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Leadership and administrative transformation in the Greek forest service: A research approach under the lens of new public management

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Abstract
Leadership is considered to be a key factor in the effective and sustainable public administration with a view to putting emphasis on efficiency, transparency, and accountability, according to the New Public Management (NPM) approach. The Forest Service of Greece was selected as the field of application to portray leadership under administrative/technological changes by empirically analyzing the aspect of leadership vis-à-vis institutional, organizational, and technological parameters. With the help of primary source quantitative data (n = 232), through Principal Component Analysis (PCA), reliability testing via Cronbach's Alpha, regression analysis, and Spearman correlations, a composite Leadership Index was constructed and its decisional variables recognized. Goal setting, staffing, and acceptance of technology were identified as the strongest variables, while digital readiness along with organizational trust is fostering administrative resilience. These findings reveal the contemporary fact that leadership should not be viewed as an individual characteristic but rather as an active institutional function.

Keywords: Evaluation, forestry, administration, trust, accountability, strategy

1. Introduction
A fundamental constituent of efficacy and longevity of public administration is leadership, as its formation ensues in a very complex mesh of institutional, cultural, and social parameters (Avolio & Kahai, 2003; Chrislip & Larson, 1994; Bass, 1985; Burns, 1978) [1,2,3,4]. Leadership is not merely restricted to simple bureaucratic functions but is rooted in profound philosophical and moral traditions. Specifically, in ancient Greece, leadership was perceived as moral virtue, collectivity, and excellence (Aspridis *et al*., 2023) [5]. These foundational tenets remain relevant and have been considered within the framework of New Public Management as aspects of institutional and ethical leadership.
Ethical leadership downplays organizational trust and empathy as bases of administrative culture (Brown *et al*., 2005; Yukl & Mahsud, 2010) [6, 7].
Simultaneously, with the strength of their endurance fit for integration into the public administration of the present time, especially in areas like natural resource management and public forest service, they may provide a serviceable theoretical framework that harmonizes with age-old values now infused in administrative practice.
In leadership, inspired by NPM, which prioritizes efficiency, transparency, and accountability as its pillars (Pollitt & Bouckaert, 2017; Osborne & Gaebler, 1992; Hood, 1991), [8, 9, 10] leadership evolves beyond a static role into a dynamic institutional function by inspiring and directing the organization.
Particularly, in the Greek Forest Service, leadership far exceeds mere management; it creates the administrative climate, deepens collaboration between administrative levels, and determines the quality of services offered.
Leadership grasps determining and governing very high degrees of complexity and certain managerial responsibilities, which manifest themselves in embracing intra-organizational flows and the management of uncertainty, thus enhancing administrative resilience (Van Wart, 2021; Nguyen *et al*., 2025) [11,12]. Effective leadership will uphold the resilience of the Public Forest Administration while greatly enhancing the management of Greek forests, so that these may be protected and sustainably utilized against contemporary environmental and administrative threats. Transformational, transactional, and participatory and authoritarian

leadership models (Burns, 1978; Bass, 1981; Chrislip & Larson, 1994) [3,4,13] must adjust to such complex settings; also emerging in digital environments is e-leadership (Avolio & Kahai, 2003; Van Wart *et al*., 2019), [1,11] while adaptive leadership focuses on resolving complex issues through institutional adaptability and human resource empowerment (Heifetz *et al*., 2009; Uhl-Bien *et al*., 2007) [14,15].

Balancing social demands with technological expansion and scientific evidence, leadership becomes the bedrock of institutional resilience, thereby creating a role that transcends formal hierarchies to shape the institutional basis for effective forest governance in Greece.

Leadership is directly associated with good governance and implementation of principles of accountability, transparency, and participation (OECD, 2020; Rothstein & Teorell, 2008; UNDP, 1997) [16, 17, 18].

Unfortunately, in the Forest Service, there stand major weaknesses (e.g., absence of a unified framework, little reliability of evaluations - Grindle 2007 [19]) that undermine the Service's capability to tackle current problems. Communication, participation, and empowerment of employees are perceived as primary factors in facilitating organizational adaptability and innovativeness (Chronopoulos; Nguyen *et al*., 2025; Koulouriotis, 2015) [20, 12, 21].

In the aftermath, studies now suggest rethinking leadership concepts, considering digital governance, participatory approaches, and the application of evidence-based decision-making (Molinari *et al*., 2022; Leontis, 2024) [22, 23] as a means to go some way toward mending an important research deficit within the Greek Forest Administration. Relating leadership associated with organizational capacity to the indicators of digital readiness is one objective of this exploration.

The Greek Forest Service, as an institutional pillar of environmental governance, is entrusted with managing a constitutionally protected natural resource with a dual mission - environmental protection and support for sustainable development.

Such a deep and complicated ownership structure (70% of forests being public) respectively engenders differentiated administrative practices: public lands, where strict frameworks call for transparency and accountability, whereas private, municipal, and monastic lands call for wider cooperation with local and religious actors, which only deepens the call for flexible administrative structures that align with inclusive leadership models (Karadonta *et al*., 2021; Möller *et al*., 2018; Chojnacky, 2012) [24,25,26].

Undeniably, contemporary administrative theory calls for adaptive leadership models that fit the characteristics and cultural context of each public organization.

As it manages increased demands for accountability and transparency, plus the complexities of responsibilities, it becomes evident that leadership approaches better aligned to institutional and operational conditions should be adopted (Avolio & Kahai, 2003; Chrislip & Larson, 1994; Bass, 1985; Burns, 1978) [1.2,3,4].

Particularly in the Forest Service, leadership has a great responsibility, initially affecting the administrative climate and cooperation at various governance levels and lastly influencing the actual delivery of public services.

With the advent of environmental crises and rapid technological developments.

Building administrative capacities and functional adaptability becomes a must.

Other international comparisons reveal a lack of a unified leadership framework and a skills development policy (ECOS, 2024), [27] undermining the Service's capacity and effectiveness.

The analysis is devoted to mapping leadership perceptions and providing an interpretation regarding their connection with critical administrative capacity indicators and digital readiness, while at the same time seeking to bolster the administrative capacity of Forest Services.

Integration of digital tools with data-informed leadership models is one of the inseparable elements of modern public governance, which in turn increases transparency and adaptability (Roman *et al*., 2022; Van Wart *et al*., 2019) [28, 11].

The main research questions guiding this study are:

1. What is the level of leadership perception among employees of the Greek Forest Service, and what is its role in shaping the administrative culture?
2. How is leadership perception related to key indicators of administrative capacity and digital readiness?
3. What are the critical determining factors influencing the relationship between leadership, organizational capacity, and the modern challenges of Public Forest Administration?

2. Methodology

The methodological approach is based on a combination of quantitative and qualitative tools, aiming at a multidimensional investigation of administrative leadership within the Public Forest Service. The analysis includes a bibliometric review of international trends, empirical research using a structured questionnaire, and the application of advanced statistical methods for the assessment of critical indicators. This approach enhances the coherence, reliability, and interpretative depth of the results.

2.1 Bibliometric Review

To scientifically substantiate the analysis, a bibliometric review was conducted based on the methodological principles of Donthu *et al*. (2021) [29] and Zupic & Čater (2015) [30].

The aim of the review was not only to capture international trends but also to identify existing research gaps and confirm the lack of empirical approaches regarding administrative leadership in the field of the Greek Forest Service.

