

Interdependence of Traditional House Form and Settlement Pattern

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Abstract: The main stream of research on traditional built form can be assumed to be focused on either cultural or natural deterministic approaches. Although the priority depends largely on the background of the scholar; culture and nature are mostly accepted to be the major factor determining the course of evaluation of traditional built form. Other forces acting on the formation of traditional built environments, ranging from defensive to administrative factors have also been issues of the discussion in scholar works. An important aspect of traditional built form, besides the constraints imposed and opportunities offered by the above forces, is the existence of discernible interdependences between the individual house form and settlement pattern. Neither the house nor the settlement evolves irrespective of one another. Individual houses are integral components of the settlements they belong to. Furthermore, no single house can be viewed as a self-sufficient building standing all by itself in the natural landscape. Isolated traditional buildings, like farm houses, are rare and exceptional. Similarly traditional settlements cannot be taken up as additive assemblies of individual masses. Space configuration of indoors and outdoors and also the modes of interaction between the two are shaped totally according to the aforementioned mutual dependence. Solid-void relationship that characterizes the textural properties of the settlement pattern, modes of enclosure and exposure, are all defined by the layout relations among the building masses. The theoretical contrast of this study is based on the binary relations of house form and settlement pattern as stated in the above.

1. Introduction

Traditional building has been, and continues to be, the subject of interest of scholars from a wide variety of disciplines which includes historians, art historians, geographers, ethnographers, anthropologists, folklorists, urban planners, architects and etc. Among this wide array of specializations the majority of the studies can be grouped in two main tracks, namely those who deal with the properties of the traditional house and those who research the traditional settlement pattern. Architects are more inclined to decipher the morphological characteristics of the individual dwelling unit. In the other words, their tendency is to see the traditional house as the end product of the traditional building. The same applies for the folklorist, architects and mostly for anthropologists, in that, the house is taken, more often than not, as the subject of investigation of material culture. In most of the available literature, the emphasis is on the individual house as if it is an independent element devoid of a context. The house is seldom viewed as an integral component of a greater entity- the settlement. Social scientists, on the other hand, are more oriented to research the process of shaping of the properties of settlement pattern irrespective of the interdependence among the individual houses.

Although the field of interest of scholars dealing with traditional building display a wide array of specialization, studies, notably those are oriented towards the research of genesis and evolution of the built form, are performed based on two main determinants namely culture and nature. This is primarily due to the fact that traditional settlements and their constituent traditional houses are culturally relevant artifacts, in that, they are the products of building traditions handed down from one

generation to the other (Eyüce, 2005).

Since they never challenge physical constraints imposed by nature, notably by climate and by topography, and are in harmony with their surroundings they are environmentally friendly settlements (Eyüce, 2005).

Other forces acting on the formation of traditional built form ranging from administrative factors, like building rules and regulations, to defensive determinants (defensive city walls) have also been issue of debate in scholarly works. As it has already been stated in the above the object of research is not the entirety of the built form as an assembly of houses but the constituent elements – the individual house.

This study does not aim at a refutation of neither the impact of natural forces nor the determining role of cultural factors during the evaluation process of the traditional dwelling. It, instead, focuses itself to the essential role of the interdependence between the individual house form and properties of settlement pattern during the shaping of traditional built form. The interdependence in some cases is so dense that it reflects itself in the built environment in the form of coexistence of house and settlement in an extremely compact setting. There exist traditional built environment that the entirety of the settlement is perceived as a big single building. The same has been stated by Rapoport as in the follow: "... it is sometimes difficult to separate dwelling and settlements. Particularly in the case of communal dwellings, where dwellings and settlement are one." (Rapoport, 1989). The same scholar goes on to state that: "The dwelling and its parts are linked to many other settings in the neighborhood, the settlement and beyond" (Rapoport, 1989) (Figure 1, 2).



Fig 1, 2. Pocitelj Traditional Settlement in Bosnia

The theoretical, construct of this study is therefore, based on the premise that the shaping of traditional built form, which includes both the house and the settlement simultaneously, is the product of a co-influence which gives way for the co-existence of the two. In other words the end product of traditional building and the object of the research in this field is the traditional built environment in all its entirety.

In connection with the aforementioned contention concerning the traditional building and particularly about traditions Charpentier's view is as follows: "traditions in this context means a way of organizing spaces from the scale of the house to the scale of the village and the town using models and practices which are legacy of the past" (Charpentier, 1989) (Figure 3, 4).

