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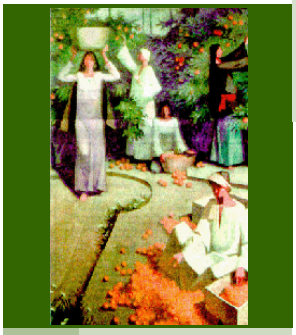

Ecological Analysis of Egyptian Rural Houses

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Introduction:

Previous studies that dealt with the problem of housing adopted a quantitative approach addressing only the shortage in the supply of houses and the large demand on them. Despite the importance of this approach, it oversimplifies the problem as it overlooks significant qualitative aspects that relate to the characteristics of the houses, to what degree they meet the needs of human beings and to what extent the components of the house are in harmony with the physical environment and available technology.

This study provides an ecological analysis of rural houses in Egypt. It presents an integrated approach that examines the social, health, and psychological aspects related to the architecture of the rural house and the mutual interactions between the physical and human aspects. Findings of this study serve as recommendations to the competent authorities in charge of the social and health development of the rural communities, and concerned with the consolidation of the role of the rural house as a productive unit. These recommendations can also be used to advance other research studies. Finally, the study also generated a manual of the environmental specifications of rural houses, which includes architectural and the social requirements in rural houses. The manual serves as a scientific document that can be consulted to improve the conditions of rural houses.

Objective:

This study examines the interactions of the architectural, social, health and psychological aspects of the rural house, both old and new, in Upper and Lower Egypt. It evaluates the rural house with regard to the performance of social functions, pollution, ventilation, finishing, presence of insects and rodents, the relationship between farmers and the surrounding environment, as well as the social relations within the rural house.

Addressing the health aspect, the study focuses on the main health problems facing residents of rural areas with regard to their types, prevalence of endemic diseases under certain housing and environmental conditions as well as knowledge of the main health providers in each community.

The study also presents an evaluation of the different architectural variables and their effect on social relations between married couples, children, neighbors, and families and the local community, as well as their impact on physical and psychological health. It identifies the main building materials used in setting up rural houses and determines the extent of their availability in the local environment. Finally, it determines the manpower needed to execute the rural house.

Using special scales, the psychological component of the study evaluates the extent to which the sample is satisfied with the rural house, and throws light on critical psychological elements, including alienation, respect for privacy, aesthetic aspects of the place, satisfaction with the house, emotional stability, self esteem and attitude towards life. The study also undertakes a psycho- ecological analysis of the rural house by focusing on some architectural aspects related to the desire to demonstrate status and personality, respect for privacy, desire to own, the use of space to undertake activities such as raising animals and poultry, attention to ornamental designs, paints and colors, and noise.

Methodology:

First an exploratory pilot study was undertaken using the ecological approach and social survey. Thorough literature review was conducted in libraries of universities and research centers in order to determine the different dimensions of the research problem. The principal investigator paid an exploratory visit to the study site to select the specific villages where the study will be undertaken, and another visit to a village in Giza in order to refine the study tools and verify their suitability to the research community. Two villages were selected in Lower Egypt: Sandyoun in Qalioub, Qalioubia Governorate and Mahallet Al Qassab village in Kafr El Sheikh Governorate and two in Upper Egypt: Al Hamam at Nasser Markaz in Beni Suef Governorate, and Bani Ali village in Bani Mazar, Minya Governorate. Two hundred individuals served as the study sample, representing 200 houses in each village, and including both males and females of different age groups and different social and educational levels. The houses include both new and old units (built prior to 1973).

The ecological approach focused on the interactions between the physical, social, health and psychological factors since it is hard to separate them from each other. A multidisciplinary research team was formed due to the wide array of issues that need to be studied. On the other hand,, the objective of the survey was to depict a dynamic picture of the society under study in order to use it in the ecological analysis. To carry out the social survey, direct contact was established with the local communities. Several tools and methods were used including interviews with respondents by posing direct questions or by observing the condition of the house without asking questions. In addition to focus groups with farmers, observations, photographing, statistical packages and some social and psychological measurements were employed.

