

A new role of mediator for extension services: a challenge for the Chambers of Agriculture in France

Claude Compagnone, Sandrine Petit, Bruno Lémery

ENESAD, INRA, LISTO-D, Laboratoire de recherche sur les Innovations socio-Techniques et organisationnelles en agriculture, Dijon, France - sandrine.petit@enesad.inra.fr

Abstract: Agriculture has been put in a new position regarding other activities and territorial actors by the emergence of the policy guideline given by the concept of sustainable development. We shall examine this new position in reference to two main changes: first, the implementation of the cross-compliance advisory system concerning environmental regulations, and secondly, the increasing interactions of this system with territorial institutions in charge of rural development. Based on an analysis of literature and field study cases, our research makes the following hypothesis : in new local places where decisions are made, the capacity of agriculture to intervene depends on its capacity to hold a position of mediation. We focus in particular on the case of Chambers of Agriculture which play in France a key role in the development of agriculture. Chambers of Agriculture have to collaborate with a broad variety of actors: public administration, private professional agricultural organisations, elected representatives of local public authorities. We describe how the Chambers play different parts in these new partnerships, either as project leaders or as providers of services. All this generates confusion... and makes the position of the Chambers ambiguous. This paper explores the required conditions for advising in agriculture in order to face the current challenges: the know-how of extension agents, the internal organisation of the Chambers of Agriculture, the management of information. We come to the conclusion that it is necessary for Chambers of Agriculture to establish a certain autonomy to take on their role of mediation. This paper develops sociological approaches and is conducted in close collaboration with agricultural organisations, in particular the Chamber of Agriculture of Saône-et-Loire in Burgundy.

Keywords: extension, chamber of agriculture, sustainable development, autonomy, mediation

Introduction

In France, the general organisation of agricultural development was set up in the 1950s-60s with a view to modernisation, and now needs restructuring (Lémery, 2003). At a time when offer used to be firmly State controlled, the framework was designed so as to inform farmers of the new technologies in order to ensure that both production and productivity should increase as expected. Today, the whole system must adapt to a very different context by redefining its purpose and its policy of intervention. Economic globalisation entails ever stronger demands in competitiveness, which take different forms according to the organisation and situation of production. Social expectations addressed to agriculture have multiplied and now call for a change in how the nature and the definition of agricultural activities are to be considered, and this change cannot but be mirrored by a deep modification in the governance of this branch of activity. As a result, the agricultural professional group is atomized while its relationships to other social groups undergoes transformation; and in this state of crisis, the concept of sustainable development shines out as a slogan expected to provide principles capable of establishing a new 'contract' between agriculture and society in general (Landais, 1998). This motto has been adopted by all public policy orientations, yet it still lacks strict definition as its meaning must be appreciated according to the scope and context of economic, social or environmental circumstances. *Out of focus*, is Vivien's sentence (2005), and J. Theys (2001) regards it as "a normative principle without a norm" allowing for a wide diversity of significations. We are concerned with the practical expressions of the notion in operating modes; our purpose here is to provide some indications on the nature and the issues of the reorganisation the network of agricultural development is facing.

Our operating basis is a research currently carried out on the Chambers of Agriculture, which belong to this network. This research is part of a broader study, "Agriculture and Sustainable Development", funded by the Research National Agency (ANR). Indeed, Chambers of Agriculture have had such a history and such a specific part in the French organisation of agricultural development that they

constitute a remarkable observation ground to analyse ongoing changes in the whole system. Chambers of Agriculture are public institutions run by managers from the agricultural world. They were created in 1924 and were given advisory functions in 1950. They have always played an important part in elaborating an internal professional point of view on agricultural development, as they were first created to voice farmers' expectations and set up discussions between representatives with relatively varied interests¹. The Chambers exist both on the level of *départements* and *régions*, which means they cover all the national territory and ensure an interface between agriculture and all other sectors concerned by agriculture. Since their mission of counselling makes them responsible for structuring many fields, the Chambers also have to test new forms of organisation². Our interest here is to investigate the question of how the Chambers of Agriculture adapt their missions to the concept of sustainable development, and the question of the relevance and justification of their position in their relationships with other actors actually or potentially involved in sustainable development. In other words, we want to know whether the reorganisation of Chambers widens their scope of action, and their agents' scope of action, and whether this effectively enable them to support new forms of production.

