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WHICH TECHNIQUES AND STRATEGIES EMPLOY TO FOSTER NEW LOCAL COMMODITY CHAINS FOR BIO-BASED MATERIALS? RESULTS OF A MULTIDISCIPLINARY SCIENTIFIC RESEARCH

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Abstract

The growing interest of French local authorities for local bio-based building materials has led them to use project-based public policy to develop bio-based material economic activities and organize local companies, associations and public organizations in corresponding commodity chains. After having built a model to understand the organization of these projects, we present two ideal-types of strategy that might allow actors to build a shared experience and learn new practices through these project-based public policies.

Keywords:
Commodity chain, bio-based material, local resources, organization, project, public policy, strategy

1 INTRODUCTION

The international approach of climate change is exclusively focused on countries' productions, excluding emissions linked to consumptions [United Nations 1997]. Whereas governments announce their achievements in reducing their greenhouse gases' emissions, they import massively products made in other countries, which includes huge local and global impacts. For example, around one-third of China's emissions are due to production of exported goods, mostly for EU or United-States [Block 2013].

The EU focused its policy on energy consumption and greenhouse gases' emissions on the building sector, as it is responsible of 40% of the first and 36% of the second. The European Directive for Buildings Energy Performances only aims to reduce consumptions linked to buildings' exploitation [European Commission 2007]. Now this policy is effective: in France the legislation imposes a medium consumption of 50 kWh/m²/yr. for new buildings [Ministry of Ecology 2012]. Feedback about experiences shows us that this optimization in buildings' exploitation lead to a higher use of construction materials. If we sum the energy used for the manufacturing of those, it equals the energy used for the building's exploitation during its entire life. In the best-case, those materials comes from the same country, in the worst one, from the other side of the globe. So it is more than time to address this issue and try to solve it.

Moreover, the building sector is responsible of half of all raw materials' consumption [Lenssen and Roodman 1995]. Concrete production emits at least 5% of all greenhouse gases emissions [Humphreys and Mahasenan 2002]. All those facts urges us to reconsider our approach of construction materials. Answers have been given to us long ago, they come from nature itself: bio-based materials are the most effective and concrete answer to those issues today. Bio-based materials are renewable, usually compostable, they capture carbon sustainably and can be produced almost everywhere on earth. This last characteristic is particularly relevant in a context of economic crisis, by relocalizing commodity chains in European countries. It makes possible to produce raw materials, manufacture and integrate them in constructions or refurbishments projects, on a unique local scale.

For all those reasons, since 2010, regional and local political French authorities have shown an increasing interest in the development of bio-based materials for the construction industry. Local policies have been designed to involve economic agents such as farmers, manufacturers and building companies, among others. Some policies serve to foster the emergence of local commodity chains which are complex systems of actors with a collective production project. But successfully making those local commodity chains emerge

implies new techniques and strategies in organizations.

2 THE NECESSARY TERRITORIAL AND SOCIAL EMBEDDEDNESS OF BIO-BASED ECONOMIC ACTIVITIES

2.1 Biomaterial-based economic activities are organized in commodity chains

The aim of this research is to try to produce a knowledge relevant for practitioners and scientists [Van De Ven 2007][Avenier and Parmentier, 2012] in order to develop activities with bio-based materials for the building industry as a part of the socio-technical transition of the French society. As such, our approach might easily be qualified as « technical » [Weber 1949] or « constructivist » [Le Moigne, 1999] because it emphasizes on what people make with bio-based materials, their intention, the constraints of the environment in which they live and the knowledge and practices through which they link these elements in everyday activities. Thus, from this pragmatic perspective, bio-based materials cannot be studied without studying as well the human activities that seek to name and manipulate them.

The category of bio-based materials activity is very broad. The concept of « activity » alone might refer to a « Characteristic of what is active or of the 'being' considered from the angle of its power or will of acting; tangible wielding and manifestation of this power » (personal translation of [ATILF, 2015]) and more specifically in the economic domain as: « the process which leads to the production of a good or the secondment of a service » (personal translation of [INSEE, 2015]). Bio-based materials for the building industry are rarely produced by only one actor (company, association or public organization) during their life cycle. The whole transformation process between the original production of the fiber (fields, forests or garbage cans) to its delivery as a ready product, and beyond, is usually seen as divided into steps, which correspond to important technical operations. So we can specify the previous definition of a bio-based material economic activity as the design, production, transformation, transportation, distribution, implementation of a bio-based material.

