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An Examination of the Leadership and Management Traits and Style in the Forest Fire Incident Command System: The Cyprus Forest Fire Service

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Abstract: Since the early 21st century, wildlands have witnessed an effusion of wildfires, with climate and social changes resulting in unanticipated wildfire activity and impact. For forest fires to be prevented and suppressed effectively, forest firefighting forces have adopted a specific administrative system for organizing and managing the fighting force. Under the administrative system, a debate on desired "leadership and management qualities" arises, and hence, this study sought to identify the leadership and management traits that should distinguish individuals in the forest fire incident command system (FFICS) applied by the Department of Forests (Cyprus). The research subject was addressed using mixed method research, employing quantitative and qualitative data. Both datasets were used to distinguish the purposes of the applied triangulation, enabling the examination of differentiation between the trends/positions recorded in terms of the object of study. These findings point to ideal forms of transformational leadership and neoclassical management. The outcomes suggest that at the individual level, the leaders of each of the operating structures should develop leadership qualities related to emotional intelligence, empathy, judgment, critical thinking, and especially self-awareness of strengths and weaknesses. At the stage of pre-suppression, a democratic leadership style (or guiding style) is supported, while during the operational progress stage of the FFICS, a "hybrid" leadership style is suggested, borrowing elements from the democratic and authoritarian (or managerial) leadership styles. The administrative skills of FFICS leaders should include the moral and psychological rewards of subordinates, job satisfaction and recognition, and two-way communication. The current study illustrates the need for divergent leadership and management traits and styles among the different hierarchical structures of the FFICS.

Keywords: wildfire; forest fire forces; wild-land firefighters; leadership and management as practices; transformational leadership; neoclassical management; mixed method research

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1. Introduction

Over the last three decades, the threat of wildfires and/or forest fires has had a worldwide increase, particularly in the Mediterranean climate zone [1–3] and in biomes that are classified as boreal forests, rainforests, and taiga forests [4–8]. Thus, extreme and catastrophic forest fires cause significant environmental destruction, massive financial

losses, and social harm due to the loss of life and property [9,10]. These consequences have led a number of studies to conclude that fire governance needs to be seen as a complex socio-ecological system and that players need to be prepared to embrace a range of solutions throughout time and in various contexts [11–13].

In the prevention and suppression system of forest fires, the fire management system and firefighters are important factors in the context of efficient management of fire events [8,12–14]. For this reason, recent studies have been conducted to highlight the need for firefighters to have excellent education and training, together with developed leadership and human resource management skills [15–19]. These studies argued that training in the leadership and management skills of highly accomplished officers and team/group leaders in rescue and firefighter forces is essential for the success and performance of fire brigades in their daily work [17]. They also supported the idea that training in leadership and management skills greatly increases the effectiveness of forest firefighters by improving decision-making, team coordination, and overall operational performance [15–17]. Particularly, the training course contributes to improving the proficiency level of specific leadership competencies, such as participatory and delegative leadership, problem-solving, conflict management, task orientation, influence by example, decision-making, vision, and proactivity [16,17]. The use of various leadership and management skills/abilities within a system, together with the corresponding styles, are crucial factors that greatly enhance its efficiency. The relevant literature defines leadership as a process of influencing the thoughts, feelings, actions, and behaviors of a group of people by a person (leader) in such a way that they voluntarily try to implement set goals with the greatest possible effectiveness [20]. Thus, in order to accomplish specific goals, leadership entails a certain amount of responsibility that involves applying the material and human resources at hand and making sure that the organization remains cohesive [21]. On the other hand, through management, the planning, forming, mobilizing, and coordinating of resources and means (human resources, land, equipment, capital) available to the organization are carried out in order to realize the common goals and objectives in a certain time and with the best possible result [22–24]. Efficient managers arise out of necessities rather than desires; they excel at defusing conflicts between individuals or departments, placating all sides while ensuring that an organization's day-to-day business is completed [25]. In conclusion, management and leadership work to accomplish the objectives of the organization effectively and efficiently using its material and human resources.

Forest firefighters' work puts them in high-risk locations where they are frequently exposed to unfavorable scenarios marked by persistent danger and unpredictability, making their task one of the most commonly acknowledged dangerous and unpredictable occupations [26–29]. Numerous studies have investigated the implementation of the military administration system in the fire service [30–32]. These parallels can be found in the competencies that foster the development of leadership, including team building, communication, supervision, teaching and guidance, technical and tactical proficiency, decision-making, planning, application of available systems, and ethics [30–33]. Consequently, there is an operational system of rules and guidelines governing the fight against forest fires, with the main goal of protecting firefighters, citizens, and firefighting equipment. In addition, forest fire forces are often called upon to manage crisis situations, where crises refer to occurrences that threaten the fundamental operation or viability of an organization (natural and/or any entity with a particular purpose) (see [34–36]). In forest fires, crisis events often result in the ecological disturbance of nature and substantial alteration of existing habitats. The routine framework of activity (work environment) of forest firefighting forces performing under uncertain conditions acknowledges this job as one of the most dangerous and unpredictable occupations; hence, crisis leadership and management are closely related to the demanding

and emergency-filled work environment in which forest firefighters work. The aforementioned traits (characteristics) impart more specialized management and leadership skills that should set fire force leaders apart during regular operations. As regards the prevention and suppression system of forest fires, human resources (i.e., fire force coordinator leaders, forest firefighters, operators of forest firefighting equipment, etc.) are crucial to managing and putting out any forest fire. In order to extinguish a forest fire (wildfire), manpower must work as a cohesive unit at the greatest level. Training, planning, and coordination in the application of firefighting tactics are the catalytic parameters of human resources [19,27]. Leadership and managerial traits must also set personnel at all levels of the forest firefighting system operation apart [17,19,27]. In fact, research studies have explored the need for leadership and management skills in firefighters (e.g., [15,17,19]). In particular, management and leadership abilities enhance flexibility [37], increase awareness of and comfort in expressing dangerous situations [38], potentially ease the handling of difficult situations [29], and ultimately guarantee well-being, highlight the role of leadership in promoting well-being, and argue that individualistic ethics may lead to a devaluation and loss of relevance for leadership, which would then lead to a decline in well-being [39,40].

In the literature, management and leadership are two separate but complementary systems of action with different functions and distinct actions [22,41,42]. Although controlling and influencing others is the main goal of both managers and leaders, the literature argues for the lack of a clear distinction between the concepts of administration and leadership in terms of the individuals who exercise them as forms of management (operation) in an organization [22,43]. Thus, the main distinction between managers and leaders is how they accomplish their objectives, since managers utilize their official authority to exert control, while leaders inspire and motivate their followers through their vision [22,41–43]. In any event, management and leadership work to accomplish the objectives of the firefighting force effectively and efficiently using its material and human resources [14,17,19]. In addition, team leaders in the firefighting force must exhibit flexibility in order to protect their subordinates [19]. In emergencies, team leaders would be directive, but not in routine situations, where they should invest in an empowering leadership style that promotes information and power sharing and raises the autonomy, accountability, and participation of subordinates in decision-making [44,45].

The purpose of this study was to investigate the perceptions of participants in the incident command system (ICS), focusing on the management system of forest fires (MSFF), particularly on identifying the management and leadership traits of individuals who carry out administrative responsibilities (team and group leaders). Besides, the study seeks to identify the leadership philosophies and management models corresponding to these traits (characteristics) that are essential to the effective operation of ICS in MSFF ("ICS in MSFF" referred to as FFICS). Since this research is one of the few on forest firefighters, and especially during the operation of FFICS, the goals of investigation toward the overall accomplishment of the research's purpose include identifying the competencies and skills that should distinguish the operational and administrative personnel of the forest fire force and developing recommendations that will serve as a foundation for creating leadership and training programs. Research points address the optimum leadership and administrative qualities of FFIC participants alongside the ideal management and leadership style for the FFICS. The study also questioned whether leadership and management philosophies at the FFICS should be modified according to the system's developmental stages (pre-/post-operational) and whether FFICS members need to exhibit different leadership and management traits depending on the level of the organization on which they operate.

