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Supporting farmers' management of change towards agro-ecological practices by focusing on the work dimension: the contribution of ergonomics

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Abstract: *The public authorities and some agricultural actors wish to develop agroecology to face the rise of new challenges (impacts of agricultural practices on natural resources in particular). Thus new agricultural work systems are being designed, raising questions regarding the inclusion of farmers' work in the agro-ecological transition. Our action research endeavours to support the development of agricultural work systems by conceiving of the agro-ecological transition as a set of processes of collective design of new work systems. To do so, we are implementing a "Building a chronicle of change" method, which appears to be an interesting way to initiate an "Enabling intervention in the management of change" with farmers engaged in different types of changes.*

Keywords: *enabling intervention, change of practice, constructive method, change management.*

Introduction

The second half of the twentieth century saw French agriculture significantly increase its productivity per hectare and per worker. However several limits and negative effects of this model, particularly on the environment and on the health of farmers, are now well identified (Meynard et al., 2012). To face these challenges, national public policies and various stakeholders from Research and Development organizations are calling for the development of innovative forms of agriculture to move towards sustainability. Hill and McRae (1996) propose the idea of "redesigning" agricultural practices, which involves profound changes in the work of agricultural stakeholders (farmers, advisers, agronomists, etc.): the development of new activities for farmers, a change of role for agricultural advisers, and new objects of research in agronomy, for instance. Our study focuses on such changes in farmers' practices, driven by the agro-ecological transition, and on the ways in which farmers manage these changes. It is informed by our choice to consider the management of change as a design activity (e.g. Barcellini, Prost & Cerf, 2015). Until now, conventional and intensive forms of agriculture have taken farmers away from their fields and promoted a significant increase in controlled action through technical and chemical means (Meynard & Girardin, 1991; Mayen, 2013). We posit that the development of agro-ecological farming systems restores their role as key participants in the design of those systems and that it may allow farmers to develop through their work. In fact, this new positioning of farmers may force them to constantly reflect on their work. Our research seeks to develop an "Enabling intervention in the management of change" focused on work (Barcellini, 2015), to support farmers in their transition towards agroecology. "Enabling" is used with the meaning proposed by Constructive Ergonomics (Falzon, 2014), in reference to Sen's work (2003). In this sense, an "Enabling intervention" aims at building an organization that allows individuals and collectives to act effectively, to safeguard their health and to develop (Barcellini, 2015). The concept has now been mobilized in the context of organizational change (Arnoud, 2013; Raspaud, 2014). Enabling intervention is based on an ergonomic diagnosis and the comparison of representations, in chat room, of the work of the actors involved in the change, using a reflexive methodology and/or simulation work. Barcellini (2015) has developed this intervention mostly based on case studies in the industrial and tertiary sectors taking place within structured projects. We posit that the "Enabling intervention in the management of change" can be organized and led differently in a work environment that is much less

structured for the worker, constantly changing, largely unpredictable and sometimes controversial, as it can be in the agricultural sector. We address the agricultural work system as a broad system including farmers and actors in interaction with them, as well as production, management and equipment, within different economical, geographical, historical and cultural dimensions. These are important determinants that could impact on the work of farmers (Leplat, 1997; Wisner, 1985; Guerin et al, 2006). We thus adopt a systemic and constructive approach, in order to understand farmers' working systems and activity, and ultimately to support the development of those activities and systems in the agro-ecological transition. This paper discusses the first part of this research. We propose to redesign the first step of the "Enabling intervention in the management of change": the ergonomic diagnosis. Barcellini (2015) defined the first step of an ergonomic intervention in change management as the "strategic analysis of a project [...] and the analysis of the work in order to produce diagnoses (on the project and labour) to inform the action of the ergonomist in connection with the strategic dimension of interventions [...], projects' structure and the organization of participation [...]" (Barcellini, 2015, p. 94). We wish to build this diagnosis with farmers to propose a co-built diagnosis. To do so, we focus on the construction and implementation of our method, "Building a chronicle of change", which is designed to chronologically trace the various elements of change (difficulties, goals, resources, etc.) with the farmers and in different regimes of change. This paper will essentially present the development of this method, "Building a chronicle of change", based on interviews with farmers. It reveals the difficulties encountered, the goals set and the resources mobilized by the farmers in the context of a change in practices.

