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Collective initiatives for the implementation of food safety management system standards in the USA and France

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Introduction

In modern agrifood systems, the development and effective implementation of food safety and quality management system standards (hereafter FSMS) such as ISO 22000, BRC, IFS and other similar standards is crucial. The food sector, mainly composed of SMEs, frequently faces difficulties in implementing these standards. Indeed, there are many barriers to appropriation of quality management standards which make effective implementation difficult for SMEs, such as limited access to information, lack of financing and cognitive resources, food hazard perception, and insufficient access to adequately trained personnel. Consequently, one fundamental objective for practitioners such as managers, public bodies and development agencies is to help these food SMEs in improving their implementation capacity, which is usually done through the launch of different forms of collective initiatives such as associations, clubs, learning platforms, regional actions and other forms of collaboration. Globally speaking, the objective of these initiatives typically is to develop a step by step approach to identify the benefits of engaging its members in food quality management programs and providing guidance on good practices associated with the implementation of these systems. More specifically, these initiatives are aiming to address the following tasks: the enhancement of the awareness in food quality management principles; the selection of adequate and competent partners such as consultants and coaches; the mobilization of the relevant services; the efficiency of the overall coordination over time; and the implementation of some global managerial recommendations. Nevertheless, the underlying hypothesis of these collective initiatives is rarely adressed, nor is it analyzed and compared in a systematic way. This hypothesis is rooted in a general idea of “network learning”: the capacity of SMEs to adopt new food quality management schemes is seen as a whole and necessitates mobilizing, at the same time, 1) formal innovation networks, which bring cognitive resources and institutional credibility, and 2) the practice by managers of informal network activities through interactive exchanges of information, benchmarking, knowledge transfer and translation, and experiential learning.

In this context, the aim of this communication is three-fold. Firstly, it is to craft an original analytical framework in line with the literature on innovation networks, managerial innovation, network learning and related learning effects, specifically devoted to the study of quality management standards appropriation and implementation. This first part is mainly devoted to the identification of three categories of so called “network effects” that are provided by collective initiatives. Secondly, the objective of the communication

is to apply this framework to specific collective initiatives conducted in two countries (e.g. USA and France) in order to identify and compare the key relevant network effects induced at SME level by these collective initiatives which occur during the process of FSMS implementation. Thus, the research will identify strengths and weaknesses of these initiatives using a common grid based upon sound theoretical foundations. Indeed, a better understanding of learning processes at the individual as well as collective levels, both in informal (interpersonal) and in formal (organizational) relationships, will provide insights into the major relevant learning principles and their possible adaptation to specific agrifood system sectors and to different national or regional contexts. Thirdly, we propose some concluding comments about the managerial implications derived from this analysis.

1-Network effects in FSMS implementation: emphasizing the interests of collective initiatives

Based upon a literature review, we will consider successively three categories of network effects that are relevant for the topic. These effects are categorized in three categories: (i) The structural effect category finds its roots mainly in the structural analysis of networks; (ii) The interactive effects question more specifically the idea of a networking activity that will support the implementation process; (iii) The cognitive effect focuses on the impact of the time dimension on any networking activity, leading to irreversibility, to path dependency and to the accumulation of new and specific knowledge useful for implementation of FSMS. A synthesis follows.

Exploring the structural dimensions of collective initiatives

For Conway and Steward (2009) the network perspective applied to innovation research has considerably renewed and extended our knowledge on innovation processes. The starting point of the process of structural analysis is to consider any collective initiative, seen as a network, as a combination of actors and relationships (Burt, 1999, 2000; Borgatti and Li, 2009). In the structural analysis of networks, the actors are not independent but rather interdependent and influence each other. To take into account the unique situation of each member and the network structure as such, the structural approach combines two complementary perspectives: the global network, that is to say its density, the average distance between each of its members, the existence of subsets more or less structured; and the ego network, that is to say the situation of an actor (an individual, a SME) in its environment and its degree of inclusion, its mode of insertion into the global network (Borgatti and Li, 2009, Borgatti et al., 2009; Coulon, 2005). Actors are considered as nodes, and relationships between them as ties. Thus, research on innovation mobilizing the structural analysis of networks (Coulon, 2005) produces representation of innovation processes as maps (Conway et al., 2001) or charts of nodes and relationships.

