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25. A participatory design approach to promote sustainable cattle breeding products and practices in Western France

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Abstract

The Maraichine is a local cattle breed originating from the Atlantic coastal marshlands. The extensive breeding of these hardy cows respects the ecological and hydrological functioning of wet grasslands. Yet, as these cows are poorly valued by the meat industry, new ways of promoting the breed are to be explored. The research presented here consisted in the implementation of a participatory design approach, using the KCP (Knowledge-Concepts-Proposals) method. This participatory design approach was set up on the basis of a long-standing collaboration between local researchers and farmers, and on a preliminary sociological diagnostic. Four workshops were conducted in 2020-2021, bringing together a total of sixty varied stakeholders: farmers, naturalists, consumers, institutional actors, researchers, meat industry intermediaries, etc. At each stage, the organizers did their best to ensure that the research-intervention approach integrated stakeholders' divergent views, was co-constructed, and accounted for the Maraichine breeding's current trajectory. Nevertheless, it raises ethical questions about the position of researchers as well as the involvement of, and appropriation by, stakeholders. This paper presents a reflexive analysis of this collective experience.

Keywords: intervention-research, collective design process, research stance, extensive farming, local cattle breed

Introduction

Scientists and citizens are increasingly calling for agriculture to guarantee food product quality while preserving biodiversity, natural resources and ecosystems. Extensive breeding of small-scale local breeds is in line with these issues (Audiot, 1995). The 'Association for the promotion of the Maraichine cattle breed and wet grasslands' (MA Association) was created in 1986 in western France to develop a conservation programme of the Maraichine local breed. While in the 80's breeders used to own 1 to 4 cows in order to maintain their wet grasslands and for heritage purposes, today the Maraichine population has reached 1,666 females for 127 breeders. Since the beginning, this programme has linked the breed conservation with the preservation of wet grasslands, which used to be important in this region and which provide a large range of ecosystem services (biodiversity preservation, water regulation, etc.). The MA Association has thus traditionally selected hardy cows, allowing extensive breeding methods that respect the ecological and hydrological functioning of wet grasslands. However, these cows are poorly valued by the meat industry, which essentially remunerates breeders according to the animals' meat yield.

Since the 2000s, farmers have tried to develop direct marketing strategies as an alternative supply chain for Maraichine animals to increase their value-added (Steyaert *et al.*, 2007). So far, marketing in short supply chain remained confined to on-farm direct sales coexisting with long supply chains. Projects of collective marketing indeed came up against technical difficulties such as managing the balance

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between meat pieces or supplying products all year round. Above all, these projects were confronted to diverging farmer representations with regard to many issues: MA breed (genetic) characteristics, wet grasslands values and best management practices, as well as MA breeding (in particular fattening) practices. In 2005, a project attempting to implement an official quality sign approach failed due to such disagreements (Roche *et al.*, 2006). While many farmers still wish to set up collective approaches for promoting the MA breed, they stump over their contrasted points of view.

On the basis of a 30 year-long collaboration, a research team from INRAE proposed to the MA Association to tackle this issue by setting up a participatory design approach. They applied the KCP (Knowledge-Concepts-Proposals) method (Hatchuel *et al.*, 2009, Hooge *et al.*, 2017), a method developed on the basis of Concept-Knowledge (C-K) design theory (Hatchuel and Weil, 2009). This method aims to make the participants identify knowledge gaps, acquire new knowledge, then reflect on desirable solutions to common problems. Over the past decade, this method, initially developed for industrial contexts, has been applied in diverse agricultural and environmental contexts and for various purposes (Labatut and Hooge, 2016, Pluchinotta *et al.*, 2019, Berthet *et al.*, 2020).

This paper reports on the implementation of the KCP method in the Maraichine breeding case, and points at some reflexivity issues when implementing such intervention-research approaches.

