

Title:**Interdependency between Cultural landscape of Isfahan and
Zayandeh roud River****Authors:**

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Abstract

Isfahan`s history going back to ancient Aspadana. At one time Isfahan was among the largest cities in the world. The city started its great reputation since it was chosen as the capital of the great Safvid Empire. The life of Isfahan, situated in the middle of the Iranian Plateau, is completely tied to the Zayandeh roud River, as a main source of water. Certainly, one of the main factors for the growth of this city, comparing to its neighbor cities, is the existence of this river. Zayandeh roud river springs from the Zagros Mountains, goes to the east, traverses the city of Isfahan, and ends at the GavKhuni swamp. The significant role of Zayandeh roud River in directing the urban growth of Isfahan in the contemporary period strengthened its role as one of the two main axes of Isfahan`s urban structure.

Keywords:

Isfahan, Aspadana, Safvid Empire, Zayandeh roud River, Zagros Mountains

Introduction

Isfahan is located in central Iran, equidistant from the Persian Gulf and the Caspian Sea. It sits on both the east-west and north-south trade routes which traverse the country. Written *Isfahan*'s history going back to ancient *Aspandana*. At one time *Isfahan* was among the largest cities in the world. It has twice been the capital city of Persia, during the Parthian Empire and again in the sixteenth century *Safavid* dynasty. In 1598, when *Shah Abbas* (King of *Safavid* dynasty), decided to move the capital of his Persian empire from the north-western city of *Qazvin* to the central city of *Isfahan*, he initiated what would become one of the greatest programmes in Persian history; the complete remaking of the city. By choosing the central city of *Isfahan*, fertilized by the *Zayandeh roud* ("The life-giving river"), lying as an oasis of intense cultivation in the midst of a vast area of arid landscape. he both distanced his capital from any future assaults by the Ottomans and the Uzbeks, and at the same time gained more control over the Persian Gulf, which had recently become an important trading route for the Dutch and British East India Companies [3],[2].



Fig.1. Location map of *Isfahan* Province in Iran

The city started its great reputation since it was chosen as the capital of the great *Safavid* Empire, Below are the four principal elements of the urban form which can be considered as the basic elements of the city form. That is, these together shape that part of the city which presents the city's identity. This is the part which leads the topography of the city over time while it preserves the main initial characters. Those are: Bazaar, *Maydan-e*

Naqsh-e Jahan (the main public square of the city), *Chahar Bagh* Promenade, and finally *Zayandeh roud* River. Accessibility to the water has been always one of the most crucial concerns of cities. Providing water recourses, as well as water for daily consumption and agriculture, have been of vital importance to the history of civilization. This importance is more tangible and undeniable in the hot arid zones, where the complete dependence of the people on water resources is undeniable. The life of *Isfahan*, situated in the middle of the Iranian Plateau, is completely tied to the *Zayandeh roud* River, as a main source of water. Certainly, one of the main factors for the growth of this city, comparing to its neighbor cities, is the existence of this river [4],[5],[3].

Zayandeh roud River, an important natural element in forming city

The *Zayandeh roud* basin covers 41,500 km² in the centre of Iran. The river rises in the bleak and craggy *Zagros* mountains, which reach over 4500 m, traverses the foothills in a narrow and steep valley, and then bursts forth onto the plains at an altitude of some 1800 m. However, the splendour of the river is short lived: reduced towards the east by natural seepage losses, evaporation and more recent extractions for irrigation, and urban and domestic uses, the river eventually dies out in the *Gavkhuni* lake, a vast expanse of white salt that forms the bottom end of the basin, lying at an altitude of over 1200 m. In this naturally confined basin, the flows reaching the lake are now much reduced compared with natural conditions, and there are extended periods when no water flows in the tail reach of the river. The total length of the river is some 350 km, but it is the central 150 km of the flood plain to the east and west of *Isfahan* that provides the basis for intensive agriculture and large settlements. Along this strip soils are deep and fertile, predominately silts and clay loams, and slopes are gentle, ideal for the irrigated agriculture built up over many centuries. The river indeed forms an oasis in the desert [8],[9]. Situated at an elevation of almost 2300 m, precipitation averages 1500 mm, much of it in the form of snow, and snow remains on the ground throughout winter, only melting when temperatures warm up from April onwards [7],[8].

In contrast, the city of *Isfahan* only receives 130 mm of rainfall each year, on average. The primary source of water in the basin is, thus, the upper catchment of the *Zayandeh roud*. Lateral tributaries joining the river in the plains are mostly non-perennial, have little regional importance and do not reach into the main part of the basin, except during winter months and rare flash floods, although subsurface runoff accrues to the main stream. Runoff generated in the upper basin is strategically stored in the *Chadegan* reservoir, constructed just above the point where the *Zayandeh roud* enters the flatter parts of the basin (Fig. 2).

