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Original Article/Research

# A comparison of the traditional use of court houses in two cities

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## Abstract

For many years central court houses have been used in parts of Iran with different climates. Though initially there appear to be many similarities, some aspects of these houses vary from one climatic zone to another. Several studies have also suggested that users of these houses moved within them as they sought for better thermal situations. This article sets out how differing sizes, forms and dimensional ratios of central courts in two climate zones of Iran (Yazd, hot and dry, and Bushehr, hot and humid) can support this behaviour. In both places these central court forms can provide good situations for human comfort on various sides and levels of the court. Consequently, residents could move within the house with the seasons to get their desired level of thermal comfort but these traditional patterns of movement differ for each climate zone.

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*Keywords:* Central court houses; Iranian architecture; Behaviour; Yazd; Bushehr

## 1. Introduction

The old architecture of Iran with a history that goes back 8000 years is famous for its central court houses, which were designed to be used in the different climates of the country (Memarian and Brown, 2006). Cooling and warming of these houses were completely based on natural energy sources like the wind and sun, the latter being “the principle source of comfort and discomfort” (Ragette, 2003:84). Iranian builders could control the effects of weather conditions mostly using architectural means. Several studies

support a widespread belief among people that residents used to move within their houses seeking for better thermal situations (Foruzanmehr, 2012, 2014; Foruzanmehr and Vellinga, 2011; Roaf et al., 2005, 2009 ed.; Roaf, 1988; Nicol et al., 2012; Heidari et al., 2000; Bonine, 1980; Madanipour, 1998; Memarian and Brown (2006)), thus linking the form of the traditional court house with behaviour. Because these central courts are used in the different climates of Iran the question arises as to how these similar forms of house can respond to these, either through design or behaviour. It seems that though there are similarities, there are also big differences in the arrangement of these central courts because as Memarian and Brown (2006:23) state “variation in climate led to variation in architectural response” both in Iran and the Arabic countries of the Middle East. This article sets out to determine how ancient Iranian architects and builders have chosen the dimensions and proportions of central courts to offer human comfort in

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the different climatic situations and what movement patterns around the houses are required.

## 2. Background

Many studies have addressed the issue of Iranian central court houses. As Memarian and Brown (2006) state, building materials with high thermal mass, the presence of a basement and semi-open spaces, use of wind-catchers, and changes in the sectional profile of the courtyard are all methods used to maintain comfort in Iranian and Arabic central court houses. This paper looks at the latter, this being a topic that has not yet been fully investigated, especially as some of the features, like wind catchers are only found in hot dry climates, not hot wet ones like Bushehr, although courts are found in both.

The presence of summer and winter rooms in Iranian central court houses and moving from one space to another to find the best thermal comfort on different days of a year and different times of the day have been studied by others (Foruzanmehr, 2012, 2014; Foruzanmehr and Vellinga, 2011 Roaf et al., 2005, 2009 ed.; Roaf, 1988; Nicol et al., 2012; Heidari et al., 2000; Bonine, 1980; Madanipour, 1998; Memarian and Brown, 2006). However, there is no study of how architectural decisions about the size of the courts can support this trend. In addition, most available studies are focussed on Yazd with its hot and arid climate, even though there is agreement the form is found in other climate types (Memarian and Brown (2006) and Ragette (2003)). This study aims to fill the knowledge gap about the role of the central court house in a hot humid climate through comparing its performance with a court house in the more familiar hot dry climate. For this reason, Yazd and Bushehr are selected to represent respectively ancient cities with these different climates.

## 3. Methodology

Ten case study houses from the two different climatic zones of Yazd and Bushehr were selected. All houses are located in the ancient zones of both cities and are examples of old central court houses. All Bushehr cases are based on measured drawings as part of Persian Gulf University of Bushehr student projects (Khajehzadeh and Yavari, 2012) and data for all Yazd houses are taken from Haji-Qassem (2005). For Bushehr, all chosen houses are the two storey on all four sides type, which is a popular form, and for Yazd, the chosen houses are a mixture of small and big houses of one storey on all four sides, again a popular type.

The ground floor plan and a vertical section generated from the measurements of each house have been used to create a table of characteristics. Length, width, height and area of open space have been taken from the drawings and according to these data other physical characteristics of the houses such as ground floor area/total building foot print, area of central court/building foot print, width/length of central court, width/height of central court and length/height of central court are calculated as percentages for each. Finally, two tables of averages of all these ratios for the Bushehr and Yazd houses are created for a comparison and conclusions have been extracted.

## 4. A brief look at Iranian central court houses

### 4.1. Yazd

A typical central court house in Yazd is surrounded by built area on all four sides and rooms on 2, 3 or 4 sides of the central court (Foruzanmehr, 2014) (Figs. 1–3). All parts of these houses including foundations, walls and roofs are

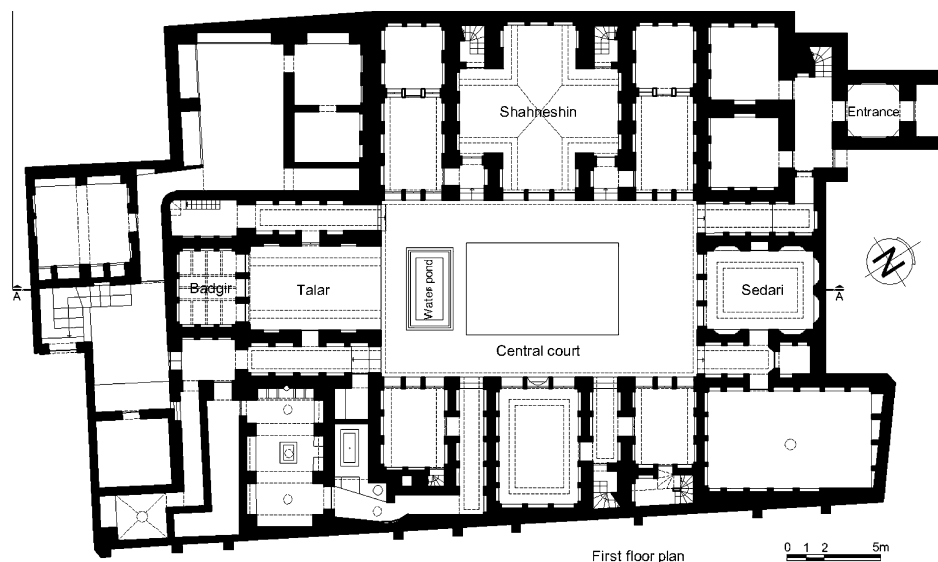


Figure 1. First floor plan, Tehraniha house, Yazd (after: Haji-Qassem (2005)).

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