Methodology

KCP is a method elaborated to enable a large collective to conduct innovative design thinking. It helps overcoming two types of obstacles: a cognitive one related to fixation effects hindering creativity, and an organizational one related to the fact that radical changes may threaten the cohesion of a collective. To that end, once a collective problem is framed, the method consists in: (1) identifying stakeholders' fixation effects and needs for collective learning; (2) generating a diversity of alternative solutions to the problem at stake; (3) developing an innovative design strategy that fosters commitment.

The KCP method is based on the organisation of workshops and consists in four phases presented below (Figure 1). In order to adapt to farmers' constraints, four successive half-day workshops were held in a central location for the members of the MA Association. Two workshops were devoted to knowledge sharing; a third workshop consisted in the collective exploration of innovative ideas; a last workshop allowed the participants to co-construct concrete projects. The workshops were held between February 2020 and May 2021; they were supposed to take place every two months, but the covid-19 health crisis caused a delay of several months.

Phase D: diagnosis and framing

To begin with, a team of four researchers and two farmers was formed to lead the KCP process. This team was the operational arm of the project steering committee composed of six researchers, five farmers and one consumer. Phase D starts prior to the series of workshops and is carried out by the KCP organizing team. Its purpose is to identify the objectives, the workshop participants to invite, and the practical organizational details. It also consists in developing a range of tools to facilitate knowledge sharing, creative idea exploration and concrete project elaboration. The question formulated to launch the design process was the following: 'What collective mechanism(s) to communicate about, protect and value a heritage made up of both the Maraichine and the wet grasslands?'








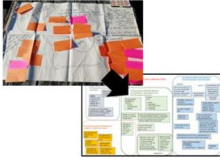

KCP Phases	Phase D: Framing	Phase K: Knowledge Sharing	Phase C: Exploration of ideas	Phase P: Elaboration of projects
Photos of the workshops				
Tools used	Ex-ante and ex-post questionnaires Control exploration map (with CK formalism)	 Expert presentations	 Mood boards	 Project canvasses
Outputs		 Knowledge sheets	 Posters with ideas	 Project description

Figure 1. Photos of the workshops, tools used and outputs related to each KCP phase.

Phase K: knowledge sharing

The objectives of this phase are to identify knowledge gaps and start filling them, and to share individual knowledge and experience among heterogeneous stakeholders. Through presentations and feedback from seven different experts, knowledge on various topics (e.g. short supply chains, consumer expectations, innovative examples of local breed valuation, issues related to wetland ecology and management) was provided and shared. This phase ended with a discussion on the very issue to collectively tackle and the identification of relevant, original and contrasted concepts -or original ideas of interest- to explore in the next phase.

Phase C: exploration of ideas

Phase C consists in a directed creativity approach. The four spotlight concepts defined were the following: ‘The Maraichine, the traditional cow of tomorrow’; ‘The Maraichine at a fair price for all’; ‘The Maraichine, a solar cow’; and ‘A well-valued diversity’. Such concepts needed to be both specific enough and open enough to guide exploration. The participants were split into subgroups of five or six people. The subgroups were composed in such a way as to reflect a mix of backgrounds. Each subgroup explored one spotlight concept and used at its convenience a mood board, a design tool aiming to stimulate creativity elaborated by the KCP organizing team. After a short period of individual reflection, the participants shared their ideas. On paperboards, each subgroup categorized the individual ideas written down on post-its. At the end of this phase, the results consisted of posters compiling the ideas of each subgroup (Figure 1). These posters were collectively shared and discussed.

Phase P: elaboration of projects

The objective of this last phase is to move from exploring a large number of ideas to developing a few concrete projects. Two project canvasses were proposed to the participants, the first one to define the

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project as such (objective, means, skills and knowledge required, actors involved, etc.), the other one to develop an action plan to implement the project. Again, each subgroup reported its results to all the participants and discussions followed.

