

Original Article

# Structural analysis modeling of participatory stakeholder management for green space improvement: evidence from Tehran Metropolis

## Modelagem de análise estrutural de gestão participativa das partes interessadas para melhoria de espaços verdes: evidências da Metrôpole de Teerã

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### Abstract

Encouraging stakeholder participation is now considered an appropriate approach to green space improvement. The main question is how to have people participate in the improvement process. This study aims to propose a participatory stakeholder management model of green space improvement in Tehran Metropolis. Therefore, 190 of Tehran Municipality's green space experts were selected as the statistical population for in-person and field interviews. The dependent research variable was defined as the green space improvement measured in four dimensions (*i.e.*, green space planning, green space designing, green space implementation, and green space maintenance). However, the independent variable included the aspects of participatory management (*i.e.*, participation in goal-setting, participation in decision-making, participation in organizational change, participation in problem-solving, and organizational culture). The results indicated that only organizational culture and participation in organizational change explained nearly 96% of participatory management variations and improved 67% of the green space.

**Keywords:** participatory management, urban green space, structural analysis, Stakeholder, Tehran.

### Resumo

Incentivar a participação das partes interessadas é agora considerado uma abordagem apropriada para a melhoria dos espaços verdes. A questão principal é como fazer com que as pessoas participem do processo de melhoria. Este estudo tem como objetivo propor um modelo de gestão participativa das partes interessadas para a melhoria dos espaços verdes na metrópole de Teerã. Portanto, 190 especialistas em espaços verdes do município de Teerã foram selecionados como população estatística para entrevistas presenciais e de campo. A variável dependente de pesquisa foi definida como a melhoria dos espaços verdes medida em quatro dimensões (planejamento de espaços verdes, projeto de espaços verdes, implementação de espaços verdes e manutenção de espaços verdes). No entanto, a variável independente incluiu os aspectos da gestão participativa (participação na definição de metas, participação na tomada de decisões, participação na mudança organizacional, participação na resolução de problemas e cultura organizacional). Os resultados indicaram que apenas a cultura organizacional e a participação na mudança organizacional explicaram quase 96% das variações da gestão participativa e melhoraram 67% dos espaços verdes.

**Palavras-chave:** gestão participativa, espaço verde urbano, análise estrutural, Stakeholder, Teerã.

## 1. Introduction

The global growth in urban population will exacerbate environmental challenges and put natural resources under more strain. As expanding cities are affected by density, urban green spaces will be pushed further.

Therefore, planning and managing urban green spaces and ecosystem services are more important than ever before (Khoshkar et al., 2018). Urban development design focuses on the development of residential units and places less

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emphasis on nature and green space development (Wang and Chan, 2019). Shan et al. (2021) believed that green space planning in developed countries would often be limited to integrated indicators (i.e., green space per capita and regional scale) and that the real demands of citizens would be ignored. The density of cities can often lead to the destruction or elimination of urban green spaces. The growing pressure on urban green space can be due to the increasing economic value of land, for landowners are more interested in developing urban land for commercial, industrial, and residential purposes than for landscapes. Despite their lower profitability, urban green spaces bring aesthetic, environmental, recreational, social, and health benefits to people (Kruize et al., 2019). Responses to the needs of urban residents and green space visitors are affected by urban planning and management models (Atiqul Haq et al., 2021).

Many researchers such as Farahani and Maller (2018) and Guenat et al. (2021) believed that urban green spaces could be a promising tool for addressing climate challenges, e.g., heat islands and the pollution caused by urbanization.

Green space and biodiversity help improve natural environments, protect different species, mitigate the effects of climate change, and give people peaceful lives (Dong and Hauschild, 2017; Mavoa et al., 2019). Most people think it is essential to have green spaces near their homes (Kruize et al., 2020).

Due to its unique characteristics, Tehran Metropolis has over 8.2 million people amounting to 12% of Iran's population and accounting for over 25% of the economic income. With its natural factors, urban structure, over two million cars, 500,000 active motorcycles, 5,000 industrial units (equal to 25% of Iran's industries), consuming nearly 20% of the nation's total energy, and concentration of 70% of the service sector, Tehran has become one of the world's most polluted cities (Atlas Tehran, 2017; Bagheri et al., 2020). The urban population's health and well-being are strongly affected by urban system characteristics such as the density of built structures, the presence or absence of green and open spaces, high population density, traffic control, effects of urban heat islands, and the growing air pollution (Lakes et al., 2014). According to Khoshkar et al. (2018), facilitating green space management in dense urban projects in the future will require more dialogs and exchange of information between different actors in green space planning. Firstly, all those involved in the planning process should be aware of the importance and features of green spaces. Secondly, they should unite to provide and strengthen green spaces. Implementing stakeholder participation in environmental projects from the identification of stakeholders to project evaluation would require a review of techniques and practical tools (Luyet et al., 2012). A successful participation depends on the accurate assessment of stakeholders and their interests and estimation of the resources required to achieve the goals. Achieving public participation means to organize a participatory process in terms of who, when, and how to participate in the process. The effects of experience on designing and organizing a participatory process can then be determined (Uittenbroek et al., 2019). Successful and sustainable management of green space requires joint decision-making by communities and policy makers such

