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Landscape as information source for studies of connections between nature and societies

Krajobraz jako źródło informacji w badaniach związków między naturą a społeczeństwem

Abstrakt: Artykuł przedstawia wybrane problemy badania walorów wizualnych krajobrazu na przykładzie prac realizowanych w Laboratoire ThéMA (Université de Franche-Comté) w Besançon.

Krajobraz rozumiany jest jako zjawisko postrzegane głównie za pomocą zmysłów; istnieje w pełni jedynie postrzegany i rozpoznawany przez człowieka. Składowe tak rozumianego krajobrazu stanowią zarówno odczucia, jak i realnie istniejące aranżacje obiektów, powstałe w wyniku procesów naturalnych bądź działalności człowieka.

Jednym z podstawowych problemów badawczych jest sposób odwzorowania krajobrazu. Wzajemne powiązania obiektów mogą być reprezentowane poprzez „widok zenitalny" (mapy dwuwymiarowe). W ujęciu kątowym krajobraz jest przedstawiany jako widok trójwymiarowy, wyróżniający się objętością scen. Te dwie podstawowe metody mogą być dowolnie łączone, zależnie od celu pracy. Ważnym zagadnieniem jest również zmienność krajobrazu w czasie. Istotnym wydaje się uwzględnienie różnych zakresów omawianego zjawiska: zmian postępowych, cyklicznych, a także problemu zmian percepcji.

Słowa kluczowe: krajobraz widziany, wartość informacyjna krajobrazu, obrazy realne, obrazy mentalne, podejście systemowe

Key words: arranged landscape, viewed landscape, informative landscape, true images, mental images, systemic approach

Theoretical propositions

Landscape is only appearance, essentially perceived by vision. Should the occasion arise, hearing and smelling can, here or there, complete this perception of it but the main information are provided by the eyes. So, landscape is above all the spectacle, directly seen or collected in pictures, like photographs, for example.

Landscapes are not equivalents to geosystems. Those produce physically, by natural or technical process, various "objects" (slope, cliff, river, forest, bush, roads, building, and so on…) spread everywhere on the earth's ground. These objects are combined in complex or simple arrangements: here a desert only with sandhill, there a mountain with rocky summits, forested slopes, cul-

tivated areas in valley, old villages and new tourist buildings. In any case, landscape is only appearance of those "spatial arrangements". It provides several spectacles of them according to the numerous view points.

Landscape exists completely only when it is seen. A well-known French geographer, Roger Brunet, gives a good and simple definition: "*un espace sous un regard*" (a space commanded by an eye). Space is earth's ground with geosystems at work; look is provided by men, one by one or in societies: landscape make connection between the two. Here, we find a second type of images: mental representations of a landscape. Those are different according to people, social groups, cultural areas. But they are always important because they have an influence on human utilisation of earthly space, and so can change geosystems. The two categories of images are different but both, when read carefully, may be useful to provide information about interactions between nature and societies.

Landscape directly seen or taken by photography offers access to spectacles produced by geosystems and so gives much important information. But to use them it is absolutely necessary to consider the spatial state of landscape. Taken in "tangential view", in a three-dimensional volume – we say a "scenic volume" – the information provided has not the same value, when they occurred at foreground or at background. Next, some masks (forest, building) exist frequently. And, last but not least, it is necessary to notice variable intensity with which each place can be seen from other places: possibility to view may be more interesting that what is seen. So, tangential view must be joint with "zenithal view", two-dimensional maps of geographical space, where arrangements of objects are represented. It is obvious that the two approaches are linked: with many pictures we can drawn up maps and with information taken in maps, it is possible to built synthesis of images of a landscape.

Landscape is present in a second type of images as well, which is: mental representations resulting from perception of visible landscape. They can physically exist: paintings, scientific diagrams, sketches in town planning, photography in tourist brochures (even touched!). If only they are examined with a critical eye, they all provide information on landscapes. Other sort of images can stay in mind: landscape as a dream of travel, landscape as a daily refuge for homeless, memories of landscape. Sociological investigations may utilise this approach to the problem of landscape.

Landscape is constantly changing. First, it changes because it is producing a system: new objects appears, other vanish. Next, time of physical production is not alone. So, the images of relatively stable landscapes know several cyclic alterations:

– by the light, during the days,
– with climatic features: snow, fog, etc.,
– across seasonal changes: growing or decreasing vegetation,
– with human activities: street full or empty, beaches with tourists or deserted, etc.

