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Study on Emerging Security Threats and National Response

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Abstract

The purpose of this paper is to consider the expansion of non-traditional security threats and the national-level response to the emergence of emerging security threats in ultra-uncertain VUCA situations. As a major research method for better analysis, the theoretical approach was referred to papers published in books and academic journals, and technical and current affairs data were studied through the Internet and literature research.

The instability and uncertainty of the international order and security environment in the 21st century brought about a change in the security paradigm. Human security emerged as the protection target of security was expanded to individual humans, and emerging security was emerging as the security area expanded. Emerging security threats that have different characteristics from traditional security threats are expressed in various ways, such as cyber threats, new infectious disease threats, terrorist threats, and abnormal climate threats.

First, the policy and strategic response to respond to emerging security threats is integrated national crisis management based on artificial intelligence applying the concept of Foresight. Second, it is to establish network-based national crisis management smart governance. Third, it is to maintain the agile resilience of the concept of Agilience. Fourth, an integrated response system that integrates national power elements and national defense elements should be established.

Keywords: *VUCA, Emerging Security, Governance, Resilience, National Crisis Management*

1. INTRODUCTION

Future research to predict and prepare for future VUCA situations is important in terms of national crisis management as the speed of change and the degree of technology evolution are predicted nonlinearly and complexly rather than single-track predictions. It can be said that the predictive future is more likely to arise when the imaginable future that I think can happen vaguely in the future than the reasonable or stochastic future is linked to the driving factors. The factors driving future change are the evolution of science and technology, population reduction and aging, and climate change. These technologies, populations, and climate are driving the Hyper-VUCA situation of hyper-uncertainty, hyper-stability, and hyper-variability beyond the VUCA situation[1].

It is difficult to respond properly in the face of new challenges and threats if war or nuclear threats, which

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were considered traditional security threats, are hung in an environment where high-tech technology is rapidly evolving, nonlinear social changes, and the Hiper-VUCA situation. Beyond the perception of tradition, the concept of security is redefined and an omnidirectional response is required.

The COVID-19 pandemic that began in 2020, the ongoing Russia-Ukraine war that broke out in February 2022, the 7.8 Turkiye earthquake in February 2023, large forest fires that occur every year, abnormal climate such as record heat waves, migrants and refugees, and conflicts due to water shortages have shifted to the level of security.

Along with the development of science that enriches humanity, population decline and aging are contributing to making human life more valuable and changing the paradigm of security. Human security advocated by the United Nations in 1994 after the post-Cold War is a good example[2]. The life of dying from violence or deficiency, such as disaster or infectious diseases, is as precious as the life of dying on the battlefield.

In the face of the COVID-19 pandemic, the state, the subject and object of security, has seen a shift in military power to protect human life from infectious diseases as well as removing threats that infringe on sovereignty and territory outside the state. In particular, due to the start of COVID-19 and the pandemic, it has responded to infectious diseases for more than three years in terms of global security. The COVID-19 virus spread around the world transnational and transnational, and the number of deaths and fears reminiscent of war reduced nationalism and blocked globalization as the threat of infectious diseases acted as an important benefit to national security rather than the threat of war[3] [4].

Contrary to expectations at the beginning of the war, the Russia-Ukraine war is heading toward a long-term war of attrition. The damage of the war is affecting energy security and food security not only in Russia and Ukraine but also around the world. In addition, the horrors and inhumane atrocities of the battlefield are increasingly causing fear to the barbaric elements of war and the global community in search of peace. Prior to the outbreak of the war, pre-cyber hacking and attacks with gray zone strategies paralyzed national infrastructure and networks, and special mission units infiltrated in advance, disrupted the country, and threatened the survival of the people. Disregarding war laws such as indiscriminate attacks on civilian facilities, hospitals and schools during the war, genocide, and threats of nuclear attacks are still underway. As such, cyber hacking, energy threats, and food threats, which were regarded as non-traditional security threats, are simultaneously mixed in the war and conflict sites that assume traditional security threats.

Emerging security is indicated in the Yoon Suk Yeol government's national security strategy announced in June 2023. In order to preemptively cope with emerging security threats, it was stated that it would actively operate a crisis prevention system for non-traditional security issues, effectively establish an early warning system, a public-private cooperation system, and strengthen international cooperation on threats such as cybersecurity[5] [6], climate change, and infectious diseases. As such, it can be said that emerging security is not only looking at the traditional and non-traditional areas, but also the opportunity to lurk and develop in human life from peacetime[7].

