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Factors Affecting Green Governance with an Emphasis on Ethical Teachings

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ABSTRACT

Green governance, grounded in ethical teachings, emphasizes the incorporation of environmental sustainability and social justice into decision-making processes. It seeks to balance environmental responsibility with ethical standards and ultimately contributes to a more sustainable and just society. The present study aimed to identify the factors affecting green governance with an emphasis on ethical teachings. In terms of purpose, this study is applied-developmental, and it was conducted using a descriptive-survey method. In the qualitative phase, the statistical population consisted of professors, experts, and academics in the field of environmental studies in Iran, of whom 15 were selected through purposive sampling until theoretical saturation was achieved. In the quantitative phase, the statistical population included all managers in the environmental sector in Tehran. Based on the sample-size formula for structural equation modeling used in Kline (2011), 200 participants were selected through convenience sampling (Kline, 2011). Data were collected through semi-structured interviews in the qualitative phase and a questionnaire in the quantitative phase. The data were analyzed using thematic analysis and MAXQDA software in the qualitative phase, and structural equation modeling and PLS software in the quantitative phase. The initial model was designed with 76 initial codes, which were categorized into 14 axial codes. According to the results of exploratory and confirmatory factor analyses, all 76 factors were confirmed as indicators of green governance with an emphasis on ethical teachings. The results indicate that green governance depends on integration among management, economics, technology, government policies, and social participation. The indicators identified in this study can support the development of more effective policies and the improvement of green governance based on ethical principles.

Keywords: Green governance; ethics; ethical teachings.

Introduction

The Earth's resources are not unlimited; rather, they are being depleted. Pollution even threatens the survival of humankind on the planet. Therefore, if human beings are to protect the environment and ensure the survival of future generations, they must necessarily attend to the ethical issues that arise from the environment. Green governance is a new, multilateral, and ethically oriented system in which the roles of the state and civil institutions must change. This requires the development of a new understanding of social development and sustainable development that goes beyond the maximization of capital accumulation and economic growth. By allowing the free flow of information and expanding the participation of ordinary people across different levels of society, the overall system of green governance will be better able to address the dispersed complexity of environmental problems (Kumar & Dwivedi, 2023). Financial, economic, and environmental crises that have occurred repeatedly have changed some of our most important assumptions about the global economy. As a result, major powers today do not agree on how the world should be organized. Aligning our beliefs and

expectations in this regard is one of the most important necessities for stimulating global action and transforming international regimes. The environment, as a fundamental condition of life, is essential for the promotion of human dignity and welfare and for the realization of other human rights. Thus, the struggle for environmental governance in the common interest becomes a struggle for human dignity and environmental well-being. However, this requires ethically oriented norms, institutions, and innovative legal and policy procedures to recognize and support environmental commons as a legal and ethical subject. The establishment of a new system of green governance requires ethically oriented laws. The social and political expression of governance must be articulated within a framework of law and moral values that takes both the environment and human beings seriously. What might such a framework look like, and how might it be realized? How can appropriate limits be placed on the market exploitation of nature? What legal and ethical principles, institutions, and procedures can help manage a shared resource fairly and sustainably over time, while being sensitive to the environmental rights of future generations as well as the present generation?

Green governance based on the green economy and human rights, sustainable development, ethical and value paradigms, and intergenerational rights plays a fundamental role in building a future for humanity through the practical assertion of the collective right to a clean and healthy environment. Therefore, reclaiming natural and environmental commons should be defined as a social priority (Debbarma & Choi, 2022; Shah et al., 2022). The proposed model of green governance is a general concept rather than a single implementation. The advantage of such a networked multilateral governance system is that it can help us move beyond the inefficient premises of the current system, provide new platforms for ordinary people to represent their environmental interests as well as their ethical and human-rights values, and thereby contribute to a closer alignment of governance. Civil society, people-centered institutions, self-organized formations, bottom-up perspectives, ethical teachings, and the value and cultural system of human society are important and necessary components for the transition to green governance. Informal norms, institutions, and procedures are usually created democratically in green governance. Establishing a new green governance system requires transparency and stability in law. The social and political expression of governance must be formulated within a framework of law and policy that takes the environment and humanity seriously (Temski & Kolahi, 2022).

In light of the foregoing, green governance is essential for sustainable development, resource conservation, and the continuation of human life because it integrates environmental protection with green management, macro-level policymaking, and the creation of effective ethical norms. Green governance ensures that resources are used responsibly and that sustainability is promoted in natural systems and the environment. This model helps solve environmental dilemmas and problems while preserving sustainable economic stability in the long term. Since understanding ethical teachings can be complex and may vary across cultures and belief systems, the aim is to envision a new and valid architecture of law and policy that enables diverse communities to transform their management of human activities, particularly economic activities, in ways that guarantee a clean and healthy natural environment. Therefore, this study was conducted with the aim of examining green governance with an emphasis on ethical teachings.