Theoretical framework to develop a co-built diagnosis of the farm and of the management of change on the farm in terms of the work actually performed

To co-build a diagnosis, with farmers, of the farm and the management of change on the farm in terms of the work actually performed, we need to investigate: (i) the work of farmers (ii) elements which trigger change in their work and (iii) what drives and structures change. In this section, we draw on the literature to build the first step of the "Enabling intervention in the management of change".

The work of the farmer

Ergonomists have not investigated the work of farmers as much as work in the industrial or tertiary sectors. However, Cerf & Sagory (2004) have listed the different types of application of such research: "improving the working conditions" of farmers, "helping to better understand the consequences of the introduction of new production techniques on the organization of work", and "designing the future organization of work" (pp. 623-625). Several characteristics of farmers' work can be examined. First, it can be envisaged at the center of a system, here called the agricultural system, combining different dimensions: economic, political, life management, family, environmental, climatic, etc. Furthermore, farmers often combine several activities (e.g. grains and livestock) (Beguin & Pueyo, 2011) that require many skills and knowledge. Second, farmers work with many different agricultural players (consultants, wholesalers, cooperatives, other farmers, agricultural works company, etc.). This relational network participates in the agricultural system: all these actors and their skills may constitute both constraints and opportunities that can affect farmers' decisions and their farming practices (Cerf & Sagory, 2004). Moreover, a farmer's work is a fundamental element of their personal project and even of their family (Cerf & Sagory, 2004). The farmer can work alone or in partnership with a farmer or farmers (sometimes a family member) with one or more employees. In this way, the head of the agricultural holding decides on his own work and on the work of others, but he also implements the work on the farm. Thus the farmer has many functions and responsibilities that would be distributed among several operators within an industry (Cerf & Sagory, 2004).

Finally, farmers' work seems to encompass a wide range of tasks that they need to situate in time, in space and within a larger system, with both professional and personal dimensions.

Change by incorporating new farming practices

The change we focus on in this paper is linked to the introduction of new practices in the work of a farmer. The farmer will have to train to master them, to integrate them on his farm, to adapt his work to them, to make them accepted in his relational network and/or to change the network in question, etc. These new practices can be designed by others: researchers in places with different properties from those of a farm (experimental farm, laboratory, etc.) and where the farmer is a simple “receiver” (Ansaloni & Fouilleux, 2006). Thus while a new practice can solve a particular problem, it will have an impact on other elements of the farming system, and possibly create new problems. This new practice can also be designed by farmers themselves. However there is no (or very little) co-development of new agricultural practices between these two fields of expertise to better take into account the real working conditions of the farmer on his/her particular farm. Moreover, the practices created by farmers are sometimes ignored by the research, as has been the case for organic farming, for example (Goulet, 2008; Le Gal, 2006). What we know about “change” comes from our interviews with and observations of farmers more than the literature. At the current stage of our intervention research, we consider change as the result of a striking event or of a succession of striking events, initiated by farmers or not, which upsets their work activity (but not only). Through encounters with farmers and agronomists, we have seen that change can differ according to two dimensions in the context of an agro-ecological transition: the source of prescription and the source of motivation. The change adopted by a farmer is induced by different levels of prescription of his/her work:

- **Change “along the way” (CAW):** farmers build their voluntary and unstructured change step by step, through meetings, tests, experience, etc.
- **Structured change (SC):** controlled and prescribed.
- **Forced change (FC):** imposed on some farmers, usually for environmental policy reasons.

Change may also be motivated by different sources:

- **Internal motivation source (IMS):** the farmer is the primary driver of his/her change of practices. The motivation comes mainly from his/her personal beliefs (e.g. a farmer wants to change his/her practices to be more in line with his/her beliefs).
- **External motivation source (EMS):** the farmer is not the primary driver of his/her change of practices. The motivation for change comes from outside (i.e. new regulation).
- **Mixed motivation source (MMS):** the farmer is the primary driver of his/her change of practices. The motivation is primarily fueled by economic and regulatory factors. The motivation for change comes mainly from external factors re-appropriated by the farmer.