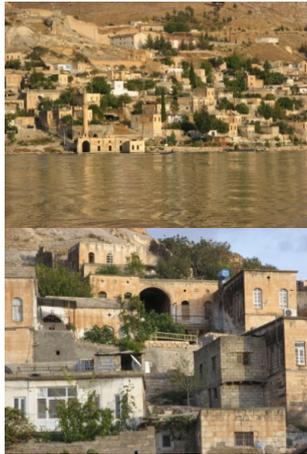


Fig 3, 4. Traditional Settlement in South East Turkey-Halfeti

The coexistence/interdependence of individual houses and the settlement pattern in traditional built environments reflects itself in the vernacular language of most traditional cultures. It is instructive to notice that the specific terminology employed for house and settlement varies considerably than that ours. As it has been mentioned by Charpentier: "... our vocabulary sometimes impoverishes certain concepts which are rich with meanings in another culture. ... The word for a village or for a quarter in a town '*ban*' also means 'house' or 'dwelling'. One word indicates the basic unit as well as the whole settlement without drawing any distinction between whether such a dwelling is a rural or an urban area" (Charpentier, 1989).

Similarly Batammaliba language employs the same word '*takienta*' to mean both house and family (Blier, 1989).

It is most appropriate in this section of this study to dwell duly on the terminology employed in this paper. The term 'traditional' has been preferred throughout the study to 'vernacular' while vernacular denotes to a specific location the term "traditional" signifies the determining role of culture and based on the fact that cultures produces similar built forms in various locations under diversified circumstances according to the same building tradition. The term built environment is utilized to signify the man-made environment, and similarly built

form to signify the artifacts produced as an output of traditional building activities. The term "traditional building" has been preferred to replace "architecture" in order to signify that traditional building is the product of a whole society not an artistic endeavor of a professional.

"Built environment is an abstract concept employed here and in some of the literature to describe the products of human building activity. It refers, in the broadest sense, to any physical alteration of the natural environment from hearts to cities, through construction by humans. Generally speaking, it includes built forms, which are defined as building types (such as dwellings, temples or meeting houses) created by human to shelter, define and protect activity. Built forms also include, however, spaces that are defined and bounded, but not necessarily enclosed, such as the covered areas in a compound, a plaza, or a street." (Lawrence & Law, 1990).

In traditional settlement interdependence between the individual houses has been the issue of discussion by many scholars in various contexts. Taking the issue of interdependence in connection with the 'traditional building practice' in Muslim countries, which is deeply rooted in the teachings of Islam, Hakim and Rowe state that: "...in a typical traditional setting in one of the old urban centers in North Africa such as in Tunis, Kairouen, Fez or Marrakesh, one can see why building design decisions by a home owner would have impacts on some or most neighbors. These impacts, the inherent interdependence between neighbors, and the resulting potential for conflict, were among the concerns of the *Mu'amalat* branch of the *Fiqh*, which is the Arabic term for jurisprudence or the science of religious law in Islam. It deals with two spheres of activity: *Ibadat*, which addresses related to ritual observances, and *Mu'amalat* which addresses concerns and conflicts arising from the interactions and relationships among people (eg. Family law, laws of inheritance, of property, of contracts, criminal law, conflicts due to building activity and/or decisions etc.) In essence, *Fikh* is the science of law based on religion and is concerned with all aspects of public and private life and business. The guiding source of the *Fikh* is the *Qur'an* (the wholly book of Islam considered by Muslims to be revealed words of god to the prophet Mohammad), and *Sunnah* (traditions, sayings and deeds) of the Prophet (Hakim and Rowe, 1983) (Figure 5).



Fig 5. Traditional Settlement-In Fez / Morocco

Another quotation to explain the complexity of traditional built environment, in connection to traditional Muslim cities is as follows:

The urban fabric in traditional Muslim cities is very complex. It is an outcome of interaction between the conditions of sites, the customs of community and the legal mechanisms that are derived from the Islamic Law, *Fiqh*. The condition of the sites could be identified in the topography, the local materials and climate agents. Evidence of these conditions can be seen in diversity of forms and typology, with greatly differs from Morocco to Persia (Ben- Hamouche, 2009).

Traditional settlements do not evolve according to a predetermined layout scheme. This is not to say that they are unplanned and haphazardly developed built environments. They are the outcome of unwritten laws of the community. That is,

they evolve in line with the accumulated and handed down building tradition emanating from cultural and natural factors. During this process of evolution house-to-house relations among the individual dwelling units play a major role. The function of each unit is not only to provide the necessary shelter so as to fulfill the spatial needs of its occupant but also to be an integral component of the whole settlement and help shape communal spaces (Figure 6).



