A Study on Perception of Core System and Acceptance of Climate Crisis Management Policy

Sungyu Choi

Korea Air Force University, Daejeon, Korea

Abstract

This study aims to determine whether core system components can function as key elements in establishing the military's climate risk management policy. In order to achieve the purpose of this study, it was determined that an exploratory study on core system components was necessary, and accordingly, the influence relationship between core system components and the Korea Air Force climate crisis management policy was analyzed. As a result, it was confirmed that among the core system components in Air Force climate crisis management, the level of awareness of Institution, Leadership, Devotion, and Expertise elements had a positive effect on the acceptance of Air Force climate crisis management policy. On the other hand, the level of awareness of core system Value elements was confirmed to have a negative impact on the acceptance of the Air Force climate crisis management policy, which can be seen as the reason that the Value system of the study subjects, High-rank Air Force officers, did not include the threat of climate crisis. Nevertheless, given that all core system components confirmed statistically significant results, it can be said that the purpose of this study was partially achieved. Accordingly, the Air Force is considering the core system as an essential policy planning element when establishing climate crisis management policy. It seems like it could be used.

Key words: core system model, climate crisis, crisisonomy, acceptance of climate crisis management policy

I. Introduction

In crisis management, Jae-eun Lee (2015) emphasizes that a Core system is necessary for the normal operation of the crisis management system when a crisis occurs. Jae-eun Lee's Core system consists of a total of five components - value, institution, leadership, devotion, and expertise(Jae-eun Lee, 2015: 4). This core system has been mainly used as a post-mortem evaluation tool for crisis and disaster situations.

However, if the five components that make up the crisis management core system model are the most important core elements, wouldn't it be possible to organize these elements in advance and use them as a framework for policy planning? This study conducted a study with this question.

In particular, this study focuses on the Air Force's climate crisis management policy, which is facing increasing restrictions on operational performance and power maintenance due to the recently worsening climate crisis.

in this study, I believe that core system components can serve as a preliminary tool in planning risk management policies, and we conduct an exploratory study on the influence relationship between core system components and climate crisis management policy acceptance in Korea Air Force. And as the need for climate crisis management in the security field has recently emerged, the survey was conducted on high-ranking officers of the Air Force.

So, The content scope of this study is the level of perception of core system components and the acceptance of the Air Force climate risk management policy. And The target scope of this study is a total of 209 high-ranking Air Force officers with the rank of captain or higher.

II. Theoretical Discussions

1. Core System Model

Five components in Core system model have circular characteristics with interconnectedness between elements. First, each component is the smallest unit element whose function and meaning is no longer subdivided into subconcepts, and second, the relationship between core system components is an open system, and although energy, materials, and information circulate between each element, The amount, speed, and direction are not constant, so they directly and indirectly interact and circulate with other systems in the crisis management system (Young-seok Cho, 2022: 70). Third, the components go beyond simple functions and contain ethics and values, which are internal human values, and fourth, each component converges to embody the value of respect for human dignity.

Value is the risk assessment standard, institution is the basis for the legitimacy of the crisis management policy, leadership and dedication are the means to achieve the goal, and expertise is the detailed, specialized action guideline. As they exist, these components hunt with the highest value of human dignity (Young-Seok Cho, 2022: 70). Through these characteristics, core system components have interconnectivity and interdependence between components, and centrality and direct and indirect exchange depending on the situation (Young-seok Cho, 2022: 71). These five components of the core system were used as a framework for post-mortem analysis of various crises in previous research.

1.1 Value

Among the core system components, ‘value’ can be understood as a belief system that influences human norms, attitudes, judgments, and behavior. Through these universal values, organizations can achieve common goals and society can focus on joint efforts throughout society (Jae-eun Lee, 2018: 32; Young-seok Cho, 2022: 41). Through this, it is possible to understand the national policies determined through the crisis management system and the actions chosen by crisis management entities, volunteers, institutions, and stakeholders (Young-Seok Cho, 2022: 138). And in order to achieve the goals of society or an organization, it is necessary to establish values that can be generally agreed upon and accepted by members (Jae-eun Lee, 2015: 4).

In this study, the 'value' of the core system serves as a rule that guides the Air Force's climate risk management, serving as an element that can achieve the Air Force's common goal of climate risk management and focus on organizational joint efforts. , defined as a standard that suggests policy direction. In particular, in climate crisis management, due to the nature of the impact of the climate crisis, the perception of climate crisis management may vary depending on the environment of the country and individual, so establishing consistent and correct values must be preceded.