2. Security Concepts and the Expansion of Security Threats

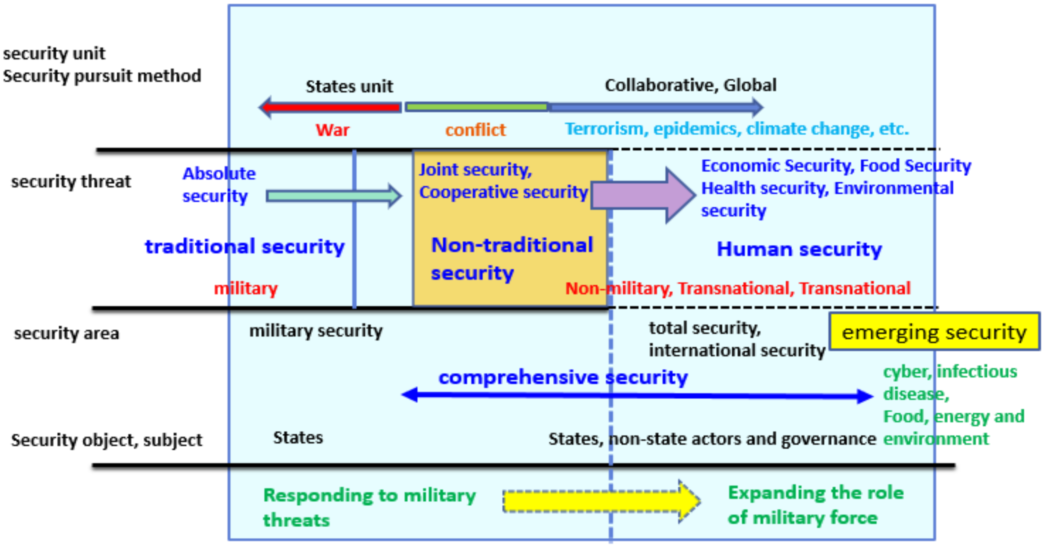
2.1. The Rise of Non-traditional Security Threats and the Expansion of Security Concepts

Security threats are largely divided into "traditional security threats" and "non-traditional security threats." Traditional security threats are threats on the military side, and non-traditional security threats mean threats in all forms, not in the military side. Traditional security threats are again subdivided into existing, potential, and non-military threats. The existing threat is a threat from North Korea, which is confronting us, and the potential threat is posed around the Korean Peninsula. Non-military threats are dealt with not only in the traditional security area but also in the non-traditional security area.

As shown in <Figure 1>, the expansion of the concept of security is a traditional security concept and stems from the lack of completeness of national security and changes in the international order and security environment in the 21st century after the post-Cold War. First, responding to security threats centered on national and military power ignores the reality of the international security environment that occurs transnational and transnational, and rather risks adding to the national crisis. Second, if you focus only on domestic and external military threats, you can neglect the provision of security for security objects by overlooking the possibility that political, economic, social, cultural, and environmental threats can go beyond safety. Third, the attitude of the traditional security concept to solve international relations that require cooperation and solidarity with military power can cause security dilemmas and destabilize security.

This is because non-traditional security threats include non-military and transnational threats in addition to military threats. Non-military and transnational threats vary in form to infectious diseases, disasters, terrorism, pirates, refugees, and international crimes.

Figure 1. Flow of security


security unit
Security pursuit method
States unit
Collaborative, Global
War
conflict
Terrorism, epidemics, climate change, etc.
security threat
Absolute security
Joint security, Cooperative security
Economic Security, Food Security Health security, Environmental security
traditional security
Non-traditional security
Human security
military
Non-military, Transnational, Transnational
security area
military security
total security, international security
emerging security
comprehensive security
cyber, infectious disease, Food, energy and environment
Security object, subject
States
States, non-state actors and governance
Responding to military threats
Expanding the role of military force

These security threats are amplified by the Fourth Industrial Revolution, high-tech science and technology, climate change, and population decline. Until now, the military force prepared for traditional security threats has reached a point where it has to be converted into non-military and transnational non-traditional security threats. Cyber hacking, abnormal climate, infectious diseases, and disaster disasters, which are classified as emerging security threats, are representative threats. In addition, these threats require international cooperation and solidarity at the transnational and transnational level.

