sciendo

Land Forces Academy Review
Vol. XXVII, No 3(107), 2022

THE INFLUENCE OF GEOGRAPHICAL SPACE ON OPERATIONAL DESIGN

Mihai-Marcel NEAG
"Nicolae Bălcescu" Land Forces Academy, Sibiu, Romania
mmneag@yahoo.com

ABSTRACT

Geographical factors can determine the planning and conduct of military action, the organization and training of the armed forces, and the choice of appropriate combat procedures. Based on these considerations, we will highlight the importance of the geographical factor in the military analysis for the planning of military operations, in the context of a comprehensive approach of the elements that constitute the operational environment. The timeliness and importance of the issues addressed are determined by the opportunity to investigate and assess the correlation and interdependencies among physical and geographical elements and the operational design, identifying specific elements of military science and art for the planning and execution of military operations.

KEYWORDS: military geography, geographical space, operational design, geographical factors, armed combat

1. Introduction

Military theorists and specialists appreciate that one cannot talk about the determinations of future military actions without analyzing the main characteristics of the geographical space in which it takes place. Recent military conflicts have brought to light the fact that in the evolution of military operations, there have been significant changes that have led to a considerable increase in their dynamics. The application of various tactics, techniques and procedures in military operations has continued to be perfected by various means, including non-military (economic, financial and even diplomatic) but anchored in the characteristics of the geographical space.

Modern operations have brought to the fore essential aspects of the effectiveness of the war effort of the warring parties in the confrontational space. The priority stemmed from the requirement to ensure much greater chances of harming the opponent, using the growing possibilities of modern equipment, but also as a result of exploiting the advantages offered by the terrain for the development of means of action, able to provide active or passive counteraction of opposing actions.

In the context of current security issues and challenges, especially those in the Eastern European area, the trends are to redefine the geographical area by criteria that underlie the security and stability of the state. This will influence the redefinition of the theatre of operations in Southeast Europe, based on the geostrategic analysis of the geopolitical phenomenon in the region and the ways of approaching regional security issues.

From the perspective of military geography, a new strategy of military knowledge is required, at theoretical and

DOI: 10.2478/raft-2022-0024
© 2017. This work is licensed under the Creative Commons Attribution-Non Commercial-No Derivatives 3.0 License.

practical level, with definite repercussions on the understanding of the military phenomenon, through the study of transformations of geographical areas with all natural and artificial elements that influence the organization and conduct of military actions, as well as the war potential of a state or group of states in the studied geographical area.

Military geography provides commanders with knowledge of the influence of geographical factors on the conduct of military operations. Based on this knowledge, the military art provides effective solutions for the preparation and conduct of armed combat. Therefore, the mission of military science is to respond to the needs of knowledge and mastery of the phenomenon of armed combat through the determinations and interactions of the geographical area with the requirements of the laws and regulations of the armed combat, in the framework of planning and execution of operations.

Military researchers and experts show a special concern for the study of the modern military phenomenon in terms of geographical conditions, social, political, and economic changes that add to military art new approaches, new strategic and operational concepts, adequate to the political military situation and purposes.

2. The Importance of Military Geography in the Orientation of Military Operations

The operational approach represents the modality in which the commander wants the operational environment to look when the operation ends. The geographical space involves focusing on the mission to determine and select possible actions that lead to the desired final state.

In the context of the activities of training and conducting the armed combat, military geography has played an important role in a better understanding of the operational environment. The knowledge provided is the basis for issuing the commander's guidelines for planning, regarding the influence of physical and geographical elements in estimating the particularities of the military action.

Military geography also provides models for the execution of operations as well as the ways in which they can be assessed in order to choose the best way to organize, deploy forces in different geographical areas, to choose the form of manoeuvre and the defensive alignments or the offensive directions.

The geographical factor also plays an important role in the design and organization of the force structure, and how to use them.

The characteristics of the theatres of operations are determined by the features of the geographical area, which influence the organization and conduct of military actions.

The estimates resulting from the geographical-military analysis can provide knowledge about a geographical area subject to analysis, which, in a certain context, can become an area of operations in a theatre of military actions.

These two directions of research, specific to the investigation of military geography, influence and complement each other, and the military and geographical component must provide means for effectively organizing space, time and information in the planning and design of operations.

The development of the design of the operation must promote mutual understanding and unity of effort in the battlefield, an optimal framework to help commanders understand the conditions necessary for success. In the early stages, the design of the operation is essentially similar to the analysis of the mission.

