

The role of the relief in territorial planning

Nicolae JOSAN

Abstract. Within the territorial planning the natural factors could be restrictive for some activities or favourable for other activities. The relief is one of the factors “deeply involved” in territorial planning in two ways: as natural resource and due to geomorphological dangerousness. Depending on the instability of relief forms different way of using could be chosen. A study related to the role of the relief in territorial planning must take into account the morphometric parameters and the geomorphological processes. During the human history, the relief played different functions: habitat function, work object function, border or boundary between states or regions, defending functions, recreative function, spiritual function.

Theoretical background

Being a vital part of sustained development, the territorial planning must take into account all the factors which are the basis of the implementation of sustained development for the present and for the future generations. This the reason why the territorial planning must take into account the natural potential of an area for the best use of it.

Within the territorial planning, the natural factors (relief, geology, climatic conditions, water resources, soils, vegetation) could be restrictive ones (for some activities) or could be favourable ones (for other actions). The most important thing is to know those elements of the natural factors which lead to the best fulfilment of our goals and helps us to avoid the induced dangers.

The basis for territorial planning must be, for this reason, the physical background or the relief.

The influence of the relief in territorial planning could have two directions. The relief is a *natural resource*, on the one hand, and the support for the human activity and a working object (together with the soil) on the other hand.

The other way of “implication” of the relief is given by the *geomorphological dangerousness* which indicates the possibility that a single phenomenon of geomorphological instability

could occur in a certain period of time. (Panizza M., Sandra Piacente). The geomorphological dangerousness is the result of the “fusion” between the intensity of occurrence and the frequency of manifestation. This is the starting point for the stability or instability of certain relief forms, with a special role in the land use of the relief.

A relief form is unstable when it is not in equilibrium with the environment. But the instability must not be considered in an absolute way because it could be unstable in connection with a process (e.g. a slope consisted of marls and clays is affected by landslides) or could be stable in connection with other processes (e.g. the same slope in connection with fluvial erosion).

Depending of the instability of a certain relief form is the way in which the land use/management is made for achieving the optimum and most efficient solutions.

The elements (parameters) which must be take into account in territorial planning are the following:

- *the altitude*, it is an important factor which condition other elements of the environment such us climate, vegetation, soils;
- *the slope or the angle of the slope*, which directly influence the stability of the slopes through the processes which could occur on it, the access of certain means of

- transportation, certain agricultural techniques, the received solar energy a.s.o.;
- *the slope exposition*, together with the angle, cause the differentiations of received quantity of solar energy;
 - *the density of fragmentation (km/sq km)* is an important element within the studies of territorial management, the higher the values of this indicators are the greater the limitations are for relief use;
 - *energy of relief*, usually closely related to the altitude and slopes, could have a restrictive or favorable role for some human activities.

In consequence, a study of the relief must integrate all these quantificated factors, the relationships among them and other elements must be established, such as the hydrographical network, vegetation a.s.o.

The *geomorphological dangerousness* must be correlated with geomorphological processes which affect a certain area. Thus it is necessary to know the intensity and the frequency of some geomorphological processes on steep surfaces (slopes, some parts of fluvial terraces) or on horizontal and sub-horizontal surfaces (interfluves, floodplains) and also processes which occurs in the fluvial system (meandering, river untwining, river banks undermining a.s.o).

The relational analysis of above mentioned elements (geomorphological elements and geomorphological dangerousness) could drive to establishing the restrictivity or favorability of relief forms for specific human activities. A relief form could be restrictive for a certain activity or favorable for other activity. For example, a high mountain area, characterized by high altitudes, high values of slopes, relief energy, is restrictive for inhabiting agriculture but suitable for winter sports, tourism a.s.o.

The function of relief in territorial planning

During the long history of human society the functions of relief forms continuously changed. These functions ennerges from the fact that the relief was and still is the base for economic,

social and technological activities of the human society.

The habitat function

From the very beginning of the history of human society the man used caves and other natural excavations of the relief for living inside but the role of relief form was a very important one. Through its morphological parameters (slope, density of fragmentation, energy), the relief played an important role in spatial extension, in the structure of human settlements. Thus the spread-settlement type are specific to mountain areas, where the fragmentation of the relief is high, and the bulk type could be found in hilly area, mainly along rivers. The plain areas have no restrictions related to the influence of the relief.

In choosing the placement of a human settlement man must take into two elements: a water source and the settlement must avoid floods. This aspect is proved by the settlements discovered on the low fluvial terraces, on glacises, on islands. Just in the last decades the human pressure forces the settlements to extend on flooded zones or on unstable slopes and the results are obvious.

The territorial planning must take into account, for choosing areas for settlements, the stability of relief forms or the geomorphological dangerousness.

