

# Sustainable River-Oriented Public Places and the Constructs Affecting them; Case Studies: Balekhlou, Zayandeh-Rood, Karun, and Zarjub Urban Rivers\*

Seyyed Mojtaba Safdarnejad<sup>a</sup>- Seyyed Abdolhadi Daneshpour<sup>b\*\*</sup> - Mostafa Behzadfar<sup>c</sup>

<sup>a</sup> Ph.D in Urban Planning, Department of Urban Planning, Faculty of Architecture and Urban Planning, Iran University of Science and Technology, Tehran, Iran.

<sup>b</sup> Associate Professor of Urban Planning, Faculty of Architecture and Urban Planning, Iran University of Science and Technology, Tehran, Iran (Corresponding Author).

<sup>c</sup> Professor of Urban Planning, Faculty of Architecture and Urban Planning, Iran University of Science and Technology, Tehran, Iran.

Received 06 September 2019; Revised 22 September 2019; Accepted 25 September 2019; Available Online 20 March 2022

## ABSTRACT

In Iran, most rivers experience unsustainability and challenge the river-oriented urban spaces. The present study aims to provide the ground for promoting these urban spaces to become sustainable public places. To this end, it attempts to explain what the "sustainable river-oriented public place" is, its macro qualities, what constructs affect it, and its conceptual model and to compare urban rivers in Iran according to the model. The present study is applied development research carried out using both qualitative and quantitative approaches. In this study, the concepts and the theoretical model are extracted using library studies. Next, field and case studies are applied to qualitatively evaluate the river-oriented public places in Ardabil, Isfahan, Ahvaz, and Rasht. In addition to field studies, observation and semi-structured interviews with people and a closed questionnaire are used to collect the required data to describe and analyze the status quo of the case studies as well as to compare them. The results are validated using the Kolmogorov-Smirnov test and one-sample T-test. The results indicate that constructs such as the river, humans, rules, resources, actors, society, city, etc., affect the implementation, survival, and development of sustainable river-oriented public places throughout their life cycles. These constructs, in turn, meet the expected qualities of such places. Macro-criteria include resilience, sustainability, anthropocentrism, and individuality, each with some micro-criteria. Comparing case studies shows that despite the citizens' sense of belonging to the river, they have more or less common weaknesses in the areas of sustainability, security and safety, facilities, resilience, etc. Accordingly, some recommendations are presented for addressing the major weaknesses of these public spaces. The contribution of the present study is the presentation of a list of factors affecting the implementation of the sustainable river-oriented public place plan and design.

**Keywords:** River, Sustainable Public Place, River-Centeredness, Place Check, Place-Making, Place Management, Place Development.

\* This article is taken from the doctoral dissertation of first author, entitled "Regeneration (revitalization) of urban rivers as sustainable public places" which has been prepared and compiled with a focus on urban design, in the Faculty of Architecture and Urban Planning, Iran University of Science and Technology, under the guidance of second author and the advice of third author.

\*\* E\_mail: Daneshpour@iust.ac.ir

## 1. INTRODUCTION

In the waterfronts of cities, due to the new function of waterfronts, a different pattern of water-city integration is formed (Al-Shams et al., 2013, 77-78). Urban waterfronts allow potential spaces to become great water body-centered public spaces (Andini, 2011, 49). Focusing on creating places for people (Carmona et al., 2009, p.5) or "sustainable places" (Golkar, 2005, p.2), urban design plays a significant role in retransforming the rivers and waterfronts into places suitable for urban life (Seyedabadi and Sardereh, 2013, p. 1), in line with the concept of continuity and reaching living and sustainable rivers (Seyedabadi and Sardereh, 2013, p. 8) if ecological protection is observed.

Not all river-oriented urban spaces are effective. However, transforming all of them into effective places through the human-led activity of place-making (MacKenzie, 2015), is the mission of urban planning (Mahmoudinejad et al., 2008, p. 282). Place-making seeks to promote the role of "sustainable public places" with a special identity, in accordance with human needs to encompass the social activities of local communities (Bonakdar and Qaraei, 2011, p. 51) to make it possible for human and social values to emerge in meaningful places (Mahmoudinejad et al., 2008, p. 282). Sustainable places, due to their natural or man-made properties, can develop and enhance the physical, functional, cultural, and institutional conditions necessary to create vital forces in human life (Phillips, 2014, p. 70).

The most important concern of the present study is the poor quality and unsustainability of river-oriented urban spaces and public places, which have led to the weakened link between the river, residents, city, and nature, loss of the efficiency of the river, as a collective space and transformation of it into a watercourse and a garbage dump. Its other concerns are including the presence of a unidimensional view towards the river (i.e. considering just a particular aspect of the river) and inattention to it as a sustainable public space, lack of urban design knowledge about river-oriented sustainable public space, constructs, and macro-criteria and the place check technique applied for it. The urban space of rivers can be transformed into sustainable public places and provide the ground for a relationship between the human, nature, society, and the city and thereby influencing the identity of the place, the sense of belonging to the river, the experience of contact with nature, and environmental protection.

What makes the present study important is the fact that along the rivers in many cities, there are urban spaces that are not successful due to their environmental problems, social desirability, lack of economic profits, etc.

The present study aimed to develop a "sustainable river-oriented public place model". To this end, it has

examined different place models in the "literature review" section and expanded them to complete them and their constructs to develop an innovative model considering the river restoration process. The model can also be used to plan, design, and evaluate other public places. In addition, the present study has turned the place check technique into diagrams measuring the quality of the place, which act as a tool to identify the weaknesses of the river-oriented public place.

## 2. RESEARCH BACKGROUND

Reviewing related research (Table 1) shows that the "river" as a "sustainable public place" has been considered only in the research by Ketabollahi et al. (2017). Unlike the present research, which seeks a conceptual model, and a theoretical place check framework, they have followed a "component-quality-measure" approach and have analyzed the case study using the SWOT analysis to provide some strategies. Other national and international studies have often applied a different approach from the present study and mainly focused on the sustainable urban design of the areas around the rivers.

**Table 1. Review of Research Background**

	Authors	Methodology	Results
National research	Eliasi (2013)	-	Aesthetic, psychological, ecological, functional and socio-economic components of urban river design\ The development of the riverside aims to establish a connection between the riverside and the surrounding area, recognize the identity of the area, and provide a public access to the riverside\ Introduction of specific operational strategies and methods for improving the quality of the urban environment
	Sashapour and Eliasi (2016)	Case study	Provision of guidelines for improving the quality of space.\ Providing macro and micro design criteria in the environmental, physical, economic, social, and cultural areas.
	Ketabollahi et al. (2017)	Case study, SWOT, and hierarchy strategy approach	Among the factors of quality of environmental sustainability, the functional factor has been determined as the first priority; and provision of sustainable place-making strategies.
International research	Mabel et al. (2013)	Case study	Environmental connections, promotion of mixed uses, heritage preservation and promotion of adaptable reuse, application of principles of green urbanism, expansion and maintenance of technological connection with urban networks and renewable energy.
	Şimşek İlhan and Özdemir (2014).	Case study	The coastal public space should create “a sense of local identity” by revealing the natural./ ecological and cultural features in planning and designing phases.

### 3. METHOD

**Objectives and Questions:** The present research seeks to achieve the research goals of explaining what is the "sustainable river-oriented public place", and examining the status quo of rivers according to the framework of the aforementioned model and the objectives of identifying its constructs, developing a conceptual model, and introducing the macro criteria of desirability. The main questions are: "What is a river-oriented sustainable public space?" "How is the status of the case studies according to the model?" and the secondary questions are: "What are the constructs of a river-oriented sustainable public space?" "What are their macro quality criteria?"

**Type of research in terms of goal:** The present study is developmental research and seeks to expand the concept of "sustainable public space", macro criteria and constructs affecting it, and on the other hand, it is applied research and seeks to assess the status of rivers (place check) in this framework and identify their strengths and weaknesses to provide general strategies for planning and designing new places as well as evaluating existing places.

**Type of research in terms of methodology:** The present study is based on the pragmatism paradigm and uses a qualitative approach to extract the definition and properties, constructs, and macro criteria of a sustainable river-oriented public place. Moreover, to evaluate macro quality criteria from the perspective of the audiences, it turns them into quantitative data

based on a Likert scale and applies a quantitative approach (descriptive and inferential statistics) to analyze the data. In the present study, several case studies are examined.

**Data collection:** First, definitions, constructs, and main criteria of the sustainable public space are extracted, summarized, and classified by library studies and literature review using indexing tools. Accordingly, it is identified those items required to evaluate the quality of river-oriented public places in the case studies. In addition, through field studies, the data required to examine case studies are collected using semi-structured interviews and semi-closed questionnaires.

**Selection of case studies:** Due to the multiplicity of rivers in Iran, the cities of Ardabil, Isfahan, Ahvaz, and Rasht (Figures 1 to 4), have been selected considering the research aspiration of using the river as a sustainable public place. The reasons for the selection of them are the prominent social role of the river in them, being famous in the relationship between the people, the city, and the river, being in different climates, having the tourist function, and having different contextual conditions.