Our current research on Chambers of Agriculture has already provided us with results for eastern parts of France (Jura, Saône-et-Loire, Côte-d'Or, Savoie et Hautes-Alpes), and data from other *départements* (Savoie and Isère) should be coming in soon. The surveys have observed the employees of the Chambers and the professional managers in charge of their administration. They aimed at showing how Chambers face new demands and get organised in order to answer them. So far, our study allows us to make a statement on the circumstances the Chambers have to deal with in carrying out their assignments; we are also able to put forward some suggestions as to their possible position in a developmental new deal structured around a principle of sustainability. These first results are currently being completed.

In the first part of this paper, we shall present the details of the present transformations in agricultural extension, and explain how institutions such as the Chambers must evolve from simply transmitting technological improvements to structuring new logics of action. Then we shall express two propositions based on autonomy and mediation as sociological concepts; first, on the part Chambers of Agriculture should play in current reconstruction, and secondly on which situations are relevant for putting our ideas to the test. We shall conclude with some thinking about what is at stake in the global repositioning of the Chambers.

Combining logics of intervention

There are two types of elements relating to the actualisation of sustainable development which seem more particularly relevant in reconfiguring the activities of the Chambers: new statutory obligations regarding environment and new actors in orienting rural development. The new legal demands are voiced on a European level: agri-environmental measures are passed, agricultural grants come with environmental cross-compliance conditions and counsel will be reorganised into networks³ of advisory bureaux⁴ as of 2008 in order to support farmers in their efforts toward complying with agricultural and environmental requirements⁵. Spontaneous forms of expression of the notion of sustainable development are bound to appear. In corporate world, following the North American example, sustainable development generates forms of auto-regulation based on the notion of corporate social responsibility. Self-regulation also tends to develop in agricultural businesses (Aggeri and Godard, 2006). Besides, new agents have emerged, who work at giving an orientation to rural development, and it has become clear that the structures of agricultural extension cannot but open up and interact with these other agents and their opinions on whether development is sustainable. The increasing segmentation of rural areas (into natural sites, conservation sites, protected sites; rural residential

¹ Representatives are elected on a proportional basis, so that "minor" unions (*Confédération Paysanne*, *Coordination Rurale*, etc.), as opposed to the "major" union (*Fédération Nationale des Syndicats d'Exploitants*), have a significant number of elected representatives (in the 2007 election, the *FNSEA* presented a number of lists echoing the various trends in many areas of the territory).

² The definition of counseling used to be limited to technical and economic aspects (Lémery, 1994); yet it now tends to concern numerous new dimensions (administration, tax, statutes, etc.) and thus generates new lines of jobs (like quality supervisor, marketing advisor, certification agents).

³ Enforcement of European regulation n° 1782/2003

⁴ Besides, as far as France is concerned, it seems that departments involved in counseling are soon to be asked to provide some kind of traceability for their actions and some internal assessment of the quality of their dealings.

⁵ Decree of the Ministry of Agriculture and Fishing, April 25th 2007.

sites, rural recreational sites; rural production site, etc.) leads the Chambers of Agriculture to reconsider more specifically their involvement and organisation on a local scale. For the Chambers as well as for institutions concerned with management and counsel, the new context we have described calls for a change: they must move on from passing on know-how and technologies, to new lines of strategy and logics of action not necessarily immediately compatible. We have identified four possible logics of action.

Four possible logics (See table 1 for a synthetic view of the four logics of action)

The first strategy may be considered as a logic of services. It is based on the fact that the Chambers provide advice to farmers expressing needs which are more and more individual and varied, as well as more and more vague. Disoriented by today's context, farmers are at a loss to name what they need; and when they do find words, they express very specific concerns which cannot be treated on a collective level. Agricultural professional organisations therefore end up providing services, yet a policy of services proves more difficult to set up than the systematic diffusion of knowledge, and it also entails mutual competition⁶. Such a logic implies, moreover, that the consultant and the farmer should co-construct a relationship in which the consultant should be endowed with a specific know-how different from a mere set of standardized ready-made pieces of knowledge (Laurent *et al.*, 2006).

