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# The Study of the Urban Environment in Old and Modern Forms (Case Study of Yazd, Iran)

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## Abstract

From a sustainable point of view, social justice and environmental parameters should be given similar attention to economical aspects. However, similar to many developing countries there have been less attention to these compared to economical part in Iranian cities. Iranian cities have mainly two forms, old and modern. While the city limits are expanding continuously, the old and historical forms are vacated and in this way a great amount of public capital is wasted. The growth model of Yazd, a city in center of Iran is not environmentally friendly. In the second half of the last century there were changes that led to cultural and historical inconsistency. This paper studies the urban environment in both old and new forms of Yazd, as well as horizontal growth, noise pollution, architecture and tourism problem.

**Key words:** urban form, Yazd, environment, tourism, architecture.

## 1. Introduction

Historical, cultural, economical, social, and environmental factors are all important in architecture. Iran contemporary architecture is influenced continuously by modernization, industry. Technology has changed the people's life and their environment. It can be said that modernization has been started about one century ago, and it is keeping on now[1]. The contemporary architecture of Iran has followed modern architecture, such as in expanding wide and straight streets, suburban and intra urban highways, high buildings, urban chess forms, but in many cases the rules and norms have not been considered. Segmentation in Iranian cities especially ones with old forms has left the country with massive destruction. The modern architecture fails to design environmentally friendly constructions. In other words some of the valuable conceptions that the modernization used for rejection the simplicity and strengthen the life were fainted and changed into disvalues [2]. In order to meet a sustainable city, one should not only take into account economical efficiency but also social justice and environmental protect. Today it is not regarded in Iran cities especially Yazd. Moreover, much supplication of land and wrong using has caused inactive lands with the most suitable services and installations. While city limits are expanding continuously, old and historical forms vacated and consequently a great amount of public capital is wasted[3]. Horizontal growth of the city is considered as urban dispersion. Furthermore, an imbalance between urban ecology and room lead to a fragile environment with less people in some area and more people in somewhere else and unmanaged lands. [3].In Iran

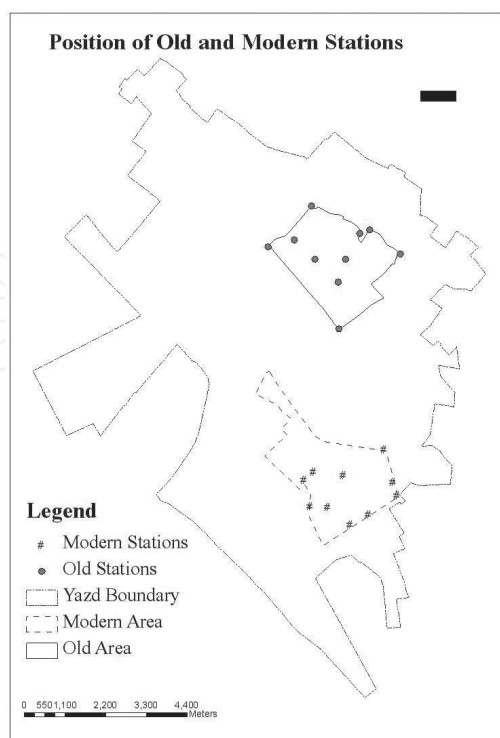
before urbanization, there were a consistency within urban areas and the city growth was controlled by people' social, economical and safety condition needs [4,5].

## 2. Horizontal expansion in modern form and forgetting old form.

Yazd has two kinds of growth, organic and inorganic. The former changes both urban elements and internal population [6]. The later led to cultural and historical destruction. Though Yazd compared to other Iranian provinces has been less affected, economical and social scanning of land reform, rapid modernization and capital relationship expansion in Iran have some effects on Yazd. The physical expansion of Yazd in this period was because of the changes in population and life style. In the way that external city growth has stimulated and the signs of inorganic growth are increasing rapidly. Most recently formation of different districts especially in south, west and east of the city has decreased the distance of between the city and the other villages and connect them to the city and increase urban growth which leads to more inorganic growth. Therefore, several small towns were made around the city by different organizations.

