

Spatial dynamic of settlement patterns and natural resources: toward a long-term integrated analysis from Prehistory to the Middle Ages

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A territory is partly characterized by the people who occupy its area and exploit the resources it offers. Considering a simple relationship, within the framework of a subsistence territory, some rules can be established for land use in accordance with available resources. Conversely, the scarcity of resources in a given area can be evaluated as a function of population pressure. Over a long duration, such a relationship is more complex. Several factors are involved and interact, such as climatic variations, changes in the soil cover, the evolution of the productive power and the interest in resources. In a broader and more elaborate socio-economic system, when the social relationships and intercommunity exchanges of goods are taken into account, the relationship becomes more complex. It implies the intervention of events on different scales that produce interacting phenomena which can only be understood through a global approach.

Archaeology provides many indices which are analysed and interpreted by different research teams to understand past territorial dynamics. Integrating the results and the assumptions in such cases is difficult since the confrontation of scale is complex, given that each studied object is comprehensive depending on its own spatial and temporal scale. In this context, the Archæodyn project¹ has developed a team with the goal of processing and analysing existing databases. This can involve important collections of more or less structured data, from large inventories to structured databases. The data, covering a very long period from the Neolithic to the Middle Ages, is extremely varied and recorded according to various protocols, and linked to several more or less extended areas localised in Europe.

The first step of the program focused on the definition and the characterization of land uses over the long term. The aim was to develop a common method in order to obtain the maximum amount of comparable information regarding territory provided by each type of archaeological index. Three

main questions were formulated to guide the team: Which are the areas that were permanently occupied? Which are the areas that were conquered, and then abandoned? Which areas were used regularly but without long-term contributions?

From a practical point of view, the aim was to produce homogenous synthetic indicators based on existing data to be compared and combined in models of spatial analysis.

Three types of indicators were defined:

- 1) indices of occupation or abandonment of an area (settlement patterns, activities, influence-abandonment of the milieu...);
- 2) indices of concentration or dispersion (population, activities, exchanges...);
- 3) indices of stability or instability (settlement patterns, agro-pastoral or socio-economical contexts...).

The dynamism of occupation can be understood by such indicators, as more or less stable areas qualified by their occupation. Occupation may be understood as settled areas or areas which present different kinds of social/economic activities perceived by archaeological remains or the concentration of objects. Finally, we would like to overlay this “cartographic” representation in order to study the relationship between land-use dynamism and the management of the resources: local or far-distant.

Thus, the indicators correspond to synthetic pieces of information which are processed from various approaches, but their meaning can be considered as equivalent, that is, in terms of the intensity of land use. For example, the relative intensity of land use, according to an area or a period, can be understood either by the inhabitant data or by the concentration of objects related to an economic activity. The level of intensity will be comparable over time and over space. Such an indicator which will produce some information about the territorial dynamics and not the spatial distribution of the raw data since the direct confrontation of the number of objects or settlements does not make sense.

1-. Archæodyn I (2005-2007): “Spatial dynamic of settlement patterns and natural resources: toward a long-term integrated analysis from Prehistory to the Middle Ages” (Action Concertée Incitative – ACI Spaces and Territories of the French Ministry of Research and New Technologies, contract ET28), coordination F. Favory and L. Nuninger

Four workgroups were set up to define such indicators on various levels. Catchment areas, local soil combinations (terroirs) and community lands are investigated on local and micro-regional scales in order to evaluate the influence which was exerted on exploited spaces to ensure domestic supply (agriculture, forestry and craft activities) (Session 2, Poirier 2007, Georges-Leroy *et al.* 2007). An additional approach aims to estimate the needs of a community and the environmental capacity to fulfil them (environmental potential: terroirs and specific resources). Settlement patterns, networks and territories on regional and micro-regional scales are the main topics of the study of territorial structuring on several scales through comparisons and inter-regional analysis. This group focuses on settlement pattern organisation (hierarchy, concentration, dispersion, interaction) and its degree of stability (Session 3, Gandini *et al.* 2007). The diffusion of raw materials and manufactured objects on regional to European scales is understood as a diachronic study of management in the area of the consumption of various products (bronze, flint, jadeite, stoneware, salt...). These products include objects of

various uses (millstones, axes, weapons, tools, ceramics...) found in different contexts (habitats, deposits, river finds...) (Session 4, Gauthier 2007).

Based on the existing and very heterogeneous databases, the project deals with problems of different scales, different points of view and the different procedures used by the archaeologists involved. In a common workgroup, "tools and methods", the main goal was to define the relevance of each archaeological type of information according to the part of the area or cell considered. The first step was to characterize the degree of reliability of the information and to compute maps of confidence to guide spatial analysis and, consequently, interpretation (Session 1, Ostir *et al.* 2007).

The following papers show, on the one hand, the common protocol designed and applied by the entire group of researchers and, on the other hand, some aspects of the choices and the results obtained based on a few case studies. Finally, a synthesis of the results will be presented (session 5) from a thematic and methodological point of view and placed in the context of French and international scientific research.