Lastly, time of perception and mental representations is also changing: mountain or sea, terrifying at the end of eighteen century, is very attractive nowadays. Similar things can be observed for certain parts of countries or towns. Understanding how mental or mythical images appears and evolves is very interesting.

Images of landscape provide information but, in order to good results, it is necessary to use techniques based on:

– systematical compilation of images, in space and (or) time,
– quantitative or statistical methods to built models (typology, classification, probability…),
– simulation models to built synthesis pictures,
– management of data bases relating to geographical space.

Some examples of research; several using of images and space

First, some description of researched projects are presented; then some methodological remarks are given.

Climatic features in Svalbard (Griselin et al. 2005)

Since May 2000, a web-cam has been operated near Ny-Ålesund, offering a panoramic vision of the Kongsfjorden (west coast of Svalbard, 78°53' north). It provides 24 pictures a day. On the pictures, a long strand-flat, water of the bay and hills of the north bank, with or without snow and ice, changing day after day can easily be seen. The study attempts to show snow cover and sea-ice dynamics.

Images provide directly information by simple reading them. They are compared, arranged and then, associated with meteorological features. So, they furnish a description of dynamic, which is never presented very clearly (Fig. 1).

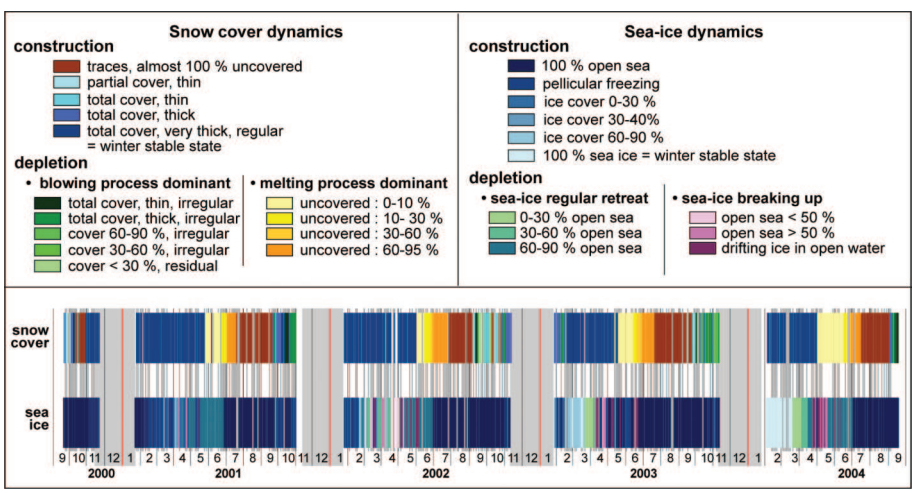

Fig. 1. Distribution of snow and sea-ice during four years in Svalbard. Remark its complexity, day after day, and the inter-annual difference

How old is a landscape? (Wieber 2004)

Using a photographs (here Besançon) we can make a study of landscape's history (Fig. 2). We see horizontal line of Jura plateau (flushed between 1 to 2 millions years ago), Doubs valley (dug since 800 000 years), the Citadelle on central hill (built 1668–1711), the old town (seventeenth to nineteenth centuries), some modern buildings (1960–1975) and the roofs of old houses, mainly renovated between 1985 et 2000. Landscape is a multi-temporal produce!

Image doesn't give information but guide the eyes and push to research explanations in various directions (geomorphological, historical and so on).

Fig. 2. Besançon, a day of autumn. View from north-west on the old town, the site with hills and Doubs valley and the border of Jura plateau

Mapping landscape as it is seen (Vuillod 1994)

By travelling through south of Jura Mountains, a collection of pictures was made as samples of landscape (mountainous ridges with forests, valley with cliffs and industrials little towns, grazing ground on tablelands etc.). The main types were chosen statistically and cartography of them was drawn.

Images in tangential view are the proper way of study. From tangential views, space is covered by map. It is also possible to built synthesis pictures by using other (analytical) maps; so we can complete the sample made during the field study.

Landscape as indicator for research of epidemiological hazards
(Foltête el al. 2005, Tolle 2005)

At first, ecological study tries to define the landscape of ecosystem where a bacterium (*echinococcus multilocularis*), dangerous for human health, can groves. This system is complex, associating bacteria with field-mice and foxes; the mainly founded landscape for those biotopes is an arrangement of meadows and bushes with even any little parts of cultivated areas and a border of forest. A second study built a Geographical Information System including these indicators of landscape. It permits to find main types where an epidemiological hazard is possible and to make maps. Beginning in Franche-Comté (16 000 km^2), the study cover now all the territory of France (550 000 km^2) (Fig. 3).