It is known that the operational environment changes during operations because the forces interact with the operational environment. The ability to recognize change as it takes place can be

essential to ensure the success of the mission, especially in the case of changes that decisively affect the confrontational environment or drastically change the operational issue.

2.1. The Importance of Geographical Space in Military Analysis

In the operational approach, in order to describe the operational environment, the operational problem and how to solve it, the commander provides the planning guidelines, which include at least the following elements: description of the operational environment; definition of the problem; description of the operational approach; limitations, constraints and restrictions; the intention of the commander (*Doctrine of the Romanian Army*, 2012).

General Andre Beaufre, paying special attention to the influence of the geographical environment on military action, in time and space, considered that: *"the first dimension of the military action is the geographical dimension, because it distributes the efforts in space in various areas of action; in this way he distinguished, the area of internal action of the future belligerents, where each one carries out his activity to mobilize the efforts necessary for the dispute; the area of adversarial action, which corresponds to the space of confrontation and which often becomes the theatre of military confrontations; the area of local action, proper to the indirect strategy, which corresponds to a theatre (third) of military actions distinct from the territory of the real adversaries; the area of action outside the territories of the conflicting states, which, in practice, would include the rest of the world, in which there are states, groups, circles interested in supporting in different ways one of the warring parties.(translation)"* (Beaufre, 1974, 138-139).

2.2. Military Consequences in the Geographical Area in the Vicinity of Romania

If we analyze Romania's position and importance on the international stage, we come to the conclusion that its role must be approached in terms of its geographical position in the region. Romania is located in an area of considerable geopolitical and geostrategic significance, due to the intersection of economic, political and military interests of major global powers, which can positively or negatively influence the state and evolution of the country.

It is useful for the military analysis to take into account the specific, geographical, spiritual, economic and historical particularities of the states positioned near the borders of Romania. Certainly, the significant geopolitical events of the region (evolutions, involutions, as well as the full range of events that define the strategic climate) are the result of the advance of the Euro-Atlantic border towards Asia. This phenomenon is part of the global geopolitical evolution, as a result of changes in the poles of power worldwide.

The extension and maintenance of some areas of influence of some states in certain geographical areas of strategic importance, involves research of the area of vital interest to Romania, specific to military geography. Through specific methods, military geography elaborates studies and analyses regarding the configuration of some territories, their specific conditions and natural resources, their economic, demographic and military potential, but also the geopolitical orientations in the geographical area of interest of Romania.

The latest military conflicts have reiterated that modern warfare is a combined combat of the land, air and naval forces. This presupposes new conditions, in a continuous evolution, of structuring and forming the groups of forces and especially of their use within the military actions.

Their use implies rigor in correlating the results of the geographical space analysis with the capabilities of the military and civilian structures in the area of military actions.

From a spatial-geographical point of view, Romania has a favourable geographical position, compared to other states in the area (Ukraine, Moldova or Georgia), whose borders are subject to the risks of conflict.

Studying the territory in times of peace is very important in developing predictable action scenarios.

These observations would aim at: studying and knowing the obstacles in different possible areas of operations (ZO); the degree of accessibility or difficulty in the mobility of troops and manoeuvre design; studying the details of planimetry – localities, communications networks, hydrography and soil and vegetation elements; studying the realities of the field in order to constitute battle-formations according to the types of military operations.

In the estimation and analysis of the situation, the ways in which the geographical factors influence the probable courses of action are taken into account. The relevant aspects are introduced in the conception of military operations.

The geographical space is complex, dynamic, and varied. *"In the relation with people, the physical-geographical component can be favourable ('oicumene' – populated territories on land), restrictive ('suboicumene' – territories with reduced population), or hostile ('anoicumene' – unpopulated territories) ... Geographical space as a whole, or only some of its components has been and is venerated by people... but it was also underestimated by those who believed that nature proposes, and people order"* (translation) (Josan, 2021, p. 19).

2.3. The Influence of the Terrain over the Military Actions on the Romanian Territory

Military experience shows that success in war depends on knowledge of the terrain and its correct exploitation. The physical and geographical importance of the terrain should not be considered a guarantee of success, the identification and understanding of the operational problem makes the difference between victory and defeat as an understanding of the environment of confrontation.

The orographic system (landforms) and its geomorphological study are of great importance for carrying out military actions. The high-elevation landforms, the large watercourses, define geographical compartments considered in the strategic and operative directions, the areas of operations, the objectives and the alignments of strategic, operative or tactical importance.