Companies, associations, political authorities and other institutionalized groups of persons operating on these materials are usually organized in 'commodity chains' following technical division of tasks as well as commercial integration [Raikes *et al.*, 1999]. These commodity chains of bio-based materials are organizations of many organizations. They might be seen as types of organizations in between the strongly institutionalized organizations (for instance, a company or a firemen brigade) and the fuzzy organizations (the crowd spreading rumors, the public opinion watching a speech of the president) mentioned in the famous study of Herbert A. Simon and James G. March on organizations [Simon and March, 1999]. According to these authors, the main criterion of this distinction is the kind of communication between parts of the organization. Institutions tend to assign tasks and positions to its members, most of the time explicitly, allowing specified communications in the form as in the content (for instance, transmission of orders in a production plant though an internal phone line). On the contrary, fuzzy organizations are constructed through massive and/or generic communication channels and usually transmit very general messages (for example, the modern mass media).

Operators of a bio-based commodity chain usually belong to the first type of organization as they are most of the time institutionalized through a legal entity and assign tasks and positions to its members. The organization of organizations that produce, transform, transport, distribute and implement bio-based materials is rarely institutionalized since it does not share one common legal status, except through some rare soft federative forms, as for instance producers associations such as the ASIV, French union of vegetal isolation industries.

Nevertheless, the various bio-based commodity chains might be seen as integrated in a fuzzy organization as they are targeted by largely spreading discourses - such as the official one of the « strategic future industrial sectors of the green economy » [CGDD 2010][CGDD 2013] - and institutional measures such as classical regulations and standards for building materials and in other areas of activities. According to the inforgetic paradigm in organization science [Bateson 1972][Le Moigne 1999] that might be briefly summarized as follows : « The information in-forms the organized organization, which, organizing, organize the creation of information this way informed; which… [and so on the sentence starts from its beginning] » (personal translation of [Le Moigne 1999, p.101]), this kind of indirect and widely spread information still organizes at some low level a community on bio-based materials.

As such, actors operating inside a bio-based materials commodity chain might be seen as organized through two contextual 'worlds': a concrete and tangible one, and a more fuzzy surrounding one. The first is related with strong and evident institutionalized ties between the actors of the chain. This kind is of organization is nowadays quite well defined in the academic literature on global commodity chains for instance [Gereffi and Korzeniewicz 1994][Gereffi et al. 2001] or for instance in the wake of the French « filière » analysis framework [Raikes et al. 1999][Temple et al. 2011]. It insists on economic exchanges (input-output analysis), legal system of interrelations as well as the governance of the chain (consumer- or producer-driven chains), spatial organisation of activities and the political and cultural context of the state or region where are based the different operators. The second is related with soft and fuzzy organization based on massive and indirect communication. For instance, a label for bio-based materials or bio-based buildings, which is at first sight only a small communicational and administrative artefact, might organizes a community by creating *de facto* the feeling of being concerned with these kind of materials by some companies, labelling organisms and some consumers. The 'organizing effect' might be seen as similar with enforced laws and standards, or even trends and fashions in architecture. From this point of view, promotion of bio-based materials at a national level from government and/or governmental agencies, academic communities, superstar

architects, big companies or other key actors might have a performative - *i.e.* a creative - effect on an « activity community of bio-based materials for the building industry » [Austin 1976].

Thus, because biomaterial economic activities are complex, we can look at them as emerging phenomena, the fruit of a continuous interaction between motivated persons and their local and institutional context [Le Moigne 1995][March 2010].

2.2 Adaptation to the local context of biomaterial economic activities

Following [Arena et al. 1988], we consider various chains of actors operating in order to produce and sell bio-based materials for the building industry as embedded in their complex local context. Research on the social embeddedness of economic activities usually consider four types of contexts that should be taken into account [Zukin and DiMaggio 1990]: cognitive embeddedness (state of mind and mental limited capacities of personal or groups), cultural embeddedness as shared values and concepts, structural embeddedness which correspond to the position in a network of interpersonal relations and political embeddedness for the contextualization in political issues and struggles. Our idea of the context is that it is first a synthetic subjective impression (a 'world' we construct), so it can hardly be split up into parts without harmful simplifications [von Glasersfeld, 1984][Morin 1992]. This point of view might be especially relevant when we consider actors (organizations, persons) in their day to day struggle with various constraints in order to run or develop their biomaterial-based activity. The local context, in respect of its various dimensions, appears to be at first sight a 'constraint', but it might be transformed as well into a resource for action [Gumuchian and Pecqueur 2007] depending on certain practices of the local actor that have been qualified as « intelligent action » [Newell and Simon 1976]. Nevertheless, we assume all persons and organizations having to live and adapt to their environment might be considered as « intelligent » in some kind of way.

