

*A CONCEPT OF THE TERRITORY IMPLEMENTED IN AND BY
OBSERVATION*

Philippe Signoret

Studies engineer, PhD student in geography
philippe.signoret@univ-fcomte.fr , + 33 (0)381666717

Alexandre Moine

Professor in geography
alexandre.moine@univ-fcomte.fr , +33 (0)381665496

Professional address

Université de Franche-Comté - UMR 6049 ThéMA – CNRS – UFC
32 rue Mégevand - 25000 Besançon Cedex – France

Summary : We propose a conceptual and graphical model of the territory built from an empirical intuitive and deductive approach of systemic paradigm of territorialization. This model is based on an individualized approach before being extended to the collective level. It is first seen in the context of the evolution of the concept in scientific thinking. Then, we introduce it in understanding the dynamics of the territory, under the paradigm of territorial intelligence, through observation and observatories that we adapt to the context of governance systems at different scales.

Keywords : territory, territorialization, concepts, complex system, model, territorial intelligence, observatory, governance, methods, tools

Résumé : Nous proposons un modèle conceptuel et graphique de territoire construit à partir d'une approche empirique, intuitive et déductive du paradigme systémique de territorialisation. Ce modèle s'appuie sur une approche individualisée avant d'être étendu au collectif. Il est d'abord replacé dans le contexte de l'évolution du concept dans les pensées scientifiques. Puis, nous l'introduisons dans la compréhension des dynamiques territoriales, vues sous l'angle de l'intelligence territoriale à travers l'observation et des observatoires que nous faisons évoluer dans le cadre de systèmes de gouvernance à plusieurs échelles.

Mots clés : territoire, territorialisation, concepts, système complexe, modèle, intelligence territoriale, observatoire, gouvernance, méthodes, outils

INTRODUCTION

New geographic studies intend to enlarge the concept of territory [Rosière, 2007] beyond the traditional definition focused on the governmental point of view¹. But, according to territorial issues and the semiotic of the concept of territory, a large part of the french literature, reveals a great confusion around this concept even though it seems to be so increasingly used to make it a generic term or a synonym of space [Giraut, 2008] [Signoret, 2008]. Furthermore, most of the time, authors are interested in the dialectics of the complexity of the territory but they simply point out what is a system, what underlies the complexity and the many references borrowed from all disciplines.

It is in this context that we conducted our research. As a preliminary result, we propose a model of the territory based on the territorialization process [Signoret, 2008]. Mathematical modelling is certainly a perspective that suggests the possibility of measuring the territorialization and to evaluate or simulate the impact of an intervention and appropriation of profits by various local actors. However, we'll limit ourselves to a mainly methodological approach implemented in observation of the territories and local events through the prism of territorialization as we'll have previously submitted

Then we will implement the model in the analysis of the management of a project of observatory [Moine, 2007] [Moine, Signoret, 2006]. It will be a kind of operating test of the model offered in order to verify the usefulness of this approach.

Last, we will try to complete the model crossing the individual and multi-agent aspects. Then we will climb a new step in analyzing the complexity of the system of territory.

So, our work on the complex system of territory joins the expectations of the territorial intelligence [Bertacchini, 2006] and the development of new tools dedicated to observation.

1. THE TERRITORY BY THE TERRITORIALIZATION

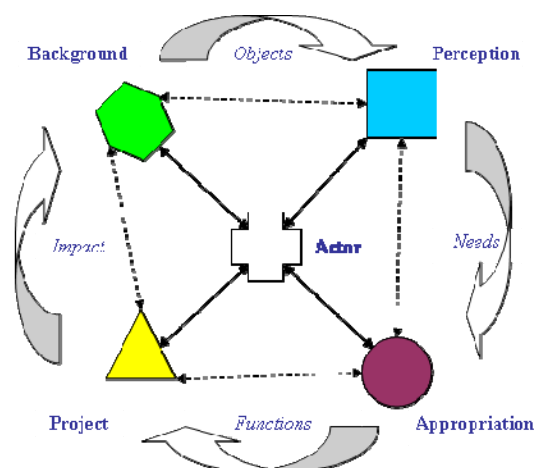
In order to clarify its meaning and its scope, we conducted an empirical, intuitive and deductive research based on the analysis of the process of territory production: the territorialization². Thus, we arrived at a model which can help us to highlight some features of the dynamics of the territory. The territory can't exist without the actor who has a central place in this concept. The actor builds its territory and participates in the development of collective territory [Signoret, 2008].

According to our model (see picture 1), an actor identifies (perception through all the senses : sight, smell, touch, hearing, intuition, deduction, etc.) in a « background » material objects, located in the geographical space, and intangible ones like representations, concepts or data. He appropriates (three main ways : use, exploitation, transformation) those objects affecting them, in this complex process, a function, an intentionality. From this stage, those objects can be used to satisfy his needs through projects and actions that necessarily affect the background (environment). In return, the perception he may have of the background will be affected too. All time, the actor is in a stage balanced by multiple interactions generated by perception, appropriation, project, in his vision of the background but also in his ability to collect and to appropriate objects and therefore to act.