To measure these ‘values,’ this study seeks to measure ‘national security awareness,’ ‘soldier spirit,’ and ‘patriotism.’ First, 'national security awareness' is a key element that soldiers must recognize (Park Hwa-no, 2007; Song Young-min, 2010: 1), and the climate crisis is recognized as a new type of threat to national security, so national security awareness is related to the climate crisis. It can lead to management. And ‘soldier spirit’ and ‘patriotism’ are related to the goals of the Air Force and include the recognition that climate crisis management is not an object unrelated to the traditional security area, but rather a realization of the value of protecting the lives and property of the people as a soldier.

1.2 Instituttion

‘Institution’, a core system component, is how all rights or obligations are justified and specified through the system in the operation of the country and organization (Young-seok Cho, 2022: 139). In addition, in carrying out crisis management, the system secures legitimacy legitimized by the social or political system through laws and institutions, and in the process performs official duties and achieves goals (Jae-eun Lee, 2015: 4; Seong Cho et al., 2016) : 21; Seong-eun Jeong, 2019: 19; Young-seok Cho, 2022: 42). Organizations establish and operate systems through laws, regulations, procedures, and customs. In particular, climate crisis management becomes more effective when multiple countries and related organizations and stakeholders from various fields collaborate rather than simply at the individual or single country level, so it can be said that the establishment of a detailed system is absolutely necessary.

Accordingly, this study focuses on the system as a basis for enabling such policies in the Air Force's climate risk management, and defines it as a device through which the Air Force's climate risk management policy can be justified and materialized. In order to measure the level of awareness of these ‘systems,’ this study seeks to measure them through awareness of ‘laws’ and ‘regulations and procedures.’

1.3 Leadership

The core system component 'leadership' plays a role in actually operating and managing the system when the values are established and the system is on a legitimate basis. It is an essential and important element in terms of organizational cooperation, operation, and management. (Jae-eun Lee, 2015: 5). There are several perspectives on leadership, including trait theory, behavioral theory, and situational theory. However, this study considers that the most influential leadership in disaster management organizations is transformational leadership (Seol-ah Kwon et al., 2019: 151-171), and also considers that the damage and impact are common to manage mid- to long-term and invisible climate crises. We considered the important role of transactional leadership in persuading members to form values and establish systems, inducing cooperation between organizations, and providing appropriate compensation.

Accordingly, this study considers transformational and transactional leadership to be the most influential leadership for climate crisis management.

In this study, the ‘leadership’ of the core system is defined as the process of influencing Air Force organizational members to voluntarily take action to achieve goals for Air Force climate crisis management. In this study, the perception of ‘leadership’ is measured through ‘leader’s open communication’, ‘leader’s motivation’, ‘leader’s appropriate compensation’, and ‘importance of leadership’.

1.4 Devotion

Devotion in crisis management can be said to be a communal effort to devote one's body and mind to crisis management and its activities with deep affection and with all one's strength (Jae-eun Lee and Young-seok Cho, 2021: 6). Since climate crisis management is an activity that guarantees not only the immediate danger but also the life, dignity, rights, and safety of future generations, it can be said that devotion to

humanity and the entire organization along with the role of values, systems, and leadership are absolutely essential.

Accordingly, this study seeks to implement a multidimensional approach to ‘devotion’ by considering all the behavioral, psychological, and attitudinal approaches that members of climate crisis management feel toward the organization. Accordingly, we intend to measure ‘commitment’ through perceptions of ‘understanding of organizational goals’, ‘active implementation attitude’, ‘sense of responsibility’, and ‘devotion attitude’.

1.5 Expertise

Expertise in crisis management refers to researching or taking charge of the field of crisis management with considerable knowledge and long-term experience related to crisis management (see Standard Korean Dictionary, 2023: “Expertise”), and long-term experience, practice, training, and It can be said to be knowledge, technology, and methods related to crisis management that can be obtained through research, etc. (Young-seok Cho and Jae-eun Lee, 2021: 7; Young-seok Cho, 2022: 22). In particular, in the case of climate crisis management, scientific knowledge and technology, which are difficult to access in everyday life, and large-scale finances and resources are invested, so the expertise of participants such as climate risk management organizations, leaders, and followers is needed for effective crisis management.

Accordingly, this study seeks to measure the perception of ‘expertise’ through ‘acquisition of professional knowledge’, ‘professional education and training system’, and ‘importance of expertise’.