Following the change, we also wish to consider how farmers manage the change. Barcellini (2015) describes the management of change as “a project for the collective design of work, in which ergonomic intervention is considered as an act which is : (1) strategic, which aims to support collective decision making through the definition of transformation intentions [...] and the relationship between the political desire for change and its feasibility, particularly in connection with the consequences of change on future work; (2) socially constructed and participatory, through the implementation of participatory structures performing functions surrounding decision making, monitoring and the production of knowledge on current and future work; and (3) collaborative and constructive, aimed at the implementation of conditions that effectively support collaborative decision making and design work, as well as learning supporting the development of activities necessary to the appropriation of the transformation” (Barcellini, 2015, p.93).

Through our interventions, we wish to work on the management of change in these different contexts. To do so, it is necessary to reflect on what could be the first step of our “Enabling intervention in the management of change”.

What does building the first step of and “Enabling intervention in the management of change” mean for us?

Taking into account the points mentioned above, “Enabling intervention in the management of change” in the context of change in a farmer’s practices towards agro-ecological practices, relates to a larger – and probably very different – work system than the ones that have been investigated until now. Our co-diagnosis of the farm and of the management of change on the farm in terms of the work actually performed should be careful not to exclude the different dimensions of this system: it must leave

enough room for the farmer to express themselves and not limit the discussion to a single dimension (e.g. technical dimension). However, the interviewer must be sure to place the farmer and his work at the center of this system. The interviewer should also have a comprehensive view of all tasks performed by the farmer on his farm. The interviewer must develop a spatial and temporal representation of the agricultural system in which the farmer is embedded. He/she must try to have a good understanding of the relational network of the farmer, at least of the one concerned by the change on the farm. He/she must also have a good perception of the responsibilities of the farmer and of the role of the farm and changes in the professional and personal life of the farmer. Moreover, we see the farmer as a source of novelty. "For ergonomists, this means that the methods mobilized to analyze the work should enable them to draw up a diagnosis, but also to facilitate the farmer's reflexive process regarding his/her own work so that he/she can define how to improve and to reorganize it if he/she so desires" (Cerf & Sagory, 2004, p. 626). This confirms our desire to establish a co-constructed diagnosis. But it seems necessary to go further: our diagnosis must be co-built but must also trigger a reflexive activity in the farmers. We will therefore undertake this co-diagnosis with a new method.

Finally, the changes driven by the agro-ecological transition position farmers in different types of change that allow them to develop their work at different levels that we must understand. We therefore propose to build a first step of the "Enabling intervention in the management of change", which is a comprehensive approach to understand a farmer's work and the changes it has entailed on his farm.

Methodological contribution: building a chronicle of change

Our approach consists in a research intervention combining comprehensive and pragmatic objectives. First, we seek to understand the work of farmers, the agricultural system in which they evolve and changes in their practices. Second, we endeavor to initiate reflection among farmers about changes in their practices. Third, with farmers, we wish to identify the enabling or non-enabling features of the agricultural system in which they work. Finally, we aim to influence/act on the design of these features by applying an approach – Enabling intervention in the management of change – leading to the co-construction of changes with farmers and agricultural stakeholders.

Presentation of the method

The objective of this PhD work is to build an "Enabling intervention in the management of change" in a context of changing agricultural practices as part of the agro-ecological transition. We here focus on the first step of such an intervention, which aims to allow the researcher, together with the farmers, to co-build a diagnosis and to understand the timeline of the elements of change in the agricultural system of a farmer. To do so, we have developed a comprehensive approach to understand the farmer's work and the changes they have introduced on their farm, including:

- An exploratory interview of approximately two hours with farmers. The goal was to have an overall view of agricultural work on the farm.
- A second interview of approximately two hours with the same farmers. The goal was to detail the first overall view to focus on the change.
- Broad observations (duration 2 to 4 days) focused on the difficulties identified during the interviews or by the farmers themselves. The goal was to move away from discourse to capture the work activity of the farmer and to consolidate our understanding of their work and of the changes.

In this paper, we have chosen to focus on the second interview, because it has proven to be key in the diagnosis process. In the oral presentation, we will provide elements on each step and their links.