Thus, the actor can start projects that mobilize many very different objects (form, consistency, location, mobility, etc.). Thanks to scientific, technological, organizational, financial or trade approaches : innovating process [Eurostat, 2000]. Projects may lead to the achievement of new objects, or the transformation of existing ones. With the experience, with time, the knowledge increase and the territory changes all time in the space.

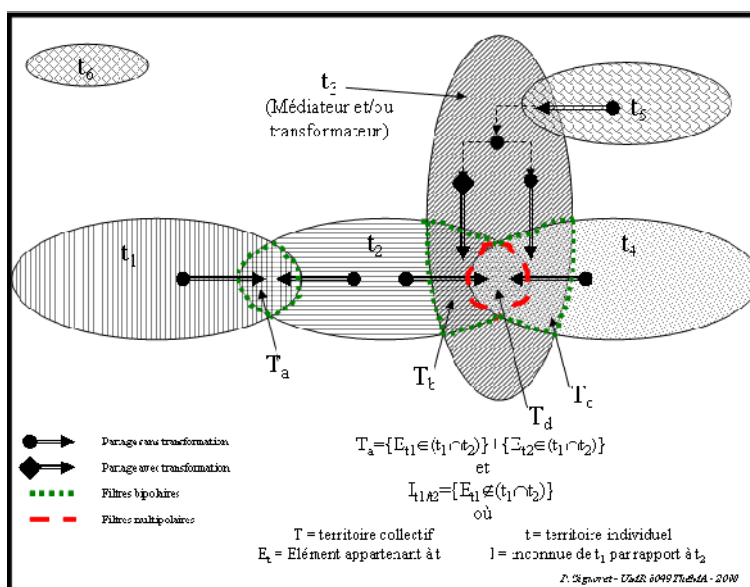
¹ For the institutions, the territory is a defined area (including land and waters), considered to be a possession of a person, organization, institution, animal, state or country subdivision.

² We consider that the territorialization (act of organizing as a territory) is different than the regionalization (division into regions, especially for administrative purposes).



Picture 1 – The process of territorialization

This complex and systemic model³ of the territory requires at the beginning an individual process. So we consider that the collective representation of the territory cannot be an addition of the individual territories [Signoret, 2008]. We propose that the collective territory is the result of the pooling of many individual territories in which everybody can hide a part of its own one. Some actors can also forward objects with or without a prior transformation. So, the collective territory integrates a higher level of complexity because of the logics influencing every system based on sharing informations (see picture 2).



Picture 2 – From the individual territory to the collective one

The model of territory is not only based on geographical objects even if this kind of object can help us to localise things or phenomena. The systemic approach is more important than the metric one although observatories have to take into account different scales.

The geographical boundaries of those territories are often fuzzy and discontinuous. But, the electoral divisions of the national space, the areas of public intervention, the spaces of projects, can also be considered as collective territories built around a boundary object which corresponds to a division of the global space. But in those cases, we can find false or divergent appropriations and representations and so different strategies or projects. It affects the representation that each individual can have about collective territories.

According to the etymology of the word policy, territorialization is a political act. This leads us to question of

³ According to the auto-eco-organisation theory proposed by authors like Joel De Rosnay, Edgar Morin and Jean-Louis Le Moigne.

the reflexivity of the territorialization and whether we built together or not the representation of space and territory.

The speech based on a vague concept of territory more often evokes the physical objects and less ideational. This invite us to take care to reintroduce the intangible objects and the anchoring of the territory but also in their representations and then in observation tools.

More over, the difficulty to understand complex systems is to find a method that allows you to understand the entire operating system without impeding the evolutivity of the model. Indeed, we must consider both the overall and the individual without avoiding the various forms of relationship between people, between objects, between people and objects. So, we can recall that our conceptual model of regionalization and territory can be simply considered as a practical guide which can support an ambitious motion brought by people who need a more precise concept of territory to help them studding it better. This is especially true in the context of observatories and in the field of territorial intelligence.

As an illustration, in the second part of our paper, we propose first to use the model in order to overview a project of observatory, then to try to integrate in the model some of the control systems able to influence the territorialization.

2. AN EXAMPLE OF IMPLEMENTATION OF THE MODEL IN THE ANALYSIS OF A PROJECT ORIENTED TO TERRITORIAL INTELLIGENCE

The observation can be presented as a careful monitoring of phenomena, without willingness to transform them, but with the aid of appropriate investigation instruments. It is therefore an indispensable step in the acquisition of data to inform future developments. In practice, most of the time, we ask suppliers to offer formalized data. To deal with this task, they seek help from a tool called observatory. Such a tool is a technical and organizational response to the needs of an actor, most of the time from a public institution, who wants to anticipate future developments taking into account the knowledge of the past. This kind of project, in the field of territorial intelligence, is a good example to test our model of territory in the analysis of a process taking into account our experience in developing observatories.