The second possible logic is expertise. We have already mentioned that the agricultural world faces deep uncertainty as to its future; in this context, farmers expect researchers and professional organisations to hand out elements capable of helping them to understand and face events. Numerous prospective studies and various observation devices have thus been set up, with a view to finding out new elements of knowledge contrasting with the traditional references used in agricultural extension, and rather more concerned with aspects like management and accountancy than with technological considerations (Chevalier, 2007). A large part of the studies was initiated by diverse institutions, though, and as they were meant to answer local delineated questions, some were conducted at the level of *departments* while others concerned *regions*; as a result, their procedures and their outcome are sometimes widely disharmonious, which leaves to the Chambers the task of combining results. On another level, the intervention of the Chambers qualifies as expertise when they have to process the data of original studies so as to cross integrate information, in order to provide an expert diagnosis on the situation of farmers asking for some global advice on 'strategy', and to help each of them, case by case, to come to a decision. Integration is two-fold: it first means that the Chambers must activate different sets of competence which, though housed by them, are often split between two different spheres of action –technical and managerial; it also implies that relevant technical-economic standards ought to be established to preset dealings, yet most development institutions have reduced or given up producing such frames (Mundler, 2006). From the advisors' point of view, here stands a problem relating to payment, for indeed, because of the Chambers' poor financial health, all work is entirely invoiced to the farmers, and this goes against the "culture" of people who generally consider themselves as agents serving a public mission (Rémy, 2006). Selling their services or advice is therefore one more issue the Chambers must think through in order to limit its scope of application and its consequences on the organisation (and assessment) of the intervention of their agents.

It is also possible to see the system as logic for securing production. The deregulation of the agricultural world is paralleled by an increasing concern for the production of standards and norms : farmers must now meet conformity standards and their activities must be "traceable". Supporting them in adapting their businesses to the requirements of multiple regulations is gaining importance, so the Chambers as well as other private organisations are refocusing their activities to that end, often at the cost of purely technical or economic advice. Let it be said that the statutory frame defines only partially what counsel is to be provided; therefore advisory agents have to work out the meaning of the purpose of public decisions they use, according to what they believe ought to be done in agriculture. As a result, for similar situations, not only a number patterns are created, which vary from one institution to another or even from one agent to another (Juntti & Potter, 2002), but also advisors are placed in an position all the more uncomfortable as they must deal with a tangle of legal texts which must be interpreted with caution, since their consequences on the future of the rural farms may be

⁶ Please note that in the French system of agricultural development, other institutions than Chambers of Agriculture offer such services –and shall probably do so even more in the future : cooperative organizations, rural economy and management centers, offices controlling quality, (milk control, for instance)...

Table 1. Characteristics of the four logics of action the Chambers of agriculture face and should integrate.

| Logics of intervention | Related changes in the context | Type of advice and extension | Consequences on the job of advisors and related skills | Consequences on the action and strategy of Chambers of Agriculture |
|--|---|--|---|--|
| 1. Logic of services | <ul style="list-style-type: none"> - more individualised and varied needs expressed by farmers; - stronger competition between agricultural organizations; - strain on the budget of Chambers of Agriculture. | <ul style="list-style-type: none"> - individual and tailored service, to be invoiced to farmers. | <ul style="list-style-type: none"> - co-construction of advice by farmers and advisors; | <ul style="list-style-type: none"> - need to evolve from transferring standard knowledge onto providing specific advice; - arbitration of the competition between agricultural organizations ; - necessity to invoice services. |
| 2. Logic of expertise | <ul style="list-style-type: none"> - uncertainty as to the future of agriculture; - farmers asked for prospective data to adapt their strategies; - Chambers of Agriculture had more or less given up producing technical and economic data. | <ul style="list-style-type: none"> - strategic advising which associates economic, management and technical components ; - support in decision making; - prospective studies. | <ul style="list-style-type: none"> - integration of advising from experts, with a general approach of the farm. - advisors have to invoice services despite their reluctance to do so. | <ul style="list-style-type: none"> - development of a data base of technical and economic data about farms; - acquisition of data (in economy, management) to enable anticipation; - combination of different knowledge and articulation of local and global issues. |
| 3. Logic for securing production | <ul style="list-style-type: none"> - new regulatory requirements (cross-compliance, traceability, etc.); - increasing standardisation and production of norms. | <ul style="list-style-type: none"> - advising including compliance with regulatory requirements. | <ul style="list-style-type: none"> - interpretation of the terms and purposes of regulations; - to give coherence to regulations from different fields; - integration of regulations in the strategy of farms. | <ul style="list-style-type: none"> - development of competences in dealing with norms and regulations; - arbitration of the competition with private organisations in this field. |
| 4. Logic of multiplication and diversification of actors in rural development | <p>Multiplication and diversification of actors (State, local, municipal authorities, etc.) in the fields of water management, environment, land use, territory.</p> | <ul style="list-style-type: none"> - participation to or activation of development projects; - joint elaboration of projects with other actors. | <ul style="list-style-type: none"> - competences in activating and managing projects ; - construction of new networks and development of cooperation with non-agricultural partners. | <ul style="list-style-type: none"> - development of the management of partnerships and of the role of mediation; - clarification of the assignments and position towards their partners (to be a partner, a provider of services, representative of the professional agricultural group) ; - organisation and competences coherent with the increasing competition with local authorities which have their own advisers in agriculture. |