The findings demonstrate the need for further investigation and deepening, confirming the necessity of a thorough study in this specific domain. The data analysis was based on searches in the Scopus and Google Scholar databases using terms such as “leadership”, “forest governance”, and “forest service” for the period 2010-2025. The results recorded a significant increase in publications related to administrative leadership in forest services, with approximately 700 publications in Scopus, showing a steadily rising trend over the past five years. At the same time, Google Scholar recorded approximately 36,000 results, reflecting the international research activity and the scientific importance of the subject.

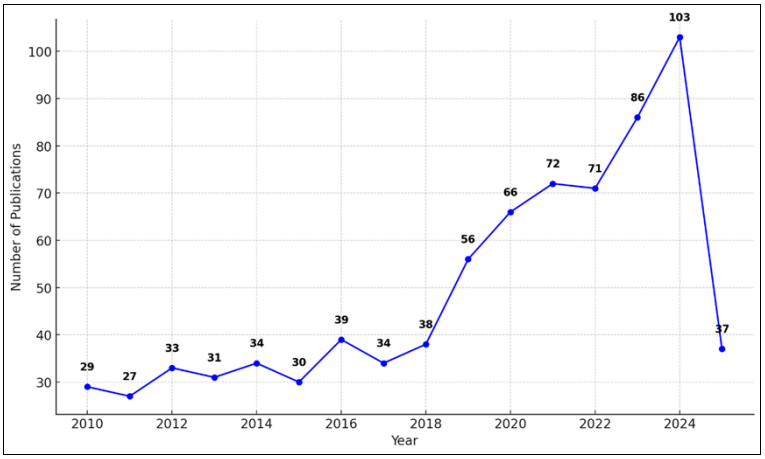

Fig 1: Evolution of the number of publications per year (Scopus data 2010-2025).

The geographical analysis showed intense activity in the United States, Canada, and Scandinavia, with Greece having no presence.

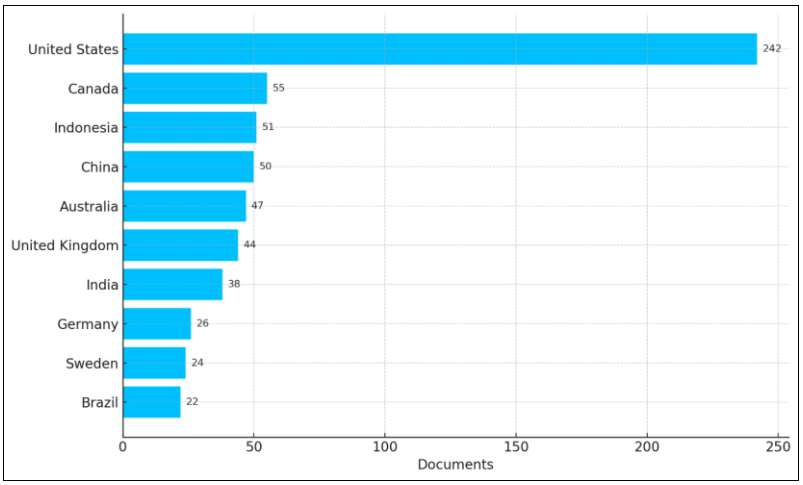

Fig 2: Distribution of publications by country (Scopus Analyze Results)

The thematic mapping using VOSviewer, combined with density analysis, revealed two main clusters: (i) natural resource management (forest management, deforestation) and (ii) participatory governance (governance approach, local participation). The term "leadership" is located at the core of the thematic structure, while "hot spots" were identified for the terms "leadership", "forest governance", and "accountability."

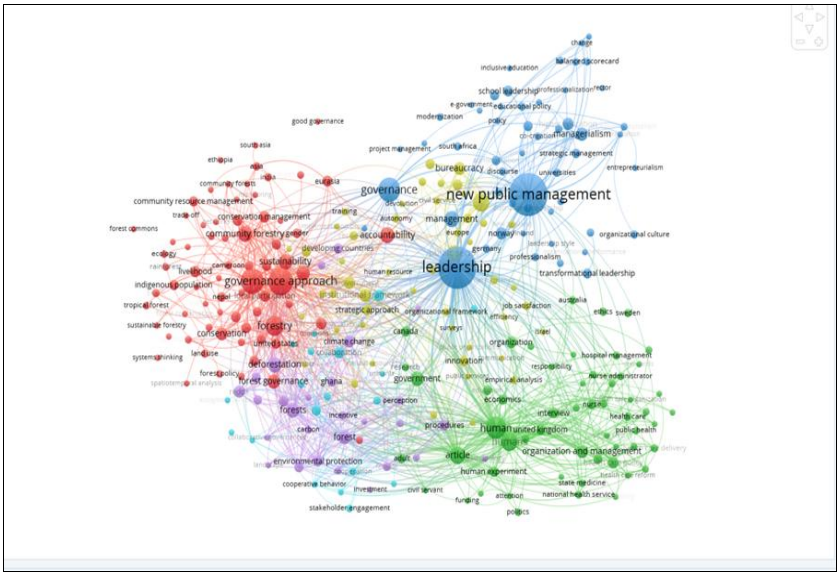

Fig 3: VOS viewer Thematic Map of Keyword Co-occurrence (Scopus data).

The results confirm the crucial role of leadership, governance, and accountability as fundamental factors for the effectiveness of public organizations (United Nations, 2022; OECD, 2020) [31, 16]. Furthermore, the bibliometric review highlights the lack of systematic study on leadership in forest governance in Greece, as only two (2) publications were found for the period 2010-2024 that combine the terms "leadership", "public administration", and "forest". This finding substantiates the need for further investigation and reinforces the importance of the present study's research contribution.

The assessment of these relationships—between leadership, organizational capacity, and technological readiness indicators within the Public Forest Administration—aims to address the identified research gap. The increase in relevant publications and the thematic priorities identified are consistent with previous studies (Nguyen *et al*., 2025; Aoki *et al*., 2023; OECD, 2020; Möller *et al*., 2018; Chojnacky, 2012) [11,32,16,24,25].

2.2 Sampling and Research Methodology

The analysis was based on empirical research conducted using a structured questionnaire, which was completed by two hundred and thirty-two (232) officials of the Forest Service in Greece, out of a total of approximately eight hundred (800). To ensure representativeness and minimize error regarding geographic distribution, administrative level, and educational background, the method of stratified random sampling was applied. The sample included officials from nearly all administrative units of the country, reflecting the diversity and complex nature of the Greek Forest Service.

The purpose of the questionnaire was to capture employees' views on critical administrative functions, with an emphasis on leadership, evaluation, organization, and the potential use of technology to promote innovation.

The quantitative analysis of the data was conducted using Principal Component Analysis (PCA), aiming to detect the underlying structures shaping employee attitudes. The PCA revealed a main component representing Perceived Administrative Competence, which includes the Leadership Index. In this context, the variables of Staffing, Goal Setting, Resource Adequacy, and Artificial Intelligence Acceptance showed high loadings, indicating their role in shaping Perceived Administrative Competence.

The Leadership Index was constructed from four (4) specific questions assessing employees' perceptions regarding: (a) administrative fairness, (b) the effectiveness of supervisors, (c) meritocracy in promotions and decision-making, and (d) the usefulness of the evaluation process. The four questions of the Leadership Index were rated on a five-point Likert scale (1=not at all, 5=very much), with a Cronbach's alpha reliability coefficient of 0.83, indicating high internal consistency.