Fig. 1. Ardabil; Baleklou River; Cold climate (Image: Baleklou River)

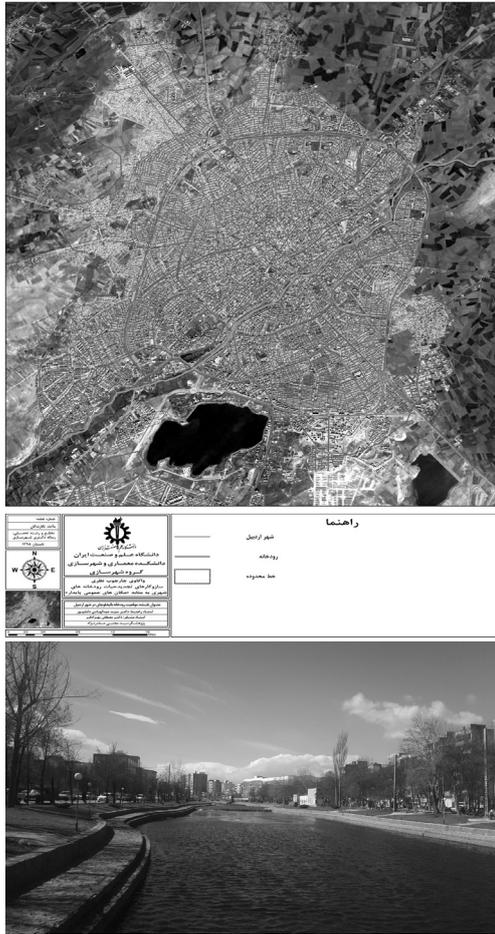


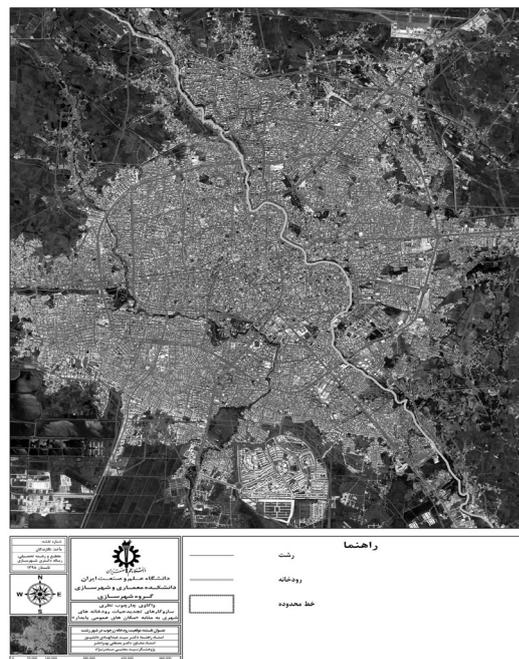
Fig. 2. Isfahan; Zayandeh-Rood River; Hot Desert Climate (Image: Maman Bridge)



Fig. 3. Ahvaz; Karun River; Hot-Humid Climate (Image: White Bridge)



Fig. 4. Rasht; Zarjub River; Temperate and Humid Climate (Image: Zarjub River)





Statistical population/statistical sample: The population included the inhabitants of the selected cities. According to the choice of the qualitative method of interview, the saturation of the respondents' answers is considered as the adequacy of the statistical sample size. 51 people in Isfahan, 47 people in Ardabil, 42 people in Ahvaz, and 56 people in Rasht (a total of 196 people) were interviewed after being selected by a non-random sampling technique. All interviewed people were in urban areas adjacent to the river in the mentioned cities.

Data Analysis: Using a place check technique, this research has attempted to initially evaluate rivers as sustainable public places to recognize their weaknesses and strengths to find strategies to transform the river-oriented urban space into a sustainable public place. In data analysis, both quantitative and qualitative

methods were used. In the qualitative method, the collected data from the literature review, field study, observation, and interview were summarized, classified, and compared using qualitative analysis methods and the necessary results were extracted and presented. In the quantitative method, qualitative data were first quantified. The results of field studies were analyzed in two sections of descriptive and inferential statistics, using SPSS software, and the final score of each criterion was calculated based on the Likert scale. Finally, the average score obtained according to the respondents' opinions shows the status of each river. Due to the equal importance of criteria and indicators for researchers, the average of them indicates the status of the river in each indicator and the average scores of the indicators indicate the final status of the case studies in quality.

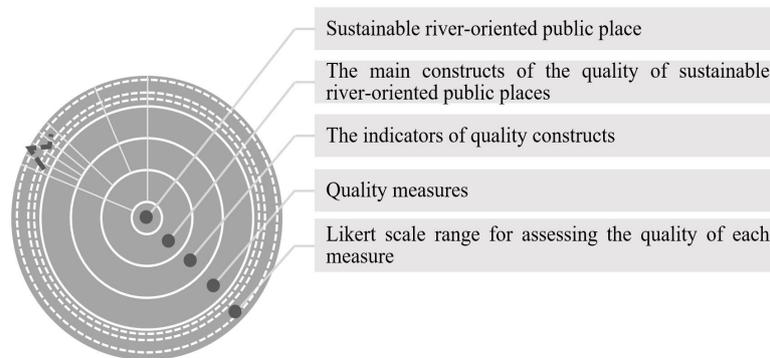


Fig. 5. Advanced Place Check Model

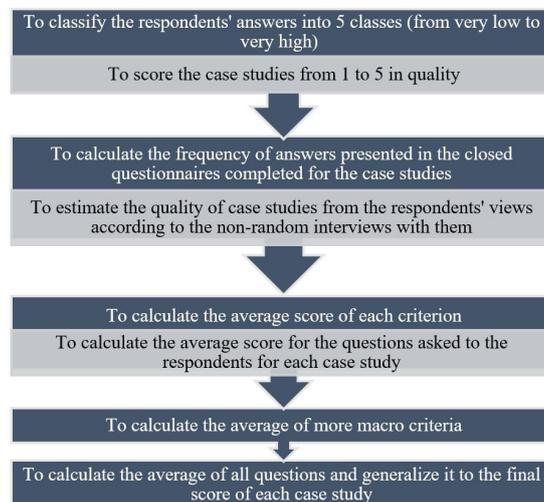


Fig. 6. The Frequency-to-Score Conversion Process in each Case Study

Validation of the results: the pragmatism paradigm-based research is validated by guaranteeing the comments and assessing the correctness of the research process (Mohammadpour, 2011, p. 76). In this study, the internal consistency (validity) and accuracy of the theoretical model have been examined by reviewing the literature. The external consistency or reliability of the research, regarding the qualities of the river-oriented public place, has been examined by case

studies and comparison of the four selected samples considering the concepts obtained from the literature. In addition, the reliability of the results is examined by inferential statistics and it was concluded that it has the necessary validity. To check the validity of the results, the Kolmogorov–Smirnov test and the one-sample T-test were used. Figure 7 shows the research process.

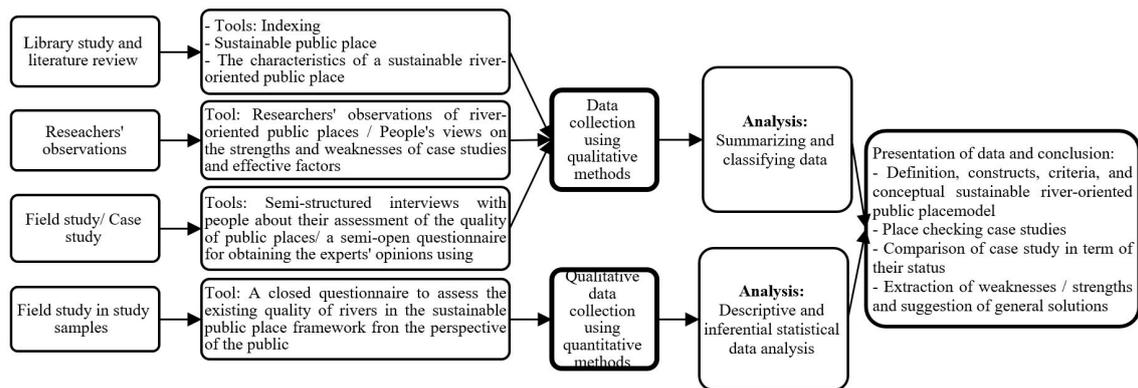


Fig. 7. Research Process

#### 4. DISCUSSION, ANALYSIS, AND FINDINGS

The following are the theoretical findings.

##### 4.1. Definition of a Sustainable River-Oriented Public Place and Its Characteristics

Sustainable river-oriented public places, as part of special open and public urban spaces (Pakzad, 2005, p. D), are considered the basis for the formation (Afshar Naderi, 1999) of special places (Mrđenočić, 2011, p. 305) with a special identity and a distinctive (Bonakdar and Gharai, 2011, p. 51) social (Bonakdar and Gharai, 2011, p. 57; MacKenzie, 2015) character. They are river-oriented places formed in the public arena of the rivers and the inhabitants of river cities spend an important part of their social lives in them. Such places have the following features:

Water quality and environment protection (Bruttomesso, 2006), water quality management, and river flood control, in other words, river bed regulation and river basin reclamation (Şimşek hanlhan & demzdemir, 2014, pp. 2-3) are their prerequisites; They are coherent and continuous in their external relations with the environment, society, the city and its systems, as well as in their internal whole; They are accepted as an integral part of the existing urban fabric (Bruttomesso, 2006); They are adapted to the urban fabric and social life (şimşek hanlhan & demzdemir, 2014, pp. 2-3); They are in harmony with the indigenous and local social and physical

contexts (Ghavampour, 2013, p. 11); All ruined areas overlooking them have been environmentally reconstructed (Hussein, 2014, p. 489) and revitalized in economic, ecological, and social forms; Water-based activities and facilities are a priority in them (şimşek hanlhan & demzdemir, 2014, pp. 2-3); They meet the current needs of citizens (Ghavampour, 2013, p. 11) and are in accordance with their demands (Bonakdar and Gharai, 2011, p. 51); They are adaptable and flexible according to the nature of their variable components (Ghavampour, 2013, p. 11) and can adapt to the citizens' future needs; All people, with any backgrounds, can live, work, play, observe, and learn in them (Urban Design Associate, 2005, p. 41); They have non-physical dimensions (cultural and social) interacting with physical dimensions (morphological, functional, and ecological) (Magdi, 2014, p. 8). For their communities, they have a value, meaning, and history that have been formed in them over time (MacKenzie, 2015); They are planned, designed, managed, maintained, operated, and developed based on the principles of sustainability; Cultural values are preserved in them, they have social cohesion, and are successful in economic competition (Mrđenočić, 2011, p. 305); They meet economic, social, and environmental needs of the local community and evaluated and developed by them (Carmona, 2015, p. 5). In addition, they are the result of the following processes: re-appreciation of perceptions, meanings, and values attached to the place, processes of sense-making, and how actors

take the lead in appreciating places; re-grounding of ecological and cultural place-based assets and resources, influenced by wider communities, cultural notions, values, assets, technology, and historical patterns; and finally, re-positioning of alternative, diverse or hidden economies and ways of value-adding, altering political-economic relations in the space/time continuum (Horlings, 2016, pp. 33-34).

