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SUPPORTING AGRO-ECOLOGICAL TRANSITION ON FARMS: CO-DESIGNING A CHANGE MANAGEMENT SUPPORT APPROACH

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KEYWORDS

Design, agro-ecological transition, activity-centered ergonomics, reflective activity, projective activity.

SUMMATIVE STATEMENT

The agro-ecological transition requires farmers to redesign their work system. To support farmers' change towards agroecology, we develop an ergonomics "enabling intervention" in a change management context to help them in the development of their design activity. By allowing farmers to reflect on their trajectories and their project regarding agroecology transition, our research-intervention aims at enhancing the farmers' capacity to design their work systems. Also, this research-intervention aims at equipping agricultural change management facilitators - who are not ergonomists - (e.g. farmers' advisors) with tool designed to embed the farmers' work in their counselling approach. These pursued goals require to design approaches, particularly tools, positioning farmers as work system designers. This is what we are trying to do in this research-intervention.

PROBLEM STATEMENT

In France, several agricultural and political actors promote agroecology to cope with the major economic, environmental and societal challenges that agriculture must face. A transition towards agroecology involves profound changes in the work of farmers and usual forms of agricultural advice are challenged. Thus, support approaches need to be designed, both for and by farmers, but also with the actors who accompany farmers to fit their own work constraints in the context of the agro-ecological transition.

RESEARCH OBJECTIVE

This research-intervention is situated in the activity-centered ergonomics community, especially constructive ergonomics (Falzon, 2014) which aims at the worker's development in and by his/her work. Our intervention intends to be enabling. "Enabling" is used with the meaning proposed by Constructive Ergonomics (Falzon, 2014), in reference to Sen's work (2003). That is to say building an organization that promotes the emergence and development of organizational rules, allows individuals and collectives to act effectively, to safeguard their health, to be in a

learning process and to develop themselves (Arnoud, 2013; Coutarel & Petit, 2009 ; Daniellou & Coutarel, 2007; Falzon, 2005 ; Barcellini, 2015). In this sense, the epistemic dimension of our work deals with a better conceptualisation of what an “enabling intervention” deployed on a case study and in a sustainable manner could be. We focus on the developmental aspect of this intervention. It may therefore be assumed that enabling interventions have to support *reflective activity* regarding the way farmers manage changes ; and *projective activity*, dealing with the development of new strategies for farmers to cope with change. We regard the reflective activity as an activity allowing the worker to construct a reflection on their past action (i.e. Barcellini & al., 2014; Mollo & Nascimento, 2014), and the projective activity as an activity to construct a reflection on the possible areas of future actions, taking into account past actions. Thus we aim at designing tools that will support the transformative change of farmers’ work and that will eventually equip the work of the facilitators of agricultural change management. These tools are the methodological ground of our change management approach. In this communication, we focus on how we design these tools with farmers.

METHODOLOGY

a. Case study

We work with 4 farms and 6 facilitators. In this communication, we concentrate on one of the cases that we follow more particularly. We are intervening with two grain farmers, who have been partners for 4 years and who have been converting to organic for one and a half years. Their partnership is a limited company located in the Centre of France. Their motivations for initiating this process are ethical and economic. These farmers have to comply with the specifications of organic farming which advocate the protection of rural areas and the strengthening of the social fabric. It is characterized mainly by the non-use of synthetic products of crop protection and fertilization in crops and the implementation of methods allowing the renewal of biodiversity and its preservation. Previously practicing no-tillage crop production, they have maintained this practice. This practice, coupled with the conversion to organic, seems to be very difficult in terms of work. The combination of organic farming and no-tillage crop corresponds to an agriculture recognized as extremely difficult to implement and to sustain in the agricultural world (Lefèvre, 2013).

b. Design and implementation of two tools supporting the transformative change of farmer's work

Our change management support approach is composed of two tools, one supporting the reflective activity, and the second supporting the projective one.

- 1) The “Chronicle of change”: this tool aims at providing several items to farmers : (i) to generate a discussion about change ; (ii) to outline the change process according to the determinants of the farmer’s work and (iii) to support the farmers’ reflexive development. To do that, the Chronicle of change requires an interest in the difficulties, the goals and the resources of farmers. Figure 1 illustrates this tool.



Figure 1 : The Chronicle of change

Figure 1 shows the support representing a historical timeline. Several post-its representing objectives, difficulties and resources have been written and positioned by farmers with the help of the ergonomist. The ergonomist works regularly with farmers to complete the Chronicle of change. The basis of this tool was built by the ergonomist ; its building has been continued by the farmers when experimented in the actual context of their farm.

2) The "Dis-jumble": this tool aims at providing several items for farmers : (i) to plan their various tasks, (ii) to anticipate their different tasks and what each requires the farmer to do, (iii) to have a reflection on what they have done, (iv) to have a reflection on what they wish to do, (v) to have a reflection on what they think of the various difficulties encountered and objectives set, (vi) to revise this "scheduling" in real time through actual work and (vii) to have a traceability of their actual work to see the future work (adjustment, regulation, reflexivity). Figure 2 illustrates this tool.



Figure 2 : The Dis-jumble

Figure 2 shows a type of task planning moving. Different colors and different lines allow the use of this support. This tool has been designed only by farmers, with the presence of the ergonomist.