The Relief - work object

The oldest human activity is agriculture, an activity closely related to natural conditions. Depending on morphometric parameters – which influence, from some points of view, the microclimate and the soils – the relief directly influence the agricultural activity in an certain area. If the climates cause an arrangement in tiers for the crops, the relief's cause an local arrangement in tiers depending on altitudes, slopes, exposition. These parameters impose agricultural techniques compulsory for preserving slope stability, avoiding erosion, increasing agricultural productivity.

In parallel, the evolution of human society gained an order function: the administrative

one, the boundary function, between states or inside a state. A valleys, an interfluves, are the most common natural boundaries between states or administrative areas inside a state.

An opposing role, which means discontinuity, is the *convergence role* of some relief forms. An example is given by the Carpathians which are the birthplace of Romanian people. The convergence role of some social, economic and technological activities often superpose over depressions (Braşov, Sibiu, Făgăraş) or some valleys (Siret, Mureş, Someş valleys).

The impact of the relief in the development of transportation means was a very important one. The favorable conditions of some morphometric parameters played an important role (the degree of fragmentation, the lack of steepness) in the development of means of transportation which are situated mainly on lower terraces, on glacis or on the floodplains. The cut of slopes, without a precise analysis of the consequences, could cause major imbalances, without knowing the processes which could be induced (meteorization) or started (landslides, falls), could cause major material damages. Such an example is the situation along Jiu valley during the winter of 2006.

Choosing the route for transportation means in mountain areas must take into account the geology, some characteristics of the relief (slope, energy, degree of fragmentation), the induced energy inside the slope, vibrations generated by heavy traffic. A special attention must be bestowed in choosing crossing point for interfluves with low geomorphological dangerousness.

The relief play an important role in choosing the location for the airports. The lack of steepness and the continuity of relief forms are essential, thus the fluvial terraces, the floodplains or even the beaches are chosen for this purpose.

The building and the extension of harbors must take into the particularities of marine relief.

The defending function – was, by far, well expressed during history when the technical means were less sophisticated and was caused by the existence of “island-like” relief forms with a reduce accessibility.

Thus, the ancient and middle-ages fortresses were built on island-like relief forms (peaks, crests) with reduced accessibility due to the steep slopes. An example could be the ancient fortresses from Orăstie Mountains, middle-ages fortresses from Moldova, in all cases the relief being the main safety factor.