2. Materials and Methods

2.1. Data Collection—Investigation

In order to address the research points of the current study, an investigation was conducted by the Department of Forests (Republic of Cyprus), the legal body for the implementation of the forest fire management system on the island. The Department of Forests (DoF) applies an integrated forest fire management system that develops along the axis of four measures: prevention, detection, and reporting of forest fires, pre-suppression (prevention measures in anticipation of a fire event), and suppression (extinguishing measures during firefighting) [46]. Under the framework of suppression measures, the DoF established the forest firefighting force (including forest station, forest officers, firefighters, firefighting equipment, aerial firefighting means, etc.) [46]. Since November 2019, the DoF's forest firefighting force has adopted the incident command system (ICS) as its forest fire management system in place of a previously used mechanism. The previous firefighting mechanism was judged as lacking coherence for both practical and theoretical reasons, as its implementation focused on local forest divisions and was based on directions and/or annual guidelines issued by whoever was the head of the DoF at a given time (personal communication with DoF). Thus, in practical terms, the large forest fire events in the Troodos mountain range in 2016 were judged to lack administrative coherence and internal coordination, as well as with other bodies. In theoretical terms, in the midst of a climatic crisis, the scenarios of large fire events (and/or mega-wildfires) are particularly pronounced, and for these reasons, the previous forest-fighting system was replaced by more coherent (holistic) FFICS. For the implementation of FFICS, the DoF was enforced by new staff (~40% more firefighters) and equipment (i.e., emergency firefighting vehicles, firefighting trucks, bulldozers, etc.). The ICS is characterized as a standardized approach to the command, control, and coordination of emergency response [47] through its achievement of a specific hierarchy and organization of critical incident management [48,49]. Therefore, the ICS aims to effectively and efficiently manage any incident by integrating a combination of facilities, equipment, personnel, procedures, and communications operating in a common organizational structure [48,49]. The FFICS of the DoF forest fire management system is based on the development and operation of five main operational and administrative axes, namely [50]: (i) administrative action, which is in charge of handling the incident overall and setting operational priorities and objectives; (ii) operational action, which organizes and guides the extinguishing forces and carries out the necessary actions for the fire extinguishing plan's implementation; (iii) planning, which aims to gather and evaluate information, record forces, and develop a firefighting plan; (iv) management, which handles providing all necessary materials and support services to bolster the forest firefighting forces engaged in firefighting; and (v) financial management, which maintains a statement of expenses and accounts for operations analysis of fire extinguishing expenses. For the purpose of this study, the investigation focused on the operational action of FFICS as this is applied by the DoF, which in the 2023 firefighting season consisted of both the firefighting group and the administrative group. The firefighting group of the FFICS in DoF comprised, from bottom to top, 527 forest firefighters, 157 team leaders, 21 group leaders, and three rectors of forest divisions, who also served as the link between the two groups. The administrative group consisted of the director and two vice-directors of the DoF.

2.2. Research Tools and Data Collection

For the current study, mixed method research (qualitative and quantitative data) was used since it is characterized by the combination of at least one qualitative and one quantitative research component (see [51–53]). This method increases the possibility of finding distinct patterns of association and potential causal linkages between variances in multiple

results (research questions and indicators) [52,54]. It is feasible to perform integration and in-depth analyses and to allow evidence from one source to support or contradict evidence from another by combining both quantitative and qualitative research data (evidence) from the participants in a particular study [54–56]. In this research, two questionnaires were necessary, and for their construction, the following steps were taken: First, a preliminary version of the questionnaire based on the findings of a literature review was designed, and then it was examined by a committee. The first study was conducted on two independent subgroups of academics from Greek and Cypriot Universities, including experts in leadership, organization, and forest fires. This step helped establish the validity and reliability of the questionnaire. Afterward, a second study was conducted on an independent sample (staff of the forest fire force units in the DoF, e.g., forest firefighters, team leaders, group leaders, and people who participated in the higher administrative positions of FFICS) that allowed us to test the convergent validity. Finally, after the collection of the quantitative data, the internal consistency (Cronbach's alpha) for each subscale of the questionnaire was examined.

2.2.1. Qualitative Research Method

The qualitative research method in the current study aimed to highlight issues that arise in conversation, treating the participants as individuals rather than mere subjects of study, as is the case in the relevant literature, since in-depth information about the subject is sought from people who possess specialized knowledge and/or hold an important position [54,55]. Through qualitative research, the study adopted a process of purposive sampling, choosing sampling units (individuals) that presented specialized knowledge/expertise regarding the object of the study [57]. The implementation of the qualitative research method in the current study was carried out through personal interviews using a semi-structured questionnaire. The semi-structured questionnaire is a tool for developing a list of topics to be discussed, where, with the interaction between the researcher and the respondent, aspects of the topics under consideration are explored, both in a different order and depth, as well as in terms of the field of analysis [56,58]. In the present research, the semi-structured questionnaire consisted of four (4) thematic discussion sections (open-ended questions), with the subject of discussion being the special leadership and administrative traits that the team leaders and heads of the operational action of the FFICS should have, and how these features work constructively in maximizing the performance of the FFICS (Supplementary Material S1). Thus, the personal interview, based on a semi-structured questionnaire consisting of open questions, was conducted for people who participated in the higher administrative positions of the FFICS pyramid. In the current study, nine individuals were personally invited to participate in the qualitative research. These individuals are the only members of FFICS who have a broader view of the operation of the system while possessing specialized knowledge of the administration and function of FFICS due to their important positions. These nine individuals were the following: (i) Minister of Agriculture, Rural Development and Environment, political head of the DoF (invitation of the acting minister and the former minister), (ii) Permanent Secretary of the Ministry of Agriculture, Rural Development and Environment, and (iii) Executive heads/leaders of the FFICS in the DoF (i.e., the director of DoF, the two Chief Conservators of Forests, and the three rectors of the Forestry Division).

2.2.2. Quantitative Research Method

The quantitative research method aims to capture the extent of the study phenomenon and explain the degree and weight of the study object using quantitative data [53,55]. In addition, quantitative research supports the generalization of conclusions characterized by

greater reliability and validity due to the size of the research sample [55]. The questionnaire was designed for the needs of this research, with questions formulated to collect information that would provide answers to the research questions. The design of the questionnaire was based on the general theoretical background of leadership and management qualities, where management and leadership are assumed to be two separate but complementary systems of action with different functions and distinct operations [37–40], as well as on the existing knowledge on firefighting and conclusions from pertinent literature [17–19,26,27]. Adopting these benefits of the quantitative research method, this study designed a questionnaire consisting of 21 close-ended questions. This type of question can be easily coded for statistical analysis, while it is convenient for respondents who are merely required to choose from a list of pre-determined answers, saving them time and effort [53,55,59], especially in cases where the study group was from different administrational and educational levels. The questionnaire (Supplementary Material S2) was divided into three main sections: (i) Introductory questions (A.1–A.6): recording the general perception about the subject of the research; includes three Likert-type questions that record the importance of specific statements, two rating scale questions, and one dichotomous scale question, (ii) Core questions (B.1–B.8): grouped according to the two thematic studies, i.e., questions concerning the formulation of positions in terms of leadership traits (B.1–B.5) and the administrative traits (B.6–B.8) of the team and group leaders and/or heads of FFICS, questions that were divided into four Likert-type questions and five rating scale questions; and (iii) Personal questions (C.1–C.3): for collecting information about the sociodemographic traits of respondents (gender, years of service, and management level in the Department), questions that were divided into one dichotomous scale question and five simple choice questions. Thus, the quantitative research method in the current study was used for recording the opinions (perceptions) and group trends of the forest fire force units in the DoF (e.g., forest firefighters, team leaders, group leaders), namely, the people who are engaged in the day-to-day firefighting procedure. The Likert-type questions were scaled into five classifications (i.e., 1–5) in order to record the opinion (i.e., satisfied and/or importance of statements) of participants in the survey, while the rating scale questions recorded the preference of the participants in the survey by classifying (rating) specific statements into a scaled range (i.e., 1 to 3 or 1 to 5) according to the order of importance and/or preference (Supplementary Material S2). The conceptualization, functionality, and reliability of the questionnaire were confirmed/tested based on the test-retest reliability [55,60]; as mentioned above, the questionnaire was distributed to two independent subgroups (with a 10-day gap between the two phases of the questionnaire's distribution).

