

A relational, transformative and engaged approach to sustainable supply chain management:

The potential of action research

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Abstract

This paper describes how action research (AR) can advance sustainable supply chain management (SSCM) research. Most SSCM research is empirical and little attention has been paid to reflecting upon how research is conducted in the field. Current research fails to make links with ideas of relationality, change and engagement proposed in broader sustainability research. We propose to address this gap by discussing how AR could help address current challenges in SSCM. The paper explores the proponents and application of AR as a relevant methodology for knowledge development in the field, based upon a critical analysis of SSCM and AR, including a review of previous AR studies and insights from a research project in which AR was applied. Particular emphasis is put on exploring the links between the sustainability dimension of SSCM and the foundations and practice of AR. The paper does not reject other methodological approaches, but it shows that the pragmatic orientation of AR is particularly suitable for an applied field such as SSCM where problems are often messy, cross-disciplinary and essentially concerned with the flourishing of individuals and organisations. Our paper has broader implications for inter-organisational research.

Keywords

Action research, Sustainability, Supply chain management, Methodology, Inter-organisational, Relational, Change, Engagement

Introduction

As researchers in sustainable supply chain management (SSCM), we are keen to study and understand its development as a growing academic field and subfield of operations management (OM), but also to contribute to its advancement. SSCM has received increased attention in the last decade, with a growing amount of literature to be found across OM, supply chain management (SCM) and sustainability/business ethics journals (Carter & Easton, 2011; Hoejmose & Adrien-Kirby, 2012; Touboulic & Walker, 2015).

In practice, the challenge of how to drive and achieve sustainability through extended production networks is one faced by the vast majority of companies, as evidenced by recent news related to the topic (e.g. garment factory fires in Bangladesh; horsemeat scandal in Europe). Initiatives driven by large corporations such as Wal-mart or Puma can be viewed as attempts to improve transparency and implement more responsible sourcing practices. These examples not only illustrate the practical and systemic nature of sustainability issues in supply chains (SCs) but also their inherent relational quality, connecting organisations, places and people across boundaries and contexts (Wickert & Schaefer, 2015). With this in mind we reflect on how management research can help answer the SSCM challenges faced by organisations.

We adopt the recent definition by Pagell and Shevchenko (2014:45), who define SSCM as ‘the designing, organizing, coordinating, and controlling of SCs to become truly sustainable with the minimum expectation of a truly sustainable SC being to maintain economic viability, while doing no harm to social or environmental systems’. Our view also aligns with sustainable development as an aspiration for the future and an imperative for the present as expressed by the Brundtland Commission (World Commission on Environment and Development, 1987). Combining both perspectives reflects the idea that the integration of sustainability in SCs is a journey (Mohrman & Worley, 2010), which relies on the relations between organisations and people.

Several authors have attempted to analyse the state of research in SSCM (e.g. Carter & Rogers, 2008; Seuring & Müller, 2008; Carter & Easton, 2011). These reviews only briefly touch upon methodologies adopted in SSCM. We are not aware of any attempt at addressing epistemological issues within SSCM research. In particular, as authors deplore the theoretical dearth in SSCM and are concerned with how to encourage theory development (Seuring & Müller, 2008; Carter & Easton, 2011), the relevance of engaging in methodological discussions is even more striking. The majority of research conducted in SSCM can be characterised as empirical research, offering unique insights into practical issues and based on evidence collected from real settings, mainly case studies and surveys (Seuring & Müller, 2008; Carter & Easton, 2011). We offer a reflection on how researchers could make the most of this empirical richness to support research in the field but also facilitate change in practice. We propose to address this methodological question by exploring the nature of SSCM and defining the legitimacy, value and challenges of an action research approach. Traditionally, OM research has been associated with positivism and more 'rationalist' approaches (Meredith, 1998: 441; Schmenner & Swink, 1998; Voss, Tsikriktsis, & Frohlich, 2002: 196). Some authors argued that rationalist research has led to the impression that OM had lost its connection with practice (Flynn et al., 1990; Coughlan & Coughlan, 2002; DeHoratius & Rabinovich, 2011). Calls for more empirical research and alternative paradigms in OM and SCM research are not recent (Meredith et al., 1989; Amundson, 1998) but even more emphasis on plurality and on reasserting the place of qualitative methodologies in the field has emerged in recent years (Näslund, 2002; Voss, Tsikriktsis, & Frohlich, 2002; Boyer & Swink, 2008; Carter, Sanders, & Dong, 2008; Barratt, Choi, & Li, 2011). Boyer and Swink (2008) explain that 'researchers should not close off any avenue of inquiry that can help describe the OM and SCM elephants' (p.343). A lack of diversity means that OM risks becoming one dimensional, lacking in creative approaches and therefore failing to uncover all the mysteries that are central to the development of new knowledge (Alvesson & Kärreman, 2007). Similar calls have been made within the SSCM literature

(Carter & Easton, 2011; Hojmosse & Adrien-Kirby, 2012; Winter & Knemeyer, 2013). It is within this broader context that this paper gains all its value and relevance. The argument frames SSCM within the realm of the human aspects of driving change for sustainability (Wright & Nyberg, 2012). Our reflection has been driven by the following question:

In what ways is AR a relevant and useful approach to create knowledge in SSCM?

This paper makes three contributions. First, we seek to provide a discussion of the current theoretical and methodological challenges in SSCM, which serves to unveil key epistemological issues that are mostly underplayed, if not absent, in research papers (Miemczyk, Johnsen, & Macquet, 2012). Second, we explore the synergy between AR and SSCM. The adoption of AR in SSCM is scarce and we argue for more research adopting this method. This is equally valuable for researchers who explore sustainability in inter-organisational contexts. Finally, we draw on the methodological discussion, review of past AR studies in SSCM as well as our empirical experience to reflect on the value of AR for researchers and practitioners in SSCM and articulate a number of key future research questions in the field.

The remaining of the paper is structured as follows. We first discuss the state of research in SSCM and consider how to define the nature of SSCM issues and challenges. We then explain the proponents of AR, explore its connection with change and sustainability. We build on this argument to show the potential value of adopting AR in SSCM and offer a number of propositions. The next sections present insights from past research adopting AR in SSCM, including insights from a project in which the authors were involved. These insights enable providing some evidence in support of our propositions. The following discussion provides reflections on the theoretical and methodological contributions, the practical value and the role of the researcher from these insights. We conclude by showing that there exists an epistemological and methodological link between AR

and SSCM that needs to be further exploited while acknowledging the potential challenges. We articulate a number of key future research avenues.

SSCM research: How can it be defined and what is the current state of research?

We draw on several key literature reviews as a way to elaborate a comprehensive picture of SSCM. We acknowledge that this approach might present some limitations considering that the studies reflect the subjectivity and the motives of the researchers who conducted them. Nonetheless, we believe that the combination of findings will allow a relatively fuller understanding of SSCM to emerge.

Scope and definition

SCM is a core organisational activity and can be viewed as a ‘locus for much of the change towards sustainability and contributing to the sustainability of the broader ecosystems’ (Mohrman & Worley, 2010: 291). Recently, the view that developing sustainable production and consumption systems (PCS) is important to progress towards sustainability has become widely embraced. This requires thinking beyond the boundaries of one organisation and considering entire value chains and production networks, putting SCs and SCM at the heart of the policy and practice agenda for sustainability (Lebel & Lorek, 2008)

Several literature reviews have been conducted in the field as attempts to provide comprehensive frameworks of SSCM (e.g. Carter & Rogers, 2008; Seuring & Müller, 2008; Carter & Easton, 2011; Hojmosse & Adrien-Kirby, 2012; Winter & Knemeyer, 2013). We draw on their findings to offer a snapshot of the current state of research in SSCM, focusing specifically on four dimensions relevant for our argument: definition of SSCM, sustainability, theoretical perspectives and methodologies. For the sake of clarity and in order to facilitate comparison, we have summarised the key findings chronologically in Table 1.

Insert Table 1 about here

From the analysis of the definitions, and the ones by Carter and Rogers (2008) and Seuring and Müller (2008) in particular, the scope of SSCM can be defined around three key characteristics. SSCM is *operational* because it is concerned with the flows of material and information that support an organisation or set of organisations' activities towards the creation of value and therefore comprises traditional SCM constructs. SSCM is *transformational* as it represents an evolution in business practice to address concerns beyond the economic sphere, namely environmental and social issues, over a long-term orientation. Finally, SSCM is *relational* as it relies on the relationships between members of the SC as well as takes into account the interest of stakeholders in the broader network, and the relation between the economic, social and natural systems. Arguably the operational perspective has dominated research in the field, having major implications on the conceptualisation of SSCM.