#### 4.2. Quality Criteria for Sustainable River-Oriented Public Places

To extract the primary criteria for such places, as listed in Table 2, the relevant literature is reviewed, precised, and classified and the process of hierarchically transforming the river from the city's natural organ into a sustainable river-oriented public place (Figure 4) is drawn.

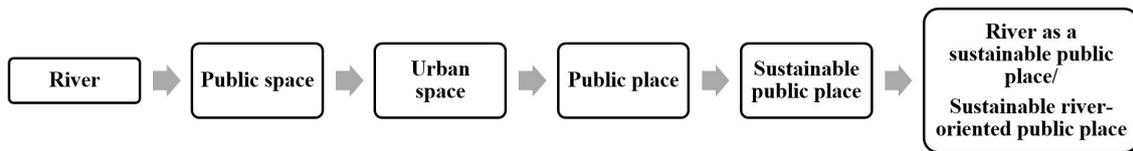


Fig. 8. The Process of Transforming a River From a Public Space to a Sustainable River-Oriented Public Place

Table 2. Criteria and Macro and Micro Characteristics of Sustainable River-Oriented Public Place

Characteristics	Micro and Macro Criteria
Urban River Space	Being open Being public Social interactions (Pakzad, 2005, p.2)
Sustainable river-oriented public place	Motivating people Meeting expectations (Bonakdar and Gharai, 2011, p. 51)
	Anthropocentrism Meeting physiological and biological, safety and security, esteem and respect, belonging, aesthetic, and knowledge needs (Ghavampour, 2013, p. 11)
	Sustainability Social sustainability: Being inclusive (Urban Design Associate, 2005, p. 41) Economic sustainability: Having an active and competitive role in the city economy (Mrđenović, 2011, p. 305) Environmental sustainability: Livability and ecological health of the river/Being aligned with nature (Bruttomesso, 2006; Şimşek İlhan & Özdemir, 2014, pp. 2-3)
	Character Distinction: Being water-oriented, healthy and quality river, and river activities (Mrđenović, 2011, p. 305; Bonakdar & Gharai, 2011, p. 51) Contextualism (Şimşek İlhan & Özdemir, 2014, pp 2-3) Identity (Bonakdar & Gharai, 2011, p. 51) Popularity and social acceptance (MacKenzie, 2015)
Resilience	Being able to return to the civic life/ flexibility and adaptability (Ghavampour, 2013, p. 11)



National Models

Model	Year	Author
-	1999	Afshar Naderi
-	2000	Madani Pour
-	2006	Pourmand
A Management Model For Creation Of Places	2006	Zekavat and Dehghan
-	2009	Charkhechian and Daneshpour
-	2012	Ahmadi
Tradition-based place	2013	Nourian
Sustainable place	2014	Golkar
Place (minimum constructs)	2017	Behzadfar
Place (maximum constructs)	2017	Behzadfar

Concepts	Value/ meaning	Meaning	Meaning	Meaning	Meaning	Meaning	Imaginations	Mind	Perception
-	-	-	Performance	Activity	-	Performance	Performance	Function	Function
Physical characteristics	-	-	Body	Body	-	Body	Body	Shape	Shape
-	Part of space	Space	-	-	Space	-	-	Space	Space
-	-	-	-	-	-	-	-	-	Time
-	-	-	-	-	-	-	-	-	Landscape
-	-	-	Social	Social	-	-	-	-	Community
-	-	-	Management	-	-	-	-	-	Management
-	-	-	-	-	-	Ecosystem	Ecosystem	-	Nature
-	-	-	-	-	-	-	-	-	-
Human behavior	-	-	-	-	-	-	-	-	-
-	Identifying factors	Special character	-	-	Character	-	-	-	-

From the definitions of place / sustainable place, urban design qualities models, interviews with people in case studies, semi-open questionnaires completed by

urban design experts, as well as authors' experiences, the constructs of the sustainable river-oriented public place were derived, as listed in Table (4).

**Table 4. Deviation of the Effective Constructs in the Formation of the Sustainable River-Oriented Public Place**

Main Construct	Sub-Construct
Human and his Presence in the Place to Experience it (Kalali & Modiri, 2012, p.44)	Individual and collective attitudes and beliefs (cultural, environmental, etc.)/the present and future needs of human beings/behaviors and activities/norms and values/ different human roles (user, decision-maker, expert, manager, etc.)/motivation to attend a river-oriented public place/expectations of people from a river-oriented public place/lived experiences and mental patterns
River and its Components	Water, flora and fauna, bed, bodies, etc.
Urban Space (three-dimensional structure of place)	The bed as the floor, the sky as the roof, and the sides as the body/Established elements such as vegetation and urban furniture
Diverse and Variable River Landscape	-
Internal Constructs	Body, form (shape)/ Functions, activities, and events/ Imaginations, perceptions, meanings, and values
Inside and Outside	Boundaries and limits of different areas/External and internal exchangers and internal joints
Network	Destinations and internal and external nodes/ Movement, flow and internal, inside-outside, and outside-inside displacements/Links between destinations and nodes
Time and Date	As a continuum in the life cycle of a sustainable river-oriented public place
Relationships and Links	The balanced and mutual relationship between man, city, and river
Context	Scales: local and global/Topics: culture, geography, history, economy, society, technology, law and politics, nature
Resources	Financial resources/ Human resources/ The earth/ Knowledge and experiences network/ Inter-sectoral cooperation network/ Information
Effective Rules and Regulations	-
Referral Cycle: from motivation to return from place	-
Life Cycle and its Processes	"Laying the groundwork" in the field of river-related sciences/ Sustainable "place-making" includes planning, design, and execution/ "Place management" includes management, operation, maintenance, and monitoring/ "Place development" for the maintenance and enhancement of desirability throughout the life cycle
Effective Actors	Government, public institutions, non-governmental organizations, facilitators, developers, the public
External Superstructures: The sustainability of these sites occurs when new arrangements are made between the river, environment, community, and the city so that the river has the necessary connection with the environment, plays an active economic role and communicates with society.	The river communicates its open ecosystem (origin to source), the hydrosphere, other systems of nature, and the environment/ The river communicates with the local community and the inhabitants of other river-related settlements/ The relationship of the river with the settlement is of great importance as a political-economic system and economic competition with other economic sectors

#### 4.4. The Conceptual «Sustainable River-Oriented Public Place» Model

According to the abovementioned, the conceptual research model is presented in Figure 9.

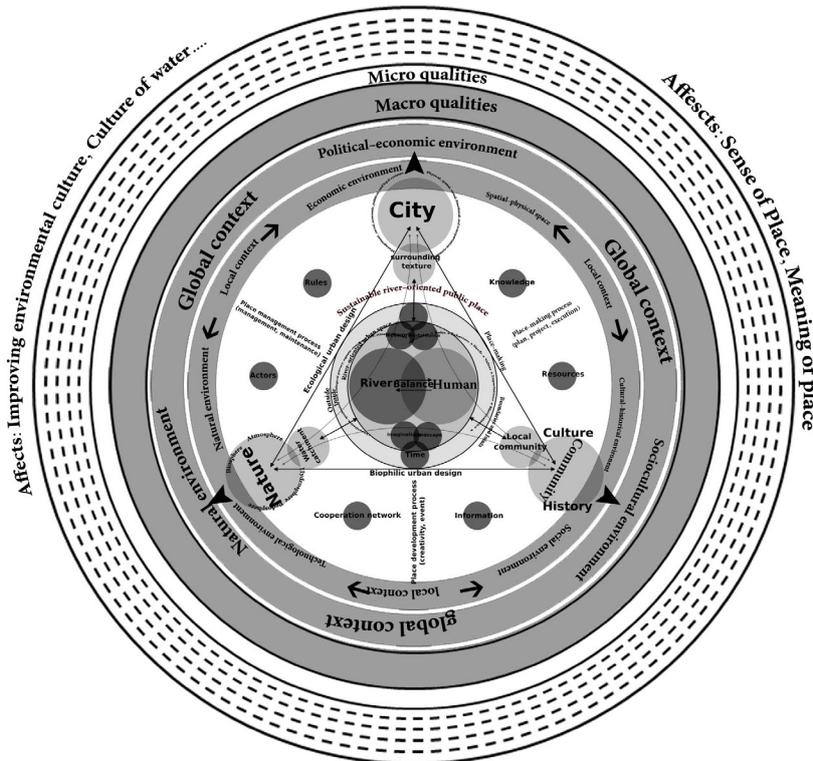


Fig. 9. The Conceptual «Sustainable River-Oriented Public Place» Model: Combination of Constructs, Processes, and Relations

#### 4.5. Findings: Comparative Study of Case Studies and the Quality Assessment of Sustainable Public Places in Them

The following are the findings on the comparative study of case studies and the quality assessment of sustainable public places in them.