Jae-eun Lee (2014, 2015: 1-18) was the first to examine the crisis management process of the Sewol Ferry disaster that occurred on April 16, 2014 through the core system and suggested a direction for improving the national crisis management system through this. Seong Cho et al. (2016) analyzed whether a systematic response was made through core system elements to the passenger ship sinking accident, and specifically analyzed the problems of the Seohae Ferry accident and the Sewol Ferry accident. Jeong Seong-eun (2019) conducted a study on the operation of the national crisis management system through core system elements, and analyzed core system elements at the time of the MERS outbreak, especially focusing on the MERS outbreak.

2. Accpetancce of Cimate Crisis Management Policy

Compared to other crises, the climate crisis has a wide and comprehensive range of impacts and responses, and the relationship between cause and effect is not visible, making the need to establish scientific management policies essential. Accordingly, research and efforts in various fields are needed based on international cooperation, and the formation of consensus through scientific proof can be said to be a prerequisite for successful policy implementation. Accordingly, research is being conducted in various fields and scopes in relation to climate crisis management policies.

Acceptance of a policy is the tendency to evaluate a policy through favor or dissatisfaction with the policy, and is a comprehensive concept that is influenced by various factors such as the policy decision

process and is accompanied by a change in internal perception (Schwitema, Steg & Forward, 2010; Yena Choi, Isu Kim, 2018; Yena Choi and Gyeongsoon Park, 2022:3, Jeongmin Park, 2022: 16). Acceptance of a policy can provide an in-depth understanding of the values, beliefs, and attitudes of the policy target (Jae-geun Kim, Ki-heon Kwon, 2007; Won-je Kim et al., 2009; Joo-hee Yoon, 2013; Ji-yoon Lee, 2018: 48). Therefore, improving policy acceptance can be said to be essential for achieving the goal of policy implementation.

In a study by Seung-Han Lee and Soon-Jin Yoon (2014), the higher the level of individual risk awareness, the higher the awareness of the need for adaptation action and community response, and the willingness to accept climate risk management policies at the individual, regional, and national levels. Confirmed. Ji-yoon Lee and Yong-jin Cha (2019) studied the factors that influence risk communication on climate change mitigation policies, and found that among risk communication, information sources, messages, and channels have a positive influence on the acceptance of mitigation policies through government trust. It was confirmed that information sources and recipients have a positive influence on the acceptance of mitigation policies. Kim Seo-yong and Kim Seon-hee (2016) attempted to measure response behavior through willingness to participate in movements to address global warming, willingness to use public transportation, willingness to pay taxes to address warming, and willingness to bear costs to address warming, which is indicative of related policies. It can be understood as acceptance, and it is suggested that perceived risks and benefits have a positive influence.

Like previous studies, much research has been conducted on variables such as risk perception regarding the acceptance of climate risk management policies. However, the relationship between the essential elements that lead to crisis management policy and the degree of acceptance of crisis management policy has not been studied. Therefore, this study examines the relationship between the level of awareness of core system components and the level of acceptance of climate risk management policies through exploratory research.

III. Framework of Research Analysis

1.Variables

In this study, the level of awareness of core system components in climate risk management confirmed through previous research was selected as an independent variable for an exploratory study on core system components. To this end, through prior research, measurement indicators for core system components in climate crisis management were established for Air Force officers.

To measure ‘value,’ this study seeks to measure ‘national security awareness,’ ‘soldier spirit,’ and ‘patriotism'. In order to measure the level of awareness of ‘Institution’, this study seeks to measure it through awareness of ‘laws’ and ‘regulations/procedures'. The perception of ‘leadership’ is measured through ‘leader’s open communication’, ‘leader’s motivation’, ‘leader’s appropriate compensation’, and ‘importance of leadership’. To measure ‘Devotion' through perceptions of ‘understanding of organizational goals’, ‘active implementation attitude’, ‘sense of responsibility’, and ‘committed attitude’. To measure the

perception of ‘expertise’ through ‘acquisition of professional knowledge’, ‘professional education and training system’, and ‘importance of expertise’.

The dependent variable was selected as acceptance of the Air Force's climate risk management policy, and measurement indicators were selected based on matters confirmed through previous research.
Specifically, the following items were selected: agreement on the direction of climate risk management policy, acceptance of inconvenience caused by climate risk management policy, and willingness to cooperate with climate risk management policy.

2. Collecting Data

In this study, a survey was conducted among senior Air Force officers to determine the influence of core system components on the acceptance of the Air Force's climate risk management policy, and a 7-point Likert scale was used. The sample characteristics of the survey subjects are as follows.