Based on the above discussion and on a review of domestic and international studies, ethics can be understood as general beliefs, attitudes, or standards that guide customary behavior. In this sense, every society has its own ethical foundations, because society itself determines specific beliefs, attitudes, and standards that become customary. Whether or not this choice is conscious, certain beliefs, attitudes, and standards determine the behavior of every individual. To assess the environmental crisis of the present era on the scale of ethics, the anthropocentric ethics that emerged in the sixteenth century must first be placed on one side, and the roots and consequences of the dominance of that ethics must be assessed. Then, one must seek a universal and all-encompassing ethics that can preserve its advantages while leaving behind its harmful consequences. The goal of this study is to present a conceptual model that can represent a small step at the beginning of this complex path.

In today's world, ethical values have been overshadowed by economic values, and modern capitalism, through the extraordinary power of media and the encouragement of consumerism, has created conflict between people and nature. Under these conditions, the destruction of natural ecosystems has been marginalized, and human-centered issues have come to dominate philosophy. Moving beyond the current situation by relying on a universal, human-centered ethics is an undeniable necessity, especially in light of the harmful consequences of declining forest cover, loss of biodiversity, increased runoff, changes in aquatic ecosystems, the intensification of dust storms, and similar phenomena. The decline of biodiversity and the extinction of animal species in the name of economic benefit represent a form of grave destruction that is not less serious than other catastrophes of the twentieth century. Air, soil, and water pollution—elements on which human life and the life of every other species depend—is a form of self-destruction. A civilization that ignores the warnings and guidance of its experts and intellectuals and fails to lead society toward creative, wise, and virtuous living is condemned to destruction.

In contrast to anthropocentric approaches, environmental ethics can be introduced as a comprehensive, ecocentric, and universal ethics that, while considering cultural plurality, species diversity, and habitat differences, is cosmopolitan in nature. Because environmental ethics is universal, it can serve as a foundational approach for changing course. Ecocentric thinkers are concerned with social justice, particularly economic equality. However, if justice is to be universal, it must include all beings in the world and establish a balance between protecting other species and human welfare. The extinction of other species for human welfare is not acceptable in ecocentric ethics, and solutions to poverty and social injustice must not come at the cost of destroying natural ecosystems. From the standpoint of nature, however, there is little difference between the dominant economic currents in today's world; they differ mainly in how they divide the "cake" of nature. These currents view ecosystems and natural habitats as arenas of exploitation, and none of them can provide a basis for a justice that neither neglects nature nor overlooks humanity. Environmental ethics, due to its cosmopolitan character, extends the horizon of ethics beyond the human species to include animals, plants, landscapes, and the biosphere. Ecocentric cosmopolitan ethics is an ethics for wildlife and domestic life, and it gives priority to moral evaluation rather than personal interest. Advocates of self-interest are the source of devaluing the natural world, instrumentalizing nature, and exploiting it. Pursuing personal interest has led to dominant environmental crises such as global warming and climate change (Mantizadeh & Karimi-Goghari, 2016). The model of this study seeks to highlight understanding, reflection, and acceptance of the position of green governance and the interspecies and transspecies responsibility of human beings based on ethical teachings.

Respect for nature means preserving biodiversity and preventing the unauthorized exploitation of natural resources. This teaching contributes to the protection of ecosystems and various animal and plant species and promotes environmental sustainability (Mashhadi, 2021; Temski & Kolahi, 2022).

Sustainability refers to the use of natural resources in a way that also meets the needs of future generations. By reducing pollution and using clean technologies, this teaching helps maintain ecological balance and prevent environmental degradation (Debbarma & Choi, 2022; Mashhadi, 2021).

Environmental justice refers to the fair distribution of natural resources and attention to the needs of local communities. This teaching reduces inequalities, improves quality of life in different communities, and prevents negative environmental effects (Baker, 2024; Temski & Kolahi, 2022).

Responsibility means accountability for environmental actions and the assurance of environmental protection. By increasing public awareness and encouraging active participation in environmental protection, this teaching helps reduce negative environmental impacts (Begum et al., 2022; Mantizadeh & Karimi-Goghari, 2016; Mazaheri Tehrani et al., 2022).

Sustainable development means supporting green technologies and sustainable development projects. This teaching reduces negative environmental effects, improves the quality of human life, and contributes to the achievement of sustainability goals (Baah et al., 2024; Debbarma & Choi, 2022; Roozbeh et al., 2023).