The predominance of an operational perspective

Sustainability has predominantly been viewed as an added dimension of traditional SCM. Many authors do not actually employ definitions of SSCM in their work. They rely on discussing the integration of aspects of SCM with dimensions of sustainability. This is in line with the triple bottom line (Elkington, 1998) conceptualisation of corporate sustainability where economic, environmental and social spheres are viewed as interconnected and of equal importance. Many definitions seem to build on Mentzer et al.'s (2001) definition of SCM:

“The systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the SC, for the

purposes of improving the long-term performance of the individual companies and the supply chain as a whole” (p.18)

The field of SSCM has been generally integrated within OM and SCM research, which means that it has inherited and has been influenced by their research practices (Näslund, 2002), creating a number of theoretical and methodological challenges. Historically OM has its roots in industrial practice with a focus on solving managerial issues. However it progressively evolved into a more theoretical and positivistic field (Meredith et al., 1989) as a consequence of the desire to develop the academic credibility, legitimacy and rigour of the discipline within the academic sphere. The relative absence of post-positivist research has impeded the development of more diverse theoretical perspectives.

Methodologically, SSCM researchers have predominantly explored issues through case studies and surveys (Table 1). These methods enable capturing meaningful insights from industry, providing rich reports of current practice and offering recommendations based on observations. However, this implies a remaining distance between the research and praxis of SSCM (Ashby, Leat, & Hudson-Smith, 2012). It has also led to a fragmented view of SSCM as these methodologies favour the exploration of a set of measurable variables or isolated organisational initiatives. Pagell and Shevchenko (2014) point out that SSCM research to date has primarily focussed on exploring the “what” of SSCM practice rather than the “how”, and remains primarily backward-looking, favouring snapshots of organisational best practices.

Theoretically, there is a consensus that currently SSCM lacks theoretical grounding (Table 1).

While some recent work, including Carter and Rogers’ (2008), demonstrates efforts to develop SSCM theory, there is still a lack of theory testing and development in the field. A-theoretical research may be able to show the intricacy and variety of sustainable SCs issues, but has limited potential to contribute to the development of practice and policy.

When authors actually adopt theoretical lenses, they tend to rely on a small number of popular organisational theories imported from other fields such as Resource Based View and Stakeholder Theory (Touboulis & Walker, 2015). These lenses imply a narrow understanding of sustainability as they favour a focus at the strategic and organisational macro level and on concepts such as competition, performance and resources, which are rooted in the neo-classical tradition and economistic view of the firm (Angus-Leppan, Benn, & Young, 2010) and technocentric paradigm (Gladwin, Kennelly, & Krause, 1995). The emphasis on performance seems correlated to the prevalence of environmental and economic approaches to SSCM, which present more quantifiable characteristics.

Current SSCM research predominantly asserts triple bottom thinking, in line with the business case for sustainability that views the sustainable development challenge as providing greater business opportunities for gaining competitive advantage (Carroll, 1979; Hart, 1995; Markley & Davis, 2007). In this sense corporate sustainability is associated with specific measures looking to improve the social and environmental conditions in which businesses operate while maintaining a certain level of profitability (Carter & Rogers, 2008). Hence current SSCM research is mostly concerned with the survival of organisations, and barely addresses the systemic and transformative nature of sustainable development.

Challenges and gaps in SSCM research: Addressing the relational and transformational aspects

In light of the above discussion, we can identify four main challenges for the SSCM research.

First, it is necessary to develop a more systematic rather than fragmented view of sustainability within the field. Current SSCM research primarily reflects a narrow shareholder view and overly focuses on the economic (i.e. profit) implications of being sustainable (Pagell & Shevchenko, 2014). Researching sustainability requires adopting a systems perspective (Checkland, 1993; Senge et al., 2007; Peattie, 2011). Such a perspective allows going beyond a reductionist view of

sustainability, looking at the natural environment as a separate variable, to account for the relationships and interdependence within the system as whole, and the interactions between socio-economic and environmental.

Authors such as Griggs et al. (2013) have criticised triple bottom line thinking and instead propose an ecocentric view of sustainability. The three dimensions of sustainability are represented using concentric circles to show how the economy and society are embedded within and ultimately depend upon the preservation of the natural system. Another recent conceptualisation of corporate sustainability reasserts the necessity to envision a prosperous future within planetary boundaries and to account for a broader network of actors (Whiteman, Walker, & Perego, 2013).

Traditional research approaches are not sufficient to provide an integrated view of SSCM phenomena. Each SC is unique, composed of idiosyncratic actors shaping their own micro-systems within the macro structure of the chain (Gold, Seuring, & Beske, 2010). A comprehensive understanding of their dynamics must account for their social complexity, their historical baggage and ambiguous causalities. Knowledge about sustainable SCs is highly embedded in context, and understanding emerges in local situations and through specific interactions between buyers and suppliers (Gold, Seuring, & Beske, 2010) and relevant stakeholders in and outside organisations' boundaries (Dentoni, Hospes, & Ross, 2012). Hence the investigation of sustainability within SCs cannot be reduced to a sum of abstracted variables.

Second, the predominance of a content rather than processual approach (Basu & Palazzo, 2008) to the implementation of sustainability in SCs means that more needs to be done to actually understand how organisations work together and how SSCM, as a radical transformation of business practices unfolds. This requires questioning current environmental and social practices (i.e. the status quo) in order to advance towards a desired future state (Spash, 2009). The core of the sustainability agenda is essentially *change* of views and practices concerning human-environment interaction (Gladwin, Kennelly, & Krause, 1995). Sustainability research is not about stability and

regularities, but about the identification of levers for change and ways of improving current practice.

It is critical to understand how integrating sustainability into the management of SCs may therefore create ambiguities and paradoxes for those involved. The concept of paradox has been adopted to explore competing demands in organisations (Lewis, 2000) and is relevant to exploring the integration of sustainability in business contexts as tensions emerge between traditional business assumptions and the necessity to take into account social and ecological systems. Paradox framing can help new theory emerge in SSCM, which can help practice deal with complexity (Poole & Van de Ven, 1989).

This last point leads to the third challenge. Researchers in the field need to produce research that is informative for practice and instigate change. There is a notable absence of research that specifically contributes to enhancing managers' ability to make decisions to progress towards sustainability and to engaging relevant stakeholders in the process (Dentoni, Hospes, & Ross, 2012). Intentionality permeates current research in SSCM where there is often an unwritten assumption about the ways companies should behave in SCs (for e.g. abide by certain ethical and environmental standards) and what they should take responsibility for (Amaeshi, Osuji, & Nnodim, 2008). However dominant observational cross-sectional approaches to inquiry have provided limited insights into the process of changing practices. Pagell and Shevchenko (2014) call for more participatory/action research to remediate to this problem.

Finally, an underlying aspect of the last three challenges is the necessity to account for the human dynamics of progressing towards sustainable inter-organisational networks. The connection that has been most investigated is between the economic and environmental aspects, with a primary focus on the link between the adoption of green practices in the SC and the achievement of economic performance. The preferred level of analysis remains the large focal firm and the social and

behavioural micro dynamics of the change for sustainability in SCs constitute a major gap in current research.

Exploration of links between action research and sustainable supply chain management

Having presented the background on SSCM research, this section explores AR as a potentially fruitful approach for the field. A number of propositions are articulated at the end of this section that will then be further discussed through the analysis of literature and a practical action research case example.

Foundations of action research

AR is accepted as a valid methodology in fields such as organisational behaviour but remains underrepresented in OM research (Baker & Jayaraman, 2012). It has been advocated by several academics in OM and SCM (Westbrook, 1995; Coughlan & Coughlan, 2002; Näslund, 2002; Näslund, Kale, & Paulraj, 2010) for it enables developing greater insights into the contextual phenomena and allows for relevant theory building. It seems therefore important to discuss the roots of AR and its underlying ontological and epistemological assumptions.

Defining action research

There are multiple ways of doing AR and being an action researcher (Cassell & Johnson, 2006). The vast majority of authors attribute the origin of AR to the work of Kurt Lewin (1946, 1947a, b). Authors also acknowledge the influence of the work of Argyris and Schön (1974) and Heron and Reason (1986). There is in fact a vast array of influences that have shaped AR and it would be possible to devote an entire paper to discussing them. Multiple conceptions and definitions of AR have been offered in the literature, but the most recent school of AR, which has embraced this

diversity, is embodied by the work of Reason, Bradbury and colleagues (Cassell & Johnson, 2006).

Hence, we adopt Reason and Bradbury's definition (2001) of AR as:

“A participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes (...) It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues pressing concern to people, and more generally the flourishing of individual persons and their communities . . . A wider purpose of action research is to contribute through this practical knowledge to the increased well-being - economic, political, psychological, spiritual - of human persons and communities, and to a more equitable and sustainable relationship with the wider ecology of the planet of which we are an intrinsic part ” (pp.1-2).

AR is clearly linked to the idea of developing knowledge to ‘make things happen’ (Cassell et al., 2009: 517), which resonates well with pragmatism. There is also a strong connection between AR and sustainable development as it places the process of knowledge creation within the context of human-ecosystem interaction, which has been associated with pragmatist thinking as well with concepts such as environmental pragmatism and adaptive management (Reitan, 1998; Norton, 1999). Figure 1 is relatively simple but aims at illustrating the connection between the three domains.

Insert Figure 1 about here

American pragmatist philosophy (i.e. Dewey, Peirce and James) is often cited as foundational to the development of AR (Cassell & Johnson, 2006; Eikeland, 2007; Barton, Stephens, & Haslett, 2009).