Main findings:

Findings of the social study:

Performance of social functions:

Findings indicated that houses in Upper Egypt fare better than houses in Lower Egypt with regard to price of land and its area (including the courtyard, living and guest rooms). On the other hand, houses in Lower Egypt were superior to Upper Egyptian houses when it came to the kitchen and bathroom because of the availability of running water, the higher individual share of water, and the larger sewage capacity. In general modern houses were better than old houses in both Upper and Lower Egypt, again due to the availability of running water.

Pollution:

Results pointed out that the nature of the rural house and its role as a productive unit that accommodates animals, poultry and baking activities, in addition to the absence of running and potable water resulted in shortage of basic services and utilities as well as pollution. Findings pointed to a generally very high level of pollution reaching an average of 64% in modern Lower Egypt houses and 75.6% in Upper Egypt. While clearly, the comparison here is between two high levels of pollution, the above results point out that the level of pollution is generally higher in Upper Egypt than Lower Egypt both in old and new houses. Pollution is also generally higher in old houses than modern ones in both Urban and Rural Egypt.

Relationship between peasants and the surrounding environment:

In general, this is a positive relationship with an average ranging between 74% among residents of old houses in Upper Egypt and 68.5% for residents of modern houses in Upper Egypt**.**

With regard to the protection of the environment against pollution, figures ranged between 77.9% for old houses in Lower Egypt and 73.8% for modern houses in Upper Egypt.

With regard to the protection of the environment against waste, figures ranged between 73% in old houses of Upper Egypt to 62% for modern houses in Upper Egypt.

With regard to maintaining environmental balance, figures ranged between 73.1% for old houses in Upper Egypt and 69.8% for modern houses in Upper Egypt. The study also revealed that in general, the nature of the house – whether old or new - did not significantly affect the peasants' relationship with the surrounding environment, thus the peasant's relationship with the environment did not change with the change in house whether modern or old, in Upper or Lower Egypt. Researchers attribute the strong relationship between peasants and the environment to their engagement in agricultural activities which brings them close to nature and makes them more aware of the need to protect the environment.

Social relations:

Findings indicated that social relations are generally strong and range between 65.6% among residents of old houses in Upper Egypt and 76.9% for residents of modern houses in Upper Egypt. Of all types of social relations, relationships with neighbors and friends were particularly strong and ranged between 84.6% for residents of modern houses in Upper Egypt to 73% for residents of old houses in Upper Egypt. On the other hand, relations among members of the village community were generally the weakest, ranging between 66% for residents of old houses in Upper and Lower Egypt to 74% for residents of modern houses in Upper Egypt. These findings conform with the nature of the agricultural rural society, characterized by cooperation between its members.

The study also indicated that housing has a strong impact on social relations particularly among residents of old houses in Lower Egypt, who fare better than residents of the old houses in Upper Egypt when it comes to social relations. Residents of modern houses in Upper Egypt are also better off than residents of old houses in the same region because of the availability of services and water and the absence of pollution. In general, the ability of the rural housing units to perform their social functions has contributed to better and stronger social relations among residents, particularly within families. Clearly, there are strong links between the different components of the study, beginning with the availability of running water and its impact on the house's performance of its social functions, and the impact of all the above factors on the degree of pollution in the house. These factors interact to affect social relations among various groups of the population and the relationship between man and the environment.

Findings of the health study:

The health study included questions on the health status in the year before the study was conducted with emphasis on acute diseases. With regard to chronic diseases, questions were posed about their occurrence in the lifetime. Symptoms were presented for each illness to facilitate the diagnosis of the disease.

Findings identified factors that contributed to the appearance and spread of certain diseases. Such factors included lack of potable water, air pollution due to the presence of animals, dust, flies and smoke within the housing unit. The highest level of bronchitis in the old houses of Lower Egypt reached 40,6% followed by the old houses of Upper Egypt at 28.5%. Generally speaking, modern houses demonstrated lower rates of diseases, compared to old houses and Upper Egypt compared to Lower Egypt. The highest level of intestinal disorders (vomiting and diarrhea) appeared in Lower Egypt particularly in old houses reaching 33.8%, and 26.2% in modern houses, compared to 20% for old houses in Upper Egypt and 18.8% for modern houses in Lower Egypt. Urinary tract problems were more prevalent in the old houses of Lower Egypt at 33.8%, followed by modern houses of Upper Egypt at 31%, against 27.8% in old houses of Upper Egypt and 22.7% in new houses of Lower Egypt. The highest level of conjunctivitis was in the old houses of Lower Egypt at 28.6% compared to 17.4% in the old houses of Upper Egypt and 16% in the modern houses of Lower Egypt compared to 13.2% in the modern houses of Upper Egypt.

