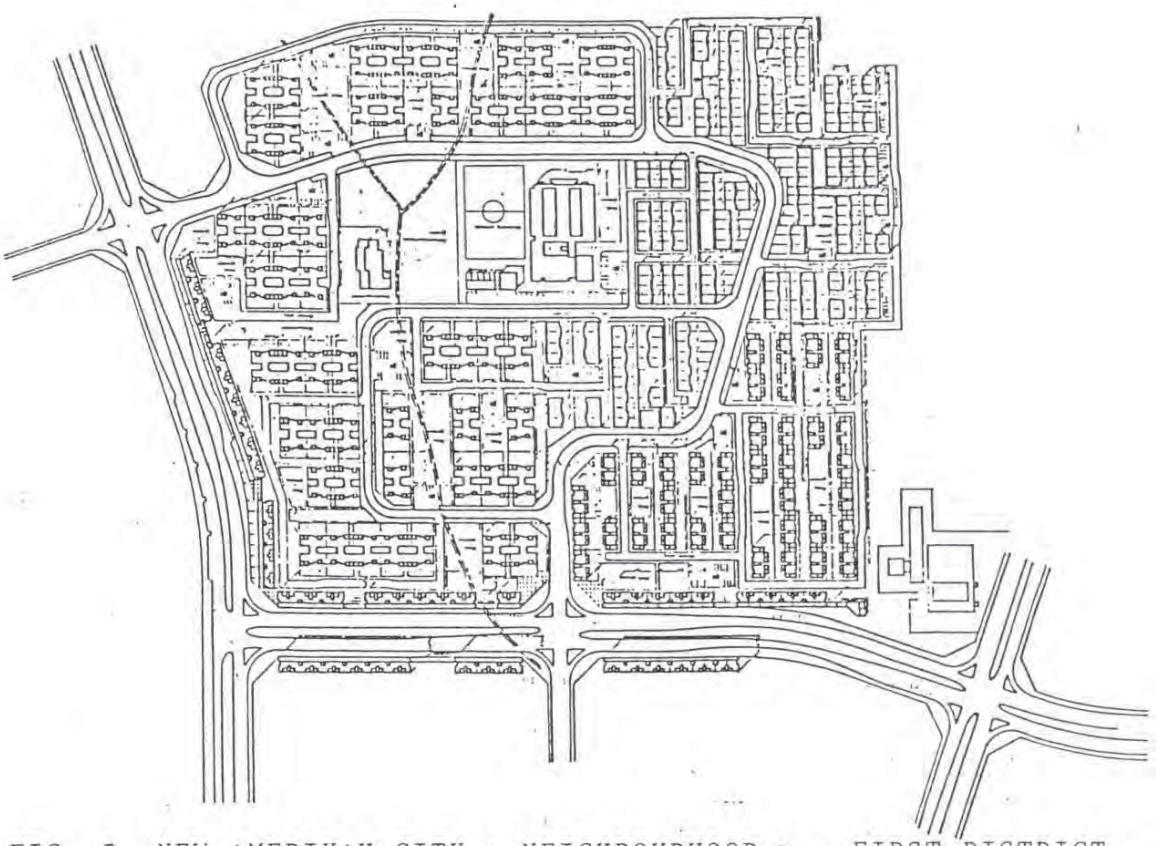

FIG. 5. NEW AMERIYAH CITY : NEIGHBOURHOOD 8 - FIRST DISTRICT, SITE PLAN (Pr.Cr. 1).

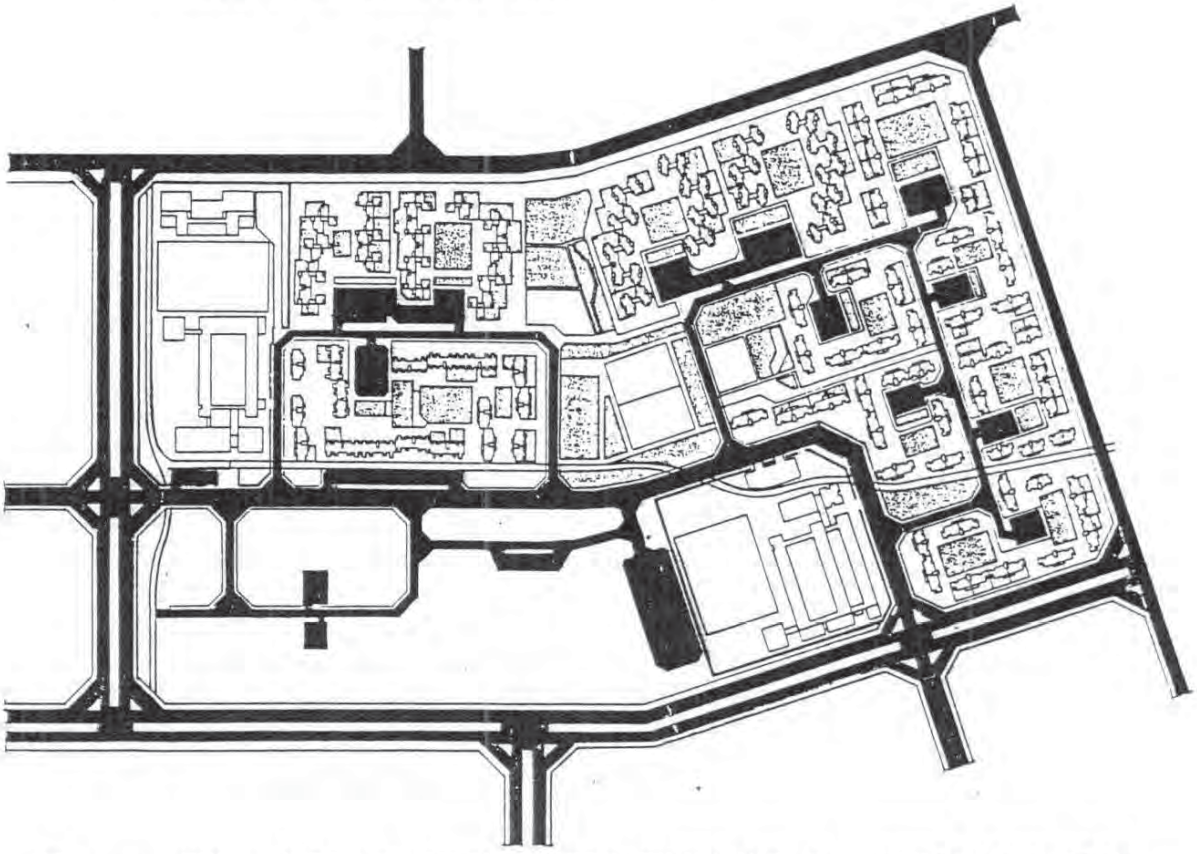

FIG. 6. NEW AMERIYAH CITY : NEIGHBOURHOOD 9 - FIRST DISTRICT, SITE PLAN (Pr.Cr. 2).

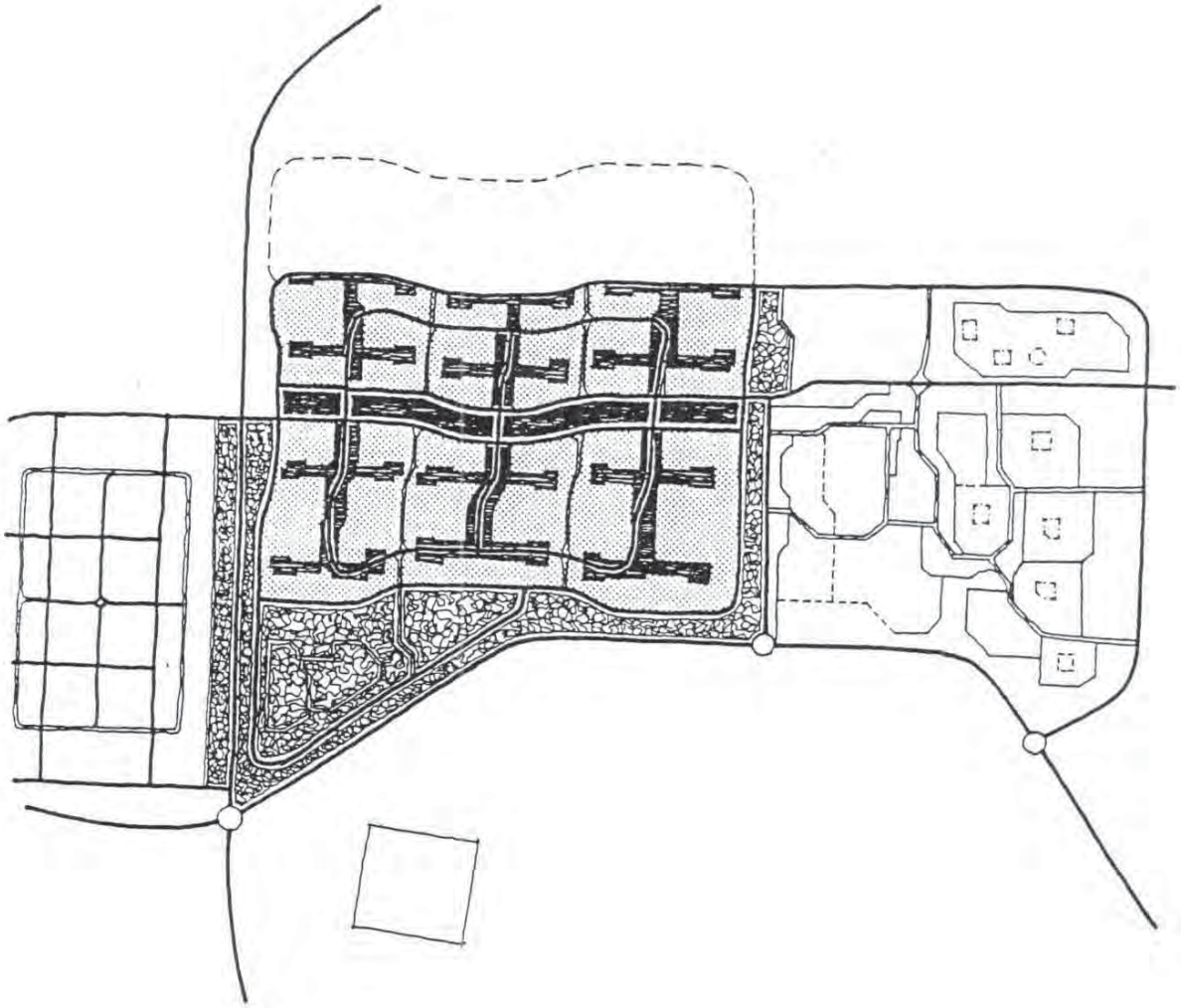

FIG. 7. SIX OCTOBER NEW CITY MASTER PLAN , EGYPT (7).

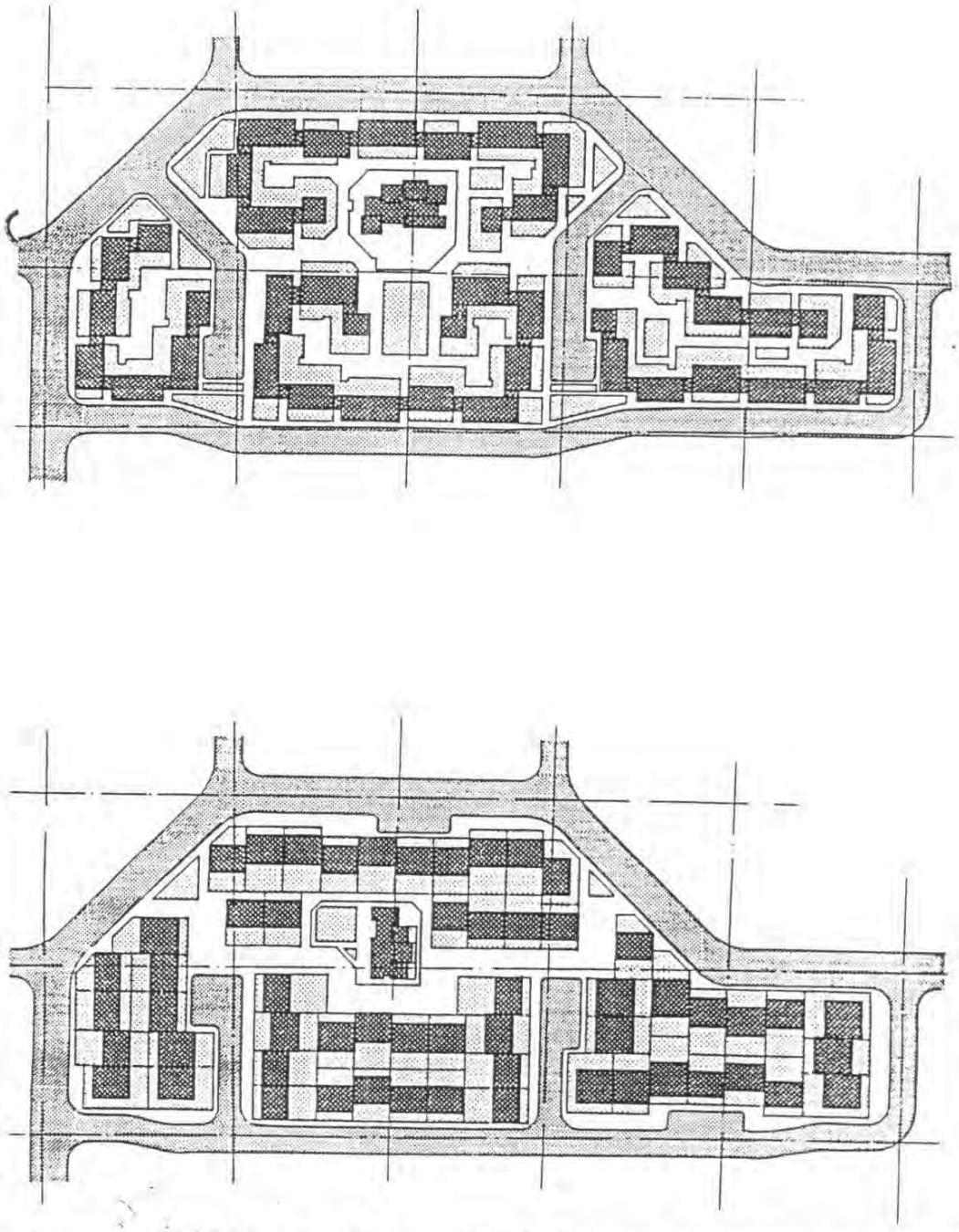

FIG. 8. SIX OCTOBER NEW CITY , EXPERIMENTAL RESIDENTIAL GROUP LAYOUTS,3 rd & 4 th DISTRICTS, (Pr.Cr. 3).

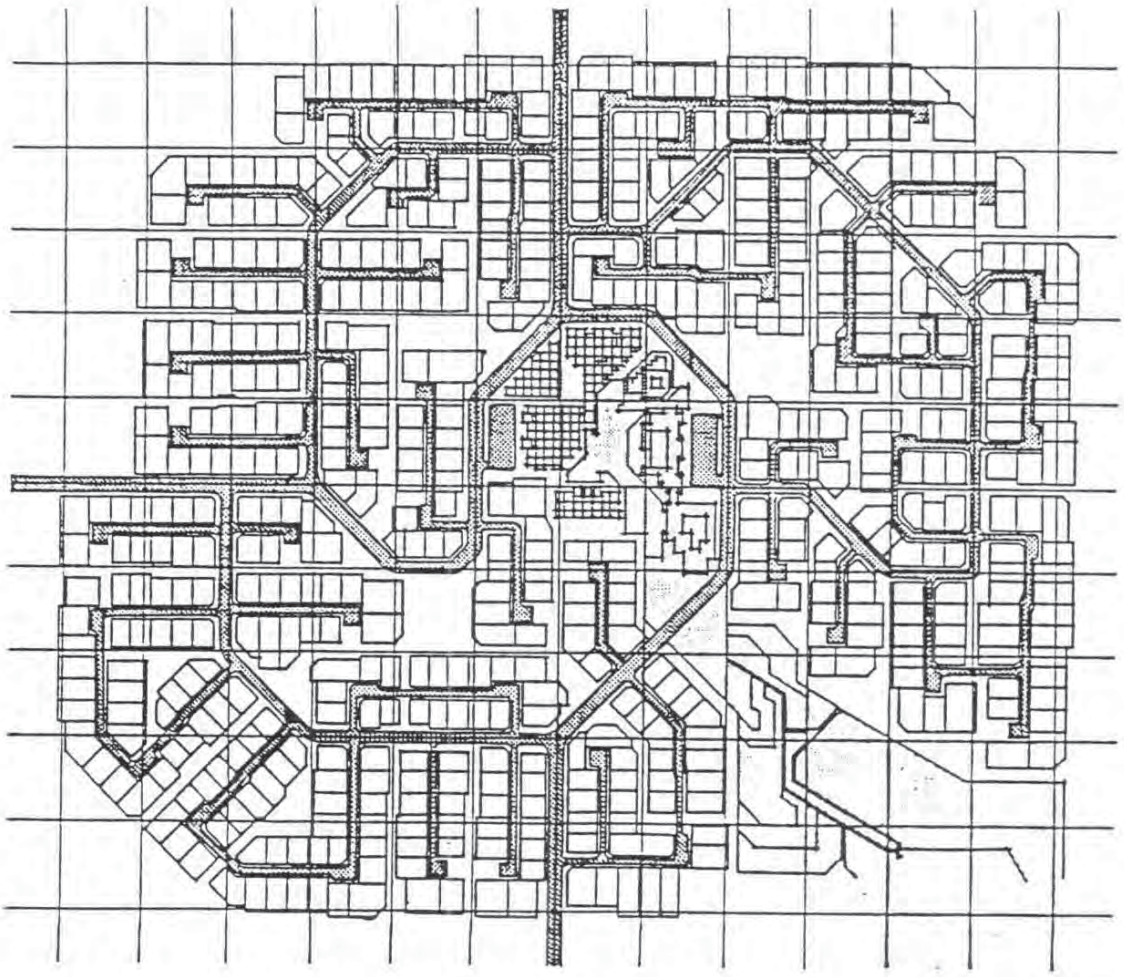

FIG. 9. SIX OCTOBER NEW CITY,FIRST TOURIST VILLAGE,THE TOURIST AREA (Pr.Cr. 4).

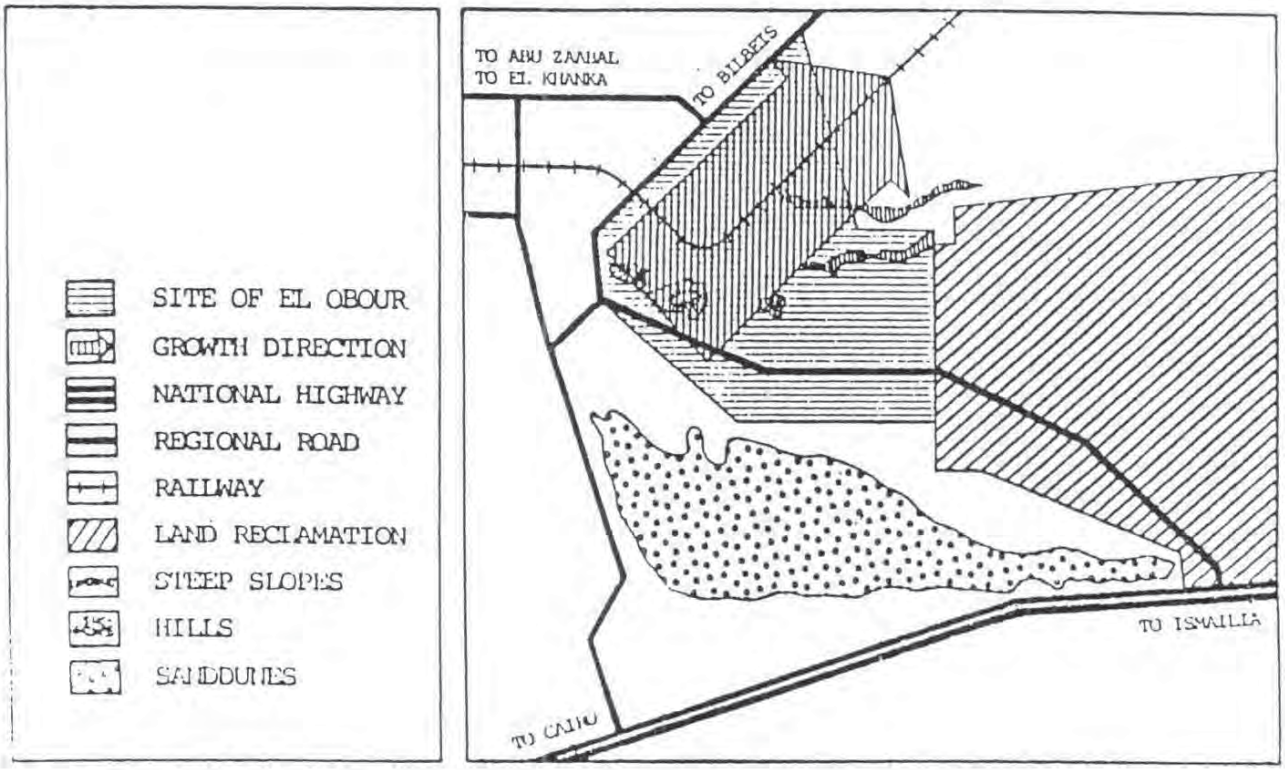

FIG. 11 A. OBOUR NEW CITY , DEVELOPMENT CONCEPT (3).

