Lessons learned from the implementation of three different research postures within a participatory research framework

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Abstract
This paper analyses how the use of different research postures (participatory, ecocentric and technocentric approaches) in participatory research with organic farmers can lead to misunderstanding and legitimacy questioning, and therefore to tensions between the different actors involved (funding administrators, advisory services, farmers and researchers). This underlines the importance of clarifying the commitment of different partners involved in participatory research as early as possible in the research process to limit any misinterpretation, develop trust and enable collaboration. To ensure an effective process, including agreement of targets, it is recommended that funding should be made available to allow sufficient time for a staged approach with a diagnostic phase, including charactersiation of the diversity of farming systems within a sector, followed by a participatory research phase to test innovative approaches to solve a shared problem. Finally, for a successful outcome, researchers must be equipped and trained in the implementation and facilitation of participatory research methodologies.

1. Introduction

To support the development of organic farming in Wallonia (Belgium), the Walloon Government commissioned the Walloon Agricultural Research Center (CRA-W) to define and complete a global research program dedicated to the organic sector. Up until this point, with the exception of a few short projects conducted by 2-3 researchers interested in the potential of this mode of production, the CRA-W had not developed expertise in this sector. To initiate the project, a working group was set up and a research program proposed and validated by institution, administration and sector representatives. The program included the three research postures proposed by Bawden (1997): (1) technocentric approaches aiming to investigate the effect of individual factors of production (e.g. bio product treatments, plant varieties, weeding techniques etc.), (2) ecocentric approaches focusing on the characterisation and performance of organic farming systems (the analysis of nutrient, biomass and cash fluxes/flows) and (3) holocentric approaches that aim to implement a participatory approach involving organic farmers, organic farmer representatives, researchers and advisers in the definition of research questions (Barnaud, 2013) and of possible solutions they are interested in exploring.

As defined by Hess (1989), participatory research can be defined as “a collective process linking researchers and practitioners to solve a problem, (enabling access to) knowledge (that is) directly relevant to actors’ practices”. Such an approach aims to encourage (1) social and individual learning, (2) improved understanding of the issues from multiple perspectives, and therefore the selection of appropriate solutions and (3) collaborative relationships (Blackstock *et al*., 2007). Involvement of practitioners in the definition and/or validation of potential solutions is also expected to improve transfer of research and innovation into practice, as underlined in the EIP (European Innovation Partnership), ‘bottom–up’ (as opposed to ‘top-down’) dynamic.

To develop and support this participatory research dynamic, groups of pilot farmers were set up under the responsibility of a 'moderator'. This moderator was a researcher whose mission was, on the one hand, to manage and sustain the interactions between the farmers involved in the group (individual visits, group dynamic development, thematic meeting organization and circulation of information between group members) and, on the other hand, to perform research to characterise farming systems, and to identify and test innovative practices. The researcher/moderator had to meet the expectations of (1) their institution, testing this participatory research model as a prototype that could potentially be promoted in future research programs, (2) the farmers within the group expecting rapid and reliable feedback and (3) the administration and organic sector representatives charged with validating the research program and providing annual funding. Researchers were therefore expected to perform the dual roles of moderator (for a diversity of farmer, advisory service and administration expectations) and researcher, mobilising a diversity of disciplines to employ a systemic participatory approach.

This situation gave rise to tensions between groups and individuals that were linked to multiple "misunderstanding" and legitimacy issues, including legitimacy of the researcher's moderator role; the method used; the knowledge provided; and of the research questions produced (Barnaud, 2013).

The main objective of this paper was to highlight how the adoption of contrasting research postures can, on the one hand mitigate, or on the other hand, exacerbate these tensions. Participatory research methods are presented, with analysis of the ways that different researchers involved in these methods have addressed these tensions. The characteristics of the results obtained and how they are perceived by sector representatives are also highlighted. This is a working paper that uses an ex-post approach to understand the challenges faced by different researchers during their interactions with farmer groups.