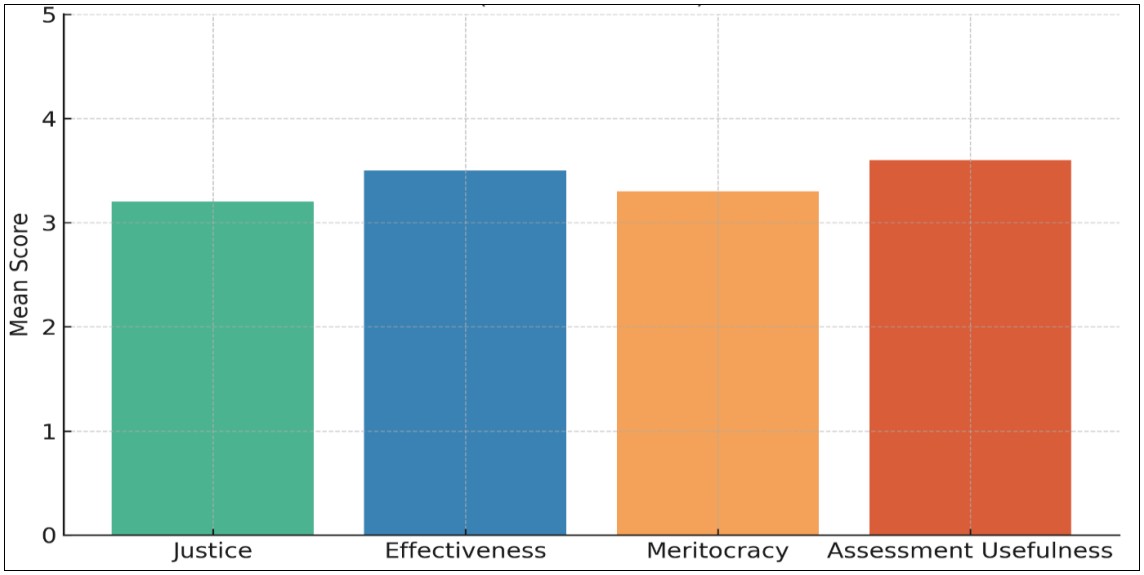

Fig 4: Mean scores of the four items comprising the Leadership Index.

The figure presents the average responses on a five-point Likert scale (1 = Not at all, 5 = Very much) to four items assessing employees' perceptions of leadership in terms of justice, effectiveness, meritocracy, and the usefulness of evaluation procedures.

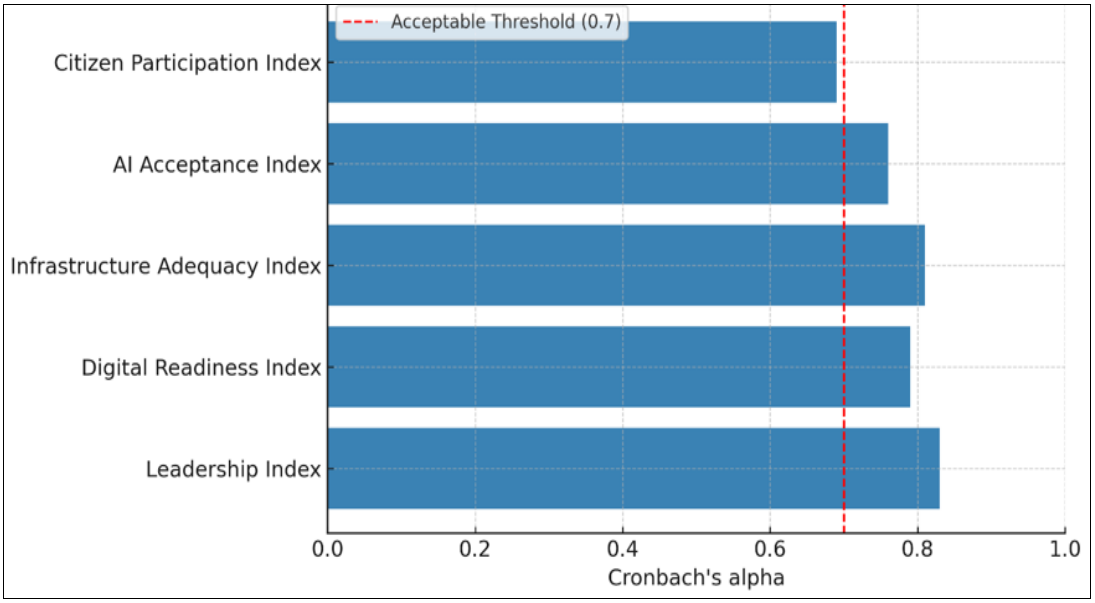

Fig 5: Internal Consistency of Composite Indices

Cronbach's alpha values for each of the five composite indices included in the analysis. A value above 0.70 is considered acceptable for internal reliability (marked with a red threshold line).

To investigate differences and correlations, the following methods were applied

- Independent samples T-test, to examine possible differences in the Leadership Index between men and women.
- (Analysis of Variance (ANOVA), to explore differences in perceptions of leadership based on age, educational level, position of responsibility, and years of service.
- Spearman correlations, to assess the relationship between the Leadership Index and other institutional variables (staffing, goal setting, available resources).
- Multiple linear regression, to determine the extent to which the Leadership Index is predicted by specific administrative parameters.

In addition, means and standard deviations were calculated for the Satisfaction and Participation indices (on a 1-5 scale), which reflect employees' overall attitudes and engagement in the goal-setting process. Differences in these indices by gender and age were tested using the non-parametric Kruskal-Wallis test, while the Spearman coefficient was used to estimate potential interaction between them. The results did not reveal statistically significant differences by gender or age, but a weak negative correlation between Satisfaction and Participation was identified.

At the same time, the analysis incorporated the technological dimension through the concept of Digital Readiness. However, the Digital Readiness, Transparency, and Accountability indices are still under development and were not fully integrated into the present analysis.

Figure 6 presents the Spearman correlation matrix between the key institutional and technological indicators, highlighting the strength of monotonic relationships.

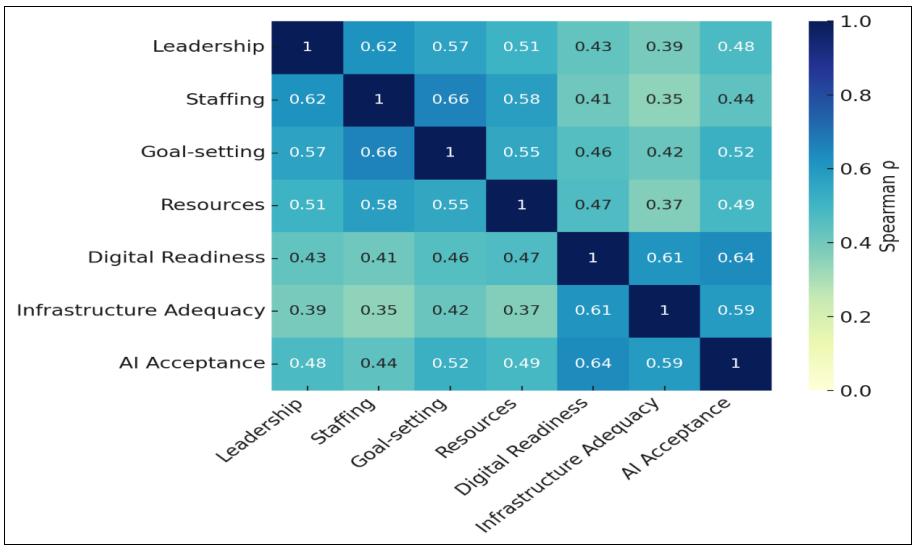

Fig 6: Spearman Correlation Matrix among Key Indices.