<Table 1> Demographic characteristics of survey subjects

		Frequency (people)	percent(%)
Gender	Male	194	92.8
	Female	15	7.2
Period of service	5~10 years	72	34.4
	11~15 years	101	48.3
	16 years or more	36	17.2
Rank	Captain	74	35.4
	Major	98	46.9
	Lieutenant colonel	37	17.7
total		209	100

3. Analysis Method

Statistical analysis was performed on the collected data using spss 29.0. First, Varimax factor analysis was conducted to analyze the validity of the independent variable, the level of awareness of core system components, and Cronbach's A test was performed to verify reliability. Multiple regression analysis was performed to analyze the influence relationship between independent and dependent variables.

IV. Analysis of Research Results

<Table 2> Descriptive statistics for variables

	N	Minimum	Maximum	Average	Std Deviation
Value	209	2.00	7.00	4.7416	1.15665
Institution	209	2.00	7.00	5.1659	1.25640

Leadership	209	1.25	6.75	4.2249	1.08293
Devotion	209	2.0.	7.00	5.0849	1.33087
Expertise	209	1.33	7.00	4.7289	1.47305
Acceptance of climate risis Management policy	209	1.00	7.00	4.7065	1.47305
Available N	209				

1. Feasibility Analysis

For feasibility analysis, principal component analysis method was performed on core system components and Varimax rotation method was implemented. The Kaiser-Meyer-Olkin measure of sample adequacy was confirmed to be 0.826, and in the case of Bartlett's test of sphericity, the significance probability was confirmed to be <0.001, so the factor analysis model was judged to be appropriate.

2. Factor Analysis

In interpreting this, the diversity of interpretations of the ‘value’ element can be analyzed as the cause. In the case of 'military spirit', which was a measurement factor of value, it can be seen that the perception of military spirit and leadership is similar due to the characteristics of the subjects of the survey as high-ranking officers corresponding to the leaders of each unit, and 'national security guarantee', The value of 'patriotism' can be understood as having characteristics similar to the perception of dedication to the country as a soldier. In this study, ‘military spirit’ was classified as a factor related to leadership, but as its loading value was not large, it was removed from the value measurement items. Also, in the case of the ‘Understanding the organization’s goals’ item in the commitment item, it was separated from the institutional items, but there was a difference in its loading value, so it was removed from the measurement items. The ‘understanding of the organization’s goals’ item is distinct from the system because although the act of understanding the organization’s goals is also an act of dedication, it can be understood as the goal being presented and implemented through institutional mechanisms. And although the commitment item was not separated from the value item, there was a distinct difference in loading, so the item was maintained and the study continued.

<Table 3> Factor analysis through Varimax factor rotation of core system factors

	Factors			
	1	2	3	4
The importance of leadership	.894	.154	.098	.157
Leader’s open communication	.881	.176	.220	.136
Leader motivation	.713	.328	.226	-.082
Appropriate compensation for leaders	.617	.474	-.059	.237

military spirit	.565	.336	.176	.054
national security awareness	.174	.819	.243	.082
patriotism	.155	.715	-.120	.276
responsibility	.177	.697	.164	.285
Active implementation attitude	.313	.643	.077	.302
dedication	.339	.633	.273	-.163
Professional education and training system	.129	.042	.885	.205
The importance of expertise	.175	.152	.868	.141
Acquire expert knowledge	.264	.152	.828	.193
Regulations/Procedures	.046	-.015	.365	.848
law	.006	.150	.236	.828
Understanding the organization's goals	.335	.351	-.158	.597

Extraction method: principal component analysis
Rotation Method: Varimax with Kaiser Normalization

3. Reliability Analysis

Reliability analysis checks whether the survey measurement results were measured consistently. In this study, we aim to verify reliability through Cronbach's alpha. The reliability of a total of 16 questions was analyzed, and as a result, the Cronbach's alpha value was 0.905. This values is understood to be sufficient for the survey results to serve as independent variables, and multiple regression analysis was conducted accordingly.

4. Regression Analysis

In this analysis, the analysis of variance (ANOVA) F value is 35.435, the significance probability is <0.001, which is suitable for the regression model, and the R-squared and adjusted R-squared are 0.466 and 0.453, respectively. According to the R-squared value considering the number of variables, this model The explanatory power of can be interpreted as 46.6%. Additionally, the Durbin-Watson value is 1.849, which is close to 2, which means that the residuals can be said to be independent (Seong-eun Kim et al., 2023: 343, Bo-kyung Moon, 2024: 126). And the Variance Inflation Factor was all small, less than 10, confirming that there was no multicollinearity problem.

