How do farmers make use of developmental intervention?

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Abstract
Many studies have dealt with developmental intervention in agriculture; most of them do not pay attention to the way farmers use such intervention to develop their activity or themselves. The review of existing approaches of farming activity and their translation into developmental approach leads us to propose the renewal of such approaches by understanding the way farmers mobilize informational resources in order to cope with their situation but also to develop their activity and themselves. We firstly qualify the notion of informational resources, and then display the diversity of livestock farmers’ logics for mobilizing external immaterial resources as it emerges from our inquiry amongst 30 livestock farmers. Based on longitudinal follow-up in 9 farms, we then propose some tracks to understand how farmers link internal and external resources to develop their activity. We draw some perspectives from this work which can serve to propose new developmental intervention in agriculture.

Keywords
Field Study, Intervention, Developmental Work, Consultancy, Agriculture

1.- Introduction
Developmental intervention is a key feature within some strands of activity theory and has become a means for researchers who wish to understand development processes. The prevalent modern form of such intervention in work activities is management consulting. However, its efficacy in terms of supporting the development of activity and subjects can be questioned. In this paper we focus on consultancy work in the agricultural industry with the aim of developing, with consultants, some new approaches for developmental intervention among farmers.

As quoted by Virkkunen (2004), the perspectives from which developmental interventions in work activities have been studied differ in two respects: one analyses the intention of the interventionist and how (s)he contributes to implement a new technology or policy; the other focuses on the community’s reaction towards such intervention. Few studies have focused on the inner structure and the developmental dynamics of the system (i.e. object of intervention). Engeström and Virkkunen proposed to achieve this by modelling an activity system and its dynamics. As shown below, a number of research studies undertaken in the agricultural sector also start with modelling of a farming system and its dynamics (whether under stable or changing conditions), and then propose some developmen-
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1. Various approaches to farming activity: evidence of cognitive, social and practical dimensions of development processes

Some farming system studies, mainly in livestock sciences and agronomy, have proposed to model farming activity as a decision system connected to a bio-technical system through an information system. As such, farming activity is mainly viewed from a Simonian perspective: farmers take information from the subsystem of production elaboration and from their socio-economic environment in order to decide how and when to act. To account for such information processing, some researchers have developed the “action model” concept (Sebillotte, & Soler, 1990). This concept has been implemented in decision support systems using object-oriented and decision rule formalisms. These decision support systems have been described by their designers as learning tools, allowing reflexivity through simulation facilities (Attonaty, Chatelin, & Garcia, 1999). Developmental intervention
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has been based on the use of such tools, whether with individuals or with farmer groups. Nevertheless, although the designers of such tools have made claims about learning through the use of their tools, developmental processes have not been described as such. Hence, the status of the “action model” remains unclear: has it oriented information collection by farmers, or has it acted as a plan? Cerf (1996a) investigated this question in cropping systems by using a “semantic network of action” framework (Tijus, Poitrenaud, Barcellina, & Richard, 1997). She pointed out some invariants in the way that farmers process information to control biotechnical processes, and showed how farmers’ objects differ from those of agronomists. In this perspective, Cerf (1996b) suggested viewing developmental intervention as a dialogical process but did not go so far as to make clear recommendations to orient consultancy work towards it. This perspective has also been argued by soft systems researchers (Ison, & Russell, 2000) who have proposed some dialogical tools like diagramming to allow exploration and drawing of different points of view.

More recently, work has been undertaken to look at the way farmers use some monitoring tools for managing their crops. Emonet (1998) has highlighted how farmers develop such tools as resources to cope with unusual situations, to orient their action or to control it. Taverne (2000) shows that such tools are actually used within complex networks combining farmers, advisers, monitoring tools, data collection support, and sometimes laboratory analysis. Farming activity is therefore viewed as distributed, in the way that Hutchins showed it to be in the case of navigation. Based on these findings, Cerf and Meynard (2006) suggest that developmental intervention should occur along with the design of new tools. Prototypes and mock-ups support the dialogical processes between users and designers of the tools, as proposed by Béguin (2005).