Consequently and in considering the FSMS context, two families of components must first be identified: actors and relations. The identification of relationships that these actors have with one another is the second component. In line with social network theorists, these relationships can be of several types: continuous (similarities, relationships, interactions) or discrete (financial flows, knowledge flows), directed or not, measured by value or not, formal or informal (Borgatti and Li, 2009). The process of implementing management system standards such as FSMS systematically typically involves two groups of major actors (Abdirahman et al. 2013; Hatanaka et al., 2005): individuals (managers, consultants etc.) and organizations (SMEs, standardization bodies such as ISO, the International Organization for Standardization, consular agencies, auditors, governmental bodies, banks etc.). Finally the network reveals itself, by its structural properties, as facilitating (or hindering) the implementation.

Networking activity within collective initiatives

In the context of the implementation of FSMS principles, knowledge transfer to the organization necessitates the mobilization of new cognitive resources and the activation of formal structures. An analytical approach applied to the implementation of FSMS is, therefore, assumed to provide a better understanding of the necessary learning processes. For Berthon et al. (2007), the mechanistic perspective is an essential step in that "the transfer of knowledge, considered as the dependent variable, proceeds from an optimal layout between the nature of network and the types of knowledge. The question is often that of a systematic identification of structural and relational properties of the network, as brakes or levers of the knowledge transfer." But this structural determinism cannot explain alone the implementation process. Implementing FSMS implies a set of interdependencies and a permanent adjustment between the actors, their objectives and the context in question. Thus emerges a vision of co-constructed knowledge. In the end, a more complete representation of the relationship between network and organizational learning should show that the network is a "channel for learning but, recursively, that the network is transformed by the learning taking place. In other words, the network is at least partly constructed by the learning processes, dynamically, deliberately and in an emergent manner" (Berthon et al., 2007).

The ambivalent dimension of the network in the phenomena of innovation is demonstrated by Owen-Smith and Powell (2004), Powell et al. (1996, 2005) and Conway and Steward (2009). By distinguishing the network itself from the networking event, they show that the study of the innovation process involves taking into account both the structural dimension and interactivity. For Conway and Steward (2009), there is an interaction between the network as a structure and the networking event taking place in this network, with “on the one hand, the network may constrain or liberate the patterns of interaction and exchanges between network members; on the other, networking behavior may serve either to ossify (i.e. fix) the existing network membership and relationships, or create a dynamic in the membership and relationships within the network” (Conway and Steward, 2009). In the context of FSMS mobilizing transfers of knowledge, social networks and learning processes are involved. Thus, “the formal structure of network, but also the quality and relational characteristics that are played out, have a role on the nature of the learning that occurs there” (Berthon et al., 2007). Simultaneous consideration of structural and relational dimensions are necessary in part according to these authors due to the fact that the individual is demanding of both resources and information but also demands a sense of belonging and social ties.

Collective initiatives as drivers of cognitive resources

The implementation of a FSMS goes through qualitatively distinct stages (Henson and Humphrey, 2009, 2010) with an evolutionary perimeter of actors involved in the process. These steps are mostly a reflection of the types of actors mobilized and of their changing status or role from one phase to another. It is therefore necessary to consider explicitly the time dimension and its corollary, namely its influence over the types of actors involved, and over the process of adopting the FSMS. This reflects the fact that the implementation is done in the long run and differentially mobilizes actors and resources.

The corollary of such a time dimension in the long run is the impact of knowledge creation and accumulation. Consequently the implementation of an FSMS within a company, with its deep impacts on organizational structures and management procedures, thus requests an original view of the combination between the implementation process and learning phenomena. Change in organization related to learning is an important body of literature, stemming mainly from the seminal works of Argyris and Schön (1996), and Levitt and March (1988). According to Pawlowsky (2003) and his extensive survey of literature on learning, it is clear that “there are distinct perspectives on organizational learning that differ in respect to certain basic assumptions”, nevertheless this author suggests that it is possible “to see outlines of a picture that visualizes basic building stones of an integrative model of organizational learning”. His review suggests four different dimensions of learning: system-levels (from individual to network); learning modes (cognitive, cultural, action); learning types (single-loop, double-loop, deutero), and phases.