The central tenets of pragmatism and AR are the integration of theory and practice and the reintroduction of values in the realm of scientific inquiry. This goes against the traditional positivist value-free stance, rejecting the separation object-subject instantiated by the researcher-observer.

AR, inspired by pragmatism, is a form of normative engaged research. This conception of engaged science is a way for researchers and practitioners to participate jointly in the knowledge creation process and in this way address the ‘double hurdles’ of relevance and scholarship (Pettigrew, 2001; Van de Ven & Johnson, 2006).

Linking action research to relationality, intentionality, change and sustainability

The concept of *usefulness* is one that preoccupies many management academics that have acknowledged the existing gap between theory and praxis. For most of them, *usefulness* means making sure that management research can be applied to and help advance managerial practice (De Margerie & Jiang, 2011). We contend that there is a deeper dimension to the notion of *usefulness*, which is intrinsically connected to the normative claims of AR.

AR plays a role in shaping the context where it takes place. In their definition of the participatory paradigm of AR, Heron and Reason have added a value dimension that they call ‘the axiological question about what is intrinsically worthwhile’ (1997) through which they examine what constitutes valuable or *useful* knowledge. The meaning of *usefulness* in AR is about interrogating the choices and directions taken in the research and confronting them to the value systems of the researcher and participants, such as what is meant by *desirable* future.

The connection between AR and sustainable development is most clear when viewing AR as driving change towards a desirable future, which implies reflecting upon the question of how to contribute to human flourishing. The notion of intentionality relates to the definition of sustaining, which implies a desire to contribute to the preservation of a certain system (Peattie, 2011).

This intention to sustain is actually present in the Brundtland definition of sustainable development, widely adopted in SSCM research (Carter & Rogers, 2008). This means that research concerned with sustainability is research that ‘seeks to contribute to the pursuit of sustainability’ (Peattie, 2011: 23) rather than simply provide accounts about sustainability. Research addressing the

sustainability challenge is bound to look into specific practical issues and pathways to improvement towards a more sustainable state. Intention and practicality become inter-related and in that sense, researching sustainability cannot be detached from addressing real-world issues (Peattie, 2011). Authors have also acknowledged the connection between AR and systems thinking (Chisholm & Elden, 1993; Westbrook, 1995; Näslund, 2002). There is a strong emphasis in AR on the centrality of relationships to advance learning and sustainability and as a way to capture the inter-dependent nature of social-organisational phenomena (Bradbury & Lichtenstein, 2000; Bradbury et al., 2009). Adopting a relational perspective to research (Bradbury & Lichtenstein, 2000) is about valuing the spaces of interactions and understanding inter-relation. This perspective questions the positivist distinction between subject and objects and re-embeds the researcher within the system. The roots and connections of approaches such as Participatory Action Research to local communities development, sustainable livelihoods and democracy, also suggest a stronger connection between AR as a methodology and the social facets of sustainability.

Many researchers have embraced AR to research sustainability issues. Evidence of this is the sheer number of articles on this topic in AR journals. Searching for the keywords “sustainability”, “sustainable development” and “SSC” in *Action Research*, *Systemic Practice & Action Research*, and *International Journal of Action Research* identified 619 initial results. Obviously this excludes key contributions such as those included in Reason and Bradbury’s book (2008) and also includes some irrelevant articles, but it gives a sense of the extent AR literature on these topics. Looking more closely at the articles reveals key differences about AR research on sustainability from SSCM research: the wide espousal of a systemic perspective on sustainable development issues, the number of articles purely considering social issues, and the inclusion of micro/behavioural aspects in many studies, by addressing specifically the role of the researcher and/or considering the perspectives of the stakeholders involved.

Space does not allow for a full review of the articles found in the AR literature but a few recent examples may be able to drive the important points home. Bidart Carneiro de Novaes and Brunstein (2013) show the importance of taking into account the ambiguities and paradoxes raised by sustainability in a business context in order to act on the development of appropriate managerial competencies. Golob et al. (2014) describe the value of developing a holistic understanding of CSR in values chains by taking into consideration the perspectives and meanings held by the various stakeholders involved. McIntyre-Mills' research (2010) focuses on complex social issues such as unemployment, domestic violence and alcohol abuse in a local community and explores how user-centred participatory design may contribute to social inclusion and democracy.

On the whole, researching organisational sustainability will need new paradigms to question current practice and for this reason, AR as alternative research paradigm can help address SSCM challenges.

AR for SSCM: where can go?

Considering the challenges of SSCM research highlighted above, we propose that AR may support the development of a more systematic perspective of sustainability in SCs, encourage change and engagement in practice, reasserting sustainable SCs and inter-organisational activities as sites of human actions.

The complex, practical and dynamic nature of supply activities calls for the engagement of the researcher with the practicing community to produce of relevant knowledge and develop practical solutions to complex real life issues (Van de Ven & Johnson, 2006; Walker et al., 2008). Especially because in the case of SSCM, SC research is concurrent with attempts to advance the sustainability agenda and address practical sustainable development issues (Walker et al., 2008). This leads to our first proposition:

Proposition 1. Challenges in SSCM research require a methodological approach that enables the development of multidimensional and relevant theory supporting the transformation of practice.

The field of SSCM is characterised by a relative absence of theory and in particular its own theory. AR could contribute to the advancement of SSCM through theory testing and theory building. An important aspect of theoretical contributions in academic fields is the quality of its connection with the empirical reality. Research agendas in SSCM are strongly linked to practical developments and managerial concerns. Several scholars (Alvesson & Kärreman, 2007; Colquitt & Zapata-Phelan, 2007; Van Maanen, Sorensen, & Mitchell, 2007) have acknowledged the relationship between the validity and power of a theory and its relation to empirical reality. The empirical nourishes the conceptual as data is used as evidence to support a theory, and the engagement with practical problems opens up avenues for good theory to emerge (Van Maanen, Sorensen, & Mitchell, 2007). Hence we have the following second proposition:

Proposition 2. AR as an engaged and relational research approach provides the opportunity to test and build theory in SSCM that draws from the rich empirical settings and is relevant to practitioners.

In addition to responding to the need for more problem solving oriented research, AR could provide an opportunity to investigate the under-explored aspects of SSCM that we have identified earlier. In particular, there are possibilities to explore SSCM in terms of change and learning processes and investigate its human aspects. AR could help unfold and participate in the sensemaking process through which the change process of sustainability takes places (Cramer, Van Der Heijden, & Jonker, 2006; Klostermann & Cramer, 2007).

Using AR, researchers could look into the behavioural aspects of SC relationships and of implementation processes between organisations, and study ways to facilitate them.

There are other areas of SSCM where AR could be applied. For example, researchers could use AR for creating and sustaining inter-organisational learning and knowledge transfer, which has been called for by Andersen and Skjoett-Larsen (2009) and Gold et al. (2010). AR could also be adopted to investigate how to stimulate SC innovation for sustainable development (Isaksson, Johansson, & Fischer, 2010). AR can assist in exploring the power dimensions of SSCM and their impact on forms of governance and sustainability outcomes (Alvarez, Pilbeam, & Wilding, 2010). AR may also be appropriate for understanding how to address communications gaps in SSC (Ciliberti, Pontrandolfo, & Scozzi, 2008), how to promote multiple stakeholders engagement in designing sustainable SCs (Dentoni, Hospes, & Ross, 2012) or addressing strategy development (Koplin, Seuring, & Mesterharm, 2007; Walker et al., 2008).

All in all, AR provides the opportunity to develop more micro or multi-level theory of SSCM. We suggest the following final proposition:

Proposition 3. AR enhances the possibility to address underexplored issues such as the relational, change and human aspects of SSCM and therefore can contribute to developing a more multilevel understanding of the field.

Insights from previous research part I: A review of action research studies in sustainable supply chain management

Rationale for conducting a review

Although the case for AR in a practical field like SSCM seems relatively straightforward, it has not been identified as a widely used approach to inquiry. This is potentially a sign that a contribution

can be made by adopting AR, but most worryingly this may mean that there are important barriers and challenges that prevent further adoption of this approach in the field.

In order to identify and analyse previous AR studies, we used the methodological approach of systematic literature reviews (Tranfield, Denyer, & Smart, 2003) and searched for relevant articles in eight major journals in the field of operations and supply research and seven journals in business ethics and sustainability research (see Table 2).

Insert Table 2 about here

We seek to provide a meaningful picture of AR practice at the intersection between OM/SCM and sustainability. The journals were selected because they covered a variety of quality standards and allowed scoping the diversity and trends in the use of AR. The decision to focus on these fifteen particular journals also stemmed from their primary focus on empirical and conceptual works rather than analytical modelling approaches. As we were interested in how researchers used AR in OM and SCM, it did not make sense to include journals with a mathematical and/or modelling focus. We have also purposefully excluded general management journals in order to fit the subject focus of this research. Although we have attempted to offer a broad review of AR in OM and SCM, we are aware that we may have missed some relevant contributions due to the exclusion of certain peer-reviewed publications that were not directly related to OM/SCM and sustainability.