The ethical teaching of green innovation refers to the set of principles and values considered in the development and adoption of innovative environmentally compatible technologies and processes. These teachings encourage sustainable behaviors and support innovative solutions for reducing negative environmental impacts. Green governance policies, by supporting sustainable innovations, can contribute to the preservation of natural resources and the reduction of environmental harm. The more strongly companies recognize the importance of environmental and economic governance, the greater their inclination toward green innovation capacities. Moreover, greater emphasis on environmental and governance dimensions increases firms' inclination toward green innovation capabilities (Salihi et al., 2024).

The ethical teaching of green fiscal policy refers to ethical principles and values considered in the formulation and implementation of fiscal policies aimed at supporting the environment and environmental sustainability. These teachings can reduce negative environmental effects and promote sustainable behavior at the societal level. They include the formulation of fiscal policies that support sustainable consumption of natural resources while considering the needs of future generations; the encouragement of investment in environmentally compatible projects and clean technologies that reduce pollution and preserve natural resources; and the promotion of transparency and financial accountability in green governance. Green fiscal policies and green credit mechanisms can reduce environmental pollution and encourage environmentally responsible investment. Regulators should accelerate the development of green financial products and strengthen the capacity of financial institutions to provide green credit (Cheng & Xu, 2024; Roozbeh et al., 2023).

The ethical teaching of waste management refers to the ethical principles and values considered throughout the waste management process, from collection to disposal. These teachings not only reduce environmental impacts but also improve quality of life and sustainability. Waste management emphasizes preventing the production of unnecessary waste, thereby reducing pressure on natural resources and the environment. By focusing on waste reduction, green governance policies and programs can reduce resource use and protect the environment. Recycling and reuse also reduce the need for extraction of new resources and decrease environmental pollution. Supporting recycling and reuse in green governance policies can improve sustainability and reduce pollution. Other important issues include proper management of hazardous waste, protection of the environment and human health, and public participation through education and awareness programs (Liu et al., 2021; Mazaheri Tehrani et al., 2022).

The ethical teachings of environmental laws refer to the set of principles and values considered in the formulation and implementation of laws for environmental protection. Environmental laws must be designed in such a way as to meet the needs of current and future generations without abruptly exhausting natural resources. They play an important role in green governance and contribute to environmental protection, sustainability, and quality of life, while helping policymakers and individuals move toward sustainable management of natural resources and ecosystem protection (Roozbeh et al., 2023).

Based on the foregoing, the initial conceptual model of the study is presented below.

The initial conceptual model derived from the literature is presented in Figure 1.



Figure 1. Initial conceptual model of the study derived from the research literature

The study was guided by the following research questions:

Main question: What are the factors affecting green governance with an emphasis on ethical teachings?

How can the dimensions and components of the green governance model with an emphasis on ethical teachings be identified?

How can the model levels and internal relationships among its dimensions be examined?

How can the final research model be validated?

Methodology

This study used an exploratory sequential mixed-methods design. It is applied-developmental in purpose and descriptive-survey in its quantitative phase. This design was selected because the study first needed to identify the conceptual indicators of green governance through qualitative inquiry and then validate the extracted structure quantitatively through factor-analytic procedures.

In the qualitative phase, the statistical population consisted of professors, environmental experts, and academic specialists with relevant knowledge of green governance, environmental management, public administration, or environmental ethics in Iran. Fifteen participants were selected through purposive sampling. The selection criteria were expertise in the study area, willingness to participate, and the ability to provide informed views on ethical and managerial dimensions of green governance. Semi-structured interviews were continued until theoretical saturation was reached; that is, additional interviews no longer produced substantially new codes or categories.

The interview protocol included questions about the meaning of green governance, ethical foundations of environmental policymaking, institutional requirements, legal and technological mechanisms, stakeholder participation, accountability, and media and civil-society roles. The interviews were reviewed and coded using thematic analysis. Open codes were extracted from the interview material and then grouped through axial coding. To improve the credibility of the qualitative analysis, the

codes were repeatedly compared with the interview texts, similar codes were merged, and the final categories were reviewed for conceptual consistency with the research objectives.

In the quantitative phase, the statistical population consisted of managers working in the environmental sector in Tehran in 2024. Based on the sample-size logic commonly used for structural equation modeling and the minimum sample-size recommendations discussed by Kline (2011), 200 participants were selected through convenience sampling (Kline, 2011). Although larger samples are often recommended for exploratory factor analysis when many observed indicators are included, the present study used the sample as an applied validation sample and interpreted the findings with this limitation in mind. The adequacy of the sample for factor analysis was also examined empirically through the KMO index and Bartlett's test.