2. Initiation of the interactions

The initiative was launched in November 2013 with an invitation to tender in the agricultural press describing the project context and aims: to understand farm practices and farm system functioning through observation of soil/plant/animal interactions; to identify 'brakes' on production and their origin; and to test solutions in partnership with scientific institutions. Ninety applications were received and two members of the project team (Dalley *et al*., 2014), one junior and one senior scientist, visited the potential monitor farmers to discuss their farming system, their interest in joining the project and their main research questions (Stilmant *et al*., 2015). Over 40 organic farms, covering a wide diversity of systems, were invited to join the project, share their expertise and provide access to their farms; thereby forming a regional farm network (Dalley *et al*., 2014). The farms were allocated to three groups (dairy & meat; monogastric & crop; and fruit & vegetable). Each group was moderated by a researcher. An agreement was signed with each farmer. The farmers agreed to participate in 2 to 3 collective meetings each year, and to record and share farm performance indicators, while researchers agreed to provide confidentiality, anonymity and frequent feedback on their assessments. It was also made clear that this collaboration would follow a research rather than an advisory framework.

Different dynamics were initiated by the researchers in charge of the facilitation of each group, in line with (1) the questions highlighted in farmer interviews and in independent focus groups with farmer unions, administration, advisory service and research teams (Stilmant *et al*., 2015), (2) the interest of the farmers involved and (3) researcher expertise. Group discussions and interactions

were also influenced to some extent by pressure from public administration and organic sector representative organisations.

3. Setting up participatory research

At project inception, working groups agreed the research approaches or postures to be used, the methods and frequency of communication between different groups (e.g. farmers and researchers) and the common actions to be carried out on each farm within the different sectors (dairy & meat; monogastric & crop; and fruit & vegetable). This initial process involved researchers acting as moderators and socio-anthropologists to facilitate and prepare the working group for participatory research at an early stage in exchanges between farmers and researchers.

Following discussions within the dairy & meat network, the researcher, who was a junior scientist qualified in livestock production, proposed to characterise feed and fodder use and to evaluate the diversity and autonomy of production systems. Farmers were then invited to join one of a number of topics (e.g. dairy cattle grazing management, heifer parasitism under grazing, performance of multi-species grassland swards and beef fattening). The process dynamic initiated with the farmers focused on characterising the performance of existing production systems and on regular exchanges with the farmers on these points.

In the monogastric & crop cluster, the researcher was a senior scientist with some experience in participatory research and in systemic approaches; although mostly in ruminant based systems. His involvement in the project began relatively late in the cropping season (in spring 2015), which limited opportunities to organise focus groups. Consequently, the researcher proposed to meet farmers individually during “field tours” to discuss and capture the main goals of their agricultural production system and the potential for a research partnership. Based on these initial interactions, the need to develop more sustainable crop rotations was identified and agreed; and, based on contacts with colleagues working on organic crops in France, on his own expertise on legumes and on a literature review, the researcher proposed to test innovative schemes using legume-rich cover crops. In proposing this innovation, the researcher also took into account (1) limited opportunities to mobilise other research units within and outside CRA-W; and (2) the need to minimise, for the farmers, the invasive nature of the research intervention. In addition, to maintain the systems focus of the research, while also investigating the link between soil fertility maintenance and crop management (the main challenge underlined by farmers and advisory services), the performance of companion cropping (i.e. cereals and cereal/legume mixes grown together) were characterised. This was done, at plot level, using a standardized methodology, on all the farms of the group. In addition, to maintain communication and provide feedback to farmers within the group, a newsletter was produced every month during the growing season, including seasonal information and field observations together with literature reviews on key issues highlighted by the farmers.

In the fruit & vegetables cluster, two researchers, senior scientists with considerable expertise in fruit production in low input and organic systems, followed the innovations set-up by the farmers, which were (1) weed control management strategies and soil fertility maintenance using cover crops and mulch; and (2) agroforestry combining fruit trees and vegetable production. Technical questions, such as variety resistance to disease (leek rust) or disease treatment efficiency (for post-harvest fruit diseases), were addressed using field trials. In most cases, to provide meaningful and scientifically robust results, field experiments were set up at an experimental station and duplicated using a simpler field trial approach on a limited number of farms. External expertise was regularly mobilized to address some specific issues and themes (e.g. rodent control and the use of no-till in vegetable production systems).