##### 4.5.1. Comparison of the Case Studies in the Quality of the Sustainable River-Oriented Public Places in Them According to the Respondents' Assessment of Them

Through semi-structured interviews with people present in the case studies, in Ahvaz and Rasht, respondents rated the overall quality of the spaces around the river in their cities as moderate to low, while in Ardabil, it was rated as moderate, and in Isfahan, it was rated as moderate to high (Table 5 and Figures 10 and 11). Since in the Kolmogorov–Smirnov test related to this question, the significance level was estimated to be less than 0.05 (sig. <0.05), the test was detected to be non-parametric. So, each city was tested separately and the one-sample t-test was used to generalize the results to the population. Considering that in the one-sample t-test, the significance level

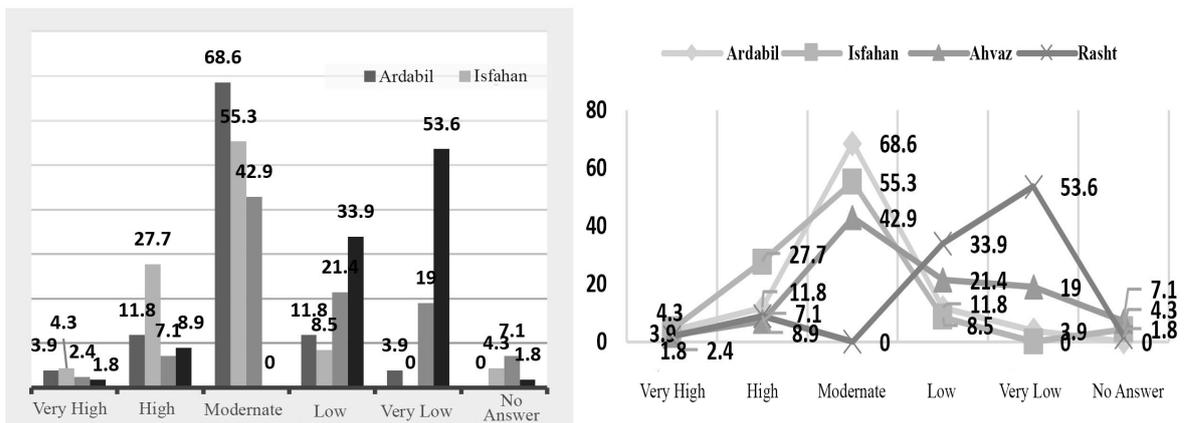
was estimated to be less than 0.05 for Rasht, Isfahan, and Ahvaz, and greater than 0.05 for Ardabil, the null hypothesis is confirmed for Ahvaz, Isfahan, and Rasht cities, and rejected for Ardabil.

**Table 5. The Respondents' Overall Quality Assessment of the River-Oriented Public Places in the Case Studies**

Macro-Quality	Score	Ardabil		Isfahan		Ahvaz		Rasht	
		N	Pct.	N	Pct.	N	Pct.	N	Pct.
Very high	5	2	3.9	2	4.3	1	2.4	1	1.8
High	4	3	11.8	13	27.7	3	7.1	5	8.9
Moderate	3	35	68.6	26	55.3	18	42.9	0	0
Low	2	6	11.8	4	8.5	9	21.4	19	33.9
Very low	1	2	3.9	0	0	8	19.0	30	53.6
No answer	0	0	0	2	4.3	3	7.1	1	1.8
Total		51	100.0	47	100.0	42	100.0	56	100.0
Average score		3.13		3.56		2.78		1.75	



**Fig. 10. Comparison of Case Studies in the Average Macro Quality Score**



**Fig. 11. Comparison of Case Studies (Ardabil, Isfahan, Ahvaz, and Rasht) in Quality According to the Respondents' Quality Assessment of River-Oriented Public Places (%)**

**Table 6. Frequency of Respondents' Opinions on Quality Assessment Criteria for River-Oriented Public Places in Case Studies**

Criteria	Ardabil					Isfahan					Ahvaz					Rasht													
	Frequency of Opinions					Frequency of Opinions					Frequency of Opinions					Frequency of Opinions													
	Very high (point 5)	High (point 4)	Moderate (point 3)	Low (point 2)	Very low (point 1)	No answer (point 0)	Average score	Very high (point 5)	High (point 4)	Moderate (point 3)	Low (point 2)	Very low (point 1)	No answer (point 0)	Average score	Very high (point 5)	High (point 4)	Moderate (point 3)	Low (point 2)	Very low (point 1)	No answer (point 0)	Average score								
Sustainability	Environmental: Being aligned with nature, Health of the river\ Social: Being inclusion, Sociability\ Economic: Participation in the economy	0	15	25	9	2	0	3.04	6	23	7	8	2	1	3.5	1	8	13	5	12	3	2.51	0	3	11	16	24	2	1.87
		1	2	14	9	20	1	2.86	1	6	32	9	3	0	2.02	1	2	14	12	12	1	2.21	0	0	5	15	35	1	1.45
		10	21	14	4	2	0	3.65	6	23	12	4	1	1	3.63	12	5	16	5	4	0	3.38	1	7	13	12	23	0	2.12
		2	16	17	13	3	0	3.02	4	8	17	10	5	3	2.91	6	10	13	7	4	2	3.17	4	7	6	12	27	0	2.09
		5	8	14	16	8	0	2.73	5	8	11	16	6	1	2.78	8	10	11	3	9	1	3.12	1	5	2	11	37	0	1.61
Anthropocentrism	Motivating\ Meeting expectations\ Biological needs: Viability\ Belongingness: Sense of belonging\ Need for protection: Safety and security\ Need for esteem: Respect and importance\ Need for beauty: Beauty\ Need for Self-actualization: Self-actualization\ Need to know: Environmental education	1	15	28	5	1	1	3.20	4	13	19	7	3	1	3.17	2	6	17	6	11	0	2.57	1	0	10	17	28	0	1.73
		1	11	24	10	0	1	2.94	2	6	32	9	2	0	3.07	3	2	18	8	11	0	2.48	0	2	9	20	25	0	1.79
		4	12	33	0	2	0	3.31	6	22	15	3	0	1	3.67	2	1	23	5	10	1	2.51	1	3	8	12	32	0	1.73
		20	26	4	1	0	0	4.27	25	14	6	0	0	1	4.42	15	17	8	1	1	0	4.05	11	16	18	5	5	1	3.42
		4	11	28	5	3	0	3.16	3	19	14	7	2	2	3.31	1	5	15	12	8	1	2.49	0	7	22	10	17	0	2.34
Character	Distinction: River-centeredness\ Being related to the context: Contextualism\ Popularity: Being related to the place and the river\ Good reputation: Place reputation	16	25	6	2	2	0	4	1	2	14	9	20	1	4.26	16	14	7	4	1	0	3.95	0	11	11	16	16	2	3.02
		2	18	26	3	2	0	3.37	20	19	6	1	0	1	3.8	7	17	10	5	1	2	2.96	0	4	19	18	13	2	2.31
		2	18	26	3	2	0	3.29	20	19	6	1	0	1	4.26	7	17	10	5	1	2	3.60	0	4	19	18	13	2	2.26
		13	16	14	6	2	0	3.63	34	9	2	0	1	0	4.63	20	14	6	2	0	0	4.24	1	9	11	17	18	0	2.25
		-	-	-	-	-	-	4	-	-	-	-	-	-	5	-	-	-	-	-	-	4	-	-	-	-	-	-	1
Universality	Being public	-	-	-	-	-	-	4	-	-	-	-	-	-	5	-	-	-	-	-	-	4	-	-	-	-	-	-	1
	Non-flooding	4	11	28	5	3	0	3.16	3	19	14	7	2	2	3.31	1	5	15	12	8	1	2.49	0	7	22	10	17	0	2.34
Resilience																													

**Table 7. A Brief Description of the Quality Status of the River-Oriented Public Places in Case Studies From the Respondents' Point of View**

Criteria	Quality Status from the Respondents' Point of View	
Character	Distinction	In Ahvaz, Ardabil, and especially in Isfahan, the river plays a central role while this is not true in Rasht.
	Contextualism	In Isfahan and Ahvaz, they agreed that public places around the river were in line with the culture and customs while in Ardabil and Rasht, they did not agree.
	Popularity	They have assessed people's relationship with the river and public spaces around it as good and only in Rasht, it has been evaluated as unfavorable.
	Good reputation	In Rasht, the facilities around the river and their reputation did not depend on the river while in other cities, the reputation of the facilities in the coast of the river is due to the river.
Anthropocentrism	Motivating	In Rasht and Ahvaz, the spaces do not motivate the people to attend them while in Ardabil and especially in Isfahan, the space around the river creates the necessary motivation.
	Self-actualization	More than 50% of the respondents said that the presence of public spaces around the river did not help them develop their talents while in Isfahan, they believed that such spaces provided good conditions for their talents to emerge.
	Physiological needs	In Ardabil and Isfahan, to a large extent, the conditions of river places for the public presence have been evaluated as favorable while in Ahvaz, and especially in Rasht, they have been evaluated as unfavorable.
	Belongingness	In Ahvaz, Isfahan, and Ardabil, more than 80% of the respondents, and in Rasht, less than 50% of the respondents, have had a sense of belonging and to the river.
	Protection	In Ahvaz and Rasht, the safety and security of public places against hazards were underestimated. In Ardabil and Isfahan, this quality was evaluated as moderate and high, respectively.
	Beauty	In Isfahan and Ardabil, the respondents enjoyed the beauty of public places around the river the most, and in Ahvaz and Rasht, they less enjoyed these spaces.
	Knowledge	More than 50% of respondents said that their presence in the space around the river had no effect on increasing their interest in promoting knowledge about nature and citizenship rights, and a small number said that it had increased their interest in citizenship rights.
	Meeting expectations	In general, the respondents' expectations from the public spaces around the river in each of the four cities were not met for various reasons and there was a higher level of expectation.
Sustainability	Economic sustainability	More than 40% of respondents in Ahvaz believed that the river is effective in increasing the livelihood of citizens while in other cities, these spaces have little effect on the livelihood of citizens. In Ardabil and Rasht, due to the low tourist attractiveness level of the river, they are not much effective in increasing the livelihood of residents.
	Social sustainability	Except for Rasht, the respondents in other cities stated that the public places around the river have provided the necessary conditions for the presence of all citizens.
		In Ahvaz and Rasht, respondents believed that public places around the river were not in harmony with the riverbed, while in Isfahan and Ardabil, they were in harmony with the natural environment. Regarding the livability of the river, they emphasized the unhealthiness of the river, which was worse in Isfahan and Rasht.
Resilience	Except for Isfahan, the respondents in other cities, especially Ahvaz and Rasht, believed in the lack of resilience of public places against the river and the possibility of being flooded due to the encroachments on the river limits and the lack of dredging.	
Sociability	Except for Rasht, in other cities, respondents believe that the spaces around the river had play a significant role in improving the level of socialization and social communication of citizens.	
Being Public	The Zarjub River has the fewest public places around the river, and a few public places around it, like the city, back on to the river.	