The quantitative instrument was a questionnaire developed from the qualitative findings. The questionnaire included the indicators extracted from the thematic analysis. Data were analyzed using exploratory factor analysis to examine the underlying factor structure and second-order confirmatory factor analysis/PLS-SEM to validate the higher-order construct of green governance with an emphasis on ethical teachings. MAXQDA was used for the qualitative coding process, and PLS-based structural equation modeling was used for the quantitative validation phase.

The qualitative and quantitative phases were integrated at the interpretation stage. The qualitative phase generated the initial components and indicators, while the quantitative phase assessed the statistical adequacy, factor loadings, reliability, and overall measurement structure of the model. Therefore, the final model should be understood as a qualitatively grounded and quantitatively validated framework. A methodological limitation is that the same quantitative sample was used for the factor-analytic validation procedures and that discriminant-validity indices requiring a full construct-level correlation matrix could not be independently recomputed from the available summary outputs.

Research Findings

The results of axial coding show that 76 initial codes were categorized into 14 categories.

Table 1. Axial coding

Component	Indicator
Balanced and integrated management	Development of effective leadership in the governance system
	Balanced growth and development in economic, social, and environmental dimensions
	Sound decision-making and policymaking
	Development of feedback mechanisms in governance
	Attitudes of government officials toward green governance
	Capacity and capability of government officials to accept green governance
Financial resource provision	Financing, accumulation, and capital management for implementing policies related to green governance
	Using financing principles and focusing on priority setting in the green governance system
	Management of infrastructure creation and green resource production
	Strategic budgeting for implementing green governance
	Financial capacity of the government
Legal requirements	Promotion of lawfulness in society
	Creation of enforcement instruments for policies, including regulations, powers, incentives, and sanctions
	Existence of binding green governance laws
	Monitoring the implementation of binding green governance laws
Political environment	Identification and definition of the roles of public, private, voluntary, and civil society actors
	Existence of a political culture supporting green governance
	International treaties and protocols
	Periodic monitoring of government performance by international institutions
Technological requirements	Establishment of e-government
	Green technologies and methods
	Use of green administrative technologies
	Provision of services with an environmental-protection approach
	Development of privatization and use of the capacity of the private sector
	Electronic and information technology infrastructure
	Existence of electronic communications and networks
	Skilled and specialized human resources for green governance
Government policies	Democracy

	Empowerment of civil society
	Stability of macro-level management
	Observance of environmental issues
Green governance affairs	Strategic orientation
	Development of knowledge resources
	Optimal management of financial and environmental resources
	Improvement of the health of public-sector administrations
	Value orientation and ethical orientation
Contractual affairs	Development of technical knowledge of green governance
	Development of implementation and operational platforms
	Management of service delivery capacity
Participatory affairs	Development of stakeholder participation for green governance
	Development of formal and informal cooperation networks among stakeholders
	Creating the grounds and motivation for coalition/participation among stakeholders
	Management of conflicts of interest
	Development of participation across different levels and sectors of society
	Creating opportunities for meetings and exchange of ideas among societal actors
	Formalizing relationships among green governance stakeholders
	Strengthening social capital and effective communication among stakeholders
Civil society demand-making	Increasing citizens' awareness
	Existence of committed and responsible citizens
	Citizens' willingness to make demands
	Culture of demand-making in society
	Willingness to make demands in civil society
	Culture of civil society demand-making in society
	Politicians' demand-making from organizations
	Increasing citizens' awareness
	Political maturity of society
Ethical leadership style	Sense of commitment to individuals and society
	Inclination of macro-level management to be accountable to stakeholders
	Inclination of organizations to be accountable to citizens
Community growth and excellence	Increasing public trust in government
	Appropriate communication between stakeholders and government
	Development of ethical principles
	Creating a sense of commitment and cohesion in society
	Strengthening and formation of public participation
	Social vitality
	Existence of an appropriate cultural platform
	Appropriate values and social norms for social accountability
Media monitoring	Mechanisms for handling the complaints of social stakeholders
	Mechanisms for free access to information
	Preparation and publication of performance reports periodically
	Holding informative meetings with the media
	Informational role of the media
	Supervisory role of the media over organizations' social accountability
Responsiveness	Periodic analysis of the needs of social stakeholders
	Formulation of a citizens' charter of accountability
	Satisfaction of social stakeholders

In factor analysis, the principal components method was used to extract the factors. The Kaiser–Meyer–Olkin (KMO) sampling adequacy index was 0.950, indicating that the research data could be reduced to a number of underlying and fundamental factors and that the sample size was adequate. Moreover, Bartlett's test result (39,661.339), which was significant at the 0.01 error level, indicated that there was satisfactory correlation among the indicators within the factors.

