RESEARCH ARTICLE

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Analyzing the role of social capital in sustainable environmental governance: A case study on Piranshahr

Mohammad Rahim Rahnama | Ebrahim Sharifzadeh Aghdam [iD]

Department of Geography and Urban Planning, Ferdowsi University of Mashhad, Mashhad, Iran

Correspondence
Ebrahim Sharifzadeh Aghdam, Ferdowsi University of Mashhad, Mashhad, Iran.
Email: eb.sharifzadehaghdam@mail.um.ac.ir

Abstract

The main objective of the present study was to investigate the role of social capital in sustainable environmental governance in relation with formation of sustainable urban residential neighborhoods, the cause of inefficiency of some of them in terms of integrated urban management, and empowering them. As the study's purpose required, the study's method was applied, and regarding the nature, it was an analytical descriptive study. According to its title, the data collection method was survey using questionnaire technique. The study population consisted of the residents of Piranshahr in 2016. To select them, Cochran formula was employed, and the sample size was determined to be 382 individuals. In so doing, stratified random sampling method was utilized. The collected data were analyzed using LISREL and SPSS software packs and through exploratory and confirmatory factor analysis and structural equation model. The results of the study indicated that the indices utilized in the study had a significant effect on the environmental sustainability of the urban neighborhoods. They also showed that the citizens' beliefs in that they, as local-oriented social capital, influence the decisions and that the urban management requires their participation in urban governance had a strong positive effect on sustainable development of the neighborhoods. These effects are so strong that the governors have been effective in unsustainability of the urban neighborhoods by ignoring the role of social capital. It was also concluded that environmental sustainability indices were not favorable enough.

KEYWORDS

environmental sustainability, Piranshahr, social capital, urban governance

1 | INTRODUCTION

Cities and urban areas are facing complex pressures, originating "from above" as well as expectations "from below" on the attributes and opportunities of "urban life." Put simply, urban areas need to be attractive and inclusive, sustainable and resilient, and prosperous and innovative from local, national, and international viewpoints (UN-Habitat, 2008).

The causal relationship between social capital and environmental outcomes through governance of collective action is far from clear and often tautological (Ballet, Sirven, & Requiers-Desjardins, 2007;

Sobel, 2002) It must engage, attract, and excite people about opportunities and lifestyles today and into the future. (Ryan, 2011) This concept is associated with incentive mechanisms or institutional arrangements to curb individuals' incentive to free ride regarding the provision of public goods (Aoki, 2001; Ostrom, 2000). The need to adopt environmentally sustainable behaviors made the international community commit sustainable development (UN-Habitat, 2008; UNESCO, 1995; W. C. S., & Tunstall-Pedoe, 1991). To develop city sustainable sector, it is not sufficient to focus only on green building designs. Sustainable designs must be looked at on a wider scale. The prospect of an effective urban environment analysis tool lies on how

to analyze the interaction between human behavior and buildings and their surrounding environments as an integrated urban design process. In this path, social capital can impact negatively on economic or environmental outcomes creating exclusion of some marginalized groups or contributing to rule-breaking behavior by community members as citation (Ray & Bijarnia, 2007; Van Staveren, 2003). Social capital is increasingly acknowledged as a theoretical construct (Van Der Gaag & Snijders, 2005). Social capital is now accepted as having at least three aspects: trust and trustworthiness, civic engagement and cooperation, and social networks (López-Gunn, 2012). However, the capacity of social capital to create collective action and positive institutional outcomes resides in the fact that it is part of a hierarchical social structure and its power to impose certain cooperative strategies as a legitimate way to act. The rational choice theory which the relationship between urban areas and sustainability has attracted (Westin, Hellquist, Kronlid, & Colvin, 2013).

Disruption of social relationships in cities, urbanization, decrease in cooperation, weakness in social support of local community in urban development programs, recession and lack of social security, consideration of disciplinary affairs, protection and security, and lack of the citizens' participation in economic and social development programs in many cities of Iran have led to wastage of material and spiritual capitals and intensification of urban problems and abnormalities (Shamaei, 2004, p. 118).