#### 4.5.3. Calculation of Scores Obtained from the Respondents' Opinions about the Quality of River-Oriented Public Places in Case Studies

In this section, according to the interviews with the respondents, the case studies are scored in the quality of the sustainable public place at three micro (criteria), meso (construct), macro (overall quality) levels, and then compared, considering the same

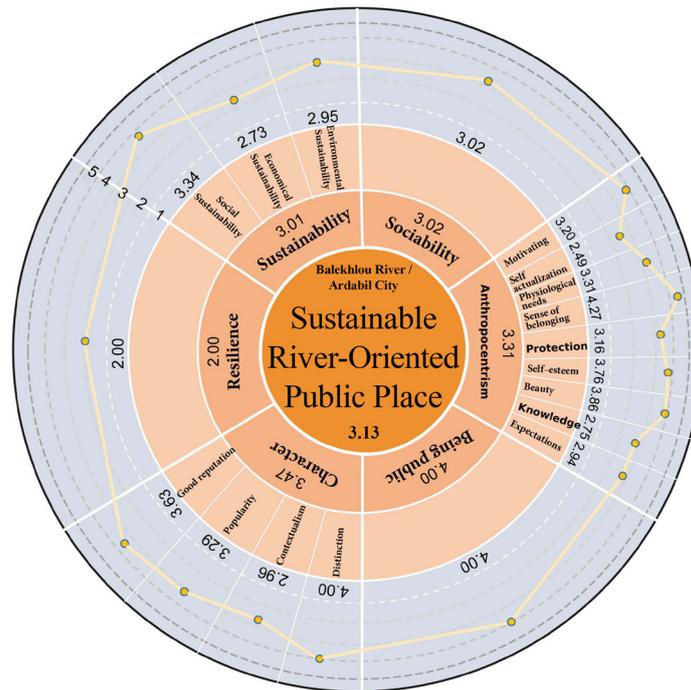
weight coefficient for criteria according to their equal importance for researchers, as presented in Table 8 and figures 12-15. At a glance, one can find the strengths and weaknesses of the public places studied. With the knowledge of the weaknesses and strengths of the public places studies, it is possible to provide proper solutions to improve their quality.

**Table 8. Comparison of People's Assessment of the Quality of River-Oriented Public Places in Case Studies Based on the Sustainable River-Oriented Public Place Model**

Scores obtained from the respondents' quality criteria assessment of river-oriented public places										Total scores obtained from the respondents' quality assessment of river-oriented public places			
Criterion score				Criteria	Construct score				Quality				
Rasht	Ahvaz	Isfahan	Ardabil		Rasht	Ahvaz	Isfahan	Ardabil		Rasht	Ahvaz	Isfahan	Ardabil
3.02	3.95	4.26	4.00	Distinction					1.75	2.78	3.56	3.13	
2.31	3.37	3.80	2.96	Contextualism									
2.62	3.60	4.26	3.29	Popularity	2.46	3.79	4.34	3.47					
2.25	4.24	4.63	3.63	Good reputation									
1.73	2.57	3.17	3.20	Motivating									
1.70	2.40	2.67	2.49	Self-actualization									
1.73	2.51	3.67	3.31	Physiological needs									
3.42	4.50	4.42	4.27	Belongingness									
2.34	2.49	3.31	3.16	Protection	2.10	2.88	3.34	3.31					
2.20	2.85	3.31	3.76	Esteem									
2.22	3.34	3.80	3.86	Beauty									
1.70	3.17	2.58	2.75	Knowledge									
1.79	2.48	3.70	2.94	Meeting expectations									
1.61	3.28	2.78	2.73	Economic									
2.11	3.12	2.73	3.34	Social	1.80	2.93	2.76	3.01					
1.66	2.37	2.76	2.95	Environmental									
3.00	1.00	3.00	2.00	Resilience	1.00	1.00	3.00	2.00	Resilience				
2.91	2.90	2.91	3.20	Sociability	2.09	2.09	2.91	3.02	Sociability				
5.00	4.00	5.00	4.00	Being public	1.00	4.00	5.00	4.00	Being public				

**Table 9. Strengths and Weaknesses of the River-Oriented Public Places in Ardabil**

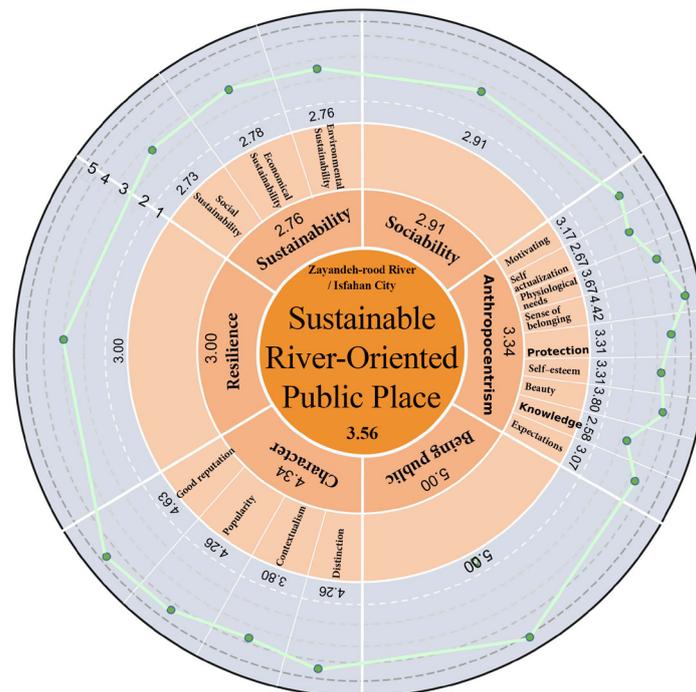
Weakness	1. Moderate environmental sustainability (rock bedding, water reduction in different seasons, removal of fauna and flora)
	2. Low level of contextualism (inattention of cultural elements of the city) and insufficient facilities
	3. Moderate level of security (especially for women and children) and safety of citizens and low flood resilience
	4. Moderate level of citizens' education of the environment and nature due to lack of related activities and signs
	5. Citizens' expectations (climate discomfort against cold winds in winter, etc.) are met at the moderate level
Strength	1. high level of sense of belonging to the river and belief in its effective role in the emergence and development of the city
	2. The universality of the entire river and the beauty of its urban space despite its simplicity
	3. Being distinct from other public places in the city due to the river
	4. High level of citizens' motivation to be present in the area due to its memorability, cleanliness, and visibility
	5. Provision of easy access from the surroundings
Solutions	1. Take river resilience measures and improve safety and security
	2. Promote its economic role in the city and environmental sustainability of the river
	3. Provide the necessary facilities for self-actualization and pay more attention to contextualism through the cultural elements of the city
	4. Quantitatively and qualitatively improve welfare facilities necessary for the comfort of users considering the cold climate
	5. Take measures to enhance citizens' knowledge of the environment and nature