The adequacy of the data for factor analysis was assessed through the KMO index and Bartlett's test, as presented in Table 2.

Table 2. Sampling adequacy index and Bartlett's test

Index	Value
Kaiser–Meyer–Olkin (KMO) sampling adequacy index	.950
Bartlett's test	39661.339
Degrees of freedom	5356
Significance level	.000

Table 3 presents the total variance explained after rotation and determines the factors retained in the analysis. Factors with eigenvalues lower than 1 were excluded from the analysis because their inclusion did not explain additional variance. The results show that 14 factors had eigenvalues greater than 1 and therefore remained in the analysis. In other words, the questionnaire indicators were influenced by 14 underlying factors. These 14 factors explained more than 89% of the variability (variance) of the variables.

Table 3. Number of factors and total extracted variance

Factor	Initial eigenvalue	% variance	Cumulative %	Rotated eigenvalue	% variance	Cumulative %
1	34.833	40.038	40.038	11.354	13.05	13.05
2	8.829	10.148	50.186	11.1	12.759	25.809
3	5.148	5.917	56.104	8.626	9.915	35.724
4	4.808	5.526	61.63	7.711	8.863	44.587
5	3.864	4.442	66.071	6.751	7.759	52.346
6	3.725	4.281	70.352	5.255	6.04	58.386
7	2.938	3.377	73.729	5.139	5.907	64.294
8	2.899	3.333	77.062	4.484	5.154	69.448
9	2.478	2.849	79.911	4.195	4.821	74.269
10	2.205	2.534	82.445	3.939	4.528	78.797
11	1.843	2.118	84.563	3.045	3.5	82.297
12	1.794	2.062	86.624	2.487	2.858	85.155
13	1.597	1.836	88.46	2.193	2.521	87.677
14	1.29	1.483	89.944	1.972	2.267	89.944

The results show the percentage of variance explained by each factor. Fourteen factors with eigenvalues above 1 were extracted. Thus, the set of indicators can be reduced to 14 conceptual factors. The eigenvalue of the first factor was 11.354 and the eigenvalue of the last factor was 1.972.

The second-order confirmatory factor analysis results for the observed variables are reported in Table 4.

Table 4. Results of second-order factor loadings for observed variables

Items	Factor loading	Standard deviation	t statistic	P values
Green governance with emphasis on ethical teachings -> Technological requirements	0.810	0.024	34.253	0.000
Green governance with emphasis on ethical teachings -> Legal requirements	0.772	0.044	17.574	0.000
Green governance with emphasis on ethical teachings -> Green governance affairs	0.842	0.021	40.428	0.000
Green governance with emphasis on ethical teachings -> Contractual affairs	0.783	0.033	23.579	0.000
Green governance with emphasis on ethical teachings -> Participatory affairs	0.786	0.033	23.655	0.000
Green governance with emphasis on ethical teachings -> Financial resource provision	0.830	0.021	39.626	0.000
Green governance with emphasis on ethical teachings -> Community growth and excellence	0.802	0.030	26.757	0.000
Green governance with emphasis on ethical teachings -> Ethical leadership	0.719	0.040	17.789	0.000
Green governance with emphasis on ethical teachings -> Government policies	0.759	0.026	29.148	0.000
Green governance with emphasis on ethical teachings -> Political environment	0.747	0.035	21.478	0.000
Green governance with emphasis on ethical teachings -> Balanced and integrated management	0.770	0.029	26.124	0.000
Green governance with emphasis on ethical teachings -> Civil society demand-making	0.812	0.025	32.621	0.000
Green governance with emphasis on ethical teachings -> Responsiveness	0.773	0.038	20.548	0.000
Green governance with emphasis on ethical teachings -> Media monitoring	0.818	0.025	32.485	0.000

As the second-order confirmatory factor analysis shows, all factor loadings were greater than 0.4; therefore, the measurement model was homogeneous and the factor loadings were acceptable. The significance results also showed that

the t statistics for all items were greater than 2.58, meaning that the relationships between the items and their corresponding latent variables were accepted at the 99% confidence level. In addition, the average variance extracted (AVE) for the second-order green governance construct, calculated from the reported factor loadings, was approximately 0.621. This value exceeds the commonly used threshold of 0.50 and therefore provides additional evidence of convergent validity for the higher-order construct. Because the full latent-variable correlation matrix was not available, Fornell-Larcker and HTMT discriminant-validity indices could not be independently recalculated and should be reported in future validations of the model. The standardized factor loading values of the measurement model are shown in Figure 2.