Based on Prieto and Batkhine’s work, some social anthropologists deny such a cognitive approach and suggest that invariants for farming activity are developed as social norms within peer groups, through local networks of dialogue (Darré, 1985). These invariants are resources that farmers can use to control and assess their action. On this basis they propose methods to identify farmers’ conceptions as social constructs built in peer groups (Darré, Mathieu, & Lasseur, 2004). They suggest that developmental intervention should be viewed as a process which supports farmers’ groups for expressing their concerns into manageable problems and for co-actively building solutions to them (Darré, 2005). Nevertheless, even though such research points out the need to consider the importance of socially constructed norms, it does not allow us to understand: (i) how such norms become operational for a given farmer, and (ii) how such a collective process might be playing out differently within individual developmental processes.

Finally, some researchers have studied farmers’ learning processes while adopting new techniques or standards. Jourdan (1997), looking at wine growers from a course of action perspective, identifies the key role of a research-experimentation process in the adoption of new cultivation techniques. Paine and Kenny (2002) study how farmers make use of new farm management techniques. They identify various learning styles and suggest they be used to adjust developmental intervention.

2.2.- Modelling farming activity: understanding the mobilization of informational resources

These research studies point out that farmers can mobilize various cognitive, social and practical resources to deal with their on-going work but also to develop their activity and themselves. However, as far as we know, the way farmers combine these resources has not yet been studied. Our own research is an attempt in this direction. It aims to understand how farmers build, combine and mobilize what we call informational resources and how these resources contribute to developmental processes. We have borrowed this notion from management science but define it in quite a different way. We want to point out that information has a meaning and a relevance that depends on the object a given farmer identifies within his/her farming activity, and that such a meaning can be motivated by and for the development of the bio-technical system or for his/her own development. This also
allows us to point out that the information is chosen, used, renewed and developed in the same way as tangible resources.

We qualify informational resources in terms of four components: their support, their origin, their content and their function. An informational resource can be viewed as a mediating tool whose underlying support, origin and content are not neutral in the interpretation made by the farmers. The content of an informational resource are the fields relating to the technical management of the farming system and refer to a set of farming practices. The origin of the informational resources may be: (i) the bio-technical sub-system or the farmer’s cultural and historical involvement in farming; and (ii) the different actors (farmers, experts) and organizations that might influence the farmers’ technical management. The type of support of an informational resource enables us to take into account the fact that (i) the relational aspect (human support) contributes to constructing the contents of the actors’ interventions with the farmers; and (ii) there are different kinds of mediation that stabilize the informational resources mobilized by farmers (written supports, computers, human supports). The function of an informational resource accounts for the meaningful relationship the farmers attribute to each of the three previous components (the way farmers transform tools in instruments) regarding the development of their farming activity as well as their personal development. We intend to analyse the links that can be identified between the way a farmer defines what (s)he need to master in order to develop his/her farming activity, and the type and function (s)he assigns to diverse informational resources.

3.- Identifying diverse farmer logics in mobilizing external informational resources

The study was conducted within three districts in the centre of France specialized in beef production and characterized by different types of organization of the consultancy supply. Semi-structured interviews were held with 30 specialized beef farmers. They were sampled by the “snowball” method which consists in interviewing farmers cited by other interviewees as being the most different from themselves regarding their use of consultancy. The process is stopped when information is redundant. The aim was to explore the diversity of the mobilization of immaterial resources by reaching farmers who were not involved in formal consultancy relationships. Interviews focused on: (i) the presentation of the farm and its functioning in order to understand the farmer’s goals, his/her orientations and actions to achieve them; (ii) the evolution of the farm since the farmer moved in, to identify how and why immaterial resources had been mobilized to design and monitor farming activity; and (iii) the checking of all the mediums and all the origins of immaterial resources mobilized by farmers in an average year.