Over last few decades, Piranshahr with its special geographical situation has experienced an increase in immigration due to accepting immigrants from other towns, presence of subcultures and different cultural types caused by immigration, which requires supervision from above and participation from below (people-oriented participation; Sharifzadeh Aghdam & Asghari Zamani, 2014). Changes that have occurred in Piranshahr over the last few decades were mostly because of economic development (designated by establishment of Tamrchin Border Market, development of dams, and destruction of villages). At the same time, the town has a heterogeneous management and is derived from local-oriented systems. As an active civil entity with an efficient role in good governance and by institutionalizing standard managerial indices, social capital, however, can result in higher efficiency of executive decisions of urban managers with presence of people in governance. Using people's participation in the process of urban plans can be an appropriate and effective solution for many problems including an increase in environmental sustainability of the town and its neighborhoods in all cases and better interaction of the residents (Sheikh, Kerematoolah, & Pourahmad, 2015). In this regard, the present study was carried out in order to examine and measure the effect of social capital on good governance in sustainability of urban neighborhoods, to investigate into the factor (s) affecting sustainability at local scope, and finally to assess the most important factor in order to achieve a reasonable assessment for this hypothesis that "social capital can play an effective role in good urban governance of environmental sustainability of urban neighborhoods." The present study was also aimed at attaining a knowledge about the urban managerial system in neighborhoods sustainability by exploring the relationship between good urban governance and environmental development of the neighborhoods in Piranshahr. In this regard, the present study was carried out in order to focus on the factors that

are effective in the local people's participant in the governance process and the scope of Piranshahr in order to achieve environmental sustainability of the urban neighborhoods of Piranshahr.

Local communities can be perceived both as a mediator for microinteractions and as the effect of social structure on individuals (Khanehru, 2011). Piranshahr has always experienced lack of integrity in urban management and severe divergence among social actors, which has marginalized people especially indigenous people in making decisions related to urban affairs and has caused the citizens' dissatisfaction. In this regard, it is necessary to have access to solutions that are based on people's participation in making decisions about urban plans. Following the change in planning approaches toward structural-strategic planning and distance form arbitrarily centered planning, the emphasis moves to participatory management and the desires of the civil community, which requires to divide the planners' duties among different managerial and decision-making levels which in turn needs cooperation among all forces. These changes indicate the importance and role of social capital as a local-oriented entity in the city, and can have an important effect on environmental sustainability of a city. This information doubles the significance of the present study. Numerous studies have focused on this issue, some of which are presented below (Figure 1). The city of Pars is a poorly managed managerial community. So it is necessary that social capital would fill this gap as an important part of the popular institutions to lead urban governance to integrated urban management.

1.1 | The scope of study

Piranshahr, which is considered as political center of Piranshahr country, is located in south of West Azerbaijan Province and 12 km to Iran and Iraq (Iraq Kurdistan). This city is encompassed from north to Oshnaviye and Naghadeh and from south to Sardasht and from west to Mahabad (Figure 2; Consulting Engineers Armanshahr, 2009, p. 2). Piranshahr's population based on the 2006 and 2011 consensus is 59,721 and 70,722 (Iran Statistical Center, 2006).

2 | METHODOLOGY

Based on its subject and objectives, the present study is a combination of descriptive-analytical methods. According to its purpose, the present study was an applied investigation, and its main approach was a multicriteria analysis including three main criteria of social capital, good governance, and urban neighborhoods environmental sustainability (Hafezniaand, 2013). In order to measure the validity of the questionnaire, interpolation or retest methods were employed, and to check its reliability, was used. The study population consisted of the residents of Piranshahr in 2016. To select them, Cochran formula (Hafeznia, 2012, p. 167) was employed and the sample size was determined to be 382 individuals. In so doing, stratified random sampling method was used.