The Carpathian core is the basic component of the system, which subordinates and controls each element and the system as a whole. It is this core that governs the relationship between the elements and two examples will be presented. The first: the rivers of Romania, among others, are arranged radially and are collected circularly, a structure that is imposed by the Carpathian system, and the flow variations are strongly influenced by the tiers of the Carpathian Domain. The second example is the climatic stratification in concentric circles and its extra-Carpathian regionalization, in accordance with the characteristics of the air masses from outside Europe, but stopped by the Carpathians, totally transformed and integrated into the Romanian system.

In Romania, the mountainous terrain is represented by the Carpathian Mountains – a sinuous series of heights, with altitudes exceeding 2,000 m, with wide valleys and containing relatively wide depressions,

which facilitates both crossings from one side of the mountain to another and the development of human settlements (Pătru, Baboș & Grigore, 1999).

From the military point of view, the mountainous terrain offers many possibilities for defence on successive alignments and the offensive is channelled along the passes. Given the variable width of the mountains between 40 km in the Făgăraş Mountains sector and 110 km in the region of curvature and between Prundu Bârgăului and Gura Humorului, the combat actions will be long lasting and supported mainly by specialized forces, on great depths, in ridge or valley directions. The existence of many depressions provides conditions for the deployment of forces, reserves and resources and the terrain provides opportunities for the execution of manoeuvring forces and means from one direction to another, on roads and bypasses.

The Sub-Carpathians represent a transitional landform unit between the Carpathian Mountains and their external landforms. Their altitude varies between 500 and 800 m. Small depression areas lead to reduced opportunities for troop concentration, as well as a significant time to build up the columns of forces. The divisions of the Sub-Carpathians are delimited by watercourses which implies that the military actions of operative level are separated and with a high degree of independence. The Sub-Carpathians of Moldova provide opportunities for manoeuvre and transport between the Eastern Carpathians and the Moldavian Plateau.

The Sub-Carpathians of Curvature represent the most complex Sub-Carpathian sector, due to the penetration of uplifting formations that interrupt the parallelism of depressions and hills. Operational-level actions are thus separated and gain a high degree of independence. They allow the organization of the defence on successive alignments, with the establishment of the limit before the defence on the watercourses: Milcov, Slănic, Buzău, Prahova.

The Getic Sub-Carpathians, which consist of the Olteniei and Muscelele Argeşului Sub-Carpathians, have the lowest average altitudes of all the Sub-Carpathians. They are of low complexity, being made up of two parallel alignments of depressions and Sub-Carpathian hills, oriented in the east west direction. They are strongly fragmented by watercourses oriented in the north south direction (Jiu, Gilort, Olteț, Olt), these being good mobility lanes in the same direction. Also, this geographical area includes two important depressions (Târgu Jiu Depression and Câmpulung Depression) located at a significant distance from each other, which determines that the forces concentrated in these depressions to act in distinct areas.

The hill and plateau landforms make the transition from the Sub-Carpathian to the plain areas. In general, the plateaus are more diverse than the hills, due to their geological structure, formation and evolution (Ostropel, Neag & Radu, 2008). The main hills in Romania are Dealurile de Vest (The Western Hills), while the main plateaus are either inside the Carpathian arch (Transylvanian Plateau) or outside the Carpathian Arch (Getic Plateau, Moldavian Plateau, Dobrogea Plateau, Mehedinţi Plateau).

Dealurile de Vest (The Western Hills) overlap over Poarta Mureşului and Poarta, two mobility lanes of special importance for military actions. The arrangement of these hills on several rows favours the mobile defence, on successive alignments.

The Transylvanian Plateau consists of the Someşelor Plateau, the Transylvanian Plain, the Târnavelor Plateau, and the Hârtibaciului Plateau. The average altitudes are 425 m, decreasing from north and south to the centre, as well as from east to west. The valleys are wide and have terraces and meadows, and the depressions are numerous. The area is exposed from a military point of view, due to the accessibility of all categories of equipment;

it is the last alignment in which the tactical-operational level defence can be organized, before entering the mountains.

The Getic Plateau is divided by the rivers that cross it from north to south (Motru, Jiu, Olteţ, Olt, Argeş), which makes the offensive military actions easier to take in this direction and the defence is organized on intermediate alignments (on watercourses, which thus become real successive obstacles for the aggressor).