As a result of multiple regression analysis, values were found to have a statistically significant negative influence on the acceptance of the Air Force climate risk management policy at a 99% confidence level (regression coefficient -0.268). The system was found to have a statistically significant positive impact on the acceptance of the Air Force's climate risk management policy at a 99% confidence level (regression coefficient 0.336). Leadership was found to have a statistically significant positive influence on the acceptance of the Air Force climate risk management policy at a 99% confidence level (regression coefficient 0.236), and dedication had a statistically significant positive effect on the acceptance of the Air

Force climate risk management policy at a 99% confidence level. It was found to have a statistically significant positive (+) effect (regression coefficient 0.389). Expertise was confirmed to have a statistically significant positive influence on the acceptance of the Air Force climate risk management policy at a 95% confidence level (regression coefficient 0.127).

<table> Result of Rgression Analysis

variable	B	Std. Error	Beta	t value	P value
value	**-.341**	**.093**	**-.268**	**-3.663**	**<.001**
Institutione	**.394**	**.072**	**.336**	**5.479**	**<.001**
Leadership	**.275**	**.081**	**.236**	**3.374**	**<.001**
Devotion	**.529**	**.105**	**.389**	**5.021**	**<.001**
Expertise	**.141**	**.068**	**.127**	**2.064**	**.040**

V. Conclusions

It was found that all core system components - values, systems, leadership, dedication, and expertise - had a statistically significant positive (+) impact. However, in the case of value, contrary to the established hypothesis, it was confirmed that it had a statistically significant negative effect on the acceptance of the Air Force climate crisis policy.

In other words, it can be understood that the more the Air Force's senior officer group recognizes that institutions, leadership, dedication, and expertise among the components of the core system are important for the Air Force's climate crisis management, the higher the acceptance of the Air Force's climate risk management policy. And it can be seen that the more value is recognized as an important element among the core system components for the Air Force's climate crisis management, the lower the acceptance of the Air Force's climate risk management policy.

The results of this study show that when establishing a future climate crisis management policy, the Korean Air Force must consider Core System Model components such as values, institution, leadership, dvotion, and expertise as essential considerations of the policy.

In particular, regarding Value, policy efforts will be needed to expand the Air Force's existing security threats to the climate crisis so that the Air Force's climate crisis management activities are consistent with the value of national security.

References

Bo-gyeong Moon. 2024. Analyzing the Risk Management of Urban Railway Crowd Accident. Chungbuk National University Graduate School. Doctor's Thesis.

Jae-eun Lee. 2015. Exploring the Core System of National Crisis and Emergency Management in Korea – The Case of Sewol Disaster management -. Crisisonomy. 11(8): 1-18.

Jeon-min Park. 2022. Analyzing the Determinants of Climate Change Risk Perceptions and Acceptance of Climate Policy: Focusing on the Youth of Seoul Special City. Seoul National University Graduate School. Master's Thesis.

Ji-Yoon Lee. 2019. A Study on the Effect of Risk Communication on the Acceptance of Climate Change Policy. Sookmyeong University Graduate School. Doctor's Thesis.

Ji-Yoon Lee, Yong-Jin Cha. 2019. A Study on the Effect of Risk Communication on the Mitigation Policy of Climate Change: Focusing on the Residents of the MetroPolitan Area. The Korea Association for Policy Studies. 28(3): 63-96.

Seo-yong Kim, Sun-hee. 2016. Analyzing the Determinants of Concern about and Responses to Climate Change. Korean Institute of Public Affairs. 54(1): 179-206.

Seol-A Kwon. 2018. A Comparative policy Anaysis on Living Environment Crisis in Local Government – Focusing on the Policy and Management Particulate Matter in Korea -. Crisisonomy. 14(3): 31-46.

Seong Cho, Da-young Kim, Ji mi-Kim, Sung-soo Byun, Jae-Eun Lee. 2016. A Comparative Analysis on Boat Sinking Disaster through a Core System Model – Seohae Ferry and Sewol Ferry Cases -. Crisisonomy. 12(3): 17-31.

Sung-Eun Jung. 2019. Improving National Crisis and Emergency Management throgh a Core System – A Lsesson from the COVID-19 Disaster -. Crisisonomy. 16(7): 23-49.

Yeong-seok Jo. 2022. A Core System Approach to Improving Local Community Disaster Resilience: Focusing on the COVID-19 Pandemic. Chungbuk National University Graduate School. Doctor's Thesis.

Yeong-seok Jo, Jae-eun Lee. 2022. A Core System Approach to Improving Local Community Disaster Resilience-Focusing on the COVID-19 Pandamic. Crisisonomy. 17(10): 1-27.

Young-min Song. 2010. A Study on the Development of Attitude Instruccctional Design Principles for Air Force Core Values Education. Seoul National University Graduate School. Master's Thesis.