2.1 | Data collection instruments

In order to collect the required data and understand the region, documentary and field methods were used. The study instruments were (a) documentary method (note taking from books, articles,
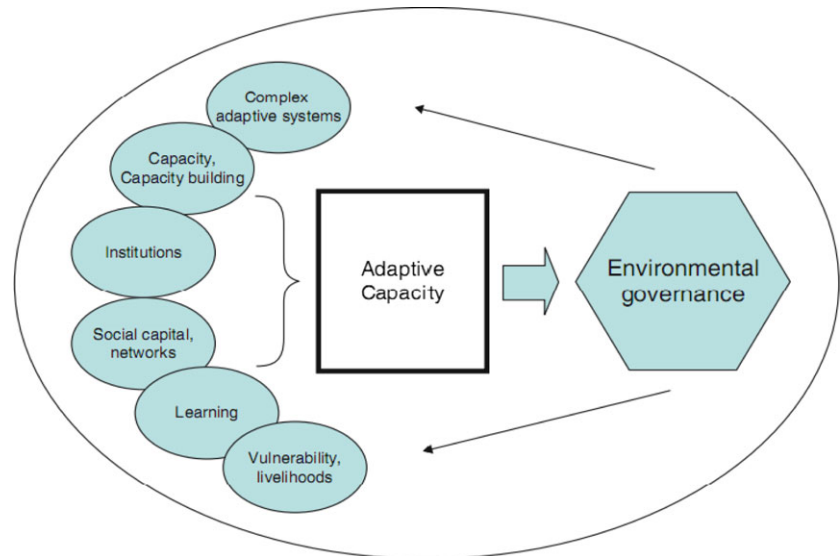
FIGURE 1 Adaptive capacity and environmental governance. Source: (Anderson, Keilor, Howarth, & Walker, 2010, p. 10 and research authors)

Source: [Anderson, Keilor, W. Howarth, & R. Walker, 2010: 10 and research authors]
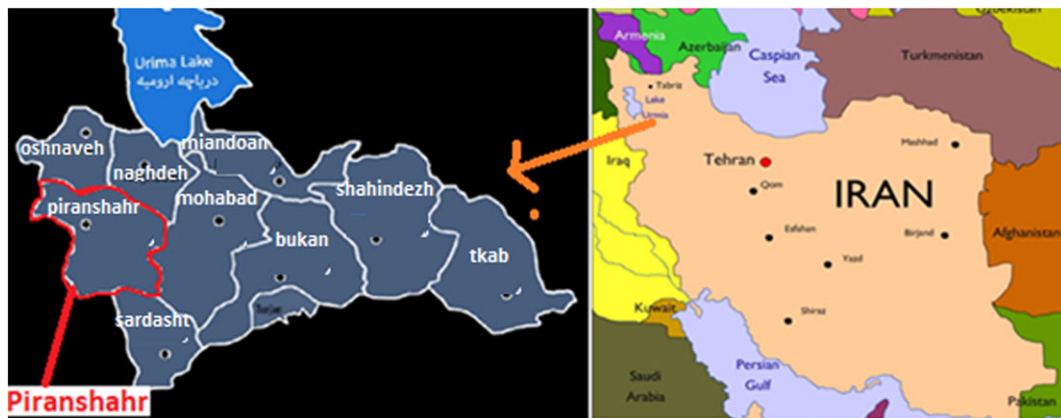
Source: Pars Boomerang Project

FIGURE 2 Geographic location city of Piranshahr. Source: Pars Boomerang Project

documents, the results of conferences, and the Internet, and also the statistics published by Statistical Center of Iran, and the town's map. (b) Field method: a questionnaire in the form of Likert scale.

2.2 | Data analysis instrument

LISREL and SPSS software packs were utilized to analyze the collected data, the results were visualized though ArcGIS software, and the results were indicated on a map. Analyses were carried out at two levels of descriptive and multicriteria analysis (structural equation modeling).