In order to ensure the representation of the opinions of all firefighting groups that comprise the FFICS in DoF, the stratified random sampling strategy was adopted for the quantitative questionnaire. The questionnaire was distributed to the forest fire force groups (e.g., forest firefighters, team leaders, group leaders) since using the stratified groups in research enables comparison and contrast of the variables between the strata and minimizes the variation of the study variables [55,61,62]. This sampling strategy ensures the advantages of random sampling, taking into account the variability of the sample in the different strata and maximizing the validity of the results (more information) about the population while maintaining the ability to draw conclusions about the different strata without needing additional sampling [62]. The determination of the sample size as it is captured per strata was performed using the formula below [63]:

$$Sample\ Size = \frac{Z^2 \times s^2 \left[\frac{N}{N-1}\right]}{e^2 + \left[\frac{Z^2 \times s^2}{N-1}\right]}$$

where: **Population size (*N*)**: Study population size; **Margin of sampling error (*e*)**: Maximum margin of error within which the population value is allowed to move, with the margin of error being 5%; **Confidence Level (*Z*-score)**: Specifying a confidence interval for setting a safety margin on sample size estimates, $Z = 1.960$ for a 95% confidence interval; **Standard deviation (*s*)**: A standard deviation value of 0.5 is accepted (since there is no survey data to determine an exact variance).

By defining the sample size for each stratum and randomly distributing the questionnaire among FFICS employees, the goal of the stratified random sampling approach in this study was established. The hard copy questionnaire was distributed by the researcher to the Forest Stations (25 stations dispersed across the island) in accordance with the FFICS's service shifts. The DoF determines as shifts the operational system of firefighters working on a standard work-period pattern from 07:30 until 19:30 on a "tour" of two days, plus one security firefighting team in each Forest Division from 19:30 until 07:30 (overnight shift). The fact that the researcher is unaware of the pattern of shifts in the Forest Stations and the staff in each shift guarantees absolute randomness and participant confidentiality when it comes to survey distribution.

2.3. Data Analysis

In the current study, the mixed method research adopted the approach of parallel data analysis, conducting quantitative and qualitative research separately but simultaneously (Figure 1). Through parallel analysis, it is possible to synthesize and compare the findings from the two procedures so that broader conclusions can be drawn [53,54,64]. In addition, mixed methods research distinguishes the purposes of applied triangulation, enabling the examination of the differentiation between the trends/positions recorded in terms of the object of study through the quantitative and qualitative data of the research [54,55,65].

The processing of qualitative research (personal interviews) was carried out based on the content analysis approach (or thematic analysis), since it achieves a focus on dominant themes and the frequency of occurrence of specific themes—codes and/or words used in conjunction–as these emerge from the participants' responses [59,66–69]. The coding of themes is achieved by examining the frequency of occurrence of themes and words from a complex set of qualitative data, aiming to draw generalized conclusions [66–69]. Using the three primary coding analysis methodologies, the analysis concentrated on finding the themes and values that exist and are conveyed in the interviews: (i) open coding, which aims to group the data into initial codes or categories in order to transition the data in a way that is adapted to the original study idea; (ii) axial coding, which organizes and connects the categories that emerged from the above stage in order to identify relationships between categories and subcategories that will contribute to the coding of the interview content; and (iii) focused coding, which aims to code the main study categories and group the codes based on the emerging main categories as core categories [70–72].

The quantitative data collected through the quantitative research in this study are ordinal scale (and/or nominal); therefore, the values do not have numerical properties, and the data analysis was performed on the basis of statistical approaches provided by the literature regarding ordinal scale and/or nominal scale analysis. The quantitative data were then coded and analyzed with the Statistical Package for the Social Sciences (SPSS v.20) [73]. Initially, descriptive statistics were applied in order to estimate the percentage (%) of the answers (choices) given for each variable of the questions under consideration. This method is able to organize and clearly describe the choices made in terms of variables for each sample question and can also define the midpoint of distribution, also referred to as central [73]. For the quantitative data, inferential analysis was also used in order to generalize the results both in terms of the reliability and validity of the questionnaire, as

well as in order to draw conclusions of a hierarchical structure between the relationships of the variables [55]. The internal consistency, or reliability, of a set of survey items was measured for the multivariate questions (Supplementary Material S2; Likert-type questions: B.4, B.5, B.8, B.9) using Cronbach's alpha reliability index [74,75]. This statistic is useful for determining whether a set of items consistently measures the same characteristic [74,75]. Cronbach's alpha quantifies the level of agreement on a standardized 0 to 1 scale, with values above 0.7 reflecting optimal evidence of research reliability [69]. Additionally, by separately ranking the variable values for each subject, the non-parametric Friedman test was applied to these identical questions to ascertain the mean rank of the ranked values for each subject [76,77]. For a number of multivariate issues, the non-parametric Friedman test thus supports the comparison of the outcomes of related sets of variables [76,77]. The non-parametric Wilcoxon paired test was run in order to investigate the homogeneity of the degree of orderliness of the variables in relation to the evolution of particular leadership styles both before and throughout the FFICS's implementation (formulations of question B.1) [55,75]. Finally, the non-parametric Kruskal–Wallis test [55,77] examined whether the FFICS participants' answers to the various variables (questions B.2, B.4, B.6, and B.9) showed the same median distribution across the different administrative levels of ICS or years of service in the DoF.

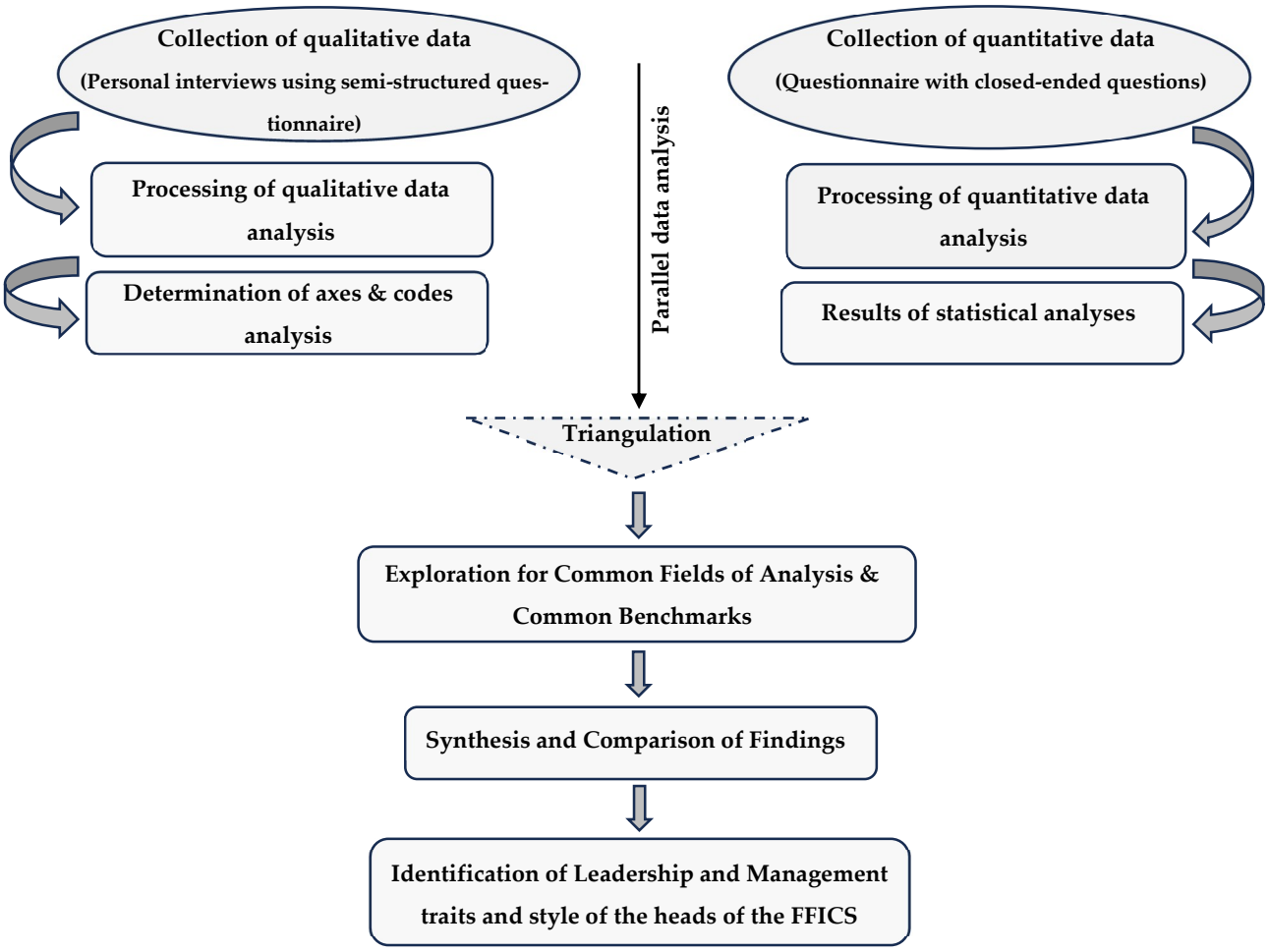

Figure 1. Chart flow of the data analysis design for the current study.