The implementation of an observatory is a complex project linking physical objects (infrastructures, machineries, human resources, etc.) and intangible ones (technologies, methods, ideas, etc.). The promoter of the project will tap into the background to find an answer to its needs (exploitation and data treatment) and those of others (support to decision). On this basis, we can try now to implement the model and to integrate the logics of the actor during the project according to the four pillars (see picture 3) :

- In terms of perception, from a lack of communication, we go to a logic of sharing and then of pooling;
- In terms of appropriation, the limited efficiency is transformed in best practices sharring and stronger decision support;
- regarding projects, lack of consistency is replaced by a better coordination and then by greater adaptability;
- Finally regarding the background, with trust, rationalization and then swarming becomes possible.

At the starting point, individuals or organizations share their individual territory and, most of the time, the project of observatory takes its origins from the difficulty in mobilizing the resources of the bacground [Moine, Signoret, 2006]. In such a case, the situation is rather gloomy: isolation, lack of visibility, individuality, redundancy are obstacles to efficient public action. Due to a lack of communication, the mutual recognition suffers of individualism and the lack of consistency increase in the individual and collective action.

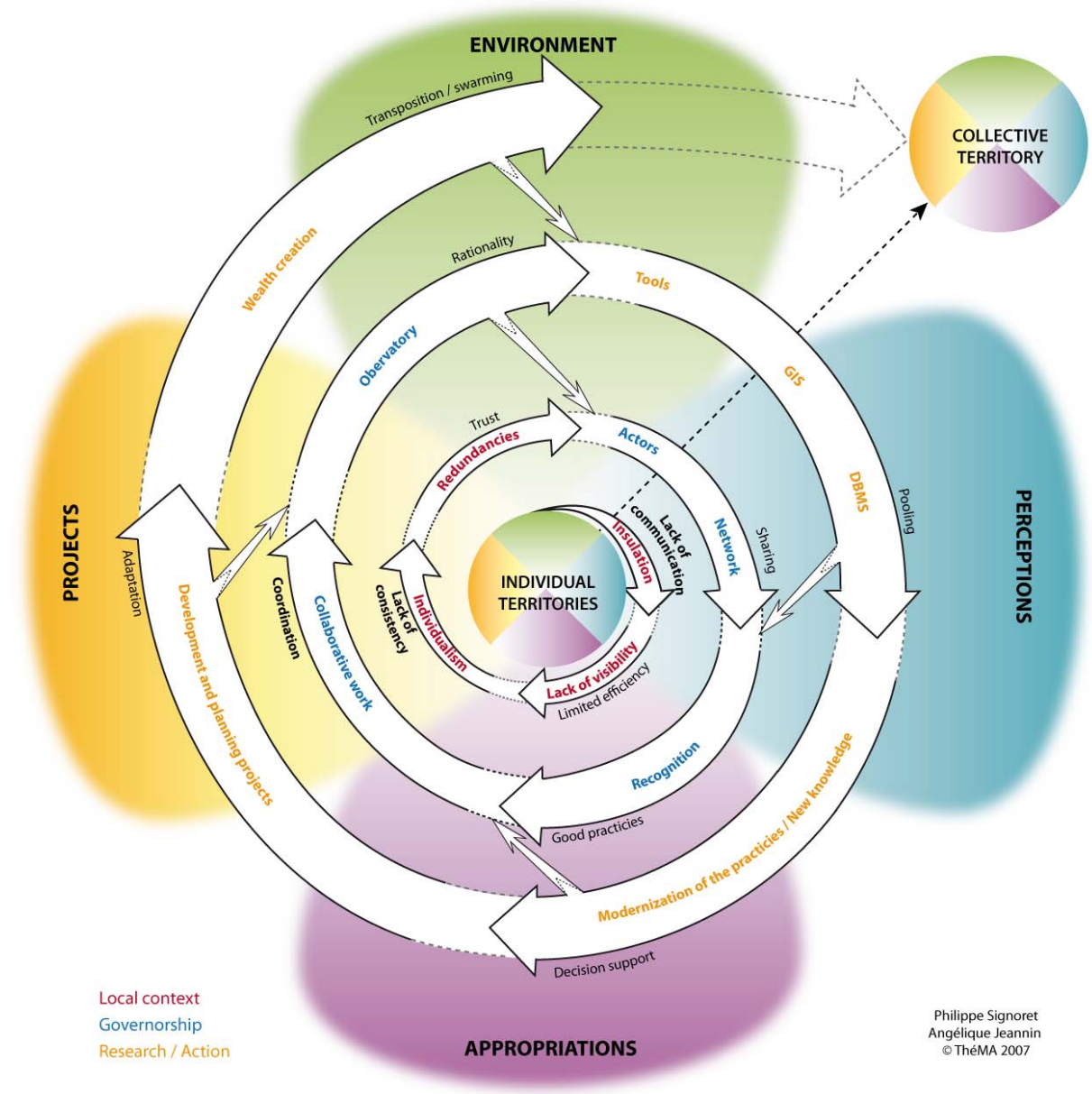
The trust between the stakeholders is one of the key factors that may influence this state and allow the changes. Indeed, it is the condition needed by the construction of networks and to remove, as we saw, the initial logics and take the benefits of the progress. This transformation of the local context in networks promotes mutual recognition of areas of intervention, and individuals or organizations potentials. The result is a collaborative effort fed by the flows of sharing and exchange.