4. Outcomes

The researcher in the dairy & meat cluster had some experience as a sales representative for a feed producer and his academic background was in livestock nutrition. Based on this experience, the researcher felt that he was justified in adopting an “advisory posture” in these areas. This position allowed him to have regular exchanges with the farmers in his group and to learn from them. He also engaged external expertise to answer farmers’ questions on specific topics. To support this advisory posture, the researcher collected samples (soil, grass, silage, etc.) and took various measurements (heifer weight, sward height etc.) to assess specific performance criteria (e.g. grazed grassland productivity and parasite pressure). On each farm, the quantity and quality of fodder crop production was assessed along with one additional topic. In these farm specific topic areas, the moderator used an ecocentric approach (i.e. to characterise the farming system qualitatively) that was not reliant on the capture and analysis of quantitative data. The farmers were not required to take numerous measurements, but were asked to record certain practices (e.g. grazing calendar, silage cutting dates etc.). Two farmer discussion group meetings were held at 12 and 18 months after project inception. To drive and stimulate interactions, the moderator used the farm data and other information gathered by farmers and the research team during the project to relate management practices to system performance (e.g. soil fertility analysis, grass feed value related to grazing management and overall economic analysis). Farmers found these discussions useful and appreciated the facilitation and guidance from the moderator; and the information provided in response to their specific needs (e.g. access to data on manure analysis, forage analysis, feeding rations, average daily weight gain measurements and grassland productivity). After two years of group interaction, some farmers asked to receive a more integrative analysis of their system so they could gain a better understanding of how management practices related to system performance; the group dynamic followed a diagnostic approach to identify aspects of the farming system that could be improved without providing or testing innovative solutions. However, the researcher, more at ease with an advisory role, felt that integration of the data to assess system performance as a whole was too ambitious and decided to leave the process. The transition from one moderator to another will be the next challenge for this farmer group.

In the monogastric & crop cluster, the moderator had less regular contact with each farmer, and focused on identifying questions through two to five ‘field tours” per farm. ‘Field tour’ frequency depended on the specific motivations and feedback from each farmer. A common theme emerging from the farm visits was the need for sustainable crop rotations for fertility enhancement and weed/disease control and improved agricultural and economic performance; particularly in systems without manure. Therefore, with the aim of improving soil fertility and increasing biomass production and nitrogen fixation, the researcher proposed that legume-rich cover crops be established early, within the main cereal crop, during the last mechanical weeding. Initially, the farmers were skeptical, as some of them had already tried to implement this technique with varied degrees of success. Nevertheless, they accepted the challenge. This innovation was tested in a network of 10 field trials implemented on four farms located in the four main Walloon agricultural regions. Each trial included six legume-rich cover crops under-sown into cereal crops. The main aim of the field trials was to test the feasibility of this innovation under real farm conditions, to quantify its impact on the next crop, compared with cover crops sown after main crop harvest.

Unfortunately, cereal yield measurements had to be made during the busy harvest period, and this led to reduced interaction with the farmers and the development of some misunderstandings in relation to the aim of the field trials.

Based on these dynamics, at the end of 2015, the frequency and quality of exchanges with the different farmers of this group was unbalanced with some farmers engaging with the project more than others. As a consequence, during farmer discussion group and project steering group meetings, at which project results were presented and discussed, numerous tensions emerged with some farmers as well as sector representatives and researchers from other research institutes expressing concerns. These tensions were linked to numerous misunderstandings and the questioning of moderator legitimacy within the context of the group. In terms of misunderstandings:

(1) Some farmers questioned the need to adopt a participatory research posture rather than an advisory or services posture expected by the majority of farmers experiencing specific technical or economic issues and expecting an answer in the short term.
(2) The funding body, the Walloon administration, questioned the establishment of trials to validate innovative solutions instead of gathering efficient and validated practices currently adopted by farmers in other areas to define turnkey solutions that could be disseminated through various channels (farming press, discussion groups, online etc.) and/or encouraged by advisory services supporting numerous farmers converting from conventional to organic production.

In terms of legitimacy:

(1) The unsymmetrical nature of the interactions with the different farmers within the group and across the different years was questioned.
(2) The farmers' representatives considered the research institution to be focused on conventional (non-organic) production. As a consequence, they found it difficult to accept that such an institution could lead a research program that included cooperation with organic farmers on innovations aiming to improve, in a systemic way, the performance of organic farming systems. Moreover, they questioned the legitimacy of the researchers to select the themes to investigate with farmers (i.e. cover crops in this case).
(3) Other research units and conventional advisory services, both organized around specific domains of expertise, questioned the legitimacy of carrying out systemic research that involved direct interaction with farmers. Indeed, it was considered that this direct interaction interfered with the work they were doing with farmers in specific competency domains, since the moderator had no recognized specific crop production expertise and was affiliated to a farming systems unit rather than a crop production unit. As a result, the project often met with resistance from these groups rather than collaboration.