The second interview consists in implementing a method called "Building a chronicle of change". This method is informed by the model proposed by Daniellou (2004) (Figure 1), which anchors the process of change in a collective design process. Change can be thought of as a succession of events and decisions

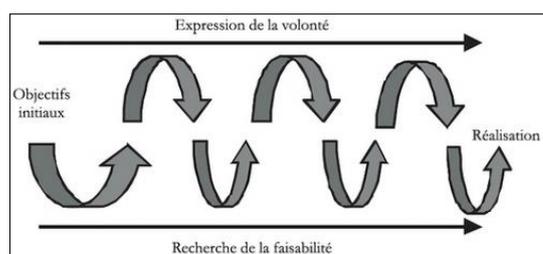


Figure 1: "Ergonomics in the conduct of work system design projects" (Daniellou, 2004).

marked by a beginning: the initial objectives, which are reviewed constantly. We do not consider that an end point can be set to a process of change, in the sense that a farmer's working system is constantly adapting to evolving objectives, which may be outside of their control. The method "Building a chronicle of change" aims to build an understanding (Goals 1 & 2) and an analysis (Goals 3 & 4) of the change process to obtain the farmer's intrinsic point of view. The goals are:

1. To create a discussion about the change between the farmers and the interviewer.
2. To outline the change process according to the determinants of farmer's work.

On this basis, we aim to identify:

3. Farmers' difficulties, goals and resources.
4. Enabling and disabling features of the change process.

This method "Building a chronicle of change" consists of a semi-structured interview: the direction is given using a diagram (Figure 2) and the questions are raised by the interviewer. The farmers are asked to supplement this diagram with post-it notes of different categories: difficulty, objective, resource, and actor. For each piece of information provided by farmers, the interviewer must, as much as possible, ask the

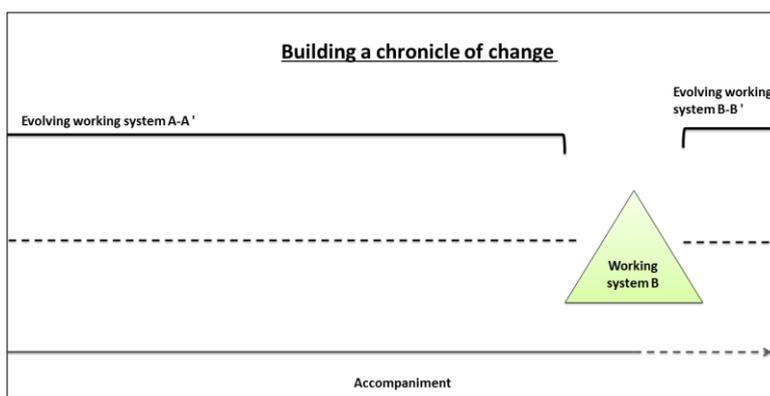


Figure 2: Diagram "Building a chronicle of change"

following questions: when? Or? Why? Are there other alternatives? An example? This method has been implemented in three case studies and iteratively refined. These explanations have allowed us to develop our method (Chizallet et al., 2016). In this paper, we present the second version of our method (Figure 2). "Working System B" on Figure 2 is defined as the working system the day of the interview. This method, "Building a chronicle of change", was applied with farmers.

Data collection

The method "Building a chronicle of change" was carried out in three case studies:

- A Limited Liability Company of two grain farmer partners for 3 years, converting to organic farming in France. They thus have to comply with the specifications of organic farming. Previously practicing no-tillage crop production, they have maintained this practice. Their farm covers 200 hectares of cereals. Their motivations for initiating this process are ethical and economic. There is an important prescription to convert to organic farming. This is a case of a structured change with a mixed motivation source (SC-MMS).
- A grain farmer and pig and cow breeder in France. He took over the farm from his father in 2014. He has 100 Ha, 45 cows and 450 pigs. He is concerned about the BAC Grenelle¹ and he must change the way that they farm their plots (e.g. to let plants grow back after harvest) in order to reduce the amount of nitrate in the soil. This is a non-mandatory but strongly advised change. The main reason is environmental. We are in a case of forced change with an external motivation source (FC-EMS).
- A GAEC of two dairy farmers and an employee starting a methanation unit with three other farms, in France. They are a father and son. They strive for autonomy on their farm by reducing outside purchases. They transform their produce mainly into cheese. They own 70 Ha plots for feeding the cows. There is also a full-time employee working on the transformation of milk into cheese. They are members of an Economic and Environmental Interest Group². They initiated this process for ethical and economic reasons. This is a case of change "along the way" with a mixed motivation source (CAW-MMS).