Nine variables (see Table 1) were built to discriminate farmers according to their logic of mobilization of external immaterial resources.

<table>
<thead>
<tr>
<th>Variables (n=9)</th>
<th>Modality 1/Modality 2/...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of domains (nutrition, genetics, health, administrative management, accounting, regulations) for which external resources are used</td>
<td>More than 4 domains/from 3 to 4 domains/ fewer than 3 domains</td>
</tr>
<tr>
<td>The medium (apart from human or oral relations)</td>
<td>None/Written/Computing/Written and computing</td>
</tr>
<tr>
<td>The favourite origin (according to farmer’s assessment)</td>
<td>Economic aims/Technical and managerial support aims/No favourite origin</td>
</tr>
<tr>
<td>Professional responsibilities</td>
<td>Yes/No/Strategic ones (i.e. built up to access immaterial resources)</td>
</tr>
<tr>
<td>Involvement in technical follow-up as offered by advisers</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>
Joining technical meetings and/or training sessions | Either/Meetings only/training sessions only/ Neither
---|---
The function assigned to advisory support | Expertise (specific skills)/ support for steering of the bio-technical processes (checking up if it runs “well”)/decision support (what to do and how to do it in a given situation)
How is the resource mobilized to cope with problems | Anticipation/Reaction
Which criteria are used to choose an external informational resource | Skill/Relation/Cost

Table 1.-Variables and their modalities used to characterize the mobilization of external immaterial resources.

A multiple factorial analysis made with these nine variables enabled us to distinguish four groups based on the first three axes of the analysis which explain 49% of the variability (Magne, Couzy & Ingrand, 2005). Groups do not depend upon location within a given district.

![Figure 1](image.png)

Figure 1.- Interpretation of the significance of the 3 discriminant axes of the factorial analysis. Position of groups along these axes.

**The eleven farmers of Group 1** mainly mobilize economic agents, whether these work in firms or are peers. These actors are considered to be the most relevant agents for giving information and operational advice. The farmers favour relations with such agents in the course of their livestock farming activity. They do not participate in technical follow-up, meetings or training sessions, but are more or less involved in peer groups. They favour human relations in choosing their external informational resources. For administrative work, they mainly seek prescriptions and delegate the work, which they consider to be inconvenient and stressful due to the possible consequences of a mistake in this domain. On the other hand, for domains related to technical management, they are interested in reports on various practices, with their pros and cons. They have no clear project for their livestock activity and do not differentiate their way of mobilizing the external resources for the various technical domains concerned.

**The four farmers of Group 2** wish to optimize their information gathering. If they belong to peer groups or are involved in technical follow-up it is mainly to capture information rather than to share...
data and references. They have learned to use software (for herd management) which they identified through their informational network and recognized as operational and effective for their own work. They select external informational resources according to various criteria such as cost, skills, and relationships. They mobilize such resources for only a few domains as they consider that they are skilled enough and do not wish to question their own skills. Therefore, they mainly mobilize external informational resources for domains which are externally driven such as commercialization or administrative work. Regarding the former, they seek information on markets, while for the latter they seek prescriptions or delegate the work.

**The four farmers of Group 3** try to minimize the time and money spent on intangible work. They therefore wish to optimize their own effort in mobilizing external informational resources. They participate in training sessions in order to improve their own skills, and seek advisers with whom to co-produce solutions to their specific technical problems. They claim to be self-sufficient, and try to control production costs and to enhance added value on their farms. They pay no attention to the origin of an external informational resource as long as it provides them with expertise relevant to the event they have to face. They mobilize such resources when they consider that it will be useful, based on their own conception of their enterprise and its results. They do not attend meetings, which they find too time-consuming, and they favour media which give them quick access to information. They have high standards for advisers, who have to prove their specific expertise which they, in turn, will use to build their own autonomy in managing their farming activity.