Thus, the draft observatory can prosper using resources taken in the background of each stakeholder (Geographic Information Systems, Data Base Management Systems, Internet portal, meetings, etc.). Everybody contributes to the modernization of the practices (standardization and data management, introduction of the spatial dimension

in the socio-economic studies, etc.). Knowledge is raising (crossing data bases, sharing results, etc.). Thus, the local authorities (institutions, companies, etc.) are in a better position to understand local issues in order to integrate them in their own development projects. At the end of the cycle, the background has changed because of the transformation of some objects and the provision of new contents.

In finally, the observatory participates to the implementation, by the stakeholders, of a collective territory on the basis of the confluence of individual territories and the renewal of the logics and of the practices.

This kind of analysis can help local politicians and technicians in understanding the major issues and in adapting to the context the project governance system, taking into account the various stakeholders, and by extension local governance system in an ambitious research / action pattern.



Picture 3 – From individual territories to the collective one by the observatory

3. THE TERRITORY SEEN THROUGH THE MACROSCOPE

Joel de Rosnay [Rosnay (de), 1977] [Rosnay (de), 1979] offers a graphical model⁴ to represent complex systems. This model integrates control systems and it seems to be a good way to implement the model taking into account the external influences of the territorialization process.

According to this model, the *background* (in reference to our model of territory) can be assimilated to the *Source* which provides the energy and all the resources (*objects*) needed by the complex process. *Flows* of energy and objects join *Reservoirs* in which the elements can be gathered. The ultimate stage is the *Sink* featuring the entropy of the system (see picture 4). We consider in this pattern that the flow is the result of different process linking the reservoirs. Each step of the process generates entropy and suffers losses allowing the flow and a sort of feedback to the back step(s).

The actor find in the source a large choice of physical and intangible objects. These objects come to complete a reservoir corresponding to the first level of individual memory. Some of them are subsequently perceived usefulness in the system of appropriation and join the second reservoir. Thus, the actor can plan projects (third reservoir), thanks to the second reservoir, in order to satisfy his vital needs or even to transform the background.

Thus, during perception, we can introduce what we call avoidance. For objective or pathological reasons, very early in the process of territorialization, the actor is in a position to deny reality and to receive only a part of the objects. This is what Albert Jacquard calls the "Titanic syndrome". Then, among the objects collected and stored in the first reservoir, only some of them will find an utility in the appropriation system while others will be definitively forgotten (return to the source) or just downgraded (return to the first reservoir and form of subconscious implementation).

The first reservoir would be a first form of representation of the background. The second one contains appropriate objects and is a more sophisticated representation of the background in which elements have won in intentionality. In the same way, many projects will stop (relinquishment). Nevertheless, they will sustain and reinforce the first reservoir or, in an ideal case, the second one enhancing like this the usefulness conviction of the objects.

Finally, many objects produced will "pollute" the background. Other products can be complex forms of knowledge able to enhance self-learning, if the actor knows how to take the benefit from experimentation.

This scheme offers the possibility to define two sub-systems in territorialization. First, the perception and the appropriation can be grouped in a *Consciousness* subsystem where the actor knows the existence and the potentiality of individual objects or of clustered ones by relationships. Then we can regroup projects and products in a *Creation* subsystem able to satisfy biological, phenomenological, ethnological or praxeological needs [Boutinet, 1993].

At this step of our analysis, we are still in a strictly individual process of territorialization. But, we all know that, everyday, we have to face external influences more or less controlled, by us or by others who support their own goals. So, if we want to go a little further with our thought, we must introduce into our model the complex systems of control (positives or negatives) which may affect the effectiveness of each steps of the process.

In examples, we offer five control systems :

- *Media* can influence the perception of the objects: television, newspapers, etc. are all carriers of messages that allow the actor to build its information system implemented by numbers, words, concepts, beliefs or representations of physical objects;
- *Regulation* is certainly one of the most visible forms of regulation of appropriation as it organizes our relationship with the objects in everyday life;
- *Training* may also focus on a number of technical knowledge and methods during the conceptualization and the planning of projects;
- *Participation* ever intervenes in any project an external involving (partner, supplier, subcontractor, expert, co-funding, etc.);
- Finally, the *Removal* means the total or partial destruction and also recycling of the objects. It is

⁴ The semiology of this iconography is widely shared in the scientific community.