Findings also revealed that the levels of urinary tract bilharzias were highest in the old houses of Lower Egypt at 34.6% against 31.1% in the old houses of Upper Egypt and 25.8% in the modern houses of Lower Egypt against 29% for the modern houses of Upper Egypt. The highest percentage of rectum Bilharzias was in the old houses of Lower Egypt at 18.8% against 14.8% in the old houses of Upper Egypt. The percentage in modern houses reached 16.8% in Lower Egypt against 7.6% in Upper Egypt.

Some correlations between certain customs and practices and the spread of some diseases were of statistical significance. For example, defecation, supply of water, disposal of waste are all linked to the spread of diseases related to the contamination of food and water, urinary tract infections, contagious diseases, skin diseases, parasites and intestinal disorders, and different kinds of Bilharzias. The prevalence of parasites in Lower Egypt (26.5% - 30.8%) was higher than in Upper Egypt (13.2% - 22.2%). Contagious diseases were far more spread in old houses both in Upper and Lower Egypt than modern houses, which points to the lack of health awareness and knowledge about personal hygiene.

The highest percentage of tapeworm disease prevailed in the modern houses of Lower Egypt at 48.5% and in the old houses of Upper Egypt at 41.7%. Tricinela spiralis appeared in the modern houses of Upper Egypt at 42.1% and the old houses of Lower Egypt at 24.4%. Skin diseases such as mange (scabies) and lice prevailed in Upper Egypt (11.1% - 16.7%) and Lower Egypt (6.6% – 18%).

The examination of non contagious diseases affected by the psychological state and the housing conditions revealed that the percentage of individuals who suffer high blood pressure ranges between 7.5% and 11.8%. These are less than figures in cities, where they reach 29% according to the findings of a study undertaken by Cairo University hospitals. The highest rate of diabetes was found in the modern houses of Lower Egypt reaching 8.2% and 7.5% in the old houses. In Upper Egypt the figures were 6.7% in the old houses and 6.2% in the modern houses.

The study pointed to a high level of asthma among residents of the old houses in Lower Egypt amounting to 14.3% and 4.3% in the modern houses. The percentage reached 7.6% in the modern houses of Upper Egypt against 4.8% in the old houses. Kidney stones prevailed among the residents of modern houses in Upper Egypt at 11.1% against 7.4% in the old houses. The percentage declined to 8.3% in the old houses against 5.5% in the new houses. With regard to service provision, the study pointed out that public hospitals were the largest service provider in the rural areas, but a relatively large number of individuals, that cannot be overlooked, also resort to traditional health providers such as the *daya*, and the barber in addition to the local pharmacist.

Findings of the architectural study:

Location of the house and distance between neighboring houses:
In general, the housing units, particularly new houses in Lower Egypt - are closer to the main roads and to each other. On the other hand, a large number of houses in Upper Egypt are situated in alleys and narrow streets. This shows that residents of Lower Egypt are more extrovert and outgoing, while residents of Upper Egypt are more introvert and show more respect for privacy.

Age of houses:
The study pointed to the high percentage of old houses in Lower Egypt compared to Upper Egypt particularly houses that were built during the last three decades. This may be attributed to the low prices of land in Upper Egypt, in addition to the attention given to the southern parts of Egypt in recent years.

Settlement:
Seasonal accommodation is higher in Upper Egypt than in Lower Egypt. Poor services and utilities in Upper Egypt in addition to remoteness from the capital force residents to leave the houses for long periods of time.

Size and area:
In general, the size of houses in Upper Egypt is larger than in Lower Egypt. This phenomenon is related to a number of factors including the price of land, population density, number of household members, and finally adherence to customs and traditions such as the value attached to male children and to extended families. In general, residents of Upper Egypt seem to adhere more to these traditions than residents of Lower Egypt.