2.2. The Emerging of Emerging Security Threats

Unlike the existing security concept, emerging security is a security concept that emerges as a macro-level security problem because minor micro-level safety issues leap in connection with other issues at a specific moment or point in time. Emerging security threats pose a huge threat to national or global security once they emerge, like a caterpillar going through a pupa and turning into an adult, or the butterfly effect where a small butterfly's wings return as a huge typhoon.

Shinheung is not simply "new" but rather the concept of "emerging" and, in other words, "bouncing out." Emerging security is a different concept from new security. Shinheung can be translated into 'emergence' in complex system theory. In the domestic natural science community, it is often translated as 'burning', but here, it can be combined with the word security and translated into emerging. Shinheung or emerging refers to a phenomenon in which phenomena, which were only simple and disorderly beings at the microscopic stage, show certain patterns and regularity, or order, by increasing interconnection amid complex interactions.

In summary, emerging security was simply a small-scale security problem at the micro level, but it means a phenomenon that becomes a more large-scale security problem at the macro level.

Table 1. Characteristics of Emerging Security Threats

Sortation	**content**
Potentiality	It recognizes serious threats because they are usually not visible or appear in insignificant forms, but if they go beyond a certain level through quantitative expansion and qualitative intensification, the threat rises rapidly
Uncertainty	It is difficult to predict when, where, and in what form it will occur due to its potential. Starting from natural phenomena where the source of the threat is outside of human control or invisible viruses, cyberattacks, and terrorism are restricted to covert spaces
Diversity	Traditional security is the subject and target of the state, but emerging security threats include inhumane areas such as fine dust, viruses, and cyber attacks
Transnationality	Close cooperation between countries is essential for the characteristics of cross-border spread and the way they respond to threats, not limited to a certain area
Interconnectivity	It occurs in many ways, but the level of threat increases as they interact with each other in close relationships between issues

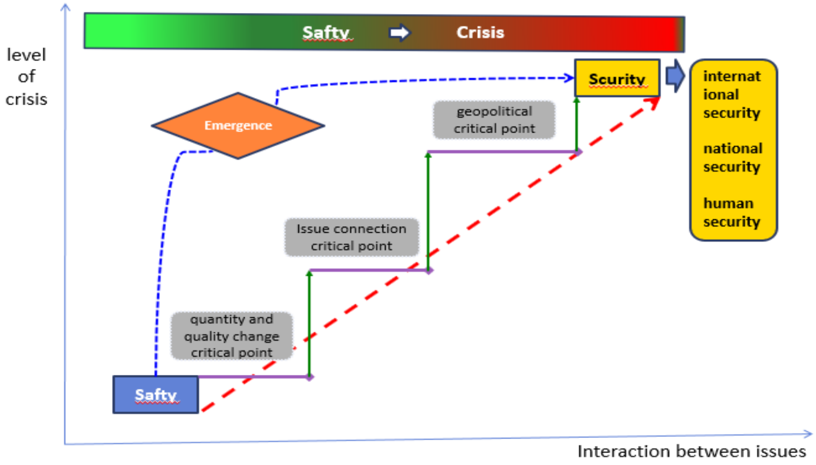
If traditional security threats are often seen on the surface, emerging security threats have naturally occurring and intended threats, as shown in <Table 1>, characterized by potential, unpredictability and invisibility, transnationality, interconnection and infringement present, and diversity[8].

Emerging security has the characteristic that low-level safety issues emerge as high-level security issues with the following three critical points in connection with other issues. If the level of crisis develops from the path of safety issues to the X-event level, which is difficult to predict, crisis management may be difficult due to a lack of response time and capacity.