as municipalities, city councils and organizations based, in the city and region, which is the prelude to establishing a common relationship between people for solving green space issues (Jazayeri et al., 2023). Participation in urban green space management is the joint outcome of personal characteristics and environmental issues, which include the features of physical and social environments while ignoring those of personal environments (Fors et al., 2019; Bagheri et al., 2020). Recognized as a main resource for a viable and sustainable city, green space provides a natural meeting place to facilitate social interaction and community integration. It also precipitates the sense of individuality and belonging (Jabbar et al., 2021). Campagnaro et al. (2020) believed that urban communities would demand proper management and more green space. Modern management suggests that organizations should become more formal by providing more opportunities for participation in decision-making, pointing to the inception of participatory management (Boyarkova, 2012). Participatory management moves decision-making downwards and allows low-level stakeholders to be involved in the correct planning and implementation of strategies. Thus, participatory management allows stakeholders to participate in decision-making and make value-based decisions for green space improvement (Ibrahim and Bahyaye, 2019). Participatory management seeks to update and transfer knowledge and mobilize stakeholder capacity and creativity to change the existing reality, thereby turning changes into routine activities by developing an innovative environment. This management approach is achieved collectively and calls for creating strategies to manage conflicts and competitions. This is a method of organizational governance and management for expanding areas of growth, valuing stakeholder capacity, creating incentive for discourse, and increasing accountability in teamwork (Garcia et al., 2015). The most fundamental issue in participatory management and stakeholder involvement is to master the bureaucratic organization model, hierarchy, and management approach. The scope of participatory management depends on the organization and its nature, performance, and processes. Although stakeholders cannot join decision-making at every stage, regular exchange of information, ideas, consultations, thoughts, decision-making, and negotiation between the employer and stakeholders will definitely enhance the organization (Ogbo et al., 2016). Awareness of the stakeholders' knowledge and perceptions and their participation in urban green space management, planning, and constructive dialog between science and politics can help improve green space management processes (Larondelle and Lauf, 2016). Participatory green space planning and design by stakeholders will provide solutions that integrate people's needs, well-being, and an ecosystem's ability to provide services (based on demand), leading to a sustainable performance (Nastran et al., 2022; Olya et al., 2019).

Therefore, designing the participatory urban green space management model is essential for finding practical strategies in certain important issues that are the key to managing Tehran's green space with the participation of stakeholders. Different classes of people live in District 4 of Tehran due to its specific geographical and regional conditions and dimensions. However, the most important

reason is the unevenly-distributed green space in the nine regions in this district with some regions having external parks such as Lavizan Park and some having very small parks. Therefore, District 4 is the best option for designing a participatory green space management model. The lack of land for developing green spaces, the severe decline in Tehran's water resources, and the lack of water for irrigation and afforestation of this area due to the Letyan Dam's lowering water level have turned problems into a crisis in this district. These problems include using traditional irrigation without drip irrigation networks, the destruction of newly-planted plants by humans, the presence and spread of pests in this district and throughout all Tehran, especially the presence of bark beetles, the excessive use of pesticides, the destruction of green space by citizens, and the low rates of stakeholder participation. These problems have hindered progress and green space improvement (Tehran Municipality Database, 2019). Research has shown that participatory management and involvement of stakeholders in strategic decisions can help preserve, improve, and maintain green spaces (Tehran Municipality Database, 2019). The main question concerns the effect of participatory management on green space improvement. In other words, what is the optimal participatory management model for green space improvement? Hence, this study aimed to model participatory management for green space improvement in Tehran Metropolis. (Figure 1) presents the conceptual model based on the research literature. The conceptual model of this research is derived from Sashkin's model with green space improved components, which has been investigated for the first time in research, as well as the relationship between organizational culture and green space improvement components (planning, design, implementation and maintenance of green space) so far, It has not been investigated in Iran.