No time period was specified when conducting the search in order not to potentially exclude any relevant articles. We used each journal online page to search for articles among all available issues. We initially conducted a search using the keyword “action research”, and then selected the papers by reading the abstracts. Our aim was to identify papers that used AR as methodology and/or discussed AR extensively as a research approach. In total, 124 papers were selected and analysed further.

Descriptive findings

The analysis of the 124 selected papers has allowed mapping general trends in terms of evolution of the use of AR across time but also across publications. As shown by Figure 2, the articles span a time period of 25 years, with the earliest article identified dating back to 1986. We included articles until 2013, which corresponds to the last full year when we conducted the review.

Insert Figure 2 about here

Most of the studies have been published since the late 1990s, and in particular there has been an evident increase since early 2000s. This is quite interesting as the emergence of AR dates back to the 1940s with a rise in popularity of the approach in the 1970s around the work Argyris and Schön (1974). There are several possible explanations for this trend. In CSR/Sustainability literature, the selected journals were first launched in the 1990s. In OM and SCM literature, it can be related to the way they have evolved as academic fields. Prior to the 1980s OM/OR was predominantly dominated by a positivist paradigm, which favoured approaches akin to those in the natural sciences and put an emphasis on quantitative methods.

The themes and topics of research in OM evolved through the decades and from the end of the 1980s, OM took a more strategic orientation and the focus has been put on areas such as manufacturing strategy, quality management, process design and improvement (Filippini, 1997; Pilkington & Meredith, 2009), which can be associated to the growth of field/empirical research and the possibility for AR to be legitimised. Research areas related to organisational processes and development as well as improvement seem to appeal more to an AR approach (Eden & Huxham, 1996).

The growth in the number of AR studies published in OM and SCM can also be linked to the increasing trend towards more qualitative research, and in particular case studies that have been

increasingly adopted since the early 2000s (McCutcheon & Meredith, 1993; Voss, Tsiriktsis, & Frohlich, 2002; Barratt, Choi, & Li, 2011).

Figure 3 shows the distribution of the studies across publication.

Insert Figure 3 about here

Out of the 124 identified papers, 53 were found in CSR/Sustainability publications and 71 in OM/SCM. The relatively small presence of AR studies across OM and SCM publications shows that it is still considered as a non-traditional research approach compared to other empirical methodologies. AR studies are more likely to be found in publications with a strong practical and problem-solving orientation such as the *International Journal of Operations and Production Management* (IJOPM) and the *Journal of Cleaner Production* (JCP), as clearly stated in their aims and scope.

We paid particular attention to the research purpose and approach (how AR has been used) and to identifying papers that focused specifically on SC issues. AR is mainly used to deal with the introduction and/or development of a tool, model or framework to address specific managerial issues in the research context (51 AR studies in our sample, approx. 41%). Looking more closely at the unit of focus, we found that 40 articles (32%) looked into SC issues such as the management of SC relationships to improve performance (Morton et al., 2006), supplier network relocation (Danese & Vinelli, 2009), or the development of lean agri-food chains (Taylor, 2006). More interestingly, within these 40 papers, 8 addressed SSCM topics such as the reduction of environmental impacts in the SC (Mont, 2004) and the integration of environmental and social standards in SCM in the automotive industry (Koplin, Seuring, & Mesterharm, 2007). These 8 AR/SSCM papers were found in the sustainability literature.

Thematic analysis of action research / sustainable supply chain management papers

In order to inform the discussion offered in this paper, we conducted a further analysis of the 8 papers that we found relating to SSCM topics around the key themes encapsulated in our propositions. We sought to understand if and how these studies had incorporated and operationalised theoretically and methodologically concepts of transformation, relationality and practical engagement (proposition 1 & 2). We also identified the key theoretical contributions they made and how they demonstrated practical value (proposition 1 & 2). Finally, we outlined the specific SSCM issues that they address and if these relate to under-explored aspects (relational, human or change) and to a multilevel view of SSCM (proposition 3).

Concerned that our review may have excluded some important contributions on SSCM in the AR literature, we searched for additional relevant articles in the 619 results described earlier. We first selected the articles based on their abstracts and then discarded those that were irrelevant when reading the full paper. There were only 3 articles specifically considering SSCM issues in the AR literature we searched. By conducting this additional search, we hope to have addressed the inherent issue that researchers engaging in AR in the field of SSCM may have anticipated a lack of fit with paradigms promoted in OM/SCM journals and hence chosen different outlets for their research. The full list of papers is presented in Table 3. In reporting our analysis of the 11 papers in Table 4, we refer to the reference numbers of specific papers as presented in Table 3.

Insert Table 3 about here

Insert Table 4 about here

Table 4 reveals that all the articles include intentional or transformational aspects, usually both in the way they define their topic and implement their methods. In all cases, attempts are made to propose new thinking about SC sustainability and methodologically this implies a strong engagement with relevant stakeholders, mostly in the forms of workshops. There are only 2 articles in the sample that do not rely on collaborative, engaged research approaches, or fail to provide relevant methodological details (Articles 1 & 6). Reflections about the rationale and value of such approaches to SSCM are largely absent.

The relational concept manifests itself in more or less subtle ways in the papers. Some papers simply acknowledge the importance of relationships between SC organisations, but do not actively seek to explore the breadth and depth of these relations and the implications of such statements in practice. In most cases the notion of relationship is viewed as the inter-organisational level rather than multilevel, e.g. between individuals within these relationships. However, the papers tend to embrace a much systematic view of SCs and sustainability, which differentiates them from traditional SSCM. In many of the papers, the idea that progressing towards sustainability requires thinking outside the boundaries of the firm translates into the authors adopting life-cycle perspectives or looking into the entire value chain from producers to consumers.

Methodologically, most of these articles demonstrate some forms of relational practice by engaging the relevant stakeholders in the research process. One paper in particular openly discusses the notion of relationality both conceptually and methodologically (paper 11). The authors not only describe the value of multi-stakeholder engagement for a more democratic progression towards sustainability, but also address the challenges that are inherent to relational practice in an inter-organisational context. These include the question of power relations between the various actors, the necessity to openly discuss the various understandings that exist on the complex notion of sustainability and the feasibility of such approaches beyond the scope of one local SC. The majority of the papers address one or more shortcomings of current SSCM research, as they are all

demonstrating attempts at changing practice and introducing novel thinking about sustainability in SC. Some of the papers, such as 11 and 5, clearly explore the human aspects of SSCM and hence offer even stronger contributions towards addressing the challenges of SSCM.

We have attempted to summarise and classify the extent of the theoretical contributions of the articles as well as their practical value. In order to evaluate these, we have drawn on Colquitt and Zapata-Phelan's framework (2007) to classify the theoretical contributions of empirical articles. The framework was useful in helping us make a judgement on the level of theory building and theory testing in each paper. Regarding the methodological contribution, we focussed on evaluating the extent to which the method adopted in the paper demonstrated practical value, i.e. the method was particularly valuable for the stakeholders involved, provided relevant insights and could be informative for practice beyond the paper. We differentiated between low, where articles do not extensively discuss their method and its practical value, medium, where novel approaches are proposed but not extensively discussed; and high, when the article adopts an engaged approach and demonstrates clear efforts to report on the research process.

The majority of papers can be viewed as qualifiers (i.e. articles that discuss previous conceptual developments and may introduce some new element, concept or mediator). Most authors here have attempted to ground their research in existing literature on SSCM while seeking to complement it with new concepts that can shed light on some under-explored issue of SSCM. For example, Burchielli et al. (2009) introduce the notion of "ethical network" and Golob et al. (2014) conceptualise "CSR as a messy problem" and propose a "holistic view of CSR in SCs". Article 4 can be viewed as a builder because it attempts to propose the new framework of "value system management" but does not extensively ground the discussion in existing research or theory. Article 6 is the only one that can be viewed as expander, building a novel framework, rooted in theory and used to develop hypotheses. Unfortunately this article does not engage practitioners and is purely conceptual. It barely discusses the potential of AR as a method for testing the framework. The three

articles classified as reporters do not propose new concepts but provide rich accounts of practical issues.

Not all articles in this relatively small sample have contributed to illuminating some fundamental gaps in SSCM research. Many focus on the development and implementation of tools or frameworks and do not offer particularly strong theoretical contributions to the field. However these studies for the most part demonstrate attempts at introducing new conceptualisations of SSCM and a strong rooting in practice, engaging the relevant stakeholders (all studies have a medium to high practical value in Table 4), rather than simply observing what is happening in industry.

Thinking more deeply the implications of these categories for the field and for AR leads back to paradigmatic issues. The striking absence of testers can possibly be related to the question of paradigm consensus. Fields that exhibit high levels of consensus, or agreement, are usually characterised by higher levels of theory testing (Pfeffer, 1993; Colquitt & Zapata-Phelan, 2007). SSCM is a relatively new research area and the conceptual diversity indicates the intrinsic inter-disciplinarity of the field, challenging theory and discipline development orthodoxy.

It is interesting to note that reporters do not constitute the main category. The high number of qualifiers shows attempts towards maturity and replication but also the need to explain diversity and come up with new concepts to explain the SSCM phenomena. Qualifiers represent efforts to make bridges with existing knowledge (continuity) while not compromising on new insights (novelty). Qualifiers evidence the transition towards a building-testing balance, and this type of articles are recognised as having more impact (Colquitt & Zapata-Phelan, 2007). As an emerging field it is healthy to have openness in meanings and conceptual developments to broaden the knowledge base (Touboulic & Walker, 2015).