crucial.⁷ The Chambers are still working on the question of how to organise advising on regulations, and on whether their activities are coherent with those initiated by the other constituents of the agricultural extension apparatus and private advisors.

The fourth logic is based on the multiplication and diversification of actors in agricultural development. A main feature of agricultural evolution in the last decade is the increasing number of sources of authority, like local public authorities and agriculture or environment administrative actors. Financial contributions granted to “projects” by local public authorities, water agencies, local and State public institutions have thus become fundamental elements in balancing the budget of the Chambers, which are therefore becoming proportionally more dependent on them. The growing influence of multiplied figures of authorities parallels a phenomenon of mutual repositioning of actors traditionally providing counsel to farmers (agents working for the Chambers of Agriculture and technical or commercial employees of cooperatives or firms), together with the arrival of new actors. Both local public authorities and rural development associations have hired agents or project leaders specifically devoted to agricultural extension or rural development (Jeannot, 2005). New lines of profession are created where interface between actors through networks is considered as crucial (Travaux et Innovations, 2003; Schermer *et al*, to be published). This diversity of participants generates new situations of competition as well as cooperation –two antagonistic feelings only separated by a thin line, or even close to overlapping, as the example of local authorities interventions shows with particular accuracy: here, Chambers of Agriculture have to establish new contacts with other entities involved in rural development (such as local public authorities, environment administrators, associations, etc.). This entails that the regulation of agriculture must be redistributed, which is clearly problematic and implies that efforts should be made in order to explicit the situation, as each actor of the system thinks and reacts according to their own interests and strategies without prior coordination. As far as the Chambers are concerned, this means they need to define their position as extensionists, the possibilities for actual collaboration and the way competences might be distributed. More particularly, how local missions shall find a place among the other “professions” (business counselling, specialised technical services...) still remains in question.

The prism of the four logics highlights the problematic situation of the Chambers in finding a new basis for their activities. Let’s now turn to another aspect of the situation, namely how the demands of sustainable development may help Chambers of Agriculture find a vantage point from which they could be able to organise these logics with coherence.

Chambers of Agriculture could act as mediators, if the autonomy of extension services was reinforced

We do consider that changing some functions of agricultural development is one of the conditions prior to concretising sustainable development. We could now discuss the various possible positive actions for reaching sustainable development, which modulate according to the interpretation of the notion by each entity concerned; yet we choose to focus on the function of mediation which to our mind, is by essence and by statute encapsulated in the concept of sustainable development. This concept is polymorphic (with social, economic, technical and environmental aspects) and projects on a large variety of actors; therefore its practical implementation is dependent on appointing actors capable of engineering such translations as are necessary to establish a common characterisation of situations, and in a position of keeping activated the links between the different relevant entities. In other words, sustainable development can only become reality if this central function of mediation is positively embodied by actors and structures. We believe that in agriculture, the actualisation of sustainable development partly depends on the condition of the ability of the counselling apparatus to occupy that function. We consider that the Chambers of Agriculture are fairly well positioned within the system to be entrusted with mediation: they are used to dealing with the pressure inherent to the enforcement of their two types of assignments –representing and supporting the profession for one, and intervening to ensure the adaptation of agriculture on the other hand. One consequence of this belief is that the agricultural advisory system should not be regarded as an isolated matter, but on the contrary as being part of the social scene. Another consequence is that attention should be paid to the organisation and coordination between emerging actors in rural and agricultural development, and between new structures and forms of action in that same field. In this respect, the role of mediation is

⁷ An excellent example of this situation may be found in the counsel on the use of plant-care products in wine growing and extensive cultures (Compagnone, 2004).

different from technical transmission traditionally provided by agricultural development structures, and must be appreciated on three levels: (i) between entities producing knowledge and people actually acting in development; (ii) between agriculture and other professional sectors; (iii) between farmers.