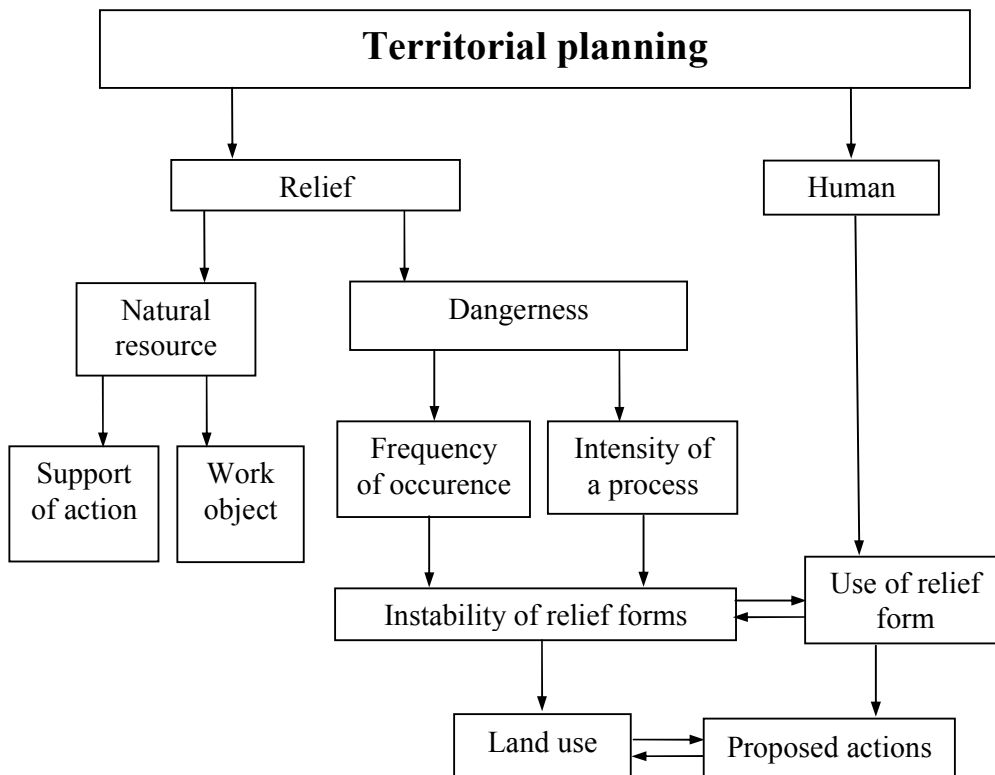
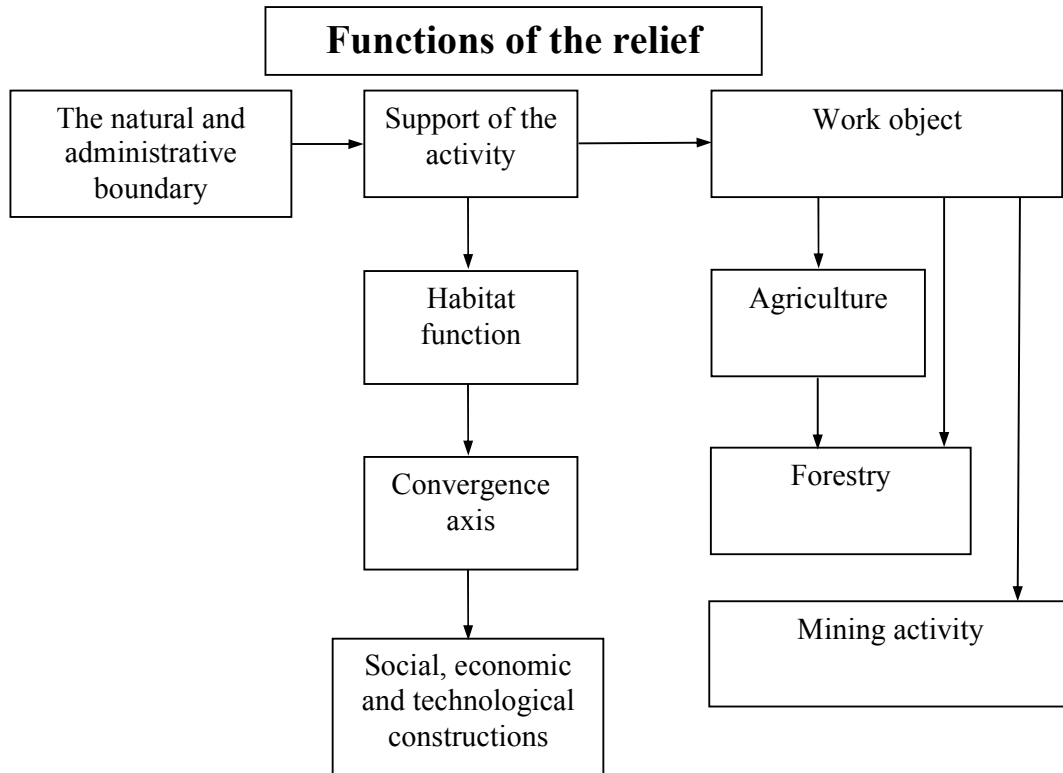
Even nowadays the role of the relief in placement the airfields, military harbors, rocket launch facilities, training areas, ammunition storage facilities is a very important one.

The touristic-recreative function. The relief could expose this function by itself or in association with other elements of the environment. The touristic features are valorized mainly in the last period of time due to the spectacularity of the relief forms. The areas with scientific values and those with unique features are declared protected areas and the territorial planning must take into account the existence of them.

Together with the climate, the relief is the main element for establishing facilities for winter sports. By itself, the relief is the “object” for some extreme sports such as climbing.

The use touristic potential must take into account the geomorphological dangerousness. The avalanches, rock falls, stone torrents, landslides are the most common processes.

The cultural and spiritual function usually is associated together with other cultural and spiritual manifestations. An example for territorial planning is the spiritual function of Athos Mountain or the Meteora Monastery. The relief, also, could be source of inspiration for artist, writers, painters, musicians.



REFERENCES

- COCEAN P. (2000), *Munții Apuseni. Procese și forme carstice*, Ed. Academiei, București.
- COCEAN P. și colab. (2004), *Planul de amenajare a Teritoriului Regiunii de Nord-Vest*, Ed. Presa Univ. Clujeana, Cluj Napoca.
- GRECU FLORINA (1997), *Fenomene de risc. Geologie și Geomorfologie*, Ed. Universității București.
- HAIDU I. (2002), *Analiza de frecvență și evaluarea cantitativă a riscurilor*, Rev. Riscuri și Catastrofe. Ed. Casa Cărții de Știință, Cluj Napoca.
- LABASSE I (1966), *L organisation de l'espace*, Ed. Herman, Paris.
- PANIZZA M., SANDRA PIACENTE, (2004), *Geomorfologia Culturali*.
- URDEA P. (2005), *Ghețarii și relieful*, Ed Universității de Vest, Timișoara.
- YATSU E. (2002), *Fantasia in geomorphology*, Ed. Sozsha, Tokyo.

Universitatea din Oradea
Departamentul de Geografie, Turism și Amenajarea Teritoriului