All workshops were audio or video recorded and transcribed for data analysis. The KCP organizing team compiled and digitalized all workshop outputs (Figure 1): the knowledge shared during Phase K; the posters elaborated in Phase P containing the participants' ideas; and the project canvasses filled in Phase P. Data compilation relied on both written and audio material. All data were made available to the workshop participants and the MA Association members through a detailed report, a synthetic leaflet and a public restitution. Questionnaires were sent before and after the series of workshops to assess to what extent the participants found the participatory design approach useful and fruitful.

Results

More than a hundred of ideas were proposed by the participants, on various themes, such as ethics in cattle breeding, revisiting traditions, allowing the coexistence of diverse farming systems, improving supply chain governance, allowing a collective definition of prices, or enhancing communication.

Three formalised projects were developed during the last workshop. The motivation for Project 1 was to raise awareness among young people about extensive farming; for Project 2, it was to relocate the production of calves; and for Project 3, the idea was to think about a governance and business model for the marketing of Maraichine meat. While their initial motivations differed, the projects ended up with being quite related. In project 1, public awareness is raised through interventions in schools via courses and/or visits or training courses on farms, while in the project 2 it is done through the consumption of meat in school canteens. Projects 2 and 3 overlap and complement each other on the idea of encouraging the micro-supply chain named 'Biodiversités Maraichines', set up by a local group of farmers in 2020 in parallel to the KCP process, to integrate collective catering (in schools, local communities and companies). Yet, on the one hand, Project 2 focuses on the skills and knowledge farmers should acquire to convince catering establishments to buy local Maraichine veal. It also tackles the collective organization farmers should set up to ensure a regular supply of canteens. On the other hand, Project 3 deals with the functioning of the micro-supply chain as a whole, i.e. it addresses the problem of defining quality criteria specific to the Maraichine, the need for farmers to know more about carcasses in order to be able to work with butchers, and the need to have a person in charge of communicating with the general public about what Maraichine breeding represents.

Our analysis reveals that the overlap between these projects is due to the fact that they are inspired by ideas from all the posters from phase C. Further, the three projects do not reflect the diversity of the ideas raised in Phase C. The outputs of phase C can thus be seen as 'reservoir ideas' and sources of potential other projects that could be initiated later on.

Regarding participation dynamics, the workshops gathered a total of sixty various stakeholders: farmers, naturalists, consumers, institutional actors, researchers, meat industry intermediaries. Yet, this participation lessened in terms of numbers and diversity along the KCP process: whereas the first workshop gathered 33 participants with highly diverse profiles, the fourth one counted 17 participants, only composed of research actors and farmers.

Discussion

Such an exploratory and participatory process appeared as promising to build fruitful interactions not only between farmers, but also between farmers and other actors of the meat supply chain, to maintain

a local breed for biodiversity preservation and local heritage conservation. The objective was to involve a diversity of supply-chain actors to explore both original and feasible solutions. Nevertheless, collectively designing new projects is challenging and conducting such an intervention-research process calls for reflexivity and assessment (Hazard *et al.*, 2020). At the time we are writing this paper, this analysis is ongoing. We present here preliminary insights about exploration and participation dynamics assessment, and about the involved researchers' roles and stances.

Assessing the exploration process

Agroecological innovation depends both on changes in knowledge (e.g. greater integration of knowledge about ecosystem regulations) and on changes in the social interactions inherent in knowledge production. It requires mobilizing a growing range of stakeholders with multiple perspectives as well as hybridizing scientific and stakeholder knowledge. March (1991) distinguishes two types of innovation processes: exploitation and exploration. Exploitation qualifies incremental improvements, which do not require the production of radically new knowledge, in order to achieve clearly defined objectives. Exploration means 'search for new knowledge, use of unfamiliar technologies, and creation of products with unknown demand' (Greve, 2007). They are processes for which objectives, performance criteria and required knowledge are not pre-identified.