First, it is the critical point of quality telephony. In the most comprehensive area, the risk of emerging security arises when safety accidents in the issue area increase quantitatively and exceed a certain level. This means the phenomenon of high-quality phones in which quantitative increase causes qualitative variation. Usually, these events were insignificant enough to cause safety at the individual level to be a problem, but if the number of occurrences increases and suddenly crosses the critical point of quality phones, they reach a serious level that threatens the national security. In the meantime, the previous boundaries that distinguished micro-safety from macro-security collapse, and even minor safety issues in daily life have to be dealt with from the perspective of macro-security. If the risks in the emerging security sector of quality phones exceed forecasts and responses, they can appear in the form of extreme events called X-event. X-event is very unlikely to occur with the existing mindset and cannot be predicted, so if it actually occurs, its ripple effect is a tremendous kind of collapse or upheaval. The designer of the Fukushima nuclear power plant designed the system considering only the intensity of earthquakes that are likely to occur within the normal distribution, but a tsunami of unexpected intensity occurred, exceeding the complexity of the technology system.

Second, it is the critical point of issue linkage. If the qualitative link between emerging security issues increases, safety issues in any sector are likely to exceed the critical point and become macro security issues. It turns into a problem of environmental and food security as it is linked to water shortages and food crises as well as natural disasters such as climate change, floods, and drought. If a cyberhacking attack is carried out against a nuclear power plant's computer system, the risk is further amplified if it becomes a means of terrorism for political purposes rather than simply stealing nuclear power plant information or paralyzing the computer system[13].

Figure 2. Emerging Security Threat Initiation Phase[9]


Safty ➡ Crisis
level of crisis
Emergence
Scurity
internat ional security
national security
human security
geopolitical critical point
Issue connection critical point
quantity and quality change critical point
Safty
Interaction between issues

The third is the geopolitical threshold. If emerging security issues arising through quality phone calls or issue connectivity are linked to traditional security issues, this becomes a matter of national security in name and reality. When it reaches this point, there is a basis for state actors to intervene, and a mechanism of international cooperation to solve the problem is activated. Emerging security issues may emerge sequentially through a ladder of quality calls and issue connectivity to reach a geopolitical critical point, but this mechanism of creation is likely to emerge through a somewhat radical path between countries that have originally been in a geopolitical conflict. From this point of view, unlike the concept of non-traditional security, emerging security is a concept that should be understood by including the issues of traditional security more actively. Recently, the problem of religious and cultural identity has emerged as an important cause of disputes or wars between countries as it is linked to problems such as terrorism.

3. Emerging Security Threats Aspects and National Policy and Strategic Response

3.1. Aspects of Emerging Security Threats

Emerging security threats are latent around us, as we have seen in characteristics, and it is not easy to predict the time, area, and scale of expression. In addition, the aspects of the threat that are revealed occur naturally or artificially or in combination. In particular, damage can reach a serious level when naturally occurring threats cause human predictions and alarms to be wrong or distorted. Although there are many opinions in academia, the aspect of threat can be categorized into five areas.

First, it is a naturally occurring threat that occurs in the natural system of sudden disaster disasters such as heat waves, heavy snow, heavy rain, and large forest fires caused by earthquakes and abnormal climates. If the threat arising from the natural system of disaster disasters works in combination with the threat of enemy or impure forces in future catfish cities, it could be an "n"th complex security threat at the X-event level.

Second, it is an artificial threat that combines high-tech science and technology with networks such as weapons of mass destruction, cyber, and terrorist threats, resulting from the technology system[15]. It is also undeniable that threats are increasing in cyberspace as digital transformation is accelerated by the intelligent revolution of superintelligence and super-connectedness. It is attacking key nodes of national important facilities with hacking attacks, voice phishing, cyber information manipulation, and logic bombs, attacks on data stores and data links such as clouds, and network infringement.

Third, it is a threat that occurs in the economic system such as the global financial crisis, economic crisis, and energy crisis. Energy is linked to the economy and the economy is linked to survival[10]. The threat of energy security is security at the national level rather than personal security of the people. This is because energy can be a weapon and energy is the foundation for economic development and national revival.

Fourth, it is a threat that arises from social systems such as population decline and aging, migrants or refugees, social polarization, community religion and identity, and social integration.

Fifth, it is a threat from ecosystem systems that arise from the destruction of natural ecosystems such as the environment, climate, food, and infectious diseases. Environmental security aims to protect humans and the ecosystem itself from pollution, destruction, or depletion of the natural environment at the global level. Environmental issues deviate from the interests of developing and underdeveloped countries and from the understanding or approach between developed countries.

Nevertheless, deforestation, overconsumption of resources, waste problems, water resource shortages, water pollution, and air pollution such as fine dust are destroying the ecosystem and making environmental problems more serious. In addition, the abnormal climate further raises environmental security threats.