## 2. Research Methods

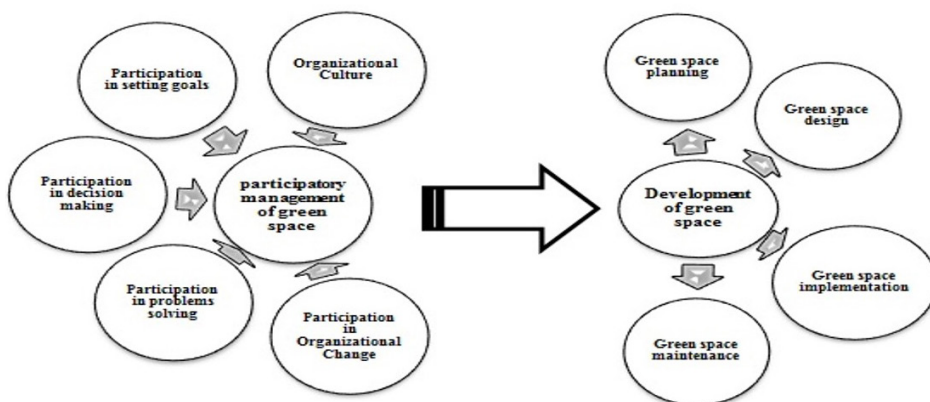
### 2.1. Research location and scope

According to the 2017 census by Statistical Center of Iran, Tehran has a population of 8,693,706 and is the world's 24<sup>th</sup> most populated city, West Asia's most populated city,

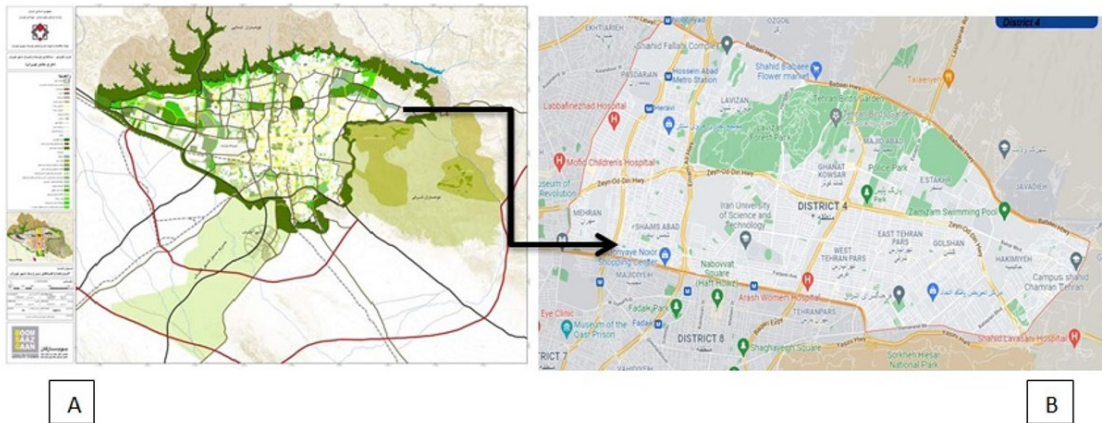
and the Middle East's third most populated metropolis. With its numerous needs and current civil issues, this metropolis is managed by 24 government organizations and agencies, the largest and the most important of which is the Tehran Municipality. Tehran is divided into 22 municipal districts and 117 urban districts (Tehran Municipality, 2019). According to the statistics from the Tehran Parks and Green Spaces Organization in 2018, Tehran has a per capita green space of 15.8 meters by only considering public green spaces. This metropolis has 2262 gardens with 42000 hectares of area. This study was conducted on District 4 of Tehran, one of its largest, most populated, immigrant-friendly, and built-up districts. It is located on the southern slope of Alborz mountain range and northeast of Tehran Metropolis with 20 neighborhoods, 163.4 km<sup>2</sup> of area, 9 regions, and a population of 919,001 people. It is home to 10% of Tehran's population (Tehran Municipality Database, 2019). (Figure 2) demonstrates the distribution of green space in the city of Tehran and District 4 (under study).