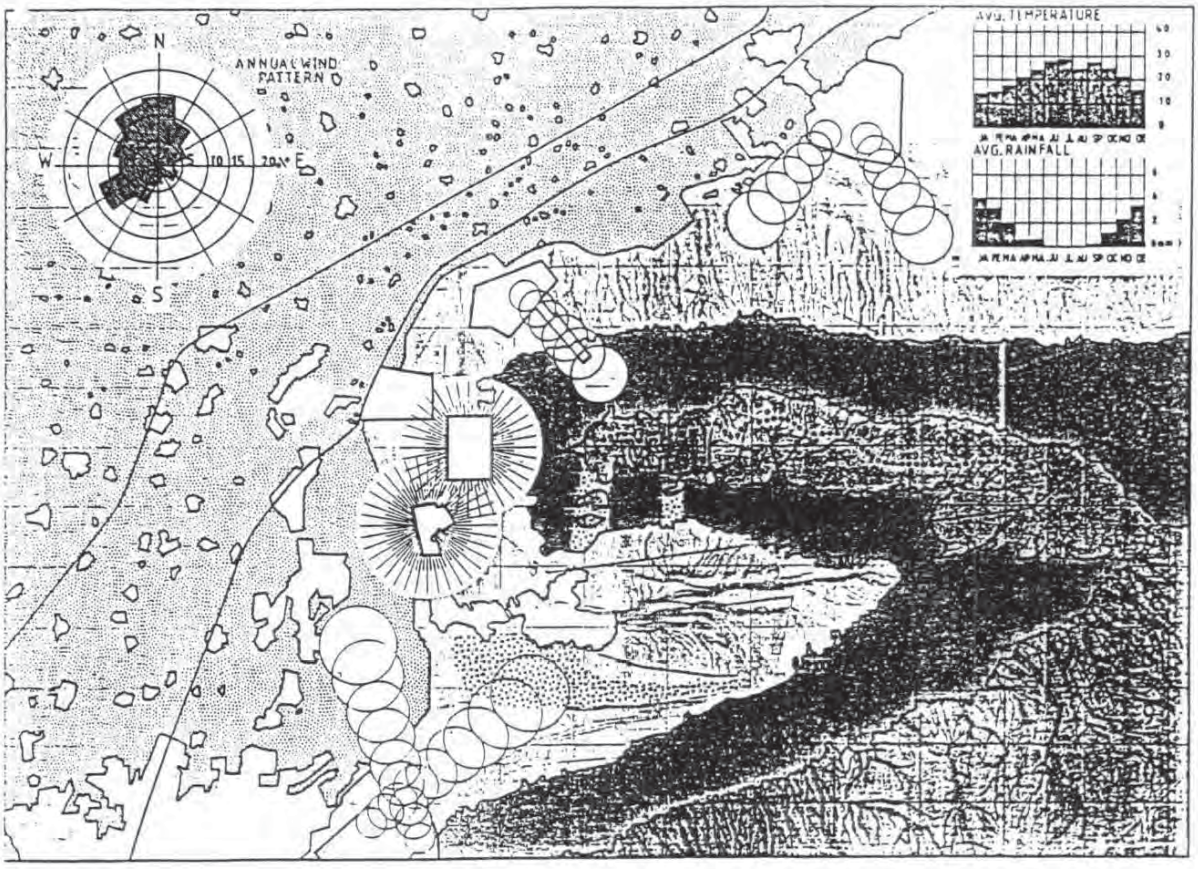

FIG. 10. OBOUR NEW CITY ,THE PHYSICAL SETTING (3).

FIG. 11 B. OBOUR NEW CITY MASTER PLAN , EGYPT (3).

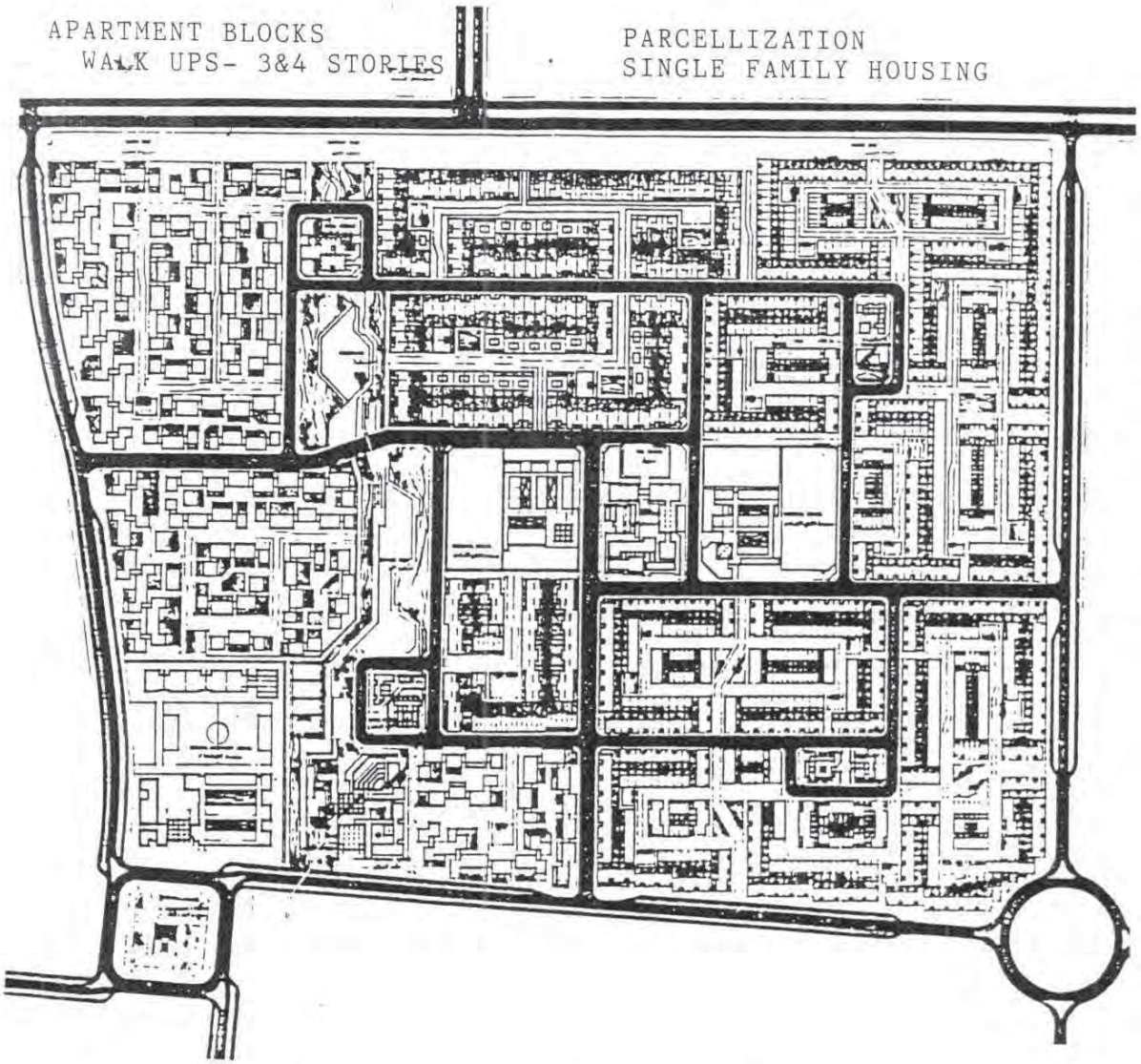

FIG. 12. OBOUR NEW CITY, FIRST DISTRICT, TWO EXAMPLES OF HOUSING LAYOUTS, (5).

PART 2 PAPER 11

INTERNATIONAL CONFERENCE ON PLANNING PLANNING AND DESIGN STANDARDS FOR HUMAN SETTLEMENTS
DAR ESSALAM,TANZANIA,FEBRUARY 1986

ON LOW COST HOUSING AESTHETICS AND VISUAL QUALITIES

DR. SAYED ETTOUNEY

CONFERENCE ON PLANNING & DESIGN STANDARDS FOR HUMAN SETTLEMENTS
DAR ES SALAM TANZANIA

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ON LOW COST HOUSING AESTHETICS AND VISUAL QUALITIES

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ABSTRACT

The complex issue of low cost housing aesthetics is reviewed and the factors affecting the visual quality and appearance of houses are highlighted. The critical issue of users role in the design process and the potentialities of their contributions to the visual form of housing area, is then discussed.

A synoptic profile of selected low cost housing facades from recent projects in Egypt complements the discourse, pointing out potentialities and limitations of current practices and graphically illustrates the design criteria for facades aesthetics.

The conclusions emphasizes the issue of "the cost of beauty" and raises questions for further research.

1- PRELUDE: ON THE SCOPE AND LIMITATIONS

The author was asked by the Conference Committee to discuss the intricate problem of "Low Cost Housing Aesthetics, appearance and "appeal". More specifically, three interrelated issues were to be covered, namely:

1- "The cost of beauty" or in other words "could poor people afford attractive houses?" Alternatively "is aesthetic quality synomymous with cost?"
2- The factors affecting appearance and visual quality - or those "factors which make a house attractive".
3- "Norms and standards to promote house beauty" or on another level "could beauty be secured and achieved & enforced through standards and control guidelines.

The core of the problem is the complexity of the question of "Aesthetics in architecture" and that the objective definition of aesthetics and aesthetic values is extremely difficult and controversial. The "art" side of architecture is in the same qualitative no-man's-land as all the other arts. It is no longer possible to expect personal views to be accepted as definitive" Smith [10].

The question of aesthetics in visual arts and three dimensional objects forces forward the hypothesis that".aethetics values is not an innate quality of objects, it is something that is conferred to objects by the human mind". [10]

Hence the relative importance of the interrelated issues of the mechanism of the brain, perception, the cultural dimensions etc.. in the study of aesthetics [8].[10].

In addressing the problem of low cost housing aesthetics within the limitations of the setting & time, a compromising form was seeked for the present paper.

The paper falls into three parts:

Part One: is a general introduction to the issue of low cost housing aesthetics summerizing the factors affecting the visual quality and appearance of houses.

Part Two: addresses the critical question of users participation in the design process, and the potentialities of their contribution to the resulting form and quality of built environment.

Part Three: comprises a brief portofolio on low cost housing facades. It comprises an analysis of some recent housing projects in Egypt. It graphically illustrates design criteria for facades form aesthetics. This section also points out potentialities and limitations on current practices of facades generation and provides a brief look into low cost housing projects facades in Egypt.

The conclusions besides summing up emphasizes the issue of the cost of beauty and raises questions and issues for further discussions.

2- LOW COST HOUSING VISUAL QUALITIES AN INTRODUCTION: FACTORS AFFECTING THE APPEARANCE OF HOUSING PROJECTS.

The question of: the appearance of housing projects, the visual quality of low income families housing and the architectural aesthetics of their habitats; is a difficult one to answer and presents a rather complex issue to handle. The complexity stems from the array of closely related realms that interact and influence that issue, including :urban planning, environmental design, house design , construction and finishing.

These realms represent the physical and relatively easier to address and evaluate (controversial albeit) aspects of the problem of housing aesthetics. The more complicated aspects are the non physical; i.e. the socio-cultural & economic together with psychological and behavioural aspects. [4], [8] & [11].

In this section, the discussion is concentrated on the physically related aspects of visual quality of low cost housing.

The articulation of the two sided problem is only academic, as many of the roots of the discussed physical criteria extend to the non physical aspects related to the users and community at large. It is convenient to handle the problem of housing aesthetics, visual quality and appearance primarily as a three dimensional form generation problem.
The problem of housing aesthetics or "appearance" may thus be simplified into:

"the external outlook of the house Unit "the dwelling", and the closely related collective visual effect of groups of houses together with the environmental image of the housing project: the houses, the spaces and the setting [i.e the site].

The visual form and appearance of low cost housing extend beyond

single buildings and their architectural expressiveness and quality.
In essence the appearance of low cost housing is an urban design & town-scape problem both in nature and scale and by no means ar - chitectural facades treatment.

The factors affecting the visual quality of housing environments should therefore be classified into three related sets,presenting three levels of physical entities, namely:

The first level: the dwelling, a single building :which is an architectural problem in terms of form generation and expression.

The second level: The cluster, the housing group or the collective architectural expression where multiple relationships dominate and introduce problems of urban and townscape" visual form" nature.

The third level: The setting, the physical context, the micro environment [the site], which affects the house unit and the cluster. It is a key element in the appearance of the housing project as it provides the stage for their existence and performance.

The interrelated factors affecting the visual qualities of the three levels in low cost housing may be summarized as follows :

2/1 The House Unit [5],[9],[12].

- Form, shape & area: simplicity, complexity regularity, form versus informal, scale, etc..
- Height: low, medium, high .
- Skyline: complex, intricate, straight, plane.
- Building line: straight, broken, regular, irregular.
- Vertical profile: plane, complex
- Porosity: solids versus voids.
- Visual features/characteristics:
  Unity: interrelation of components and the whole [12]
  Rhythm: horizontal/vertical - masses, lines regularity.
  Balance: of visual elements & intensity
  Proportions : the hidden order.
- Textures & Colours [9],
- Use of vernacular & traditional themes, components and elements [10].

2/2 The Collective Form: The street, Residential Group & Cluster

The factors or elements affecting the visual quality of low cost housing may be classified in two manners [4]:

1- As elements/factors affecting the visual character of housing areas,
2- As elements/factors affecting the visual quality of urban spaces & paths.

The former is more comprehensive and covers most of the aspects of the latter.

Generally speaking the factors affecting the visual character of housing areas could be classified into three sets:

1- Factors related to the micro and macro contexts [section 2/3].
2- Factors related to the buildings and builtscape, namely: visual features of groups of juxtaposed buildings. The factors are similar to those of a single building, but

the difference arises from scale & application. The visual features are those of the street facade or cluster comprising several buildings.

3- Factors related to the macro visual form of the area, the project and surrounding urban fabric, these include :
- site organization principles & features
- street and circulation network concept
- form and quality of urban spaces
- interrelation of "juxtaposed" local identity areas.
- distribution and location of visual accents [landmarks] and their relation to the over all form.

2/3 The Physical Context, Setting : The Site [4]

The site plays a crucial role in the collective appearance of housing layouts. Respect of and harmony with the site and its physical determinants on one hand and exploitation of its visual potentialities on the other are key elements in the "total image of housing schemes".
The "physical context" factors affecting the visual quality may thus be summarized as follows:

- Location: spatial relations.
- topography: slopes, direction.
- natural elements: trees, vegitation, water, rocks etc..
- views: from the site (outward) and to the site (inward).
- climatic effects: eg. lighting intensity.
- environmental quality: freedom from derilictions, air & surface pollution.

3- Note On The Non Physical Aspects: Users Participation and The Visual Quality.

3/1 Introduction:

Having a pleasant dwelling is a need that ought to be fulfiled in housing schemes. In case such a need is fulfilled, users will be proud to live and belong to the scheme. They will take care of their houses and the external environment, and will try to improve and maintain their quality.
However. this type of need is rather difficult to achieve since the definition of a pleasant & beautifull house is rather subjective and culturally variable [10]. Aesthetic values are subject to the socio-cultural and psychological characteristics of the user. Accordingly, when the designer of a housing project is taking decisions related to aesthetic values, he is in fact predicting the unpredictable.
The information usually available to the designer during the design process does not allow him to clearly identify the socio-cultural and psychological needs of the user. The understanding of the nature of available information and its relationship to the decisions made during the design process is crucial in allowing the designer to know how and when he could integrate the socio-cultural and psychological users needs into the design and form generation process.
The result may hopefully be a pleasant and appealing product to The designer, user and the community.

3/2 On The Design Process And Appropriate Information

In the design process, the designers role is to attempt to satisfy the users needs within the limits of available resources. Users

needs could be loosely classified into three main categories:

- the physiological needs
- the functional needs,
- the socio cultural and psychological needs [1].

The physiological needs are easily identified since they depend on measurable factors such as levels of natural lighting and ventilation, noise pollution and so forth.
The functional needs are relatively difficult to define though standards and guide lines make them rationally accessible and quantifiable. Generally speaking those needs are related to the types of activities undertaken in the dwelling, furniture and fixtures used and their impact upon areas of spaces and their interelationships.
The socio-cultural and psychological needs are the most difficult to identify and impossible to quantify ,as they do not depend on measurable factors and considerably vary from one user to the other and even for the same user within time. Such needs are related to controversial issues such as psychological privacy. aesthetic values, symbolism,spiritualconcerns etc.
The designer could have information allowing him to suggest reasonably satisfying designs for the physiological and functional needs of the user, but he would be in a difficult position when it comes to design decisions related to the socio-cultural and psychological needs.
In order to overcome that lack of information, the design process should be extended to allow the integration of users opinions in the decision making stages, affecting the form and appearance of dwellings [1].

3/3 Users Participation in The Design Process

In the design process, decisions are taken within the limits of various determinants & constraints, i.e. political, economic, technical, socio-cultural and environmental etc. Such constraints have a direct impact on basic decisions (e.g. the economic constraints impact on dwelling areas, the technical constraints impact on the selected methods of construction, the political and socio-cultural constraints impact on the type of houses to be produced). The identification and study of such constraints should help the designer in conceiving the general framework of his project before dealing with the details related to internal designs or facade treatment. This means that design decisions usually occur on two levels:

- on the first level , general decisions regarding: housing types dwellings areas and techniques of construction are taken,
- on the second level, detailed decisions regarding internal dwelling designs and facade treatment are taken.

Accordingly, the designer with his knowledge and capabilities could deal with the first level of decisions. At this level, dwellings are just conceived as areas with predecided location for bearing elements and technical services.

Afterwards, when it comes to the second level of decisions, the designer could suggest options or alternative internal design for dwellings of the same area, and optional facade elements that could be used for the same cost.

A rich vocabulary for facade elements and optional internal design

for the dwellings could result from the study and analysis of local architecture, and visual character.
Optional designs for dwellings could then be available to the users according to different scenarios; for instance:

- Brochures could be distributed to the users showing the optional designs and their cost. Users participation will be limited to the selection of a dwelling among equal cost solutions within the users affordability to pay.
- Users participation could be extended to a more active level. The user is not just selecting the design option but has the choice to get a finished or semifinished dwelling or unifinished dwelling. He will still choose among equal cost solutions but has the choice to get a bigger unfinished area for the same price of a smaller finished dwelling. He will complete its finishing with time according to his need and resources. However facade elements will be decided on and built at the early stages of development in order to have an appealing image of the scheme from the outset.

Other scenarios could be suggested as well. This approach to design allowing a variety of solutions within a well established frame-work would probably lead to successfull aesthetics. Severe uniformi-ty and lack of individuality would disappear from housing schemes for low income groups.

4- A Synoptic Profile Of Low Cost Housing Facades - An Analysis Of Some Recent Housing Projects In Egypt.

4/1 Introduction

This section is primarily a portofolio of low cost housing facades. It comprises nine carefully selected facades - belonging to five recent low cost housing projects in Egypt.

The author was solely or jointly the designer for these projects . This makes the sample rather unrepresentative of the main stream of low cost housing facades treatments and configurations, currently prevailing.

The facades however bear and illustrate most of the pressures affecting the design and production of low cost housing in Egypt, including:

- the influence of the clients, developers, cooperatives
- market trends and construction techniques
- building regulations and development criteria

Within these bounds the facades reflect an endeavour to break loose from the limitations dictated and enforced on the designers of low cost housing projects in Egypt.

The most serious of these limitations are the aesthetic/image of low cost housing, the culturally limited tastes of the clients representatives [bodies, institutions], the casual process of evaluation and approval of designs and the continuous threat of disregarding the designs and execution documents if it does not conform to "stereo type" images and treatments of low cost housing buildings.

The present section attempts to highlight & stress the following:

1- to graphically illustrate the design criteria for facades form aesthetics, referred to in earlier parts.
2- to highlight potentialities and limitations of the current

practice of facade generations and compositions in Egypt.

3- to present a brief account of low cost housing facades composition glossary, prevailing in Egypt in the last decade.