3 | RESULTS

## 3.1 | Confirmatory factor analysis model using LISREL statistical software

In order to find out the fundamental variables of a phenomenon or to summarize a set of data, factor analysis method is used. The primary data for the factor analysis included the matrix of correlation between variables. Factor analysis does not have predetermined variables. Factor analysis is utilized in two cases:

a) Exploratory purposes

b) Confirmatory purposes

Exploratory purpose is a method that is used to discover and measure latent process resources and to process the measurements (Hooman, 2013, p. 11). In exploratory cases in which the purpose to summarize a set of data, analysis of main components is employed. In analysis of the main components, the total variance of the observed variables is analyzed. Confirmatory factor analysis investigates whether the available data fit with the extremely limited pre-experiential structure that meets similar conditions or not (Sarmad & Bazargan Harandi, 1997). In the present study, the model of the exploratory variable available in the present study is as follow (Figure 3).

Since the study's variables were of latent type and each of them was measured through some observable variables (Figure 3), therefore, in the first step, it was necessary to pay attention to the measurement model; as a result, the validity and reliability of the model
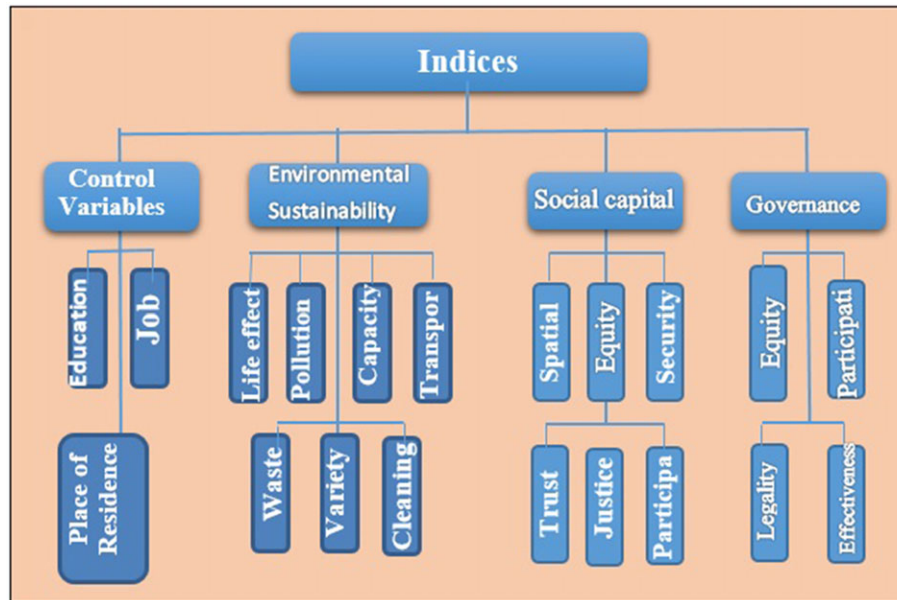
FIGURE 3 The exploratory factor analysis model for the study's variables. Source: Authors (Research findings)

was assessed. According to Diagrams (Chalabi, 2007, p. 280), it can be seen that the four observable latent variables (governance indices, social capital, and environmental sustainability with a series of the questionnaire's questions) were measured. The diagrams of the measured models indicated to what latent variable, each observed variable is related, and to what extent this overt variable measures the latent variable. The validity of the questionnaire could be measured in this way. Factor validity is a form of the structure's validity that is obtained through factor analysis. A factor is a hypothetical variable (structure) that affect the observed scores in one or some variables. Whenever factor analysis occurs on a correlation matrix, the tests that are under the influence of specific factors will have high factor loading (Sarmad & Bazargan Harandi, 1997, p. 173). Therefore, to prevent interpretational ambiguities of the latent variables, first, it is better to measure the measuring model and then to estimate the structural model.