3 STRUCTURATION OF A LOCAL SUPPLY CHAIN MIGHT BE FOSTERED BY LOCAL, MULTI-ACTOR PROJECTS SEEKING TO DEVELOP AN ACTIVITY WITH BIO-BASED MATERIALS FOR THE BUILDING INDUSTRY

How biomaterial economic activities for the building industry might be developed? This part proposes a model of organizational dynamics in projects intended to foster the emergence of local commodity chains of bio-based materials for buildings. After having presented briefly the various policy tools used by local authorities in this projects, we used Jean-Louis Le Moigne's modeling epistemology [Le Moigne 1999] and Marie-José Avenier's dialogical research method [Avenier and Parmentier-Cajaiba 2010] to construct an ideal-typical model [Weber 1949] of local project implementation. The ultimate goal is to make intelligible what are the logic of action that allows some projects to develop a better collective intelligence.

3.1 The local project as a widely spread technique to foster emergence of local commodity chains

As stated in the introduction, a growing number of French local authorities are interested in the development of bio-based materials for buildings. In order to foster the development of corresponding economic activities as well as organize the local interested actors in what might be called a 'local commodity chain', these public actors have numerous possibilities of public policies (see the table bellow; for an broader overview of some public policy techniques among others, see [Dunn 2012]).

Technique	Short description
Example 1: Information sessions	With the help of national experts on bio-based materials, public authorities can organize information sessions which can permit to foster people on this specific subject and identifying those willing to develop projects.
Example 2: Local think tanks	Think tanks organized by public actors can permit to aggregate a variety of local actors - experts, professionals, economic development agencies, etc. - aiming the emergence of new projects.
Example 3: Promotion of local offer of materials	Public or private actors can create labels to promote materials produced and transformed locally. It gathers people of a same territory on local economic development.
Example 4: Call for projects	Public local authorities can launch call for projects for identifying groups of actors who aims to develop local commodity chains, or innovative bio-based materials.
Example 5: Exemplary public buildings	Refurbishments or constructions of public buildings can be catalyzers for local actors to create new commodity chain to answer a public demand.
Example 6: Technical and financial support	Once a project is identified, the perspective of a public financial support can foster people around a common objective and a faster development of this new activity.

We were especially interested in project-based public policies. We assume it is a special type that differentiate for instance from incentives-based policies. Project-based policies regroup a very large amount of techniques and programs. « Project » has been defined by a distinguished practitioner as « a job that is done one time » [Lewis 1998]. These public policies use the implementation of a project - for instance, developing new product, building an experimental building or implementing new agricultural practices - in order to gather interested professionals and local actors and make them work together. So, from the supervising authority's point of view, it is expected from the projects to have two positive outcomes: to succeed as stated in its official document - for example to reach the goals defined in the 'bill of specifications' - and foster more cooperation, shared values, common knowledge as well as new practices among actors involved in the project; in other words, to organize a group of persons. This second outcome usually can hardly be mentioned as a mandatory goal, especially in contracts, as it cannot be defined and measured, and one cannot oblige participants of the project to build friendship and common values. Indeed, these phenomena are seen as spontaneous. Nevertheless, some specifications for the process through which work will be organized inside the project might be decisive.

3.2 Social dynamic in the construction process of the biomaterial economic activity through local multi-actor projects

The modeling method we used aim at creating a purposeful representation of the relations between actors taking parts inside set of selected local projects to develop a bio-based activity. We tried to identify the roles and intentions of each actor as well as tried to qualify their action inside the organization of the project. So we could make hypotheses about the conditions that lead to the establishment, upholding, evolution or deterioration of relationships between actors. We finally could generalize upon seven cases, and through dialogical and abductive inquiry could model an ideal type of the organization of the project.

First phase: Beginning

A political actor wants to implement some changes (« forecast of a desired future ») in an area of action where he has the legitimacy to act (« Vision of a positive change »). In order to implement those changes, this actor needs to act indirectly: it will search for local interested actors, who will endorse the project and implement changes by themselves. These local actors usually have already an activity in the building, transformation, distribution, education or farming sector. They will have to change their practices or even sometimes learn a completely new one.