Following Podolny (1999), and authors in social capital theory (Burt, 1997, 2000; Inkpen and Tsang, 2005; Nahapiet and Ghoshal, 1998), we will identify some characteristics of these cognitive effects that are paramount in the understanding of FSMS implementation. The basic idea for these effects is the fact that at a certain period of its development, learning processes lead to different forms of institutionalization within a formal network, which thus become a kind of “institution”, producing its own rules, norms, values and culture, aspects themselves embedded in idiosyncratic resources and skills. In the terms of Powell et al. (1996), the network becomes progressively the “locus of innovation”.

Network effects in FSMS implementation: synthesis and managerial implications from a collective initiative point of view

The approach developed of FSMS implementation is the delineation of the structural characteristics of network, of the characteristics of the networking activity and of the network seen as a source of specific cognitive resources. We have seen that this idea of three categories of network effects finds its source in the social capital theory (Burt, 197, 2000; Nahapiet and Ghoshal, 1998; Inkpen and Tsang, 2005) and has already been developed in the context of innovation in general (Zheng, 2010) and managerial innovations in particular (Agarwal et al., 2012). Nahapiet and Ghoshal (1998) for instance define social capital as ‘the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual of a social unit, it comprises both the network and the assets that may be mobilized though that network’. As suggested by Pittaway et al. (2001) and Conway and Steward (2009), the connection has been made between the benefits of network and innovation. But the literature on the role and functions of networks on innovation can be approached through at least two interpretations (Conway and Steward, 2009). In the first one the network is seen as a new way of organizing innovation activities, between market and hierarchy: it is thus the governance aspect that is emphasized. In the second one the network is not considered *per se* as a specific mode of organizing activities benefiting (or not) to innovation. Instead it is viewed as a new analytical lens interesting to focus on because it produces a wide range of effects, of externalities, that will influence the innovation

processes. Doing so, the network is tracked via the effects it may produce, as a phenomenon affecting any economic life.

Interaction effects between individuals for instance will be probably more important at early stages of the implementation processes, while structural dimensions are more predominant in well-established network relationships. Finally, cognitive effects will be mainly related to the institutionalization of a formal innovation network, especially when it becomes formalized into rules, routines and procedures which also tend to create path dependency, organizational memory and common resources. Through two examples in the USA and in France we will show the nature of these effects and the necessary conditions under which these collective initiatives may be beneficial to SMEs.

2- Case study of collective initiatives for FSMS implementation in the USA and France

In the USA (with global implementation): the Food Safety Knowledge Network developed by MSU

Beginning in 2008 and in collaboration with several international partners, Michigan State University launched the Food Safety Knowledge Network (FSKN) initiative (Geith et al., 2010). The overall objectives of the FSKN initiative are to 1) develop internationally recognized competences in relation to food safety for individuals at all levels and in all sectors of the food supply chain, and 2) promote knowledge transfer within the food safety community. The FSKN achieves these aims by harmonizing existing technical food safety training schemes through the development of the competencies of food safety professionals, recognized by international stakeholders, both from the public and the private sectors.

The FSKN is a collaborative platform that provides free access to high-quality, standardized learning resources in a highly scalable manner. To that end, all content (cognitive resources) is shared on the internet as Open Educational Resources (OER) under Creative Commons licensing via the FSKN web portals. The FSKN uses open source tools and openly-licensed materials encouraging development of derivative works that only require attribution to source and sharing under similar license as standardized FSKN content. This approach enables other users to customize, translate, and localize content for specific audiences or sectors of the food industry, and share these derivative works through either the MSU FSKN portals or their own web sites.

The FSKN approach has been pilot-tested in a number of countries in collaboration with numerous partners from the food industry (individual companies and associations), development agencies, academic institutions and other service providers. The specific approach has varied somewhat from country to country, but in general the target audience for capacity development has been small- and medium-scale suppliers (both primary producers and food processors) who are seeking to execute sales contracts with multi-national food retailers or other high-value markets within their country, or to engage in regional or distant trade of their products to more discriminating markets. Gaining access to these higher-value markets (both domestic and export) requires the suppliers to reach a much higher level of sophistication with respect to food safety and quality management systems, and ultimately the execution of sustainable contracts in these markets requires certification of the food safety management systems that are being implemented by these suppliers against recognized international standards.

Organizational level

The FSKN project engages a wide variety of organizations in accomplishing its mission. As the leader of the FSKN initiative, Michigan State University (MSU) and the faculty leading the effort are principally focused on the creation and transmission of knowledge to improve the competitiveness of primary producers (i.e. farmers) and SMEs in less-developed countries. Beyond improving food safety systems implemented by these suppliers, another long-range objective of these efforts is to improve the livelihoods of farm families and front-line workers in these less developed businesses.