Fig 6. Passenge Way between Houses-Fez, Morocco

According to Charpentier: “the layout of some houses is fixed by the layout of neighboring houses, thus generating a regular pattern in the organization of settlements (Charpentier, 1989).

The source of coexistence, on interdependence, can be interpreted, in a way, to be the outcome of house-to-house dependence.

2. Traditional Ottoman Settlements

It has to be mentioning here that traditional Ottoman settlements defy all natural differentiations emanating from locational variations abiding by the same settlement pattern principles over a considerably wide geographical expanse from East Anatolia to Balkans. Some minor modifications are the result of extreme site conditions.

One discernible aspect of this long lasting building tradition is the realization of settlements on the slope. This unwritten building tradition has produced its own saying which can be translated into English as: ‘Land aback, plain afore’, with very few exceptions, majority of Ottoman settlements have been realized on hilly sides for not only defensive purposes but also to make space for agriculture on the plain (Figure 7).



Fig 7. Traditional Settlement in West Turkey-Şirince

Hilly sites have their own difficulties and also advantageous peculiarities which reflect themselves both on the formation of the house form and on the shaping of settlement pattern. In other words being settled on a hilly site has a considerable impact on the shaping of the built form. It is an indispensable building tradition not to obstruct the view towards the plain of the neighbor in the front. In other words, each individual house in an Ottoman settlement, adapts itself to natural topography so well

that no house hinders the view of the house situated behind. In this way the desirable effects of nature, like prevailing wind for ventilation and solar orientation, are also admitted to indoors (Figure 8, 9).

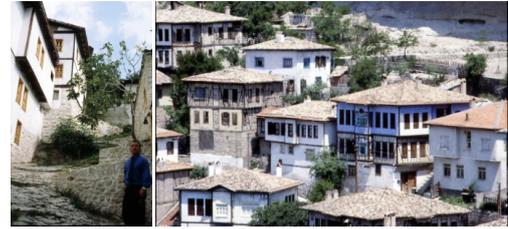


Fig 8, 9. Safranbolu-Turkey

Like all settlements realized/inhabited by Muslim communities provision of the necessary measures for privacy is of utmost importance in traditional Ottoman settlements. Teachings of Islam have always been a priority during the formation of the characteristics of the settlement and in shaping the necessary sequences among various spaces. This is achieved through the spatial hierarchies from the most public to the most private or vice versa.

Most important them all is the presence of this spatial sequential connection beginning from the most private-the room, continuing with ‘sofa’- the fluid space linking various part of the house, and giving onto courtyard, proceeding from the main door of the house to the street in front of the house and finally ending in the public open space locally called ‘meydan’, where more often than not a tree and a coffee house is located. The existence of a hierarchical chain from the most public to the most private or vice versa is the proof that in traditional Ottoman settlement individual houses and the entirety of the settlement can only be taken in unison. The integral structure of the settlement pattern is so strong that even the indoor spatial organization of the house is a part of the whole system.

As it is mentioned in the above, in traditional Ottoman houses with an open “sofa” the extroversion of the indoors is controlled, so far as the privacy is concerned, by the introverted court surrounded by high walls which also constitute a breath taking void for the whole settlement. This aspect of the settlement displays an evenly distribution of green areas among the built up areas.

Traditional Ottoman settlements consist of irregular street patterns whereas the first floor plan organization, which is the main living floor, consists of square or nearly square rooms. Cerasi explains this formation in traditional settlements as follows: “...patterns are open and allow the house to be composed as an agglutination of preconceived and geometrically regular rooms (Cerasi, 1998) (Figure 10, 11).



Fig 10. Traditional Settlement from East Turkey-Kemaliye



Fig 11. Kula-West Turkey

The ground floor at street level, which is reserved for ancillary utilizations like storage, is surrounded by high and windowless walls to secure complete isolation from the public space. These high periphery walls abide by the irregularities of both the site and also the ownership lines. In other words the ground floor morphology is not necessarily a projection of the regularly organized living level plan.

The living quarters are situated well above the ground level with two distinctly differentiated façade treatments. The one, which one may call the external façade is enriched with overhangs-‘*çıkma*’, and overlooks the street. The other façade giving onto the court-“*avlu*” is completely open and can be called as interior façade (Figure 12, 13).