### 2.2. Statistical population and sampling method

In this applied descriptive non-experimental survey, a cross-sectional field method was employed for data collection. The statistical population included 190 green space experts in District 4 of Tehran such as managers, experts, green space contractors, and assistant councils of District 4 as well as the Education Department and Deputy of Regional Affairs of the Tehran Parks and Green Spaces Organization. Cochran's formula was adopted to evaluate a research sample of 125 people through proportional stratified sampling. The data collection instrument was a researcher-made questionnaire designed within the theoretical framework. This study also checked face, construct, and discriminant validities. Content and convergent validities were utilized to validate the measurement instrument. Cronbach's alpha and ordinal theta were used separately for each section of the questionnaire. Cronbach's alpha of 0.78–0.91 was obtained in SPSS, whereas the ordinal theta of 0.82–0.92 was obtained through R. They both indicated that the questionnaire was reliable.



**Figure 1.** Conceptual Participatory Management Model for Green Space Improvement.



**Figure 2.** (A) The State of Green Space in Tehran and (B) the State of Green Space in the district.

This study used the partial least squares (PLS) factor analysis to avoid the limitations of the covariance-based approach regarding distributive properties, measurement level, and model complexity (Chin, 2010, Fornell and Bookstein, 1982). The formative structures in this study are consistent with the PLS features. The analysis of PLS-SEM results is a two-stage process covering the separate evaluation of formative measurement models and the structural model. The formative measurement model used convergent validity, collinearity of variables, significance, and the fitness of external weights (Sarstedt et al., 2022). The structural model was evaluated through the coefficient of determination ( $R^2$ ), significance of path coefficients, and the redundancy index ( $Q^2$ ) (Shmueli et al., 2016).

### 3. Findings

According to the descriptive statistics, a majority of participants (39.2%) had master's degrees, whereas 1.6% had high school diplomas. Moreover, the majority of participants were men (63%), whereas 37% of them were women. Most of the participants (60%) were assistant councils, whereas 8.8% of them were managers.

The theoretical model was evaluated in PLS. The results of the convergent validity index used for validating the measurement instrument indicated that the AVE value of the latent variables was above 0.6. Therefore, based on the Fornell and Larcker (1981) validity criterion, the average variance extracted (AVE) increased from 0.5 (Hair et al., 2017; Azar et al., 2012), indicating that the measurement model had adequate convergent validity.

The multi-collinearity analysis was conducted on observable variables to show whether the designated indicators were accurate enough to measure the constructs.

Since all variance inflation factor (VIF) values were below 5 (Hair et al., 2011, 2014), the questions for different components had acceptable collinearity. Thus, the construct validity used to check the accuracy and importance of the indicators selected for measuring structures depicted that the indicators provided adequate factor structures for measuring dimensions in the research model (Azar and

Gholamzadeh, 2015). The  $p$ -value  $< 0.05$  confirmed the significance of external weights (Hair et al., 2019).

To evaluate the structural model, the coefficient of determination ( $R^2$ ) denotes the percentage of endogenous variable changes caused by the exogenous variable. The values of 0.75, 0.50, and 0.25 for hidden endogenous variables in the structural path model were respectively described as significant, moderate, and weak (Hair et al., 2011, 2019). However, if the hidden endogenous variable is affected by a few exogenous variables, average values of the coefficient of determination are also acceptable. The goodness of fit for the structural model was confirmed. After the reliability and validity of the criteria were confirmed, the structural model's explanatory and predictive ability and the significance and correlation of the path coefficients were evaluated (Hair et al., 2020). As a principle,  $Q^2$  values for a specific exogenous structure should be greater than 0 to indicate that the structural model is predictive for the structure. As a general rule,  $Q^2$  values greater than 0, 0.25, and 0.50 indicate small, medium, and large predictive correlation (Hair et al., 2019), indicating that this study had the necessary explanatory and predictive ability.

The significance of path coefficients is an indicator of confirming correlations. The significance of path coefficients complements the magnitude and direction of beta coefficients in the model. If the value is greater than the minimum statistic at the confidence interval, that relationship or hypothesis is confirmed.

At this stage, the variable refinement phase is completed, and it is ascertained that the indicators accurately measure the relevant concepts and variables; thus, the research hypotheses can be tested. The significance of the effects between research constructs can be analyzed by evaluating the results of the relationships between independent and dependent constructs through the relevant coefficient.

(Table 1) reports the significance of path coefficients in the initial model, indicating that participation in goal-setting had a significant correlation with green space implementation and maintenance. Moreover, participation in decision-making had a significant correlation with green space maintenance at the confidence interval, and



**Table 1.** The significance of the path coefficients of participation in goal-setting, decision-making, and problem-solving with green space components.