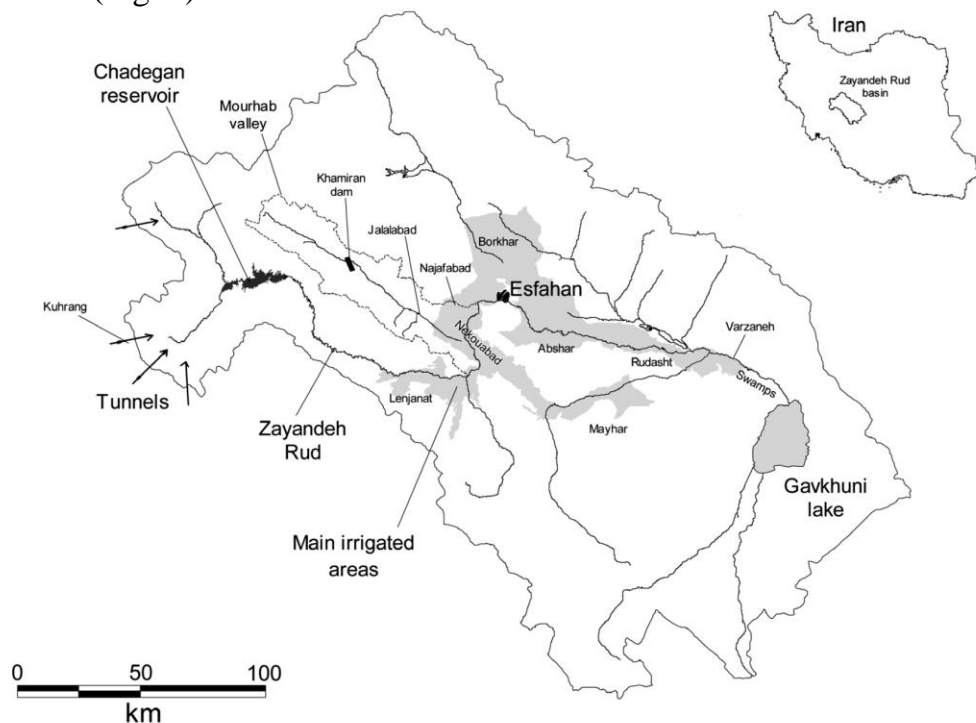


Fig.2. The Zayandeh Rud basin.

From September until February, inflows only average between 50 and 75 Mm³ per month (20–30 m³/s), reflecting both the dry conditions of summer and then the cold conditions dominated by accumulation of snow in the upper parts of the basin. From March onwards snowmelt increases and discharges normally peak in April or May, with average flows of 125–150 m³/s. In June and July, the discharge slowly declines to the low-flow conditions. The peak flows from April to June provided the basis for widespread downstream irrigation using simple diversion structures. *Zayandeh roud* river springs from the *Zagros* Mountains, goes to the east, traverses the city of *Isfahan*, and

ends at the *GavKhuni* swamp. The significant point is the way that the water of this river is directed to the locations where it is needed. Several water channels in *Isfahan* traverse the city in different directions, bringing water to all the districts of the city [5],[8].

Each of these channels, which are called *Madi* in *Isfahan*, branches off from the main stream of the *Zayandeh roud* in its way before reaching to the city, and it will again join the river after traversing the city. There are many accounts of who and how has established these channels. Whatever it may be, the influence of these channels on the patterns of human settlement in the city should be taken into consideration. In the hot, arid zones of Iran, water always has been one of the cores of the urban structure. Not only does it affect the city location as a whole, but also exerts influence on the way different residential zones take shape and create interconnections within the city. Comparing the city with an organic entity, or even with a human body, the residential system in addition to the channel system can be recognized as veins and nerves systems. In the same way, Ardalan & Bakhtiar (1979) discuss: “Analogous to a leaf blade, the residential quarter is served by a disposition of ‘veins’ that sustain its tissue which, in return, regenerates the whole body”.

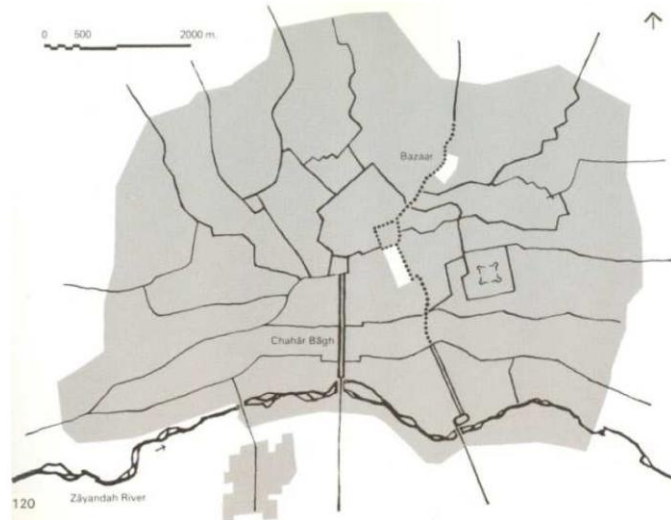


Fig.4. Schematic map of Isfahan’s water channel (Madi) system, The river is supplemented with all those water channels, which have had great influence on the physical extension and transformation of the city during the course of its long history (Adopted from: Ardalan & Bakhtiar, 1979).