In the fruit & vegetables cluster, researchers maintained a classical research posture based on the 'laboratory model' (Bawden, 1997), with the implementation of field trials to compare varieties; investigate techniques to control weeds; and test alternative bio products to control disease. These field experiments, set up in a replicated four block design, were formulated by comparing the experience, expertise and demands of the researchers and farmers. They were implemented with the most motivated farmers, on a limited number of farms. To reduce the risk of field trials failing to produce meaningful results, a duplicate was set up at an experimental station. In this cluster, the legitimacy of the researchers was not questioned to the same extent as in the monogastric & crop cluster, since:

(1) The researchers were working in their field of technical expertise, within the research unit dedicated to this domain and, for this reason, additional expertise from other research units was not needed (apart from laboratory analysis to characterise soil fertility);

(2) The researchers were working with a limited number of farms (five farms per researcher with half their time allocated to this project compared with more than 15 farms per researcher, working at full time, in the other groups). This allowed researchers to maintain regular individual contact with the different farmers.

However, it was challenging for these researchers to adopt a true participatory approach; the oligopolistic nature of the fruit and vegetable sectors in the Walloon area made it more difficult to set up group discussions and dynamics, as this was not within the strategic interest of (often) competing producers. Furthermore, the two senior researchers confirmed that they were not well equipped to use participatory approaches and felt uncomfortable in the role of moderator.

5. Discussion

More time committed to establishing a clear and detailed agreement at the outset could have resulted in a more productive and efficient research process. Within each cluster, even when an approach had been agreed between researchers and farmers, there was still a degree of uncertainty around farmers' expectations and personal investment in the process, on the one hand, and around the actions plans associated with the different research approaches (technocentric, ecocentric and holocentric), on the other hand. A deeper and more precise description in the agreement of the level of commitment required from farmers and the overall research process could have resulted in a greater level of trust and collaboration. Indeed, as underlined by Restrepo *et al*. (2014), "the first difficulty (in participatory research) is to create a joint definition of a problem, where researchers and practitioners together decide upon the need to organize the process, and how to ensure that a project's goals, tasks and activities do not depart from a common reference point".

The level of innovation that could be explored varied widely between clusters and this appeared to be related to the research method or posture adopted by the moderator (Table1). Indeed, the moderator (in the dairy & meat cluster) adopting an advisor posture was able to improve farmer skills while mobilizing existing knowledge without exploring innovative approaches that could have been proposed by the farmers. The advisor/moderator therefore retained a top-down knowledge transfer dynamic. By contrast, within a moderator/researcher mode (closely aligned with a holocentric approach), innovations can come from literature or from any part of the value chain. A systemic / integrative approach strongly involving the farmers could have had a clear added value. Nevertheless, in some chains, with a limited number of actors and a limited market, the oligopolistic position of some actors may limit knowledge transfer and information exchange/sharing. These limitations were more associated with the nature of the market than any technical limitations of the approach. By integrating expertise in system and participatory research, the moderator/researcher mode questions farmer practices and allows participants to explore innovative practices and how they impact the entire farming system.

The main tensions underlined in the implementation of these dynamics, whatever the group, can be connected to the two main (and partly conflicting) objectives agreed when the farm networks were established:

(1) To characterise organic farming systems under a diversity of soil and climate conditions, production types and management strategies;
(2) To implement a participatory research approach to identify problems recognized by the sector and to explore potential and innovative solutions.

The first objective led to the establishment of a large number of diverse groups while the second objective required the mobilization of farmers sharing similar questions in a limited sector to promote interest and exchanges within the farmer groups and with the moderator.

In such a context of farming system diversity, the advisor posture allows, in a first step, to identify, in a superficial way, the diversity of questions posed by the farmers, with the satisfaction of the different farmers involved in the dynamic. Nevertheless, this posture does not allow sufficient time or resource for the group to explore innovative solutions that could resolve a variety of specific issues. The group can only remain in a relatively superficial diagnostic phase.

Table 1: The link between the research posture of the animator and the potential for innovation exploration and farmer involvement in a participatory research dynamic.