Finally, for **the ten farmers of Group 4** intangible work is really an investment: they therefore organize the mobilization of informational resources according to this view. It can even go as far as taking responsibility within advisory agencies or producer cooperatives. They use all available media, and spend time in farmers’ meetings in order to be aware of emerging innovations and to secure their decision by checking the truth of the information circulating in their neighbourhood. They participate in individual or collective technical follow-up, which allows them to identify which specific knowledge they will need to handle their own problems. They seek to improve both their technical and economic results, but will not lower their technical requirements for economic reasons. Improving their technical mastery of their system is a challenge for them. They will adopt any new technique which will improve their work organization, economic results or technical skills.

**4.- Formalizing the way in which farmers mobilize informational resources**

The follow-up phase was intended to allow us: (i) to better understand how farmers analyse their mastery of their farming activity, whether at the activity system or the action level; and (ii) to identify the links between their understanding of their need of mastering or/and of developmental processes and the way they mobilize informational resources.

We chose 9 farmers among the 30 we had interviewed, in the 4 groups, in order to monitor them during a 9-month period. We visited them twice during that period. Visits started by looking at the on-going situation with the farmer (looking at the cows, the fields, etc.). Discussions then focused on farming practices and informational resources to identify how they are organized throughout the year. We collected data on farmers’ actions (farming practices and use of informational resources) as well as their judgement about those actions. The aim was to identify how farmers related their actions and the results of those actions with: (i) some points of reference or standards they built up; and (ii) the ways they designed their farming activity and thought about it.

The first results show that, of the 9 farmers, none had the same way of describing what had to be mastered at the system level to successfully perform their activity. Each farmer also developed his/her own references, whether to define the range in which they wished to keep the processes they used or to assess their performance. Nevertheless, these points of reference depended upon those of experts.
and advisers. It seems to us that farmers mainly internalize those references which allow them to become autonomous in domains which they consider as the core of their activity.

Our data enable us to identify at least one specific process for the adoption of new techniques. When a farmer detects a problem in his farming system or when he is aware of new technical opportunities (two different triggering events which reveal different ways to engage in a developmental process), he assesses his current practices (in case of a problem detected) or the new technical opportunity in relation to his peers’ practices. If he concludes that a new opportunity can be relevant for increasing his technical mastery of bio-physical processes, he evaluates the opportunity in relation to his own values and the potential need to change their ranking (e.g. trade-off between economic relevance and work-load increase). Depending on the situation, this can result in a change in his practice and values (at least their hierarchy), or in reinforcing his current practice when he is not willing to change his scale of values.

During our follow-up, we noticed that farmers do not frequently request external support to assess their actions. Even if they frequently question the value of their practices (Am I right to act as I do?), they engage in a working process with advisers only when the triggering event becomes recurrent. Thus, it seems that a process of reflection starts by questioning themselves on their ability to identify the “best practices for themselves”. This questioning is unlikely to be conducted in front of an adviser. It mainly concerns the farmer’s positioning within his/her peer group in which practices might vary widely. Such diversity might hamper the recognition of what will be good for him/her. But it should also be noted that farmers hardly recognize that consultants might be a resource in a process of reflection.

Finally, our first findings show that farmers assign functions to external informational resources, whether these are oriented towards themselves or towards their livestock activity. The main functions towards the farmer are namely: delegation of the work (whether for administrative or commercial work), support for personal development, building of professional recognition, and support for decision-making. We still have to explore further how these functions are combined. Nevertheless we suggest that they are organized according to three registers: knowledge, praxis, and proof. Two main developmental modes are observed: one rests on reflexivity, the other on the mediation of others to foster change.