3. Results

Sampling for the current study was performed with approval from the Cyprus National Bioethics Committee and Department of Forests.

The qualitative research adopted purposive sampling by conducting personal interviews with six out of the nine experts who received an invitation to participate (the individuals who did not participate stated that they were unable to take part in the research within the set time frame because of their workload). The process of purposive sampling in the format of personal interviews included one of the political heads of the DoF and five technocrats (executive heads/leaders of the FFICS) (Table 1).

Table 1. Coding of personal interviews carried out for this study.

Personal Interview Coding [1]	Date of Interview	Date of Interview Completion
E.I.-1	29/11/2023	10/12/2023
E.I.-2	04/12/2023	12/12/2023
E.I.-3	06/12/2023	29/12/2023
E.I.-4	12/12/2023	29/12/2023
E.I.-5	12/12/2023	05/01/2024
E.I.-6	13/12/2023	08/01/2024

[1] E.I.: Expert's interview.

The quantitative research based on the structured questionnaire was randomly distributed among the staff of the FFICS of the DoF. The number of questionnaires was determined based on stratified random sampling, where a total of 309 completed questionnaires were collected (Table 2). The survey with the quantitative questionnaire was carried out from 15th November 2023 to 18th December 2023.

Table 2. Stratified sample size distribution for conducting quantitative research.

Staff Rank	Completed Questionnaires per Stratum
Forest firefighters	212
Team leaders [1]	87
Group leaders [2]	9

[1] Forest Officers and 1st Class Officers; [2] Senior staff.

3.1. Qualitative Research Data Analysis

The qualitative research data were analyzed based on content analysis (thematic analysis) of the interviews, which was conducted in such a way as to capture the complete dialogue of the oral (recorded) interviews in a printed form so that the application of the stages of analysis was possible (visible): open coding—axial coding—focus coding. Based on the analysis of the transcribed interviews, two thematic axes of the study were identified: (i) "leadership traits" which included six codes that describe particular traits that, by examining the opinions of experts, should differentiate the type and style of leadership, as well as the unique qualities of the leaders in the various SDKDP structures and (ii) "management traits", which are the result of four codes that describe and reinforce the function of administrative structures with particular references. Excerpts from the interviews were used to document the codes found during the coding of the qualitative data (Section 3.3). In addition to the focus codes, the content analysis also identified specific traits for the operation of the FFICS management system in practice: "*. . . I think every position has the same requirements, it's just that the amount of work of each level has been different. However, the leaders (i.e., First-Class Forest Officer) commanding four Forest Officers on a front should not be undistinguished in leadership and management qualities. If the leader doesn't have any of these it means the leader will fail.*" (quote from E.I.-4) and "*. . . organizational and management skills apply to everyone, however the higher you go up the management pyramid the more necessary management skills and abilities are. Administrative errors are more easily seen. . . in the absence of managerial characteristic abilities.*" (quote from E.I.-5).

3.2. Quantitative Research Data Analysis

The data analysis was conducted by adopting the rules of descriptive statistics and capturing the percentage frequency of occurrence (%) of the responses for each structural part of the questionnaire, as well as for the individual questions present therein. The sampling data from the quantitative questionnaires were entered into a worksheet in SPSS, forming a value entry system equal to 35,226 cells (114 question fields × 309 questionnaires).

Despite the fact that the FFICS has only been in place since 2019, the survey respondents' sociodemographic information revealed that they were adequate since they exhibited a long experience in forest firefighting. In particular, 43.7% of the staff that participated in this study had been serving in forest firefighting for more than 16 years, while the majority of the respondents (56.3%) had 2–15 years of experience (Supplementary Material S2).

Examining the introductory questions (Supplementary Material S2; Questions A1–A6) revealed the general perceptions and positions of the participants regarding the survey subject. Investigating the satisfaction degree of respondents with their participation in the FFICS of the DoF captured a relatively equivalent distribution of variable percentages, since 38% recorded "Satisfied", 24% "Very satisfied" and 21.4% "Extremely satisfied", while 16.6% of the questionnaires scored "Slightly Satisfied" to "Not at all satisfied". The same pattern of answers, without a variable with a percentage above the average, was also recorded to assess the familiarity degree of respondents with the FFICS. More specifically, 29.2% of the questionnaires scored "Satisfied", 31.5% "Very satisfied" and 20.5% "Extremely satisfied". A critical point of view for the participants in the quantitative survey was that the development of leadership and management traits (skills) of leaders (supervisors) in the FFICS, is strongly related to their previous service (years of work in the field), since 24.7% of the questionnaires reported "Satisfied", 30.2% "Very satisfied" and 37.3% "Extremely satisfied". The survey also demonstrated that the development of leadership and management traits of FFICS leaders (88.7% of the questionnaires) seems to strengthen the team's functioning under the ICS. Finally, the majority of the research participants seemed to be familiar with the correct wording of both the terms of leadership (48.4% of the questionnaires) and management (56.5% of the questionnaires).

A descriptive analysis of the core questions highlighted the views and opinions of the participants in the FFICS regarding the leadership and management traits that should distinguish the leaders of the FFICS.

As regards leadership (Supplementary Material S2; Questions B.1–B.5), the intelligence and capabilities traits should distinguish the FFICS leaders according to 69.4% of the questionnaires, while 57% believe that judgment/critical thinking is a very important personality trait. In addition, the FFICS leaders should be distinguished by other personality traits such as ethical behavior (45.5%), ability to develop a team (67.8%), and responsibility (46.8%) (Supplementary Material S2). A significant outcome is also the view that leaders should possess distinctive traits since the argument that "The leader takes into account the views of the employees, but the leader makes the final decision" is fairly preferable during the forest fire pre-suppression (59.2%) and during the forest fire suppression (61.3%) action. On the contrary, the passive leader was not chosen in the questionnaires since the leadership style of "The leader has a limited role, and does not take enough responsibility for planning the work execution" was slightly preferred in the questionnaires during both pre-suppression (59.2%) and suppression (54%) of forest fire action. A critical point of view for the FFICS's leaders is the emotional intelligence components, with the traits of "Awareness of the leader's own strengths and weaknesses", "Understanding of employees' emotional state" and "Managing interpersonal relations between employees, aiming at guiding them towards goals achievement", clustering as the most important in over than 50% of the questionnaires.

In terms of management (Supplementary Material S2; Questions B.6–B.8), the quantitative research illustrated the preferred traits that should distinguish the FFICS's leaders. Thus, the most important administrative function is the "Organisation: Division of work, definition of activities, definition of employee roles, formulation of work rules and relationships, organisation of material resources" with 54.1% of the questionnaires classifying this as the most important. In addition, the traits of "employee motivation" and "cultivating a culture of cooperation and communication in the service" were those with the highest preference in the questionnaires, with 52.2%. The results from this analysis provided useful guides that were used for the triangulation analysis between qualitative and quantitative research data (Section 3.3).

The inferential analysis provides useful information for sampling data quality and generating observations on a specific leadership and management type and style that should characterize FFICS leaders. The non-parametric Wilcoxon paired test showed statistically significant levels ($p < 0.05$) of difference for four out of the ten traits in their classification by respondents during the FFICS pre-operative action (before) and operative action (question B.3). Thus, the traits: #1. The supervisor (leader) takes the decisions alone bearing the institutional (legal) responsibility for them, #6. Only with the presence of the supervisor increases the productivity of the staff, #7. The supervisor encourages the participation of the staff, developing a sense of responsibility, without the staff bearing institutional responsibility, # 9. The supervisor does not set goals, thus hindering productivity and progress, creating little interest in work and a loose sense of teamwork, and demonstrating variations in the preferences given by respondents for these traits in the different phases of the development of FFICS, namely pre-suppression (prevention) and suppression management systems. Examining the reliability index for each of the Likert-type questions, recording a Cronbach's alpha greater than 0.7 strengthens the reliability of the sample's answers to each question (Supplementary Material S2). Moreover, the Friedman test was employed to ascertain that, with regard to the questions under investigation, there exists a statistically significant disparity between the group means (df = k − 1; the distribution in the Friedman test corresponds to χ^2) and defines the rank of the answers for every question (refer to Supplementary Material S2; questions: B.4, B.5, B.8, B.9). The Kruskal−Wallis test determined the hierarchical breakdown of the statistically significant difference between the medians of the independent groups either according to the role/position in FFICS or according to the number of participation years in FFICS. According to the Kruskal−Wallis test, there was a significant difference between preferences for the groups based on the role/position in the FFICS in 16 leadership and management traits (Table 3) and for 13 attributes based on group rendering to the participation years in FFICS (Table 4).