	Research posture of the animator of the group		
	Advisor (moderator)[1]	Advisor / Researcher[2]	Moderator / Researcher[3]
Example	Dairy & meat group	Fruit/vegetable group	Monogastric/crop group
Farming system diversity characterised	+	+/-	+
Farmers' questions identified	+/-	+	++
Potentialities for innovation explored	+/-	+	++
Farmer motivations - temporality	+ in a first step +/- thereafter with farmers demanding a systemic approach	+ for the farmers sharing a common issue	+/- in a first step (objectives are fuzzy) ++ thereafter for the farmers with a common issue

[1] Closest to an ecocentric approach

[2] Closest to a technocentric approach

[3] Closest to a holocentric approach.

By contrast, in a participatory research dynamic, the researcher/moderator aims to highlight questions shared by the different farmers within their group to initiate a collective dynamic around trials exploring innovative solutions to address the identified challenges. Nevertheless, due to the diversity of these groups, the legitimacy of the choice of the questions, and of the associated innovations explored is questioned by some farmers of the group and by the organic sector. Moreover, due to the significant investment in time associated with participatory research and the limited time and financial resource available, researchers were unable to fully invest in characterising the diversity of farming systems. The size of the groups and the diversity of the objectives limited the level of research investment in each farm and on each of the research

objectives, leading to frustrations and, therefore, tensions for both farmers and researchers. As noted by Restrepo *et al*. (2014), trust building is a key element for collaborative success in the learning and research process. It is the result of a well-structured process where actors have sufficient time to integrate their knowledge, gain a common understanding of the problem and contribute to the definition of goals, tasks and activities (Restrepo *et al*., 2014).

Under the conditions encountered in some research projects; where (1) the demand is research driven, (2) the role of each stakeholder in the process is not clear or explicit enough, (3) the target of the research is too broad and the role of the researcher is too ambitious without mobilizing all the necessary expertise; tensions can be exacerbated and the risk of researcher divestment is high. This can lead to the departure of key staff and results in a loss of momentum in the interaction until newly recruited staff can be fully integrated into the project (Dalley *et al*. 2014).

In legitimacy terms, different issues were pointed out by different stakeholder groups that related to their particular perception and expectations of the research process. For example, even if the Walloon administration supported a participatory approach, they associated the process more with a development objective than with a research objective. The Walloon administration, therefore, expected results in the short term, in contrast to the delays necessary to develop a participatory research dynamic; questioning in this way, ex-post, the legitimacy of the dynamic initiated within some of the groups. In line with administration perception, the legitimacy of participatory research was also questioned by the scientific community, who often linked this practice to an over-complicated development process (Barnaud, 2013). Moreover, ongoing interactions also highlighted the questioning of the legitimacy of a generalist researcher working in a diversity of interconnected research fields in which he shares some expertise, even under a collaborative arrangement with specialized teams. Finally, due to the perceived association of participatory research with sector development, the legitimacy of the dynamic was also questioned by the group in charge of the development of the organic sector. All these points made it challenging to develop a good level of trust between the actors involved in the participatory research interactions, leading to the exacerbation of any tensions.

6. Conclusions

The contrasting objectives assigned to this project made it challenging to complete the first task in any collaborative learning dynamic; that is to create a joint definition of a problem, where researchers and practitioners together agree how the research process will be carried out (Restrepo *et al*. 2014). This first step in the research process provides an opportunity, for each researcher, to adopt a research posture that is most in line with their expertise, ranging from an advisor to a moderator/researcher posture. These differences in research posture or approach lead to a diversity of results in terms of characterising farming system performance, innovation exploration and actor interaction. This underlines the need for the formulation of clear objectives and processes and recognized expertise to equip and sustain the involvement of researchers and practitioners in participatory research. A participatory approach can be useful when the process is effectively facilitated with research questions identified that address shared issues (i.e. research is demand driven) and clear trust is developed between the actors involved.

In retrospect, it would have been more effective to address partly conflicting objectives in sequence with a first phase of one to two years to characterise the diversity of farming systems in terms of their structure, management and performance. This period of diagnostics, with regular communication, knowledge exchange and feedback with participating farmers would have allowed a good level of trust to build between the actors and to clarify their roles. It would also have allowed

the researcher to acquire the necessary skills to start a participatory dynamic with a limited number of actors sharing a common problematic as part of a second phase. Nevertheless, this sequential approach would not have been possible within the temporal constraints of the project specification.

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