Content development in the FSKN initiative is guided by international standards, with programs being delivered on international food safety guidelines adopted by the Codex Alimentarius Commission managed by the Food and Agricultural Organization of the United Nations (which are recognized as the *de minimis* food standards in member countries of the World Trade Organization) and other programs focused on helping suppliers meet the expectations of international private food safety standards such as those benchmarked by the Global Food Safety Initiative (GFSI). Individuals from several GFSI-member companies have participated in content development for the FSKN since its inception, whereas engagement with public sector food standards representatives (e.g. Codex or individual governments) has been more sporadic.

Content delivery in the FSKN project typically has been conducted by MSU researchers in partnership with academic institutions based in the countries where training is occurring. The partner academic institutions are

essential to the effective delivery of the content for local clientele because of the ability to deliver the training and mentoring in local language(s) and also because of their capabilities to localize the content with respect to local practices and cultural norms. It is preferable for MSU to work with local academic institutions in this manner as they share a similar culture of academic inquiry and knowledge dissemination. These collaborations also have a high likelihood of sustainability over the longer term.

The beneficiaries of the capacity development (e.g. farmers or processing establishments and their employees) may self-select for participation in these capacity development programs, but more commonly they are identified as potential or existing suppliers for multinational companies (either for the domestic market or export) who are in need of training and mentoring on the development and implementation of internationally-recognized food safety management systems. Many of the participating beneficiary farmers or manufacturers also are members of cooperatives or other food industry associations, which often work collectively to address key challenges such as compliance with food safety and quality standards. The multinational companies are motivated to identify suppliers for participation in these programs for a variety of reasons, but chiefly it is to help ensure the overall safety and quality of products sourced from these suppliers and, therefore, serves to protect the brand of these multinationals.

A variety of service providers also have engaged in the FSKN project since its inception. These have included third-party certification bodies who provide food safety certification, organizations offering food traceability support, equipment suppliers, sanitation services organizations, chemical suppliers, and providers of other ancillary services to farms or food processors.

Finally, several donor organizations, UN organizations and other NGOs have participated in or contributed to the FSKN initiative since its inception. Donor organizations such as the United States Agency for International Development (USAID) and the World Bank have provided financial support for FSKN development and delivery of programs. In addition, organizations such as the United Nations Industrial Development Organization (UNIDO) and the International Finance Corporation (IFC) of the World Bank Group have utilized FSKN-created materials in their own development projects that are focused on food safety capacity development in a number of countries. For the FSKN initiative, organizations such as UNIDO and IFC have been continuously engaged throughout the program. These collaborations have been critical to the successful implementation of FSKN and its dissemination to several economies outside the US.

Clearly, the FSKN initiative has engaged with and benefitted from this large number and variety of international partners. Each has been critical to the successful implementation of FSKN and dissemination of its content to beneficiaries in several economies.

Individual level

At the individual level, there has been a tremendous amount of networking among key individuals working for FSKN partner organizations. Although some of this networking and collaboration has occurred through events organized explicitly for FSKN development and implementation, a considerable amount of networking has occurred through other fora such as the Global Food Safety Initiative of the Consumer Goods Forum (<http://www.mygfsi.com>), the Partnership Training Institute Network of the Asia Pacific Economic Cooperation Forum (<http://fscf-ptin.apec.org>), and the World Bank-organized Global Food Safety Partnership (<http://www.worldbank.org/en/topic/agriculture/brief/global-food-safety-partnership>). This networking has involved a relatively small, yet highly influential, group of individuals who collaborate on FSKN and similar globally-focused initiatives in the area of food safety standards and food safety management systems implementation. This core network interacts less directly with beneficiary groups such as farmers or SME food processors, who typically have been identified for participation in the programs by their buying companies (e.g. multinational food corporations) or donor organizations such as UNIDO or IFC. Content delivery in FSKN-related projects has been conducted by a select group of highly-qualified experts working in academia (e.g. MSU), the food industry, or as consultants. In many cases, the same experts have been enlisted to implement training and capacity development programs by multiple food industry companies, associations or donor agencies. This highlights the need for engagement of more experts in networks such as FSKN, but also speaks to a relative dearth of recognized international experts in this specific discipline.