**Fig. 12. The Quality Assessment of Balekhlou River According to the Sustainable River-Oriented Public Place Model**

**Table 10. Strengths and Weaknesses of River-Oriented Public Places in Isfahan**

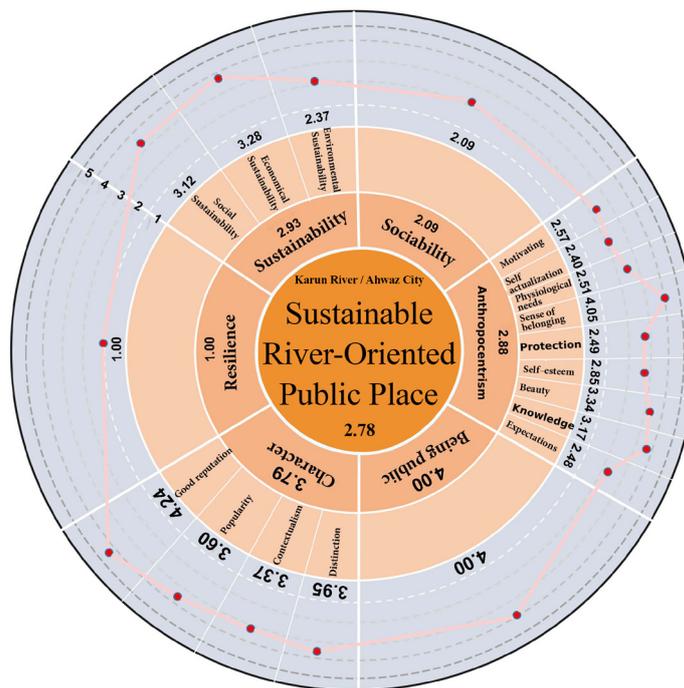
Weakness	<ol style="list-style-type: none"> <li>Moderate level of safety and security, especially for women and children at night</li> <li>Moderate economic and social sustainability due to seasonal water cuts</li> <li>Insufficient facilities for self-actualization of citizens</li> <li>Citizens' expectations are met at the moderate level due to seasonal water cuts and their low motivation</li> <li>Relatively low environmental sustainability due to seasonal water cuts</li> </ol>
Strength	<ol style="list-style-type: none"> <li>The universality of the river bank in most parts and being distinct from other public places due to the matching of the city green spaces with the river space and the existence of historical bridges</li> <li>High contextualism due to the presence of historical bridges, the popularity and good reputation of the river</li> <li>Citizens' sense of belonging to the river</li> <li>The relatively high level of the beauty of public places</li> </ol>
Solutions	<ol style="list-style-type: none"> <li>Improve resilience, security and safety</li> <li>Promote its economic role in the city</li> <li>Promote social sustainability (especially sociability)</li> <li>Promote environmental sustainability through permanent environmental protection</li> <li>Provide facilities for self-actualization and enhance citizens' knowledge of the environment and nature</li> </ol>



**Fig. 13. The Quality Assessment of Zayandeh-Rood River According to the Sustainable River-Oriented Public Place Model**

**Table 11. Strengths and Weaknesses of River-Oriented Public Places in Ahvaz**

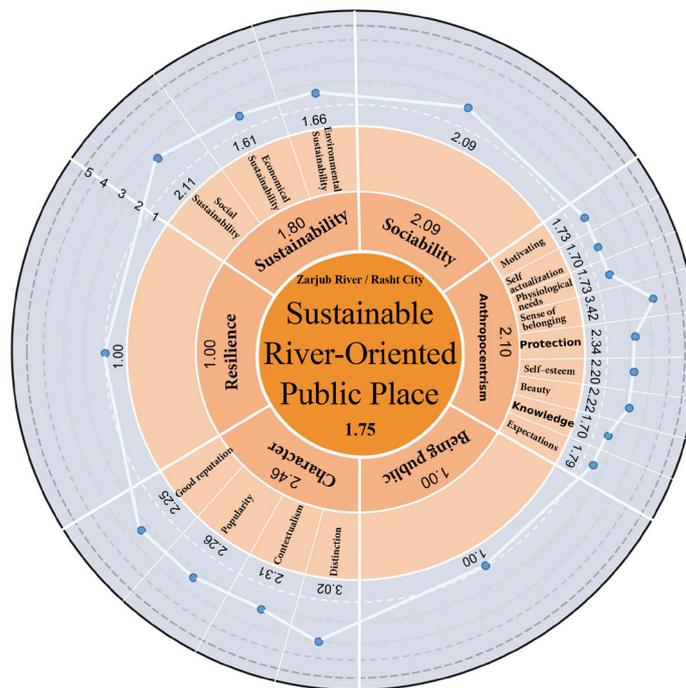
Weakness	<ol style="list-style-type: none"> <li>1. Low resilience against rivers and floods, moderate safety and low security, especially for women and children due to the presence of unsuitable people.</li> <li>2. Low environmental sustainability of the river and the high level of pollution due to sewage discharge</li> <li>3. Moderate social and economic sustainability of the river, mainly due to water pollution</li> <li>4. Relatively low sociability and moderate level of social acceptance</li> <li>5. Low level of motivation of citizens and their expectations are met at the low level</li> <li>6. Insufficient facilities for the citizens' self-actualization</li> </ol>
Strength	<ol style="list-style-type: none"> <li>1. Citizens' sense of belonging to the river and collective memories of Karun</li> <li>2. The universality of the most parts of the riverbank and the relatively high level of beauty</li> <li>3. Relatively high level of distinction from other public places in the city and good reputation and popularity</li> </ol>
Solutions	<ol style="list-style-type: none"> <li>1. Promote flood resilience and enhance river sustainability by dredging and removing pollution</li> <li>2. Improve the sociability and social acceptance</li> <li>3. Motivate citizens to present in the area and improve the level of meeting their expectations</li> <li>4. Enhance the facilities for the actualization of citizens' talents</li> <li>5. Enhance the security and safety of citizens</li> </ol>



**Fig. 14. The Quality Assessment of Karun River According to the Sustainable River-Oriented Public Place Model**

**Table 12. Strengths and Weaknesses of River-Oriented Public Places in Rasht**

Weakness	<ol style="list-style-type: none"> <li>Lack of public places along the river and the city back on to the river or is separated from the river with a concrete wall</li> <li>Low flood resilience due to periodic dredging and insufficient safety and security</li> <li>Low level of distinction from other public places in the city due to greenery and sufficient water</li> <li>Decreased level of good reputation and popularity of the river due to severe pollution</li> <li>Low level of motivation and the citizens' expectations are met at the low level due to pollution, lack of necessary facilities and facilities</li> <li>Lack of necessary facilities for self-actualization of citizens</li> </ol>
Strength	<ol style="list-style-type: none"> <li>High level of sense of belonging of citizens according to their memories of the river</li> </ol>
Solutions	<ol style="list-style-type: none"> <li>Create public places along the river considering its centeredness</li> <li>Promote economic, social and environmental sustainability</li> <li>Improve sociability and the amount of facilities necessary for comfort</li> <li>Promote beauty, security, safety and resilience</li> <li>Motivate citizens to present in the area and meet their expectations</li> <li>Enhance the reputation and social acceptance of the place</li> <li>Increase facilities for self-actualization and enhance of citizens' environmental knowledge</li> </ol>



**Fig. 15. The Quality Assessment of Zarjub River According to the Sustainable River-Oriented Public Place Model**

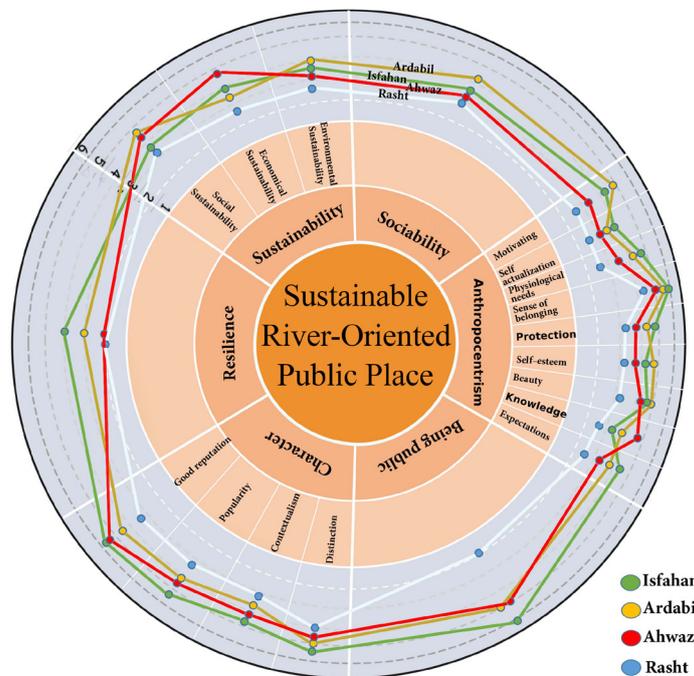
**4.5.4. Comparison of Criteria Status in River-Oriented Public Places in Case Studies**

In Figure (13), the quality status of the case studies is examined and they are compared according to the general score obtained from the respondents' opinions

and also their status in terms of the criteria of the sustainable public place model, by drawing the quality status of the four case studies in the same diagram. In addition, weaknesses, and strengths shared by them are extracted and presented in Table (13).

**Table 13. Strengths and Weaknesses of Public Places in the Case Studies**

Similarity	Strength	<ol style="list-style-type: none"> <li>1. People's sense of belonging to the river and the good reputation of the rivers</li> <li>2. Distinction of the place from other public places due to the presence of river and water</li> <li>3. Beauty</li> <li>4. Assigning most parts of the Zayandeh-rood, Karun, and Balekhlou riverbanks to public places</li> </ol>
	Weakness	<ol style="list-style-type: none"> <li>1. Low economic and environmental sustainability</li> <li>2. Low level of resilience</li> <li>3. Relatively low level of contextualism</li> <li>4. Relatively low level of sociability</li> <li>5. Relatively low level of security especially for certain groups (children and women)</li> <li>6. Low level of social acceptance</li> <li>7. Relatively low level of self-fulfillment and cognition facilities</li> <li>8. The quantitative and qualitative weakness of facilities required for comfort and wellbeing</li> </ol>
Difference	Strength	<ol style="list-style-type: none"> <li>1. Historical weirs (shadorvans) of Zayandeh-rood river as an outstanding attraction</li> </ol>
	Weakness	<ol style="list-style-type: none"> <li>1. Severe weakness of Zarjub river in most criteria, especially the lack of river-oriented public places along its banks</li> </ol>



**Fig. 16. Comparison of Case Studies in Quality at Meso and Macro Levels**

#### 4.5.5. Validation of Results

Given the qualitative nature of the questions, the results of the Kolmogorov–Smirnov test (which showed that the questions were non-parametric) and the separate qua of the quality assessment of the

case studies, a one-sample T-test was applied to each question to generalize the result of each case study to the relevant population. To validate the results, Cronbach's alpha test was performed on each of them, as described in Table 14.