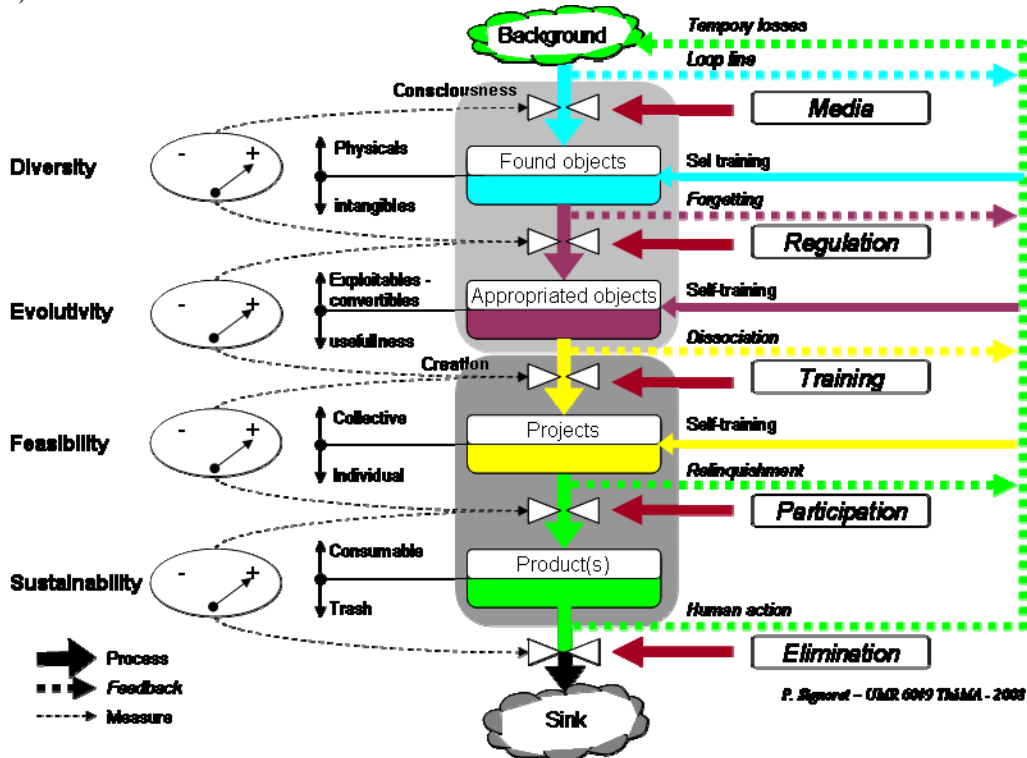
then possible to distinguish what goes directly to the background of what is reinvested into the system.

Naturally, the system consumes energy, which is represented here as a loss to the sink. This energy consumption is also the ultimate transformation of objects.

On this model, we can also introduce different assessment criteria, collected by adapted measuring instruments, which we could apply to analyse the behaviour of either individuals or communities. For examples:

- The diversity of objects collected : nature (tangible and intangible) but also spatial and temporal distribution;
- The different forms of appropriation of individuals or groups, taking into account the location;
- The projects feasibility based on the societal impact and the conciliation of collective and individual interests;
- The quality of the actions and their relevance to sustainable development criteria, etc..

All this necessarily needs to adapt existing methods and technologies (eg. surveys) or to develop new ones (eg. web tools) in order to collect data.



Picture 4 - The territory, a complex system to observe

4. THE INCREASING COMPLEXITY OF THE COLLECTIVE TERRITORY

If we resume our model, each cycle of territorialization can be considered as a distributed and heterogeneous long process and each individual territory is an autonomous entity. So, individual is both actor and agent in its individual territory. This model refers to multi-agent systems.

Each individual carries its own representation of the environment (background), but with a partial view of it. However, the territorialization is not a closed system. It undergoes external influences due to interaction between many agents. The natural construction of individual territory is disturbed by the permanent effects of interrelationships with other actors (see picture 5).

If we consider an agent A (individual actor/agent) and an agent B (a local institution represented by an elected or a technician), for the both, two questions arise:

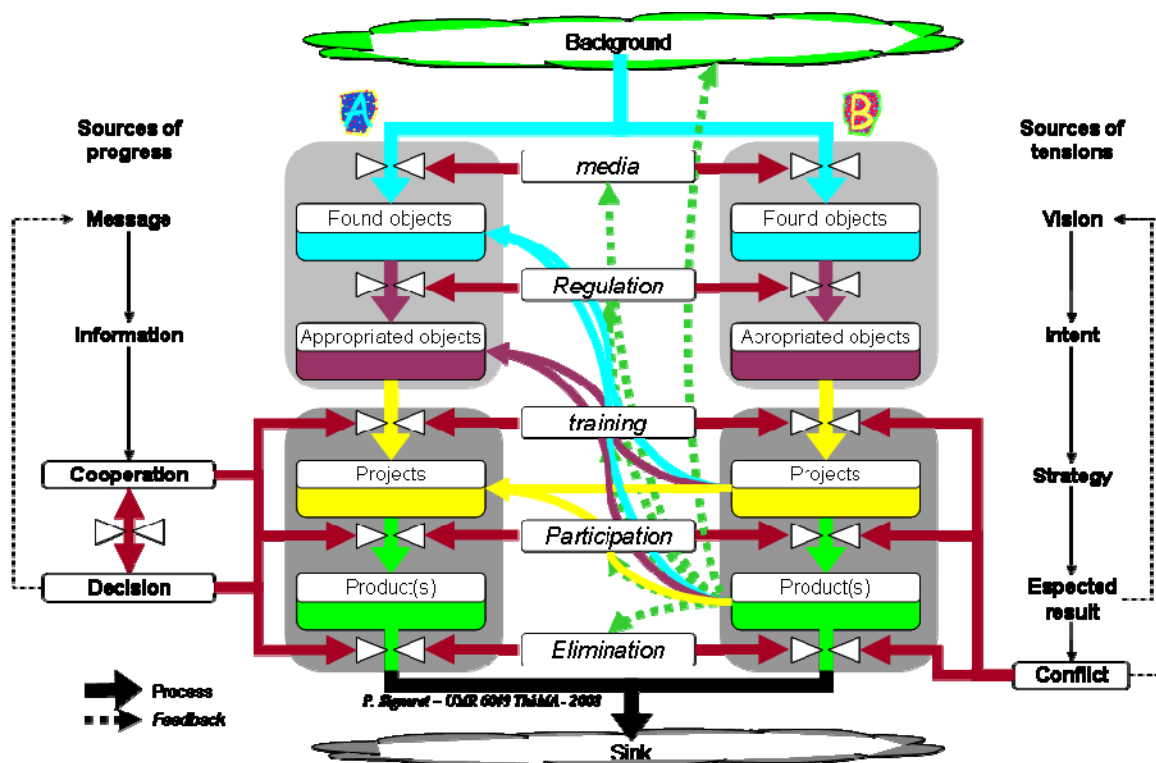
- how to make the content of the background accessible in order to find a solution to the needs?
- how to share individual values and to transcend individualities ?