In France: the ISO 22000 club launched by CCI Picardie

In spring 2007, the Chamber of Commerce and Industry (CCI) decided to launch, for ten regional food companies (including Paris Caramel) an informal 'ISO 22000 club', a regional program to support ISO 22000 standards. This ISO 22000 program has consisted of business leader coaching along with accompanying collective actions for all participating companies. The Paris Caramel's management decided to embark on the

process of certification because of new customers' requirements and changes in the business environment. The certification was not an absolute necessity for this healthy company but appears as a possible supplementary marketing asset in accordance with the policy of sustainable customer satisfaction ensuring the safety of products sold. It would also eliminate the different and heterogeneous customers' specifications and create differentiation towards competitors. Ultimately, Paris Caramel attained ISO 22000 certification in October 2008.

Founded in 1957, Paris Caramel is a food SME located in the Picardie region in Northern France and manufactures chocolate and confectionery products. The company manufactures three main types of products of the highest quality: caramel, fruit pulp and chocolate, for a turnover of 900 000 Euros per year. Their customers are pastry confectioners, delicatessens and shops selling local products. The company has forty employees, mainly makers of caramels, fruit jellies and chocolate candies. In year 2000, the company decided to develop the certification of various stages of the production process, starting with HACCP. As a small family-owned company with mostly self-educated staff, Paris Caramel is very cost-efficient with a short decision process. Another important characteristic of the company is its human dimension: human capital is more important than financial returns, and the managers put more emphasis on training their employees and on maintaining employment than on profits.

Organizational level

Continuous ties such as spatial (the location in the Picardie region, the role of the Regional Council) and cultural ties have been acknowledged by the company as important features, as they provide trust and easy communication. The tacit knowledge dimension of the standard is also to be considered: for that type of knowledge, considered as soft information, organizational proximity is sufficient. For the responsible in charge of the implementation at Paris Caramel, the institutional embeddedness of the initiative, promoted both by AFNOR and by the Chamber of Commerce, has played a crucial function in providing seriousness and credibility. The congruence of goals between all the stakeholders of the initiative, creating a specific relationship and a sense of responsibility, provided an environment for mechanisms such as emulation and mimicry. Indeed these effects can be considered as learning effects as well, in reinforcing/auto-promoting the exchange of skills and information.

The learning by doing effects have been identified mainly between the consultancy firm and Paris Caramel: the role at that organizational level is significant at the initiation stage (establishment of a first contact and of a formal tripartite contract between the CCI, the consultancy firm and the company), but the main interaction effects have occurred at the individual level.

Organizations involved in the process of standard adoption are: AFNOR, CCI, consultancy firms, other SMEs.

- AFNOR, the French ISO affiliated organization, has a central role in the definition of ISO 22000 standards. But this role can be qualified as highly differentiated, according to the phase of innovation. In the initial phase of creation, AFNOR has a leading role, but it is interesting to note that Paris Caramel is not involved at all. In the phase of initiation, AFNOR has played a more contrasted role: thanks to its leadership and size, AFNOR always plays a central role in awareness of companies. But its actions are mainly oriented towards large companies. In the adoption phase AFNOR has no specific role. During the implementation phase, AFNOR provides its expertise and acts as a training entity both for companies and for consultants.

- The CCI (Chamber of Commerce and Industry) had no role in the definition phase. Its action is crucial in the adoption phase: the organization has acted as a pivotal organization between AFNOR, consultancy firms and SMEs, through the program funding and the set up of the tripartite contracts.

- Consultancy firms: Protechnic, a consulting firm had a central role in the adoption *stricto sensu* phase. It is difficult to separate its role as a company and as a person. Indeed the manager of the company has been largely convinced by the consultant to adopt the standard. But the company has also a very good experience and reputation at working with SMEs. The specific expertise is at the basis of the successful interaction process.

- ISO 22000 club for SMEs: this club is the heir of another previous club devoted to HACCP. Its role has been to connect companies from different industries (thus not in competition) to exchange views and questions about the standard and its consequences. Its role is both formal (membership) and informal (interpersonal relations, cf. below).

- Third party certifier: the certification body Bureau Veritas has conducted the certification process and has been the main player, with Paris Caramel, during the conformity assessment phase.