Table 3. Results of Kruskal−Wallis test determined the statistically significant differences in leadership and management traits between groups of staff according to their role/position in FFICS.

Question Code ǂ	Traits §	Chi-Square	Asymptotic Significant (*p*-Value)
B.1 (1)	Judgment/Critical thinking [(c)]	18.243	0.000
B.1 (1)	Decisiveness [(b)]	7.215	0.027
B.1 (2)	Personality—Personal integrity [(c)]	8.127	0.017
B.1 (3)	Ability to develop a team (collaborativeness) [(c)]	10.040	0.007
B.1 (4)	Completing and achieving results [(b)]	10.876	0.004
B.3	The leader (supervisor) makes the decisions himself, bearing the institutional (legal) responsibility for them. [pre-suppression] [(a)]	12.191	0.002

Table 3. *Cont.*

Question Code ǂ	Traits §	Chi-Square	Asymptotic Significant (*p*-Value)
B.3	The leader has a limited role and does not take enough responsibility for planning the work execution. [pre-suppression] (a)	19.916	0.000
B.3	The leader does not set goals, thus hindering productivity and progress, creating little interest in work and a relaxed sense of teamwork. [pre-suppression] (a)	18.221	0.000
B.3	The leader (supervisor) makes the decisions himself, bearing the institutional (legal) responsibility for them. [suppression] (c)	6.046	0.049
B.3	The leader has a limited role and does not take enough responsibility for planning the work execution. [suppression] (a)	8.289	0.016
B.3	The leader enhances motivation and skills development during employees' work and during the System's operation, thus, however, running the risk of losing time in cases of crisis and/or cases of reaction time being limited. [suppression] (a)	8.510	0.014
B.3	The leader does not set goals, thus hindering productivity and progress, creating little interest in work and a relaxed sense of teamwork. [suppression] (a)	16.427	0.000
B.3	The leader grants autonomy to the employees, contributing to the development of high performance; however, if employees are inexperienced and are unaware of how to manage time, this can be disastrous for productivity. [suppression] (c)	11.185	0.004
B.5	To prioritize the importance of events according to the purposes of the system. (b)	9.520	0.009
B.7	To manage "bureaucratically", staying true to formulas, business plans, and procedures. (a)	11.866	0.003
B.7	To utilize the skills and knowledge of each employee separately. (c)	7.781	0.020

ǂ Question code: The code number of the question in the quantitative questionnaires (Supplementary Material S2); pre-suppression: Traits that should characterize the leaders of FFIC during the preparation of firefighting force, before the fire event (prevention); suppression: Traits that should characterize the leaders of FFIC during the suppression of fire event; Asymptotic Significant at the level of 5%. § For each trait, in brackets, the group with the highest score of mean rank after the Kruskal−Wallis test: (a) forest firefighters, (b) team leaders, and (c) group leaders.

Table 4. Results of the Kruskal−Wallis test determined the statistically significant differences in leadership and management traits between groups of staff according to the number of participation years in FFICS.

Question Code ǂ	Traits §	Chi-Square	Asymptotic Significant (*p*-Value)
B.1 (1)	Self-awareness (c)	16.570	0.005
B.1 (2)	Integrity (f)	17.486	0.004
B.1 (3)	Ability to develop a team (collaborativeness) (f)	17.559	0.004
B.3	The leader (supervisor) makes the decisions himself, bearing the institutional (legal) responsibility for them. (f)	12.198	0.032
B.3	The leader has a limited role and does not take enough responsibility for planning the work execution. [pre-suppression] (b)	13.116	0.022
B.3	The leader does not set goals, thus hindering productivity and progress, creating little interest in work and a relaxed sense of teamwork [pre-suppression] (b)	29.581	0.000
B.3	The leader grants autonomy to the employees, contributing to the development of high performance; however, if employees are inexperienced and are unaware of how to manage time, this can be disastrous for productivity. [pre-suppression] (d)	18.097	0.003
B.3	The leader shows confidence in the team's abilities, renouncing any decision and responsibility. [suppression] (d)	17,732	0,003

Table 4. *Cont.*

Question Code ǂ	Traits §	Chi-Square	Asymptotic Significant (*p*-Value)
B.3	The leader enhances motivation and skills development during employees' work and during the System's operation, thus, however, running the risk of losing time in cases of crisis and/or cases of reaction time being limited. [suppression] (d)	12.846	0.025
B.3	The leader does not set goals, thus hindering productivity and progress, creating little interest in work and a relaxed sense of teamwork [suppression] (a)	14.701	0.012
B.3	The leader grants autonomy to the employees, contributing to the development of high performance; however, if employees are inexperienced and are unaware of how to manage time, this can be disastrous for productivity. [suppression] (b)	14.288	0.014
B.5	To highlight collaborative work and mission. (f)	11.679	0.039
B.7	To manage "bureaucratically", staying true to formulas, business plans, and procedures. (b)	17.150	0.004

ǂ Question code: The code number of the question in the quantitative questionnaires (Supplementary Material S2); pre-suppression: Traits that should characterize the leaders of FFIC during the preparation of firefighting force, before the fire event (prevention); suppression: Traits that should characterize the leaders of FFIC during the suppression of fire event; Asymptotic Significant at the level of 5%. § In brackets the cluster of employees' years of service in the Department of Forests, recorded by the questionnaires: (a) <2, (b) 3–8, (c) 9–15, (d) 16–23, (e) 24–32, and (f) >33; as these correspond to the highest score of mean rank after the Kruskal−Wallis test.

3.3. Mixed Method Analysis of Survey Data

In the current study, mixed method research was utilized to identify and highlight the leadership and management traits that should distinguish the FFICS leaders. Parallel analysis of both data sets and triangulation between their conclusions lead to the specification of ten leadership and management traits that ought to set the FFICS leaders apart. The interpretation of findings from both data sets was based on the codes that arose from the qualitative data analysis (Section 3.1) and also used the quantitative questions that matched the highest desired (positive) degree of characterization of the leadership and administrative traits of leaders (Section 3.2). In addition, the triangulation of both data sets from qualitative and quantitative research clarified the specific traits that must distinguish the team and group leaders in FFICS (Table 5). Notably, triangulation analysis promoted the specific traits that must distinguish each of the leader groups in the hierarchical structure of the FFICS. Specifically, the head of the administration (director of DoF or chief of command) should possess more management skills, while team and group leaders should have more leadership skills.

Table 5. The leadership and management traits of leaders in FFICS result from the triangulation of quantitative and qualitative research data.