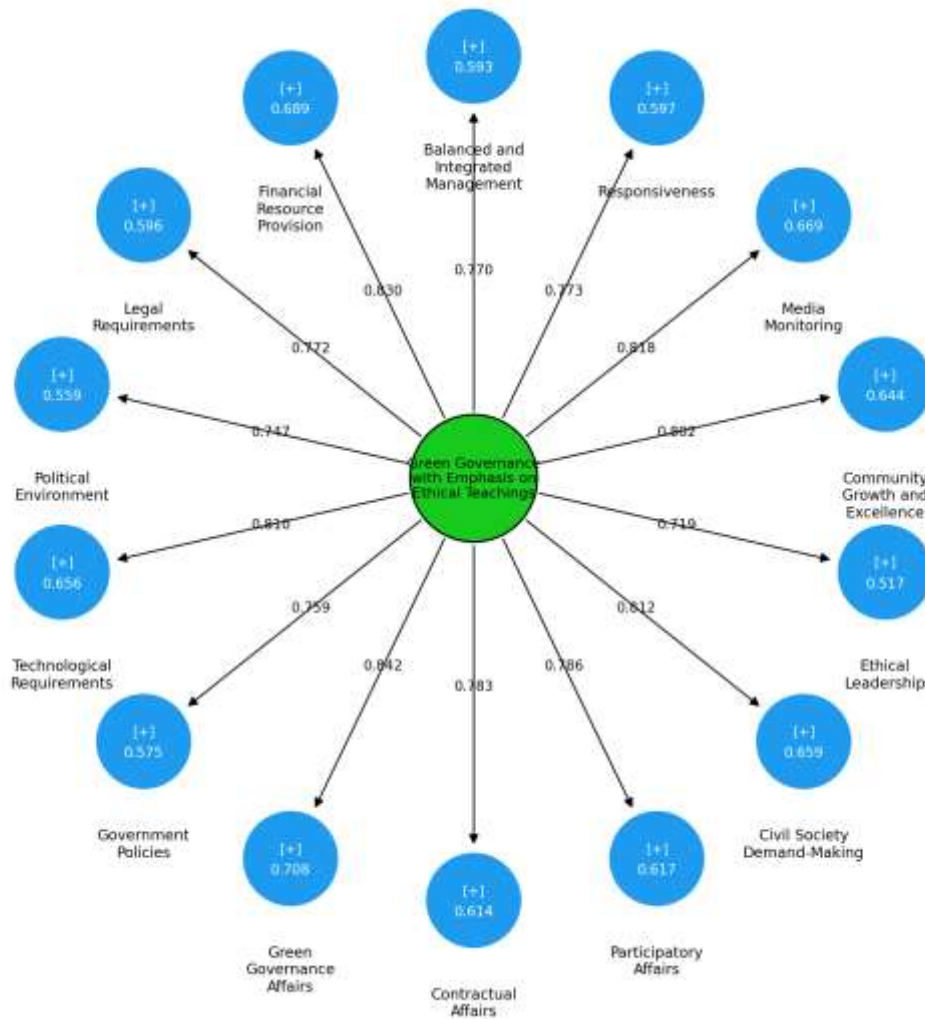


Figure 2. Factor loading values with standardized coefficients

The significance values of the factor loadings are presented in Figure 3.