The absence of testers may allow inferences about the nature of AR as a methodology. AR is motivated by practical relevance and change, and hence may not be fit for the purposes of rationalist hypothetic-deductive theory testing. Rather it suits exploration and discovery, following

more inductive or abductive designs. These insights already suggest that more epistemological diversity is needed for the field to advance.

Insights from previous research part II: An action research case study

In this section we describe the practical application of AR in a three-year collaborative research project led by one of the authors. We hope to provide some empirical insights that can support our argument in favour of applying AR to research SSCM issues but also highlight the specific challenges of this approach.

Research context and project overview

This project provided the opportunity to collaborate and engage with a multinational company (MNC) in the food and drinks sector and their UK based agricultural growers in potatoes, oats and apples. These are the most critical agricultural raw materials sourced by the MNC in the UK, hence their strategic importance with regards to advancing towards sustainability.

The Responsible Sourcing and Agricultural Sustainability managers of the MNC initiated the project as a way to collaborate with an academic researcher to address their practical concern of driving the sustainability agenda to UK farmers in their SCs. They were keen to develop a better understanding of the different aspects of implementing a sustainable SC and identify drivers and barriers to success, which both the MNC and the growers could build upon to share responsibility, create knowledge sharing opportunities, and engage in a sustainable business venture.

The MNC is behind five of the UK market leading consumer brands and has been recognized for its proactive engagement around sustainability over the last 5 years, having received a number of business awards. It is one of the FT500 companies and is ranked in the Dow Jones Sustainability Index. It has been a participant in the UN Global Compact since 2008 and is also an active member of the Sustainable Agriculture Initiative Platform and of the Sustainable Food Lab. In their

sustainability report their risk and impact strategy are described as revolving around five key areas: fossil fuel free, sustainable agriculture, water, collaborative leadership and responsible products. Sustainable farming is at the heart of the MNC's sustainability strategy. A number of elements are presented to support the focus on agriculture. First, agricultural raw materials are a critical part of the MNC's operations with approximately >350,000 tonnes of potatoes, >75,000 tonnes of oats and >25,000 tonnes of apples bought yearly from UK growers. Second, the farmers represent a large and diverse part of the MNC's SCs with over 350 suppliers across the UK. Finally, when considering the carbon footprint of each of its products, the MNC realised that a large part of the emissions was down to agricultural production (36% in the case of potatoes).

The MNC has promoted a long-term goal of zero impact and risk and in 2010 the reduction of its carbon and water impact in 5 years. It cannot achieve these ambitious targets on its own, and needs to address the question of how to engage its suppliers around these issues. The company initiated a number of UK-focused sustainability projects in 2010, specifically aimed at improving agricultural sustainability and hence requiring working with growers. It has rolled out a number of projects to its suppliers, such as carbon and water management, and has worked in collaboration with consultancies and non-governmental organizations (NGOs) to develop its strategy and tools. One of the projects initiated in 2010 is the adoption of the Cool Farm Tool (CFT), which is a tool to calculate greenhouse gas emissions from farm activities. It allows farmers to measure the carbon footprint of producing their crops, livestock, etc. and aims to provide decision support by facilitating exploration of 'what if' scenarios based on amendments to farm management practices. The example of the CFT is a good illustration of the way in which the MNC has approached sustainability issues with its suppliers. It already reveals the criticality of the relationship to achieve sustainable production systems.

Research process

There is a clear emancipatory quality to research questions that initiate an AR project, and they are almost always of the kind “how can we improve this situation?” (Reason & Bradbury, 2008). This was exactly the nature of the problem that the research project was attempting to address. This research adopted a longitudinal participative approach as a way of developing both academic and practical knowledge by bringing people together to explore issues and work towards solutions. The research process revolved around three main phases that explored the relational and transformational aspects of SSCM and relied on different levels of engagement with stakeholders.

Phase I: Exploration of the problem (6 months). The project started with a broad focus on the dynamics of the relationship between the MNC and their agricultural suppliers when dealing with sustainability. Early on in the process, meetings and discussions with the industry collaborators helped define the research area more precisely. In early 2011, some preliminary contacts with the MNC’s sustainability team and participation in meetings allowed gaining additional insights into the practical issues.

In January, the researcher attended the Sustainable Food Lab Sponsors Meeting, where progress regarding the CFT was discussed. In February, seven exploratory interviews were conducted with a number of people involved more or less closely in the sustainability strategy of the company. These interviews allowed discussing initial research ideas with key stakeholders, learning from their perspectives and mainly identifying issues that were relevant to them.

This exploratory phase enabled developing an initial sense of the existing issues between the MNC and its suppliers, but also get a sense of what the role of the researcher would be in this context and challenges that may arise. The following extract from the researcher’s dairy reveals the inherent political issues in the project:

“There are concerns on how to present myself to growers: I am not representing the interest of the MNC but as an external researcher, working on how the mutual benefits of sustainability cooperation. This concern emerged after a remark made by the only farmer present at the meeting saying that my project was looking to ‘find new ways to exploit farmers’.” (January 2011)

These exploratory findings enabled articulating an initial overarching research aim that would guide the subsequent cycles of inquiry and data collection. Transforming the SC relationship structure and governance to encompass sustainability emerged as one of the key challenges. In particular stakeholders expressed their concerns about the conflicting commercial and sustainability agendas, as on the one hand contract negotiations still happen on a yearly basis but the sustainability initiatives rolled out imply engagement over medium and long-term.

The necessity to create engagement within and across organisations was the second area that raised most concerns, and the general perception from the MNC stakeholders was that suppliers were not being particularly receptive to the new projects implemented. At this stage it became critical to start gather the suppliers’ perspectives in order to build a full picture of the current situation and move towards more change-oriented phases.

Phase II: Interviews with relevant stakeholders (13 months). The second empirical phase of the project revolved around reflective interviews with 37 stakeholders involved in the inter-organisational relationships. These included stakeholders from the MNC and supplier organisations as well as external stakeholders (NGO staff, consultants) who had been involved in the sustainability efforts in the three SCs (potatoes, oats, apples). The primary purpose of conducting these interviews was to explore more deeply the relational dynamics at play in the transition to sustainability between the MNC and the suppliers, and to capture the different perspectives in this context.

Findings from the interviews revealed several key points to build upon for further work with the MNC and the growers. Both growers that MNC stakeholders referred to the existence of strong relational antecedents (length of relationships and level of trust) between them that had been evidenced by the commitments of both sides over the years, especially in adverse conditions. Most of the suppliers described themselves as “heritage growers”.

On the other hand, the power dynamics of the relationships could not be ignored as the sustainability agenda was driven by the MNC with a relative lack of a ‘growers’ voice’ in the development and implementation of sustainability projects. They tend to be more “the recipients of expectations”.

However, as the MNC is facing increased resistance from the suppliers, it was important to take into account the growing interdependence between them, for example in order for the MNC to access environmental information and for the suppliers to remain economically sustainable.

This situation has created particular tensions between the MNC and the growers. Communication about sustainability has tended to remain confined to the context of formal meetings led by the MNC and the delicate question of short-term contracts is not part of these discussions. Both parties hold strong perceptions about the other’s motives, level of engagement and understanding of sustainability.

While the MNC stakeholders perceive that the suppliers “are not getting the message”, the supplier’s wariness regarding the MNC’s sustainability agenda is illustrated in the following statement: “You always think there’s a secondary motive, there’s an ulterior motive somewhere behind what they’re actually saying.”

Phase III: Participatory workshops (17 months). The lack of a unified and congruent approach to sustainability between the MNC and the suppliers was evident. The various stakeholders held strong views about each other and about what sustainability should entail for the relationship. There

were some strong power dynamics affecting the way in which the sustainability journey was approached. The final phase revolved around a series of workshops with a small number of research participants. The workshops were organised iteratively to facilitate the co-exploration of ways to improve the working relationships between the MNC and the growers on sustainability.

The workshops were organised with the potato suppliers and employees from the buyer firm to discuss the key themes that had emerged from the interviews. The main purpose of the workshops was to bring participants together to create an opportunity of dialogue, to gather feedback and identify implications for their relationships. The workshops aimed at creating a new form of engagement as they represent new spaces of dialogue, which are open and different from other meetings that have been one-sided and organised by the MNC.

The workshops were organised in a dialogical fashion and used as a way to define what a coordinated approach to sustainability would look like in the context of the relationships between the company and its suppliers. The rationale for running the growers' workshops with potato growers only is that they had been more engaged on sustainability projects than growers from other SCs. It was also important to build confidence and create a sense of intimacy, as well as ensure coherence in the dialogue. Gathering suppliers with similar interests, shared experience and stakes was a good way to achieve this.

Through the workshops, the researcher and participants discussed meanings of sustainability, visions for the relationships as well as existing barriers and enablers to achieving this. A particularly critical aspect of the workshops was to let the participants see the similarities between the growers' idea of sustainability and the views held by the MNC stakeholders. This served to show that there were misperceptions being held by both parties. Another important aspect of the workshops was the fact they provided forums for people to express their emotions and for these emotions to be discussed and made transparent.