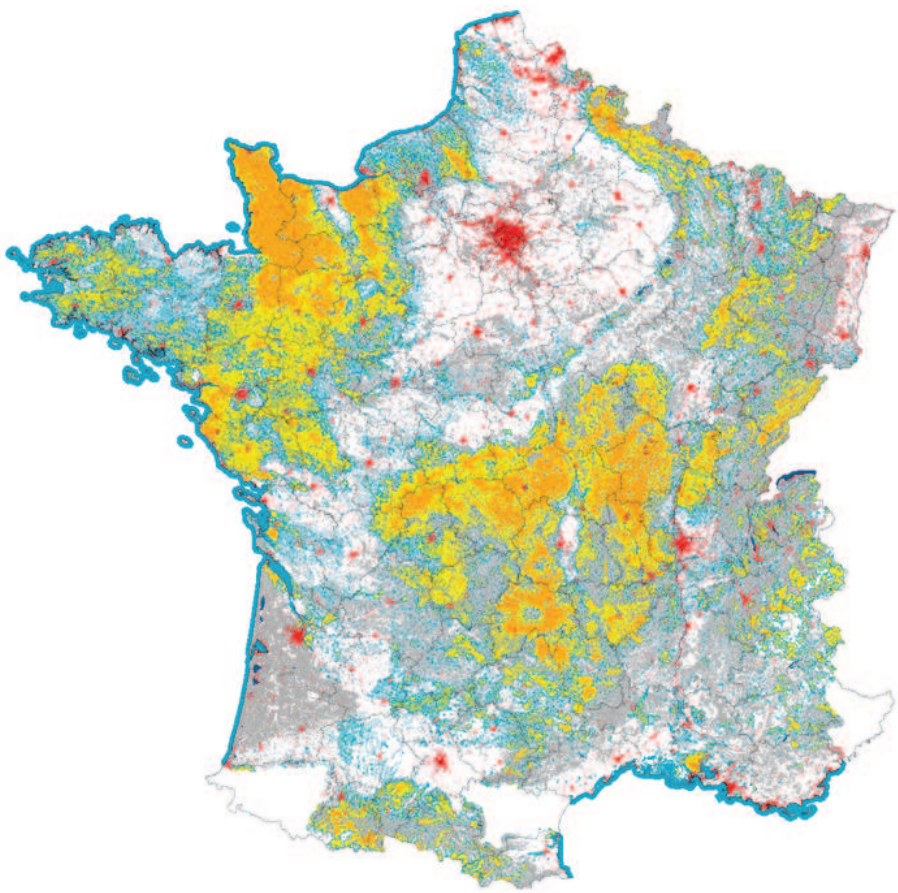

Fig. 3. On French territory, from light blue to orange by grey, green and yellow, biotopes are more and more potentially propitious to *echinococcus multilocularis*. Urban areas (red), cultivated spaces (white) and littoral (deep blue) are not or less propitious

From "true" images (those of defined biotopes), a typological analysis allows to built "mental" images: a model is created. It is used as a tool for scanning space and forecasting hazards probability.

Impacts of growing urbanized areas on visible landscape (Tourneux 2006)

Ile-de-France region surrounding Paris is continuously expanding. The aim of study is to appraise the transformations of landscape in the zone just out of its boundaries (a ring more than 550 km long, 10 to 20 km wide). Using information given by statistical tables, maps and satellite images, a precise cartography is drawn. It shows recent changes in allotments of ground. The region is, more or less, occupied by cultivated areas (40%), forest (34%) which have lost 3% of surface going to urban and industrialised areas (20%) and water (6%). Impact on landscape should be shown by synthesis images (this work is now continuing).

The map (zenithal view) is used to built images (tangential view): process does the opposite than in example above. Images would be used to guide future town planning.

Do landscapes have a measurable price? (Brossard 2004)

A sample survey was conducted with economists around Dijon (Burgundy) on more or less 4000 km^2. It measures impact of landscape on price of houses. The problem is complex but results are positive: landscape "cost" 2500 euros, mean price (2,5% of total price); it can reach 10 700 euros (Fig. 4). The significant are: open view, presence of forest and agricultural land, possibility of hiding himself. We see here anything evoked by Jay Appleton in the seventies: "prospect and refuge" concept.