The heatmap illustrates the strength of monotonic relationships (ρ) among key institutional and technological indices, including Leadership, Staffing, Goal setting, Resource adequacy, Digital Readiness, Infrastructure

Adequacy, and AI Acceptance. Correlations are measured using Spearman's rho.

Figure 7 illustrates the standardized regression coefficients predicting the Leadership Index, providing information on the relative contribution of the indicators of staffing, goal-setting, resources, digital readiness, infrastructure adequacy, and AI acceptance to the formation of leadership perception.

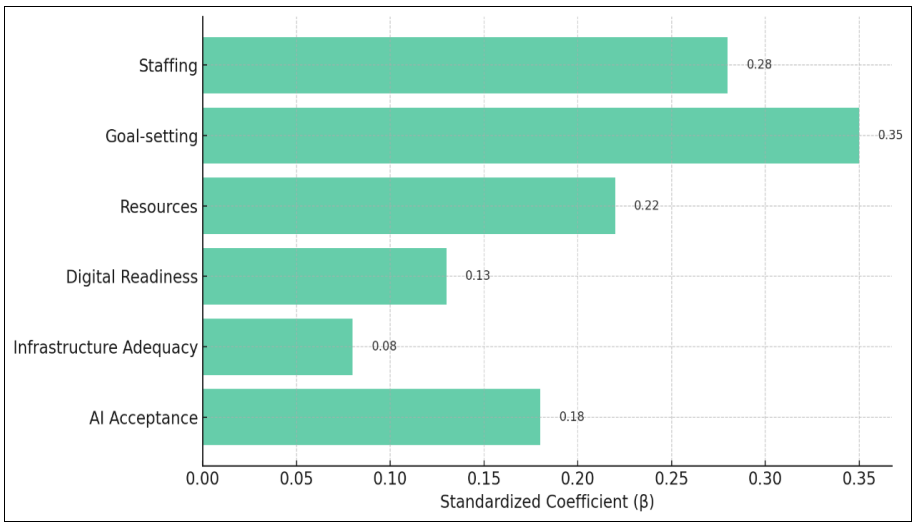

Fig 7: Regression Coefficients Predicting the Leadership Index.

Standardized β coefficients from a multiple linear regression model using Staffing, Goal setting, Resource adequacy, Digital Readiness, Infrastructure Adequacy, and AI Acceptance as predictors of the Leadership Index.

The overall methodological approach was based on the logic of triangulation (Flick, 2018; Denzin, 1978),[34] which enhances the validity of conclusions through the simultaneous use of quantitative data, statistical indicators, and institutional variables that reflect organizational functioning (Flick, 2018; Molina-Azorín, 2016; Carter *et al*., 2014) [33,34,35].

This approach seeks not only to capture statistical trends but also to interpret the findings through the lens of the institutional characteristics of the organization and the principles of New Public Management (Osborne & Gaebler, 1992; Hood, 1991) [36, 10].

Particular emphasis was placed on the analysis of institutional indicators related to leadership, such as staffing, goal-setting, available resources, and the indices of Satisfaction and Participation, which reflect measurable characteristics of administrative competence and organizational culture. This methodological foundation ensures the consistency and validity of the conclusions, embedding the findings within a coherent framework for evaluating the administrative capacity and organizational maturity of the Greek Forest Administration.

3. Results

The combined evaluation of the statistical findings allows for the identification of the key variables that influence the Leadership Index, through an integrated approach of Principal Component Analysis (PCA), Spearman correlation, regression analysis, and reliability testing (Cronbach's alpha). The variables "Staffing" and "Goal-setting" emerge as the strongest components shaping the Leadership Index, with high PCA loadings (0.68 and 0.72 respectively), strong Spearman correlations (ρ = 0.62 and 0.57), and significant standardized regression coefficients (β = 0.28 and 0.35). These indicators also present very good internal consistency (Cronbach's alpha > 0.79), which confirms the reliability of the questions comprising them. The contribution of these two variables demonstrates that employees associate leadership quality with adequate personnel and the existence of a clear direction. Staffing strengthens organizational stability, while goal-setting provides measurable criteria, enhancing trust and administrative legitimacy.

Adequate resource availability displays moderate statistical strength (ρ = 0.51, PCA loading = 0.65, β = 0.22), reinforcing the view that the technical and financial support of units enhances the sense of capacity and fair governance. In practice, resource adequacy acts supportively for the leader who seeks credibility and organizational flexibility.

Digital Readiness and Infrastructure show lower but statistically acceptable effects (ρ = 0.43-0.39, β = 0.14-0.08), indicating that technological support plays a supplementary role without replacing the human and strategic dimensions of leadership (OECD, 2020) [16].

Artificial Intelligence (AI) Acceptance shows a positive correlation (ρ = 0.48, β = 0.18), indicating the influence of innovation on leadership perception. Although its effect is smaller compared to structural variables, it reinforces the need for leaders who understand and integrate artificial intelligence based on ethical and operational criteria. Technological maturity is associated with organizational adaptability and accountability (E&M, 2025; Leontis & Papadakis, 2024; Macedo & da Silva, 2019) [37, 38, 39].

Employees' perception of leadership is shaped through a network of administrative, functional, and technological parameters, with staffing and goal-setting being the most critical. Strengthening leadership requires institutional and technological adaptations and is not limited to individual characteristics. Administrative effectiveness is based on leadership with goals, transparency, and meritocracy (Osborne & Gaebler, 1992; Hood, 1991) [9, 10].

The following figure provides a visual comparison of the key variables and their contribution to the Leadership Index, based on PCA loadings, Spearman correlations, and regression coefficient

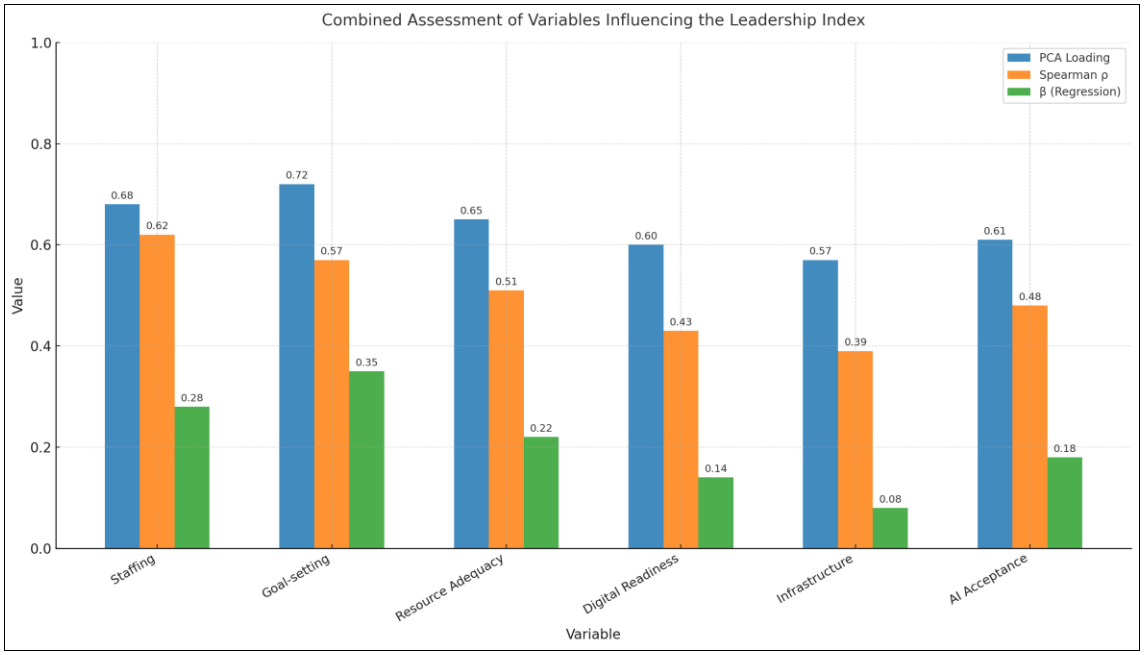

Fig 8: Combined assessment of the variables influencing the Leadership Index, based on PCA loadings, Spearman ρ, and regression β values.