Individual level

The inter-individual aspects of the network learning effects are more difficult to evaluate for confidentiality reasons. Nevertheless, there is a clear complementarity of the continuous ties between the two levels, leading to strong coupling effects. The managers from Paris Caramel (the CEO, the quality responsible) are part of a

coherent community of leaders in the Picardie region and everybody knows each other quite well. This fact has played an important role in the decision to adopt. However, the individual level is also of tremendous importance for learning in terms of discrete ties and interactions (mainly with the consultant, but also with other food managers during the period of the CCI initiative as well as with some customers).

Informal contacts and exchanges may occur at any time and for confidentiality and privacy reasons interviewees are reluctant to answer. Nevertheless interpersonal contacts seem to play an important role especially with one consultant and with all the managers from the ISO 22000 group.

According to the analytical framework, the learning effects are different from one phase to another. We will consider successively the five main phases, namely standard setting (antecedents), decision of adoption, implementation *stricto sensu*, conformity assessment (certification), and enforcement (post certification).

During the standard setting phase, only limited network learning phenomena occurred, at the individual level, in the form of previous personal experiences of the quality manager of Paris Caramel in similar fields. Indeed, no formal contacts between the company and AFNOR has existed, showing that during its definition, the ISO 22000 standard does not include all potential users such food SMEs.

The adoption decision is reached thanks to contact between the company and CCI: the learning effect can be defined as the rise of awareness of the company leaders involved in the initiative in the development of the standard and soft information exchange for the establishment of the tripartite contract.

The implementation phase is obviously the period of time (almost 2 years) that has witnessed important learning phenomena. The most important learning phenomena has occurred at the interindividual level, in the form of a strong interaction between the quality manager and the consultant in charge of the program. The formal explicit knowledge included in the ISO standard specifications necessitates adaptations and translations in the real world of the Paris Caramel specificities. On the contrary, formal contacts between organizations are limited during this period of time. Another significant network learning effect is the permanent contact between the food managers involved in the initiative, in terms on comparisons, informal exchange and emulation.

The conformity assessment phase is more formal: this is the recognition of the compliance with specification, done through a certification audit. The process of learning is done through an exchange of explicit information (such as files, information control procedures etc.) between the company and the certifying body.

The enforcement phase is the post certification period of continuous improvement. Learning effects occur mainly in-house, with the practical involvement of the employees. Nevertheless, the informal contacts established during the implementation phase with other managers remain active, in the form of informal meetings, cross auditing practices and informal exchanges.

3- Discussion and concluding comments

The objective of the communication is twofold: (i) to propose an original framework for the analysis of the implementation of internationally-recognized food safety management systems (e.g. ISO 22000, GFSI-benchmarked food safety schemes), in using a network effect perspective; (ii) to apply this framework to two case studies. The major motivation is the fact that the implementation of a FSMS is a long and complex process strongly related to its organizational and individual context. Quality management standards are immaterial in nature and difficult to implement: food SMEs and their managers will inevitably rely heavily upon collective initiatives.

From this analysis it is possible to summarize a few key features. At the preliminary stages of the implementation process, the learning effects do not extend outside the organizations. These effects occur more clearly during the implementation phase. The dynamic approach shows an interesting phenomena: in the latter phases of the implementation process (i.e. conformity and assessment phases), new types of partners emerge and their roles are of tremendous importance for the success of the ISO 22000 adoption. It suggests that the position/relationships of the individual companies *vis à vis* these partners during that period of time must be clearly emphasized as a key component of the success of the initiative.

Preliminary results, still to be confirmed and extended to other cases, could have interesting managerial implications for food SMEs. First of all, the collective (i.e. network) dimension of the process is shown. No food

SMEs in these initiatives could have decided in isolation to set up FSMS. Instead, the food companies of the case studies are strongly embedded in a web of partners, defining a networking activity for innovation. Within this network, the process of learning is doubly collective: at the institutional level, where institutions (e.g., Chamber of Commerce and Industry, academic institutions), consultancy firms and associations (e.g. AFNOR, GFSI) have worked together to promote the initiatives; at a micro-analytic level, with the SMEs building strong relationships with service providers (e.g. consultancy firms, certification bodies) and, at the same time with a broader community of food business leaders having its own dynamics, objectives and social interaction mechanisms.