The Moldavian Plateau, the largest plateau in our country, consists of the plateaus of Suceava, Moldavia, and Bârlad. In general, the average altitudes are 300-400 m, increasing to the north-west and decreasing to the other extremities. The landforms are fragmented by a dense network of valleys. Given the subdivisions of the plateau, it is expected that the pace of the offensive will be higher in north-east of Moldova, where the terrain contains wide valleys and heights that do not exceed 250 m. On the other hand, the southern area of the Plateau of Moldova is favourable for defence on intermediate alignments with great possibilities to execute the manoeuvre from one direction to another, on the bypass roads, generally oriented in the north-south direction.

The Dobrogea Plateau is composed of the North Dobrogea and South Dobrogea plateaus, with average altitudes of 200-300 m. The terrain is generally rocky, containing numerous coverings in the north, and flatter, open, with heights that do not exceed 200 m in the south.

The Mehedinti Plateau contains extensive plateaus and high peaks, partially restricted to access with military equipment. The presence of the Danube to the west turns it into a significant line of defence.

In Romania, the plains are arranged radially with respect to the Carpathian arch and occupy about a third of the national territory. The main plains in Romania are: The Romanian Plain, the largest, with altitudes decreasing from north (320 m) to south (5 m); Câmpia de Vest (The Western Plain) with altitudes decreasing from east (150 m) to west (below 100 m) that penetrates into the mountains and hills in the form of depressions.

Through their characteristics, the plains allow the conduct of large-scale military actions, the access of all categories of forces and the means of moving troops in all directions due to the dense network of communications. The absence of natural obstacles, of dominant landforms, complicates the protection against fire weapons and weapons of mass destruction, and the lack of sizing and concealing disadvantage the organization of defence. To ensure a high level of survival, protection capabilities must be rapidly deployable, and self-sustaining. At the same time, the influence of the plains on the conduct of military actions is determined by the slightly uneven terrain.

From a military point of view, we mention that the orographic system (landforms) exerts an important influence in the aspects regarding the planning and development of the armed conflict, but without constituting the decisive element. The art of studying the terrain and properly assessing its influence is a complex set of measures and activities for the decision-making.

Usually, the study of the terrain refers to the following: the general study of the characteristics of the terrain, the detailed study of the terrain, the study of the conditions of observation and concealing, the study of the characteristics of protection, the study of the conditions of terrain accessibility, in which the lowland and the middle ground include the main operational directions, the offensive actions being advantaged.

If we refer to the geographical characteristics of the national territory, we also notice the diversity of the landforms; its division is advantageous for the conduct

of military actions in different forms and in any season. From this perspective, we consider that the national territory requires a special attention in the analysis of all geographical areas for the preparation of the national territory for defence, aiming at the judicious combination of the economic with the defence necessities.

3. The Geographical Space and the Armed Combat

In a military operation one of the initial activities is the delimitation of the geographical boundaries of the area of operations, after which each combat structure is assigned an area of responsibility, which includes all the dimensions of the combat area.

The terrain can be described in its military aspects (OCOKA – Observation and Fields of Fire, Cover and Concealment, Obstacles (man-made and natural), Key or Decisive Terrain, Avenues of Approach) that are used to determine the course of action of both your own forces and the opponent's forces.

The military aspects of the terrain may offer an advantage or a disadvantage to one of the warring parties. These must be taken into account in establishing the lines of effort, depending on the mission, paying attention to the manoeuvre, which is the key element of any military operation.

The skilful use of the advantages of the terrain and the avoidance of critical moments given by the disadvantages of the terrain, enhance the efficiency of the combat at the tactical level of one's own forces. For the opponent, these aspects could determine the direction of the actions in areas where his fighting capacity is limited by the elements of the terrain. Moreover, it involves *"applying the creative imagination of commanders and personnel, supported by their skills, knowledge and experience to plan major campaigns and operations and to organize and engage military forces in combat"* (translation) (*JP 3–0*, *Joint Operations*, p. xiii, xix).

The operational design process confirms the importance of continuously updating the operational problem, especially the working hypothesis, by assessing the characteristics of the terrain. Further information about the terrain offers advantages in certain circumstances, but it can also limit the conditions of the combat. Problems become known as operations progress. In addition, the information disseminated produces the evolution of the problem and determines the adjustment of the initial paradigm.

The concept of a comprehensive approach of operations proposes a significant change from traditional operations planning by promoting the idea that an efficient and creative operational design is based on very good communication between all participants in military operations to understand and build a common image of the operational environment. Communication and exchange of ideas result in a deeper understanding of the operational issue as well, leading to a stronger interaction between all entities present in the process.