¹ BAC Grenelle: Water basins-catchments concerned by a nitrate content greater than 50 mg/L of water.

² Economic and Environmental Interest Groups: voluntary collectives of farmers, on the same territory, engaged in the process of changing their practices.

Data analysis

The data are collected using a diagram completed by the farmers but also by listening to recordings of the interview process. The data collected are processed according to four related categories in order to investigate Goal 3, "Identifying farmers' difficulties, goals and resources":

Table 1: Dimensions included in data processing

Category	Definition	Example
Difficulties	Event planned or not, the management of which requires the resolution of one or more problem(s)	Increased weeds ³ on some plots
Goals	Goals to achieve in the short, medium and long term on the farm	Working on living and self-fertile soil
Resources	Implemented by farmers to solve problems and achieve objectives	Buying a machine
Deficiencies	Absence of a goal and/or resource to deal with a problem	Lack of a goal and resources to overcome a difficulty: anticipation

We now focus on the implementation of the method "Building a chronicle of change" on these three case studies.

Results: implementation of the method "Building a chronicle of change" in three case studies

The nature of the difficulties, objectives and resources in changing agricultural practices as part of an agro-ecological transition

In this paper, we focus on the three dimensions: difficulties, goals and resources (we will study deficiencies in our talk). The method "Building a chronicle of change" allows us to identify different types for each of these three dimensions we summarize in Table 2.

Table 2: Nature of the difficulties, goals and resources

	Farmers converting to organic farming, SC-MMS	Grain farmer and breeder, BAC Grenelle, FC-EMS	Dairy farmer starting a methanation unit, CAW-MMS
Difficulties	<ul style="list-style-type: none"> - Economic - Technical - Related to climate change - Ethical - Social 	<ul style="list-style-type: none"> - Technical - Related to climate change - Equipment - Workload 	<ul style="list-style-type: none"> - Administrative - Financial strategy - Related to climate change - Relational : one's place in the working system
Goals	<ul style="list-style-type: none"> - Economic - Environmental - Exploratory - Working conditions 	<ul style="list-style-type: none"> - Economic - Environmental - Autonomy 	<ul style="list-style-type: none"> - Economic - Environmental - Technical - Diversification - Autonomy
Resources	<ul style="list-style-type: none"> - Economic - Technical - Environmental - Experimental - Network of agricultural actors 	<ul style="list-style-type: none"> - Technical 	<ul style="list-style-type: none"> - Expertise, knowledge and research - Technical - Human resource

Through these case studies we can see the nature of the difficulties, goals and different resources. If we first focus on the similarities observed in all case studies, we can see that the climate seems to be a difficulty that will impact farmers' activity in all contexts (e.g. farmers cannot return in the field because it just rained). Similarly, they all share the same environmental and economic goals. Moreover, in the context of SC-MMS, the economic aspect is present in three ways: in the difficulties (e.g. economic difficulties influenced the reflection on the conversion to organic farming), in the goals (e.g. by converting to organic farming, farmers want to achieve economic stability and each have income) and resources (e.g. farmers have invested a lot of money to purchase equipment to implement no-till organic farming on their farm). In all contexts the technical aspect seems to be a resource in the sense that farmers implement their own technical strategies to meet specific needs

³ Weeds are plants other than those sown by the farmer on a parcel.

(e.g. apply a tool several times to destroy the bean sprouts or build a tool to promote scalping weeding).

There are also differences. For example, the technical aspect represents a difficulty in the context of SC-MMS and FC-EMS, but not in the context of CAW-MMS. We may assume that a CAW-MMS promotes a better implementation and a better command of the various parameters of change. In the context of FC-EMS and CAW-MMS only, farmers are seeking autonomy for their farm. In the context of SC-MMS, farmers converting to organic farming have a working conditions goal. Finally, in the context of SC-MMS and CAW-MMS, we see the importance of farmers' knowledge and skills, but also that of the network of actors around them, as well as farmers' capacity and desire to try new things and learn.