**Table 14. Results Validation of Evaluate Quality Criteria of River-Oriented Public Places in Case Studies**

Criteria	Ardabil		Isfahan		Ahvaz		Rasht		
	Test Result	Sig.	Test Result	Sig.	Test Result	Sig.	Test Result	Sig.	
Sustainability	Environmental: Being aligned with nature, Health of the river\ Social: Being inclusion, Sociability\ Economic: Participation in the economy	Cronbach's alpha	0.75	Cronbach's alpha	0.73	Cronbach's alpha	0.79	Cronbach's alpha	0.62
		Sig. One-sample T-test	0.008	Sig. One-sample T-test	0.0492	Sig. One-sample T-test	0.036	Sig. One-sample T-test	0.026
		Sig. Kolmogorov–Smirnov test	0.0075	Sig. Kolmogorov–Smirnov test	0.0075	Sig. Kolmogorov–Smirnov test	0.01	Sig. Kolmogorov–Smirnov test	0.0075
		0.027	0	0.003	0	0.016	0	0	0
		0.0212	0	0	0	0	0	0	0
		0.0109	0.003	0.0545	0.003	0.01145	0.003	0	0.003
		0.038	0.016	0.0253	0.016	0.023	0.016	0	0.016
		0.0495	0	0.0455	0	0.005	0	0	0
		0.030	0.007	0	0.007	0.0025	0.007	0	0.007
		0	0.0215	0	0.0215	0	0.0215	0.011	0.0215
		0.74	0.0125	0.0144	0.001	0.75	0.0015	0.001	0.78
		0	0.0034	0.037	0.0034	0.0223	0.0034	0	0.0034
0	0	0	0	0.0253	0	0	0		
0	0.003	0.035	0.003	0.002	0.003	0	0.003		
0.0205	0.002	0.0085	0.002	0.01925	0.002	0	0.002		
Anthropocentrism	Motivating\ Meeting expectations\ Biological needs: Viability\ Belongingness: Sense of belonging\ Need for protection: Safety and security\ Need for esteem: Respect and importance\ Need for beauty: Beauty\ Need for Self-actualization: Self-actualization\ Need to know: Environmental education	0.74	0.0125	0.001	0.73	0.0144	0.001	0.75	0.0015
	0	0.0034	0.037	0.0034	0.0223	0.0034	0	0.0034	
	0	0	0	0	0.0253	0	0	0	
Character	Distinction: River-centeredness\ Being related to the context: Contextualism\ Popularity: Being related to the place and the river\ Good reputation: Place reputation	0.75	0.03945	0.005	0.77	0	0.005	0.81	0.0259
	0	0.0006	0.0022	0	0.0022	0.81	0.0005	0.0022	
	0	0	0	0	0	0	0	0.0491	
Universality	Being public	-	-	-	-	-	-	-	
	Non-flooding	0.67	0	0.0034	0.71	0.037	0.0034	0.79	0.0223
Resilience	Being public	-	-	-	-	-	-	-	
	Non-flooding	0.67	0	0.0034	0.71	0.037	0.0034	0.79	0.0223
Resilience	Being public	-	-	-	-	-	-	-	
	Non-flooding	0.67	0	0.0034	0.71	0.037	0.0034	0.79	0.0223
Resilience	Being public	-	-	-	-	-	-	-	
	Non-flooding	0.67	0	0.0034	0.71	0.037	0.0034	0.79	0.0223

## 5. CONCLUSION

Sustainable river-oriented public places, as part of special open and public urban spaces, are considered the basis for the formation of special places with a special identity and a distinctive social character. They are river-oriented places formed as part of the urban fabric and the inhabitants of river cities spend an important part of their social lives in them. In such places which were revitalized economically, socially and ecologically, the quality of water and the environment is protected and managed and the floods are controlled through river basin reclamation. They are adapted to the social life and in harmony with the environment, society, the city and the systems of each of them. They are indigenous and local social. Water-based activities and facilities are a priority in them to provide the ground for river-city interaction. They are inclusive and motivate citizens to attend there. They meet the current needs of citizens and can adapt to their future needs through adaptability and flexibility. In these places which are planned, designed, constructed, managed, maintained, operated, and developed based on the principles of sustainability, cultural values are preserved and there is social solidarity. They are economically successful. For their communities, they have a value, meaning, by which they are developed.

The constructs of such places are humans; The river and its components as the axis of such places; Urban space as a three-dimensional structure of the place; River landscape; Internal constructs (including shape, functions, activities, events, and imaginations); Outside and inside; Network; Time; Mutual relations and links; Contexts; Resources; Rules; User referral process; Effective actors and, ultimately, external super-constructs, including watersheds, hydrosphere, nature, and the environment; Communities and settlements that will affect the realization, survival and development of the river-oriented public place life cycle (including the processes of laying the groundwork, place-making, place management, and place development). Constructs, in turn, meet the expected qualities of such places. The proposed sustainable river-oriented public place model shows the construct affecting the formation of river-oriented public places. This model can be generalized to other types of public places and attention to it is effective in the realization of such places, because many of the weaknesses of public spaces are due to the inattention to the constructs affecting their formation and continuity throughout their life cycles. The present study considers the macro quality criteria for sustainable river-oriented public places as follows: resilience, sustainability, anthropocentrism, character, universality and sociability; Other micro criteria are included in these general criteria.

The comparison of case studies shows that according to the sustainable river-oriented public place model

presented in this study, the quality of river-oriented public places in the cities of Isfahan, Ardabil, Ahvaz and Rasht has been evaluated as high to low, respectively. However, most of them were evaluated as high in terms of the citizens' sense of belonging. They had common weaknesses in areas such as economic and environmental sustainability, resilience, contextualism, sociability, security and safety, social acceptance, provision of facilities for the self-actualization of citizens, and citizens' knowledge of the environment and nature, inadequate quality facilities for the comfort of citizens. Accordingly, in addition to the suggestions provided to remove the weaknesses of river-oriented public places in four selected cities, it is recommended to assess the status quo of each river and the river-oriented public places related to them in detail to provide more detailed suggestions.

This research, beyond other research, provides a way to define and identify the constructs affecting the realization and the macro criteria of desirability and quality of sustainable public places and does not seek the design statement, planning and design criteria, and so on. It is suggested to examine the indicators of sustainable river-oriented public places in future research to provide a checklist for planning, designing, or evaluating such places to urban planners, designers, and management.

## REFERENCES

- Ahmadi, S. Y. (2012). *Specialized Urban Design and Architecture Dictionary*, Tehran: Daneshpajoo Publications
- Afshar Naderi, K. (1999). From user to place. *Memar Magazine*, - (6), 4-7.
- Al-Shams, A., Ngah, K., Zakaria, Z., Noordin, N., Zool Hilmie, M., & Sawal, M. (2013). "Waterfront Development within the Urban Design and Public Space Framework in Malaysia". *Asian Social Science*. 9( 10). DOI:[10.5539/ass.v9n10p77](https://doi.org/10.5539/ass.v9n10p77) , [https://www.researchgate.net/publication/273709340\\_Waterfront\\_Development\\_within\\_the\\_Urban\\_Design\\_and\\_Public\\_Space\\_Framework\\_in\\_Malaysia](https://www.researchgate.net/publication/273709340_Waterfront_Development_within_the_Urban_Design_and_Public_Space_Framework_in_Malaysia)
- Andini, D. (2011). *Exploring The Social Life Of Public Spaces On Riverfronts: A case study of Sudirman and Tendean Riverside Quays in Banjarmasin*. South Kalimantan, Indonesia, HAAN, H.L. de, Wageningen University.
- Behzadfar, M. (2017). *Principles of designing urban gate corridors*. Tehran: Technical and Engineering Consulting Organization of Tehran Municipality.
- Bonakdar, A., & Gharai, F. (2011). Paradigm Shift In Urban Design Principles; From Physical, Social And Perceptual Components Towards A Place-Making Approach. *Journal of Architecture and Urban Planning*, 3(6), 51-70.
- Breen, A., & Rigby, D. (Eds) (1994). *Waterfronts: cities reclaim their edge*, Unitedstate, McGraw-Hill, Inc.
- Bruttomesso, R. (2006). *Waterfront development: A strategic choice for cities on water*, Waterfront Development Forum. China Maritime 2nd, Hongkong. [https://www.harbourbusinessforum.com/download/060303\\_transcript.pdf](https://www.harbourbusinessforum.com/download/060303_transcript.pdf)
- Carmona, M. (2015). Sustainable urban place-shaping. *Urban Design*, 21(1), 31-35. DOI:[10.1080/13574809.2016.1114375](https://doi.org/10.1080/13574809.2016.1114375). [https://www.researchgate.net/publication/287806601\\_Sustainable\\_Urban\\_Place-shaping](https://www.researchgate.net/publication/287806601_Sustainable_Urban_Place-shaping)
- Carmona, M., Heath, T., Oc, T., & Tiesdell, S. (2003). *Public places, Urban spaces: The Dimension of Urban Design*. *Architectural press of Elsevier*, Burlington.
- Charkhchian, M., & Daneshpour, S. A. (2009). The Study of Responsible Public Space Designing Components. *Geography and Planning*, 14 (30), 53-85. Available on: <https://www.sid.ir/fa/journal/ViewPaper.aspx?id=147159>
- Daneshpour, S. A., Sepehri Moghadam, M., & Charkhchian, M. (2009). Explanation To "Place Attachment" And Investigation Of Its Effective Factors. *Memari-va-Shahrsazi (Honar-Ha-Ye-Ziba)*, - (38), 37-48. Available on: [www.sid.ir/en/journal/ViewPaper.aspx?id=97341](http://www.sid.ir/en/journal/ViewPaper.aspx?id=97341)
- Eliasi, E. (2013). Sustainable urban design principle for urban rivers with sustainable development approach. Zahedan: The First National Conference of Islamic Architecture & Urban Design & Definition of Sustainability Based on Islamic & Iranian Lose(Absent) Identity. Available on: <https://civilica.com/doc/421979>
- Ghavampour, E. (2013). Sustainability in Public Space and the Changing View of Nature. 6th Making Cities Liveable Conference, in conjunction with the Sustainable Transformation Conference, Melbourne (VIC), 17-19 June 2013, Victoria University of Wellington. [https://www.academia.edu/8422878/Sustainability\\_in\\_Public\\_Space\\_and\\_the\\_Changing\\_View\\_of\\_Nature](https://www.academia.edu/8422878/Sustainability_in_Public_Space_and_the_Changing_View_of_Nature)
- Golkar, K. (1999). *Exploration in the definition of urban design*, Tehran: An Iranian Center for Urbanism and Architecture Studies.
- Golkar, K. (2005). Place Appraisal In Urban Design: An Introduction To Placecheck Technique. *Soffeh*, 15 (40), 28-49.
- Golkar, K. (2014). *Creation of a sustainable place*, Tehran: Shahid Beheshti University.
- Harrison, S., & Dourish, P. (1996). Re-place-ing Space The roles of place and space in collaborative systems. *ACMM Press*, 67-76.
- Horlings, LG (2016). Connecting people to place: sustainable place-shaping practices as transformative power, *Current Opinion in Environmental Sustainability*, (20), 32-40. DOI:[10.1016/j.cosust.2016.05.003](https://doi.org/10.1016/j.cosust.2016.05.003). <https://www.sciencedirect.com/science/article/abs/pii/S1877343516300288>
- Hussein, R.M.R. (2014). Sustainable Urban Waterfronts Using Sustainability Assessment Rating System. *International Journal of Architectural and Environmental Engineering*, 8 (4), 488-498. [doi.org/10.5281/zenodo.1094221](https://doi.org/10.5281/zenodo.1094221)
- Kalali, P., & Modiri, A. (2012). Explanation Of The Role Of Meaning Component In The Process Of Creating The Sense Of Place, *Memari-va-Shahrsazi (Honar-Ha-Ye-Ziba)*, 17 (2), 43-51. Available on: [www.sid.ir/en/journal/ViewPaper.aspx?id=294821](http://www.sid.ir/en/journal/ViewPaper.aspx?id=294821)
- Ketabollahi, K., Salehi, S., & Alimardani, M. (2017). Sustainable Place-Making Strategies of Urban Rivers By Hierarchy-Strategy Approach (Case Study: The Urban Zone Of Qara-Sou River Within Kermanshah City), *Sustainable Architecture and Urban Design*, (5), - (1), 29-46.
- Mabel, J., Lehman, S., & Sivam, A. (2013). The sustainable design of Waters Edge Public Spaces in the Asia Pacific region: smaller scale Australian examples and case studies in Sydney. Hong Kong and Singapore, State of Australian Cities Conference 2013. <https://researchportal.port.ac.uk/en/publications/the-sustainable-design-of-waters-edge-public-spaces-in-the-asia-p>