A second idea is that of resources. The critical success factor in FSMS implementation by SMEs in these case studies seems not to be financial resources, but rather access to cognitive resources, (i.e. the ability to connect and to be connected through a web of relationships to the relevant people and organizations). Learning phenomena appear to be complex, multifaceted and done through several mechanisms and mediation. Consequently, an important managerial implication of the research, to be validated by other situations, would be to enhance these cognitive resources and mechanisms, to identify more precisely their nature, the partners involved and their roles for learning in relation with the requirements of the different phases of implementation.

References

- Abdirahman, Z.-Z., G. Kisempa Muyuala and L. Sauvée, 2013. France: Case studies 3D Network, ARI Picardie and BioBourgogne. In: Mapping Formal Networks and Identifying Their Role for Innovation in EU Food SMEs. G. Schiefer and J. Dieters (Eds), Centmapress, University of Bonn, Germany, 67-88.
- Argyris C., Schön D. A. (1996). *Organizational Learning II. Theory, Method, and Practice*. Addison-Wesley: Reading, MA.
- Avermeate T., Viaene J. (2002). On innovation and meeting regulation: the case of the Belgian food industry Paper presented at the DRUID Summer conference, Copenhagen, 6-8 June, 22 p.
- Berthon B., Charreire-Petit S., Huault I. (2007). Réseaux sociaux et processus d'apprentissage, une relation complexe et ambivalente. Communication à la XVIème Conférence Internationale de Management Stratégique AIMS, Montréal, 6-9 juin, 30 p.
- Borgatti S. P., Mehra A., Brass D. J., LaBianca G. (2009). Network analysis in the social sciences, *Science* 13, Vol. 323, 892-895.
- Borgatti S. P., Li, X. (2009). On social network analysis in a supply chain context, *Journal of Supply Chain Management* 45 (2), 5-22.
- Burt, R. S., 2000. The network structure of social capital. *Research in Organizational Behavior*, 22, 345-423.
- Conway S., Steward F. (1998). Mapping innovation networks, *International Journal of Innovation Management* 2 (2), 223-254.
- Conway S., Jones O., Steward F. (2001). Realizing The Potential Of The Network Perspective, In *Social Interaction and Organizational Change: Aston Perspectives on Innovation Networks*, Jones, O. Conway, S., Steward, F. (eds.), Imperial College Press.
- Conway S., Steward F. (2009). *Managing and Shaping Innovation*. Oxford University Press, 504 p.
- Coulon F., (2005). The use of social network analysis in innovation research: a literature review. Working paper, Lund University, January, 28 p.
- Geith, C., K. Vignare, D. Thiagarajan, and L. D. Bourquin. 2010. Designing corporate training in developing economies using open educational resources. *Journal of Asynchronous Learning Networks* 14:3-12.
- Hatanaka M., Bain C., Busch L. (2005). Third-party certification in the global agrifood system. *Food Policy* 30, 354-369.
- Hatanaka M., Bain C., Busch L. (2006). Differentiated standardization and Standardized differentiation: the Complexity of the Global Agrifood System. In *Between the Local and the Global. Confronting Complexity in the Contemporary Agrifood sector*, Research in Rural Sociology and Development, Marsden T. and Murdoch J. (Eds), Elsevier, 39-68.
- Henson S., Humphrey J. (2009). The impacts of private food safety standards on the food chain and on public standard-setting processes. Report Codex Alimentarius commission, May, 51 p.
- Inkpen, A. C. and E. W. Tsang, 2005. Social capital, networks, and knowledge transfer. *Academy of Management Review*, 30(1), 146-165.
- Levitt, B. and J. G. March, 1988. Organizational Learning, *Annual Review of Sociology*, Vol. 14, 319-339.
- Nahapiet, J. and S. Ghoshal, 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2), 242-266.
- Pawlowsky, P. 2003. The Treatment of Organizational Learning in Management Science. In: M; Dierkes, A. B. Antal, J. Child and I. Nonaka (Eds). *Handbook of Organizational Learning and Knowledge*, 61-88.
- Pittaway L., Robertson M., Munir K., Denyer D, Neely A. (2004). Networking and innovation: a systematic review of the evidence. *International Journal of Management Reviews* 5/6 (3/4), 137-168.

Podolny, J. M. and K. L. Page, 1998. Network Forms of Organization. *Annual Review of Sociology*, 24(1), 57-76.

Powell, W. W., D. R. White, K. W. Koput and J. Owen-Smith, 2005. Network dynamics and field evolution: The growth of interorganizational collaboration in the life sciences. *American Journal of Sociology*, 110 (4), 1132-1205.