The positive correlation between the perception of leadership and variables such as staffing, evaluation, and goal setting highlights the critical importance of human resource quality and internal administrative organization. Administrative combinations of adequate staffing and clearly defined goal-setting criteria form the basis for administrative functionality (Christensen & Lægreid, 2023; Exarchou *et al*., 2022) [40, 41]. Technological parameter digital readiness and AI acceptance are associated with the contribution of smart tools to transparency and accountability (United Nations, 2022; OECD, 2020) [16, 31].

The multidimensional involvement of these variables establishes the Leadership Index as a complex and dynamic measure of administrative capacity. Leadership in the Greek Forest Service reflects the overall organizational maturity and the ability to adapt to challenges of administrative innovation (Leontis D., 2024; Van de Walle & Bouckaert, 2003) [43, 42].

The analysis incorporates three complementary indicators—Satisfaction, Participation (Goal setting), and Digital Readiness—with mean scores of 2.54, 1.84, and 3.8 respectively (on a 1-5 scale).

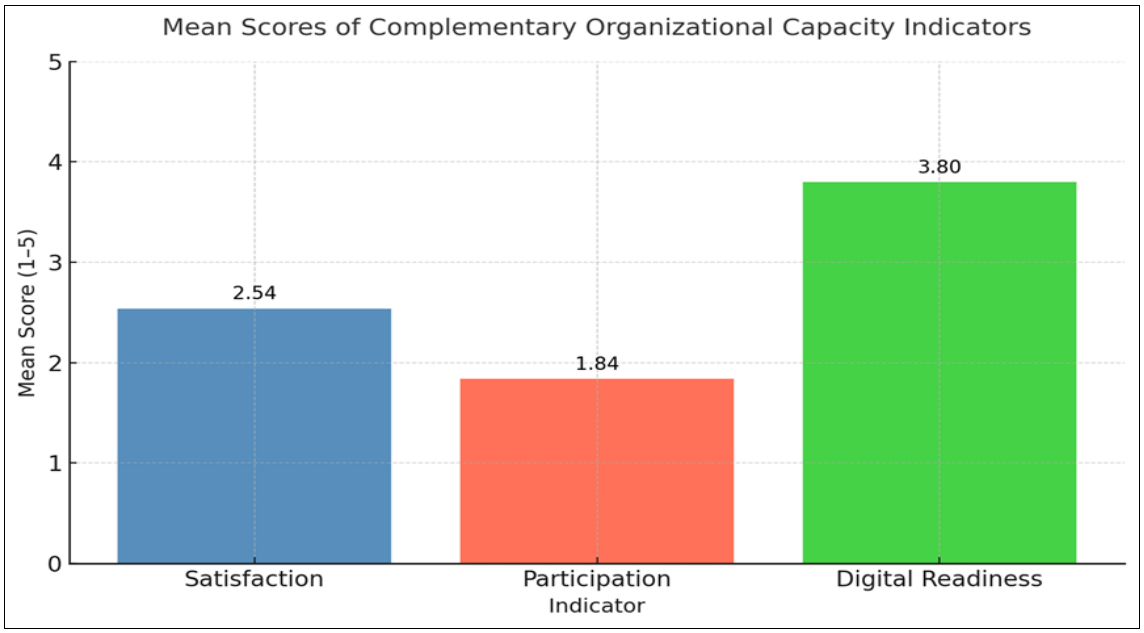

Fig 9: Visual representation of the mean scores of complementary organizational capacity indicators (Satisfaction, Participation, Digital Readiness).

Although they were not included in the Leadership Index model, these indicators reflect critical dimensions of organizational maturity. Satisfaction captures the internal attitude of the human resources, Participation reflects the level of involvement in goal-setting processes, and Digital Readiness represents the willingness for adaptation and innovation.

Table 1: Mean Scores of Complementary Organizational Capacity Indicators

Indicator	Mean Score (1-5)	Description
Satisfaction	2.54	Reflects the internal attitudes and the employees' trust in the administration.
Participation (Goal-setting)	1.84	Records the level of employee involvement in goal-setting processes.
Digital Readiness	3.80	Highlights the willingness for adaptation and the technological maturity of the organization.

This table presents the average scores (on a 1-5 scale) of three complementary indicators—Satisfaction, Participation (Goal setting), and Digital Readiness —highlighting their relevance in the overall organizational maturity and administrative effectiveness framework.

Future studies may further explore the dynamic correlation of these three indicators with the Leadership Index, enhancing the understanding of the multifactorial nature of organizational leadership in Forest Services.

Table 2: Overview of the Leadership Index Analysis Structure

Analysis Stage	Statistical Method	Key Findings and Conclusions
Correlation Analysis	Spearman	Strong correlation of Staffing (ρ=0.62) and Goal setting (ρ=0.57) with the Leadership Index.
Factor Analysis (PCA)	Identification of key factors	Key variables with high loadings Are Goal Setting (0.72) and Staffing (0.68).
Multiple Regression Analysis	Assessment of predictive power	Goal setting (β=0.35) and Staffing (β=0.28) as the strongest predictive variables.
Reliability Analysis	Cronbach's alpha	All key variables show satisfactory internal consistency (>0.76).
Interpretative Synthesis	Combined evaluation	Leadership is primarily linked to human resources and goals, with resources and technology playing a complementary role.

This table summarizes the combined methodological approach used in the study, from correlation to interpretative synthesis, and emphasizes the main conclusions and the variables' role in shaping the Leadership Index.

These findings are reinforced by recent studies that confirm the critical role of administrative leadership in shaping adaptive, technologically mature, and institutionally flexible public governance organizations, particularly in the field of environmental administration (Leontis & Papadakis, 2024; Exarchou *et al*., 2022) [37, 41]. The empirical observations align with the trends identified in the bibliometric review, especially regarding the importance of leadership, staffing, and institutional accountability. The convergence of quantitative analysis and scholarly production strengthens the validity of the conclusions and underscores the need for a unified perspective on the administrative and technological transformation of the Forest Services (Nguyen *et al*., 2025; Christensen & Lægreid, 2023; Molinari *et al*., 2022) [12, 41, 22,].

4. Discussion

The empirical data revealed that employees' perception of leadership in the Forest Services is shaped by a complex web of institutional, operational, and technological factors (OECD, 2020; Pollitt & Bouckaert, 2017) [16, 8]. The research conducted on a sample of two hundred thirty-two (232) executives of the Greek Forest Service highlighted strong correlations between leadership and variables such as staffing, goal-setting, evaluation, technological adaptation, and acceptance of innovation (Mergel *et al*., 2019) [44]. Leadership is not a static hierarchical trait but rather an institutional and organizational condition that requires clear objectives, meritocracy, and ongoing evaluation (Osborne & Gaebler, 1992, Hood, 1991;) [9, 10].