We have noticed, during our experiences of setting up observatories that mutual ignorance is an obstacle to the development of territories [Moine, Signoret, 2006]. We all have also many examples that describe the misunderstanding between citizens and local authorities. However, the cohabitation is organized and the territories are transformed under the influence of regulations and arbitrations. Understanding these relationships is an important issue, less for the modelling process than for the renovation of local governance systems. The problem must be considered at the junction of different individual territories but also between the individual and collective representations.

So, the agent B is able to create objects and thus to change the background. But he can also modify the control systems that will operate on A and himself (eg. monthly publication that will allow A to take note of the actions of B, creation or closure of a school canteen, grant associations, waste treatment plant, etc.).

The projects (eg. reducing the urban traffic jam) and the products of B (eg. bylaw regulating parking) will be perceived and appropriated by A who will integrate them into his projects (eg. to go to the city centre). But this idyllic scheme is not the daily reality. In fact, all those interactions create sources of tensions because different points of view have to be faced : for B, the city is a space of regulation and, for A, the city belongs to everyone. This contributes to place the parties in different patterns of intent expressed through the strategy of the agent [Marten, 1994] [Harbulot Baumard, 1996] and the expected result of his action. These are serious sources of conflicts generated by transformation of the background.

In addition, products and conflicts may change the vision of A and/or B and invite them to reconsider their positions. Then, in a more positive attitude, we can consider that these interactions related to the transformation of control systems can also be sources of progress. Indeed, the exchanges between A and B may allow the parties to enter into a cooperative system that can influence their own decision making system.



Picture 5 - The interactions between the individual and the collective territories

This pattern of the collective construction of the territory refers to a high level of complexity in where, both A and B refers also to our basic model of territorialization including feedbacks at every steps of the process. So, collective territory suffers also of avoidance actions and lapses of memory. This to remind how much energy it costs to maintain the collective territory in a dynamical stability.

However, the expression of the difference is often confrontational whereas if we adopt a positivist, by taking into account actions, ambitions and needs of the human person, this understanding of the difference may contribute progress and sustainable development [Brundtland, 1987].

CONCLUSION

The territory is confirmed as an open and cyclical system. Each control system refers to a specific complex system in which, by territorialization, the actor becomes agent or object. The actor is always in the paradox of the observer / designer. To build its own representation of the territory, he needs to take into account the other points of view. So, the observation has to analyse the mutual influence of the actors/agents on the control systems but it can also help him to perform his territory.

Tomorrow, observatories will have to take into account more informations than statistics and documents and will have to offer technical solutions to manage and represent the relations between objects.

Now, to close this work, some research opportunities we may develop latter :

1- In terms of modeling :

- Mathematical modeling allowing us to simulate decision support and decision making : the adaptation of the theory of information [Shannon, 1975] to the territory seems be an interesting starting point.
- We can consider an econometric approach in relation, for example, to game theory and all its variations within the control systems of governance that contribute to the territorialization.
- Game theory incorporates an empirical / descriptive approach based on data (laboratory studies) and on psychological facts: behavioral game theory. If it is necessary to do so, we can recall the importance of also involving sociologists, psychologists and anthropologists to these reflections.

2 - In terms of quantitative analysis :

- Measuring the proportion of spatial objects in the whole of the territory system in individual and collective performances but also address a systemic approach to the form, scope, scale, representations, spatial time dynamics, functions and effects on space and territories of all geographical or not elements;
- Diversifying indicators in the analysis of territory : we have habit to mainly operate context indicators (eg. census of the population) but sometimes we neglect to take into account the nested and causal relations;
- Expanding the use of achievement and performance indicators (see project management) to measure the local dynamism and the potential of innovation.