Fig 12. ‘Çıkma’, Open ‘Sofa’ and Door to ‘Avlu’- Court / A House in Kula-West Turkey



Fig 13. ‘Çıkma’-Beypazarı

“*Çıkma*”, the protrusion from the main body of the building plays so important a role in the spatial syntax of both the house and the whole settlement that without mentioning its importance none of the analytical studies will be complete. It is not only an extension of indoor space toward the outdoors but also it provides the interior space with a full length view of the street. If the house is a corner building the two streets on both side of the corner become visually accessible (Figure 14, 15, 16).



Fig 14. Two House with “Çıkma” from Kula



Fig 15. A House from Muğla with high count walls



Fig 16. Coffee House in the Public Space

3. Traditional Hejaz Settlements

Hejaz, situated along the Red Sea coasts of Arabian Peninsula at the Western Region of Saudi Arabia possesses distinct features of traditional building as far as the peculiarities of its built environments are concerned. In other words, despite locational differentiations there exists substantial amount of evidence to consider a common building language of Hejaz and, even beyond the region, one can easily extend the boundaries and talk about a Red Sea tradition of building taking into account the Suakin Houses on the opposite coast of Red Sea (Greenlaw, 1995).

Unlike traditional Arab houses that one encounters in many Arab countries Hejaz Houses have not evolved taking the courtyard as the main organizing space around which other spaces are introvertly positioned. They do not also possess a court at the street level which is largely due to the scarcity of available land for building. The corresponding open spaces are situated well above the ground level in the form of open to sky terraces locally called: “*kharja*” –meaning outside. These open terraces are surrounded by high periphery walls so as to ensure

the privacy of the indoors. 'Kharjas' positioned at different levels display a roof scape peculiar to Hejaz (Figure 17, 18).



Fig 17. Traditional Street Pattern, Cumalikızık



Fig 18. Traditional Street Pattern, Kemaliye

Hejaz settlements consist of multistoried houses, positioned in a densely built compact pattern with irregular streets. The number of storeys varies between four to six. The houses have thick stone walls, quarried from the bottom of Red Sea. In sharp contrast with courtyard houses, Hejaz, have extroverted indoor spaces through large window openings. The houses windows are covered with highly elaborate wooden surface covering elements called "mashrabiya". Windows in Hejaz have open, openable and closed parts. Having several layers and displaying highly artistic and ornamental features. The wooden claddings do not have glass surfaces to allow the maximum benefit from the wind. The wooden elements are so cleverly designed and implemented that the house inhabitants can see the outdoors without being seen. Moreover, they lend themselves suitable to look downwards and upwards (Eyüce, 1985).

Compactness of settlements is the general property which holds true for all Hejaz cities. It is climatically appropriate and also bears relevance with cultural necessities. Nevertheless there are discernible settlement pattern differentiations among various cities emanating from the peculiarities of each city. Jeddah, Makkah, Madinah, Yanbu and Taif are the main cities of the region. In this study Jeddah and Makkah will be dealt with for a comparative analysis (Figure 19, 20, 21, 22).



Fig 19. Roofscape with 'Khanjas' in Jeddah



Fig 20. Proximity and Separation of Houses in Jeddah



Fig 21. Traditional Settlement in Jeddah



Fig 22. Traditional Settlement in Madinah-Saudi Arabia

Jeddah is a port city on the coast of Red Sea with hot humid climate. Being surrounded by city walls which remained intact until 1947 caused to scarcity of available building land. Jeddah houses have less shared walls and more exposed surfaces, compared to Makkah, in order to admit the maximum amount of wind from the Red Sea, so as to cope with extreme humidity with the help of passive ventilation systems.

Traditional settlement in Makkah on the other hand, has evolved, primarily, according to the criteria of proximity to holy Kaba- the most sacred place of Islam. This preference resulted in a highly dense and compact pattern of settlement. A hot dry climate prevails throughout the year in Makkah resulted in houses with more shared walls so as to minimize the heat gain. This property of the settlement has a direct impact on the organization of the individual houses with the development of airshafts called "manuar" to facilitate the air circulation inside the house.

4. Settlements with Courtyard Houses

Courtyards are utilized in almost all building types, in all periods of history of architecture, in every part of the world as an organizing element of building design. Houses, palaces, monasteries, mosques, schools, governmental and private administrative buildings to name a few. So far as the traditional houses are concerned the genesis of the courtyard house is traced back to 7000 BC in Çatalhöyük/Anatolia and 10.000 BC in Beijing/China (Chen Li, 2000).

An elaborate version of courtyard house is the Roman Domus. Courtyards which can be interpreted as an assembly of solid masses around a void or as a void in the body of a solid mass has been, and still continue to be the preferred house typology by many a culture all around the globe. Both the house and the settlement composed of courtyard houses have proved to be the solutions which fulfill functional, cultural and environmental requirements.