Correlations	Original sample	Sample mean	Standard deviation (SD)	T statistics	P value
<b>Green space implementation → participation in goal-setting</b>	<b>0.36</b>	<b>0.44</b>	<b>0.07</b>	<b>5.09</b>	<b>&lt;0.001</b>
Green space maintenance → participation in goal-setting	0.34	0.38	0.12	2.85	0.005
Green space maintenance → participation in decision-making	0.46	0.48	0.09	5.16	<0.001
Green space design → participation in problem-solving	0.69	0.72	0.07	1.52	<0.001
Green space maintenance → participation in problem-solving	0.62	0.62	0.07	8.91	<0.001

**Table 2.** The significance of the path coefficients of participation in organizational change and organizational culture with green space components.

Correlations	Original sample	Sample mean	Standard deviation (SD)	T statistics	P value
Green space implementation → participation in organizational change	0.44	0.46	0.14	3.22	0.002
Green space design → participation in organizational change	0.57	0.58	0.17	3.32	0.001
Green space implementation → organizational culture	0.61	0.66	0.06	10.77	<0.001
Green space planning → organizational culture	0.59	0.62	0.07	8.22	<0.001
Green space design → organizational culture	0.66	0.71	0.04	16.44	<0.001
Green space maintenance → organizational culture	0.74	0.76	0.05	15.73	<0.001

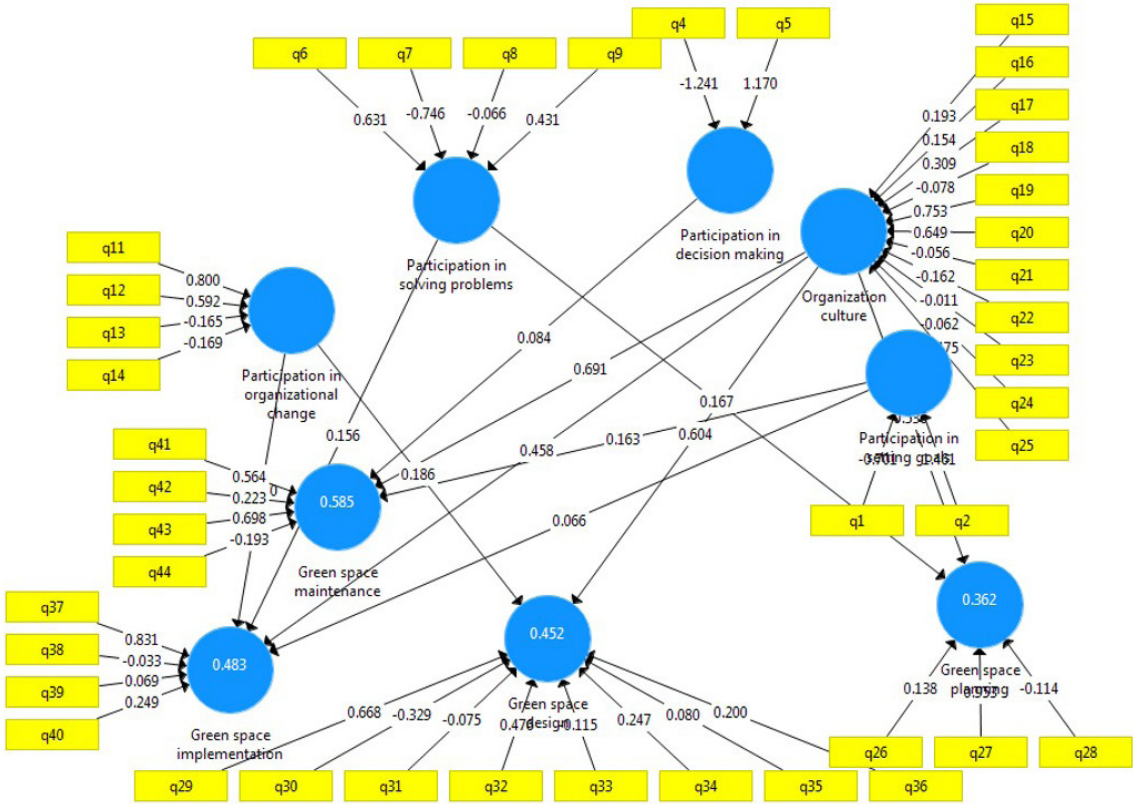
participation in problem-solving had a significant correlation with participation in designing and maintaining green space.