4/2 A Brief Classification Of The Facades

The set of nine facades presented here belongs to five housing projects for low income families, they may be classified according to housing supply, or the client - sponsor as follows:

1- Es Saff project, Fig.1., Cooperative housing society.
2- Helwan Project, Fig.2, Cooperative housing society.
3- Mersa Matrouh Project, Figs. 3 & 4, Cooperative Housing Society.
4- El Obour 1st district, Fig. 5, Government housing - Ministry of Development, Egypt.
5- Katamiyah Housing Project, Figs. 6,7,8,&9 Ministry of Housing - emergency housing .

With the exception of El Obour project which presents single family housing to be developed on private plots where each plot is allocated to one family (extended or otherwise); the projects present a common low cost housing type, namely direct access medium rise apartment blocks.
The maximum height [6 storeys] - controlled by building regulations-is the limit of height of residential buildings without mechanical vertical circulation and means of fire escape [additional staircase].
All the projects are R.C. skeleton construction and brick walls, though el Obour project Fig. 5 may also be built as loadbearing brick walls and R.C. slabs.
The facade materials and finishes are similar as they are partly controlled by housing law on one hand and government subsidized construction materials on the other, these include cement & lime plaster, exposed bricks, imported timber [soft wood] for fenestration.
The average net cost per square metre of house units 1984/85 prices] is L.E. 100-120 or [U.S.dollars 74 - 89, formal rates].

The influence of the clients/developers and the contractors on the design and on shaping the facades varies in the selected projects This is an important factor, as it directly reflects the relative freedom of the designer.
In the three cooperative projects, an architect or a civil engineer represented the cooperatives and exerted some pressures upon the designer to modify the treatments and to change components and finishes. A more serious role was played by the contractors, forcing changes that may reduce cost and simplify execution irregard of form and appearance. In the case of the two Government projects the designs were to be approved by the Ministry of Housing officials.

An inflexible and rather conventional criteria & mediocre vocabulary were applied and cost criteria was used as a decisive tool to enforce modifications and rejection of design proposals for facades details, form and configurations.

El Obour project is rather unique, being a competition entry and with the panel of Jury comprising intellectuals, high quality experienced local professionals and academics together with three international experts.

The designers enjoyed the freedom and responsibility of logical selection. Furthermore the facade proposals has to fulfill aesthetic criteria, enhance character within the limits of cost and affordability.

4/3 Design Criteria

The set of facades, presented, were visually developed according to a rather ambitious criteria which was difficult to enforce in many instances due to the pressures and influence of the other sides of trio (designer - client [representative) - contractors,)
The criteria may be summarized as follows:
Functionally based:

- size and location of opening
- order and respect for structural requirements.
- respect of climatic recommendations including:
  - size of openings
  - compact designs, limited exposed surface
  - use of light colours,
  - thermally appropriate materials
  - provision of shadows

Aestetics, visual criteria

- simplicity versus complexity
  simple over all design (form & shape) and intricate details [8].
- intricate skyline whenever possible,
- projection and recession in section and plan
- limited width of bay
- vertical and horizontal rhythms, regular and irregular.
- limited use of metals
- use of vernacular elements and treatments eg: decorative panels, window shatters etc.
- use of decorations and motives exploiting moulds and construction possibilities,
- provisions for users additions
- control of the intensity of visual event [11].
- careful use of materials and colours.

5- Reserved Conclusions.

Low cost housing appearance, aesthetics and visual quality is a multi-faceted problem that deserves to be approached on various levels ranging from the theoritical , philosophical & conceptual to the methodical, political and organizational[1], [6].
The visual quality and imageability of low cost housing environments are not extravagant development goals or superficial design objectives. They play fundamental roles in formulating character and identity of communities, hence securing the values of pride and belonging, commitment & responsibility together with Social welfare and positive behaviour which are key objectives in comprehensive community development.

There is no contradiction between high visual quality, attractive environments and immageable housing areas, on one hand and the limited resources synonymous with low cost housing on the other.
Visual quality of low cost housing may be conveniently attributed to three sets of related factors, namely:

1- Design related issues, comprising:
   - appropriate locations
   - contextually viable site plans.
   - the visual organization of housing areas:
   - urban spaces, visual form & character etc..
     collective design of facades: the street scape.
   - housing units designs and external treatments.
   - appropriate use of construction materials, components, and finishes.

2- Operation & maintenance related issues.

3- Socio cultural & Community related factors
   - administrative & political frame work.
   - community dynamics & responsibilities
   - users participation in the design, operation and upgrading of housing areas .

The above factors reflect the complexity of the appearance or visual quality issue. The problem is understanding the complexity rather than securing the costs. What is costly in the development of housing areas for limited income families is the absence of good design, efficient organization and committed communities [see also Blake [3]].

The three factors present a convenient frame work for achieving: "Better living environments for the poor"

To reiterate what is needed is a trio:
- A designer who is an "enabler" rather than a "creator" [7].
- A supplier who is an "organizer" rather than a "producer" (2) and
- a self sufficient, confident, dynamic and self help community,

Better living Environments is a large enough goal to secure: appearance, visual quality and imageability of low cost housing. Though the very words Better, appearance, quality and imageability raise a serious query: whose taste, judgement & criteria ? - the designer's or the communitys' as they are definitely not, the two sides of one coin.

Fig.1 Facade Study - Direct Access Walk Ups Railways Drivers Housing Coop, Es Saff District, Gizah, Egypt.

Fig. 2 Facade Study - Direct Access Walk Ups, Surveying Dept Staff Housing Coop, Helwan Gardens, Egypt

Fig. 3 Facade Study [1] - Direct Access Walk Ups, Limited Income Housing Coop, Mersa Matrouh, Egypt.

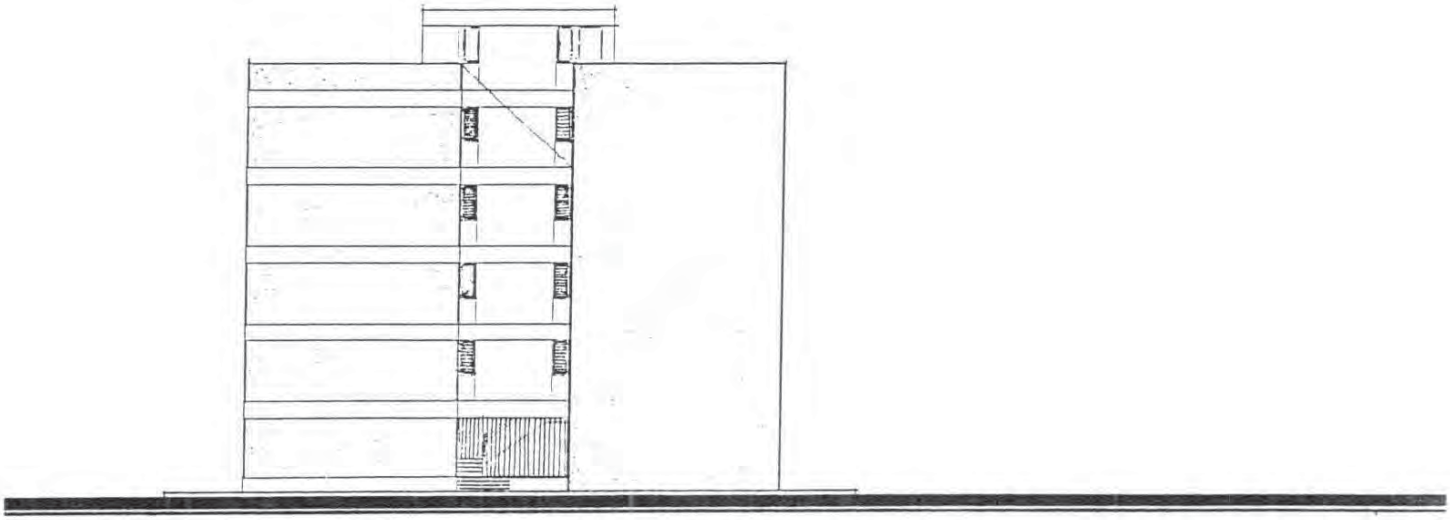

Fig. 4 Facade Study [2] Direct Access Walk Ups, Limited Income Housing Coop, Mersa Matrouh, Egypt.

Fig. 5 Facade Study - Low rise High Density Developments - El Obour New City. 1st District Competition, Egypt.

Fig.6 Facade Study [1] Direct Access Walk Ups 9000 Housing Units District, Katamiyah, Egypt.

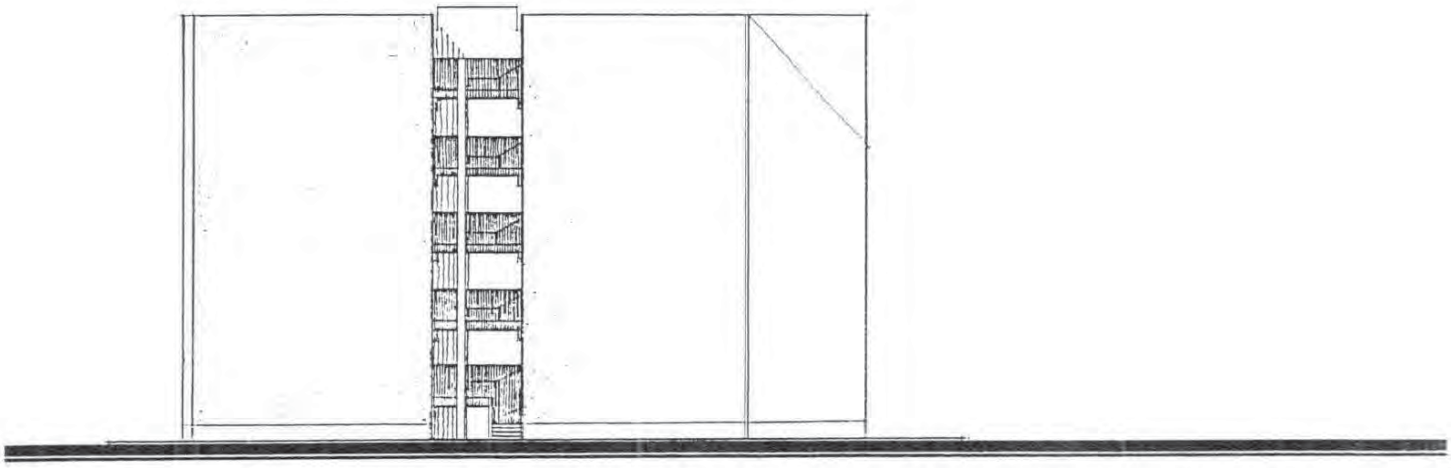

Fig.7 Facade Study [2] Direct Access Walks Ups 9000 Housing Units District, Katamiyah, Egypt.

Fig. 8 Facade Study [3] Direct Access Walk Ups 9000 Housing Units District, Katamiyah, Egypt

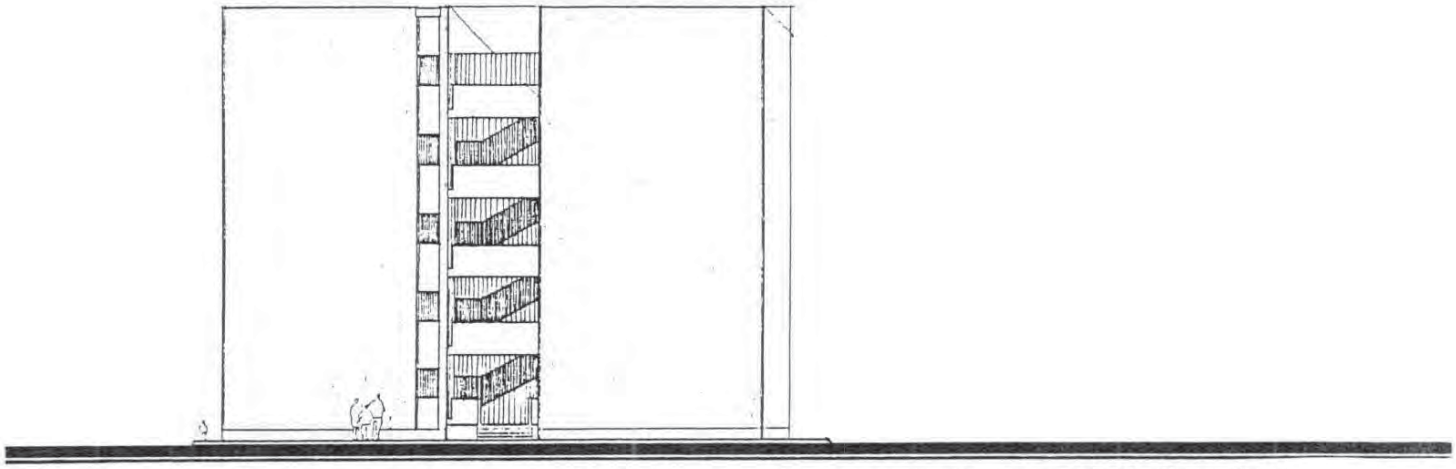

Fig. 9 Facade Study [4] Direct Access Walk Ups 9000 Housing Units District, Katamiyah, Egypt.

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PART 3
THE MACRO SETTING & RELATED ISSUES

PART 3 PAPER 12

IAHS- FIU WORLD CONGRESS ON HOUSING
NEW TRENDS IN HOUSING PROJECTS
EMPHASIZING DEVELOPING COUNTRIES
MIAMI,FLORIDA,DECEMBER,1986

THE DESIGNER IN THE DEVELOPMENT LABYRINTH

DR. SAYED ETTOUNEY

THE DESIGNER IN THE DEVELOPMENT LABYRINTH -

AN INVESTIGATION INTO THE ARCHITECTS' AND PLANNERS' ROLES IN THE PHYSICAL DEVELOPMENT PROCESS, IN DEVELOPING COUNTRIES, WITH EMPHASIS ON HOUSING.

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ABSTRACT

Comprehensive Development is synonymous to survival in Third World Countries, the South or less developed nations.

It is the process and means through which changes in: the socio-cultural, political, economic and physical structures of societies, can be achieved; i.e. to force what is desirable to replace the existing, without sacrificing local identity and values or clashing with nature.

The physical aspects of comprehensive development are of crucial importance to the success or otherwise of development strategies. It presents the setting for the nonphysical aspects of development and includes: urbanization, community facilities provision, housing and the man-made (built) environment. Hence is the importance of the role of the designers (architects, urban designers and physical planners) being the master manipulators of mans' habitat and physical environment, in the development process.

This paper closely looks into the role of the architects and planners in the development process and re-examines the complex interrelation between them and the society. Together with an introduction and conclusions, it comprises three consequitive notes; namely: On Comprehensive Development, the Physical Aspects of Development & Rephrasing the Designer's Role, with reference to Housing.

1- Introduction

The designers' role in the development process in developing countries, is a heavely loaded issue, multi-faceted and controversial. It's complexity suggests an obvious course for its investigation, centered on definitions of the various aspects and highlighting conflicts and interrelations, e.g. who are the designers in question? , What development is?, Which developing nations? and so on. The simplicity of such an approach is only skin deep as each of the components is critical and rather difficult to define.

It is convenient however with the limitations of the present context to loosely follow this course, to pinpoint the nature of the main components, to highlight inherent complexities and to allow the central theme to emerge, discussed and developed (but not completed as this is likely to be among the major concerns of academics and professionals involved in development, housing and shelter provision for 3rd world countries, in the following decades) namely: the role of the architects and their relation to community in 3rd world countries.

Third world countries are invariably adopting comprehensive development both as means and an end to achieve various goals; basic and complex. Closely related to the attainment of those goals are physical plans, policies and actions to achieve specific aspects of development, e.g. settlement developments, housing & community facilities provision etc.

The master manipulator of the physical aspects of development are architects, arthitect-planners, physical planners etc..

The failure of developing nations to achieve development goals and to secure the basic needs, including housing and shelter provision, emphasized the need for evaluation of the roles of the professionals; architects (et al) and their relation to the community and the frame work affecting both.

2- On Comprehensive Development, In Developing Countries.

Comprehensive development is a controversial issue; a major concern and a serious challenge to developing countries. It is both a means and an end, a process and an ultimate objective. It is rather difficult to define, inspite of the proliferation of related literature; a fact supported and accentuated by the poor record of development experiments and unfulfilled ambitions of 3rd World Countries during the past three decades.

Comprehensive Development may be loosely defined as: "the balanced development of the various aspects of life of a community namely: social, economic, political, cultural and physical- a process that should lead into the regeneration of societal abilities and potentialities and transforms the structures, the value systems and administrative and technical mechanisms", Abdallah (1).

Development as a concept and process combines qualitative and quantitative, physical and nonphysical, materialistic & intellectual dimensions - the continuous interactions of which characterizes the process and provides the context for change and transfor-

mation. Development cannot be borrowed, copied or ecclected; it's a unique, creative and private process, the success of which very much depends on the its congruence and appropriateness to the society, the locale and the context in hand, Abdallah (1),(2).

Development is categorically different from economic growth and related processes, which aims at the steady increase and maintenance of the rates of growth of gross national products or the percapita shares of it. Economic growth is an integrated part of comprehensive development, being the wilful societal process aiming at the creation of structural changes resulting in the establishment of autonomous basis for production and regeneration, which in turn improves the well being, satisfie's basic needs, enhances participation, secures continuity and independence for the community, Kawari (6).

The comprehensive development process depends on the interactions of three closely related factors:

- Development Goals; definition, acceptance, appropriateness.
- Available Resources, physical and otherwise.
- Determinants, tools and actions affecting the use of resources and potentialities to attain development goals , Firjani (17)

It may be looked at as a three sided process of goals.potentialities and actions.

To reiterate development in essenceis a comprehensive endeavour to reach a balanced & efficient societal framework, capable of self generation and maintenance of positive progress. It stems from a societal collective will supported by a political committed will to cause and attain change and to replace what is existing with what is required.

Development is characterized by an array of closely related features,including:

- It is a dynamic and directional process rather than a static condition.
- It is planned and rational drive comprising goals, objectives, programmes, policies and actions.
- A societal process, stemming from the society at large.
- It aims at changes in society's structures and related systems.
- It aims at the establishment of a production base, self generating and independent.
- It should be continuous , maintaining a progressive rate reflecting the cumulative potentials and society's improving performance rates.
- It should enhance socio-political frame work to secure transformation will and to guarantee continuation, Kawari (6), Abdallah (1), (2), Firgani (17).

A corner stone of the development process is the mobilization and release of collective will whichis akey factor in benefiting from human resources, the important-most of communities potentialities.

The development of human resources is a two fold action, one oriented to the quality of human resources and the second into the administrative and institutional mechanisms to manipulate and guide people (See for example Friedman (18) & the Ecologist (11)).

It is generally accepted that the emergence of society's will is a precondition for development process initiation, a state manifested by a number of conditions topmost among which is the acceptance and belief in public participation.

The failure of development ambitions of developing nations during the past three decades may thus be attributed to two basic facts, Kawari (6).

- The lack of understanding of the wholistic nature of the process and the emphasis put on the economic growth dimension and
- the absence of societal will and effective participation. (See also Seers (23) & Donaldson (10)).

It should be emphasized that development is not synonymous to Westernization or growth. It is an inward oriented, private process reflecting the potentialities and features of the development context. It's success depends on self reliance and optimum use of own resources, especially human. It needs not be closed to the outside world, eg. regional linkages and integration between developing countries is likely to enhance the self help development drive.

3- The Physical Aspects Of Development

There is an unmistaken similarity between development and planning; they share concepts, features and general characteristics though they differ in scale.

Planning is arguably the optimum use and minipulation of resources in a given locale to achieve a certain end within a defined period. Furthermore it may be regarded as a rationale to define potentialities, limitations and determinants on one hand and means of synthesizing them to attain goals and objectives on the other.

The planning process comprises most of the characteristics of the development process namely: the complexity, logical structure, directionality, temporal nature and concern with the future, continuity and openendedness... etc.

Planning is a tool or means to achieve development goals, objectives or policies. It may be directed to and applied on an aspect,sector or a geographical level (ranging from the local to the national and beyond). There is a close link in conception and contents between sectorial development and the plans to attain it.

A planning process is a chain of integrated actions in a sequence of stages comprising goals definition, programmes and resources, determinants, potentialities and limitations definitions, generation of scenarios and strategies, evaluation and evolution. Implementation and feedback, Ettouney (15).

The physical aspects of comprehensive development are the concern of physical planning. Physical planning is regarded as a distorted conception of comprehensive planning suggesting the bias

and misconception of the architects when entrusted with new realms of man made environments and habitats; offered by planning. The term development planning was forced to replace it, to reflect the restored balance between the physical and nonphysical aspects of the process. Physical planning is arguably clearer and correctly refers to and deals with a defined locale; an environment dominated by man made objects, systems and activities. A process aiming at the upgrading and development of such environment or setting to enhance and support human activities & behaviour and to attain certain goals. See also Ettouney (12), (13).