We now want to clarify these different dimensions using the chronicle of change built for each of the three cases.

Illustrating difficulties, objectives and resources through the "Building a chronicle of change" method in the three case studies

In a context of structured change with mixed motivation sources, farmers converting to organic farming help to identify a goal: they want to work living soil (in black, Figure 2). To do so, the resource mobilized is biodiversity, by integrating new crops such as soybeans (in grey, Figure 2). The farmers seem to struggle with the inoculation of soybean: anticipation (in light color, Figure 2). Figure 2 captures three dimensions according to the chronology of change and also identifies "deficiencies" that appear in the change process: faced with the difficulty of the "Inoculation of soybeans: anticipation", the farmers have no objectives nor resources to overcome this challenge.

Farmer 1: "We want to do organic farming, but on a living soil. (...) Today, organic farming proposed and recommended in the county is (...) on inert soil to which one brings things labeled organic. (...) Other introductions are necessarily required because we followed a pretty simple system, binary, two plots, two crops, winter cereals, spring maize, finished. Wheat, corn, wheat, corn, we worked like that, which is not very good. We are integrating (...) soybeans, colza tomorrow, to move towards biodiversity."

Farmer 2: "If you introduce biodiversity, you solve disease, weed and fertility problems (...)."

...

Farmer 1: "We have a specific job in which we encountered a difficulty. (...) We incorporated soybeans in our rotation. This bloody soybean presents us with a problem. We are forced to inoculate it (...) once it's done, it will not keep, it is just in time. (...) You cannot do it 10 days before. You cannot anticipate."

We translate this dialogue as follows:

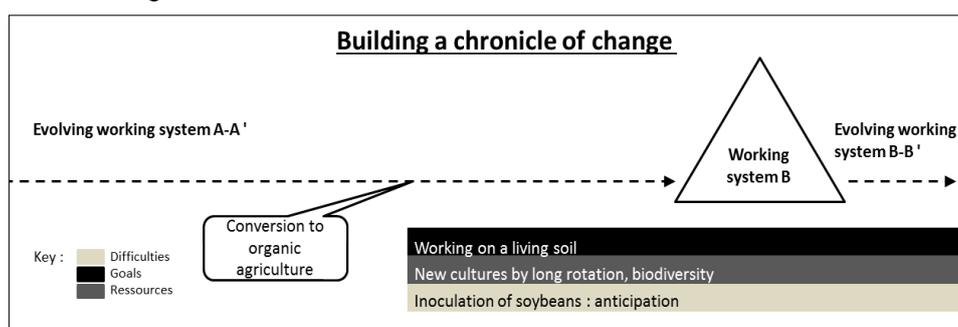


Figure 2 : Example of "Building a chronicle of change" in a context of SC-MMS

In a context of forced change with an external motivation source, the grain farmer and pig and cow breeder concerned by the BAC Grenelle helped to identify two types of goals: goals arising from constraints imposed by the BAC Grenelle and others set by the farmer (in black, Figure 3). The goal set for the farmer is to reduce the amount of nitrogen in their soils. However, this raises some difficulties leading to an increased workload (in light color, Figure 3). To meet the new requirements of the Grenelle BAC, the farmer had to tailor his practices by repeatedly using different tools, for example (in grey, Figure 3). In Figure 3, we can observe that the difficulties arise after a new objective and news resources are introduced. There are no set objectives and resources to face the new difficulties. We can speak of a "deficiency" in objectives and/or resources, for example looking at the "deficiency" in objectives and resources to make up for the absence of tools to destroy rapeseed.

Farmer: "The objectives of the BAC are to get to the start of winter with as little nitrogen in the plot as possible (...). Before, we would stubble the rapeseed and three weeks later, when there was a small carpet, we went over it with a tool to prevent it from growing (...). The only problem is that (...) now we must try to do it as soon as possible, sometimes (...) during the harvest, making the workload heavier than expected at a time when there is already a lot of work. (...) In late September we destroy the following crop (...). That is what is the most complicated (...) because the following crop of rapeseed (...) can be high like that and I don't have the tools to destroy them (...), I often need to go over it twice with two different tools, 3-4 days apart" (...)