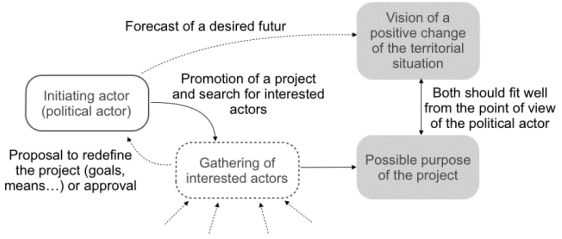

Fig. 1: Scheme of the beginning of a project

For instance, in the Gâtichanvre case, a company of farmers growing hemp, the local regional park authority wanted to diversify the local agriculture because of positive expected outcomes for the economy as well as for the environment. It was decided to organize a big meeting in 2007 in order to present the opportunities of various alternative crops to standard ones. After the meeting, some interested farmers agreed to further reflection on opportunities, means and issues of the different diversification options, in order to potentially develop a new business.

Second phase: Maturing

Once some local actors decide to constitute an operating group, they will start designing and adapting their technical activity (the biomaterial economic activity). They usually need some additional resources (technical, financial, integration in a social network), so they will try to find some supporting actors that could bring those ones. These supporting actors might ask for some requirements and conditions in exchange. The political actor might help by showing the operating actor has legitimacy to act in a specific area, or by giving minimum support to get funding for instance or to specify the target of the technical activity. So the operating actor will have to design accordingly his functioning in between the constraints and requirements coming from these three relations among others.

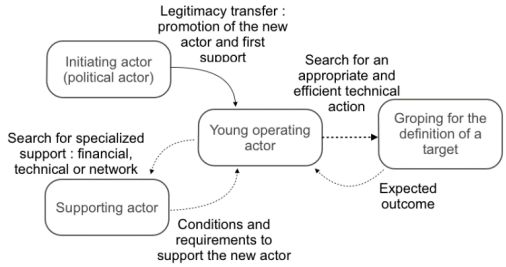

Fig. 2: Scheme of the maturing of the project

For instance in the IDEE Group case, a company recycling of used cardboards, in order to start its biomaterial-based activity, the company need to have minimal contracts during two year, time for getting an important administrative assessment. They need to secure their bio-based resources as well, and establish good relations with local social institutions as their group business belong to the "social economy" and they hire persons with integration difficulties.

Third phase: Stabilisation

When the activity of the operating actor brings some positive results, its functions and the resources exchanges needed in order to make the activity of the operating actor work on the long term might be stabilized. In other words, the ties bounding actors allow an equilibrium and each stakeholder might find its own advantage in the relations. Nevertheless, a tension between two contradictory dynamics appear in this context: the political and the supporting want the operating actors to become autonomous which means among others to require less external resources. On the other hand, the political and supporting actors do not really want the operating actor to change his domain of action: it should still 'fit' with the long term "vision of positive change" of the political actor, and should still be

impregnated by the requirements of the supporting actor.

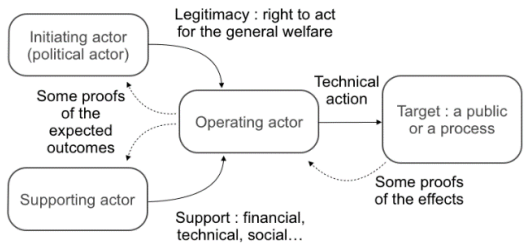

Fig. 3: Scheme of the stabilisation of interdependences between actors of a project

Because of the quite high diversity of cases (from development of new cultural practices for farmers to innovative governance of projects for social housing) one reproach made was that the model seem too broad and general. However, when taken as reference model to understand isolated cases, our experience showed that it is quite effective to help distinguish the different functions, roles and types of relationships as well as strategies. Then, we can try to describe and understand what made each case so special and how some cases seem to be so successful.

4 TRENDS IN THE PRACTICE OF PROJECT MAKING THAT FACILITATE THE EMERGENCE OF LOCAL NETWORKS OF OPERATING ACTORS

In our quest for better understanding of how some cases of projects to implement bio-based material activities and organize actors of the possible commodity chains were especially successful, usually only on some limited aspects of the project. Our hypotheses is that actors need not only to have new experiences in the project to learn new practices; they also need to recognize these practices are special, which relies on the overwhelm capacity of the project to be a really special event. We assume we can define general strategies used to obtain certain positive effects that are relevant. These strategies are not necessarily intentional. In some cases we deduced them from a train of practices that seem to be framed in one logic of action (this technique is related with Mintzberg's notion of strategy according to [Avenier 1997]).