Physical planning as such is an integral part of the comprehensive development process; its achievements are vital and easier to discern, eg. environmental quality, housing and community facilities provision, accessibility etc. It is the process that deals with the physical aspects of development and aims at the provision of setting for development actions and human activities the elements of which are spaces, structures, networks, infrastructures etc. It overlaps with other planning processes including: structural and general planning. They all deal with man made contexts and aim at the optimization of physical settings, though they differ in emphasis and scale inspite of their structural and sequential nature.

General planning is more oriented towards the details, it attempts to translate the policies and directives of development and structural plans into more defined actions and quantitative components covering landuses,networks and related components: housing, community facilities, industry,...(13), (14).

At this level the role of architects, urban designers and physical planners and their interactive relation with the community emerges and their influence on the development drive emanates.

4- Rephrasing The Designer's Role

4.1 An Introductory Note

Architecture, settlements and man made environments are (arguably) expressions and manifestations of communities cultures and values and more appropriately a live registration of societal endeavours to develop, satisfy basic and complex needs and to achieve their goals and aspirations.

The architects and physical planners are trained to provide optimum forms to answer given requirements and fit their contexts (physical & otherwise). In the wake of industrial and technological revolutions, architects extended their influence to encompass site planning and landscaping, urban design and townscaping, physical planning & environmental design etc. The basic role continued to be the same, albeit with added difficulties and challenges of scale, complexity and magnitude, namely: to provide forms and settings. In development contexts however, the architect-planner is faced with a major problem, i.e. the relation with the users and the community (who are rarely his clients).

Traditionally the designer was the master builder with no barriers between him and the act of building nor the community. The relation changed with the emergence of architects who worked

for (and were attached to) patrons, hence divorced from building and the community.

Their roles diminished to the expression of the whims and views of the patron. A further decline was the abandonment of structural and technical aspects to the engineers with architecture becoming "the additions to a building of unnecessary features (Ruskin) and " the art of ornamental and ornamented construction (Fergusson)", Samy (22). The situation was partly improved with the emergence of modern movements, puritanical values and functional doctorine and the related design criteria; functional, economic and aesthetic. But the real problems architects and planners had to face, emerged in the wake of the industrial and technical revolutions in the west (most evident in the inter world-war years and beyond) namely: rapid urbanization, housing demand and the array or related problems of work, movement, accessibility, amenities and community facilities.

The situation in poor nations, is far worse with the added complications of population explosion, scarce resources and decadent socio-economic and political structures. The architects and planners of the poor nations were to face and alleviate the dehumanizing conditions of the urban poor. They were entrusted with manipulation of resources to solve the problems of housing and environments. (See also Correa (8)).

The scale and nature of the problem on one hand and the relation between the designer and the community on the other, proved not only a challenge to the professionals but also a real threat to their status and continuity.

4.2 Restoring Traditional Relations

Among the views forwarded to address and answer the problem of the professionals (architects & planners) role in the development process is that, emphasizing the relations between the parties involved in the form generation and implementation process: the client, users, architect, builder and others.

Hassan Fathy (16), points out referring to his internationally acclaimed experiment of housing the poor in "Gourna" Egypt, "In Gourna we were our own designers, supervisiors and contractors... the masons were as conservant with all the processes of architecture as the architect himself... this is one of the great advantages of using traditional building methods and bringing the craftsman back into the team..., the unit of design is the room which may be left to the master mason..."

This is one of the corner stones of Fathys conceptions to solving the problem of shelter provision to the poor, and though it is generally refered to as " let the people build" it practically amounts to " the re-establishment of the trinity: owner architect and craftsman relationship, Fathy (16). A sad fact is that, Fathy's architecture for the poor was not embraced by them. The "trio" worked more successfully in his designs for the rich, (See also Afshar (3)).

This conception agrees with Allsop's (5) view that "Architects can't produce architecture all on their own.. and the main burden of blame for inhumane architecture rest upon clients who

failed to educate themselves for the great responsibility they undertake". Allsop stresses the importance of restoring the productive safeguards of the old Patron - Architect relationship.

The real value of this view, if loosely interpreted, is perhaps that, in such a relation, the architect is subservient to the patron. The new patron should really be the community, the lay persons and users.

The main reservation on this line of thoughts is the fact that in housing the poor or community development processes, there are other parties besides the traditional trio, their absence is likely to seriously affect the theoritical balance suggested by Fathy or Allsop.

The parties beyond the trio includes: the client (who is usually not the user), contractors, the society (external users), planning control agencies and political institutions.

4.3 Redefinition of Roles

Contrary to the romanticism of the calls for restoring trios and patronage, there is a strong stream of thoughts questioning the roles of architect (et al) and doubting the validity of their contributions to the development process and housing the poor.

Extreme views call for the elimination of the need for architects; on the ground of minimizing development costs and saving limited resources. Bender (7) points out the fact that, the vast majority of building projects do not require the services of an architect directly " The adoption of good custom and traditions of buildings can result from a small number of prototypes".

Charles Correa (8) reiterates the essence of this view indicating that " the only thing the poor can afford are simple single storey structures, they so skillfully and beautifully build for themselves using local or recycled materials..."

Furthermore there are growing doubts about professionalism and designers attitudes towards communities and participation, and specifically their ability to positively enrol in the development drive.

Banham (9.2) pointed out, in the early seventies, that the problem is inherent in the concept of professionalism, "a professional is trained to solve a particular problem in a particular way" he also stated that " we can't trust the professional because he has a vested interest in his own type of problem continuing to exist".

Another reservation on the roles of designers is that, unlike the politicians they are really answerable to none, they are shut from the real world, working according to their own perceptions of the needs and interpretations of the rules of the development contexts, See for example Page (9.3).

The essence of any meaningful change or redefinition of the architect's role is simply "to demystify the profession, destroying the former dependency relationship between the community and the architect", Goodman (10).

In redefining the relationship it should be remembered that "what is in short supply is the appropriate context & process and not the buildings themselves" See also Correa (8).

4.4 An Enabler not a Producer

The core of the suggested changes in the roles of the designers of the built environment is the firm belief in the collective will of Societies as the valuable-most resource in development drive and process. This is the corner stone of the current wave of development thoughts namely; independent inward oriented and self relied development, Abdallah (2). It should be remembered that, to many, the major contribution of Hassan Fathy to the Third World are not his beautiful buildings but rather his message about development, i.e. inspiration and the material means for 3rd world must primarily comes from its own resources - a fact ignored by generations of designers" Afshar (3), See also Larsson (21).

Effective community participation is the true manifestation of collective societal will. It, in real sense, is giving the community access to the tools, resources and power.

"Real participation is "do it yourself" when resources are in the hands of the people and they invent the rules of the game", Banham (9.2), See also Cross (9.1).

The shift towards new rules of the game, and hence new roles for both the designer and the community marks the third stage in physical development and housing provision. The earlier two stages saw the attempts of governments to play the role of the sole developer and supplier for low and moderate income housing;followed by the realization of the limitations and inadequacy of central provision and the emergence of sites and services and emphasis on participation. (See for example Alexander (4), Ettouney & Abdel Kader (12)).

The third wave is characterized by a shift from service programmes to other interventions to increase local access to resources, maximize users participation and rephrase designers roles (20).

The architecture and planning for enablement of the communities to play positive and effective role in shaping their habitat is still a conception in the making. Its realization simply means the end of professional practice in its traditional sense, as it is likely to affect every aspect of the process, e.g. the brief formulation, the communications media, the relation between the involved parties etc.

In contrast to normative planning process where the participation of the community only takes place in the public hearing at the Master Plan presentation stage, the community is likely to participate in most of the planning stages including brief and community identification, survey and analysis, policies and plans and implementation, Lambert (20.1).

The architect as an enabler, means: a professional participant in local development. His role is not to design structures and completed packages but to design processes, to formulate means of gaining access to and utilizing land, to stage and to

implement development according to users preference. The arehitect or the planner involvement spans the whole process from conception via realization and through extensions by users after development, Turner (20.2), Das (20.3).

5- Conclusions

For the architects and planners to continue to play a positive role in Comprehensive Development of developing nations and to effectively participate in shaping mans habitat and physical environments, within contextual constraints - the nature and essence of comprehensive development has to be understood and respected. Topmost among these is its dependence on: the societal collective will, the optimum use of human resources and participation of the society at large in the development drive.

The inward looking nature of the process of development, self reliance and the creative use of local resources should be adhered to in the related levels & aspects of development planning and housing.

In such a context a change in the roles of planners and architects from sole producers of completed packages (building and plans) into enablers of people to design, plan and shape their living environments is conceivable.

The extents and repercussions of the role changes on the learning and educational processes on one hand and professional practice on the other has to be fully understood. This calls for investigation and experimentation on both fronts.

Architects and planners to be,will have to be taught how to work with people, new communication media to be developed and criteria for design & curricula, should be carefully rethought.

As for the practice, the essence of change is simply to demystify the profession,to allow people access to decision making to the tools and resources. In other words to transform the profession into a committed organization, truely presenting the society at large, answerable to and acceptable by, people.

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PART 3 PAPER 13

INTERNATIONAL CONGRESS ON HOUSING
LOW COST HOUSING FOR DEVELOPING COUNTRIES
ROORKEE, INDIA, NOVEMBER 1984

LOW INCOME FAMILY HOUSING - NOTES ON EGYPT'S EXPERIENCE

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LOW INCOME FAMILIES HOUSING - NOTES ON EGYPT'S EXPERIENCE

SYNOPSIS This paper briefly reviews the Egyptian urban housing context, it highlights endeavours, promising conceptions and actions, seeking solutions to the problem of housing low income families. The paper falls into five (almost independent) passages and an appendix, each separately lights a facet of the complex image. Collectively, the sequence of glimpses into the problem, outlines its boundaries and contextually - aware solutions & strategies to face it. The loosely knitted sequence comprises:

- On Housing & Development,
- The Problem/The setting,
- Housing as a political issue,
- Selected recent housing projects — A profile,
- Towards solutions - An Epilogue.

The appendix outlines a contextually aware — approach to low income families housing in Egypt.

1. PRELUDE: ON HOUSING AND DEVELOPMENT

Development is the collective will and endeavours to bring change, to replace what is existing with what is desired. In development the process is as important as the ends (Goals). The ultimate objective of development is man and the fulfilment of his birth rights: food, shelter and well being. Development is a shared agony (in most cases synonymous to survival) of developing nations.

HOUSING: The existing stock of shelter and the intensive efforts to maintain, replace and provide shelter-is a key issue in development and development processes (plans). Housing is synonnymous to development, a clear manifestation of its stages (or underdevelopment) and shares the nature, complexities and features of development. Housing is the conditions and actions, it comprises: objectives, needs, stress, resources, strategies, evaluation, choice/decision making, implementation, feed backs... etc, in an open ended sequence, (Wakely, 1976). The housing process with its multi-faceted and complex nature, extends beyond the realms of local contexts - hence the need and importance of sharing experience, synthesising findings and views and consolidating efforts of the family of man (specially those who are hardest hit; third world nations) in facing the challenge of housing the poor.

2. HOUSING LOW INCOME FAMILIES - EGYPT. THE PROBLEM: THE SETTING.

Egypt, a million squared kilometres of arid desert and barren land, if it has'nt been for the Nile; the life axis and the fulcrum of activities for the old country. Egypt's population is predominantly concentrated in the Nile valley and its Delta in an area of approximately 40,000 sq.km (a mere 4% of the country's total). The result is an overcrowded area where rural and urban settlements mix and clash with limited (invaluable) agricultural land (population density reaches 1250 person/km^2 - among the highest in the world). (Waterbury, 1978), (M.O.D., 1982) (Beshara, 1981). Egypt is also, highly urbanized with nearly half its population (44 millions, 1984) living in urban areas. Rapid urbanization is coupled with two other, typical development hurdles, namely:

- High rates of population growth - around 2.8% per annum (gross) and 3.5% for urban areas.
- Regional imbalance and distorted urban structure (rank - size distribution), (eg. 40% of the urban population is concentrated in two primate cities: Cairo & Alexandria). (G.O.P.P., 1979).

Population explosion, rapid urbanization, regional imbalance, limited resources, burdens of war together with questionable housing policies and legislations; collectively resulted in an acute housing problem characterized by two main features:

1. An enourmous housing deficit: The number of household units that should be built between 1981 and the year 2000 is 3.6 million units (M.O.H. 1980) distributed as follows:

Current housing deficit (till 1981)	831000 units
Replacements	589000 "
New units to meet fresh demand (1981 - 2000)	2,180,000 "

2. Affordability crisis: the enormous gap between the cost of housing supply and the ability of the majority of housing demand groups to pay (more than 70% of the households cannot afford to rent or buy a house unit) typical incomes and distribution of income groups are as indicated in Table I, (Al Gayar 1983), (Abdel Kader 1983).

These two features are coupled with low standards of housing, proliferation of peripheral (informal) developments around urban centres, the gap between what is available and what is needed, soring prices of development and labour and construction materials (10 folds increase in less than a decade), deteriorating relation between owners and users... etc., (Hanna, 1978), (Hiltermann, 1983).

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TABLE I

Yearly Income, Housing Groups, Egypt)

Income Group	Income, Egyptian Pounds / Year *		
	1976	1983	%
Low	300 - 500	800 - 1200	60
Middle	500 - 1300	1200 - 2400	35
High	1300 +	2400 +	5

* L.E. = Egyptian Pound = 1.2 U.S. dollars, formal rate (1984).

3. INTERLUDE 1: HOUSING AS A POLITICAL ISSUE.

The immanence and magnitude of the housing problem forced it among topmost (key) issues to be addressed by the Egyptian government and a debating subject between the government and opposition (reaching climax during the last general elections (1984). The government stand versus the opposition's proposals to remedy the housing problem, cast more light on the extents of the problem and means of solving it.

The government approach to the problem was outlined in an extended report, outlining the problem and presenting some general policies for implementing a proposed housing plan. The plan concentrates on intensive provision of house hold units, to close the gap between demand and supply. (M.O.H., 1980). Tables II and III highlight the essence of the government plan - Table II presents the national housing plan (1981 - 1985) which aims at the completion of 675,000 housing units at an average cost/ unit of 4000 L.E. and a total cost of 3243 million L.E. Table III shows the details of the housing plan for the year 1981 (the 1st year of the plan). The plan indicates the core of the approach, the government as a producer and people as receivers in a basically quantitative process.

The burdens on the economy and limited resources is obvious together with exaggerated standards (area/per person ranges from 9 - 24 sq.m) and costs, hence affordability is questionable.

The policies for implementing the plan are rather general in nature, stressing: population control, redistribution of population, developing new self contained settlements in the desert, modularity and standardization of housing units, developing construction industry, maintenance and efficient use of housing stock, encouraging private sector and cooperatives ... etc.

The opposition parties on the other hand stressed the qualitative aspects of the problem, pointing out the following actions:

- Strict control of development land, and peripheral Developments (to combat speculation/inefficient landuse).
- Stopping luxury developments for 5 years (to save building materials & labour to support economic developments).
- The bulk of government investments in housing (90%) should be directed to low income families.
- Developing of fair criteria for distribution and allocation of land and housing units.
- Establishing a national/local housing register to ensure fair distribution and allocation of units
- Expansion of training centres for construction workers.
- Cross subsidies and taxation to support a low income families housing fund.
- Critical evaluation of the cost effectiveness of new towns policy. (Taleaa, 1984).

TABLE II

Egypt's National Housing plan (1981 - 1985)

Year	No of house Units x 1000	Average Unit Cost L.E.	Total Cost Million L.E.
1981	110	4130	530
1982	125	4269	602
1983	135	4387	650
1984	145	4468	690
1985	160	4538	770

TABLE III

Housing Plan 1981, Egypt

Housing Types (socio/economic groups)	%	No of Units	Average Area m^2	Average Unit cost L.E.
Economic	45	60500	45 - 50	2356
Middle	37	40700	70 - 80	4645
Upper Middle	8	8800	100 - 120	8000
		110000		4130

4. INTERLUDE 2: SELECTED RECENT HOUSING PROJECTS.

Table IV provides a reasonably representative picture of current housing developments in Egypt, it reviews eleven major projects covering a variety of development contexts:

1. New Cities (1st stage developments)
   - 10th Ramadan
   - Sadat new city
   - 6th October
   - 15th May
2. New communities
   - Helwan new community
   - Cabanon (Suez)
3. Public housing
   - El Berkah (Cairo)
   - El Hekr and Abou Atwa (Ismailia)
4. Cooperative housing
5. Assuit: site and service
6. World Bank, upgrading (Cairo).

Target population of each project together with other key data for housing demand socio - economic groups (low - middle - high), are also presented (N.U.P.S, 1983).

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TABLE IV

Selected Housing Projects - Egypt (N.U.P.S., 1983)

Project	Population	Average Dwelling Area m2	Average Dwelling Price L.E.	Minimum Income Current Policies L.E.	Minimim Income Full Cost Recovery L.E.	Percentage Total Number Of Units %	Remarks
1. 10th of Ramadan	150000						
Low		21.5	2500	375	2191	37	core housing
Middle		90	6789	1475	4592	20	Flats
High		117.5	9897	1928	6543	43	Flats & Villas
Average		--	5880	1193	4118	100	
2. Sadat City	41900						
Low		34.5	2984	685	1426	47	Flats
Middle		78.5	5469	1476	3302	48	Core Houses
High		141	15121	3858	8731	5	Flats & Villas
Average		--	4426	915	2303	100	
3. 6th of October	70000						
Average		--	7408	1953	4130	100	Self financing
4. 15th of May	150000						
Low		37	3552	1080	2928	10	Flats
Middle		65	6380	1770	3906	29	Flats
High		160	16080	7374	7236	61	Flats
Average		--	7772	2187	4374	100	
5. Helwan New Community	30000						
Low		--	3900	1260	2100	77	core houses
Middle		18.5	6048	1938	3114	15	" "
High		55	19537	5665	4043	8	Flats
6. Public Housing	280000						
Low		45	3337	318	1752	100	One and two bed-rooms flats
7. Cooperative Housing							
Low		--	4000	1012	2537	40	Loans for Private Organizations
Middle		--	6000	1586	3159	60	
8. Ismailia (Hekr/Atwa)	134000						
Low		--	739	504	516	100	Upgrading & Site & Services
9. Suez (Cabanon)	40600						
Low		24	1726	840	1086	--	Serviced plots & Core housing
10. Assiut Site & Service	14000						
Low		9	1620	878	1033	100	Serviced plots only.
11. World Bank Cairo Upgrading	70000						
Low		--	855	426	684	100	Ugrading & Infill plots

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The key data includes:

1. Dwelling unit arearange in square metres.
2. Selling price of dwelling unit in Egyptian pounds.
3. Minimum required annual income per household to amortize a housing loan at the terms defined by the housing suppliers of these projects (low income house holds would be able to spend 15% of their income on housing - middle income and upper middle would be able to spend 20% of their income).
4. The minimum annual income required for full cost recovery to afford a housing unit at current central bank rates (no government subsidy).
5. Share of each demand group from the total housing supply in each project.
6. Notes on the type of the housing units.

Further analysis of the given income figures (required under current policies and full cost recovery) and the formal income figures (see Table I) indicated that "the majority of households cannot afford the housing provided if all costs of development and finance were charged to them - only 0.1% of urban house holds can afford most house options without paying more than 20% of their income" (N.U.P.S. 1983).

5. EPILOGUE: TOWARDS SOLUTIONS

Inspite of the gloomy snaps of the Egyptian housing context presented earlier, recent corrective measures and contextually - aware plans leave more room for optimism, which may also be justified on the following grounds.

- The growing understanding among the parties involved (specially politicians and decision makers) of the complexities and nature of the housing process.
- Realization of the importance of the non physical dimensions of housing eg. socio-cultural, political, administrative, economic ... etc. (M.O.D. 1982).
- The recognition of the dynamics and potentialities of the users, the communities, the informal sector etc..., and the evolution of the balanced relation: The government facilities and people self-help.

A successful example of this contextually aware - sensible approach is briefly presented in the appendix A.1. It highlights the approach to low income families housing in one of Egypt's New Cities: El Obour (1982).

To conclude, solving the housing problem in Egypt is feasible as long as suggested housing strategies:

- Seek solutions from within the context,
- Regard people as the greatest resource there is, and
- understand the simple but overlooked fact, that housing is an expression of a total social order and the inherent dangers of partial seeing and partial planning.

APPENDIX: A.1. EL OBOUR NEW CITY - EGYPT LOW INCOME FAMILIES HOUSING.