5.- Discussion and conclusion

At this stage of the work it is still unclear how a global logic towards external informational resources, as identified through our first inquiry, is actually translated by farmers into practice. The diversity we presently observe (through our monitoring) in the ways that farmers describe what needs to be mastered, and attribute functions to informational resources, cannot easily be interpreted in terms of the 4 global logics we pointed out. It seems more relevant to analyse such diversity by exploring the dynamics which farmers try to manage between their understanding of what needs to be mastered, their own interest in being skilled in a given area, the function they assign to external resources, and the way they construct some points of reference through the joint mobilization of internal and external resources, whether to prepare their action or to control it. Gaining insight into these dynamics aims, from a more developmental perspective, at furthering our understanding of how farmers try to achieve coherence through their differentiated use of external resources, between the axiological, praxeological and cognitive dimensions of their activity. Our first analysis allows us to point out that the development of the activity through the adoption of new technical opportunity implies a first assessment of this opportunity from an axiological point of view.

The analysis of global logics for the mobilization of external informational resources highlights the different types of inter-subjectivity in which farmers wish to be involved for developing their activity system or themselves. Therefore, developmental intervention has to adapt to such diversity. We also
point out various developmental stakes among the farmers and start to identify various developmental processes. In particular, we highlight the role of values in such processes. Consultancy agencies which offer developmental support should benefit from these results and offer a diversity of developmental interventions. This also means that consultants have to develop awareness of their contribution to the different quoted dimensions of the activity, as well as to their function, as expected by the farmer, in order to provide them with relevant support. As many consultants work on a given farm, this finally means that they might have to coordinate their advice. We have now started to work with some consultants to discuss such recommendations with them and to work on the implementation of new consultancy practices based on our findings.

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Referencing


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RÉSUMÉ
De nombreuses études traitent des modalités d’intervention des agents de développement agricole. Mais la plupart n’aborde pas la façon dont les agriculteurs mobilisent ces interventions pour développer leur activité ou eux-mêmes. L’analyse des travaux conduits sur la modélisation de l’activité agricole et sur la façon dont cette dernière guide le travail d’appui à des processus de développement nous conduit à proposer de renouveler ces approches en cherchant à comprendre comment les agriculteurs mobilisent des ressources informationnelles pour faire face à leurs situations de travail mais aussi pour développer leur activité et eux-mêmes. Nous précisons tout d’abord ce que nous entendons par ressources informationnelles, pour montrer ensuite la diversité de logiques de mobilisation des ressources informationnelles externes telle qu’elle ressort de nos entretiens avec 30 éleveurs de bovins allaitants. Nous proposons ensuite quelques pistes pour mieux comprendre comment les ressources informationnelles sont mobilisées par les agriculteurs pour transformer leur activité sur la base de suivis longitudinaux réalisés dans 9 exploitations. Ceci nous permet de dessiner quelques pistes pour renouveler la façon d’aborder l’intervention des conseillers en agriculture.

MOTS CLÉ
Etude Empirique, Intervention, Développement, Conseil, Agriculture
RESUMEN

Numerosos estudios tratan las modalidades de intervención de los agentes de desarrollo agrícola. Pero, en su mayoría, no abordan la manera en la cual los agricultores movilizan esas intervenciones para desarrollar su actividad o para desarrollarse personalmente. El análisis de los trabajos que proponen modelos descriptivos de la actividad agrícola y de la forma en que ésta última guía el trabajo de apoyo a los procesos de desarrollo, nos lleva a proponer una renovación de los enfoques, buscando comprender no solo cómo los agricultores movilizan los recursos informacionales para enfrentar sus situaciones de trabajo sino, también, para desarrollar sus actividades y para desarrollarse personalmente. Primero, especificaremos lo que entendemos por recursos informacionales para, luego, mostrar la diversidad de lógicas de movilización de los recursos informacionales externos, tal como surge de nuestras entrevistas con 30 criadores de ganado bovino para lactancia. A continuación, y sobre la base del seguimiento longitudinal realizado en nueve explotaciones, proponemos algunas pistas para comprender mejor cómo son movilizados los recursos informacionales por los agricultores, para transformar su actividad. Esto nos permite trazar algunas pistas para renovar la manera de abordar la intervención de los asesores en agricultura.

PALABRAS-CLAVE
Estudio Empírico, Intervención, Desarrollo, Asesoramiento, Agricultura.