Images are important firstly because of their simple existence and also because of their special character. Images are also an important tool in sample survey because results are better with questions of inquiry presented with tangential view (images) than those presented with zenithal view (maps). Images are written down also in the spirit of interrogated persons. So, in this study, images have different statutes; all they are acting together.

Walking in town, driving in country
(Piombini Foltête 2005, Nageleisen 2005)

Two studies attempt to appraise connections between practical experience of space by moving people and landscape.

In towns, people are still walking. The question is what their reasons are to go by one or other route. Inquiries in Besançon (500) and calculated models show the most usual ways. For example to go from a residence in city center to the railway station, there are three main routes (Fig. 5, see p. 8); distances and times are more or less the same. The first (red) route goes through quiet streets

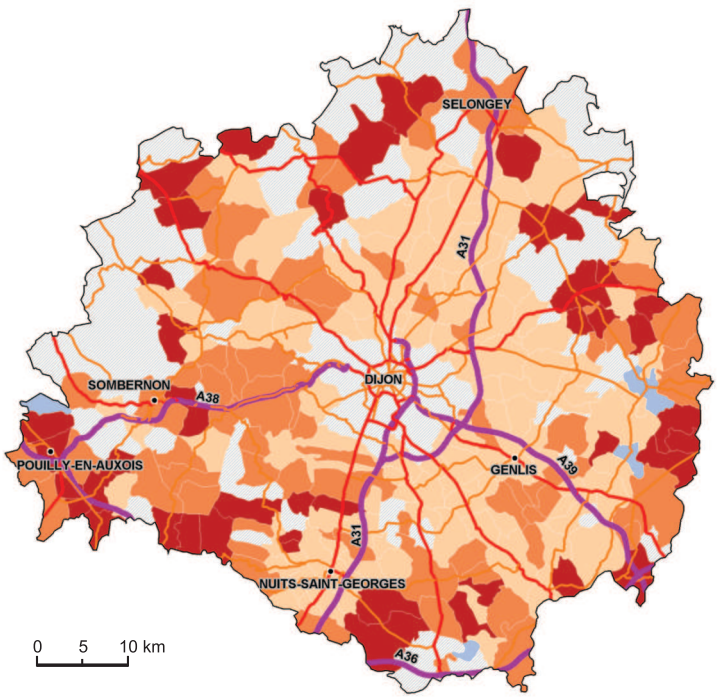

Fig. 4. Around Dijon, the part of landscape in the price of houses may be various. Red reach 5000 to 10 700 euros, dark pink 2500 to 4 999, light pink zero to 2499; white: not date; blue: negative price

and, after a big bridge, go up to station by a large boulevard following line of old fortifications with park; it presents several open views on landscape. The second (blue) goes by busy shopping streets; on the central bridge we can have open views. The third (green) begins like the second. After the bridge it uses the river quay with ageable views and take a quiet but steep street with open view. What is important in choice: quiet street or busy shopping one, not too steep ways, possibility of views on landscape? Perhaps all of that, it depends of weather, day of a week, hours and purpose of walking. A further inquiry should give information about that.

In the country, views on landscape are present everywhere in geographical definition, but, in practice, people don't go everywhere. A complete survey of Franche-Comté shows that the road plays a great part in differentiation of space and landscape. Road itself creates its proper images of landscape and, overall, it gives access to view more or less wide and so valorize differently the landscape (much seen and so well known, little seen so forgotten). We can say that practice of road network contribute to built mental images about landscape. It is more important with secondary roads, which are more quiet than motorways.