(Talking about BAC Grenelle) "The experiment will last 5 years and if at the end of 5 years there are no results, (...) it will become mandatory" (...)

"This is even goal number 1: (...) to avoid the prefectural decree which would heavily affect revenue"

We translate this dialogue as follows:

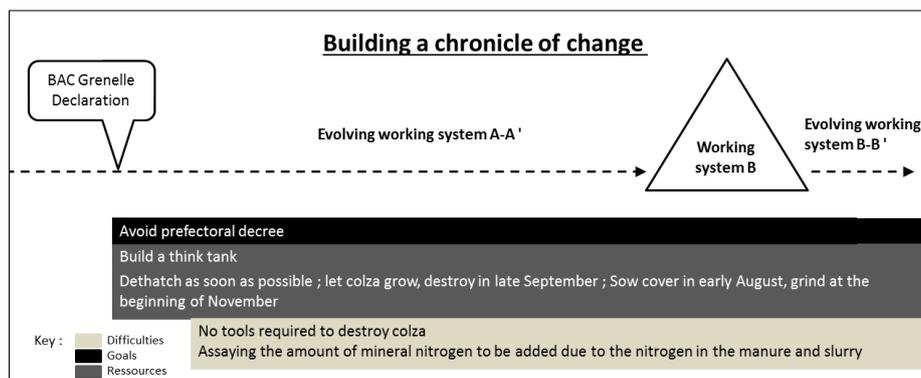


Figure 3 : Example of "Building a chronicle of change" in a context of CC-EMS

In a context of change "along the way" with a mixed motivation source, the case of the dairy farmer starting a methanation unit shed light on a difficulty that the farmer has to face: the formation of a group against methanation (in light color, Figure 4). This period extended over two months (April – November 2015). His knowledge of neighboring villagers and farmers allowed him to ease tensions against the construction of the methanation unit (in grey, Figure 4). Figure 4 shows a difficulty raised by the construction of the methanation unit, which the farmer overcame. The difficulty was thus temporary and the farmer was able to keep and reallocate some of the resources mobilized to address it.

Farmer: "There was a big problem (...) A group of neighbors organized against us, and here I would say that to know your general environment, that is to say to know your neighboring farmers but also to know your neighbors, who does what, how they reacted, (...) to have knowledge of the environment (...) is important because otherwise I think I would not have been able to manage this phase. I went to see (...), individually, I went to see several of them (...). I knew that everyone did not expect the same thing from me at all, because their reasons for opposing methanation were not at all the same (...). I waited for this famous meeting where they wanted to create this group to do it (present methanation), while they were not expecting it."

We translate this dialogue as follows:

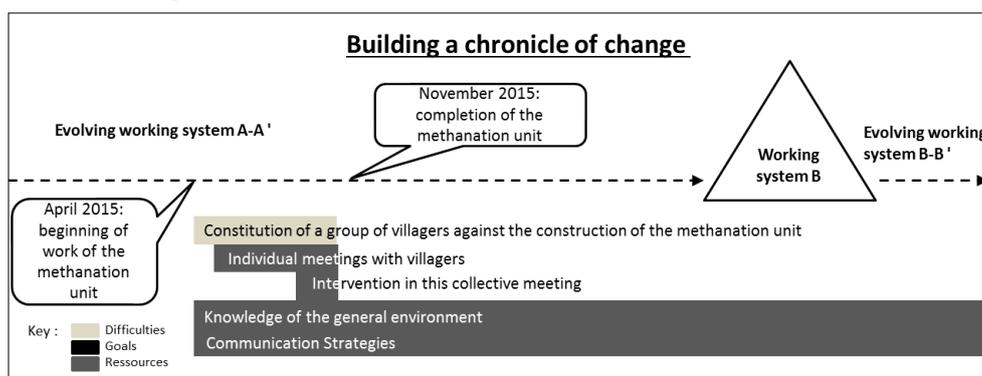


Figure 4: Example of "Building a chronicle of change" in a context of CAW-MMS

This representation sheds light on the temporality of the processes of change. For example we have good insight into the difficulties faced by farmers but also those who have not yet found solutions. This representation therefore allows us to identify several "deficiencies" over time. This representation is also precious as it allows the interviewer to present his/her understanding of the situation to the

farmers and to make it directly evolve. We thus consider this representation as an interesting tool to work with the farmers. These deficiencies seem very promising to us as they reveal some discrepancies within the work of the farmers, between their resources, their goals and their difficulties. They can be targeted as the main factors on which to focus our work in an “Enabling intervention in the management of change”.