3.2. national policy and strategic response

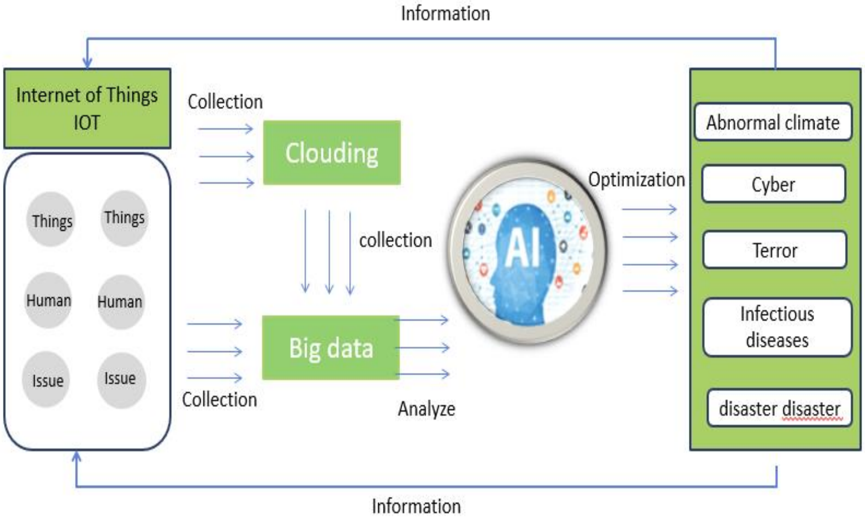
The national crisis can be divided into the security sector, the disaster sector, and the terrorism sector. The traditional crisis management concept focuses on the security field, but after the emergence of emerging security, it has expanded to the disaster and terrorism fields and began to use comprehensive concepts.

Predicting emerging security threats and preventing, eliminating, and responding appropriately to identified threats is important at the national security level, as seen in the characteristics and aspects of emerging security threats. It is necessary to respond at the level of national crisis management by maintaining strategic thinking through the national total defense system of the concept of comprehensive security. In particular, if emerging security threats are approached as a comprehensive security concept, the central government should plan, plan, and implement them in an integrated manner, forming authoritative governance, including local governments. At this level, in order to respond to emerging security threats, I would like to present several policy and strategic development directions at the level of national crisis management[11] [12] [13] [14] [15].

First, it is an integrated national crisis management that applies the concept of Foresight. It is a concept that secures response time and makes a soft landing on threats by warning in advance by adding a prediction stage to the existing crisis management stage, the prevention-preparation-response-recovery stage. The fourth industrial revolution and advanced science and technology of hyper-connected and super-intelligent such as big data, cloud, and artificial intelligence will be able to meet these requirements. As shown in <Figure 3>, it is to establish an integrated national crisis management system based on artificial intelligence. Information and various cases should be established as big data, covering security, disaster, and terrorism, so that immediate alerts can be made in connection with a group of crisis management experts in the event of an issue[16].

Second, it is to establish network-based national crisis management smart governance. It is to supplement scattered crisis-related laws and systems, and to establish a consensus and network in advance so that related organizations and organizations such as local governments, NGOs, civic groups, companies, and individuals can be integrated with the central government. In addition, it will be important to establish the responsibility and authority of the control tower for prompt response[17] [18] [19] [20].

Figure 3. Integrated National Crisis Management System Based on Artificial Intelligence



Third, it is to maintain the agile resilience of the concept of Agilience. The concept of Agilience is to respond with Agile in addition to basic resilience. In order to effectively recover damage and prepare for future threats through rapid support, software-level preparations such as rapid support manuals, professional education and training programs[21], and communication systems with related agencies should be made as well as hardware such as troops and equipment. Resilience is a concept that restores more than the original state by emphasizing agile problem-solving skills, not administrative power[22].

Fourth, in order to respond to the X-event-level threat of emerging security, it is necessary to interconnect various crisis management systems and establish an integrated response system that can achieve policy consistency of individual actors. In addition, it is to prevent emerging security threats or respond appropriately to unexpected situations by integrating the DIME element, which is a national power factor. In addition, the National Army, police, government, reserve forces, civil defense units, and important national facilities, which are the nation's seven major defense elements, including fire fighting, should be integrated[23].

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