Direction of buildings:
Most of the new buildings in Lower Egypt face north or east. These are the same directions of the old houses in Upper Egypt.

Type of ceiling:
Concrete is used more in the construction of ceilings of houses in Lower Egypt, particularly in new houses. In Upper Egypt, other materials, such as wood, are used. The buildings are also lower in height and the number of stories is less than in Lower Egypt.

Type of land before construction:
The study revealed that most of the houses are built on agricultural land, more so in the new houses of Upper Egypt and in the old houses of Lower Egypt. The area of land originally designed for construction is very small and does not exceed 7% in Lower Egypt and 4% in Upper Egypt for new houses. The percentage is slightly higher in the old houses of Upper Egypt than in Lower Egypt. Essentially, this means that the new rural house is built on agricultural land.

Open courtyards:
This type of courtyard represents 27% of the old houses in Upper Egypt and 25% in Lower Egypt; 32% of the new houses in Upper Egypt and 16% of the houses in Lower Egypt. This means that the houses of Upper Egypt are more suiting to the climate and surrounding environment since the open courtyard helps reduce temperature inside the house.

Houses overlooking agricultural land:
The percentage of houses overlooking green areas and agricultural land has increased in Upper Egypt and exceeded their counterparts in Lower Egypt. The number of houses is significantly higher with regard to new houses in Lower Egypt. Moreover, the percentage of residents of Upper Egypt who plant trees in front of their house is much higher than residents of Lower Egypt.

House with two doors:
About 34% of the old houses in Upper Egypt have two doors compared to 16% only in Lower Egypt. The percentage reaches 30% in the new houses of Upper Egypt compared to 13% in the new houses of Lower Egypt. Usually one of the two doors open to the guestroom, which indicates respect for privacy of household members.

Multiple courtyards:
Findings are comparable in the two regions and range between 20-25% of the old and new houses in Upper and Lower Egypt. This demonstrates the importance of courtyards for ventilation, privacy and the protection of children and women. In general, the courtyard is located in the center of the house. A limited number of courtyards are situated in the back area.

Open staircase:
The number of staircases that are open to the sky is higher in the modern houses than the old ones particularly in Upper Egypt. In general, the best location for the staircase is the center of the house, thus allowing for proper ventilation.

Potential for expansion and enlargement:
The potential for expanding the modern house is generally greater than old houses. This general principle also applies specifically to the houses of Upper Egypt. Moreover, the number of completed houses is higher in Lower Egypt than in Upper Egypt, particularly old houses.

Ventilation openings:
The number of long ventilation openings is higher in the houses of Upper Egypt, particularly in new houses, which renders them more adaptable to the climate and the environment.

Window screen:
Generally, the percentage is very small in both old and new buildings in Upper and Lower Egypt.

Reasons for choosing a specific shape:
About 38% of the new houses in Upper and Lower Egypt resemble city houses or the houses of village notables or rich individuals. In general, the study indicated that houses in Upper Egypt adhere more to Egypt's architectural heritage and are more suiting to the surrounding environment and climate of Egypt.

Findings of the psychological study:
This part of the study throws light on the psychological aspects of the rural house through the examination of two main dimensions: psychological harmony with the house and the psycho-ecological analysis of the rural house. The scale used to measure psychological harmony includes several sub-scales that examine and measure the extent to which the study sample experiences harmony and other related psychological manifestations such as:

Alienation:
Findings revealed the phenomenon of alienation in the modern houses of Upper and Lower Egypt with no statistically significant differences between the old or modern houses in the two regions. This may be attributed to the similarity of both the modern and the old houses in the two regions.

Privacy:
In general, there is more privacy in the old rural house than its modern counterpart, which is a replication of the urban house. Findings of the study indicated that the feeling of privacy is more pronounced among residents of the old houses than residents of new houses.

Aesthetic aspects:
The study indicated a low level of aesthetic appreciation among residents of the new houses in both Upper and Lower Egypt, who have replaced the simple and unique rural house, traditionally harmonious with the environment, with cement buildings.

