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Warfare Ecology Approaches in Issues of Military Operations

Hadviselés-ökológiai megközelítés a katonai műveletek kérdéseiben

The fulfilment of environmental protection requirements and social expectations has become a requirement in the field of military operations as well. Impacts that threaten the ecosystems increasingly occur during the activities of the armed forces and military operations. A recently created new field of science, the ecology of warfare, investigates the military, the support systems for the armed forces and national defence, and their relation to the environment as living systems above the level of the individual (like human ecology). Ecology of warfare examines habitats, the relationship between organisms and the environment in the military field. The capability-based, mission-based, coordinated (target, place and time) ability to use military forces has an impact on the ecology. The analysis of the place and role of military operations from the perspective of the ecology of warfare is an important, timely issue. In the study, the author analyses the tasks required for planning, organising and conducting a military operation and their relationship to environmental protection.

Keywords: ecology of warfare, environmental protection, military operations

A környezetvédelem követelményeinek, társadalmi elvárásainak érvényesítése a katonai műveletek területén is elvárás lett. Az ökológiai rendszereket veszélyeztető hatások a fegyveres erők tevékenysége során, a katonai műveletek végrehajtása során gyakran előfordulnak. A közelmúltban megjelent új tudományterület, a hadviselés ökológiája katonai területen vizsgálja az egyed feletti élő rendszereket (humán ökológiához hasonlóan), a haderő és az országvédelem egyéb támogató rendszereit és azok környezethez való viszonyát. Az ökológia katonai területen az élettereket, az élőlények és a környezet kapcsolatait vizsgálja. A katonai erő küldetés alapján történő, összehangolt (cél, hely és idő) képességalapú alkalmazása hatással van az ökológiára. Helyének és szerepének elemzése a hadviselés ökológiájának szempontrendszere

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alapján fontos, időszerű kérdés. A tanulmányban a szerző elemzi a katonai művelet tervezéséhez, szervezéséhez és végrehajtásához szükséges feladatokat, és azok környezetvédelemhez való viszonyát.

Kulcsszavak: **hadviselés ökológiája, környezetvédelem, katonai műveletek**

Introduction

Efforts to transform the environment are as old as human society, but the need to protect the environment has also become a significant factor for communities and individuals alike. The correlation of the personal and communal demands – or the shifting of the centre of gravity in one direction – depends on several factors. The systemic approach to environment preservation and the emergence of global environment protection began to gain ground in the last third of the 20th century due to the increasing environmental damage, and is thus considered to be a relatively new social issue. "The existence of a natural environment (ecosystem) is an essential condition for the appearance of the built environment but changing any element of the ecosystem can affect all other factors," highlights Nagy and Hornyacsek the importance of the topic. [1: 111] The need to protect ecosystems has evolved into a significant social expectation, strongly reflected in the field of national defence. "The challenge for researchers is how to explain in digestible terms what complex, overlapping and geographically unique systems are," [2: 1056] writes C. M. Briggs in his study. The field of warfare (as a complex and unique system) and military operations (as a process) are becoming increasingly prominent in the study of the ecology of warfare. Briggs points out in his work that the issues of military activities and the environmental load related to it are typical. The area of military operation and the support system of military forces, as well as their complex, comprehensive entities, can be interpreted as ecological[2] systems, and their examination may support those examining the environmental impacts of military operations and the possibilities of defending them. The danger of war from the threats to ecosystems is not to be neglected. In recent years, the definitive study of warfare ecology by Gary Machlis and Thor Hanson has led to significant advances in research in this field and the interpretation of its concepts. "Warfare ecology would apply ecological theory, methods, and empirical studies to such environmental effects and war-related conditions. With its emphasis on interactions among organisms, and between organisms and their environment at multiple scales (populations, communities, ecosystems, biomes), ecology is well suited to helping understand the complex relationships between warfare and natural systems." [3: 730] In the following, I will examine military operations in a war-ecological approach.