The structure of the military forces, your own level of command and that of the enemy, influence the choice of terrain for planning operations. From the military point of view, the characteristics of the selected terrain must ensure a balance between protection and the projection of forces.

Referring to contemporary wars, which are characterized by geographical limitations, we note the tendency for military actions to take place in the territory of a single state. Based on the thesis that knowledge of the geographical environment is a basic condition for the conduct of military actions in order to obtain victory in war, we must also consider other key factors that refer to the military potential of the state. The identification of existing economic resources and capacities is a key element of the logistical support of

operations. Road, rail, air and river communication routes, together with the telecommunications system, form the infrastructure that directly influences the troops' mobility. Localities are key elements of the area of operations and have a considerable influence on the planning and conduct of operations, because they are strong defence nodes, and numerous forces are necessary for their conquering; the conflict in Ukraine shows that the combat in localities is just as current as it was in the past.

It is very important to carry out extensive geographical studies to determine in advance some of the sites that can become areas of military action. The essential attribute of military art is to identify, within these geographical areas/ operations (possible battlefields) the objectives, directions and alignments of strategic, operational or tactical value that may form the basis of the process of planning military operations in certain combat scenarios prepared in advance.

We consider that the elements of economic-military nature play a decisive role in the delimitation of some possible areas of interest that could be transformed into areas of military operations.

Along with the economic development of the states and the technological progress, the problem of equipping the military structures with weapons also intervened, and it became dependent on the economy. Therefore, the armed combat aims, in addition to the annihilation or neutralization of the armed forces, the destruction of the economic potential, more precisely of the military infrastructure but also of the state.

The armed combat is a general term specific to war, which entails using the armed forces to achieve its goal. The armed combat, in all its diversity and complexity, is guided by its own laws and regulations, and the knowledge of the notions related to the geographical area by the military is a matter of utmost importance, without it the preparation and the conduct of military actions is unthinkable.

4. Conclusions

The development of the combat equipment has influenced the parameters that analyse and assess the geographical area in which the armed forces are used and has imposed the emergence of new terms, notions and concepts used in the military art.

The operational design extends the vision of military art and the contribution of geography to understanding the operational environment, the problem military forces is facing, as well as possible general solutions to the identified problem. The operational design uses various design elements – concepts and tools that help the commander and the General Staff to develop and refine a general approach that will guide the detailed planning of the operation.

The confrontational environment has constantly evolved, adding new features and developing new dimensions with the evolution of society and technological progress, which culminates with practical applications in the military field.

The physiognomy of the battlefield is constantly changing, due to the fluidity of factors and variables that shape a confrontation, leading us to conclude that adaptability and the complete, comprehensive way in which the confrontational environment is understood is the first step in successful planning and conduct of military operations.

From the military point of view, we mention that the diversity of landforms on the Romanian territory, their accentuated compartmentalization, the distribution and the complementarity of these compartments, show that on the national territory military actions may take place in varied forms and aspects, but at the same time, the landforms may also impose certain restrictions.

The existence of various resources, evenly distributed throughout the territory, provides excellent conditions for the logistical support of military troops and actions in all areas of the country.

One of the characteristics of the armed combat is that confrontations take place in all geographical spheres. Therefore, the geographical study should be a priority in addressing the operational environment. Understanding the links between the effects of the terrain and the courses of action available to the opponent and one's own forces is the basic condition for a modern approach to operations and the achievement of the desired final state in an effective way.

The geographical information also makes it possible to identify the resources available that can be used to achieve the desired effects, in the spatial and temporal coordinates determined by an in-depth understanding of the operational problem and the confrontational environment.

REFERENCES

Beaufre, A. (1974). *Introducere în strategie. Strategia acţiunii.* Bucharest: Editura Militară.

Doctrine of the Romanian Army. (2012). Bucharest.

Josan, N. (2021). *Spaţiul geografic românesc. La răscruce de vânturi, de drumuri şi de interese*. Oradea: Editura AUERO.

Ostropel, V., Neag, M., & Radu, Gh. (2008). *Geografie militară* – curs. Sibiu: Editura Academiei Forţelor Terestre.

Pătru, Gh., Baboş, A., & Grigore, L. (1999). *Geografie militară* – curs. Sibiu: Editura Academiei Forţelor Terestre.

U.S. Joint Force Command. (2014). *JP 3–0*, *Joint Operations*. p. xiii, xix