The analysis identified goal-setting and staffing as the strongest factors shaping leadership perception, confirming that clear objectives, transparency, and institutional monitoring mechanisms are pillars of dynamic leadership (Van de Walle & Bouckaert, 2003) [42]. Although the technological dimension plays a secondary role, it underscores the need to integrate digital transformation into the public sector (OECD, 2020) [16].

International examples such as Estonia's X-Road, South Korea's OPEN and e-People systems, and Denmark's digital public administration highlight the importance of technology and institutional support in developing leadership skills and enhancing transparency and accountability (United Nations, 2022; OECD, 2020) [31, 16].

Leadership is not to be understood in isolation but rather as a function of institutional tools, organizational culture, and technological infrastructure. Thus, organizational trust and digital readiness emerge as critical accelerators of leadership effectiveness in public organizations, strengthening accountability and administrative resilience (Nguyen *et al*., 2025; Leontis & Papadakis, 2024; Molinari *et al*., 2022) [12, 37, 23].

The complementary indicators of Satisfaction, Participation, and Digital Readiness, although not directly linked to the main Leadership Index, highlight essential dimensions of organizational maturity and administrative capacity. Satisfaction reflects internal acceptance of administration, Participation denotes active involvement of personnel, and Digital Readiness represents the willingness to adapt and innovate.

Leadership, therefore, is not an inherent trait but is constituted through functional consistency, expertise, and the capacity to guide within a transparent institutional environment. Transparency, evaluation, participation, and access to digital tools form the core of modern leadership, reinforcing trust and effectiveness (Christensen & Lægreid, 2007) [41].

Specifically, effective leadership in the Public Forest Service includes:

- Administrative justice and meritocracy,
- An active goal-setting role with clear objectives and feedback,
- Technological innovation and digital readiness,
- Institutional consistency and transparency,
- Fostering trust.

This analysis constitutes the first empirical attempt in Greece to examine leadership in the Public Forest Service using quantitative tools and composite indicators, integrating it within the principles of New Public Management. The findings not only reflect the current situation but also provide a strategic tool for strengthening administrative capacity and upgrading the role of leadership in facing contemporary environmental challenges.

4.1 The Role of ICT and Artificial Intelligence

The technological dimension constitutes a critical factor in employees' perception of leadership. Although digital readiness and the acceptance of Artificial Intelligence (AI) demonstrate moderate statistical weight compared to other administrative variables, their positive correlation with the Leadership Index underscores the catalytic role of Information and Communication Technologies (ICT) in enhancing administrative functions and promoting transparency (OECD, 2020; Mergel *et al*., 2019) [16, 44]. Technology is not merely a tool, but an integral part of the institutional framework that shapes the roles, responsibilities, and practices of modern leadership.

Digital readiness reflects an organization's capacity to respond to the demands of digital transformation through adequate equipment, staff training, and functional information systems. Similarly, AI acceptance corresponds to a culture of innovation that enhances evidence-based decision-making and promotes transparency and accountability. The findings confirm that integrating technology—combined with meritocracy and organizational support—facilitates the transformation of the Forest Service into a flexible, transparent, and technologically up-to-date public structure (Van de Walle & Bouckaert, 2003; Osborne & Gaebler, 1992) [43, 10].

However, the targeted development and improvement of digital skills and infrastructure are essential so that leadership actors can fully utilize the potential offered by ICT and Artificial Intelligence. Strengthening these skills should be a central component of both educational and organizational policy, tailored to the contemporary needs of Public Forest Administration and the ongoing environmental and technological challenges.

The findings confirm that digital technology functions as a key catalyst for enhancing the capacity of the Public Forest Service to evolve into a flexible, transparent, and innovative organization. Technology supports effectiveness, increases accountability, and facilitates real-time feedback—but always in conjunction with the values of meritocracy and organizational support (Van de Walle & Bouckaert, 2003; Osborne & Gaebler, 1992) [43, 10].

In the context of digital transition, administrative leadership is called upon to support the adoption and effective use of technological tools and skills. Digital technology emerges as a decisive factor in improving administrative efficiency and organizational operations in the public sector. The development of digital skills and the provision of modern technological infrastructure foster innovation and encourage effective collaboration. At the same time, leadership plays a central role in shaping strategic planning and cultivating a culture that promotes flexibility, transparency, and participation in an environment of constant change. Digital transition, as a substantive administrative challenge, requires a holistic and institutionally supported approach to enhance the sustainability and efficiency of public services (Exarchou V. *et al*., 2024) [45].

Digital transition also necessitates the development of digital competencies among leadership personnel and staff through continuous training and education. Strengthening the digital capacity of human resources is vital for the proper use of technological tools and for supporting innovation in public administration.

The integration of Information and Communication Technologies (ICT) and Artificial Intelligence (AI) into public administration presents significant opportunities but also challenges, laying the groundwork for the development of targeted strategies and institutional interventions. Digital readiness and AI acceptance are embedded in a broader administrative framework that combines technology with participatory processes, transparency, and accountability, shaping a functional and institutionally grounded leadership. This form of leadership is capable of responding effectively to contemporary challenges such as climate change and the sustainable management of natural resources.

4.2 Institutional Framework and Roadmap for Leadership Enhancement

The substantial reinforcement of leadership requires the establishment and fortification of a coherent institutional framework, which:

- Establishes clear and mandatory goal-setting structures (e.g., through presidential decrees or ministerial decisions).
- Links the evaluation process to the advancement and ongoing training of supervisors.
- Formally secures the role of leadership, with a clear description of duties and responsibilities related to strategic management and human resource administration.
- Promotes training pathways for the development of leadership skills, utilizing institutional structures such as the National Centre for Public Administration and Local Government (EKDDA).
- Integrates Information and Communication Technologies (ICT) and Artificial Intelligence (AI), emphasizing their complementarity and their role in supporting human leadership.

Such a framework ensures transparency, strengthens accountability, and makes leadership organically connected to the mission of Public Forest Administration (Van de Walle & Bouckaert, 2003) [42].

The development of a coherent system of indicators — such as employee satisfaction, participation in goal-setting processes, performance, and environmental adaptation — constitutes a critical tool for measuring the effectiveness and resilience of Public Forest Administration. These indicators allow for the monitoring of administrative leadership and the understanding of the relationship between governance and organizational culture.

Specifically, satisfaction indicators capture the level of acceptance of administrative processes by employees, while participation indicators reflect their degree of involvement in decision-making procedures. Additionally, performance and environmental adaptation indicators are directly linked to goal achievement and the alignment of practices with environmental requirements.

The systematic monitoring and evaluation of these indicators create the foundation for targeted interventions and the development of strategies that respond to the needs

of New Public Management and the challenges of modern forest governance.

4.3 The Common Assessment Framework (CAF) as a Key to Improving Administrative Function in the Public Forest Service

The adoption of the Common Assessment Framework (CAF) is a necessary condition for systematically strengthening administrative capacity and implementing a holistic, participatory approach in the management of the Greek Forest Service. As a self-assessment tool grounded in the principles of New Public Management, CAF integrates core values such as transparency, accountability, continuous improvement, and active staff involvement (Karampotsis *et al*., 2024; Pollitt & Bouckaert, 2017; Van de Walle & Bouckaert, 2003) [46,42].