3 - Finally, in terms of observing systems of governance :

- Analyzing the kind and the role of boundary objects⁵ like institutions, personalities, scales of space, concepts, values, etc. ;
- Examining how to put into perspective the public intervention in order to share a vision and strategy with the citizen and organizations;
- Considering the inclusion of consciousness (awareness) in the preparation of land development projects and anticipating or resolving conflicts that may arise.

We could extend this list and we could refer every item to many works in progress. But here, we just wanted to link theoretical modelling and research plans able to meet the social demand which integrates more and more the complex systems of the daily life.

⁵ In reference to Susan L. Star and James R. Griesemer.

BIBLIOGRAPHY

Bagnasco A., Le Gales P., 1997, Les villes européennes comme société et comme acteur, in *Villes en Europe*, Ed. La Découverte, pp. 38

Banos V., 2007, Repenser le couple « territoire-lieu », pour une géographie de la « démocratie » ?, in *Territoires, territorialité, territorialisation : et après ?* », Vanier M. et alii (eds.), actes des entretiens de la cité des territoires, Université Joseph Fourier, Grenoble, 7-8 juin 2007, disponible en ligne sur <http://iga.ujf-grenoble.fr/territoires/index.htm>

Bertacchini Y., 2006, « Intelligence territoriale : le territoire dans tous ses états », Collection Les ETIC, Presses Technologiques, Toulon, 316 p.

Bonnefoy, JL., 2002, Une approche géographique de l'interaction entre le matériel et l'idéal par le complexe et l'artificiel, dans *GÉOPOINT 2002 L'idéal et le matériel en géographie*, disponible en ligne sur <http://sites.univ-provence.fr/bonnefoy/informations/Geopoint02.pdf>

Boutinet JP., *Psychologie des conduites à projet*, PUF, Paris, 1993, 126 p.

Brundtland, G. H., 1987, *Report of the World Commission on Environment and Development : Our Common Future*, United Nations, disponible en ligne sur : <http://www.un-documents.net/wced-ocf.htm>

Cailly L., 2007, Des territorialités aux spatialités : pourquoi changer de concept ?, in *Territoires, territorialité, territorialisation : et après ?* », Vanier M. et alii (eds.), actes des entretiens de la cité des territoires, Université Joseph Fourier, Grenoble, 7-8 juin 2007, disponible en ligne sur <http://iga.ujf-grenoble.fr/territoires/index.htm>

Martre H., Commissariat Général au Plan, *Intelligence économique et stratégie des entreprises*, rapport présidé par Henri Martre, La Documentation Française, Paris, 1994, 167 p., disponible en ligne à l'adresse : <http://lesrapports.ladocumentationfrancaise.fr/BRP/074000410/0000.pdf>

Dauphiné A., 2003. *Les théories de la complexité chez les géographes*. *Anthropos*. 248 p

Eurostat, 2000, *La mesure des activités scientifiques et technologiques, principes directeurs proposés pour le recueil et l'interprétation des données sur l'innovation technologique*, Manuel d'Oslo, Commission européenne, 13 p., disponible en ligne à l'adresse : <http://www.oecd.org/dataoecd/35/56/2367523.pdf>

Giraut, F., 2008, Conceptualiser le territoire, pp. 57-67, in *Historiens & Géographes*, N° 403 « Construire les territoires », APHG, Paris, 188 p.

Harbulot C. et Baumard P., 1996, *Intelligence économique et stratégie des entreprises : une nouvelle donne stratégique*, communication présentée lors de la Cinquième Conférence Annuelle de l'Association Internationale de Management Stratégique, 24 p., disponible en ligne sur : <http://www.strategie-aims.com/lille/com7502.pdf>

Herbaux P., 2007, *Intelligence territoriale, repères théoriques*, l'Harmattan, Paris, 195p.

Jaillet M.-C., 2007, Contre le territoire, la « bonne distance », in *Territoires, territorialité, territorialisation : et après ?* », Vanier M. et alii (eds.), actes des entretiens de la cité des territoires, Université Joseph Fourier, Grenoble, 7-8 juin 2007, disponible en ligne sur <http://iga.ujf-grenoble.fr/territoires/index.htm>

Lima S., 2007, Le dépassement des territoires, bâtisseurs et passeurs d'espace, in *Territoires, territorialité, territorialisation : et après ?* », Vanier M. et alii (eds.), actes des entretiens de la cité des territoires, Université Joseph Fourier, Grenoble, 7-8 juin 2007, disponible en ligne sur <http://iga.ujf-grenoble.fr/territoires/index.htm>

Melé P., 2007, Identifier un régime de territorialité réflexive, in *Territoires, territorialité, territorialisation : et après ?* », Vanier M. et alii (eds.), actes des entretiens de la cité des territoires, Université Joseph Fourier, Grenoble, 7-8 juin 2007, disponible en ligne sur : <http://iga.ujf-grenoble.fr/territoires/index.htm>

Moine A., *Le territoire : comment observer un système complexe*, L'Harmattan, Paris, 2007, 176p.