[2] Ecology is a subdivision of the supra-individual (i.e., supra-individual organisation) branch of biological science. It deals with the location patterns of groups of living beings and their relation to their environment. [3: 7]

The military operations in the ecological issues of war

Warfare ecology as a concept has several different interpretations. The basic idea is interpreted differently by international and Hungarian experts. The Anglo-Saxon ecology covers a much broader field of science than the Hungarian concept of ecology (or the German Ökologie); instead, the English expression is synonymous with syn-biology[3] as used in the national biological literature. The application of the foreign and Hungarian environmental protection concept poses difficulties of interpretation. The reason is the special Hungarian system and perception created by the work of the famous Hungarian scientist Pál Juhász-Nagy. In short, syn-biology (in Hungarian "szünbiológia") is the biological science of organising above the individual. The disciplines are as follows. Synpheno-biology (in Hungarian szünfenobiológia) is a discipline that studies the phenomena of organisation over an individual. Ecology also examines and explores the causes of the phenomena of super-individual organisation. Warfare ecology is a separate discipline that emerged from the study of Machlis and Hanson. [4] This sub-science exclusively examines the relation of military operation and military activities to ecological (according to the Hungarian concept, synbiological) issues. If it is the case, I would like to interpret the generally accepted goals of the interdisciplinary science called "ecology of warfare" by comparing them to "ecology", as shown in the following table. Later, it will be seen that the ecological issues of warfare can be found within the interdisciplinary system of generic ecology.

Table 1

Comparison of ecology and warfare ecology [3: 10], [4: 732–734]

Ecology	Warfare ecology
Examining and understanding the functions of the environment and nature.	Exploring the conditions of the theatre of war is the key to considering its priority, the success of military activities and the criteria system to protect the environment.
Examining and understanding human activities affecting nature.	Investigating the military human environmental factors affecting military activities (operations).
Searching for and examining methods for mitigating problems arising from natural and human activities.	Searching for and examining methods for mitigating the impacts of problems arising from military activities.

Based on the study of warfare ecology, it can be stated that the results from both areas of syn-biology (ecology and synpheno-biology) can be used, for practitioners wishing to research this field. Ecology is an investigative, fact-finding science, so it cannot stand on its own, but it also relies on the results of synphenobiology. Synphenobiological information from description of the phenomena of flora and fauna does not play a significant role in military operations. It is at most supplementary information at the level of military decision support. Warfare ecology also examines

[3] Science in the study of supra-biological systems (parts of ecology, synphenobiology). [3: 10]

human activities affecting the environment. As László Földi stated in his study: "Warfare is an ecological threat." [5: 401] In the Hungarian view, the other sub-area of ecology is environmental damage mitigation, which, as already mentioned, belongs to synpheno-biology. Mitigation does not appear to be of the same weight as the study of impact; I intend to focus on these areas as well. The Machlis–Hanson study classifies warfare ecology both spatially (local, regional, global) and in time, creating the taxonomy of this discipline as shown in Figure 1 [3: 729]:

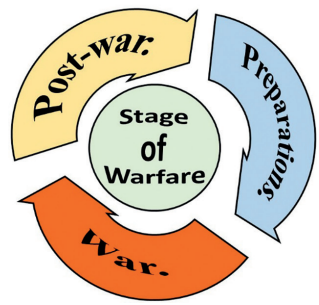

Figure 1
Taxonomy of Warfare ecology. Created by the author, source: [4: 729].

Significant environmental impacts can also result from military activities in peacetime. Yet the greatest environmental damage is related to war activities. Asymmetric warfare, war without a face line, increasingly justifies the following suggestion. "The state of peace among men living side by side is not the natural state (status naturalis); the natural state is one of war," [6: 7] writes Immanuel Kant. Parallel to post-war reconstruction, the return of the armies is usually followed by the analysis of military operations and lessons learned. The analysis of the lessons of war brings modernisation and development in the military field. Recovery and preparation are done in parallel, interacting. The border between war and peace is increasingly disappearing. With the emergence of mass armies and military advancements/developments as a result of the Industrial Revolution, the warfare had spread over several continents from the early battlefields of a few square kilometres. John Keegan wrote in his book *The Face of the Battle:* "Industrial development has dramatically increased the forces that countries can wage against each other in their wars, and the development of weapons has extended scopes of some generals." [7: 214] Massive acts of warfare, affecting almost the entire population and the environment, have had an almost incalculable impact on the environment. Although the impact of the emergence of weapons of mass destruction reduces the risk of open global and continental wars, the use of the existing weapon potential also causes irreversible environmental change. "Guaranteeing sustainable development for the existence of humanity is inseparable in the present and the future, what is more, unthinkable, using age-appropriate and societal demands for an effective, complex, decisive response segment to the security challenges that threaten our security," [8: 137] writes István Szendy. The importance of developing warfare ecology is unquestionable in the future.