In order to prove the LISREL output fit values, about four fit indices were reported, and in confirmatory factor analysis, each one confirms the model from a different angle. In order to come up with important fit, chi-square was used, which shows more appropriate fit if it is closer to zero. Since chi-square is affected by the sample size, if its value is divided by degree of freedom, it will be equal to 1 in an ideal fit. If its value is 2 or less, it shows appropriate fit. Moreover, if Root Mean Square Error of Approximation (RMSEA) is less than 0.05, it shows appropriate fit, and when it is equal to 0, the model is fitted in a complete way. Goodness of fit index (GFI) and adjusted goodness of

fit index (AGFI), proposed by Byrne (2013) and Jöreskog and Sörbom (1989), are not dependent on sample size and indicate that to what extent the model has better fit compared with the case where it does not exist. Since these two indices show more fit compared with other indices, some researchers have proposed fit point 0.95. According to agreements, the value of GFI and AGFI should be bigger than 0.90 in order for the model to be accepted. One of the relative indices is normed fit index (NFI) that does not depend on chi-square assumptions. Since NFI ranges between 0 and 1, it is considered an appropriate model. Bentler and Bonnet (1980) suggested NFI equal or larger than 0.90, which is an appropriate value for theoretical fit models, while some researchers used fit point as 0.80 (Hooman, 2001).

In all cases, the reported fit was higher than an appropriate level in all of the employed indices. Therefore, the model used in the present study is an appropriate model. Before presenting the section of answering to the study's questions, it is necessary to make sure about the accuracy if the indices that were used in evaluating the employed model. Therefore, in continuation, the models of measuring the study's indices and the control variables are, respectively, presented. In the present study, confirmatory factor analysis was carried out though path analysis for the factors recognized in exploratory factor analysis. Finally, the analyses were completed through structural equations and using LISREL statistical software. Table 1 only presents the results of confirmatory factor analysis for fit and reliability of the indices employed in the study.

TABLE 1 Fit and reliability of the study model (confirmatory factory analysis models)

Reliability and validity of model	AGFI	(PGFI)	df	GFI	chi-square	p value	RMSEA
Social capital	0.99	0.43	15	0.99	12/51	0.63991	0.000
Sustainable environmental	0.97	0.44	1	0.99	0.000	0.98188	0.000
Urban governance	0.98	0.20	2	0.99	2.51	0.28499	0.026
Control variable	0.99	0.20	2	0.99	1.63	0.44159	0.000

Note. AGFI: adjusted goodness of fit index; GFI: goodness of fit index; PGFI: Parsimony Goodness-of-Fit Index; RMSEA: Root Mean Square Error of Approximation.

Source: Authors (Research findings).

According to the outputs obtained in Table 1, the coefficients and parameters obtained in the measuring model are significant in the mentioned indices in all factors. Since the significance test of each of them in RMSEA is lower than 0.05 (or 0.09), the exploratory factor analysis is significant. If the ratio of X^2 to df is lower than 3, the X^2 value is low and appropriate and the model is relatively fit. The lower the value of X^2, that is, the smaller the ratio of X^2 to df, the model will be more fit and appropriate. According to the results presented in Table 1, it can be figured out that the study's exploratory model and factor analysis led to results with appropriate fit, which indicates that the model had a high significance of the indices employed in social capital and essential factors at a significant level.
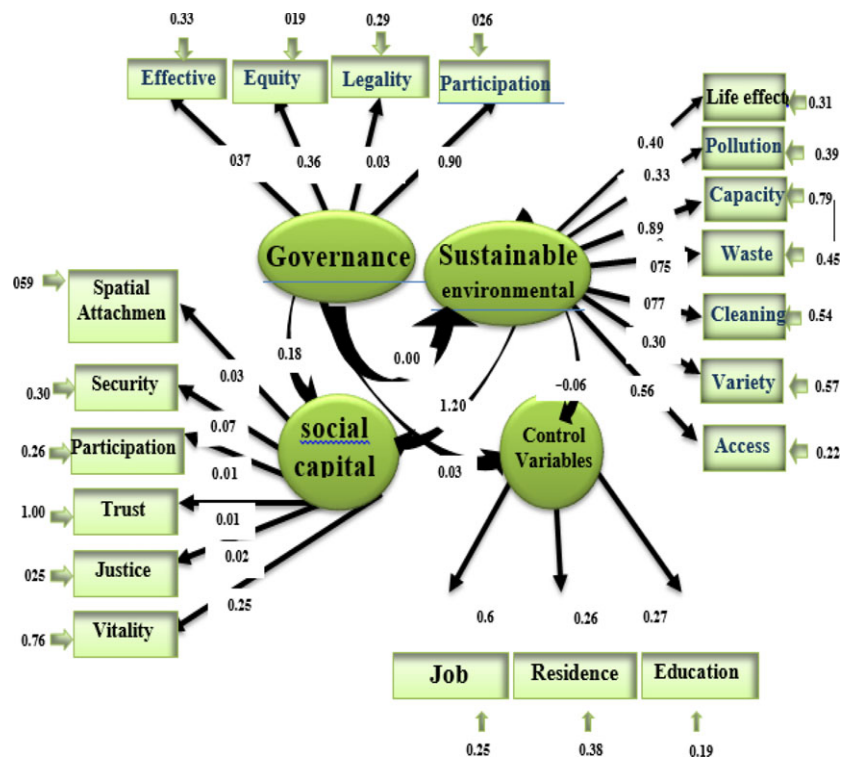
3.2 | Structural equation model