El Obour is one of the third generation of Egyptian new towns, a self contained city providing jobs for most of its working force, target population 350000 persons, with industry as the major economic base. El Obour is located some 30 km to the N.E. of Cairo. Master planning was completed in 1982, (G.O.P.P., 1982). In El Obour study the approach to housing benefited from earlier cities experience, it recognized the drawbacks of public sector housing namely:

- Heavy subsidies
- exaggerated standards
- limited role of the user.

Furthermore the study pointed out the merits of the informal sector housing (which was the supplier of some 70 - 80% of the new housing stock in Egypt during the last decade), including:

- Flexibility and adaptability
- Minimum over head costs and bureaucratic delays
- Maximization of communities dynamics & skills
- Incremental construction according to need,
- Mobilization of families funds & savings.

Within this frame-work the Obur study group organized a competition for selected consulting teams to study and prepare designs for low income housing areas in the city, with minimum government subsidy and stressing the following criteria:

- Importance of owners participation in the housing process,
- Economic viability, minimal cost of infrastructure & buildings, stage development and incremental growth of the house units.
- Importance of character, inspite of cost limitions.

The competition called for formulating proposals for the development of the initial growth stage : a residential area for low income families with yearly incomes of the order of 1050 - 2750 Egyptian pounds.

The enlighted approach, of the Master plan study group, to low income family housing was further elaborated by the competitors proposals.

Figs 1,2 & 3 highlight some of the organizational & economic aspects of one of the winner's proposals. (Abdel Kader, Ettouney , 1983).

The organizational aspects covers land subdivision, distribution and allocation, incremental provision of the infrastructure, production of designs and alternatives, financing, training and provision of labour, construction and implementation etc.

The economics of proposed housing took into consideration

- Families income (1050 - 2750 L.E./annum)
- Affordable rent/installments (presenting 20% of yearly income).
- Interest rates, current policies (3 - 5%)

The total capital cost of house units in terms of families income was then worked out (approximately 4 times). From an extensive list of various possibilities of designs, stages, plot areas, finishes; affordable plot area and house type (completed stage) were also worked out for each household income, (Figs. 2 & 3), (See also Abdel Kader, 1984).

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ACTIONS / INSTITUTIONS MATRIX

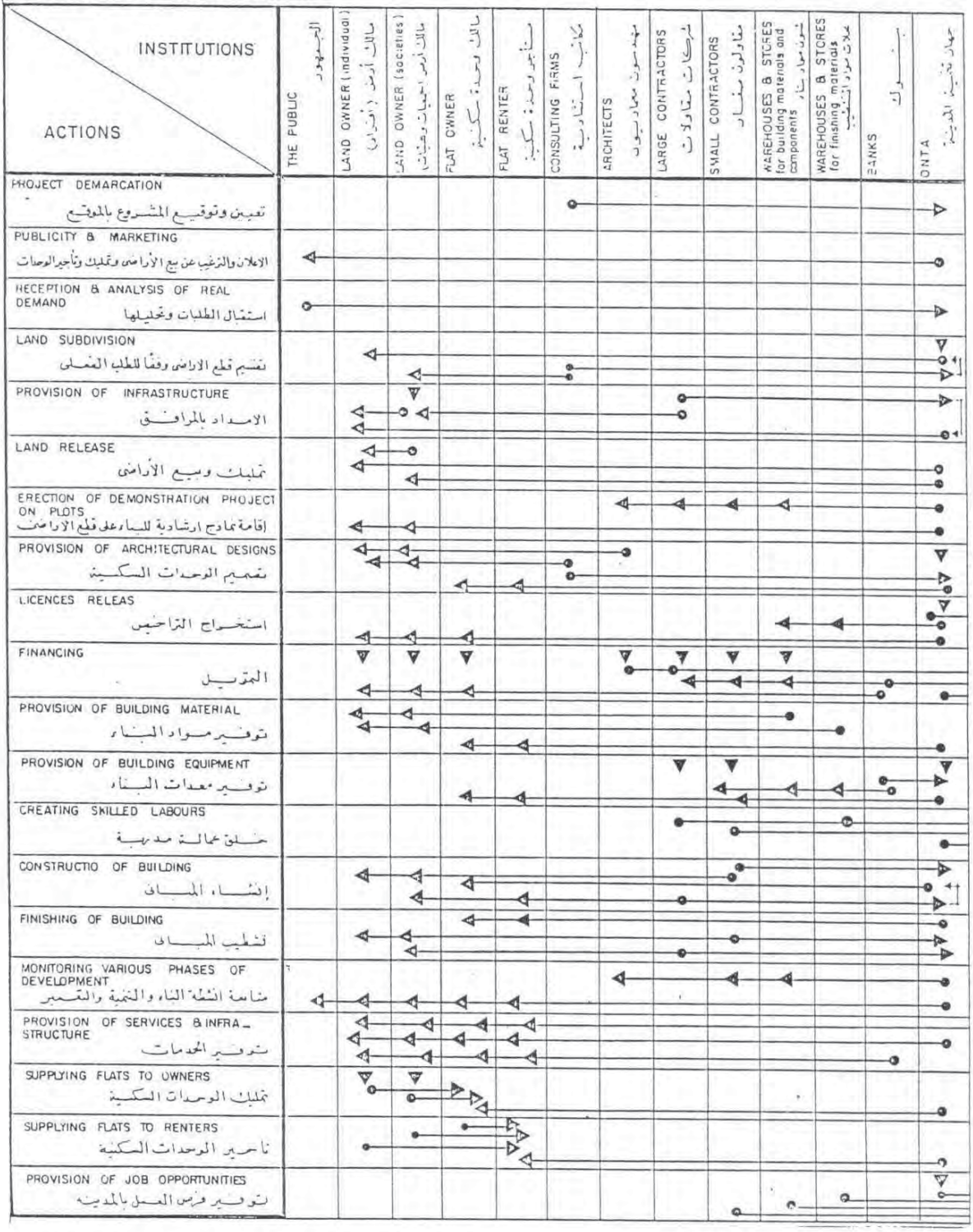

Fig. 1 Low Income Families Housing, El Obour New City, Egypt : Organizational Aspects.

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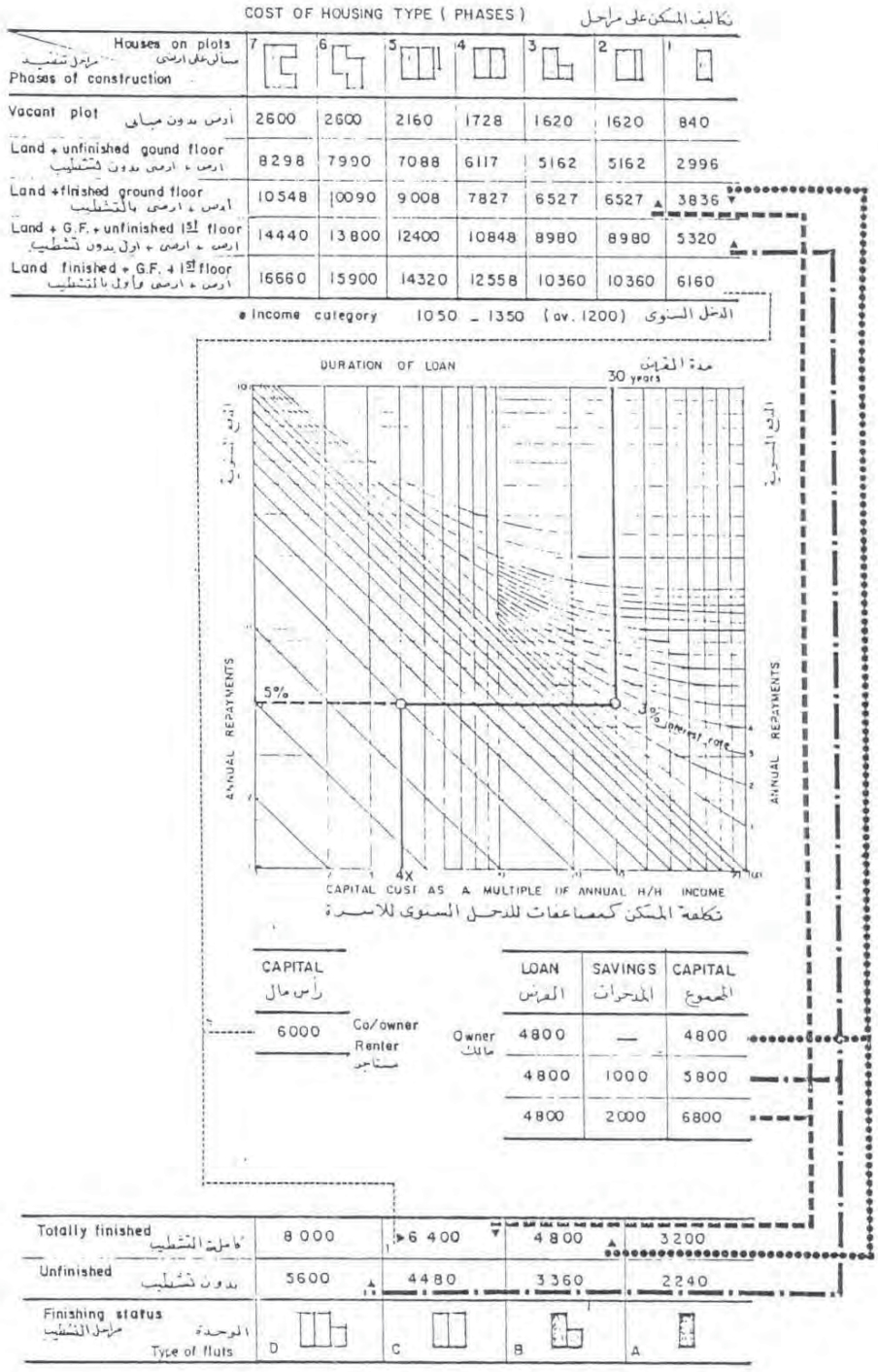

Fig. 2 Income Category 1050 - 1350 L.E./Year - Affordability & Appropriate Housing Unit.

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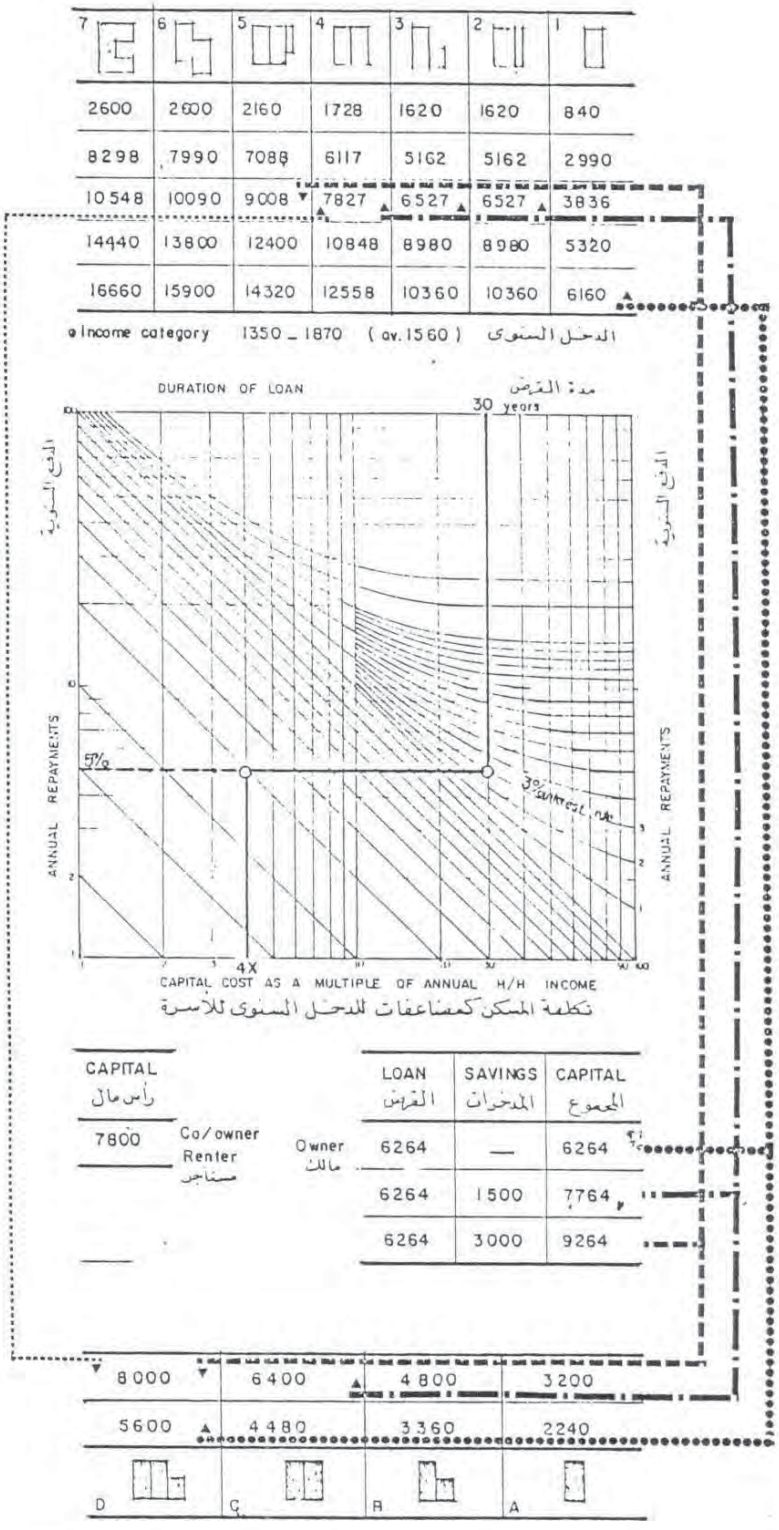

Fig. 3 Income Category 1350 - 1870 L.E./Year - Affordability & Appropriate Housing Unit.

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PART 3 PAPER 14

IAHS- FIU WORLD CONGRESS ON HOUSING
NEW TRENDS IN HOUSING PROJECTS
EMPHASIZING DEVELOPING COUNTRIES
MIAMI,FLORIDA,DECEMBER,1986

URBAN CONSERVATION OF OLDER HOUSING AREAS - APPROPRIATING THE PROCESS

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URBAN CONSERVATION OF OLDER HOUSING AREAS - APPROPRIATING THE PROCESS.

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ABSTRACT

Urban Conservation; the two streamed process aiming at the preservation of architectural and urban heritage on one hand and the inspiration, guidance and control of changes in the built environment of the historic and older districts on the other - provides an important tool in the physical development of existing cities.

This paper critically reviews the concept, context and features of urban conservation. It outlines problem areas and pinpoints limitations on the process application and implementation of conservation policies with special reference to older housing areas.

It briefly looks into the case of Cairo, Egypt and illustrates further limitations presented by the context of historic areas in 3rd World cities.

Means of appropriating Urban Conservation process, in older housing areas are then presented in the form of physical, social, administrative and economic guidelines. The paper comprises four sections namely: On Urban Conservation - An Introduction, On the limitations of the Process, The case of Cairo - Urban Conservation in a 3rd World Metropolis and Towards Effective Urban Conservation in the cities of Developing Nations.

1. On Urban Conservation : An Introduction

1.1 A Reserved Definition

Urban Conservation is a conception and an approach to the development of existing urban areas. The essence of conservation is rooted in the belief in "continuity" and its importance to cultural identity and societal well-being on one hand and the

positive concern about the preservation of environmental resources, natural and man made, on the other.

Urban Conservation aims at the preservation of the architectural heritage and the visual (and townscape) character of urban areas; together with the protection of socio cultural identity of the community inhabiting it. Though preservation, protection and revitalization of the existing physical environment is the major concern of conservation. It also comprises the guidance, inspiration and control of change and additions to the built environment, Ettouney (5).

In other words urban conservation is preservation and develpment control combined; see also Worskett (10), Appleyard (3).

The nature, context, objectives and media of urban conservation necessitated and justified its close links to urban planning. Though many regard conservation and preservation as synonymous to "no planning", anti planning, or "reverse planning" (8), the overlapping of urban planning and urban conservation is inevitable; their integration is a must for the success of both.

1.2 The Context

The concern of urban conservation is existing urban settlements and environments where development and change is likely to (or will) clash with the old. It differs from other rationales and approaches dealing with existing and decaying fabric of urban areas (eg. renewal, upgrading and rehabilitation) in the context. Conservation is directed towards the areas characterized by concentration of old buildings of architectural and historic merits distinct visual character and local identity.

The context of urban conservation is the older parts of towns where excellence and quality dominate, (7) & (10).

Designation of conservation areas is a crucial aspect of conservation, and is likely to greatly affect the success or otherwise of conservation objectives & policies.

Conservation areas vary dramatically in size, it may comprise a limited number of buildings and their setting, an alley way, a district or extends to cover a whole town.

The setting of a building may propagates to hundreds of metres and similarly the setting of a conservation area is likely to extend far beyond its formal borders.

Conservation areas should always encompass buildings; connective tissue and settings. Their area and extents should however not be exaggerated. They should be regarded as active parts of the larger contexts and not frozen museum pieces, hence integrated into the city systems, (10).

Conservation areas predominantly coincide with the central cores of settlements characterized by mixed uses and variety of ingredients (i.e. development over a relatively long period); alternatively it may encompass a uniform use (e.g. residential areas) or simply a group of historic buildings, (3) & (10).

1.3 The Process

Inspite of the complexities of the urban conservation process

the core of its interest is physical; i.e. the architectural and urban stock (of value); its protection and enhancement.

As a process it is characterized by its complexity (which is a result of the overlapping of sets of complex systems: economic, cultural, political, physical), its logical and rational structure (sequential and cumulative, evaluative and evolutionary, cyclic and continuous nature) and an inherent concern with time values (the present and the future).

Similar to physical planning urban conservation is a process that comprises a sequence of stages: objectives and goals definition, context definition (comprising in turn surveys and data compilation), analysis of setting and determinants, policy formulation, plans and actions, evaluation and implementation, monitoring and feedback, (4), (7) & (10).

Urban Conservation operates from within urban planning, as conservation areas are parts of large urban settings, this is likely to accentuate the inherent difference in essence between the two processes. Preservation which is the main concern of urban conservation is in a way "non plan" while urban planning is future oriented which creates a sensitive framework for urban conservation to operate within.

Furthermore the traditional emphasis in the planning process on economic criteria and cost effectiveness directly clashes with the loose non material nature of urban conservation; see also Kuban (8).

The paradox of the urban conservation process is a result of its dialectic nature, as it is the synthesis and simultaneous interaction of two sub processes, one directed to preservation and the other to control of change (the latter is very much similar to physical planning).

2. On The Limitations Of The Process - With Special Reference To Older Housing Areas

The conception and practice of urban conservation as a comprehensive process, inspite of earlier associations and preceeding outcries is a new phenomenon in physical & development planning that dates back to the late 1960's. The conservation movement coincided with and immediately followed the opposition to the practice and outcome of planning and architecture in European cities in the Post 2nd World War period, and the resulting erosion of character & identity (Social and physical) together with the waste of resources and potentialities of existing fabric, Appleyard (3).

The concept, format and principles of urban conservation were formulated in the West and benefited from two main streams of thoughts and experience: civic design, urban design and townscape analysis & criteria together with planning practice in renewal and upgrading of existing urban environments.

Urban Conservation was further established through: the introduction of regulations & acts (together with related guidelines and development briefs), the collective national & International efforts to enhance the conservation drive and the pioneering comprehensive studies and projects on conservation, (3),(4) & (7).

By the midseventies urban conservation (process, practice and related principles) was well extablished and its influence extended to developing nations.

The major principles affecting its applications were summarized in the authoritative work of Worskett (10) and acclaimed conservation studies by C. Buchanan , see for example (4). Those principles have a direct effect on the practicality and feasibility of application, hence they may be regarded as limitations on the process effectiveness.

The three major aspects directly affecting the process are: Selection and Balance, Finance & Economic Effectiveness & the Role of the Public.

Selection and Balance are two closely related factors characterized by openended nature and a "relativity" dimension, (e.g. the extents of preservation, the limits of antiquity or how old is old?, the size of conservation areas). Selection should be based on clultural & economic criteria, which invariably clash. Similarly Balance refers to the clash between the two sides of conservation, i.e. preservation versus development and the related dialectics and interactions between the old and the new & restriction versus expansion, (10).

Economic Aspects is two folds one directed to the costs of implementation and the related issues of investment shares (public & private), the other is the principle and criteria of economic viability.

The Western approach to conservation stressed the importance of economic viability, or the potentiality of a historic or old building and its setting for adaptive reuse (i.e. location, accessibility, conditions, costs of repair, running and maintenance etc) or the "convenience, suitability and efficiency of use at reasonable cost" (10).