Courtyard as an organizing element of spatial syntax of the house is the privatization of an open space totally under the control of the house inhabitants: it provides a clear spatial division of public and private domains. As an element of climate control it functions as a regulator of heat loss. Çatalhöyük and Aslantepe are early settlements located in Turkey. These two settlements are assemblies of courtyard houses with no streets among the houses at all. The access to each individual house is provided through the roofs. The compactness of the settlement to the extent of unifications must have been dictated by defense requirements (Figure 23, 24, 25).



Fig 23. Street Pattern in Traditional Madinah



Fig 24. A Courtyard House in Dirijah, Near Rijadh-Saudi Arabia



Fig 25. A Courtyard House in Mardin-Turkey

It has been mentioned in the preceding parts of this study that despite the fact that all traditional buildings are in harmony with nature and although different cultures have their own approaches to cope with the impact of natural forces. There are numerous examples of different cultures settled in the same geographical region and shaping their built form on their own way. Therefore courtyard houses are as components of settlements are assembled in varying degrees of compactness depending on the cultural interpretation of natural environmental factors. Chinese quarters in Malaysia with traditional row houses is one such case, in that, traditional Malay houses in the same region and under the impact of some natural factor have evolved according completely different principles of shaping. Traditional Malay houses are detached buildings and are elevated from the ground on stilts, whereas the Chinese house are constructed on the street level and have shops on the ground floor (Figure 26).



Fig 26. Shop Houses with Courtyard in Melaka-Malaysia

Despite the high level of humidity which prevails throughout the level in Malaysia these climatic situations are being coped through the help of courtyards positioned within the main body of the building. There exists usually more than one courtyard each of which functioning as air and light well. Since they are limited in size they hardly function as an activity space (Eyüce, 2005).

Courtyard house settlements with not only consisting of dwelling with shared walls but also with shared floor slabs is the case of Mardin with very peculiar type of compactness.

Mardin is a city situated at southern part of the turkey on the slope of a rocky hill. So far as the morphological properties of the traditional built environment is considered it displays all aspects of co-influence to support the main premise of this study. It is the epitome of compliance with constraints imposed by natural factors like topography and climate and also with the cultural determinant emanating from kinship relations of its inhabitants.

The settlement consists of houses with not only shared walls but also with shared slabs at several levels. The street pattern which is partly opened partly covered has so evolved that its continuity is provided with vaulted passage ways realized underneath the living quarters of the dwelling units. The vaulted passage ways are locally called 'abbara' (Figure 27, 28).



Fig 27. 'Abbara' in Mardin



Fig 28. 'Abbara' in Mardin

The case of Mardin constitutes the perfect example of evaluation of a settlement fabric with its solids and voids.

5. Conclusion

The main concern of the study is the interdependence between the morphological properties of the individual living unit and the pattern of settlement in traditional built environments. This interdependence, which reflects itself on the built form at varying degrees depending on the natural constraints and the specific requirements of different cultures reaches, in some cases, to the extent of an unavoidable coexistence of the integral components of traditional settlements. There are even cases that, like for instance the entirety of the settlement functions as if it has been conceived as a single building mass (Figure 29, 30).



Fig 29. Traditional Settlement Pattern-Kemaliye



Fig 30. Traditional House in Kemaliye

The settlements utilizing the surface of the earth as the basic building material and carving the method of building production, the interdependence, though each settlement has its own specificities, is largely and outcome of the necessity to comply with the cultural norms and also to be in harmony with natural surroundings (Figure 31).



Fig 31. Settlement Where Carving Utilized as the Fundamental Building Production Method-Hasankeyf

Although different cultures have their own way of approaching to the treatment of natural environment and adopting their habitat to their surrounding, to be in harmony with nature is a property which is perfectly in line with the eco-centric environmental logic which preaches "building with limited ecological foot prints" (Guy and Farmer, 2001).

Traditional societies have varying understanding/requirements of privacy on the indoors necessitating different means of proximity and separation with their neighbors. This in turn reflects itself in a wide variety of spatial organization schemes. These requirements are not solely fulfilled by means of the morphological properties of the individual houses but also by means of the properties of the settlement pattern. It is not surprising to notice that the need for privacy does not always necessitate separations and isolations. It can be solved instead by means of appropriate house-to-house relationships.

The evaluation of traditional built environments has to be taken as a process of interaction and development in unison. Therefore all research endeavors must be carried out under the guidance of this wholistic point of view which is intrinsic in all ecological approaches.

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