Structural equation model is a very general and potent multicriteria analysis technique belonging to multivariate regression family, in more precise words, it is the expansion of linear model (Hooman, 2013, p. 11). To examine the causal relationship among the variables, structural equation model or multicriteria analysis with latent variables was employed. This model is referred to as causal and covariance structure analysis model. Through this model, the acceptability of the theoretical models in special populations can be tested using correlational data. In a structural equation model, the hypothesis is a specific casual structure in a set of unobservable structures. These structures are measured through a set of indicating observable variables. The model can be analyzed using LISREL software, and its fit can be tested for a population from which a sample has been extracted. This analysis provides estimations for the model's parameters and also some indices

for goodness of the fit. Estimation of the parameters and the data related to the goodness of the fit can be used for probable change of the model and the re-examination of the theoretical model (Hooman, 2010). The digit that is drawn with an arrow toward the observable variable indicates to what extent each overt variable plays a role in measuring the latent variable. The higher this factor loading, the higher the reliability will be.

Now, these questions are posed: "How does each item of the governance index or their combination in the neighborhoods of Piranshahr influence urban sustainability?", "Which one has a significant effect on urban sustainability," and "Which one has a bigger influence?" To answer these questions, the following indices can be referred to, which indicate poor governance of the managerial organizations.

According to the results presented in Figure 4, it can be understood that the model's fit indices indicate that the model has an appropriate fit. RMSEA of this index (0.030) is almost lower than what Garson states (i.e., 0.08), and if Human's statement in this regard is accepted as the criterion, it can be claimed that the model has a very good fit because this index is lower than 0.10. Moreover, the closer to 1 the GFI of this model, the better the fit of the model will be (Sarmad & Bazargan Harandi, 1997, p. 276). This index in the present model is 0.30; therefore, it can be stated that the model has a relatively good fit. Other indices like AGFI and NFI are over the stated values; therefore, the above model (Figure 4) has a relatively good fit.

According to the results presented in Figure 4, the coefficients and parameters obtained from the measuring model in the indices of the independent and dependent variables were significant in the effect of social capital in the governance on urban sustainability, such

FIGURE 4 Structural equation modeling in the city of Piranshahr. Source: Authors (Research findings)

Chi-Square=220.13, df=164, P-value=0.00226, RMSEA=0.030

(PGFI) = 0.73 (GFI) = 0.94 (AGFI) = 0.93 (RMR = 0.042) IFI = 0.96 (RFI) = 0.87

that the significant level of the coefficients and parameters obtained from the structural model of governance on urban neighborhoods sustainability was 0.000, which indicates an inappropriate level of significance; therefore, the citizens believed that the governance had not positive and efficient effect. The significance level of the relationship between governance and social capital was 0.18, which indicates the importance of social capital in the useful role that good urban governance can have. In another relationship between the two main factors of capital and environmental sustainability, the appropriate condition (1.20) indicated the efficiency and activeness of nongovernment organizations. However, since the significance level is between −2 and 2, it can be stated that urban governance had no positive and significant effect on the sustainability of the neighborhoods. In following sections, the analyses of the model are presented, which is also a justification for this fact (lack of positive and significant effect of urban governance on neighborhoods sustainability).