## 3. Noise pollution as one of the environmental issues

In one study [7] sampling noise levels campaign was carried out, in 20 areas (10 for historical zone and 10 for modern zone) during the work days of the week using a 2260 Bruel & Kjaer between August and September 2010. The instrument was installed on streets line adjacent and 80 cm above of the road and was calibrated prior to taking measurement using its corresponding calibrator, 4231B8K. A wind screen was also used, although no sensible and strong blow during sampling days was observed. Two traffic peak periods, morning peak (7:00 – 9:00) and evening peak (19:00 – 21:00) was considered. The coordinates of study stations were defined by GPS and transferred to GIS. Figure 1 shows the place of stations in the GIS platform.



**Fig 1.** Sampling stations in two zones in the study area

In order to compare traffic noise levels, the average of traffic noise levels in the morning and evening in each street were considered. Then using SPSS and one sample T-test comparison between street noise levels was carried out. In one study [8] considering related researches about noise pollution and its effects on people in work places, a questionnaire was provided. For examining noise effects on people in commercial - official zones, ten street that their  $L_{eq}$  was measured in 2008, were chosen [9]. This questionnaire was distributed between 500 persons in commercial places randomly. Table 1,2 show the results of study noise levels of 20 street in Yazd (old and new from) with standard SPSS.

One-Sample statistics

	N	Mean	Std. Deviation	Std. Error Mean
leq	20	72.6450	2.85228	0.63779

**Table 1.** Standard Deviation, standard Error, Mean of noise levels in sample stations

The output of one sample T-test is made up of two parts. In the first table (one-Sample Statistics) the Number, Mean, Standard Deviation and Standard Error Mean has been reported. It is seen that the mean of street noise levels has been 72.64 dB. In the second table (One Sample -Test), t-statistic and degree of freedom (df) has been reported. For One-Sample T-test the df equals to one subtracted from the sum of case numbers (n-1 that is 20-1=19 in here).

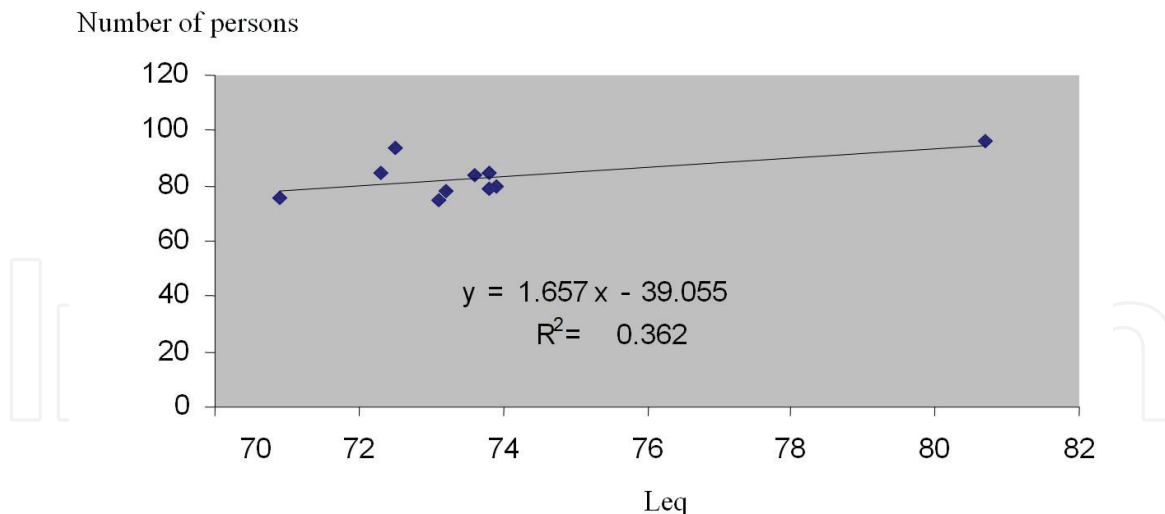
One-Sample Test

Test Value = 65						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of Difference	
					Lower	Upper
leq	11.987	19	0.00	7.64500	6.31001	8.9799

**Table 2.** Comparing noise levels of streets studied with standard amount (65dB)

In performing the Iranian law made in (19.3, 1387), the permissible limitation of noise in commercial zone in the day is 65dB. As we see P-value is 0 that is less than 0/05. So it can be said that that noise levels with standard amount has meaning full difference and is more than standard. Fig 2 shows the relationship between noise level and the number of people.

