

## Learning from the past: exploring the clues of climate responsiveness in the vernacular urban pattern of Mardin

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*Why should we try to be more 'modern' honey? We are comfortable and happy enough in our existing 'primitive'(!) living environment.*

This is the response I received from a 48-year-old woman when I asked her whether there were aspects of her 'Old Town' living environment that could be applied to contemporary developments in the new city of Mardin. She had so internalised her way of life and the built environment in which she had lived for many years, that, in response to my line of questioning, she started to criticise those living 'contemporary lifestyles' on account of their consumption-oriented and ostentatious way of life.

This scene, which took place in August 2014 in Mardin, was one of the encounters with local people that form part of my doctoral research. The city of Mardin, located on the slopes of a rocky hill in the southeastern part of Turkey, is mainly medieval in origin and has been named as a candidate for inclusion in UNESCO's World Heritage List. My research is designed to compare urban design patterns and associated lifestyles in the vernacular/traditional part of the city (Old Town) and the more contemporary sector (New Town). A key part of the study is to look for variations in climate responsiveness between the designs of the two settlements and to make recommendations about how to integrate better the two so as to create a more climate responsive urban environment.

The climate responsive approach to urban design originated in the field of architecture, and is one of the movements that seeks to produce inherently comfortable urban settings which consume minimal energy in order to reduce negative effects on the natural world (Energy Design Resources 2010). This requires the exploitation of natural regional climatic characteristics in order to reduce the use of finite energy sources, while seeking desirable levels of urban comfort. In other words, two major foundational goals of climate responsive design are (1) to reduce energy consumption and (2) to provide a comfortable living environment. The former goal might be achieved through (a) technologically innovative solutions that foster the use of less energy and obtain efficient performance in built environments and/or (b) by reducing the demand for energy through design by exploiting as fully as possible the natural climatic characteristics of the region under consideration. However, as Milne and Givoni (1979) note, the parameters of human comfort vary from culture to culture. Therefore the latter goal might be achieved by approaching urban design as a socio-technical process which allows for the integration of local socio-ecologic values into urban development processes.

Considering that each locality has its own culture and that lifestyles vary widely from place to place, designing a climate responsive urban environment calls for an in-depth analytical approach which enables the exploration of contextual requirements and the limits of urban development. Therefore, I approach urban design as an on-going process, one which comprises not only spatial organisation and physical adjustments to the built environment but which also integrates human dimensions, including an understanding of social interactions and (variations in and barriers to) climate adaptation. In order to understand how social and cultural lifestyles relate to the spatial organisation of particular climatic territories, I examine both the vernacular urban setting in the city of Mardin, which has developed throughout history in harmony with climatic conditions and the inhabitants' lifestyles, and the contemporary urban setting, which has been developing since the 1960s as part of the wider rapid urbanisation seen across Turkey.

As seen in the pictures below, the two settlements represent quite distinct urban development patterns. While the Old Town presents a horizontal development mainly based on a terraced housing system, the New Town has developed in a predominantly vertical direction and comprises high-rise apartment blocks. However, this verticality does not equate to compactness. Although Mardin is a medium-scale city, urban sprawl is still visible in the New Town.



With the generous support of the British Institute at Ankara, I have been able to complete a large part of my fieldwork research in Mardin. The fieldwork was composed of 60 in-depth interviews and 600 street questionnaires, half of which were completed by users of the Old Town and the other half by users of the New Town. The main objective was to understand the way people use the built environment and provide thermal comfort in both indoor and outdoor spaces.