The role of river in developing city

The river acts as an effective axis on the growth of Isfahan. As mentioned before, Isfahan extended its limits towards the north bank of the *Zayandeh roud* River as well as the other side of the river. The significant axis of *Chahar Bagh*, built in the *Safavid* era, intersected with the river, over the marvelous *Si-o-Se Pol* Bridge. In fact, the intersection of these two axes of expansion creates “a *chahar bagh* on the macro level of the city, dividing it into quadrants and in effect transporting the garden’s paradisiacal associations onto *Isfahan*, the city of paradise” [2]. This “combined historic-natural axis” is the main structure that has led the urban growth of *Isfahan* during its past four centuries [6]. Several historic bridges belong to different periods of history as well as several new ones cross this river inside the city zone.



Fig.5. Pole Khajoo bridge constructed in Safavid dynasty, over the river basin

“The historic site (result of two historic and natural axes in perpendicular shape) is the only remaining work of an integrated planning and design scheme in the country's history that, in spite of mentioned negligence during the past three centuries, still possesses the potential of self-demonstration in the contemporary city. During some eras, the south side of the river was the place for the royal gardens and palaces. There were also some colonies of religious and ethnic minorities. With the growth of Isfahan during the Safavid era to the early 18th century, the *Zayandeh roud* River became an integrated part inside Isfahan (Chardin, 1735).



Fig.6. Remnant of royal gardens around the *Chahar Bagh* axis

However, it was not yet functioning as an important urban element in the urban fabric of Isfahan. By the further developments of the city and during its contemporary urban renewals, the city borders reached and transcended the south side of the river, and put the *Zayandeh rood* River's bed in the central axis of the city. The significant role of *Zayandeh rood* River in directing the urban growth of Isfahan in the contemporary period strengthened its role as one of the two main axes of Isfahan's urban structure.

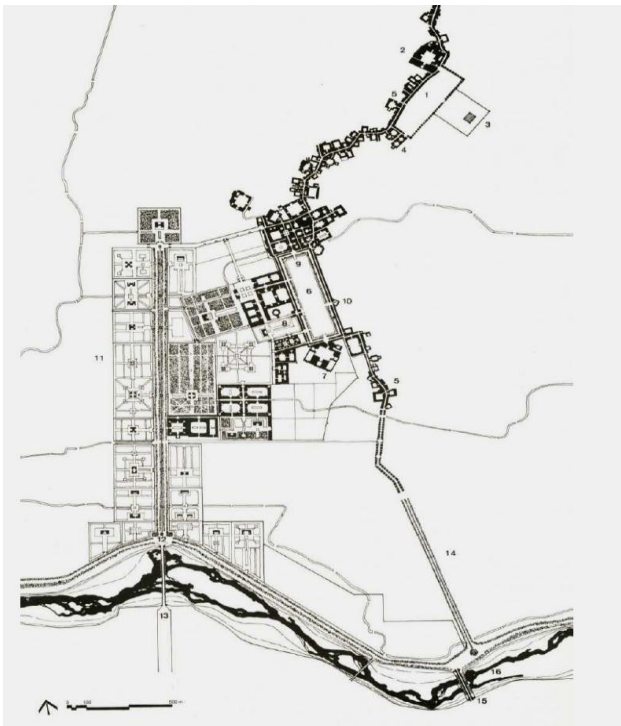


Fig.7. The central design structure of Isfahan's urban fabric; axes of Bazaar, Chahar Bagh and the Zayande-Rud River (Adopted from : Ardalan & Bakhtiar, 1979).

Conclusion

Before the contemporary physical growth of Isfahan, the *Zayandeh roud* River was considered as the natural southern border of Isfahan. The access to the south of this river was provided with several bridges over it, which was constructed in different periods. However, the river and its bridges had been never a crucial element in the socio-spatial relations of the urban fabric of Isfahan, since the river was not located inside the city. However, the significant role of the *Zayandeh roud* River and its water in the emergence and evolution of Isfahan during the course of its life should not be overlooked. *Zayandeh roud* River has used as a sustainable water resource at the present and past. Important role of river in the *Safavids* dynasty was:

- 1- The river had run through the middle of the city, and it along with the *Chahar Bagh* axis had divided the city to four sections.
- 2- *Zayandeh roud* River was utilized throughout the city and had formed *Isfahan* according to a model of a garden city.
- 3- *Safavids* Designers had caused sustainability in the green urban spaces by the intelligent use of the *Zayandeh roud* water all over the city.
- 4- Commercial activities that had depended on water had spread all over the city.
- 5- Celebrations were conducted on the *Zayandeh roud* riverbank.

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