Enabling the identification of knowledge gaps and providing tools to foster creativity, KCP is oriented toward innovative design. Our first assessment of the Maraichine KCP design process thus deals with the 'quality' of the exploration process. Regarding knowledge extension, most knowledge shared and discussed was closely related to the field of cattle breeding, yet inspiring examples from other regions as well as innovative tools were introduced to the participants. Furthermore, the number of ideas explored and proposed by the participants was very high (more than a hundred); their originality for the field remains to be assessed. Finally, the projects developed at the end are not radically innovative, and for some of them, have already been initiated by some pioneering members of the MA Association.

Collective design workshops are typically places where farmers exchange, learn and transform themselves (Hazard *et al.*, 2020). We tried to capture these changes through various tools: questionnaires were distributed to the participants before and after the series of workshops; the process was discussed several times with the research project's steering committee; all workshops were recorded and transcribed. Our conclusion to date is that in this particular case, even if the KCP process allowed the accumulation of valuable knowledge and the exploration of many ideas, it was not so much implemented to generate radical innovation as to create a shared project to which most farmers of the Maraichine association could agree with and commit to.

Workshop format and participation dynamics

The format of the KCP process had advantages regarding farmers' constraints and organization, but also limitations. The first limitation is the lack of continuity between the workshops, exacerbated by the COVID-19 crisis: one year passed between the two K-workshops. The transition between the second Workshop K and Workshop C encompassed a fruitful collective discussion (face-to-face then remotely) for the formulation of the spotlight concepts. However, the month separating each phase (K, C and P) impeded fluidity and reuse of content for the following workshop. The second limitation was the difficulty to involve heterogeneous stakeholders who not all had the same degree of involvement and expectations with regard to the approach over the long term. Although a group of motivated and dynamic farmers was present all throughout the process, the erosion of participation (in terms of number and diversity) as the workshops progressed attested to this difficulty. This is a current difficulty in applying the KCP method, initially created for companies in which there are clearly shared objectives

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and a management authority that can oblige employees to participate in workshops, in contexts where one seeks to bring together diverse territorial actors in a common design process. Comparisons with other KCP formats implemented in the agricultural sector are ongoing.

Researchers' roles and stances

Finally, the role of researchers in such a participatory and exploratory process is a central element in its dynamics (Hazard *et al.*, 2020). Such a role of enabling collective design is not well described in the literature: it is close to the 'honest broker' category proposed by Crouzat *et al.* (2018), who aims at 'expanding the range of proposed policy alternatives'; yet to do so, '[honest brokers] combine diverse sources of knowledge to achieve consensual and innovative outcomes.' They do not drive collective exploration as researchers may contribute while organizing a collective design process.

The researchers carried out several diagnoses prior to the KCP process, analysing social, agronomic and cognitive aspects, then shared and discussed the results with the local stakeholders. At each stage, the KCP organizers did their best to ensure that the intervention-research approach integrated stakeholders' divergent views, was co-constructed, and accounted for the MA Association's current trajectory: they co-designed and co-organised the KCP process; the initial question, the needs for knowledge inputs as well as the spotlight concepts were also collectively defined. Some researchers played the role of workshop facilitators, others contributed to the production of ideas and knowledge in the same way as other participants.

In such a collective design process, power relations can be critical to its success and the adhesion to the process outputs. Yet, dealing with power relations depends not only on facilitators' skills, but also on other factors such as methodological choices, stakeholder scouting or social context understanding (Barnaud and Van Paassen, 2013). When choosing to produce scientific knowledge by interacting with stakeholders, researchers are exposed to their values and interests; this creates a commitment to these stakeholders, and hence a responsibility (Hazard *et al.*, 2020). We consider that this experience is typically what Ansell and Bartenberger (2016) qualify as 'generative experimentalism': conducted on the long term, such an experimental process seeks to generate new, and above all relevant solution concepts, to a specific situation. It requires iteration and dialog, thus necessitates long term collaborations. The KCP collective design process presented here, which lasted about two years, was only a step in the collaboration between INRAE researchers and MA Association, and more generally in the MA cattle breeding and wetland management trajectories.

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