4.1 An « integration » strategy type

Project-based policies need to integrate the various participants and interested actors (see the « First phase ») in order to have a better coordination as well as adaptation capacities in case of problem. This strategy is of a major importance because a good integration from the beginning will allow reorganizing the different actors in the frame of the project and will allow good dialogue conditions [Senge 2006]. Ideally, it allows actors to break with their stereotypes and standardized social conventions in order to push people to try to know better each other's, despite their differences. Two practical examples might illustrate the diversity of possibilities. We focused on the type of speech promoted inside the project, because we assume they frame interactions between actors then.

The Eco-habitat (eco-housing) program of the 'Fondation de France' seeks to support local rehabilitation and construction of houses in rural areas, usually for modest populations. In order to have the participation of all, including the most modest people, often excluded from the decisions, the person in charge of the program used a special kind of speech: « we are all inhabitants of the region, so we can all have the right to talk and take part to that process ». In addition to that, a lot of meetings were organized, with exchanges of useful knowledge on each experience between the project managers. This kind of tactics together helped putting more equality and openness, helping to better integrate more actors.

The 'Réseau Rural Français' (French rural network) is a public organization devoted to develop rural areas by helping various local initiatives. In the wake of their « Local commodity chains for a sustainable construction » program, they needed to make work together persons from the various bio-based materials heritages (from straw, to hemp and stone). In order to make the group more coherent, the civil servant in charge of the project practiced a speech seeking to make the participants cooperate better and feel together: « We never refuse someone as long as he/she has a good will to take part [in the project] *because we are all different* ».

4.2 An « experience » strategy type

This strategy can be identified when a project makes its participants share an unforgettable experience and really learn new practices, i.e. to become an important time in one's experience that will create some changes. The « important time » or « unforgettable-ness » effect might help to a large extent transform the experience of a project to perform: to make the practitioners reflect upon their experience of manipulation of bio-based materials and try to replicate or develop a new technical skill and practice. Moreover, the social cohesion and good cooperative atmosphere as well as respect seem to be crucial: participants enjoy social interaction more than the work itself. Two cases in particular seemed to us particularly interesting.

The eco-housing participatory workshop, in the wake of the territorial project of the Seine-et-Marne departmental council (in the « Ile-de-France » region) has been designed to gather interested local actors (elected representatives like mayors, associations, departmental public organizations, companies, etc.) and allow them to co-design a vision and a strategy for the transition in the building sector. Instead of doing regular meetings in an office, participants decided to meet each time by a different participant that had accepted to invite and make visit something (a factory, a building). This kind of « action research » allowed participants to have a common experience of inquiry and discussion, making them closer and even letting some cooperation on projects emerges.

The school hall of Tendon, a village in the Vosges' mountains, has been built with very local wood and a new building technique. The goal of the chamber of craftsmen and small companies (the initiating actor) was to have an exemplar project with a nice building with rarely used types of local bio-based materials that would encourage local companies to learn to use this unexploited wood resource and advertise bio-based constructions. The local project managers succeed in convincing companies of taking part to a meeting every week, where

numerous topics where discussed. Moreover, a huge communication and unconventional design choices gave the participants the impression the project was really uncommon and so, encouraged by the project managers, they should pay a special attention to new practical crafts needed.

5 CONCLUSION

The study of local commodity chains for bio-based material teaches us that choices made for the organization and its implementation are critical. Techniques and strategies exposed in this article are focused on human and social factors, as experience has proven that those are key factors for successful project that manage in addition to organize local actors involved. The different categories of actors shown in our model– political actors, support actors, operating actors and target publics – are often present from the very beginning of projects. Despite this presence, many projects are aborted, mostly because of organization, competencies, comprehension or shared objectives between actors. A key point is to integrate a collective vision of a common future for the group. Establishment of shared values and their transmission through the entire commodity chain - and its socio-institutional environment - might be facilitated by a broader integration of some adapted 'participatory' collective practices.

Beyond the subject of bio-based materials for buildings, this issue concerns all sectors. Value transmissions and a sense of a common future are key features in the change of professional practice toward sustainability. It could permit to rearrange the international approach of climate change, from a 'bottom-up approach', based on local experiences.