Certain conditions must be observed before entrusting Chambers of Agriculture with mediation, though. Our second hypothesis is that the Chambers may occupy this position only if they are able to achieve autonomy. Becoming autonomous -which must be understood as an active position and a process, not as a perpetual state (Castoriadis 1975; Dupuy 1982)- implies for the Chambers : (i) to be endowed with their own means of reflection; (ii) to be capable of getting involved in social relationships, even when they mean conflict; (iii) to have their own point of view on their functions in controversies about defining agriculture. Speaking in terms of sociological action (Touraine, 1978; Dubet, 1994, 2005), these three conditions are indeed necessary to build both an identity and controlled action. The purpose of our research in progress is therefore to characterise, assess and evaluate this ability for counselling organisations to set up frameworks of reflection, independence and involvement in their action.

Let us mention three emblematic situations of tension and repositioning faced by the development system; we find them particularly interesting in the context of this study to test how capable of mediation the Chambers are. The first example is provided by territory matters. Chambers of Agriculture are more and more frequently trying to integrate the development schemes of organised territories (Country, Regional Nature Park...) and in doing so they must qualify their new relationships with actors involved in that field (local public administrations, environment managers, associations, etc.). Studying these cases should illustrate the way they take part to existing rural development schemes and how they find their place within them, and also show how they reset their internal structures to answer the requirements of such participations. The second situation is the case of counsel on plant-care products. Because of the new requirements imposed on farmers in using such products, counsel has to be revised even though it had been formerly structured. A good indicator here is to watch the position of each actor and focus more specifically first on how the Chambers intervene and take measures to create and organise accurate counselling, then on how they provide support reaching further than mere technical accompaniment or observance of the multiple statutes regulating farms. Finally, the third situation concerns counsel in livestock farms strategies⁸. In a context of growing uncertainty and instability, farmers voice expectations for strategic advice in order to anticipate and control the future of their farms. We are interested here in seeing how the Chambers manage to combine the production of the information needed and the reflection on this knowledge, in order to provide case by case advice. In this situation, specific attention should be paid first to the relationships between farmers and advisors, and then to the proposals which, although they are based on the technical and economic system of reference, take into account the diversity and value of the farmers' experience.

Conclusion

Since they have started adapting to a situation of change, Chambers of Agriculture seem to be in the most favourable position to operate as mediators in the process of integrating sustainability into the action of the multiple actors intervening, in their various capacities, in agricultural and rural development. As we have just explained, though, taking this position in today's rough context entails that the Chambers must become autonomous and self-reflecting entities in order to keep or generate an accurate point of view on what agriculture ought to be. Only under this condition can they become actors-translators recognised by others actors as able to conduct normative investments (Thévenot, 2006) necessary to the simplification of situations and to the definition of common actions. New patterns of organisation therefore remain to be created by the Chambers to help harmonizing the actions between their own agents and other actors, while giving their agents power to keep on analysing together practical cases and possible interventions. With that assignment to fulfil, the Chambers must both elaborate counsel appropriate to the new requirements of production and take part to the creation of a new form of "governance" in agriculture. The counsel must be able to conciliate the notion of "global achievement" of farms in a perspective of sustainability and the resolution of specific problems implied by actions carried out in a context of strong uncertainty. As for the new form of governance, it must express as well as encourage, not only the involvement of more and more varied extension agents, but also brand new cooperation devices between structures

⁸ Here strategy means long-term support provided by extension services to farmers facing a drastic reorientation of their business.

directly related to the apparatus of agricultural extension, and entities formerly exterior to this system but now involved in this field; within extension structures, it must also help combining modes of intervention pertaining to a logic of market services or public services. Public service counsel is dependent on the capacity of the Chambers to endorse this mediation part, at a time when in Europe the trends are in favour of private counsel, as may be seen in the United Kingdom or in Germany (Laurent *et al*, 2006). This preference for the merchandising of services raises the question of the accessibility to counsel for farmers, in particular for those of them with small businesses (Labarthe, 2006), and, more generally speaking, the question of free access to information (Leeuwis, 2006).