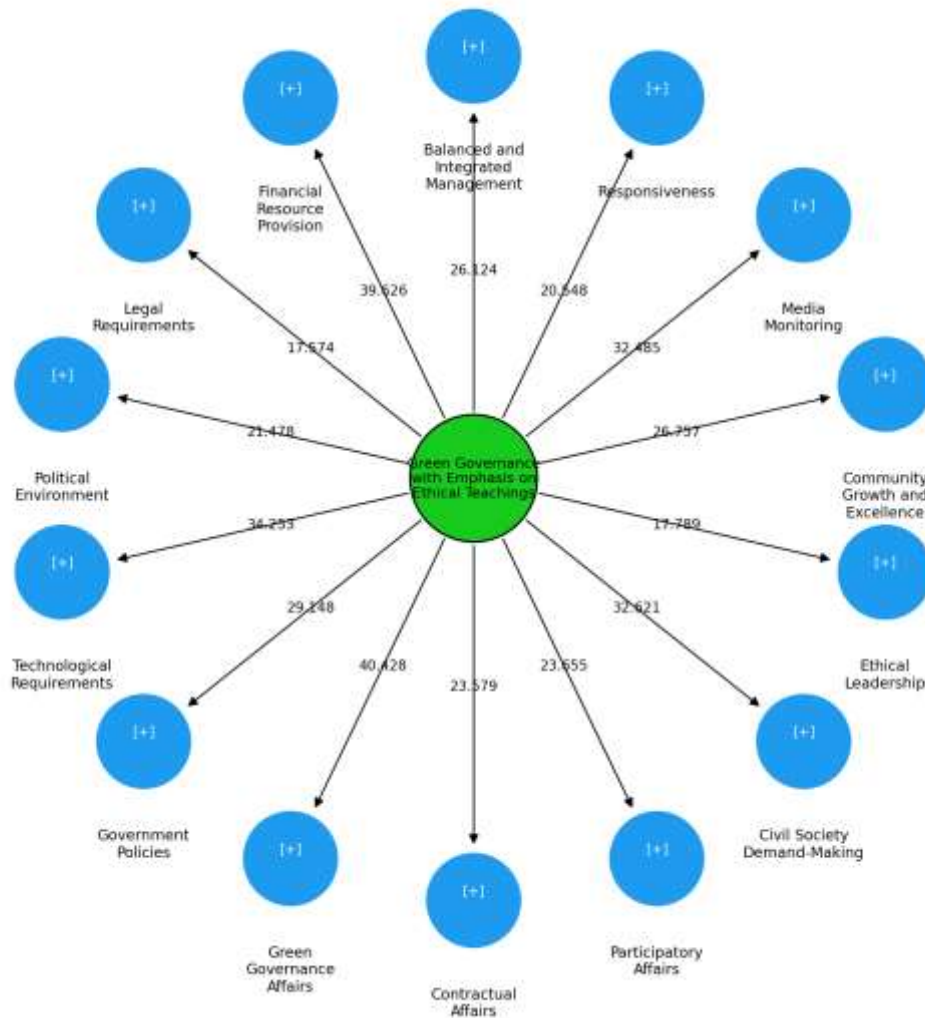


Figure 3. Significance of factor loading values

Cronbach’s alpha is used to calculate the internal consistency of measurement instruments, including questionnaires or tests that measure different characteristics. In such instruments, responses to each item may take different numerical values. To calculate Cronbach’s alpha, the variance of scores for each subset of questionnaire items and the total variance must first be calculated. Cronbach’s alpha assumes that the observed variables in each measurement model have equal weights and that their relative importance is equal. To address this limitation, the composite reliability index proposed by Werts et al. (1974) was used (Werts et al., 1974). Because this index uses the factor loadings of items in its calculation, it often provides a stronger estimate of reliability than Cronbach’s alpha.

The internal consistency and composite reliability coefficients of the constructs are presented in Table 5.

Table 5. Cronbach’s alpha and composite reliability

Variable	Cronbach’s alpha	rho_A	Composite reliability
Technological requirements	0.868	0.870	0.896
Legal requirements	0.808	0.833	0.874
Green governance affairs	0.849	0.848	0.893
Contractual affairs	0.828	0.833	0.897
Participatory affairs	0.902	0.904	0.921
Financial resource provision	0.890	0.890	0.919

Community growth and excellence	0.881	0.892	0.907
Ethical leadership	0.778	0.787	0.872
Government policies	0.829	0.832	0.886
Political environment	0.797	0.811	0.867
Balanced and integrated management	0.884	0.893	0.913
Civil society demand-making	0.888	0.899	0.910
Responsiveness	0.789	0.729	0.826
Media monitoring	0.873	0.876	0.906
Green governance with emphasis on ethical teachings	0.903	0.905	0.917

Discussion and Conclusion

The present study identified and validated a multidimensional model of green governance with an emphasis on ethical teachings. The thematic analysis produced 76 initial codes, which were organized into 14 axial categories: balanced and integrated management, financial resource provision, legal requirements, political environment, technological requirements, government policies, green governance affairs, contractual affairs, participatory affairs, civil society demand-making, ethical leadership style, community growth and excellence, media monitoring, and responsiveness. The quantitative results supported this structure and showed that all second-order factor loadings were acceptable and statistically significant. The strongest second-order loadings belonged to green governance affairs, financial resource provision, media monitoring, civil society demand-making, technological requirements, community growth and excellence, and participatory affairs. This ranking suggests that ethical green governance is not limited to moral discourse or individual environmental responsibility. Rather, it requires institutionalized mechanisms for strategic orientation, resource allocation, public monitoring, civic demand-making, technological capacity, social trust, and stakeholder participation. In practical terms, the model shows that ethical teachings must be translated into organizational routines, enforceable rules, transparent reporting systems, participatory platforms, and accountable leadership practices.