With the exception of national monuments and special cases, the costs of preservation of buildings & adaptive reuse should be generally undertaken by the private sector, institutions and individuals, supported by incentives from the government and local authority. The costs of environmental improvement, infra structure and preservation of outstanding monuments present the share of the local and national governments.

Public Participation is another key factor in the success of conservation policies. The community and the general public should understand and support the case for conservation and hence be involved in the various stages of the process (goals formulation, context definition, alternative policies etc). This is likely to ensure passive and active public support including environmental protection and sharing the costs of implementation.

Another major inherent limitation on urban conservation is that it applies to an area within a living city with its pressures, values and standards which are likely to clash with the constraints of conservation policies. This makes the designation of conservation areas a critical limitation on the process as it defines an area with different rules, criteria & restrictions on development.

Conservation areas predominantly exist in central and inner city areas and it is convenient to classify them into two types: mixed core areas and housing areas.

Urban conservation of older housing areas accentuates many of the limitations of the process, some of which are already highlighted.

In housing areas, the subject of conservation is not only the monuments and master pieces but also the collective character (vernacular, local, connective tissues etc).

Related problems include: the size of the area, land and building uses, external environment & infra structure, lack of services & community facilities, the structural and general conditions of buildings, the external appearance, the internal design and suitability, internal installations and socio-economic structure & population profiles, ownership and tenure patterns, etc.

3. The Case Of Cairo - Urban Conservation In A Third World Metropolis

3.1 On The City & The Historic Core

Many Third World countries adopted the concept and practice of urban conservation and applied it in the historic parts of their older cities and though the contexts were categorically different from those in the West, the process, principles and techniques were very much the same - albeit with more limitations on its effectiveness and ease of implementation.

A brief look into the case of Cairo may help in illustrating some of the limitations and problems presented by the context in which urban conservation operates in 3rd World countries and enables guidelines for appropriating the process to be formulated.

Cairo, the one thousand years old capital of Egypt, faces most of the problems - typical of 3rd world primate cities, including: rapid and uncontrolled urbanization, population explosion inadequate infra structure, housing shortage, decadent social facilities & poor environmental quality (see for example Abu Lughod (1) & Antonio (2)).

Cairo also possesses an unparalleled wealth of architectural and civic heritage, monuments, urban fabric & connective tissue which is hardly matched in number, variety and quality. The monuments punctuate the older parts of Cairo and are concentrated in the historic centre of Cairo,comprising;primarily the site of the mediaeval city and its surroundings together with the Eastern cemetery & Saladin Citadel together with the site of the first settlement built by the Arabs (in Egypt and the Region), Fustat (641 AD) and the area loosely joining it to the mediaeval city. Fig. 2, Antonio (2). The historic area of Cairo is one of the richest in art & architecture in the whole Islamic world and one of the best preserved, Meinecke (9.2), Antonio (2).

The mediaeval Cairo (Al Kahirah) was founded by the fatimides in 969 AD, it reached its apex during the Mamluk period (1250 1517) and retained its architectural and urban qualities till the arrival of Napoleon in 1798.

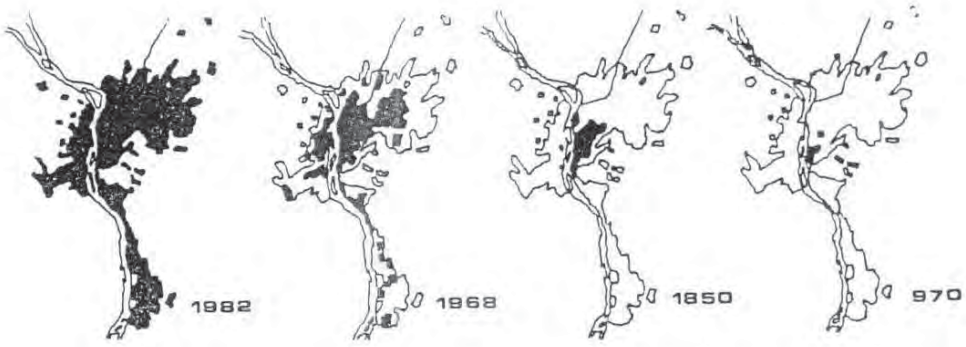
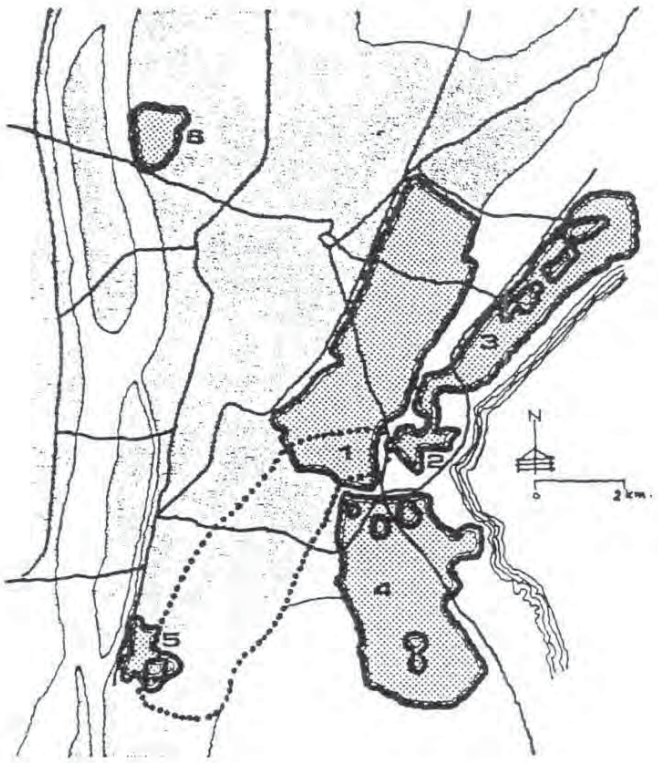


FIG. 1
Cairo urban mass growth ;970 AD.,1850,1968,1982 (11).



Historic Areas
Urban mass

1 Mediaeval city & extensions,
2 Saladin citadel,
3 & 4 Eastern cemetery,
5 Old Cairo,Fustat,
6 Bulaq.

FIG. 2
Historic core and potential conservation areas,Cairo,Egypt,(2).

FIG. 3
Fatimide Cairo,Al Jamalyiah section;listed buildings & connective tissue,(9.3).

The number of listed buildings is of the order of 560, they date back from the foundation of the city till the middle of the 19th century, giving Cairo the highest concentration of Mediaeval monuments in the Islamic World (6), (9).

The survival and preservation of the historic area of Cairo is the result of three factors:

1- The stagnation period between falling into the Ottoman Empire and the French conquest (1517-1798), during which the city hardly changed in terms of area and population.

2- The active growth of Cairo in the second half of the 19th Century and the Western style development under Khedive Ismail was directed to the west away from the historic core, and left it almost unaffected, Berg (9.1).

3- The impressive and comprehensive preservation endeavours of the Committee for the preservation of Arab monuments, Meinecke (9.2).

From the mid 19th century onwards, Cairo experienced an unprecedented urbanization explosion, manifested in the dramatic increase of its population from some 200000 at 1800 to ten millions in the early 1980's (a 50 folds increase) and in the parallel growth of its urban mass. The area of Cairo at the time of the French conquest, the turn of the 19th century (which accurately presents the area of the present day historic area of the city) amounted to nine sq.km.. Between 1850 & 1950 the bulk of the present metropolis was developed to reach some 100 sq.km. During the past three decades the land mass of Cairo doubled to a total of more than 220 sq.km, with gross residential densities of the order of 30-250 thousands per sq.km. (among the world highest), (1), (2) (6).

There is no formally designated conservation areas in Cairo, though the Fatimide section of the historic area was recognized in an annex to the building regulations, aiming at the control of development in the area, (9.4).

The designation of conservation areas in Cairo should not prove problematic if the two fold criteria of: the concentration of historic monuments & connective tissue together with the authentic pre 1800 urban fabric & urban mass is applied. Fig 1 (2), loosely shows the extents of historic & potential conservation areas. These comprise:

1- The old city, including the Fatimide Cairo and its extensions together with the site and setting of Saladin Citadel. This area is predominantly residential and characterized by mixed uses, commercial, hand crafts industry, services and administrative landuses.

2- The Eastern cemetery which extends at the foot of the Mukattam hills to the east of the old city , it contains some of the most valuable islamic monuments, dated back to the Mamluk period. Though the area is still used as burial places, there lives some half a million of the over population spill and the migrants.

3- The two old ports of Cairo: Fustat & Bulak, the former is characterized by the overlapping and integration of old

Islamic and Coptic (Christian) monuments, the latter dates back to the 14th century and includes a number of Mamluk and Ottoman monuments many of which are not listed or studied (2) (6), (9).

Some of the transition areas linking and surroundings these areas may be regarded as settings for the historic areas and hence deserve special attention, which may also be justified by the numbers of monuments punctuating them.

Figure 3 shows a section of the Fatimide Cairo, the quarter "Al Jamaliyah", which contains two important paths " the Northern part of the central fulcrum " Kasabah", "Al Muizz" and "Al Jamaliyah" they together with the surrounding area accommodate a wealth of monuments, fabric and visual components. The area comprises some 102 monuments - 33 of which are not listed; these represent 20% of the built area, (1150 x 400m) . The area was the subject of a joint survey conducted by the UNESCO to define the surviving historic fabric & to indicate measures for future preservation, Berg & Meinecke (9.3).

Figure 4 shows another segment of the historic city, the southern wall of Cairo (the southern-most part of the Kasabah); namely the Bab zuwailah gate and urban space. Fig 5 shows the configuration of the space and, figures 6 & 7 illustrate the visual character of the area adjacent to the southern wall.

The set of maps and sketches briefly highlights the features and wealth of the context for preservation and conservation in Historic Cairo.

3.2 The Context Deficiencies

The historic core of Cairo suffers from a multitude of problems which threatens the survival of the architectural monuments and the connective tissue, and seriously impede the effective implementation of urban conservation.

The deficiencies are the result of national and local contexts' characteristics (with limited resources top most), the clashing relation between the historic area and the surrounding urban mass, together with typical problems of inner city areas.

The problems may be classified into two sets, physical and non physical (though such articulation is rather academic). The deficiencies of the Cairene context may be summarized as follows:

3.2.1 Physical Deficiencies

- Historic area - surroundings inter-relations.
- Poor environmental quality: (e.g. noise, rising water table, solid waste accumulation, surface and air pollution etc).
- Decadent infra structure (especially sewage disposal net work).
- The intrusion of the motor car, lack of facilities and serious planning.
- The clashing buildings and land uses and adhoc mix.
- The poor conditions of buildings & lack of maintenance (connective tissue).
- The number of monuments and the escalating need for massive restoration, repair and structural remedies.
- The proliferation of informal and substandard developments.

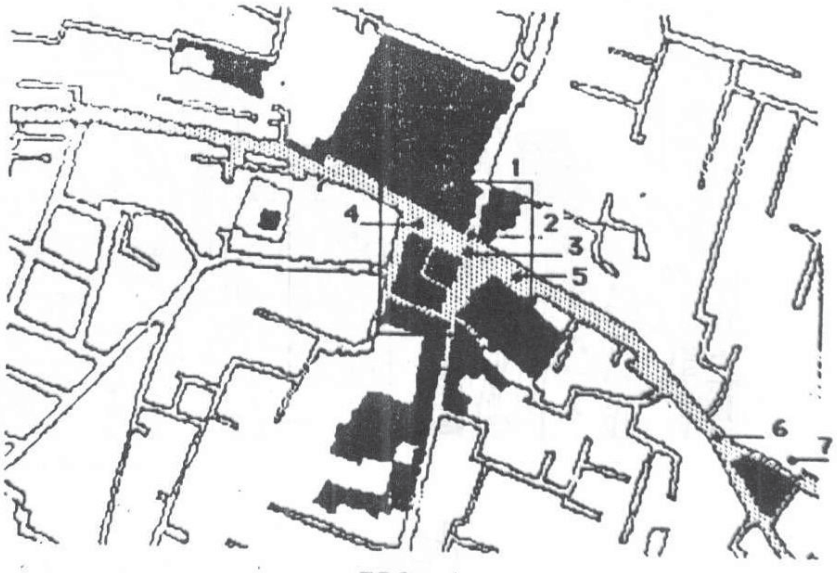


FIG. 4
Fatimide Cairo,the southern gate & wall;Bab Zuwailah urban space-listed buildings,tissue & key to sketches and serial views Nos. 1-7,Figures 5,6 & 7.

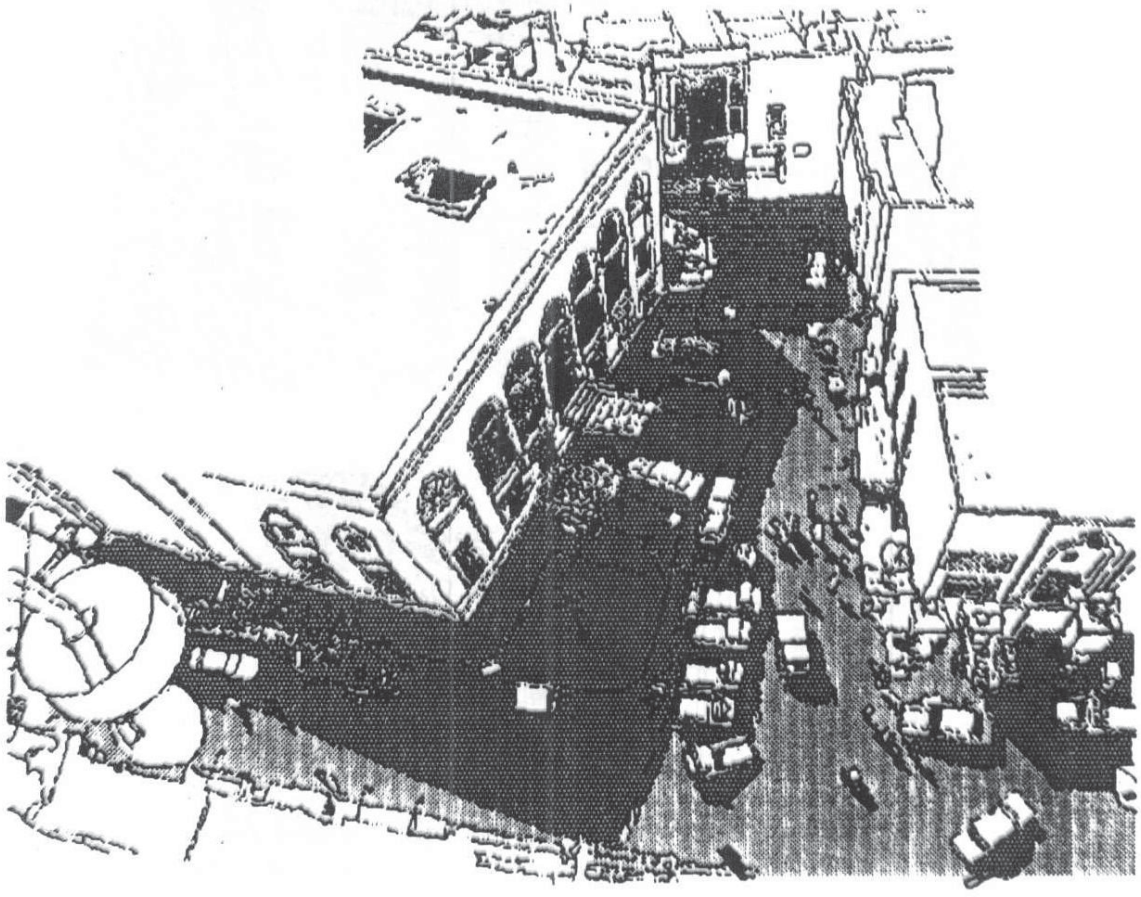


FIG. 5
Bab Zuwailah urban space,view down No. 1

view no. 5

view no. 6

view no. 7

FIG. 7
Bab Zuwailah urban space,Fatimide Cairo,serial views Nos. 5,6 & 7 .

- The misuse and defacing of monuments and their settings.
- Lack of community facilities.
- The negative and damaging effect of building regulations.
- The size of the historic areas, its visual and functional complexity.
- Escalating pressures for development and change.

3.2.2 Non Physical Deficiencies

- Population related problems (over crowding, environment misuse etc).
- Distorted socio-economic structure (outflow of the middle and upper middle groups and inflow of low income groups. the relatively high ratio of rural migrants among new settlers, with no social ties or association with the context).
- The absence of community ties, sense of belonging and territorial pride.
- Lack of private investment in development.
- Deterioration of local economic base.
- Inflated land values.
- Central decision making and bureaucratic clash of responsible institutions.
- Lack of comprehensive planning policies with urban conservation, integrated.
- Lack of community participation and effective representation. (see also (1), (2), (6) & (11)).

4. Towards Effective Urban Conservation In the Cities Of Developing Nations

The conception of urban conservation and preservation and the inherent attitudes towards natural and man made environments including: the careful handling of resources, the reserved and doubting outlook as regard industrial efficiency, the adoption of minimal standards, the rejection of fashion and change for its own sake, the respect paid to the locale and its products and the dependence on peoples' will, endeavours, participation and resources - make urban conservation the true expression of appropriate development planning for Developing nations.

Urban conservation should be adopted as a national development goal expressing the societal will to protect and safeguard local identity and heritage (architectural and otherwise). It should be an integral part of development planning and physical plans (regional & urban).

Though the essence of the process of urban conservation as developed in the west is suitable for application in the cities of developing nations, many of the underlying principles and particularly the dialectic interaction (if not the clash) between the old and the new characterizing its structure should be carefully addresed, expanded and monitored during the various phases of policy formulation and implementation.

The following issues are thought to be of crucial importance to the success of urban conservation process and its application in developing countries, they may also be regarded as guidelines for policy formulation. They are listed as a brief check list (because of the limitations of the present context).

The guidelines for process enhancement are classified into three sets: Physical, Social & Economic.

Guidelines For Appropriating The Urban Conservation Process

Physical Aspects

- Conservation areas should be carefully designated, care should be given to the connective tissue and circulation network linking it to the surrounding areas.
- The setting of conservation areas, the transition zone between it and the larger context is critical to its appearance and performance, it may thus require a special development control criteria.
- During the policy formulation stage, and/or if implementation faces problems of finance, control, or other causes that may impede effective action. Development should be frozen for a period, i.e. a non planning phase.
- Environmental quality and infrastructuree problems in the area should be controlled from the outset as they adversely reflect on the visual quality, economic viability and building safety. Special care should be given to problems of solid waste collection, sewage & underground water.
- Substandard and poor quality (informal) buildings, alien to the spirit & character of the area should be cleared, their sites should not be developed till infill guidelines are formulated.
- Connective tissue and urban fabric should be registered and documented, development guidelines and briefs should respect its form and character.
- Industrial standards and building regulations are inadequate means of controlling development in conservation areas - detailed design briefs and guidelines for local identity areas together with general directives for the whole area should provide the bases for control.
- Circulation and accessibility should be based on car exclusion whenever possible , e.g. through the use of public transport, perephiral parking and limited access, pedestrianization etc.
- Systems of package maintenance and repair should be provided.

Social And Administrative Aspects

- Immediate social stress should be relieved through direct intervention of the local authority or control agency.
- Restore balance to socio-economic and cultural profiles of the inhabitants of the area: resettlement of rural migrants who recently moved to the area, encourage citizens working in & associated with the area to stay and move in(e.g. shop keepers, professionals & civil servants), encourage the settlement of the lacking socio economic groups.
- Encourage government and other institutions, activities in the areas (headquarters, housing, offices etc).

- Organization and administration should be decentralized and trusted to an urban conservation agency or more, related to the areas in question.
- Public participation should be incorporated into all levels of policy making, implementation, control and finance.

Economic & Financial Aspects

- Improve local economy of conservation areas, preserve jobs and encourage small business and enterprises.
- Improve local funds and allow community access and control over them.
- Encourage private investment in land, infill and adaptive reuse projects.
- Provide systems of (passive) incentives and rewards including taxation exemption, reduced rates etc.

Epilogue

Appropriating a process that deals with ongoing changes in environmental complexities - even if it aims at taming and controlling changes - is an openended and continious action.

Defining the limitations of the process should pinpoint approaches to solutions while the formulation of guidelines is the first step in appropriating urban conservation process and practice in Developing nations.

Monitoring and feedback of experiments and policy implementation is of crusical importance to improve and restore balance to the underlying principles and guidelines.

Experimentation in urban conservation should be approached with care and sensitivaty as the price of mistakes is rather dear; the permanent loss of invaluable architectural and urban heritage.