Satisfaction with house:
Findings indicated that the old rural house spreads a feeling of comfort, which induces satisfaction with the house.

Emotional balance scale:
The study pointed to the negative impact of the pattern of modern housing in rural communities on individuals. The emotions of residents of modern houses are suppressed within cement fortresses and do not offer the warmth of the old mud houses.

Sociability:
Findings pointed to remarkable differences between residents of old and new houses in Lower Egypt in favor of the old pattern, which is designed to facilitate and enhance social relations. This characteristic was not pronounced among residents of Upper Egypt. There the street plays an important social role, being the place where people meet to discuss their problems and entertain themselves.

Attitude towards life:
Findings pointed to differences between residents of old and modern houses in Upper and Lower Egypt in favor of old houses. This attitude may be attributed to the inappropriate physical characteristics of the modern houses.

In order to carry out a psycho ecological analysis of the rural house, the researchers studied the following:
On the level of the desire to demonstrate status and character, particularly in old houses, the façade of the buildings were painted in bright colors; colorful designs and drawings decorated windows and balconies, including the name of Allah and Al Kaaba for pilgrims to Mecca. These symbols do not necessarily reflect reality but are rather attempts to move from one status to a higher one.

Control of spaces was manifested in closing off balconies and designating them as rooms. Particularly in new houses, adding balconies, or annexing parts of the street to have a garden is common. Despite the illegality of such measures, they express the desire of residents to fulfill basic and social needs, such as maintaining privacy. In new houses, some flat owners closed off balconies, or put up curtains as a shield against the street. By so doing, these families have taken positive and flexible action to accommodate their modest living conditions with the external environment.

With regard to the external space, the study pointed out that houses are lined up close to each other, thus reducing to a remarkable extent the unoccupied space. And yet, such conditions allow social interaction particularly among women who visit with their friends in the open space in front of their houses. These spaces are also used to undertake buying and selling activities and are considered important to form networks of unofficial social relations. Thus, architectural design is considered a physical expression of the social fabric.

The study also pointed to the modest standards of cleanliness and hygiene both in the streets and inside houses, as well as the high level of pollution, which is detrimental to public health and the individuals' image of themselves and their relations with others. Findings also indicated that noise pollution augments distractions and leads to a low level of concentration and memory and has negative impact on social behavior.

With regard to the use of colors, the study revealed that yellow is the most prevalent color in modern houses of Upper and Lower Egypt. Green prevails in old houses of Upper Egypt, while white is the dominant color in new houses in Lower Egypt. Yellow is the symbol of the sun and the air, while green points to land and fertility and white reflects modesty, perfection, purity and is a symbol of life and death. The designs on the walls were mostly lines and squares, which are signs of water, air, soil and fire. These are all influential in rural life and reflect a high level of morality and strong belief in honesty and straightforwardness..

Recommendations:

This study addressed the reciprocal interactions between man and the constructed environment represented in the rural house, with emphasis on social, psychological and health variables. It clearly points to the need for intervention on the part of competent authorities to enhance the rural house as a productive unit, and improve the health condition of inhabitants of rural areas. Using the manual of environmental specifications for rural houses as a benchmark, this study offers the following suggestions and recommendations to improve the condition of the rural house:

-Encouraging the construction of housing units without imposing specific designs or prototypes on residents of rural units, who are themselves naturally capable of choosing the right house. They should be encouraged to use resources available in the environment and agree on a general planning and design for their villages.

-Expediting the process of providing basic services such as potable water to all villages and helmets.

-Examining available options on the national level – such as the biogas project - to solve the problem of sewage and the disposal of garbage and agricultural waste for the largest number of population groups.

-Providing guidance to improve the human side of the house with emphasis on proper ventilation and combating pollution; the correct way to obtain pure water by boiling or using filters or underground water; combat of pests and insects such as lice, flies, cockroaches, rats and mosquitoes; and paying special attention to hygiene.

-Raising health awareness among health providers such as barbers, and *dayas* and encouraging individuals to link up with the health unit through the family doctor.

-Providing basic services and loans to build rural houses so they would regain their role as productive units through the support of organizations such as the Social Fund, the Real Estate bank and *Al Shorouk* project.

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