Impact of Zayandeh Rud Drought on Social Interactions and Populated Spaces in Isfahan City

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Introduction: There is a special competition among many metropolitans for improving physical and semantic quality of urban landscape to upgrade their positions in global level and attract more tourists. Based on such characteristics, one of the important goals of metropolitan management planners of the society is to develop open populated spaces and make leisure centers. Urban spaces development in the present era without sufficient knowledge of urban rivers characteristics and taking advantage of their potentials has had many problems for the cities. Zayandeh Rud is one of the largest rivers in Iran. It is flowing on the center of the country and from west to east. Many tourists visit Zayandeh Rud each year, because several historic bridges are remained from Safavid Majesty and before over this river and it is also located in historical city of Isfahan. But it is a few years that this large river has been exposed to drought; this issue, in addition to the effects on the rate of tourism of the city, encounters the farmers of this area with irrigation problems. Zayandeh Rud River as one of the largest rivers of central plateau of Iran is located in Gavkhooni area. Zayandeh Rud originates from Zard Kooch Bakhtiari, Haft Tanan in the area of Shourab Tang-e-Gazi in Chaharmahal Bakhtiari Province. After absorbing running waters in some parts of Faridan and Fereydoon Shahr it flows towards Isfahan city. The length of this river is 405 km and the average slope of the channel bed 15 percent. Eventually, this river terminates in Gavkhooni Swamp, about 120 km in southeast of Isfahan. Average annual rainfall along the river is 450 mm and the extent of catchment area is about 27,100 km2. Isfahan city's share of the river water that used to be distributed in the city through 9 major streams and their sub-branches is so high that in the recent eras it converted this city as a garden city (existence of 158 gardens and farms) and its passages as garden alleys. The main reason of Zayandeh Rud nomination to this name is that it revives and reclaims many villages, gardens, and farms. From ancient times, this river has been named as Zayandeh Rud, Zendehrud, Zand Rud, Zarin Rud, Zarinehrud, Zarnrud, and Zandak Rud. On one side, this river as artery and vital vein itself has had an important role in residents' leisure. Beside other cultural and economic profits for Isfahan city, Zayandeh Rud River has made a public area to develop humans' social interactions with each other. In addition a place for entertainment and leisure, the river provided a special position for urban identity of Isfahan citizens. This river shapes influential in the main identity of Isfahan city. This can be felt due to different signs and symbols that are visible in culture of Isfahan city and each has a sign of Zayandeh Rud.

Materials and Methods: The present study in terms of time is a longitudinal research with a survey methodology. Questionnaire tool has been employed to gather information. The present study is considered longitudinal because it was done in two stages before and after drying of Zayandeh Rud River; Because of the lack of access to the respondents who can answer the questions before drought, in the second stage it was tried to select the respondents with the same age and gender characteristics as the first stage. In the present research two types of survey method have been used: documentation method of study by which conceptual and theoretical review have been conducted on this topic; this make it possible for the researcher to present conceptual and theoretical definitions for variables and use the previous methods and findings in the research. Statistical population of this study contains all citizens of Isfahan city that attended in this place for comfort and leisure or crossing of Zayandeh Rud. Sample volume of this study is 325 people that were selected in form of simple random sampling. In the present study a researcher made questionnaire tool was used to gather information. Its validity was confirmed using structural validity and through confirmatory factor analysis (CFA) method. According to the results of this method, factorial loads of each of indicators on the related variables are in acceptable level. Cronbach's alpha test was used to assess reliability of the research tool. The rate of Cronbach's alpha is obtained 0.73 for social interactions variable and 0.81 for environmental quality variable which both of them indicate optimal reliability of the research tool.

Results and discussion: The role Zayandeh Rud has played in the creation of social interaction is different before and after drought. The respondents' evaluation of the quality of public spaces around the river affects the rate of their interactions. Average exercise and entertainment around Zayandeh Rud is 2.54
hours a week among men which is significantly more than women with 1.94 hours a week. Null hypothesis was rejected in the index of sport and entertainment and in terms of gender, and opposite hypothesis was confirmed. In age of respondents, there is no significant difference among average sport and entertainment around Zayandeh Rud and all age groups are almost similar in exercise and recreation in these spaces. Average friendly appointments in the spaces around Zayandeh Rud with 2.98 hours a week among men is significantly more than women with 2.55 hours a week. Also, average friendly appointments in the spaces around Zayandeh Rud before river water drought, with 2.98 hours a week, are significantly more than those after river water drought, with 2.57 hours a week. In terms of age of the respondents, there is no significant difference among average friendly appointments in the spaces around Zayandeh Rud and almost all age groups have similar friendly appointments in these spaces. Average talk with others in the spaces among men, with 3.32 hours a week, is significantly more than women, with 3.01 hours a week. In terms of age the respondents, average talk with others in the spaces around Zayandeh Rud shows no significant difference and almost all age groups talk with others similarly in these spaces. The results of structural equations modeling show that the respondents' evaluation on the quality (access quality, services, aesthetic elements and comfort and security) of the spaces around Zayandeh Rud River has positive and significant effect on the rate of their interactions. Also, comparison testing of the averages shows that the role of these spaces in social interactions of men is more than women, but no significant difference was observed in terms of age. Moreover, the results of this study show that Zayandeh Rud River drought has significantly reduced the rate of social interactions among citizens that visit this place.

Conclusions: It was always thought that natural ecosystem in various forms can be involved in improving life of people. One of the most important aspects of natural ecosystem is its social functions. Natural ecosystem is effective on social elements in three aspects. The first aspect is that it can create an environment for human recreation and leisure. The second aspect is that being in natural environments makes humans familiar with cultural and social values. The third is that people become familiar with the nature and learn more about it. Natural environments such as the park around Zayandeh Rud have this capability that provides places for human regular and ongoing activities. Recreation can improve the possibility of social interactions as the important aspect of social health. Providing a public space that is aesthetically attractive, natural environments are able to attract people and increase human interactions and random communications with one another. Random face to face communications provide an opportunity for social interactions and familiarity and thus connecting with each other. Social ties also provide for the people with social health. The results of this study show that social interactions of citizens around Zayandeh Rud River have also been significantly reduced by river water drought Thus, it is obvious that the viability and survival of an environmental element such as Zayandeh Rud can play an important role on the continuity and dynamism of social life. Another important achievement of the present research is that addition to water flow in Zayandeh Rud River channel, evaluation of the citizens about the environment quality around this river such as easy and rapid access, services for citizens like appropriate spaces for sitting and shopping, and visual and welfare elements can also play a significant role in social interactions of citizens near the river. Effective attempts can be made to increase a set of scientific capacities to solve the problems arising from the river drought. It can be recommended to consider environmental demands of researchers, citizens, and managers at national and provincial levels, and increasing public awareness in Isfahan and the entire country of Zayandeh Rud drought and the possible hazards, planning for citizen participation and social cohesion in restoration of Zayandeh Rud flow, and taking advantage of new research findings and successful executive experiences. Generally, due to the findings of this study, it can be said that expanding, maintaining, and enhancing public spaces can provide for the public with social interactions such as visiting, talking, doing group and common activities, exercise and playing games; and promote the social vitality.

Keywords: Drought, Isfahan, social interaction, urban rivers, Zayandeh Rud