6 REFERENCES

[Arena et al. 1988] Arena, R.; Benzoni, L.; De Brandt, J.; Romani, P.M. (eds.); Traité d'économie industrielle. Paris: Economica, 1988

[ATILF 2015] ATILF; Trésor de la langue française informatisé; « Activité ». online (28.01.15.): http://atilf.atilf.fr/dendien/scripts/tlfiv5/visusel.exe?11;s=618393360;r=1;nat=;sol=0;

[Austin 1976] Austin, J.L.; How to do things with words. New York: Oxford University Press, 1976

[Avenier and Parmentier-Cajaiba 2010] Avenier, M.-J.; Parmentier-Cajaiba, A.; The dialogical model: developing academic knowledge for and from practice, European Management Review, 2010, Vol. 9, 199–212

[Avenier 1997] Avenier, M.J.(dr.); La stratégie chemin faisant. Paris: Economisa, 1997

[Block, 2013] Block, B.; Exports account for One-Third of China's Emissions. Washington, D.C.: Worldwatch Institue, 2013, online (28.01.15.): http://www.worldwatch.org/node/5846

[Dunn 2012] Dunn, W.N.; Public Policy Analysis. 5th Edition, New Havn: Pearsons International, 2012

[European Commission, 2007] European Commission, Energy-efficient Buildings – Challenges ahead. 2007, online (28.01.15.): http://ec.europa.eu/research/industrial_technologies/eeb-challenges-ahead_en.html

[Gereffi et al. 2001] Gereffi, G.; Humphrey, J.; Kaplinsky, R.; Sturgeon, T.; Globalisation, Value Chain and Development. Institute of Development Studies Bulletin, 2001, Vol. 32, N°3

[Gereffi et al. 1994] Gereffi, G.; Korzeniewicz, M.; Commodity chains and global capitalism. Wesport: CT Praeger, 1994

[Gumuchian and Pecqueur 2007] Gumuchian, H.; Pecqueur, B. (ed.); La ressource territoriale. Paris: Economica

[Humphreys and Mahasenan, 2002] Humphreys, K., Mahasenan, M., Climate Change. Toward a Sustainable Cement Industry. Geneva: World Business Council for Sustainable Development, Substudy 8, 2002

[INSEE 2015] Institut Nationale de la Statistique et des Etudes Economiques; « Activité économique ». Online (28.01.15.): http://www.insee.fr/fr/methodes/default.asp?page=definitions/activite-economique.htm

[Le Moigne 1999] Le Moigne, J.-L.; La Modélisation des Systèmes Complexes. Paris: Dunod, 1999

[Le Moigne 1995] Le Moigne, J.-L.; If you believe your industrial system is really complex, then…. RAIRO Operations Research - Special issue on Complexity and Industrial System, 1995, Vol.29, N°3, pp. 225-243

[Lenssen and Roodman, 1995] Lenssen, N., Roodman, D.; A building revolution: how ecology and health concerns are transforming construction, Washington, D.C.: Worldwatch Institute, 1995

[Lewis 1998] Lewis, James P.; Mastering Project Management. New York: MacGraw-Hill, 1998

[March 2010] March, J.G.; The ambiguities of experience. New York: Cornell Univ Press, 2010

[Ministry of Ecology, 2012] French Ministry of Ecology, Thermal regulation, 2012

[Morin 1992] Morin, E.; From the Concept of System to the Paradigm of Complexity. Journal of Social and Evolutionary Systems, 1992, vol. 15, p.371-385

[Newell and Simon 1975] Newell, A.; Simon, H.A.; Computer Science as Empirical Inquiry: Symbols and Search. ACM Turing Award Lecture, 1975

[Senge 2006] Senge, P.M.; The Fifth Discipline. The Art & Practice of The Learning Organisation. London: Random House, 2006

[Temple et al. 2011] Temple, L.; Lançon, F.; Palpacuer, F.; Paché, G.; Actualisation du concept de filière dans l'agriculture et l'agroalimentaire. Economies et Sociétés, Développement, Croissance et Progrès (pre-print version). Paris: Presses de l'ISMEA, 2011, AG (33), pp.1785-1797

[United Nations, 1997] United Nations, Kyoto Protocol. New York: United Nations Framework Convention on Climate Change, 1997

[Van De Ven 2007] Van De Ven, A.H.; Engaged scholarship: a guide for organizational and social research. New York: Oxford University Press

[von Glasersfeld, 1984] von Glasersfeld, E.; Introduction to Radical Constructivism. in Watzlawick, P. (ed.); The invented reality. New York: Norton, 1984, pp. 17-40

[Weber 1949] Weber, M.; Methodology of social sciences. Glencoe, Illinois: Free Press, 1949

[Zukin and Di Maggio 1990] Zukin, S.; DiMaggio, P.; Structures of Capital. Cambridge Univ press, 1990