Note that all VIF values are under 5 and that the questions about different components have acceptable collinearity. The  $R^2$  values in both models show a moderate effect of the green space design. Regarding the component of participation in organizational change (nearly from 0.11 to 0.19) and the organizational culture model (from 0.34 to 0.54), the positive nonzero values of the  $Q^2$  criterion (predictive correlation) suggest that the observed values were properly reconstructed and that the model was predictive. Participation in organizational change had a significant correlation with green space implementation and design. According to the findings, the correlation between organizational culture and green space improvement components remained unchanged from the original model. Out of the participatory management components, organizational culture had the most effective role, whereas participation in goal-setting had the weakest correlation and role in creating participatory management. (Table 2) demonstrates that participation in organizational change had a significant correlation with green space implementation and design. The table also indicates that organizational culture had a significant correlation with all green space improvement components.

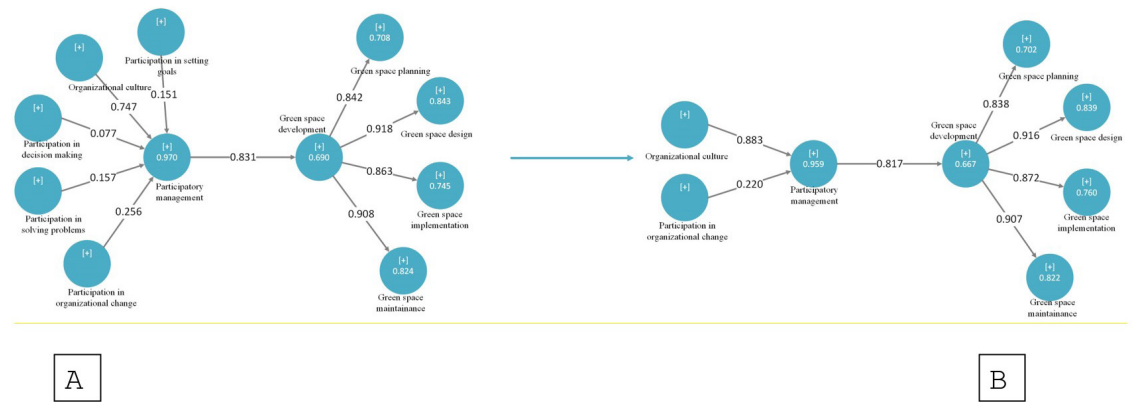
The correlations of every participatory management component with green space components were determined. (Figure 3) depicts the final model, which explained 58% of green space maintenance changes, 48% of green space

implementation changes, 45% of green space design changes, and 36% of green space planning changes.

(Figure 4A) illustrates the initial model and indicates that 97% of cooperative management changes are explained by its five components, whereas 69% of green space improvement changes are explained by the participatory management variable. Out of the participatory management components, organizational culture had the most effective role, whereas participation in goal-setting had the weakest correlation and role in establishing participatory management. In this figure, green space design had the strongest correlation of the green space improvement components. For the final interpretation, the significance of these correlation should be tested. (Table 3) reports the significance levels of the following correlations: The correlation between participation in decision-making and participatory management, the correlation between participation in problem-solving and participatory management, and finally, the correlation between participation in goal-setting and participatory management were insignificant. These three correlations were removed, and the final model can be seen in (Figure 4B). Organizational culture and participation in organizational change explained nearly 96% of participatory management changes. Organizational culture was recognized as a stronger factor in establishing participatory management. The impact factor between collaborative management and green space improvement was 0.82, whereas collaborative management explained nearly 67% of green space improvement changes.



**Figure 3.** The Final Model for Evaluating the Correlation of Participatory Management with Individual Green Space Improvement Components.



**Figure 4.** (A) The Initial Model for Investigating the Relationship between Participatory Management and Green Space Improvement in an Integrated Manner (B) The Final Model for Investigating the Relationship between Participatory Management and Green Space Improvement.

The results confirmed the main research hypothesis (i.e., establishing the participatory management model of green space improvement), for the relationship between participatory management and green space improvement became significant in the final model. Moreover, Tables 4 and 5 indicate that participatory management with impact factors of 0.68, 0.75, 0.71, and

0.74 affected green space planning. In other words, they are related to green space maintenance, thereby confirming the research hypotheses. Participation in goal-setting, decision-making, and problem-solving had no significant effects on the realization of participatory management, rejecting these hypotheses. However, organizational change and organizational culture had significant effects on the

**Table 3.** Analyzing the significance of the relationship between participatory management and green space improvement in an integrated manner in the initial model.