Discussion

This first step of the “Enabling intervention in the management of change” has allowed us to build a diagnosis, with the farmers, of the farm and the management of change on the farm from the perspective of their real work. This co-diagnosis must be organized and shaped to initiate a common discussion with farmers in order to initiate a reflexive practice among the farmers. This restitution-discussion would help achieve a strategic, socially constructed, participatory, and collaborative and constructive management of change, as described by Barcellini (2015) in the context of a structured change project. However, we have not a structured change project in the agricultural sector. We should investigate whether the different changing contexts studied allow change management as a project, and if not, we should continue to investigate the field to adapt this method to a new context.

We still posit that this method, “Building a chronicle of change”, is an interesting way to begin an “Enabling intervention in the management of change” as it helps to provide an analysis of the process of change: it furthers our understanding of the overall system in which the farmer and his work (discussed with the farmer in the first exploratory interview) belong. Moreover, it provides a visual representation of the change which can support the interviewer but also the farmer. Finally, it reveals some information about difficulties, objectives, resources and deficiencies. The older ones, already managed by the farmers, can be very interesting to study to understand how the farmer coped with them, for example. Difficulties, goals and resources are real anchorage points for transformation and thus for the design of new enabling work situations for farmers. The identified “deficiencies” can also be real anchorage points to do so. This is based on the premise that this method could allow us to identify enabling features and disabling features of farmers’ working environment to (i) develop and lead an “Enabling intervention in the management of change” on a farm, and (ii) characterize the change of perspective on the concept of “enabling environment”. Based on the identification of these “features”, we wish to work with farmers to overcome disabling “features” and to consider how to recover, strengthen/amplify (if necessary) and preserve enabling “features”. We also posit that changes in agricultural practices induce these enabling or disabling “features” of the work environment, which can themselves evolve during the change introduced on the farm: these “features” are not linear and fixed in time and space. We must regularly review the status of these “features” to have a real impact on them.

Moreover, implementing the method “Building a chronicle of change” with farmers revealed another function of the method: at the end of the interview, a farmer shared his thoughts about farm work more generally and the role of farmers in society. The representation of agricultural labor in society seems to be extremely important for some of the farmers we met. That is why we believe that changing agricultural practices cannot be treated separately from the agricultural and social work system in which farmers are embedded. This social aspect should be taken into account in the “Enabling intervention in the management of change”. Moreover, for our method to improve, it seems necessary to strengthen the coherence of the first and second interviews – “understanding the farmer’s work” and “understanding and analyzing change”, respectively – and of the analysis of the activity carried out through observations. One point still remains to be addressed: it is currently not yet entirely clear whether or not our desire to initiate reflection among farmers is a success. For the SC-MMS, our method, “Building a chronicle of change”, seems to have an effect on farmers’ vision of their work and on their management of change. For example, they voiced that one of their goals was to anticipate, a goal which appeared thanks to our method. They had neither made them explicit nor discussed them among themselves before the interview. We must research the literature regarding reflexivity, in order to have a more precise assessment of our method on this point. However we can also see two other possibilities to increase farmers’ reflexivity: to continue to make our approach evolve in this direction,

and/or to further focus our efforts on discussions with farmers about the constructed representation of the farm and the management of change.

Finally, this study is geared towards the development and modeling of “Enabling intervention in the management of change”. It endeavors to offer another perspective on the concept of agroecology by putting farmers and their work at the center of the analysis. We are currently working on how to integrate the concept of sustainable employment (Gollac, Guyot & Volkoff, 2008) into the “Enabling environment” (Falzon, 2005) to enrich and support these ambitions.

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