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PART 3 PAPER 15

INTERNATIONAL CONVENTION ON URBAN PLANNING,HOUSING AND DESIGN
SINGAPORE INSTITUTE OF PLANNERS
SINGAPORE,JULY 1986

URBAN FORM GENERATION FOR NEW COMMUNITIES - AN ALTERNATIVE APPROACH

DR. SAYED ETTOUNEY

URBAN FORM GENERATION FOR NEW COMMUNITIES- AN ALTERNATIVE APPROACH

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ABSTRACT

In new communities development, UrbanForm generation is that critical phase where: planning goals and objectives, development programmes and physical & non physical determinants mix , interact and clash, and where form alternatives are formulated, developed and finalized.

The present paper suggests a modified approach for plan formulation in urban form generation rationales namely:

" to enhance the sequential and synthesizing nature of the generative process with emphasis on the evolution of alternative forms rather than on sieving, selection and elimination of options"

Thus the form generation process is transformed into a structural action: building up merits and avoiding drawbacks in a progressive drive towards the optimum form or plan-to-be.

The suggested approach was applied in a recent Egyptian development project- a new settlement to accommodate 35000 population and provides a new settlement for Damietta City, in the North - East corner of the Nile Delta.

The paper comprises three sections and an Epilogue, namely:

1- On Urban Form Generation.
2- Evaluation versus Evolution - an Alternative Approach.
3- An Egyptian Experiment: A brief review of the form generation of Shattah New Settlement, Damietta Egypt.

1.ON URBAN FORM GENERATION - THREE INTRODUCTORY NOTES.

1.1 Urban Form

Urban form is the ultimate objective of the design phase, the creative most of the planning process. It marks the turning point (and hence the transition) between the conceptual and the Implementary phases of the process. Urban form is that heavily loaded, abstract-graphic statement that provides the spatial setting for development strategies and related activities.

It is the synthesis of planning goals & objectives, planning and development programmes and the planning context and its determinants.

In simple words, an urban form may be defined as: "the spatial

organization of landuses within a physical context ,a site or a designated geographic location". Or the physical configuration providing the optimum fitness between: landuses, functions, activities and linkages on one hand and the site on the other, (See also Alexander (1)). To reiterate it is the optimum composition of form components.
To reiterate it is the optimum composition of form components that integrates with the locale to fulfil and achieve certain development objectives.

Urban form is basically the concentration of the "drama" of Urban Development into a single abstract statement that is able to expand in essence and details through time to provide for, satisfy and accomodate development activities.

1.2 Urban Form Components

From a "purely" physical perspective an Urban Form (in the planning process is a "Map". Its two dimensional, apparent nature is only skin deep, as the shapes and areas of landuses reflect and affect most of the related three dimensional, qualitative and quantitative aspects of the resulting built environment (e.g. densities, intensity of usage, urban land economics, environmental quality.. etc). (See for example Lynch (3)).

The major physical components of Urban Form are: functions, linkages and visual form elements. Function includes: landuses, activities & behavioural settings, i.e. housing, services, community facilities, open spaces, industry etc., see also Lynch (3). Linkages, circulation networks and flow systems provide communication channels and connectors between landuses and activities - or the grains of city fabric. Further more it (together with adjoining infra structure) delinates urban tissues, and provides a key element in determining the efficiency of landuse on one level and the character of built areas on onther.

Visual form elements and quality result from the interactions between the two key components (and their sub-components) on one hand and their integration (or lack of) with the site or the physical context on the other, (see also Pillorge (6)). Visual form qualities inspite of their qualitative nature, play a key role in the success or otherwise of urban forms as they affect form generation decisions as regard structure, unity, articulation, tissue formulation, growth qualities and complexity or simplicity of spatial organization.

1.3 Urban Form Generation

It is that "intuitive" or pseudo rational process aiming at the achievement of maximum fitness between an urban forms (to-be) and its physical context. The drive towards the formulation of a form is a directional, iterative sequence that emanates from the planning objectives and progressively passes through (and shuttles between), the programme and the contextual determinants (See also Roberts (9) & Ratcliffe (8)).Within the bounds of the pseudo-rational nature of the process, form generation is achieved (conventionally) through three overlapping techniques, namely:

1- Elements matrix and Synthesis.

2- Abstract versus Detailed patterns dialectics.
3- Actions and Design Criteria Sets.

The Element Matrix and Synthesis, comprises two distinct phases. The first phase is the articulation and manipulation of form elements and the formulation of a design matrix, or a vocabulary of alternative solutions. Each covers a possible interactive scenario for an element and combining: objectives, programme & determinants.

The second phase is to develop comprehensive solutions or "total" form alternatives based on combinations of the elements matrix.

The Abstract versus Possible (or contextually fit) patterns dialectics, technique is based on the exploitation and development of archetypal urban forms to suit the site, accommodate programme and satisfy planning objectives (see for example Lynch (3)).

Actions and design criteria sets, technique attempts to logically simulate planning rationales, by translating design ojectives into alternative actions and design criteria (decisions). Urban forms are then developed as sets of patterns, criteria and actions.

The three form generation techniques, besides their intuitive nature, share structural similarity of the processes involved, i.e. a sequence of closely related steps comprising
- Formulation of Alternatives.
- Evaluation of Alternative urban forms.
- Selection and development of a proposed urban form.

The Evaluation and Selection are decisive factors in the success and efficiency of the process.

2. EVALUATION VERSUS EVOLUTION - AN ALTERNATIVE APPROACH.

It is generally accepted that the most critical aspect of the plan making (or generation) process is decision making and taking, i.e. the evaluation and selection of alternative strategies, plans and urban forms.

An urban form is the solution to a planning problem, hence is the relative importance of Evaluation of alternative solutions, contents, features and potentialities which is justifiably regarded as the corner stone of the form generation process. Evaluation combines the rational and quantitative together with the subjective, qualitative and value oriented aspects.

The evaluation process stems from & closely relates to development goals and objectives as it practically transforms them into evaluation and weighting criteria; reflecting their relative importance. The scores and weights of the various criteria allow ranking and grading of alternative forms and solutions.

Weighting and ranking of qualitative and value oriented criteria and planning objectives is a major defficiency of evaluation rationales. The tendency to force false precision on the evaluation process through the use of numerical ranking of solutions or parts there of, is likely to adversely affect the product and results in poor, inadequate proposals.

False precision is also a by product of the forced simplicity on,

and abstraction of, the complex planning problems characterized by the clashing requirements and nature of its components. (see for example Rapoport (7)). False precision, misleading evaluation criteria and the resulting unsuccssful selection of urban form and plans-to-be may be avoided through minor modifications of the generation- evaluation process. The modifications concentrate on the use of resources, attitudes towards and understanding of the nature of the process rather than on the ingredients.

The suggested modifications on the generation & evaluation process may be summarized as follows:

1- The use of rich vocabulary of archetypal urban forms, solutions and physical alternatives covering theoritical and practical approaches to the spatial organization problem,Lynch (3),(4).

2- Form alternatives should be formulated and developed to the highest possible standards. They should satisfy two simple and hard to achieve criteria, namely:
   - Maximum fitness with the context.
   - Suitability for implementation.
   (for further elaborations, see Lynch (5)).

3- Evaluation of alternatives should be executed as a synthesizing process, i.e. synthesis of merits and potentialities of the various alternatives rather than mere weighting & ranking. exclusion of the inferiors and selection of the topmost.

In short the evolution process should be developed into a dynamic drive, avoiding drawbacks and minimizing their effects on one hand and enhancing merits on the other. Furthermore collectively mixing and transforming alternatives into a final optimum configuration, i.e. integrating alternatives.
Within this integrating framework numerical weighting and quantitative evaluation are acceptable as a tool for selecting details and components that may be used in the developments of solutions and enhancing its efficiency in the drive towards the optimum. Thus the quantitative weighting provides an effective and flexible indicator in forms evolution.

3- AN EGYPTIAN EXPERIMENT - A BRIEF REVIEW OF THE FORM GENERATION OF SHATTAH NEW SETTLEMENT, DAMIETTA, EGYPT.

The proposed evolution oriented - evaluation of alternative urban forms, approach, directly affects the form generation process and transforms it. The approach was applied in an Egyptian new settlement project, Shattah New Settlement (SNS), located on the North east most corner of the Nile Delta - a satellite to be of Damietta, City, Fig.1, Ettouney (2).SNS site is 91 Hectares and is located some five km to the east of Damietta, the proposed target population for the settlement is 35000 by the year 2010. The SNS is a semi autonomous settlement with a mixed economic base comprising services and light integrated industry.

This section briefly highlights selected aspects of the form generation process for SNS. It may be regarded as graphical presentation of the discourse & proposals introduced earlier (Sections 1 & 2).
The SNS form generation phase comprised three closely linked

stages namely:
- Formulation of planning determinants.
- Urban forms development.
- Evaluation and synthesis.

The three stages are briefly presented in this section with emphasis on their structure and outline, rather than details.

3.1. SNS Planning Determinants

Four physical form determinants affected form generation and element organization of SNS namely:

1- The designated site, shape, boundaries and neighbouring uses, Fig.2.

2- The regional road bisecting the site and forms a physical barrier, a functional & visual edge;which for political and administrative reasons could not be relocated at the early stages of the settlements development. Fig.2.

3- The proposed functions and development programmes for SNS, i.e. to create a reasonably self contained settlement comprising: housing, workshops and light integrated industry together with essential community facilities . Two types of residential areas were to be developed: conventional neighbourhoods and mixed (residential - workshops) neighbourhoods.
The mix of work and residence is a traditional physical pattern in Damietta city, where typical urban plots comprise workshops, show rooms and dwelling units, Ettouney (2).

4- Conventional physical determinants,including the physical context, site, topography, soil,views & micro climatic aspects etc. Those were however of relatively minor influence on elements organizations. The SNS site is flat and homogenious throughout, with no accents or view points. The micro climate is thermally comfortable with a need for breeze penetration during the hot-humid season.

3.2 Urban Forms Development

The settlement comprised four major landuses namely: Industry, mixed neighbourhoods, residential neighbourhoods and service centres. Figures 3,4,5 & 6 illustrate nine urban form alternatives, developed from a larger number of possible forms.

They provided a rich vocabulary to answer development requirements, Figure 7 summarizes the basic concepts and classifications of alternatives. Four basic concepts are presented namely A,B,C, D. For each concept two or more variations were developed (where the location of the Regional Road is retained or changed) resulting in variations : A1,A2,B1,B2,B3,C1,C2,D1 & D2.

Concepts A,B & D share the linear service spine perpendicular to the Regional Road. In concept C the services are centrally located. The alternatives also share the principle of mixing, juxstaposing and seggregating landuses.

3.3 Evaluation and Synthesis

The evaluation criteria was an elaborated transformation of the development objectives for SNS. The evaluation criteria comprised the following:

1- Urban and visual form related aspects.

2 - Efficiency of Landuse.
3 - Accessibility, (internal & external).
4 - Location and spatial relationships of the service centre.
5 - Infra-structure efficiency.
6 - Internal & external flexibility.
7 - Phasing of development - autonomous phasing.
8 - Environmental considerations.
9 - The regional road and the general urban form.
10- Social development considerations.

Table 1 summarizes the evaluation of the form alternatives, indicates the relative importance of the weighting criteria and shows the performance of the alternative against each criterion.

Table 2 shows the relative weighting and the evaluation ranking scale matrix, used in Table 1.

Alternatives A & B were then developed and partly integrated with merits of other alternatives incorporated, resulting in the proposed urban form for SNS,Fig. 8,Ettouney (2).

EPILOGUE

Generating urban forms, to meet development objectives and to fit the planning context, followed by evaluating the resulting forms to select the fittest for futher development and implementation (arguably) mark the critical most phase of planning rationales. The relative importance of the phase is attributed to its ultimate objective,i.e. the urban form-to-be. Which in turn will provide the physical setting for development activities and functions, and effectively determine the success or otherwise of the process.

The critical nature of the generation - evaluation phase stems from the dual nature of its components and performed tasks within its bounds,i.e. the combination of the qualitative & intuitive and the qualitative, rational & methodical.

Form generation and evaluation should be transformed into an evolutionary process, based on the concepts of integration of alternatives and synthesis of their potentialities and merits.

Furthermore the evolutionary process depends on:
1- The skilful formulation of rich vocabulary of form alternatives,
2- The quality and standards of formulated alternatives, i.e. they should be thoroughly competitive, contextually fit and suitable for implementation.
3- The exploitation of the iterative nature of the planning process, i.e.review of and feed back of earlier phases (e.g. goals and objectives and planning criteria) to add flexibility and enhance integration possibilities.

The transformation of urban form generation process is likely to secure better results, in terms of optimum fitness and objectives fulfilment. The dialectic clash between the qualitative and quantitative aspects (inherent in all creative processes) of the evolution process will however remain a serious challenge to physical planners.