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References

- Aggéri F., Godard O., 2006, Les entreprises et le développement durable. *Entreprises et Histoire*, dec. 45 : 6-19.
- Castoriadis C., 1975, *L'institution imaginaire de la société*. Paris, Seuil.
- Chevalier B., 2007, Les agriculteurs recourent de plus en plus à des prestataires. *Insee première*, n°1160, octobre.
- Compagnone C., 2006, Le *juste* dans la relation de conseil en agriculture, In Rémy J., Brive H., Lémerly B. (dir), *Conseiller en agriculture*, Dijon / Paris, Educagri / INRA , pp 221-234
- Compagnone C., 2004, Agriculture raisonnée et dynamique de changement en viticulture bourguignonne, *Recherches Sociologiques*, 2004/3, pp 103-121.
- Dubet F., 2005, Propositions pour une syntaxe des sentiments de justice dans l'expérience de travail, *Revue Française de Sociologie*, 46-3, 2005, 495-528.
- Dubet F., 1994, *Sociologie de l'expérience*, Paris, Seuil.
- Dupuy J.-P. 1982. *Ordres et désordres. Enquête sur un nouveau paradigme*, Paris, Seuil.
- Jeannot G., 2005. Les métiers flous du développement rural. *Sociologie du travail*, 47 : 17-35.
- Juntti, M., Potter C., 2002. Interpreting and reinterpreting Agri-Environmental Policy: Communication, trust and knowledge in the implementation Process. *Sociologia Ruralis* 42, 3:215-232.
- Labarthe, P. 2006, Technological innovation in extension services and institutional change : learning from a historical comparison between France and Netherlands. In Langelveld. et Röling eds, *Changing European farming systems for a better future. New visions for rural areas*, Wageningen Academic Publishers, 330-334.
- Landais E., 1998, Agriculture durable : les fondements d'un nouveau contrat social, *Courrier de l'Environnement*, 33, 5-22.
- Laurent C., Cerf M., Labarthe P., 2006. Agricultural extension and market regulation : learning from a comparison of six EU countries. *Journal of Agricultural Education and Extension*, 12 (1), 5-16.
- Leeuwis C., Klerkx L. 2006, New knowledge arrangements in the Dutch agro-ecological innovation system : Tensions between privatisation and innovation discourses, in Langelveld. et Röling eds, *Changing European farming systems for a better future. New visions for rural areas*, Wageningen Academic Publishers, 340-344.
- Lémerly B., 2003, Les agriculteurs dans la fabrique d'une nouvelle agriculture, *Sociologie du Travail*, 45/1 : 9-25.
- Lémerly B., 1994. Une position d'expert incertaine : les conseillers techniques en agriculture. In : Darré J.P. (dir), 1994 : *Pairs et experts dans l'agriculture. Dialogues et production de connaissances pour l'action*. Ramonville, Editions Erès, coll Technologies / Idéologies / Pratiques, pp. 91-116.

- Mundler P. 2006. Les conseillers d'entreprise entre guichet et projet, in Rémy J., Brives H., Lémery B. (dir.), *Conseiller en agriculture*, Dijon / Paris, Educagri / INRA : 119-135.
- Rémy J., 2006, Portait social des conseillers : retour sur image, in Rémy J., Brives H., Lémery B. (dir.), *Conseiller en agriculture*, Dijon / Paris, Educagri / INRA : 83-99.
- Schermer M., Kirschengast C., Petit S., Magnani N. (en préparation). The role of local activators within territorial development. Managing social capital.
- Touraine, A, 1978, *La voix et le regard*. Paris, Seuil.
- Thévenot L., 2006, *L'action au pluriel : Sociologie des régimes d'engagement*, Paris, La Découverte.
- Theys J., 2001. A la recherche du développement durable : un détour par les indicateurs, in Jollivet M. dir. *Le développement durable, de l'utopie au concept*, Paris, elsevier : p.269-279.
- Travaux et innovations. 2003. Accompagner les acteurs ruraux. Des métiers en évolution. N° spécial 100. Aout-sept : 73 p.
- Vivien F.-D., 2005, *Le développement soutenable*. Paris, Collection Repères, La découverte : 122 p.