4 | CONCLUSION

Presence of a good governance with global standard indices and a local-based approach in Piranshahr puts more emphasis on the necessity of sustainability than ever. In this regard, according to the services they deliver in urban neighborhoods, social capitals can affect the sustainability of urban neighborhoods through influencing the urban governors. In studies dealing with the urban sustainability of Piranshahr's neighborhoods, the results indicate the fact that the neighborhoods have experienced different levels of sustainable local development over the last few decades, and there has been a type of injustice in delivering services because there has been no justice-oriented approach in the urban governance. Although urban management needs people's participation in order to be able to follow its goals, it is necessary to involve all nongovernmental organizations at all geographical levels uniformly instead of looking for a good urban governance. In this procedure, the emphasis should be on people's participation in actualization of urban neighborhoods sustainability, participatory approach, and justice- and local-oriented methods instead of central unilateral planning, and responsiveness and necessary efficiency of urban affairs need to be highlighted.

The results of the present study indicate that there is a significant relationship between the two (independent and dependent) variables in urban affairs, and this relationship was over the assigned level. This indicated the interactive relationship between the two variables, such that the more optimal the effect of social and local-oriented capitals on urban governance, the level of environmental sustainability of the urban neighborhoods will be higher, which leads to an increase in the quality of the people's lives according to the standards of a citizen-centered governance and development of a bottom-up tendency pattern and brings about general welfare and an increase in the quality of the people's lives. In other words, it can be stated that the urban authorities should be more sensitive toward this issue, and in addition to applying the people's opinions in urban affairs, they should personally be committed to egalitarianism and collaborative approach in all urban aspects in order to achieve a pluralistic democratic society

based on citizen-centered principles, and this in turn affects the environmental sustainability.

The results obtained from the structural equation model indicate that this model had a relatively good fit. The RMSEA value of this index (0.030) indicates better fit of the model and the significant relationship between the two variables. Therefore, the first hypothesis of the present study, that is, there is a significant relationship between good urban governance and sustainability of urban neighborhoods, is confirmed.

In order to measure the level of governance in Piranshahr in managerial affairs of the urban issues and to manage the town optimally based on the standards of good urban governance, four indices were employed that were chosen as the most important indices of measuring good governance at an urban level. These indices were the rate of participation, legitimacy, justice, and efficient effectiveness. According to the results of the structural equation model, the significant level of the coefficients and parameters obtained from the structural model of the local-oriented governance was 0.000, which is not appropriate. The consequence of such an extreme administrative and managerial centralization will be ignorance of social justice and cooperation and irresponsiveness, which has led to a significant difference among the urban neighborhoods with regard to urban sustainability and caused many indices in Piranshahr to be lower than the average level. As the results of the structural equation model showed, urban governance has a significant effect on urban sustainability of neighborhoods. This effect; however, is negative, as the value of the obtained parameters and coefficients also highlighted this fact existing in Piranshahr.

Suggestions

- Development of popular institutions and use of the opinion of elites and community experts
- Increased participation of people in the process of preparing environmental projects
- Creating a democratic environment for the participation of all segments of society
- Environmental diplomacy with other countries in the region
- Creating a logical scenario based on the urban environmental potential

ORCID

Ebrahim Sharifzadeh Aghdam https://orcid.org/0000-0002-3679-8013

REFERENCES

Anderson, B. N., Keilor, V., Howarth, A. R. W., & Walker, L. R. (2010). *Springer Series on Environmental Management*.

Aoki, M. (2001). *Toward a comparative institutional analysis*. MIT press.

Ballet, J., Sirven, N., Requiers-Desjardins, M. (2007). Social capital and natural resource management: A critical perspective. *The Journal of Environment and Development*, *16*(4), 355.