Qualitative Data				
Axis	**Term (Definition)**	**Codes ∫**	**Imprint/Statement (Source)**	**Quantitative Data ∫**
Leadership traits	**Leadership is the process/way through which the behavior and actions of the staff are influenced to achieve the objectives of the** FFICS.	Empathy (LT-E)	Empathy is the A and Z; we understand difficulties to feel them, and they feel us. . . (E.I.-1) You go out of your way to serve your staff. . . (E.I.-2) It understands what your staff is feeling at every moment. . . (E.I.-4)	Intelligence and Capabilities (B.2) Understanding of employees' emotional state (B.4) To manage in an employee-centered manner, aiming at effectively utilizing employees at the lowest possible cost. (B.7)
		Judgment/Critical Thinking (LT-J/C)	Judgment: the higher you are in the system structure, the more decisive it is. . . (E.I.-5) Ability to assess the situation, quickness in making your decisions. . . (E.I.-5) Ability to perceive and judge. . . can make correct decisions. . . (E.I.-6)	Judgment/critical thinking and Decisiveness (B.1) Intelligence and Capabilities (B.2) To prioritize the importance of events according to the purposes of the system. (B.5)
		Self-knowledge (LT-Sk)	We make mistakes; I apologized and moved on. . . (E.I.-3) Not having the strength to continue and transferred my responsibilities to someone else. . . (E.I.-3) When your staff is in danger, you will definitely take a step back; you will not lose a person, a life, for which you are responsible. . . (E.I.-4)	Self-awareness (B.1) Awareness of the leader's own strengths and weaknesses. (B.4) To be in a process of reviewing critical elements that are taken for granted. (B.5)
		Urge (LT-U)	It encourages staff. . . (E.I.-1) Sometimes it takes engagement. . . (E.I.-1) To encourage, to guide, to cooperate, to support, to be by their side. . . (E.I.-2) A team leader leads others away. . . (E.I.-3) To be "motivating" their staff to do the right thing. . . (E.I.-4)	Managing interpersonal relations between employees, aiming at guiding them toward goals achievement. (B.4) To encourage employees to perceive problems in many ways (different perspectives) instead of single-dimensionally. (B.5) Employee motivation. (B.7) There is motivation and productivity, members cooperate and work effectively toward the purposes of the FFICS. (B.8)
		Social skills (LT-SS)	Earn the trust of the team. . . (E.I.-2) You show importance to the other person, listen to them, discuss the issue, come to a common decision. . . (E.I.-3) Characteristic of diplomacy, because in cases of crisis and tension, you will need to negotiate many things. . . (E.I.-4) You function more as a team with the personal level [character] . . . (E.I.-5) First, you are devoted, so will the rest of the incumbents. Let's all go together, teamwork and hard work, let there be trust. . . (E.I.-5)	Ability to develop a team (collaborativeness) (B.1) The leader has a limited role and does not take enough responsibility for planning the work execution. (B.3) To outweigh the benefit of the group over his/her own self-interest. (B.5) To be a skilled/effective negotiator. (B.7) To contribute to increasing the sense of duty among team members. (B.7) There is mutual trust between members. (B.8)

Table 5. *Cont.*

Axis	Term (Definition)	Qualitative Data		Quantitative Data ∫
		Codes ∫	Imprint/Statement (Source)	
Leadership traits	**Leadership is the process/way through which the behavior and actions of the staff are influenced to achieve the objectives of the FFICS.**	Operational Action (LT-OA)	You are not allowed to waver… (E.I.-5) The Director must be purely administrative, be behind, manage operationally, see the bigger picture… (E.I.-1) During the preparation, before even going to the fire, both traits must be present, leadership and management…, but during the operations, the leader must impose their point of view more. Thus, during the operations, the suppression of the leader must certainly be stricter… (E.I.-2) There must be prior contact with the teams to know you very well, and to understand that what you say must be implemented… (E.I.-2) You also get opinions; the final opinion is taken… There are limits—responsibilities both administrative and leadership… (E.I.-2) Down the management pyramid, you have to have the ability to work in a team as you go up more strategically… (E.I.-5)	The leader encourages employee participation, developing a sense of responsibility, however without employees having institutional responsibility. (B.3).
Management traits		Planning and Organization (MT-P and O)	The political decision is determined by the Department and its implementation through administration, organization, leadership, planning… (E.I.-1) To have a vision, to set goals in a specific period of time… (E.I.-4) There is a management system; without a management system, you do nothing; it ensures from one level and the upper importance of the system… (E.I.-5) … I think it is very important that there is a proper organization of good planning, good planning that everyone knows their role, very important, where their own role begins and ends. Avoiding confusion in terms of responsibilities is something that, I think, has plagued the system… (E.I.-6)	To exhibit a vision for the future. (B.5) Organization: Division of work, definition of activities, definition of employee roles, formulation of work rules and relationships, organization of material resources. (B.6) To believe that the goals will be achieved. (B.7)
		Control(MT-C)	Safety above all, don't lose personal… (E.I.-1) Safety issues are important… (E.I.-2) We meet, we review the process we followed, we discuss this data in a very friendly style and context, we don't judge. (E.I.-4)	Control: Assessing final work results, formulating potential problems and errors, determining corrective interventions to achieve results. (B.6) There is control and planning, members distribute work based on ability; the scheme is flexible and members can operate independently. (B.8)

Table 5. *Cont.*

Axis	Term (Definition)	Qualitative Data		Quantitative Data ∫
		Codes ∫	Imprint/Statement (Source)	
Management traits	**Management, the development of structure and the execution of the necessary functions of the FFICS that are necessary for the implementation of its actions and intended goals.**	Address(MT-Ad)	The Director of DoF (head of FFICS) should be behind to protect their staff and correct the wrong decisions of the rest. . . (E.I.-1) Calm, cool when talking to them, flexibility to differentiate. . . (E.I.-2) The one who exercises the entire management of the fire has administrative responsibility. . . (E.I.-2) Training academy, we should strengthen the supply of knowledge and theory, seeking development of the forest firefighter program and staff development. . . An independent operator has responsibility for evaluation and control, with specific elements that you want to control. . . (E.I.-3) Management of difficult incidents, calmness, composure, clear mind, these are also transmitted to the staff. (E.I.-4)	Direction: Creating a favorable organizational climate and optimal management, supervision, guidance and motivation of human resources. (B.6) To encourage employee participation in training activities. (B.8)
		Decision-taking(MT-D)	Each employee can take the initiative, propose a solution, good employees come up with the solution. . . (E.I.-1) To hear the facts, if the employee's suggestion is correct, I adopt it so that the forest firefighters also understand that we work in this way. . . Thus, a line or solution is followed, which puts. . .(E.I.-4) In the episode, you don't have time to negotiate; if a staff member has a doubt and tells you, you have to solve it. . . (E.I.-4) You realize something is wrong, you have to find other ways to move forward; my decision was to make immediate changes. . . (E.I.-4) You have to get information, they are rules, you have to listen, and put your judgment in order to decide. . . (E.I.-5)	The leader (supervisor) makes the decisions himself, bearing the institutional (legal) responsibility for them. (B.3) Decision-making: Identifying actions and exploring solutions to problems, implementing an optimal solution and evaluating the outcome. (B.6) To encourage employees to take initiative. (B.7)

∫ In brackets: (i) Qualitative data—The code of each personal interview and Quantitative data—The code number of the question in the questionnaires (Supplementary Material S2).

4. Discussion

The debate on the desired "leadership and management virtues" in the various operating structures of organizations and systems has been a point of research and discussion across time [78–80]. The impetus for conducting the current study was the general argument in the literature that there are no commonly recognized patterns of leadership and management traits that are thought to be more effective than others and that management and leadership styles vary between individual contributors, organizations, and/or systems [79,81]. The aforementioned arguments served as an incentive for the use of mixed method research, which allowed for the first investigation of the traits of leadership and management, as well as the style of leadership and management that should set apart the heads of the FFICS's management structures. To describe and record correlations between the study objects without processing and modeling the outcome, the current study's design and completeness of the questionnaires show how to extract objective, global, and substantive content from the discussion topics and conclusions. The thematic formulations made during the in-person interviews, suitability of the quantitative research questionnaire (refer to Cronbach's alpha in the reliability index analysis), and statistical processing of the data and questionnaire all corroborate this observation.

The general outcome of this study demonstrates that the functioning of FFICS is a unique regime that necessitates flexibility and composition in terms of the management and leadership traits that set its employees apart, as well as the management and leadership style that emerges from it based on FFICS's developmental stages. In addition, the study illustrates that certain traits should diverge at different administrative levels (management pyramid) of the FFICS in the DoF. While the existing literature proposes a blurred distinction between the concept of the manager (administrative officer) and the leader (supervisor) when referring to the individuals exercising these forms of management/operation in an organization [36–38], the present study deviates from this view, supporting that the optimum management pyramid of the FFICS should exhibit a differentiation of traits between its levels. Thus, at the top of the FFICS pyramid, leaders are to exemplify more managerial traits, supporting the day-to-day operation of FFIC, whereas team and group leaders at the first line of the firefighting force should be characterized by more leadership abilities. The present results are in accordance with the existing argument that the role of management in an organization is to lead in the direction of effective and efficient functioning of the organization toward achieving a specified objective, while leadership should support the ability of an individual to influence, motivate, and enable others to contribute to the organization's success [82]. Remarkable is the fact that this study follows a mixed method research, wherein the quantitative survey, and a large number of questionnaires were collected, which, together with the high expertise of participants in the qualitative survey, have contributed toward formulating this study's outcomes. These outcomes illustrated that in spite of the short time of the implementation of FFICS in DoF, the forest firefighting force staff have formed clear judgments on the specific leadership and management style and virtues to be adopted by the leaders/heads of the system.