The workshops enabled surfacing each party's desires for the relationship in that respect. From the

growers' point of view, and quite surprisingly given their "tough" façade, much was said about the soft aspects of the relationships and the desire to "feel wanted" as suppliers. They said that essentially they were not against the content of the MNC's sustainability agenda but they would like to see more engagement going forward and more mutuality in the relationship. Many of them explained that they felt misunderstood and not listened to. The growers as a group have been particularly engaged in the work and have solicited more workshops to address these relational issues, which reveals their willingness to work hard on improving the relationship with the MNC. Participants at the MNC workshop also expressed a desire to see the relationship become more balanced. However, this was primarily meant in the sense that they considered that at the moment the sustainability agenda was driven by them and they would like to see the growers take ownership of the projects and become more proactive in terms of environmental and social ideas. As mentioned previously, there was some confusion about why the growers felt that there was no communication and some participants expressed their desire to see the growers expressing themselves freely about the potential issues they face.

During the final workshop five key actions were proposed by the growers as possible ways to advance the relationships, based on the ideas that had been suggested by the MNC stakeholders.

These were:

- i. Have an open discussion about costs/payback: talk margins and fair returns for both parties
- ii. Creation of a forum/specific interest group about sustainability: fundamental change in style of engagement
- iii. Ask/listen to growers' priorities: links with previous one
- iv. Use "catalysts" for discussion: idea of bringing MNC and growers together and need of a mediator
- v. Bringing external experts to present on relevant sustainability issues and experiences.

The last three months of the project were dedicated to reporting and discussing the reports with relevant stakeholders and ideas for continuity.

Evaluation of project contributions

In view of informing the argument presented in this paper, here we focus on the contributions process and outcomes of the research project in the light of our earlier three propositions.

Theoretical contribution

Inter-organisational relationships for sustainability formed the core of this research project. The concept of relationality is therefore evident in the research topic itself but also in the research approach that attempted to build upon existing relational dynamics between the participants to create new spaces of interaction on the question of sustainability.

Whether a certain level of transformation has been achieved is open to discussion. In this research, relationships for sustainability became both ‘outcome’ of investigation and a context for action (Uhl-Bien, 2006). The researcher has been involved as a facilitator in the development of sustainable SC relationships.

The participative research project with the MNC and their growers provided an opportunity to get unique insights in the processes of SSCM as embedded in their context and was a platform to address the practical issues faced by both buyers and suppliers. The research sought to develop a greater understanding of inter-organisational and interpersonal dynamics in the implementation of sustainability while having the researchers acting as dialogue facilitator between the different parties. As such the product and the process of the research became interwoven (Lüscher & Lewis, 2008). Consequently the contributions of this research lie both within the nature of the insights provided, their practical use and theoretical relevance, and the way in which the research was conducted.

Providing a useful and academically relevant answer to the problem faced by the MNC in their transition towards sustainable SCs has meant engaging in multiple cycles of inquiry that have addressed different dimensions of the question of SC relationships for sustainability at two levels: inter-organisational and micro level of individuals. The researcher has drawn on various theoretical lenses to discuss the findings gathered as part of this AR project.

At the inter-organisational level, the AR project enabled gathering insights on both the collaborative aspects and power dynamics of the relationships between the MNC and its suppliers. We provided insights into the enabling and hindering factors to collaboration. The power perspective is a particularly novel contribution to the SSCM literature that has primarily advocated trust and the development of strong partnerships. Drawing on Resource Dependence Theory enabled exploring the question of balance of power and dependence at an inter-organisational level.

It may seem surprising that little research in SSCM has explored the notion of power, especially when considering that change for sustainability is likely to involve a strategic discursive process of elaboration and implementation, in which power and resistance play an inherent part (Foucault, 1980; Thomas, Sargent, & Hardy, 2010). However, at the time the research was conducted, most SSCM research primarily focused on the positive aspects of collaboration. Many authors in SSCM had identified this gap around power in inter-organisational relationships and called for more research (Boyd et al., 2007; Pullman, Maloni, & Carter, 2009; Boons, Baumann, & Hall, 2012; Hojmosse & Adrien-Kirby, 2012; Walker et al., 2012) but few had investigated it in this context. This is possibly a major shortcoming of the dominant rationalist/positivist approaches to research that have dominated the field, and have tended to build a picture of change for sustainability as an unproblematic process. This translated into silencing issues of conflict, resistance and power, perceived as negative.

Research that adopted Stakeholder Theory and discussed multi-stakeholder processes in the field of SSCM very much remained about “control” and “performance”, reducing these conceptual lenses to

questions of how to manage stakeholders for performance (Touboulic & Walker, 2015) rather than unveiling power dynamics of negotiation. This clearly links with the predominance of a large firm perspective in the field and lack of behavioural research.

Interestingly the concept of power was also relevant at the micro level as individuals engaged in a process of negotiation of what sustainability entailed in the relationships and in implementing new practices. We showed that stakeholders in the SC were involved in processes of sensemaking and sensegiving (Gioia & Chittipeddi, 1991; Weick, 1995) as there were attempts to define sustainability in the context of their relationships.

For example this was visible through the MNC's attempts to dictate the way forward by integrating sustainability requirements in the contracts or through the hostile reactions of the growers who refused to install new technologies that they had not been consulted about. Insights gained through the research support the view that change emerges from collective action (Hargrave & Van de Ven, 2006).

In a SC, the interactions, either collaborative or confrontational, between the various agents in different positions shape the direction in which the sustainability agenda advances. It is arguable that change for sustainability in the SC is a negotiation process between individual change agents (Gioia & Chittipeddi, 1991). While this negotiating process creates uncertainty and tensions that can paralyse the advancement of sustainability, the development of a shared framework comes from working through the ambiguity rather than escaping it (Lüsher & Lewis, 2008). This is where external change agents, such as researchers, can help by facilitating communication between SC agents and by linking embedded sustainability issues to broader societal concerns.

Practical value

The practical value of the research aims at supporting the development of better management practices for the implementation of sustainability practices in a SC involving a large MNC and their

small suppliers. This work has definitely contributed to creating connections and experiences. It has introduced a new form of reflective dialogue at the individual and inter-organisational level that has supported the development of an awareness of what better relationships for sustainability may look like. In this sense, it has contributed to increasing the capacity of the research participants for appropriate action and their ability for self-awareness in the context of their business relationships. Participants have been able to reflect and articulate their conception of a sustainable future. The value of the research to the participants themselves is evidenced through their expressed desire of continuing this type of work beyond the scope of the project, but also through their visible emotional reaction at the end of the process.

What has been achieved in terms of practical value is clearly linked to relational practice and building a collaborative and communicative space. Over three years, the researcher worked alongside a company and their suppliers while at the same time being affiliated to an academic institution. The relationships that have been built, and have formed the crux of this research, have been characterised by trust and respect and have demanded that efforts be put in developing and maintaining them. At the end of the research, the participants were left with some tangible outputs of the work accomplished, in the form of report and action plans, and the intangible learning acquired through the workshops. The dialogical process started can be viewed as contributing to building infrastructures for the future.

Learning from past research: Reflection on the value of action research for sustainable supply chain management

Reflection on theoretical contribution and practical value

We have learned through our review that AR still is under-represented but has tremendous potential notably regarding theory development and understanding ‘process’ or unfolding of journeys (Westbrook, 1995; Coughlan & Coughlan, 2002; Dumay, 2010). In this sense it is particularly

suitable to studying concepts such as improvement, learning and change that are inherent to the progress towards sustainable SCs. The analysis of past AR studies in SSCM demonstrates that the strong connection with practice that is often reflected in the methods employed in the articles has the potential to make the human aspects of SSCM more transparent. It enables understanding how different parties in inter-organisational contexts relate to each other, the dynamics of these relations and provides snapshots of how research can have different roles in the progress towards sustainability.

The insights from the case study revealed that adopting a relational approach like AR can offer a more multilevel understanding of SSCM as it enables observing and participating in an inter-organisational context alongside individuals. Drawing from the work of Vlaar et al. (2006) can help explain that inter-organisational relationships are often characterised by high levels of uncertainty and ambiguity, which results in the different parties involved in these relationships to develop different and sometimes divergent interpretations and understandings of the same issue. By attempting to address sustainability through their existing relationships, organisations are bound to face some “problems of understanding” that impede coherent collective action (Vlaar, Van den Bosch, & Volberda, 2006).

Sustainability poses new challenges and therefore requires that business relationships evolve to accommodate it. In our case, the MNC and the growers are in the midst of this transformation, caught between existing relational structures and the necessity to address new requirements, and face the difficulty to understand what type(s) of relationships they are currently engaged in and the context in which these are embedded. AR can help illuminate the power dynamics at play in progressing toward sustainability in inter-organisational relations, especially those involved large and small players. Vlaar et al (2006) actually note that power asymmetries are likely to affect the way in which the SC partners deal with these “problems of understanding” as it affects for instance who controls the agenda and the style and extent of communication.