Bentler, P. M., & Bonnet, D. C. (1980). Significance Tests and Goodness of Fit in the Analysis of Covariance Structures. *Psychological Bulletin*, *88*(3), 588–606.

Byrne, B. M. (2013). *Structural equation modeling with LISREL, PRELIS, and SIMPLIS: Basic concepts, applications, and programming*. Psychology Press.

Chalabi, M. (2007). "Social analysis of in action space", Tehran, ney publication

Consulting Engineers Armanshahr. (2009). Plan of the rehabilitation of the old urban texture of the Piranshahr, Housing and urbanism organization of the West Azarbaijan.

Hafezniaand, M. R. (2013). *The introduction to research methods in human sciences* (the eighteenth ed.). Tehran: Samt publisher.

Hooman, H. A. (2001). *structural equation modeling*. Tehran: Samt publisher.

Hooman, H. A. (2010). *Structural equation modeling with LISREL application*. (pp. 235–247). Tehran: SAMT Publication.

Hooman, H. A. (2013). *Structural equation modeling with LISREL application*. Tehran: SAMT Publication.

Iran Statistical Center. (2006). General Census of Population and Housing 1996, 2006 and 2011. (In Persian).

Jöreskog, K. G., & Sörbom, D. (1989). LISREL 7: A guide to the program and applications SPSS.

Khanehru, M. (2011). The study of social capital and the factors affecting its formation at the neighborhood level. *Social Sciences*, *6*.

López-Gunn, E. (2012). Groundwater governance and social capital. *Geoforum*, *43*(66), 1140–1151.

Ostrom, E. (2000). Crowding out citizenship. *Scandinavian Political Studies*, *23*(1), 3–16.

Ray, S., & Bijarnia, M. (2007). Power relations and institutional outcomes: A case of pastureland development in semi-arid Rajasthan. *Ecological economics*, *62*(2), 360–372.

Ryan, T. P. (2011). *Statistical methods for quality improvement*. Canada: John Wiley & Sons.

Sarmad, Z., & Bazargan Harandi, A. (1997). Methodology in behavioral sciences, The publication of agah Tehran

Shamaei, A. (2004) The development of local communities and its impact on urban management system enabling community development conference abstracts, Tehran: Tehran Municipality

Sharifzadeh Aghdam, A., & Asghari Zamani, A. (2014). Assessing Consultative Management in the Formation of Sustainable Urban Neighborhoods (In Terms Of Environmental Aspects). *International Journal of Humanities and Social Science Invention*, *3*(8). August.

Sheikh, A., Kerematoolah, Z., & Pourahmad A. (2015). Piran city development strategies with the approach of CDS, senior thesis, Tehran University

Sobel, J. (2002). Can we trust social capital?. *Journal of Economic Literature*, *40*(1), 139–154.

UNESCO. (1995). World Water Assessment Programme. Kenya National Water Development Report 2005 Prepared for the 2nd UN World Water Development Report, *Water: A shared responsibility*.

UN-Habitat. (2008). State of the World's Cities 2008/2009: Harmonious Cities. London: Earthscan.

Van Der Gaag, M., & Snijders, T. A. (2005). The resource generator: social capital quantification with concrete items. *Social Networks*, *27*(1), 1–29.

Van Staveren, I. (2003). DEVELOPMENT AS FREEDOM v-v AND AS WHAT ELSE?. *Feminist Economics*, *9*(2-3), 137–161.

W. C. S., & Tunstall-Pedoe, H. (1991). Antioxidant vitamin intakes assessed using a food-frequency questionnaire: Correlation with biochemical status in smokers and non-smokers. *British Journal of Nutrition*, *65*(3), 337–346.

Westin, M., Hellquist, A., Kronlid, D. O., & Colvin, J. (2013). Towards urban sustainability: Learning from the design of a programme for multi-stakeholder collaboration. *Southern African Journal of Environmental Education*, *29*, 39–57.