4.1. From the Leadership Traits to the Leadership Style in FFICS

In scholarly literature, the term leadership is one of the most flexible and dynamic concepts, with a wide range of descriptions and definitions [83–85]. There is no single comprehensive definition of leadership, and the academic literature has introduced new terms and definitions of leadership (see [86]). The results obtained from this study indicate that the leader in FFICS should possess a variety of qualities that combine to create an adaptable style of leadership that works for the organization under various operating circumstances. Traits such as communication, ethics, leadership behavior, and right judgment are those

that influence the performance of members of the firefighting force in DoF. These findings verify what is known about leadership, which holds that certain leadership attributes foster cooperation and have a catalytic influence on the systems' successful operation [81,87].

The team and/or group leader in FFICS should act to create a sense of pride in those who work with the leader; the leader should consider the team's benefit to be above any self-interest, demonstrating a sense of power and self-confidence, with the aim of achieving the respect of subordinates. In addition, the findings of the current study determine leadership traits that include emotional intelligence, social intelligence, and empathy, which differentiate excellent leaders from average forest fire leaders [88].

The triangulation of quantitative and qualitative research data emphasizes leadership traits in terms of the anthropocentric and emotional intelligence of the heads. It is thus concluded that the form of leadership that is qualified to be applied in the FFICS is that of transformational leadership (also borrowing, in some cases, traits of transactional leadership). Adopting transformational leadership as a form of leadership in FFICS coincides with the development of the ICS, which supports open communication and the transfer of administrative duties, with the growth and enlargement of the forest fire management system, depending on the episode. These findings are supported by recent research studies, which argue that despite traditional perceptions of the development of hierarchical structures in firefighting and chiefs leading through "authoritarian leadership", evolving the process into a form of transformational leadership achieves optimization of the firefighting system's functioning [15,89,90]. In contrast to other hierarchical structures of administrative function, the FFICS supports transformational leadership since the team and group leader are distinguished by leadership traits such as highlighting the collective work and mission, creating confidence in the achievement of the goals, urging the staff to understand the problems that are created in many ways (not one-dimensional), and treating each team member as a separate person, and not as a simple team member. The traits emerging from the present study have also been recorded in other studies on fire safety team management systems [15,17,81,87,89].

Another important aspect is the need to adopt a complex pattern of leadership style. In FFICS, a critical point is the flow of information (pre-suppression actions and suppression actions) from the firefighters (subordinates) to the leaders (and chief of command) of FFICS since it guarantees the leaders' ability to make the ultimate choice. At the same time, there is a need for institutional responsibility for decision-making, strategic planning, and an active role of the head in the fire extinguishing strategy. In addition, leaders' decisions ought to be implemented immediately without hesitation or tension, achieving rapid action. The synthesis and interpretation of the above findings, as these are fingerprinted during the pre-suppression (prevention) and suppression actions, lead to the argument of a hybrid leadership style developed by the leaders. As a result, a "chameleon" leadership style, including the democratic leadership style (or guiding style) and the authoritarian leadership style (or managerial), should be implemented in FFICS. A leader of FFICS, using the "chameleon" style of leadership, gains the capacity to discern when a different kind of leadership is needed in a certain circumstance, to determine which particular style would work best in that circumstance, and to modify the leader's behavior to fit the new approach [91]. Thus, at the pre-suppression stage, a democratic leadership style emerges in order to achieve the dissemination of knowledge and information and encourage initiative by all members of the FFICS. Conversely, during the suppression stage, the leadership style borrows elements from democratic and authoritarian leadership styles. The need for information flow and exchange of views, which operate in a way that enhances sound judgment and decision-making by the heads of the FFICS, supports the democratic leadership style, while the authoritarian leadership style is also required to ensure personnel safety, facilitate

the work of subordinates who must execute the instructions, and encourage the efficiency and effectiveness of the goals set. In addition, during the suppression stage, the authoritarian leadership style guarantees that the goals, tactics, and operational procedures of the firefighting team are clearly defined to provide clear guidelines and instructions, lessen employee uncertainty regarding task and role assignments, and encourage the prompt decision-making that is necessary in emergency situations. According to this leadership style, leaders and the head of command should bear institutional responsibility for strategic planning, decision-making, and an active role in the firefighting strategy. This finding regarding the hybrid leadership style in firefighting forces is consistent with previous studies, in which the development of a complex leadership style (systems) by the team leaders aimed at the well-being of their subordinates in the pre-operational (pre-suppression) phase with the development of a directive-democratic leadership style, while in the operational (suppression) phase, the development of a managerial-authoritarian leadership style was distinguished [19,39,86].

4.2. From the Management Traits to the Management Style in FFICS

In FFICS, there appears to be a lack of research on organizational management and human resources, particularly when compared to international literature, where there are several studies on organization management and human resources in firefighting (see [92–94]). The results of this study identify management traits and a management type that ensure the efficient implementation of FFICS. In the firefighting force, where human resources are the main component in dealing with fires, operating in all phases of their work as a single unit [19,27], investigating the views of the FFICS staff contributes to identifying specific management traits, such as moral and psychological rewarding of subordinates, satisfaction and recognition of work, participation in the decision-making process, and two-way communication. In addition, a critical point of view for the function of FFICS seems to be the "organization" that defines activities, the determination of the role of employees, the formulation of rules and working relationships, and the organization of material resources. In overview, the findings lead to the argument that the management form suitable for the FFICS borrows elements from both the neoclassical approach and the modern approach to administration. Neoclassical management theory aims to accomplish the work's objectives by emphasizing the development of two fundamental foundational approaches: human relations and individual behavior and attitudes [94–96]. These approaches are intertwined with the objectives and operation of FFICS, as this study has demonstrated. Besides, the neoclassical management theory acts to expand the structures of FFICS (teams, groups, fronts, and sectors). At the same time, the gradual development of the hierarchical structure of FFICS, according to the intensity and extent of forest fire events (linked to the development of ICS), advocates the need to establish practices of modern management theory, since it considers the connections and exchanges that an organization has with the surroundings in which it grows [97,98]. As mentioned in previous studies [22,99], the current study supports the assumption that, in the firefighting force, management should focus on the continuous improvement of its administrative functions (planning—decision-making—organization—direction—control), achieving the logistics and operation (firefighting) of the system, while ensuring the safety, speed, and correctness in decision-making based on the specific traits of forest firefighting teams and their equipment.

The triangulation of data highlights the need for information flow and evaluation of the variability of the conditions, a case that abides by the systemic theory of modern management. The systemic theory accepts that the mutual influence and interconnection among administrated groups are in direct contact with the environment and the conditions

in which they develop, with the flow of information being continuous and direct (characteristic of open systems) [97,100]. The data analysis also supports that efficient management in FFICS should aim to achieve the existence of control and organization of firefighting teams, since the firefighting team is the fundamental component for the evolution of an efficient ICS. Therefore, the rational management of the fire force team achieves division of work based on the abilities of team members, flexibility in team development, and work independence of team members in terms of the role they have to perform [101].

4.3. Insights on Leadership and Management as Practices in FFICS

The above paragraphs argue the specific leadership and management traits that should characterize the FFICS team and/or group leaders, as well as the style of leadership and management that significantly affect FFICS productivity and efficiency. The composition of the forest firefighting force (i.e., heterogenic characters and personalities) and the way in which the FFICS operates contribute to an elaborate administrative framework. In this system, leadership and management are shaped through everyday administration and direction matters, and hence, both need to exhibit a dynamic process of interrelated phases with substantial impact from the pre-suppression stage to the suppression stage (and reversely). Considering that FFICS act under unfavorable conditions and perform under uncertainty due to the distinct nature of forest fire fighting, the day-to-day conduct, where human relations center on emotional intelligence, ensures that the leadership is perceived both under usual circumstances, as well as in fire suppression (and/or crisis) conditions [102]. In FFICS, leadership is associated with greater levels of positive affect, needed when performing under uncertain conditions, since positive affect leads to higher resilience among team members during firefighting events; these traits were also identified to distinguish leaders in cases when crisis situations evolve [35,103]. Therefore, this study finds that at the base of the forest firefighting forces' pyramid (firefighters' teams), the team leader's personality and behavior are increasingly significant; such features also characterize team leaders in crisis events [104]. In FFICS, the ability of leaders to identify their subordinates' needs is a critical point since, in this way, subordinates express interest in the task and work collectively toward set targets, which is also true in extreme situations (in the field and/or interpersonal relations) [104,105]. Transformational leadership in the FFICS can motivate members to carry out commands more effectively and efficiently during forest firefighting in such events classified as crisis situations by means of self-sacrificial behavior and a sense-making approach [106]. This study highlights a crucial point for the leadership and management of FFICS: two-way communication. This strategy ensures that the head managers and leaders of FFICS listen and are aware while at the same time disseminating information effectively [107]. This outcome is in line with the assumption that emergency system leadership seeks the engagement, actualization, and coordination of positive policies, strategies, and systems in order to act beneficially across regional, national, and global communities [108].