These two tools stay in the farm to be used by the farmers when they need to.

c. Methods of data collection and analysis

Several meetings with the farmers in their farm allowed them to manipulate and to push forward the two tools. Our main interest will be the experimentation of these tools and the continued designing of these tools in farm by farmers. For that we analyse interviews (audio data) and workshops (video data) and identify the direct impacts of the farmers on the design of the tools :

- The Chronicle of change: a first support and functioning was proposed to farmers. The support is positioned in the farm. The ergonomist comes once a month to complete it with farmers using post-its. Our question is to understand how farmers participate in the modification of the tool by using it. To answer that, we analyze five interviews and the evolution of the support.
- The Dis-jumble : farmers designed the support in two steps. First they drew it on a scrap paper. Secondly the ergonomist asked them to design it on a solid and malleable support. Our question is dual. First, what criteria from the point of view of their work appear in this conception ? Secondly, what types of exchanges does the design of this tool create between farmers ? To answer these questions, we analyze two movies : two sessions of design. First a draft design with paper and pencil. Secondly, a “solid” design during which the ergonomist proposed different materials to use : plated metal, magnets, post its, colored papers, etc..

RESULTS

The *reflective tool* “Chronicle of change” was designed by the ergonomist to underline different dimensions in change management (goals, difficulties and resources). It helps the farmers to step back from their trajectories of change and work management. During its use, the farmers and the ergonomist agreed on the definition of different components of the support like post-its, lines, etc.; the farmers also appropriated the specific words of the ergonomist like “agricultural work system”, “resource”. Farmers expressed their doubts: “I have trouble, I need an example”; and their difficulties to use the support “They are not easy to use, your post-it, because there are many of them”. Thus, the ergonomist proposed adjustments over the use of the support such as : “I simplified it a bit because (...) there was too much information”. Farmers also expressed their needs concerning the use of the Chronicle of change : “We must read again a little what we have already put” speaking of post-its written earlier. The ergonomist kept an open attitude towards the proposals of the farmers, to which he answered : “We can take again (the post-it written at the latest interview) and we see (today) where you are and we see if we add new things ?”.

Farmers and ergonomist made the rules of the use of the “Chronicle of change” evolve through its experimentation. For example, at the first use, a farmer proposed : “We are gonna talk more and you (ergonomist) are gonna put the post-its”. At the fourth utilization, the ergonomist proposed : “Maybe it would be good for you to take control of it”, speaking about post-its.



The *projective tool* “Dis-jumble” was designed by the farmers themselves with the help of the ergonomist, in order to facilitate its sustainability for farmers. The two farmers decided to organize their tool along two main elements: a time scale (two years) and the crops (spring/ autumn). The functioning of this tool is based on the dispersion of magnets indicating mainly an action, in time and concerning a crop, for example : to sow the wheat. These magnets are used to allow the farmers to adjust the planned action in real-time.

Thanks to this process, farmers engaged in a projective activity. They exchanged and adjusted their vision of work and what they were planning to do. We realize farmers did that thanks to a reflexive activity : they reflected on what they had done the previous year to plan forthcoming work. For example, a farmer explained to the other : “Remember last year, we struggled to harvest the faba bean as

it was too ripe. We should anticipate and harvest the faba when we harvest the wheat, or even before the wheat". The reflexive activity seems to be necessary to develop a projective activity. Also, it helps farmers to take decisions and to develop new strategies for more efficiency. For example : Farmer 1 "We may improve our system if (...) I do not know if it is possible, but we might find a variety of faba bean that could be harvested in early July" ; Farmer 2 "We would not have to bother to store it for a year". An over example : Farmer 1 "There is order and delivery, these are 2 different things" Farmer 2 : "It happens a week or 2 between those 2 (...) because if we don't anticipate, we are lousy" Farmer 1 : "Yes". Thus, this tool seems to support the farmers to reflect on new operating rules in order to cope with difficulties and goals identified thanks to the chronicle of change.

DISCUSSION

The work described in this communication is a "one-shot" experiment, but a key challenge of our research in order to promote the "sustainability" of our approach is the development of the use of our tools by agricultural change management facilitators actually advising farmers. This may imply: (1) construction of a large scale deployment approach with facilitators and (2) refinements of our tools. The problematic point, seems to be the difficulty of the two different approaches : technical approach / work approach. Facilitators are, in part, animators or advisors working with an approach rather targeted at the technical side whereas the ergonomist's approach is rather targeted at the working side. Thus, it seems very important to reflect on the transfer, appropriation and re-designing of tools by facilitators based on their taking into account the farmer's real work.

CONCLUSIONS AND PERSPECTIVES

This research-intervention allows us to support farmers in the design of new work situations by designing - with them - *ad hoc* reflective and projective tools. But a key issue of our work is to deploy the approach on a broader scale and thus to transfer it to change management facilitators. The tools have been presented to agricultural facilitators and seem to meet some of their needs to accompany farmers in the agro-ecological transition. Thus, we will follow a second step : to continuing their design with agricultural facilitators by making them use the tools by themselves and by collecting their feedbacks through observations of their work. A design workshop will help the appropriation and adaptation of these tools to the work of these facilitators.

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