CAF, as a tool to enhance organizational effectiveness, enables the systematic monitoring of administrative performance through targeted Key Performance Indicators (KPIs). These indicators capture both critical functional dimensions—such as human resource management, innovation, and strategic targeting—and outcomes related to staff engagement, participation, and satisfaction (Karampotsis *et al*., 2024; Denes *et al*., 2023) [46, 47]. Through these indicators, an organizational culture focused on continuous improvement and citizen-oriented service delivery is fostered.

Leadership plays a critical role in the CAF, being the first criterion of the framework. Leadership is not limited to administrative oversight but is expected to shape vision, empower staff, coordinate actions, and promote a culture of evaluation, innovation, and collaboration (Karampotsis *et al*., 2024; Cano *et al*., 2017; EIPA, 2013) [46, 48,49]. In the context of the Public Forest Service, building strategic leadership capacity is a fundamental prerequisite for responding to the challenges of the climate crisis and multi-level environmental governance.

Moreover, leadership functions as a mechanism for aligning strategic objectives with day-to-day operations, enhancing administrative coherence, and making performance measurable through KPIs. Particular importance is given to the activation of middle management, as mid-level managers serve as key implementers of CAF in decentralized and functionally diverse environments such as the Forest Service (Charlwood *et al*., 2017) [50].

The digital transition, actively supported by CAF, enables flexible and evidence-based decision making (data-driven decision making), integrating technologies such as ICT and Artificial Intelligence (OECD, 2020; Mergel *et al*., 2019) [16, 44]. These technologies strengthen transparency, accountability, and the administration's capacity to address complex administrative and environmental issues.

Overall, the integration of CAF acts as a strategic tool for coordination, organization, and evaluation, which:

- Supports the continuous improvement of administrative effectiveness.
- Enhances transparency and institutional accountability.
- Activates employee participation and strengthens leadership at all levels.
- Links organizational functioning with the achievement of environmental and social objectives.

The implementation of CAF in the Greek Public Forest Service may serve as a pillar for a sustainable, innovative, and efficient public administration, founded on institutionally secured and participatory leadership, aligned with the requirements of New Public Management and the digital era.

4.4 Challenges and Improvement Strategies

A network of structural and functional challenges emerges as a critical obstacle to enhancing leadership within the Public Forest Service, negatively affecting employees' perceptions and administrative effectiveness. Key problems include inadequate staffing, particularly at higher administrative levels, lack of systematic and transparent goal-setting, limited use of evaluation tools as development mechanisms, and insufficient digital support. These factors undermine cohesion, trust, and leadership effectiveness, confirming the need for structural interventions (Pollitt & Bouckaert, 2017; Hood, 1991) [8, 10].

Addressing these challenges requires the implementation of a comprehensive strategic framework, which includes:

- Enhancing meritocracy in the selection of leadership staff through transparent mechanisms and the creation of a capable leadership pool.
- Institutionalizing clear, participatory, and transparent goal-setting processes, with active staff involvement and regular target evaluations.
- Redesigning the evaluation system to focus on leadership development and coaching, promoting leadership capacity and organizational effectiveness.
- Horizontally and vertically integrating Information and Communication Technologies (ICT) and innovations into decision-making processes, with emphasis on data-driven leadership, dissemination of best practices, and the development of digital skills.

The implementation of these strategies aligns with the core principles of New Public Management, shifting leadership from an individual attribute to a collective and institutional endeavor that fosters transparency, trust, and flexibility within the public administration framework (OECD, 2020; Christensen & Lægreid, 2011) [16, 51]. Furthermore, it reinforces the need for institutional safeguarding of leadership based on evidence, interoperable information systems, and participatory decision-making models (Nguyen *et al*., 2025; Leontis & Papadakis, 2024, Molinari *et al*., 2022;) [11, 42, 22].

5. Results

The key findings are assessed synthetically, highlighting leadership within the Public Forest Service as a multifactorial phenomenon shaped by the combination of institutional, functional, and technological parameters (OECD, 2020, Pollitt & Bouckaert, 2017) [16, 8]. The empirical investigation of 232 employees demonstrated that leadership cannot be approached as an individual trait or static administrative position, but as a dynamic function that requires institutional stability, goal-setting, transparency, meritocracy, and technological adaptability (Osborne & Gaebler, 1992; Hood, 1991) [9,10].

The combined analysis identified critical contributors to administrative effectiveness, confirming that leadership quality is closely linked to internal organization, technical and digital capacity, and the ability to adapt. Goal-setting and staffing emerged as core structural pillars for strengthening leadership, while the role of digital readiness and acceptance of innovative tools, such as artificial

intelligence, was also recognized in improving operational performance (OECD, 2020) [16]. Digital technologies are no longer treated as secondary support tools but as fundamental components for enhancing transparency, accountability, and administrative flexibility.

International experiences from countries such as Estonia, South Korea, and Denmark show that leadership, digital infrastructure, and participatory governance are essential for shaping a modern, efficient, and transparent public sector (United Nations, 2022; OECD, 2020; Christensen & Lægreid, 2007) [31, 16,41].

Within this framework, effective leadership in the Public Forest Service is based on five key pillars:

- Administrative fairness and meritocracy, which strengthen acceptance and the credibility of leadership personnel.
- Active and clear goal-setting, allowing for ongoing assessment and process improvement.
- Technological innovation and digital competence, essential for accelerating and increasing transparency in administrative functions.
- Institutional consistency and transparency, which guarantee accountability and public acceptance.
- Trust-building, as a prerequisite for stability and sustainability in administrative operations.

This first systematic assessment of administrative leadership in the Public Forest Service goes beyond descriptive findings, aiming to reveal the underlying structures, challenges, and opportunities for strengthening leadership under the framework of New Public Management. Through the analysis, specific directions are outlined for enhancing administrative capacity, leveraging technology, and upgrading the role of leadership in addressing contemporary environmental and administrative challenges.

The findings confirm that leadership in the public sector—particularly in the Forest Service—is not a static or person-centered trait but a dynamic function cultivated through a combination of institutional tools, organizational culture, technological adaptation, and active participation. This approach also defines the future direction of administrative reform, which must respond to the evolving needs of society, technology, and the environment.

5.1 Research Limitations

The study focused exclusively on the Greek Forest Service, an agency with distinct organizational characteristics and a high degree of operational complexity, due to the management of a dynamic natural resource and its subordination to a multi-level institutional framework. This focus limits the generalizability of the findings to other public entities, except for those with a similar mandate and functional structure, such as Protected Areas Management Agencies or comparable forestry services in other countries.

Although the research is based on high-quality quantitative data that provide a reliable foundation for capturing administrative relationships and perceptions, the future integration of qualitative methods is expected to enrich and complement the findings, offering a deeper understanding of the dynamics of leadership and the internal culture of the Public Forest Administration.

5.2 Generalizability and Future Research

The complementary utilization of qualitative methods is expected to broaden the understanding of the cultural and organizational parameters that shape the dynamics of leadership and the internal culture of institutions. The use of multi-methodological approaches will significantly strengthen the theoretical and practical substantiation of the field.

In addition, comparative analysis with corresponding forestry or environmental agencies in other European countries is expected to offer useful conclusions for the adaptation of international practices and for deepening the understanding of differences in institutional and technological approaches. In this way, the Public Forest Service can design a modern institutional and organizational framework capable of effectively responding to the challenges of the modern era.