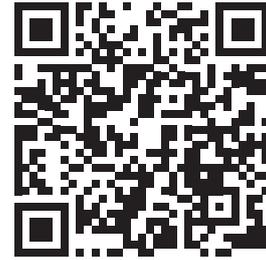
- MacKenzie, A. (2015). Place making And Place- Led Development. <https://www.pps.org/reference/placemaking-and-place-led-development-a-new-paradigm-for-cities-of-the-future>
- Madani Pour, A. (2008) Design of Urban Space: An Inquiry into a Socio-Spatial Process, trans. Mortezaei, Farhad; Tehran: *Urban Processing and Planning Company*.
- Magdi, S. (2014). Towards a Successful Sustainable Public Space: A parametrical Approach to strengthen sense of Place Identity (An Egyptian Case Study), Global Built Environment Review GBER Open House Publisher, *GBER*, Issue 9.2. [https://www.researchgate.net/publication/280287085\\_Towards\\_a\\_Successful\\_Sustainable\\_Public\\_Space\\_A\\_parametrical\\_Approach\\_to\\_strengthen\\_sense\\_of\\_Place\\_Identity\\_An\\_Egyptian\\_Case\\_Study](https://www.researchgate.net/publication/280287085_Towards_a_Successful_Sustainable_Public_Space_A_parametrical_Approach_to_strengthen_sense_of_Place_Identity_An_Egyptian_Case_Study)
- Mahmoudi Nejad, H. et al. (2008). Phenomenology of The Urban Environment: Promoting Urban Spaces To Urban Places, *Environmental Science and Technology*, 10 (4), 282-297. Available on: <https://www.sid.ir/fa/Journal/ViewPaper.aspx?ID=143817>
- Mohammadpour, A. (2011). Qualitative research method against method, logic and design in qualitative methodology (Volume 1), Tehran: *Jame'eshenasan Publications*.
- Motloch, J. (2000) Introduction to Landscape Design (Volume II), Trans. Deputy of Education and Research of Tehran Parks and Green Space Organization, Tehran: *Parks and Green Space Organization*.
- Moretti, M. (2008). Cities on Water and Waterfront Regeneration: A Strategic Challenge for the Future, Grundtvig, II meeting Rivers of Change- River/ Cities Warsaw, Poland.
- Mrdenović, T. (2011). INTEGRATIVE URBAN DESIGN IN REGENERATION - PRINCIPLES FOR ACHIEVING SUSTAINABLE PLACES. *Journal of Applied Engineering Science*, 9(2011)2, 305-316. <http://www.engineeringscience.rs/images/pdf/rad2360244503.pdf>
- Nourian, A. (2013). Components of Sustainable Place in Architecture and Urban Planning Based on Iranian-Islamic Tradition, Tabriz: Second National Conference on Islamic Architecture and Urbanism. Available on: <https://civilica.com/doc/289653>
- Pakzad, J. (2005) Iranian urban space design guidelines, Tehran: *Payam Sima Publishing Company*.
- Pakzad, J. (2006). Theoretical foundations and process of urban design. Tehran: *Shahidi Publications*.
- Phillips, Ch. (2014). Sustainable Place: A Place of Sustainable Development, Tran. Azemati, Hamidreza and Bagheri, Mohammad, Tehran: *Shahid Rajaei Teacher Training University*.
- Pourmand, H., & Rikhtegaran, M. (2006). The Essence of Place and The Architectural Space, *Islamic Art*, 2 (4), 43-60. Available on: [www.sid.ir/fa/Journal/ViewPaper.aspx?id=92040](http://www.sid.ir/fa/Journal/ViewPaper.aspx?id=92040)
- Razaghi Asl, S., & Jam, F. (2014). Theories of Urban Design; Emphasizing some applied theories in Iran, Tehran: *Shahid Rajaei Teacher Training University*.
- Sashapour, M., & Eliasi, E. (2015), Urban waterfront design with sustainable development approach, case study: Mahabad river. *Journal of Urban Landscape Research*, Vol.2, - (4), 19-33.
- Seyyedabadi, M., & Sardareh, A. (2013). Investigating the capacities and frameworks of urban design in ecological protection and regeneration of urban rivers; Case study of Zarjub and Goharrod rivers in Rasht, National Conference on Architecture, Culture and Urban Management, Karaj. Available On [www.civilica.com/Paper-ACUM01-ACUM01\\_425.html](http://www.civilica.com/Paper-ACUM01-ACUM01_425.html)
- Şimşek İlhan, B., & Özdemir, Z. (2014). Public Space Production as a Part of Urban Riverfront Development Scheme: A Contemporary Approach for Turkey, Case of Amasya. 50th ISOCARP Congress 2014, Gdynia, Poland. [https://www.researchgate.net/publication/338937414\\_Public\\_Space\\_Production\\_as\\_a\\_Part\\_of\\_Urban\\_Riverfront\\_Development\\_Scheme\\_A\\_Contemporary\\_Approach\\_for\\_Turkey\\_Case\\_of\\_Amasya](https://www.researchgate.net/publication/338937414_Public_Space_Production_as_a_Part_of_Urban_Riverfront_Development_Scheme_A_Contemporary_Approach_for_Turkey_Case_of_Amasya)
- Urban Design Associate (2005). Sustainability framework, Toronto: Toronto waterfront Revitalization corporation, 41.
- Zekavat, K., & Dehghan, Y. (2016). Dimension To Develop Quality In Public Realm And A Management Model For Creation Of Places, *Armanshahr*, - (17), 215-224. Available on: [www.sid.ir/en/Journal/ViewPaper.aspx?id=305543](http://www.sid.ir/en/Journal/ViewPaper.aspx?id=305543)

#### HOW TO CITE THIS ARTICLE

Safdarnejad, S. M., Daneshpour, S. A., & Javidnejad, M., Behzadfar, M. (2022). Sustainable river-oriented public places and the constructs affecting them; Case Studies: Balekhlou, Zayandeh-rood, Karun, and Zarjub Urban Rivers. *Armanshahr Architecture & Urban Development Journal*. 14(37), 173-197.

DOI: 10.22034/AAUD.2019.199192.1972

URL: [http://www.armanshahrjournal.com/article\\_147097.html](http://www.armanshahrjournal.com/article_147097.html)



#### COPYRIGHTS

Copyright for this article is retained by the author(s), with publication rights granted to the Armanshahr Architecture & Urban Development Journal. This is an open- access article distributed under the terms and conditions of the Creative Commons Attribution License.

<http://creativecommons.org/licenses/by/4.0/>