Correlations	Original sample	Sample mean	Standard deviation (SD)	T statistics	P value	Results
Green space improvement → Green space improvement	0.86	0.87	0.03	27.57	<0.001	Confirmed
Green space planning → green space improvement	0.84	0.85	0.03	31.06	<0.001	Confirmed
Green space design → green space improvement	0.92	0.93	0.01	60.61	<0.001	Confirmed
Green space maintenance → green space improvement	0.91	0.91	0.02	53.29	<0.001	Confirmed
Participatory management → organizational culture	0.75	0.74	0.07	9.93	<0.001	Confirmed
Green space improvement → participatory management	0.83	0.86	0.03	30.17	<0.001	Confirmed
Participatory management → participation in organizational change	0.26	0.21	0.07	3.67	<0.001	Confirmed
Participatory management → participation in decision-making	0.08	0.02	0.09	0.88	0.378	Rejected
Participatory management → participation in problem-solving	0.16	0.16	0.09	1.81	0.073	Rejected
Participatory management → participation in goal-setting	0.15	0.14	0.08	1.91	0.058	Rejected

**Table 4.** Evaluating the indirect path coefficients in the relationship between participatory management and green space improvement in an integrated manner in the final model.

Components	Green space implementation	Green space planning	Green space design	Green space maintenance	Green space improvement
Organizational culture	0.63	0.60	0.66	0.65	0.72
Participation in organizational change	0.16	0.15	0.16	0.16	0.18
Participatory management	0.71	0.68	0.75	0.74	

realization of participatory management, confirming these hypotheses (Tables 4 and 5) report the results.

#### 4. Results and Discussion

According to the results, participatory management had significant effects on green space planning, design, implementation, and maintenance. Malik (2017) reported that participatory green space management policy in municipalities was beneficial to green space improvement. Atiqul Haq et al. (2021) concluded that it was necessary to adopt an integrated approach to green space design, maintenance, monitoring, and evaluation in order to maximize green space benefits according to the environment and environmental sustainability. Out of all green space improvement variables, participatory management had the greatest effect on green space design. Mpofu (2013) reported that most green space management strategies were based on the concept of equal access and distribution of green space. The results

also suggested that participatory management was related to all areas of green space improvement. Lindgren (2010) described green space management including green space maintenance, planning, and development. Thus, green space management can be considered a comprehensive activity that covers green space repair and maintenance. Marinosci (2020) and Pantaloni et al. (2022) argued that adopting a participatory green space management plan would greatly affect quality, reduce green space maintenance costs, and improve sustainability.

According to the results, participation in decision-making in the integrated analysis had a minor effect on establishing participatory management. Although this relationship was insignificant, participation in decision-making only had a significant effect on green space maintenance. For designing more effective and appropriate participatory processes, Reed (2008) showed that, to better perceive the research results, the stakeholder participation factors should be prioritized to produce stronger and enduring decisions in various fields. Moreover, Ulibarri (2018) believed that the participatory approach increased trust in using information

**Table 5.** Evaluating the significance of the indirect path coefficients in the relationship between participatory management and green space improvement in an integrated manner in the final model.

Correlations	Original sample	Sample mean	Standard deviation	T-statistic	P-value
Organizational culture→ green space implementation	0.63	0.67	0.05	12.13	<0.001
Organizational culture→ green space planning	0.60	0.65	0.05	12.10	<0.001
Organizational culture→ green space development	0.72	0.76	0.05	13.56	<0.001
Organizational culture→ green space design	0.66	0.71	0.05	12.82	<0.001
Organizational culture→ green space maintenance	0.65	0.69	0.05	12.13	<0.001
Participatory management→ green space implementation	0.71	0.75	0.04	19.40	<0.001
Participatory management→ green space planning	0.68	0.73	0.03	21.65	<0.001
Participatory management→ green space planning	0.75	0.79	0.03	24.82	<0.001
Participatory management→ green space maintenance	0.74	0.78	0.03	21.57	<0.001
Participation in organizational change→ green space implementation	0.16	0.13	0.06	2.62	<0.001
Participation in organizational change→ green space planning	0.15	0.13	0.06	2.63	0.010
Participation in organizational change→ green space development	0.18	0.15	0.07	2.68	0.008
Participation in organizational change→ green space design	0.16	0.14	0.06	2.64	0.009
Participation in organizational change→ green space maintenance	0.16	0.14	0.06	2.68	0.008

for decision-making and solving organizational problems. Guenat et al. (2021) indicated that the green space challenges of stakeholders were mostly due to poor management features such as poor green space maintenance declining security. Furthermore, the participation of different stakeholders in green space planning, maintenance, and management can improve green spaces.

