

Geosystem

The geosystem is a concept enabling the analysis of dynamic combinations of biotic, abiotic and anthropic factors occurring within a « territory ». It belongs to systemic approaches generally, and is used in geography to study interactions between the natural environment and societies, both temporal and spatial.

It has considerable affinities with the ecosystem approach that developed in the 1930s in scientific ecology, which mainly concerned relationships between living species and their « biotopes ». It however differs from it by the fact that it involves a larger spatial scale, since it enables the study of geographic space on the level of regional sub-spaces. Consequently it also integrates a wider range of factors, among which action by humans, and longer time scales.

As a conceptual tool, the geosystem appeared in the 1960s in the Soviet Union, driven by the development of vast, sparsely populated areas. It was formalised by Viktor Borisovitch Sochava on the basis of an approach centred on flows of energy and living or mineral matter. Via analyses and correlation of data collected at given points, the geosystem enables an environment to be approached from three complementary angles: the spatial structure, both horizontal and vertical, functioning and changes in state. It was used in particular by Nicolai Beroutchachvili in the Caucasus.

The concept was introduced in France at the end of the 1960s by Georges Bertrand in a process seeking to reconstruct physical geography. Indeed, it went beyond the classic partitioning-off of physical geography to analyse interactions between geomorphological, hydrological, bio-geographical, pedological and climate datasets. In addition, because of the systemic dimension, this also opened the way to integrating another factor for change, that is to say anthropic action, whether past or ongoing. It was thus a break with environmental studies implemented in geography at the time. Indeed, while the concept of a particular environment enabled a global approach to the relationship between humans and their living environments, it later led to studies that only took account of bio-physical components envisaged in isolation.

From the outset, the geosystem is closely linked to the notion of « landscape », both in Russian "landscape science" and in the approach implemented by Georges Bertrand. In his founding article "*Paysage et géographie physique globale*" (landscape and global physical geography) published in 1968 in the *Revue Géographique des Pyrénées et du Sud-Ouest* he presents the geosystem as a tool to redefine the geographical approach to landscape. Subsequently, with the emergence of the environment as a social issue, the geosystem has also been associated with the concept of territory in an endeavour to place approaches to the environment in a dimension that is at once social and territorial.

This evolution was formalised by Georges Bertrand in 1991 in the form of "GTP": geosystème, territoire, paysage (geosystem-territory-landscape). Pursuing his objective of apprehending the environment in its complexity and diversity, in this conceptual system he proposes to re-launch research on a multidimensional basis. Within this combination, the geosystem finds its place at the interface between the natural environment and societies, enabling the naturalistic and material dimensions of the environment to be envisaged in a social perspective. This is completed by more social and cultural approaches using the concepts of territory and landscape.

By means of the quantification of very diverse parameters, geosystem analysis enable interactions between different factors to be evidenced, as well as the dynamic processes involved. In a given geosystem, it also enables the identification of nested sub-sets whose evolution conditions the overall dynamic: geofacies and geotopes. The former are spatial ensembles of a few hundred square metres that are homogenous from the physiognomic and functional viewpoints. For instance, if a slope or watershed forms a geosystem, the various landscape units that it comprises can be considered as geofacies. The latter for their part are very small spatial units of a few square metres, such as hillocks or wet hollows in one of the units on the slope.

However, as the strict application of this approach is difficult to implement, the concept has tended to become a way of envisaging the articulation between the natural environment and societies rather than a tool for analysis. In this form it has been spreading and popularising in highly diverse applications, but sometimes rather far removed from the initial concept.

Along the lines of the geosystem another concept is gaining ground, that of the anthroposystem. This also aims to take account of the interactions between natural systems and societies over time, but differs by the fact that it focuses more specifically on human

societies.

see also : «[anthropisation](#)»

Christine Vergnolle-Mainar
Documents joints

[chart geosystem](#)

Bibliographie

Références :

- BERTRAND C. et G., 2002 : Une géographie traversière, l'environnement à travers territoires et temporalités, ARGUMENTS, Paris.
- BEROUTCHACHVILI N. et ROUGERIE G., 1991 : Géosystèmes et paysages, bilans et méthodes, A. Colin, Paris.