Preliminary results show that, although people living in the New Town have better living conditions in terms of infrastructure and social services, they suffer from thermal discomfort, especially during the summer. It is possible to conclude that providing thermal comfort is a significant problem in the New Town. Eighty percent of survey respondents said they were not able to live without air conditioners during the summer and 93% of respondents in the New Town have at least one electronic cooling device. Although 33% of the residents in the Old Town have an air conditioner, respondents mentioned that they tended to use air conditioners for just one or two hours at a time, and only on extremely hot days. Findings also revealed that daily life in the New Town is highly dependent on the use of electricity. In the event of an electricity power-cut (which happens frequently in Mardin), people are not able to use their air conditioners, boilers, lifts and other facilities essential to everyday life. The results indicate that, during the summer, the average electricity consumption for a single family in the New Town is twice that of a same-sized family in the Old Town. Unsurprisingly, the significant difference in consumption levels is caused by the greater use of electronic cooling devices in the New Town.

Unlike that of the New Town, the vernacular architecture of the type found in Old Mardin provides particular advantages to maximise the benefits of natural air ventilation. Two of the significant features most frequently mentioned in the interviews are the courtyards and terraces of residential units. Both these architectural features provide air ventilation, natural cooling and also the opportunity for local people to escape to an external space when they experience thermal discomfort inside their home.

*I would prefer to die rather than move to one of those high-rise 'cage' blocks in the new town! Look at this lovely courtyard [interviewee points]. I am able to see the sky, I am able to breathe fresh air whenever I want.*

This response from a 75-year-old male interviewee indicates that these external architectural features are not only important in terms of thermal conditions, they also play a crucial role in terms of general mental and physical well-being. Apparently, people living in the Old Town have adapted to extreme climatic conditions with the help of the physical organisation of their domestic environments. For instance, hosing the courtyard is a widely used adaptive technique which provides natural cooling by the effect of evaporation, especially in the afternoons. Similarly, sleeping on the terrace is a common activity in the Old Town. In comparison, this is almost impossible to do on the balconies of apartment blocks in the New Town due to the way in which apartments are orientated to one another. The ordering of the built environment also explains another reason why people in the New Town are pushed to exist within closed

apartments and obligated to live with air conditioners: people are unaware of the reality that by using air conditioners they are triggering a vicious cycle of cooling the indoor environment and simultaneously heating the urban outdoor environment. Almost every single building in the New Town has a façade covered by the external units of air conditioners. The heat released by these devices contributes to an increase in the urban temperature, an effect which is referred to as the 'urban heat island effect' in the literature.

In line with the discussion of urban climatic conditions, 75% of survey respondents mentioned that they do not enjoy going out during the daytime in the New Town. According to the respondents, a lack of shade and trees makes walking or using open spaces almost impossible on sunny days. Conversely, the narrow streets of the Old Town, which are lined by the walls of houses and oriented against the sun, create a comfortable walking environment for pedestrians.

*It is possible to find shaded streets in the Old Town, but if you want to walk in the New Town you have to wait for the setting of the sun.*

This response, from a 19-year-old interview respondent, demonstrates how the formation of the built environment affects the way people behave, commute or live their daily lives. This highlights the role of urban design in terms of its capacity to shape many of the parameters pertaining to the living conditions of citizens.

This study has revealed that there are many lessons to be learnt from the past in terms of maximising our ability to live sustainably within the built environment. The vernacular urban pattern in Mardin, which has been largely sustained in its present form since the medieval era, demonstrates that, even though many of the technological solutions we utilise and take for granted today were not available in the past, it was nonetheless possible to find adaptive solutions to variations in local climatic conditions. Considering the level that technological development has reached in the 21st century, there is great potential for designers and engineers to find implementable and sustainable climate responsive solutions by combining the innovative solutions of the past with advanced technologies. Further results will be discussed in my doctoral thesis, planned to be submitted at the University of Reading towards the end of 2015. Furthermore, a documentary detailing the results of my research will be prepared and published through social media channels soon.

#### References

- Energy Design Resources 2010: *Design Brief: Design for Your Climate* (Architectural Energy Corporation). Boulder CO
- Milne, M. and Givoni, B. 1979: 'Architectural design based on climate' in D. Watson (ed.), *Energy Conservation through Building Design*. New York