The other results concern the variable of participation in goal-setting in integrated analysis, which had a minor role in establishing participatory management, suggesting no correlations between participation in goal-setting and green space implementation and maintenance. Teo and Low (2016) showed that organizations were constantly looking for certain strategies to achieve their (general or specific) goals. Goal setting is a tool to help employees achieve a competitive advantage, supporting the argument that there is a good reason why goal-setting (as individuals, in groups, or on the organizational level) improve operations. King (2003) analyzed participation in goal setting and reported that higher participation in goal setting increased goal acceptance, thereby affecting performance. Uittenbroek et al. (2019) found that a more systematic and informed approach in which public participation goals and plans were clearly communicated and discussed by participants increased the likelihood of achieving the objectives. Stakeholder analysis is an essential step in successful planning of participatory green space (Nastran, 2014). The limitations of the current research include the lack of similar studies, the use of a questionnaire as a research tool and the possibility of the respondents making mistakes when answering the questions, the cross-sectional nature of the research, and the inability to control all unwanted variables.

Javaid and Habeeb (2018) argued that participation in urban green space planning denoted public empowerment, and recognizing their contribution was a vital component for legitimizing green plans in democratic governance. Consistent with the results of this study, Haaland and van Den Bosch (2015) found that stakeholder participation and encouraging public participation was very important to green space planning. Zhang et al. study (Zhang et al., 2020) indicated that stakeholders needed to know about facilitating a participatory process, moderating a discussion, mediating in conflicts, holding meetings, and cooperating with other stakeholders to participate and assume new roles in urban planning, something which is consistent with the results of this study. Daneshyar et al. (2021) argued that the roles of stakeholder groups (consultation, participation in planning, participation in decision-making, implementation and monitoring) have a great impact on the proper design and implementation of the green space participatory management process model. Therefore, to improve the participatory management of green space, special attention should be paid to the roles of the stakeholders. The most important action in the implementation of participatory management is the training of the stakeholders and, in the first stage, the training of managers and employees. Managers and employees should be aware of the thinking about participating. By receiving the necessary training about participatory management, managers realize that the purpose of participatory management is not the involvement of stakeholders, but rather a kind of cooperation in order to optimize the work process in the organization and the atmosphere of organizational trust.



Out of all the factors for establishing participatory management, only organizational culture and participation in organizational change help establish participatory green space management. These two components explained approximately 96% of variations in participatory management. Research by Rashid et al. (2004) also indicated that organizational culture was essential to organizational change. Furthermore, Garcia et al. (2015) indicated that organizational culture guided by the adopted management style had an effect on organizational change. Lavafan and Soltani (2014) argued that promoting employee participation through organizational culture had countless benefits for the organization, a finding which is consistent with the results of this study.

## 5. Conclusion and Recommendations

The PLS<sup>1</sup> results showed that out of all the factors for establishing participatory management, only organizational culture and participation in organizational change can help to establish participatory green space management. Together, these two components explained nearly 96% of the changes in participatory management. This model explained 58% of green space maintenance changes, 48% of green space implementation changes, 45% of green space design changes, and 36% of green space planning changes. The effective implementation of participatory green space management (green space planning, design, implementation, and maintenance) was achieved by organizational culture and organizational change and was ultimately determined by compatible factors. When strengthened together, organizational culture and structure shaped decisions and activities and affected organizational participation. Therefore, regarded as determinative factors in improving the implementation of participatory green space management, organizational culture and organizational change can be facilitators, obstacles, or even inhibitors. It is recommended that the municipality consider previous analyses and its cultural precedence (organizational values and outlook) before deciding on implementing participatory green space management.

Based on the results and the importance of implementing participatory green space management, the following recommendations are made:

### Micro-Level Recommendations:

- Planning to expand the urban bounds only by creating green spaces according to the area of District 4: Given its 8300-hectare boundary, the per capita area of Tehran's green space can be expanded through green space planning and design.
- Utilizing the unused land owned by the municipality for creating green spaces to increase the per capita green space: Since military barracks contribute largely to District 4's per capita green space inaccessible to citizens, the per capita green space can be expanded by converting the unused land owned by the municipality.

### - Macro-Level Recommendations:

- Improving organizational culture by enhancing the spirit of teamwork, honesty, and transparency as prerequisites for building trust
- Holding meetings with all team members at regular intervals to discuss progress
- Promoting openness to criticism among municipality managers and employees at all levels of the municipality as the most important instrument for progress
- Valuing meritocracy and infusing competition between employees by managers for progress through learning
- Receiving feedback on the results of suggestions to employees for motivating and inspiring creativity.

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