While it is important to acknowledge the potential of AR, we must remain aware of its potential limitations and challenges. In our analysis, we showed that existing case studies contribute to new conceptual developments in SSCM and are of fairly exploratory nature. The theoretical and practical contributions of AR studies to SSCM need to be evaluated with care. Considering the nature of AR as an engaged research approach, findings remain highly embedded in the context in which they have emerged as noted by several authors (Coughlan & Coughlan, 2002; Näslund, 2002; Ribeiro & Zwirner, 2009). While this may be criticised for lack of generalisability and validity, the nature of this critique is rooted in a different paradigm than that of AR.

As pointed out by Reason (2006), there is a need for “a greater variety of validity considerations that include the practical, the political, and the moral; and away from validity as policing and legitimation toward a concern for validity as asking questions, stimulating dialogue, making us think about just what our research practices are grounded in, and thus what are the significant claims concerning quality we wish to make” (p.191).

Hence the value of AR for developing knowledge in the field of SSCM clearly links with the key epistemological question of the nature and quality of knowledge. The contribution of AR in the SSCM field would be to introduce an alternative epistemological perspective, which would help reframe several issues (Cunliffe, 2010) and engage in a *generative dance* between different kinds of knowing and knowledge (Cook & Brown, 1999).

The value of AR in SSCM to the wider society lies primarily in the ways in which the research can enable the creation of communities of inquiry along the SC and exploring individual and collective contributions to the sustainable development agenda. The question of relationality at the institutional level is a trickier aspect to address and is certainly less salient. This is perhaps because relationships need to be built first at the more local and individual level before being able to scale up such projects. This reveals the need to reflect on the role of the researcher and the method in this context.

Reflection on the role of the researcher and method

Van de Ven and Johnson (2006) accurately point out that traditional research designs tend to only capture the information that people are willing to share through formal and shallow interviews.

They argue that engaged research over an extended period of time will provide greater penetration into the subject matter as a result of mutual trust. The richness and depth of the findings found in the past AR studies and the case reported in this paper are an indication that this is a promising and fruitful approach for these relationships.

The preferred method of engagement has clearly been a form of group discussion such as workshops or scenario development seminar. The question of feasibility of such approaches in the context of extended SCs needs to be posed, with for instance less homogeneous, more international and geographically scattered audiences. In our case study, designing and organising the workshops has required time and resources – not simply material but also in terms of personal development to become skilful facilitators – and considerable efforts have been spent trying to coordinate the schedule of the workshops. Considerations about the resources that would be needed to scale up this kind of approach are required.

There are also some important ethical and political aspects to take into account. Action researchers as ‘boundary subjects’ (Huzzard, Maina Ahlberg, & Ekman, 2010) can play a key role in the practice of transition towards relationships that are better suited to address sustainability. However, they face the challenges of finding themselves confronted to and limited by existing political tensions that arise in inter-organisational contexts, where actors have different roles, priorities and levels of influence on the sustainability agenda.

For instance, Ribeiro and Zwirner (2009) report the difficulty to engage with all stakeholders, in particular those that enjoy a powerful position and have so far been driving the initiatives implemented. In our case, some of the managers within the buying firm were initially slightly hostile to the research as it was critical of the way the relationships with the suppliers had been

approached on questions of sustainability. It proved particularly difficult to make these individuals commit to taking action. Emphasizing that findings from the work were not to be taken personally and seeking contributions from these managers on how the relationships were to move forward, gradually led to the dissipation of these initial adverse feelings.

The dilemmas faced relate to broader issues of resistance to participation and resistance to change. Some coping strategies can nonetheless be adopted. Regarding participation, it was particularly useful to gather a strong evidence base that could serve to show the criticality and inevitability of the topic (i.e. initial exploration and interviews of relevant stakeholders). Progressing from a less participative (interviews) to a more engaged phase (workshops) also facilitated a gradual process of involvement. Particular care was given to the initial introductions (written and oral) to the different stakeholders, in order to clarify expectations.

Building trust by showing a genuine interest in the different stakeholders' perspectives and activities was also important. This involved various means, including phone calls and face-to-face visits when appropriate. Spending time on the farms and within the MNC's premises was critical to demonstrate commitment and interest. Further strategies were adopted to stimulate change and engagement. Changing the context or setting of the conversation, in particular for the workshops, helped participants feel freer to discuss sensitive issues but also made them see things in a new light. Involving gatekeepers or influential people from the MNC was helpful to foster commitment from more hostile individuals, who then perceived the work as important and their involvement as necessary.

Empowerment is critical in addressing resistance to participation and to change. Practically, in the research project, this involved taking on board the stakeholders' perspectives in the design of the activities, their feedback on findings and letting participant-led solutions emerge. Dealing with confidentiality issues early, which involved presenting findings anonymously, was also critical to build trust but also facilitate openness.

The question of what happens once the timeframe of the research comes to an end is critical. As an action researcher, one is bound to wonder if there will be lasting change from the research or if things will revert. As noted by Ribeiro and Zwirner (2009), the question that naturally arises is what happens when the focal or powerful actors are left to their own devices.

Action researchers working to facilitate the transition for sustainability in inter-organisational context may become viewed as the knights in shining armours or in other words, the crystallisers of change in this context. This raises concerns about the power of researchers themselves in the development efforts.

The idiosyncratic influence of the researchers on the outcomes of the projects must be recognised and care must therefore be taken in assuming that similar initiatives, in a different context and without the presence of the facilitating researchers, would necessarily lead to comparable achievements. Huzzard et al. (2010) actually encourage action researchers to reflect on the discursive aspects of their interventions and their role as boundary subjects.

From these reflections, we have summarised the advantages and challenges of AR for inter-organisational sustainability research in Table 5.

Insert Table 5 about here

In considering the broader challenges and interesting issues that AR experts may face in dealing with the SSCM field, we identify the following. It is necessary to develop a thorough background understanding about the inter-organisational relations prior to being able to engage participants, which may result in longer exploratory periods. AR experts have a critical role to play in moving away from path dependence. Second, sustaining engagement of multiple organisations over a long period may also prove challenging. Also, the danger of the researcher becoming co-opted is greater in inter-organisational contexts. More broadly, SSCM arguably involves networks of organisations

across boundaries (Lebel & Lorek, 2008) and AR experts need to reflect on what an international network of collaborating local communities may look like for change on a wider scale to happen.

Conclusion

We have sought to contribute to the development of SSCM research by offering a methodological discussion exploring the relevance of an AR approach to addressing issues in the field. In particular, we argued that the nature of SSCM challenges calls for innovative research approaches that could make the most of the empirical richness of the field while not compromising on theoretical developments. We showed that AR was particularly suited to researching SSCM phenomena because it offers insights into the social and relational aspects of the field and allows a deeper connection between research and praxis, complementing the understanding developed through more traditional research approaches. SSCM research is as much about understanding the dynamics of managing sustainability in SCs as delivering research for sustainability.

This paper has implications for both SSCM research and practice. From our experience in the field and review of past studies, we have identified some of the advantages and challenges of adopting AR when researching SSCM issues. In progressing towards sustainable PCS, there is a need to understand activities at the boundaries of organisations. While existing power relations may prevent open dialogues and collaboration between these organisations, action researchers may be able to facilitate such approaches by bringing in new methods and external perspectives. In this AR can help move beyond company-centric, internal initiatives. AR is often relatively well perceived and accepted amongst practitioners as it contrasts from more traditional research approaches where researchers collect information about industrial practice with limited engagement.

In this study we advocate an alternative paradigm to drive sustainable SCs to new directions and identify critical aspects for researchers to explore. We suggest that SSCM researchers should engage further in philosophical reflections in order to embrace paradigmatic diversity. In addition,

we have highlighted how adopting an AR approach can benefit the field of SSCM but we also notice the relative scarcity of AR studies in OM and SCM publications. We acknowledge the difficulties of engaging in AR and warn of the challenges. In practice, it may prove difficult to conduct an AR study beyond the scope of a single organisation or local SC. In addition the political aspects of AR may be daunting for a researcher to address.

The discussion presented in this paper has actually opened several new lines of inquiry that we consider exploring in the future. Some of these lines of inquiry relate to issues that have already been touched upon in the literature but would benefit from more in-depth investigation. Others have simply burgeoned from our own experience with the research process, through the engagement with the topic and the research participants. We offer a non-exhaustive list of examples of key future research avenues.

First, researchers could explore the way in which AR can support the evolution of inter-organisational functional roles and governance mechanisms to deal with sustainability. Potential research questions could be: how can participatory research support the evolution of procurement skills to deal with sustainability questions and manage supplier relationships in this context? How might contracts for sustainability look like? What would they include and exclude?

Second, the potential of AR to research change agency for sustainability has not been much investigated and there exist opportunities to provide deeper explorations of the role of multiple individuals in inter-organisational networks, their connections and the challenges they face. This would help go beyond the heroic perception of sustainability change agents, in order to avoid pitfalls of sustainability implementation. This would also provide an opportunity to understand the interplay between organisational and individual aspects of change agency for sustainability and explore concepts such as values and motivations for sustainability, and how they may play out when multiple stakeholders are engaged.