Evaluation and classification of military operations from the military-ecological perspective

The taxonomy of the warfare ecology examines the environmental impacts of military activities (operations) not only in time but also in space. In the field of military operations, in parallel with the exploration of the damaging effects of the natural environment and the built environment, it seeks methods of prevention and reduction of harm. The Machlis–Hanson study considers this taxonomy dimension as a separate sub-area. "As a distinct subfield of ecology, it would be multi-scaled (landscape, regional, and global), and its scope would encompass all three stages of warfare." [4: 730] To approximate warfare ecology from a systematic point of view, an interpretation of the concept of the military operation is essential. In my view, the best short definition is as follows: *"The capability, the deployment of a military force based on a policy-defined mission, coordinated in terms of purpose, location, and time is called a military operation."* [8: 21] We have compared it with the elements of the scope of tasks based on the above comparison of war ecology, identifying it as a negative factor for the environment. It can be seen from the table below that although the objectives of the operations are not considered by the authors as the area to be examined, other subsystems can be examined in the operational context.

Table 2

Comparison of the military operation as an application element and the ecology of warfare. Created by the author, source: [4: 728–730]

Military operation application elements	Subsystems of taxonomy in warfare ecology	Complies	Partially Complies	Does not Comply
Aim (operational objectives, (occupied area, destroyed environmental elements, loot material, etc.)	Not investigating			X
Location (battlefield and operation support area.)	Multi-level (local, regional and global)	X		
Time, phase (war, peace and after war termins)	War, armed conflicts, Restitution Preparation period		X	

If we compare the current classification system of military operations, we can assume that the environment-centred warfare-ecology taxonomy approach is well applicable within the framework of today's and future military environment research. The systematic classification of military operations based on theory and practice provides more opportunities for exploring the environmental impacts of warfare.

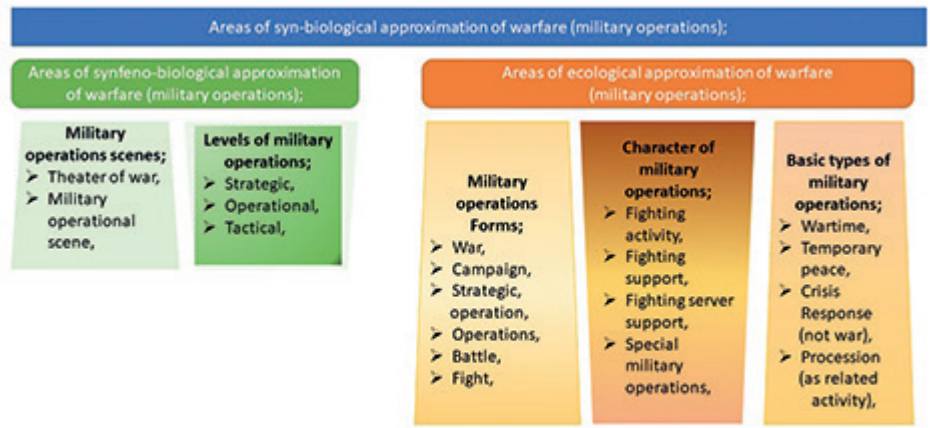

Figure 2
Areas of military operations according to warfare ecology.
Created by the author, source: [4: 728–730] and [9: 107–112]

Figure 4 shows the place and role of military operations in the taxonomy of war ecology. It can be stated that a military operation can be investigated and mapped on a "synfeno-ecology" basis at the local, regional and global levels.