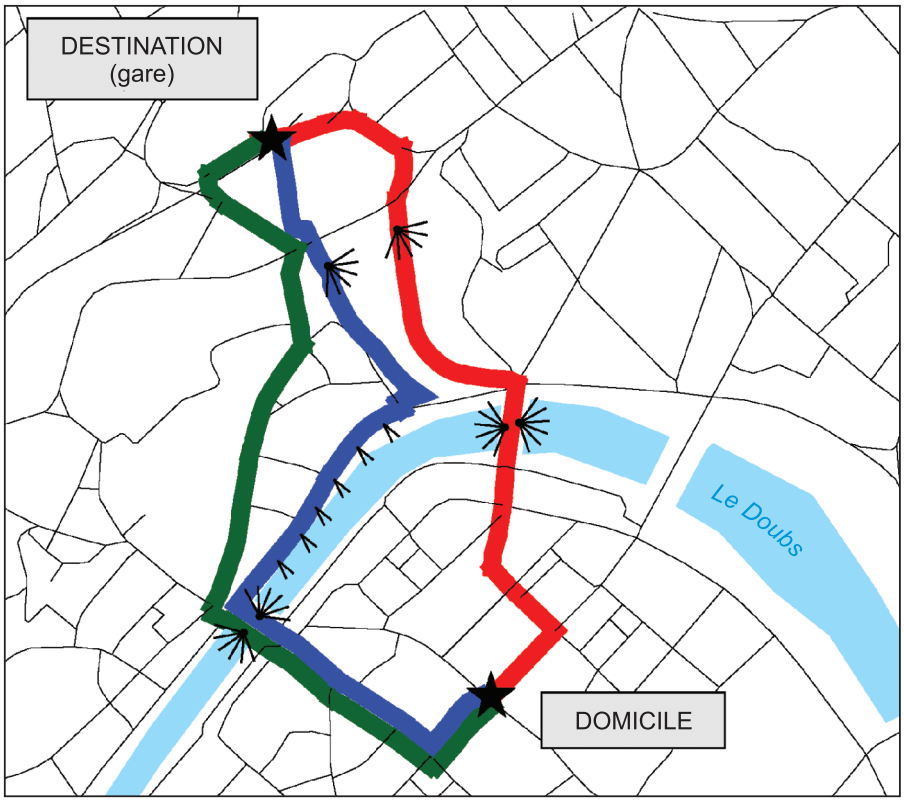

Fig. 5. Three ways to walk in the north-east part of Besançon; places, when it is possible to have a look on the landscape, are indicated

In these two studies, work is based on analysis of space (landscape in zenithal view). Even if they are not effectively studied, images in tangential view are always present as potentially visible. These two kinds of images contribute to influence development and use of mental images.

Landscape and tourism (Tritz 2004, Fontaine 2005)

Beautiful landscape is frequently an important touristic attraction. It is interesting to understand why and how that is acting.

First, a study on a collection of traveller's guides on "Cote d'Azur" (France), published between 1957 and today, shows how visible images of landscapes be seen in an area are chosen and praised in guide. So they become more or less mythical in the mind of travellers and contribute to make landscape itself mythical. Landscapes change (urbanisation, change in cultivated areas, roads, factories…); mythical images also change but not at the same rhythm. Mental images may become a tool in the production of landscape, new or protected, influencing the planning choices.

Here, images of landscape provide information by a complex system of interactions: true images – choice – mental images – partition of space (protected – unprotected) – changing true images and changing mental images and so on.

A second research (Fontaine 2005) investigates how the classical mental image of Sahara is used by travel agencies (to sell) and travellers (to buy). The classical mental image is not exactly the same as the true images of this desert: sandhills (erg) are very overestimate and gravel tablelands (reg) mainly forgotten. An important sample of travel agencies publications shows that the descriptions of "erg" are simple, to strike and sell. A questionnaire for travellers tells that the problem is more complex: for the clients a mountain made out of sand expresses a part of their dreams.

Images of landscape are far from geographical facts. Information provided by all this mental and mythical images are more important for understanding people and societies than landscape itself.

Building a cultural education to landscape (Caille-Cattin 2005)

More and more, the different regions in France publish one or several "Atlas des Paysages". Here, some books were analysed and their contents described: iconographical and textual information, aims and thought process of writers, main topics presented. Finally the study try to describe if such a publications served as a good tool to develop knowledge about landscape, especially for person who works in town and country planning.

Maps are associated with images to give information. Images are true one (photos, postcards) for yesterday and today; synthesis images are built to show what should be possible tomorrow. Choice of pictures is under influence of mental images of writers.

Some short remarks to conclude:

- landscape appears to play more or less important role in many kinds of geographical problems,
- the word "image" must be understood in all the meanings it can have, from direct view to mythical dream,
- within a landscape, the complexity is the rule for interactions between Nature and Societies; so taking out information from images is complex also,
- this work is directed by a mental scheme (systemic approach) in loops associating space, true images or by synthesis one, model-images, mental images, mythical representations,
- in future, a succession of loops, which participate in production, perception and use of landscape changes, may occur.

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