Survey participants mentioned that the group leaders and the section heads of FFICS need to have the institutional responsibility of making decisions and for the decisions to be provided with clear and unambiguous instructions in such a way that they are carried out without delay and questioning, thus referring to the authoritarian style of leadership. Therefore, in the FFICS, the ability of leaders/managers to make clear and on target decisions is needed. This statement is in line with the argument that in crucial conditions of extraordinary stress during crises, the ability of the administration to cooperate effectively and provide clear directions and decisions ensures the efficiency of the system [109]. At an administration and operational level, the FFICS should provide positive reinforcement for developing team- and group leaders' and members' ability to make decisions during crises,

for transforming internal firefighting and procedures, redesigning strategy, and focus on clear communication in order to effectively manage each forest fire event. This need is mandated not only by the dynamic and unpredictable environment of a forest fire event but also by the climate crisis itself.

The outcomes of this study are of added value because they were formulated by those directly involved in the implementation of FFICS in DoF. The observations and discussion of this study result from the professional and experiential understanding of those involved in the implementation of FFICS in Cyprus and are interpreted on the basis of scientific knowledge and international bibliography. Despite the fact that the FFICS has been in effect for a relatively short period of time at the DoF, the current study provides rare and precious insights into the participants in the FFICS themselves. The outcomes from this study can act as the baseline for designing and developing training courses for the members of the Cyprus forest fire force, focusing on building specific leadership and management skills that are essential for the success and performance of fire brigades in their daily work and during firefighting events, as these traits are supported by the relevant scientific literature. However, a critical point of view is that FFICS and other crisis management systems are diverse and multifaceted, culture- and staff composition-specific, and their functions are based on several components (society composition, equipment/facilities, and conditions of each separate incident). For this, there does not exist an exact correlation between optimum leadership and management styles, on the one hand, and efficiency of the system, on the other hand, but an effort to optimize a parameter of the administrative system.

4.4. Limitations and Future Research Directions

The present study has some limitations, which can be addressed in future research. One of them is that the FFICS workforce in DoF exhibits a significant degree of variety in age, educational experience, and familiarity with the organization's mission and objectives. These parameters, in some cases, were the reason why participants needed more time to complete the questionnaire, while in very few cases, participants needed clarification regarding some questions. The existing hierarchical administrative pyramid, comprising a limited number of FFICS employees, reduces the possibility of a large number of participants during qualitative research. In addition, the fact that a high number of firefighting staff in FFICS are relatively new employees in DoF makes any comparison between the previous and the current firefighting administration system impossible for the purposes of the present study. Finally, the lack of scientific research and the scant literature on leadership and management competencies in forest firefighting forces and the fire response leadership in FFICS necessitated further investigation in order to gather references from other fire services, which are frequently characterized by distinctly different organizational structures, with specific cultural, social, and firefighting strategy dimensions. The current study identifies the general frame of optimum leadership and management traits/styles for the FFICS of DoF. Further investigation could potentially detect which competencies are considered core to firefighters according to the respective functional profile applicable to each type/team of the firefighting force. This would open new research routes in leadership, either by diagnosing the current competency proficiency level and developing a specific leadership management model for firefighters or by anticipating the needs of officers and commanders before they rise in the hierarchy. Additionally, future studies could assess in-depth variability in leadership and management in FFICS during the pre-firefighting phase and firefighting phase based on real-situation firefighting conditions. Furthermore, a perennial research questionnaire could deal with investigating the ideal leadership and management traits of FFICS leaders (according to subordinates) versus their current traits, and subsequently employ these results in designing practical training courses for improving

the performance of FFICS holistically. Finally, to obtain a clearer picture of the reason why, in the current study, the traits of "creativity and innovation" and "promoting innovations in the service" have the lowest scoring in preference by the firefighters, future studies should include qualitative data collected by semi-structured interviews.

5. Conclusions

Leadership focuses on motivating and directing individuals or groups toward a common goal, whereas management is primarily concerned with allocating resources and carrying out duties effectively. Mixed methods research is a powerful tool for the analysis and interpretation of two-way flow opinions (from bottom to top and top to bottom), achieving the combined approach in leadership and management traits (characteristics) needed for FFICS, which appears to be absent in the present literature. Firefighting team leaders are often required to develop flexible organizational and managerial strategies centered on the well-being of their subordinates; thus, the study's overall conclusion aligns with sophisticated models of firefighting leadership and management, surpassing militaristic conceptions of firefighting administration issues.

The current study supports the idea that the heads of the FFICS's management and leadership styles promote teamwork. Teamwork in the frame of FFICS requires that key decisions be made with good judgment, based on the flow of relevant information, and by implementing a focused and succinct exchange of views between top managers. This presumption addresses the necessity of developing leadership frameworks that facilitate the transfer of crucial knowledge and guarantee that the appropriate course of action is chosen, such as transformational leadership and neoclassical management forms [103,104]. The data triangulation resulted in the fingerprinting of the divergence of leadership and management traits and styles among the different hierarchical levels of FFICS (Table 5). Hence, the leadership and management traits and forms that present the team and group leaders and/or the chiefs of command of the FFICS should be distinct in terms of the role they have to implement. Therefore, team and group leaders should concentrate on fortifying the operational arm of the organization by cultivating leadership traits that center on the goals of the fire incident in which they are involved. The chief in command (head of FFICS) should focus on determining the purpose, strategy, and final achievement goal for the forest fire forces and firefighting strategy. Hence, the flow of responsibilities and characteristics also establishes the leadership and management components that set apart each organizational structure of a forest firefighting system and should not be consistent across its developmental spectrum. As the action's objective arises and is determined by human resource management, the leaders and heads of each management unit in FFICS should recognize the significance and function of each member of their operational team as one of the primary assets to achieve the action objective. However, FFICS firefighters do not seem to support innovation in the FFICS service, resulting in any new suggestions (i.e., methods, equipment) and administrative aspects from leaders to be introduced discreetly.

Reading the aforementioned paragraphs creates the rhetorical question: *How does one become a competent leader and manager in the FFICS?* This question was addressed to the interviewees of this study, who responded: "*. . . the experience, the participation in many episodes, gives the leader the ability to better exercise leadership and management duties. . ., that is, the leader, the commander, should have reached this level through experience, to start from the low steps and reach high.*" (quote from E.I.-2) and "*. . . the training academy to create effective people. . ., the management should be trained to be able to manage personnel matters, this applies to all supervisors.*" (quote from E.I.-3). These responses indirectly support the existing theory on human resource management, where leadership and management traits and skills are

neither present in every person to the same degree nor a supernatural gift for a few people. Leadership arises as a combination of nurture and nature; however, if a natural inclination toward leadership is absent or insufficient, then education, training, experience, practice, and effort can develop efficient leaders. Thus, the staff members of FFICS can personally develop and gain the skills required to apply effectively and satisfactorily through friction in forest fire events and participation in training courses on human resource management in forest fighting. Their observations can act as a springboard for the training of team and group leaders in firefighting forces.

Supplementary Materials: The following supporting information can be downloaded from https://www.mdpi.com/article/10.3390/fire8010006/s1, Supplementary Material S1. Qualitative questionnaire; Supplementary Material S2. Quantitative questionnaire, including an analysis of 309 questionnaires.

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Informed Consent Statement: The research was carried out upon obtaining informed consent from both the Department of Forests as well as from each of the participants in the research. Participants were assured of confidentiality and anonymity.

Data Availability Statement: The quantitative data are contained within the article. For the qualitative data, namely the personal interviews, the raw data are available upon request from the corresponding author due to privacy restrictions.

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