In all sampling days and different seasons, the noise levels were higher than the standard levels that can be dangerous for Yazd citizens in a long time period. It is because of the increasing number of vehicle such as motorcycles. According to a research done in 2008-2009 the result was that People in commercial – official zones are annoyed because of the noise pollution traffic. Reaction of the persons to noise pollution was confusion, fear, anxiety, anger, headache and problems in sleeping that among them anger was the most importance of all. The environmental pollution such as soil and water because physical illnesses, while the noise pollution is important because not only its physical impacts but



**Figure 2** . The relationship between noise and annoyed people

mental consequences. A great number of motor vehicles are added to the transportation navy each year. Most of them in cities and for city traffic are used. City construction in Iran, especially Yazd, has a traditional system that is related to geographical, cultural and religious conditions. These two means that increasing of vehicles and traditional system are not compatible, so the condition planning should be in the way that the society can enjoy both of them in the best.

#### 4. Tourism industry

Of the Iranian cities, Yazd is the most important one because of the historical structure in old form, with valuable architecture and unique features [10]. Although the old form has some problems such as destruction, the less wide of pavements and migration of people, it has important points that have caused its reduction [11]. The old form regarding to the cultural and historical structure has attracted a lot of tourists. Diplomacy and programming for new and better construction as well as old form reconstruction protect historical and cultural heritage and paying attention to their suitability and fitness with environmental and cultural structure causes constant expansion of cities. Old sections of Yazd need a controlled movement for continuing the life [12]. Figure 3 shows one of the tourist programs in Yazd old form (Walking Tour).

#### 5. Architecture

One example of architecture elements in Yazd is Air trap. As its name shows it is an important part of the buildings in hot and dry or hot and humid areas, that causes wind blow and using pure energy in mild temperature in the houses to a comfortable degree[13]. The other examples are old houses in Yazd, which are in the direction of Kiblah. With this direction summer space and winter rooms are placed around the central yard. The central yard is the main space in Yazd houses. There is a pool in the middle of the yard with small gardens around it, full of trees needing a little water such as: pomegranate, grape, fig and pistachio. They provide a green space, shadow and cool weather [14]. Unfortunately, despite this con-

scious architecture, a new architecture is appearing that is inconsistent with the climate of area. There are line houses madding up of concretes, irons and bricks. Their yard with short walls from one hand unable to make a suitable shadow, protect the buildings against strong winds and sunlight and on the other hand, using thin walls, ceilings and using bitumen on the roofs that because of darkness cause increasing temperature in summer and decreasing temperature in winter and finally using heater with fossil fuels and cooling machines used in different seasons. It can be said that the new architecture with unsuitable structure causes the residents' discomfort and with unfit construction materials it makes instability [15]. Figure 4 shows an old house in Yazd with an Air trap.



**Fig 3.** Walking Tour



**Fig 4.** An old house in Yazd with an Air trap

## 6. Summer and result

Exploring the city forms and its platform for different aspects of economic, social, environmental highlighted that we need a holistic approach to assess. New development should take into account problems such as negative growth, lack of facilities, increasing ruin spaces, sport and medical needing. The old from should be cared because it contains monuments, historical and cultural works and it is important in attracting tourists. It can be suggested that local authorities consider: land preparation, arid land situation, reduction of destroyed forms and transferring unsuitable using with their unequal distribution all over the city and also the differences between requiring lands in various districts. Finally we suggest further research on relationship the city, climate conditions, and old from.

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