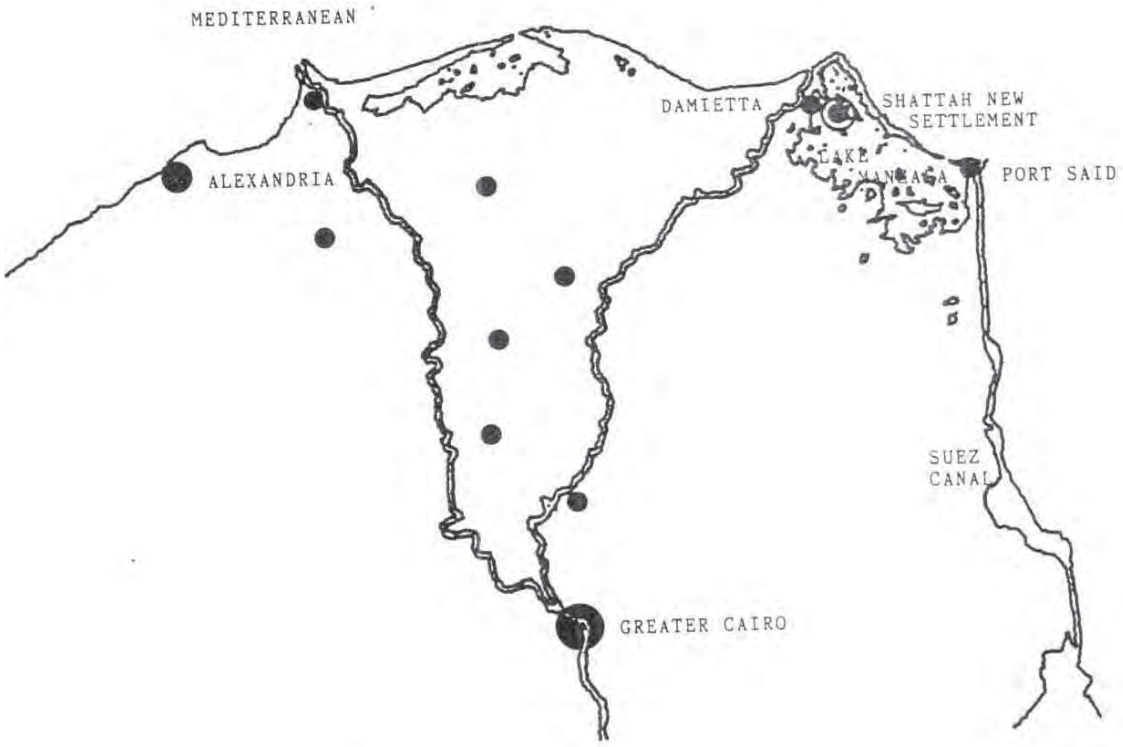

Fig. 1. SNS Location, Damietta Governorate

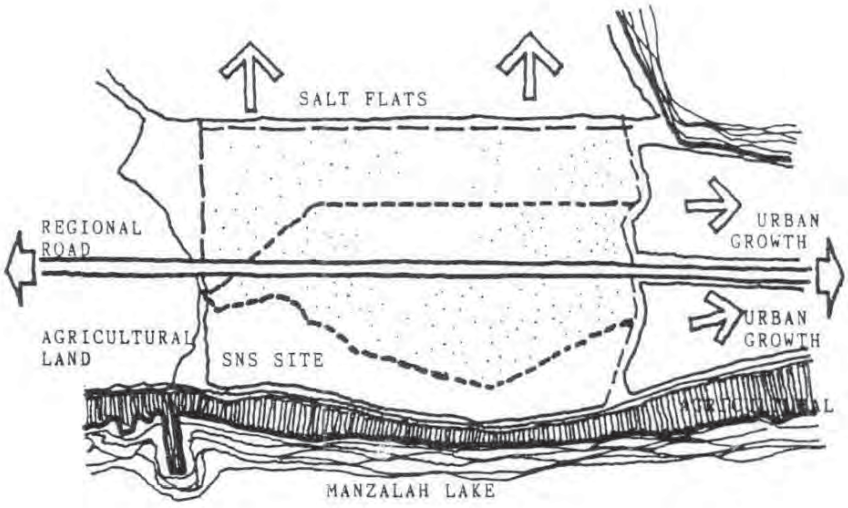

Fig. 2. SNS Site

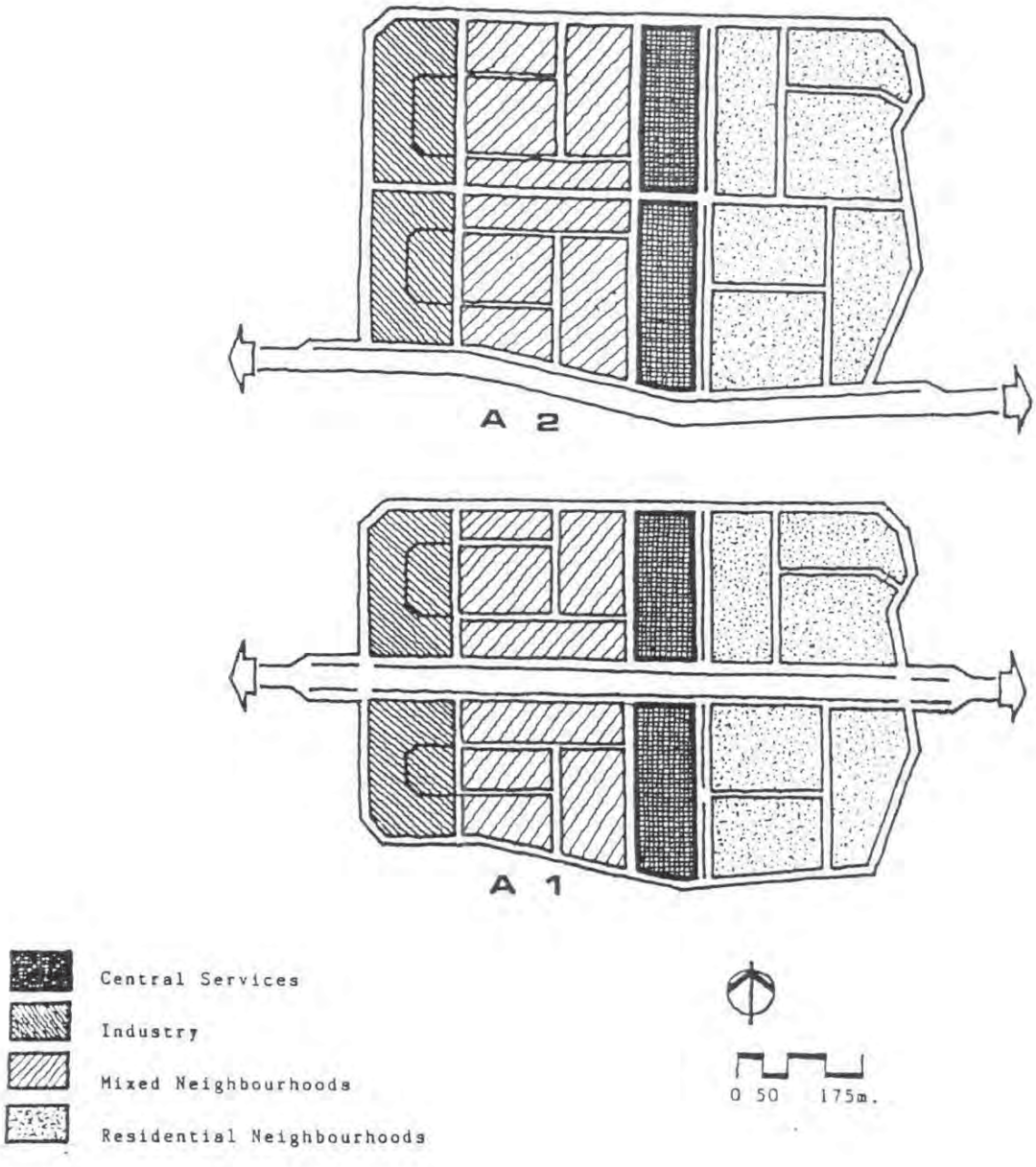

Fig. 3. Alternative A : variations A1 & A2

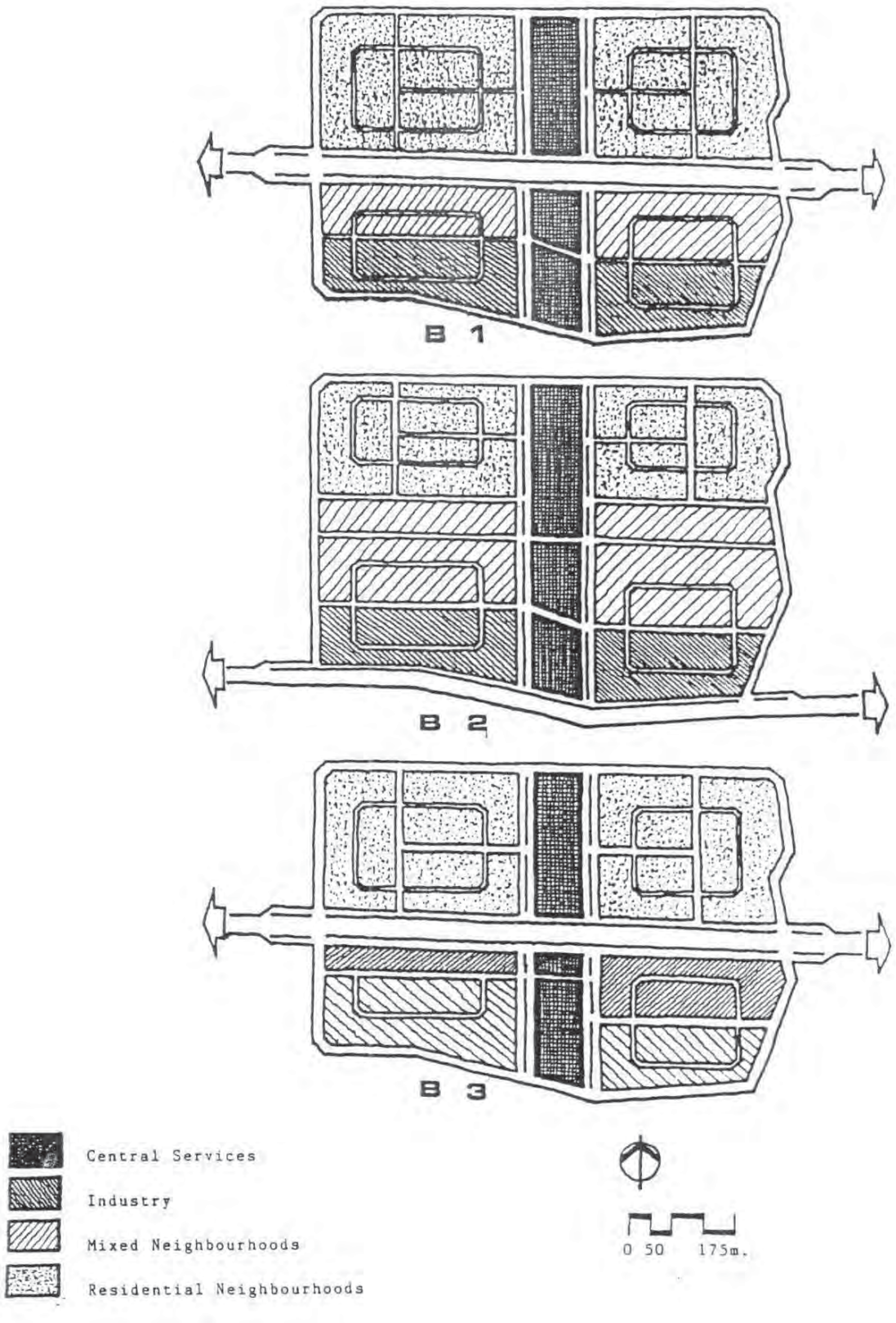

Fig. 4. Alternative B : variations B1, B2 & B3

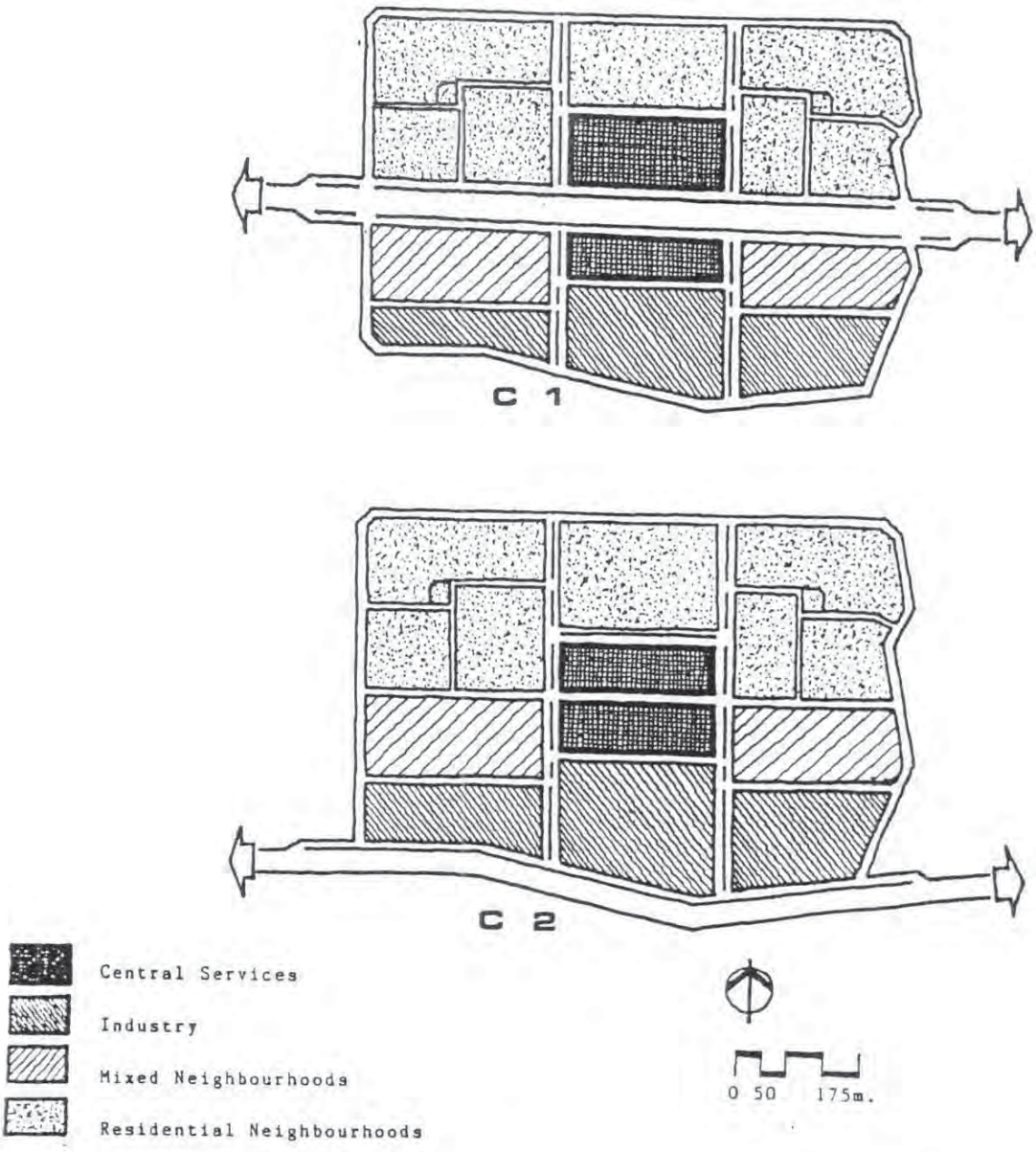

Fig. 5. Alternative C: variations C1 & C2

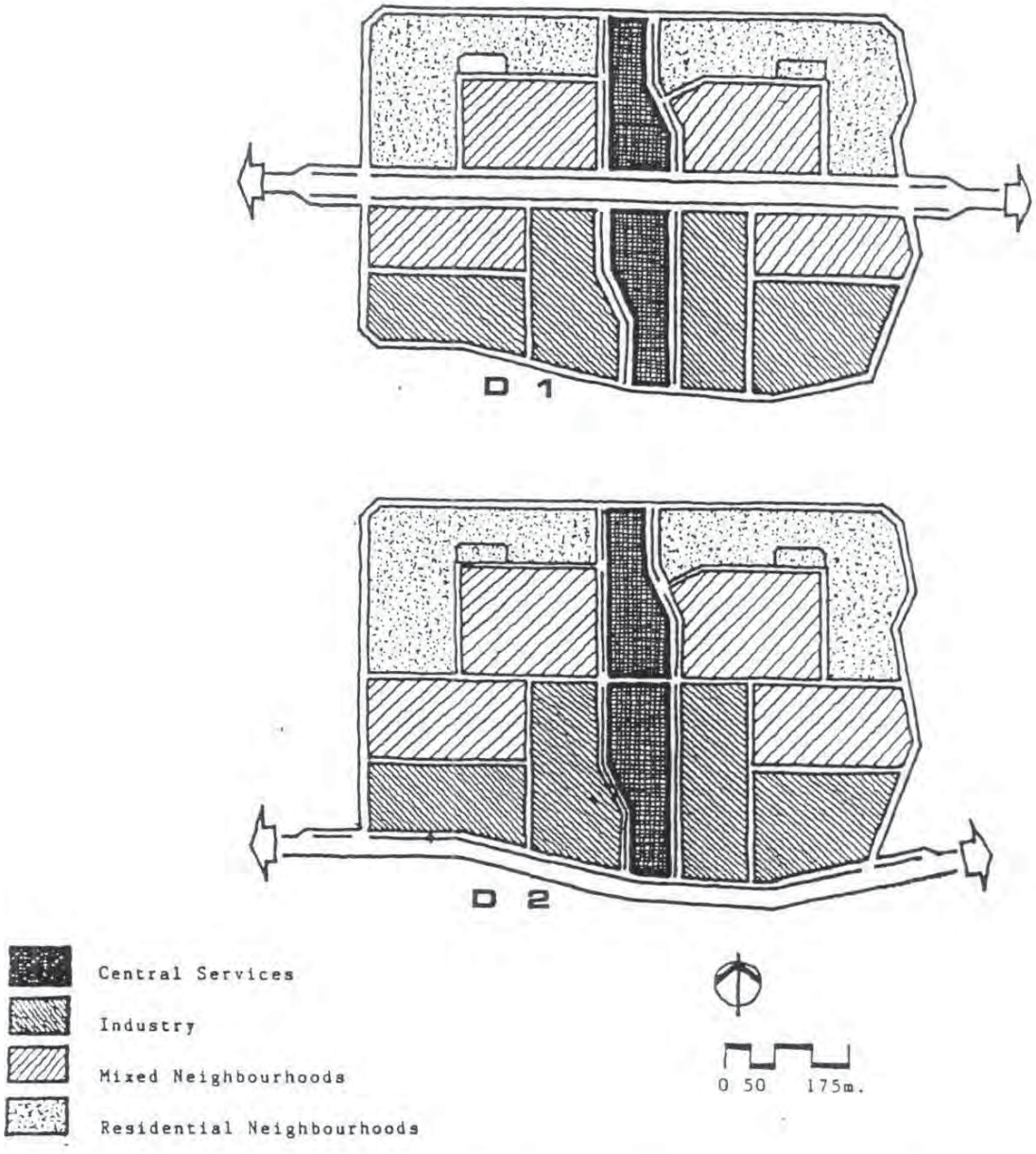

Fig. 6. Alternative D : variations D1 & D2

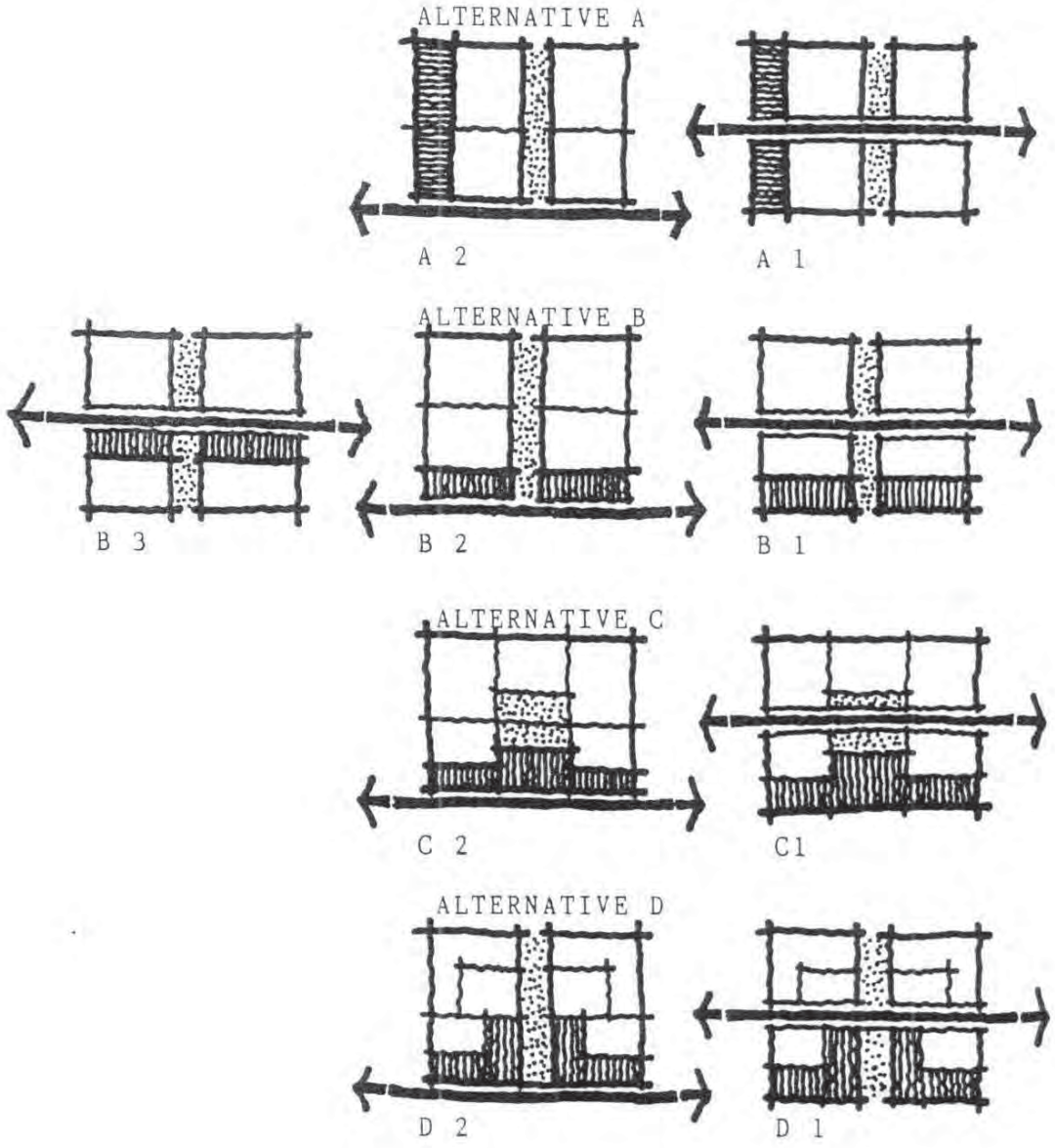

Fig. 7. Alternatives and Variations.

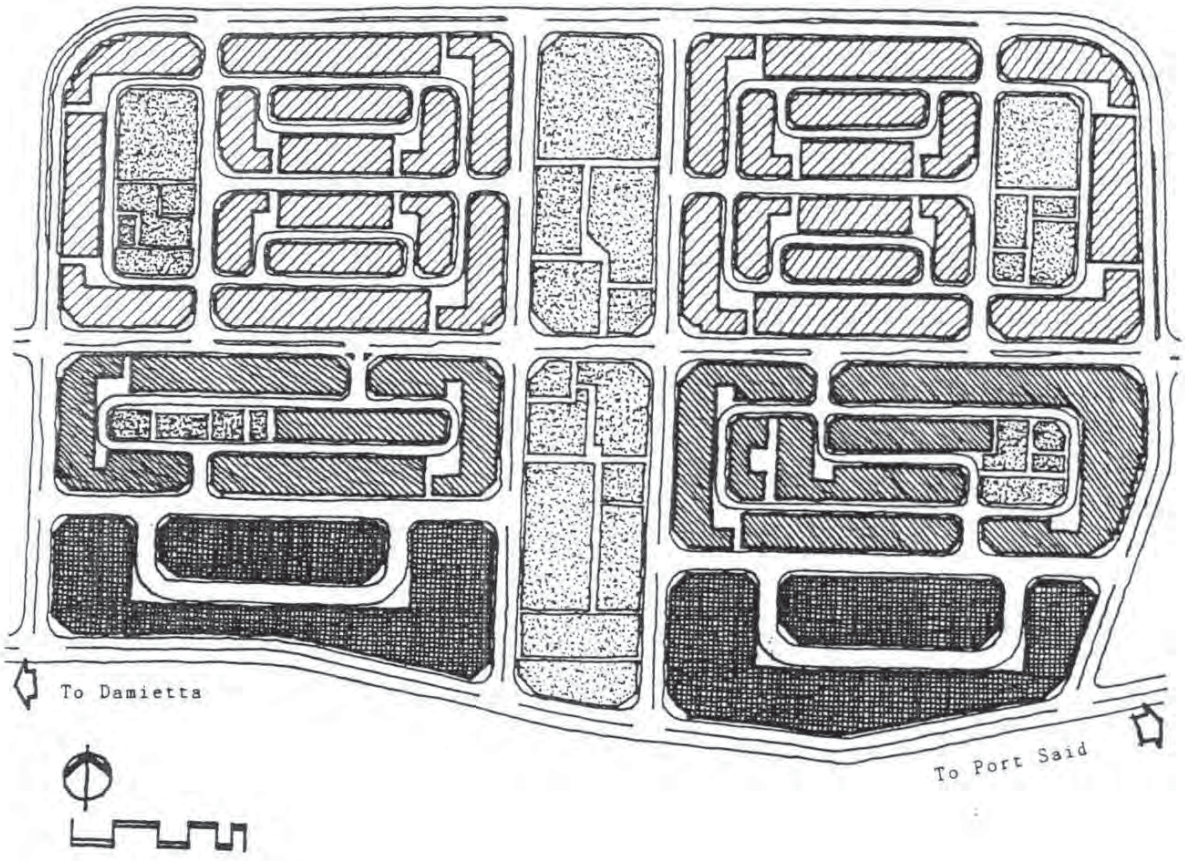

Fig. 8. Proposed Master Plan, SNS, Damietta, Egypt

TABLE 1. Evaluation Of Urban Form Alternatives

EVALUATION CRITERIA	RELATIVE WEIGHTING			ALTERNATIVE A		ALTERNATIVE B			ALTERNATIVE C		ALTERNATIV	
	3	2	1	A 1	A 2	B 1	B 2	B 3	C 1	C 2	D 1	D 2
1 .URBAN & VISUAL FORM ASPECTS	*			■	■	■	■	■	●	●	●	●
2 .EFFICIENCY OF LANDUSE	*			◉	■	●	■	●	●	◉	▲	▲
3 . INTERNAL & EXTERNAL ACCESSIBILITY	*			■	■	●	■	●	●	■	▲	●
4 . SERVICE CENTRES LOCATION AND SPATIAL RELATIONSHIPS		*		◉	■	◉	■	◉	▲	●	●	◉
5 .INFRA STRUCTURE EFFICIENCY	*			■	◉	■	◉	■	■	◉	●	▲
6 .FLEXIBILITY	*			◉	■	◉	■	◉	◉	■	●	■
7 . PHASING OF DEVELOPMENT	*			■	■	◉	■	◉	●	◉	●	●
8 .ENVIRONMENTAL CONSIDERATIONS		*		●	◉	◉	■	●	●	■	▲	●
9 . THE REGIONAL ROAD AND THE GENERAL FORM	*			◉	■	●	■	●	●	■	◉	■
10. SOCIAL DEVELOPMENT CONSIDERATIONS			*	◉	■	▲	■	▲	◉	◉	◉	◉
RANKING ORDER				3	2	5	1	6	8	4	9	7

TABLE 2. Evaluation - Weighting Matrix

EVALUATION \ WEIGHTING			3	2	1
			IMPORTANT	FAIR	UNIMPORTANT
GOOD	3	■	9	6	3
G / F	2.5	◉	7.5	5	2.5
FAIR	2	●	6	4	2
F / P	1.5	▲	4.5	3	1.5
POOR	1	▲	3	2	1

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PART 3 PAPER 16

UIA REGIONAL CONFERENCE ON THE CHARACTER OF NEWLY
URBAN PLANNING DEVELOPED SETTLEMENTS IN EGYPT
CAIRO,EGYPT,DECEMBER 1983 DR. SAYED ETTOUNEY