Environmental impact assessment of military operations

Military operations often have a negative impact on the environment. Think of the technology needed for fight, construction, maintenance and the energy consumption of military facilities. The use of explosives in weapons also causes environmental damage. Exploring and understanding human activities affecting nature in the field of military operations is an old endeavour, and there are many deficiencies in this field. According to the ecological approach of warfare, using the taxonomy mentioned above, impacts can be studied by phases (preparation, combat or deployment, recovery) and spatially (local, regional, global). The Hungarian environment research examines structures beyond the individual as a system. According to Attila Kerényi, "A multitude of units and elements are connected in the system. These can be materials, objects, non-natural components. The elements of the system are not randomly connected; there is integrity, loan relationship, the operational relationship between them" [10: 9]. The study of integrity, interrelationships, and operational relationships is extremely important from the point of view of warfare ecology. Examining military operations as a system, we can see complex, supra-individual, highly complex relationships and interdependencies. The impacts of the armed forces as a system can be explored using the methods based on their capabilities. It consists of the human resources basis (human resources) and the armament and military equipment and the infrastructures serving them. Together, they determine the capabilities that would be deployed in military operations. The exploitation of capabilities leads to impact-based

operations, as György Szternák states in his study: "*The new approach to military success made the issue of effect-based operations one of the main issues in the field of military science research.*" [11: 45] Utilising capabilities and impact-based warfare is not new, as all military and non-military capabilities have been, and will continue to be, imagined to be successful. There are several methods of environmental impact assessment. I found no recommendation for a targeted procedure for the effects of military operations. The procedures used in civilian life, especially in the field of production, are likely to be well applicable to the environmental impact assessment of military operations. In my view, impacts can be implemented by examining human and technological assets and services involved in a military operation on the one hand, and military capabilities on the other. The first step in examining both directions is to explore the current situation. In civilian life, there are many indicators and environmental performance measurement methods that can be used to examine both system components (human resource base/live force/weapons and military equipment and their supporting infrastructures and processes concerning attack, defence, delay). The application of environmentally conscious procedures and methods in everyday military practice should be the subject of further research.

Conclusion

In the daily news, we see more and more events leading to environmental damage. Environmental damage, destruction of habitats, and the extinction of species characterise human activities that influence nature. Warfare, armed conflicts and preparations for war also have significant adverse impacts on the environment. Communities, political and military decision-makers are increasingly recognising the need to prioritise the development and use of methods of detecting and mitigating the impacts of operational problems in a warfare, including its military capabilities and supporting infrastructure. The planning, organisation, conduct and follow-up of military operations should also consider the protection of sensitive ecosystems[4] in the theatre of war or areas of operations. The ecological approach applied to society is the product of the last century. The need for applying the ecological approach to the military area is evident. Machlis and Hanson, in their study of Warfare Ecology, outlined the essence of the topic, the directions, aims, and methods of research. The study developed taxonomy and provides research directions for the study of this field. Based on the mapping of the areas of ecology in the military field and their study, the following conclusions can be drawn:

- The warfare ecological approach is suitable for investigating the use of both the natural and the built environment for military purposes, and for developing new environmentally friendly operating methods.

[4] Ecosystem is a community of living organisms in conjunction with the non-living components of their environment, interacting as a system. [12: 380]

- Environmental issues of military operations can be highly significant and influential. Warfare ecological studies can help the development of this field, which is not only a military but also a public interest.

There is a need for ecological issues in the field of warfare and defence. Still, despite the development of environmental protection, it is not always possible to consider ecological aspects and integrate them into military operations. Applying the results of warfare ecology in the planning, organisation, and conduction of military operations can also promote the success of an operation and the preservation of the environment. The soldiers participating in military operations are as much victims of environmental destruction as the inhabitants. Therefore, the use of modern precision weapons with a limited range, for example, is a factor that affects not only the success of the operation but also the protection of the environment. Warfare ecology is expected to be an essential research area in the future. Military strategies increasingly formulate the need for environment-conscious planning of operations, which is to be emphasised in everyday life, both at the strategic and tactical levels. Participants in an operation could learn the basics of environment-conscious planning and operations management during their preparation.

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