Moine A., Signoret P., 2007, How the local governance system is influenced by the creation of an observatory : the OSER 70 experiment, in : *International Conference of Territorial Intelligence*, Organised in the framework of CAENTI, Huelva, Spain, 24-27 October 2007, 16p., disponible en ligne sur : <http://www.intelligence-territoriale.eu/index.php/fre/content/download/1069/9236/file/huelva07-Moine.pdf>

Morin E., Le Moigne J.-L., 1999, *L'intelligence de la complexité*, L'Harmattan, Paris, 160p.

Musso P., 2007, Critique de la notion de territoire numérique, in *Territoires, territorialité, territorialisation : et après ?* », Vanier M. et alii (eds.), actes des entretiens de la cité des territoires, Université Joseph Fourier,

Grenoble, 7-8 juin 2007, disponible en ligne sur <http://iga.ujf-grenoble.fr/territoires/index.htm>

Négrier E., 2007, Politique et territoire : fin de règne et regain critique, in Territoires, territorialité, territorialisation : et après ? », Vanier M. et alli (eds.), actes des entretiens de la cité des territoires, Université Joseph Fourier, Grenoble, 7-8 juin 2007, disponible en ligne sur <http://iga.ujf-grenoble.fr/territoires/index.htm>

Painter J., 2007, Territory and network : a false dichotomy ?, in Territoires, territorialité, territorialisation : et après ? », Vanier M. et alli (eds.), actes des entretiens de la cité des territoires, Université Joseph Fourier, Grenoble, 7-8 juin 2007, disponible en ligne sur <http://iga.ujf-grenoble.fr/territoires/index.htm>

Poix, C., Michelin, Y, 2000, Simulation paysagère : un modèle multi-agents pour prendre en compte les relations sociales, Cybergeog, Systèmes, Modélisation, Géostatistiques, article 116, disponible en ligne sur : <http://www.cybergeog.eu/index2242.html>, Consultation du 10 mars 2008

Préfecture de région Franche-Comté, 2005, Atlas des zonages en Franche-Comté, disponible en ligne sur http://www.franche-comte.pref.gouv.fr/actu/publi/doc_01.htm

Queva C., Vergnaud G., 2007, L' « intermédiation » des territoires locaux : essai de réflexions croisées sur les constructions territoriales locales en Allemagne, en France et en Espagne, in Territoires, territorialité, territorialisation : et après ? », Vanier M. et alli (eds.), actes des entretiens de la cité des territoires, Université Joseph Fourier, Grenoble, 7-8 juin 2007, disponible en ligne sur <http://iga.ujf-grenoble.fr/territoires/index.htm>

Retaillé D., 2007, L'espace mobile, in Territoires, territorialité, territorialisation : et après ? », Vanier M. et alli (eds.), actes des entretiens de la cité des territoires, Université Joseph Fourier, Grenoble, 7-8 juin 2007, disponible en ligne sur <http://iga.ujf-grenoble.fr/territoires/index.htm>

Rivron V., 2007, La construction hertzienne du territoire Brésilien, in Territoires, territorialité, territorialisation : et après ? », Vanier M. et alli (eds.), actes des entretiens de la cité des territoires, Université Joseph Fourier, Grenoble, 7-8 juin 2007, disponible en ligne sur <http://iga.ujf-grenoble.fr/territoires/index.htm>

Rosière S., 2007, Comprendre l'espace politique, in L'espace politique, n° 1, 16 p., disponible en ligne sur : <http://www.espacepolitique.org/numero1.php>

Rosnay (de), J., 1977, Le « microscope ». Vers une vision globale, Seuil, Paris, 346 pages

Rosnay (de), J., 1979, « The microscope » sur Principia Cybernetica Web, Harper & Row, p. 314. disponible en ligne sur <http://cleamc11.vub.ac.be/MACRBOOK.html>, Consultation du 4 septembre 2008

Séchet R., Keerle R., 2007, Petite histoire de « l'équipe-de-géographie-sociale-de-la-France-de-l'ouest » avec le territoire, in Territoires, territorialité, territorialisation : et après ? », Vanier M. et alli (eds.), actes des entretiens de la cité des territoires, Université Joseph Fourier, Grenoble, 7-8 juin 2007, disponible en ligne sur <http://iga.ujf-grenoble.fr/territoires/index.htm>

Shannon, C. E., Warren, W., 1975, The Mathematical Theory of Communication, University of Illinois Press, Champaign, 125 p.

Signoret, P., 2008 : Le territoire dans les systèmes d'observation : Approche conceptuelle et perspectives ; XLVème colloque de l'ASDRLF, Rimouski, Québec, Canada, 25 au 27 août 2008, disponible en ligne sur [http://asrdlf2008.uqar.qc.ca/Papiers en ligne/SIGNORET-P.doc](http://asrdlf2008.uqar.qc.ca/Papiers%20en%20ligne/SIGNORET-P.doc)

Smouts M-C., 1998, Du bon usage de la gouvernance en relations internationales », in La gouvernance, in Revue internationale des sciences sociales, n° 155, pp. 88.