Consistent with the research literature, the findings indicate that green governance rests on several ethical teachings, including respect for nature, sustainability, environmental justice, responsibility, sustainable development, green innovation, green fiscal policy, waste management, and environmental law. Respect for nature and sustainability emphasize the preservation of biodiversity and the responsible use of natural resources (Debbarma & Choi, 2022; Mashhadi, 2021; Temski & Kolahi, 2022). Environmental justice highlights equitable access to environmental resources and protection from environmental harms (Baker, 2024; Temski & Kolahi, 2022). Responsibility emphasizes accountability, civic awareness, and active participation in environmental protection (Begum et al., 2022; Mantizadeh & Karimi-Goghari, 2016; Mazaheri Tehrani et al., 2022). Together, these teachings provide the ethical foundation for the validated components of the model. Balanced and integrated management emerged as a central component because green governance depends on coordinated decision-making across economic, social, environmental, and administrative domains. Effective leadership, policy feedback mechanisms, and government officials' willingness to accept green governance are necessary for transforming ethical principles into administrative practice. Similarly, sustainable financing and capital management are essential for implementing green governance policies. Without adequate financial resources, strategic budgeting, and investment in green infrastructure, ethical commitments remain largely symbolic. This interpretation is consistent with studies emphasizing the role of sustainability reporting, green finance, and green credit in advancing environmental governance (Chairina & Tjahjadi, 2023; Cheng & Xu, 2024).

Legal requirements and the political environment also play a decisive role in the proposed model. Green governance requires binding regulations, enforcement mechanisms, monitoring systems, and a political culture that supports environmental responsibility. In this sense, ethical teachings must be embedded in the legal and policy architecture of governance. Environmental laws and good-governance principles provide the institutional framework through which moral commitments to sustainability can be made operational (Faghih Habibi, 2023; Kumar & Dwivedi, 2023). Technological requirements were also confirmed as an important dimension of green governance. E-government, green administrative technologies, information infrastructure, electronic communication networks, and skilled human resources can reduce

resource consumption, improve transparency, and enhance the efficiency of environmental decision-making. Technological capacity should therefore be seen not only as an operational tool but also as an ethical infrastructure that supports accountability, responsiveness, and responsible use of resources (Wei'an & Yin, 2022). The results further indicate that participatory affairs, civil society demand-making, media monitoring, and responsiveness are essential for ethical green governance. These components show that green governance cannot be achieved through top-down regulation alone. It requires stakeholder participation, public awareness, social capital, free access to information, complaint-handling mechanisms, periodic reporting, and media oversight. Public participation and civil-society monitoring help ensure that environmental decisions remain transparent, inclusive, and responsive to social needs (Dieng & Pesqueux, 2017; Nafisifar & Heydariyeh, 2021; Usman et al., 2024).

From a policy and managerial perspective, the findings indicate that green governance should be understood as a multidimensional governance capacity rather than as a single environmental program. Strengthening only one dimension, such as environmental law or green technology, is unlikely to produce sustainable improvement unless it is accompanied by coordinated action across management, financing, legal enforcement, political support, civic participation, ethical leadership, and media monitoring. The validated model can therefore be used both as a diagnostic framework for assessing the current state of green governance and as a practical guide for designing institutional reforms that connect environmental sustainability with social responsibility. This study also has limitations that should be considered. First, the quantitative phase used a convenience sample of 200 managers in Tehran; therefore, the generalizability of the findings to other regions and administrative contexts should be examined with caution. Second, although the KMO index, Bartlett's test, factor loadings, Cronbach's alpha, rho_A, composite reliability, and the calculated AVE supported the measurement model, future studies should report additional validity evidence, including Fornell-Larcker and HTMT indices. Third, the same quantitative dataset was used for factor-analytic validation, and future research may test the model with larger and independent samples across different provinces, sectors, and organizational levels. Overall, the findings suggest that green governance with an emphasis on ethical teachings requires a shift from fragmented environmental actions to an integrated governance architecture. Such an architecture should combine ethical leadership, participatory policymaking, legal enforcement, green financing, technological capacity, civic demand-making, media monitoring, and institutional responsiveness. The study therefore contributes to the literature by presenting a framework in which ethical teachings are not treated as abstract values, but as operational principles that can shape the design and evaluation of green governance systems.

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Authors' Contributions

Authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

AI use statement

Artificial intelligence tools were used only to support language editing, translation refinement, formatting, and consistency checks. The authors take full responsibility for the accuracy of the data, analyses, interpretations, citations, and final content of the manuscript.

Ethical Considerations

This study was conducted using interview and questionnaire data. Participation was voluntary, and the confidentiality of participants' responses was preserved. The research procedure was designed to avoid harm to participants and to respect the principles of informed participation and academic integrity.

Transparency of Data

Reasonable requests for research materials should be directed to the corresponding author, subject to university policies and participant confidentiality.

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