6. References

1. Avolio BJ, Kahai SS. Adding the ‘E’ to E-Leadership: How it may impact your leadership. Organizational Dynamics. 2003;31(4):325-338.
2. Chrislip DD, Larson CE. Collaborative leadership: How citizens and civic leaders can make a difference. San Francisco: Jossey-Bass; 1994.
3. Bass BM. Leadership and performance beyond expectations. New York: Free Press; 1985.
4. Burns JM. Leadership. New York: Harper & Row; 1978.
5. Aspridis G, Poulianou L, Koukoumpliakos I. Management and quality management principles in ancient Greece and their reflection today. International Conference on Business and Economics - Hellenic Open University. 2023;1(1). doi:10.12681/icbe-hou.5304.
6. Brown ME, Treviño LK, Harrison DA. Ethical leadership: A social learning perspective for construct development and testing. Organizational Behavior and Human Decision Processes. 2005;97(2):117-134.
7. Yukl G, Mahsud R. Why flexible and adaptive leadership is essential. Consulting Psychology Journal: Practice and Research. 2010;62(2):81-93.
8. Pollitt C, Bouckaert G. Public management reform: A comparative analysis—Into the age of austerity. 4th ed. Oxford: Oxford University Press; 2017.
9. Osborne D, Gaebler T. Reinventing government: How the entrepreneurial spirit is transforming the public sector. Reading, MA: Addison-Wesley; 1992.
10. Hood C. Public management for all seasons? Public Administration. 1991;69(1):3-19.
11. Van Wart M, Roman A, Wang X, Liu C. Integrating ICT adoption issues into (E)-leadership theory. Telematics and Informatics. 2019;45:101-105.
12. Nguyen T, Le T, Vu H. Functional narcissism and leadership effectiveness in public organizations: Evidence from transitional administrations. Public Administration Review. 2025;In press.
13. Bass BM. Stogdill’s handbook of leadership: A survey of theory and research. New York: Free Press; 1981.
14. Heifetz R, Grashow A, Linsky M. The practice of adaptive leadership. Boston: Harvard Business Press; 2009.
15. Uhl-Bien M, Marion R, McKelvey B. Complexity leadership theory. The Leadership Quarterly. 2007;18(4):298-318.
16. Organisation for Economic Co-operation and

Development (OECD). Digital government index: 2019 results. OECD Public Governance Policy Papers, No. 03. Paris: OECD Publishing; 2020.
17. Rothstein B, Teorell J. What is quality of government? A theory of impartial government institutions. Governance. 2008;21(2):165-190.
18. United Nations Development Programme (UNDP). Governance for sustainable human development. New York: UNDP; 1997.
19. Grindle MS. Good enough governance revisited. Development Policy Review. 2007;25(5):533-574.
20. Chronopoulos T. Participation and communication in public services. Unpublished internal report; 2023.
21. Koulouriotis DE. Evaluating administrative capacity in Greek public sector. Hellenic Journal of Public Administration. 2015;11(3):145-160.
22. Molinari C, Zuffada R, Bonacina M. Digital government and participatory governance. Public Organization Review. 2022;22(1):93-108.
23. Leontis D. Digital governance in Greek public sector. Journal of Administrative Sciences. 2024;12(2):45-61.
24. Karadonta A, Papadopoulos I. The forest service and the new administrative challenges. In: Proceedings of the 20th Panhellenic Forestry Conference; 2021 Oct 3-6; Trikala, Greece. p. 164-172.
25. Möller G, Tait D, Neumann M. Faith, forests, and institutions. Journal of Environmental Governance. 2018;7(2):89-102.
26. Chojnacky DC. Leadership in the USDA Forest Service: Where have we been and where are we going? Journal of Forestry. 2012;110(8):424-431.
27. European Centre for Organizational Studies (ECOS). Comparative governance models in forestry administration. Policy Brief No. 12; 2024.
28. Roman A, Van Wart M, Liu C. E-leadership for digital governance. Government Information Quarterly. 2022;39(3):101676.
29. Donthu N, Kumar S, Mukherjee D, Pandey N, Lim WM. How to conduct a bibliometric analysis: An overview and guidelines. Journal of Business Research. 2021;133:285-296.
30. Zupic I, Čater T. Bibliometric methods in management and organization. Organizational Research Methods. 2015;18(3):429-472.
31. United Nations. E-government survey 2022: The future of digital government. New York: UN Department of Economic and Social Affairs; 2022.
32. Aoki C, Hansson L, Lidström A. Collaborative governance in the Nordic countries: Trends and tensions. Scandinavian Journal of Public Administration. 2023;27(1):7-28.
33. Flick U. An introduction to qualitative research. 6th ed. London: SAGE Publications; 2018.
34. Denzin NK. The research act: A theoretical introduction to sociological methods. New York: McGraw-Hill; 1978.
35. Carter SM, Bryant-Lukosius D, DiCenso A, Blythe J, Neville AJ. The use of triangulation in qualitative research. Oncology Nursing Forum. 2014;41(5):545-547.
36. Christensen T, Lægreid P. The whole-of-government approach to public sector reform. Public Administration Review. 2007;67(6):1059-1066.
37. Leontis D, Papadakis M. Institutional capacity and technology in Greek administration. Public Sector Innovation Review. 2024;18(1):15-33.
38. Macedo IM, da Silva MM. Digital maturity and organizational transformation. Government Information Quarterly. 2019;36(4):101-113.
39. Exarchou V, Aspridis G, Savvas I, Sirakoulis K, Garani G. The impact of digital transformation on human resource management. International Journal of Research in Human Resource Management. 2024;6(1):24-32.
40. Christensen T, Lægreid P. Reconfiguring public administration through NPM. Public Organization Review. 2023;23(1):71-90.
41. Exarchou V, *et al*. Digital strategy in public sector reform. International Review of Administrative Sciences. 2022;88(4):685-701.
42. Van de Walle S, Bouckaert G. Public service performance and trust in government: The problem of causality. International Journal of Public Administration. 2003;26(8-9):891-913.
43. Leontis D. Institutional leadership in Greek forest services. Administrative Research Journal. 2024;6(2):88-97.
44. Mergel I, Edelmann N, Haug N. Defining digital transformation: Results from expert interviews. Government Information Quarterly. 2019;36(4):101385.
45. Exarchou V, Aspridis GM, Dounias G, Garani G. Strategic planning and CAF in Greek public organizations. Journal of Public Sector Management. 2024;29(4):330-352.
46. Karampotsis E, Aspridis GM, Dounias G, Exarchou V. Critical success factors and key performance indicators in the modernization of public services: Empirical evidence from Greece. International Review of Public Administration. 2024;29(4):330-352.
47. Denes A, Papadakis M, Exarchou V. Employee satisfaction indicators in Greek public administration. Journal of Governance Indicators. 2023;12(3):77-91.
48. Cano E, Fernandez-Ferrer M, Ion G. Innovative practices in the public sector: Human resource development and organizational change. Journal of Organizational Change Management. 2017;30(1):128-143.
49. European Institute of Public Administration (EIPA). The CAF 2013: Common assessment framework—Improving public organisations through self-assessment. Maastricht: EIPA; 2013.
50. Charlwood A, Dewson S, Meadows P, Miller L. Line managers and the delivery of effective people management. London: Department for Business, Innovation and Skills; 2017.
51. Christensen T, Lægreid P. Complexity and hybrid public administration—Theoretical and empirical challenges. Public Organization Review. 2011;11:407-423.