Third, given the democratic orientation of AR, research could adopt this method to offer insights into the role of small companies in progressing towards sustainable networks. Large companies' perspectives prevail in current research in SSCM and the case presented in this paper reveals the potential of AR to engage alongside SMEs. A particularly fruitful research area would be to better understand and facilitate SMEs adaptability and responsiveness to change for sustainability. Finally, an AR approach could serve to unveil concepts of resistance, power and discourse in SSCM. This would add to our knowledge of power dynamics at the inter-organisational level by exploring these aspects. Investigating the relation of stories, jargon, objects related to sustainability in SCs and power may help understand why some initiatives fail and how on the contrary engagement amongst a diverse group of stakeholders may be facilitated.

Promising theoretical grounds may be found in psychological theories, structuration theory (Giddens, 1984), theories of discourse and organisational development (Marshak & Grant, 2008; Thomas, Sargent, & Hardy, 2010) and relational leadership (Maak & Pless, 2006; Uhl-Bien, 2006). In the end, we hope to have changed the representations of AR for sustainable SCM scholars and others involved in broader inter-organisational sustainability research. This paper is based upon our take on what constitute the main challenges in SSCM research and what approach to inquiry would be most likely to help address them. By doing this we have to some degree addressed the question of 'analogic appropriateness' as advocated by Marshall (2008), which encourages finding some level of congruence between form and content in research. We welcome further reflections on this matter in the future.

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Table 1. Selected findings and definitions from literature reviews in sustainable supply chain management (SSCM)

	Dimensions	Findings
Carter & Rogers (2008)	<i>Definition of SSCM</i>	“The strategic, transparent integration and achievement of an organization’s social, environmental, and economic goals in the systemic coordination of key inter-organizational business processes for improving the long-term economic performance of the individual company and its supply chains.” (p.368)
	<i>Sustainability</i>	Multiple definitions of sustainability: primacy of standalone topics, e.g. environmental or social Sustainability mainly viewed as ecological, lack of economic criteria Lack of integrated approach (3BL) to sustainability
	<i>Theories</i>	Lack of integrated and consistent SSCM framework
	<i>Methodologies</i>	Richness of empirical literature
Seuring & Müller (2008)	<i>Definition of SSCM</i>	“The management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements. In sustainable supply chains, environmental and social criteria need to be fulfilled by the members to remain within the supply chain, while it is expected that competitiveness would be maintained through meeting customer needs and related economic criteria.” (p.1700)
	<i>Sustainability</i>	Fragmented understanding of sustainable development, often one dimensional – lack of social and 3BL More comprehensive approach to sustainable development can be found in more recent papers Topics common in studies: pressures for SSCM, SSCM and performance, SCM for sustainable products
	<i>Theories</i>	Lack of strong theoretical background, main focus on original empirical findings
	<i>Methodologies</i>	Predominance of empirical methods, in particular case studies and surveys
Carter & Easton (2011)	<i>Definition of SSCM</i>	Same as Carter and Rogers (2008)
	<i>Sustainability</i>	Main focus on environmental aspects of SSCM Emergence of literature considering CSR and sustainability comprehensively after 2000 Mainly focal firm perspective but lack of exploration of other dimensions such as individual, the dyad or chain.
	<i>Theories</i>	55% of papers examined are a-theoretical Imported theories in the field and predominance of stakeholder theory and RBV
	<i>Methodologies</i>	Surveys are dominant methodology employed in the studies but the number of case studies has increased since 2000 Lack of richer qualitative approaches such as ethnographies
Miemczyk, Johnsen & Macquet (2012)	<i>Definition of SSCM</i>	“Sustainable purchasing is the consideration of environmental, social, ethical and economic issues in the management of the organisation’s external resources in such a way that the supply of all goods, services, capabilities and knowledge that are necessary for running, maintaining and managing the organisation’s primary and support activities provide value not only to the organisation but also to society and the economy”.
	<i>Sustainability</i>	52% of sample of articles focus on environmental aspects and only 23% on social. 50% of articles consider issues at the firm or dyadic level in contrast to SC or network level 69% of measures found in the literature focus on environment and 31% on social aspects. Most measures are at the dyad (46%) and internal level (35%)
	<i>Theories</i>	N/A
	<i>Methodologies</i>	Only 1 survey article represents the SC level in comparison to 8 case studies In depth-case studies required to understand the complexities of SCs and networks
	<i>Definition of SSCM</i>	None specified

Ashby, Leat & Hudson-Smith (2012)	<i>Sustainability</i>	Green SCs as main area of focus Limited number of studies looking at social dimension or integration of both environmental and social Environment seems more aligned with concepts of performance and measurable benefits
	<i>Theories</i>	Recent attempts at theory development but limited Lack of holistic understanding of the SSCM phenomena
	<i>Methodologies</i>	Qualitative approaches to research prevail with high number of case studies Next popular research method is survey Research approaches are focussed on understanding emergent phenomenon but not on informing practice significantly
Hoejmose & Adrien-Kirby (2012)	<i>Definition of SSCM</i>	None specified
	<i>Sustainability</i>	Primacy of environmental focus with limited number of studies looking at social dimension Lack of integration between environmental and social
	<i>Theories</i>	A few theoretical lenses have prevailed notably to examine the external and internal drivers of socially and environmentally responsible procurement and its relation to performance Literature dominated by descriptive pieces that fail to contribute to theory
	<i>Methodologies</i>	Fairly even split between quantitative and qualitative approaches Lack of mixed designs
Winter & Knemeyer (2013)	<i>Definition of SSCM</i>	None specified
	<i>Sustainability</i>	Most articles focussing on environmental dimension rather than sustainability as a holistic integrated concept. Environmental dimension primarily encompassed green initiatives such as waste reduction, reverse logistics, etc. Similar findings on SCM aspects: main focus on single aspects rather than adopting holistic view of SCM. Key aspects of SCM explored: supplier relationship management, manufacturing flow management and returns processes management. Lack of focus on social dimension
	<i>Theories</i>	Notable increase in articles engaging in theory development recently But few conceptual constructs developed and tested to date
	<i>Methodologies</i>	Qualitative approach as prevalent, especially case studies. Quantitative studies primarily rely on surveys. Potential value of experimental methods to move the field forward

Table 2. List of selected journals

Journals	
Operations management / supply chain management	Sustainability/Business ethics
International Journal of Operations and Production Management International Journal of Physical Distribution and Logistics Management International Journal of Production Economics International Journal of Production Research Journal of Operations Management Journal of Purchasing and Supply Management Journal of Supply Chain Management Supply Chain Management: An International Journal	Business Strategy and the Environment Corporate Governance Corporate Social Responsibility and Environmental Management Environment and Planning A Greener Management International Journal of Business Ethics Journal of Cleaner Production

Table 3. List of action research / sustainable supply chain management papers reviewed

Ref. N°	Article
<i>Articles in operations management / supply chain management and sustainability journals</i>	
1	Ammenberg & Sundin (2005)
2	Burchielli et al. (2009)
3	Koplin et al. (2007)
4	Mont (2004)
5	Partidario et al. (2007)
6	Seuring (2011)
7	Subramoniam et al. (2010)
8	Zackrisson et al. (2008)
<i>Articles in AR journals</i>	
9	Golob et al. (2014)
10	Lambert et al. (2012)
11	Ribeiro & Zwirner (2009)

Table 5. Advantages and challenges from applying action research in sustainable supply chain management

	Advantages	Challenges
Customer firm (large)	Engagement in research Change supporting strategic direction Supports other initiatives Reflect critically on practice	Short-term engagement on issue without long-term change Strategic direction change Suppliers get a voice Wary of critical view of researcher What happens next?
Suppliers (smaller)	Gives a voice Democracy Reflect on practice Access to research	Veiled power What happens next? Wary of research agenda View of researcher as “knight in shining armour”
Researcher	Part of change Access to deep qualitative data Not restricted to pre-defined themes Learn to deal with sensitive issues and manage relations	Managing expectations and political aspects Address ethics and question of objectivity Feeling lost or in-between Ending the process and future of work done
SSCM field and future research	Much research focussed on activities of large buying firms, AR provides a more egalitarian view of SCM Creative ways to include organisations in SSC Forward-looking research Opportunity for novel theory testing and building Impact & teaching cases	Manage engagement alongside multiple organisations: can AR be applied beyond the scope of one organisation?

Table 4. Thematic analysis of the action research/sustainable supply chain management papers

Art.	Part I: How have these articles conceptualised and operationalised the notion of transformation, relationality and engagement?		Part II: How do these articles evidence theoretical contribution and practical value?	
	Theoretically	Methodologically	Theoretical contributions	Practical value
1	Acknowledges the value of moving towards collaboration for reduction of environmental impact Life cycle-thinking through SC	Recognition that consultants, auditors and researchers can act as driver or barrier, but limited discussion of aspects in method	Qualifier. No theory adopted but model proposed on factors influence adoption and outcomes of Product oriented EMS	High. Identification of barriers and enablers to product activities in EMS, Difficulty for SMEs to collect and process environmental information for products
2	Researchers as homework activists and network study set up with intention to change - view of improving policy and governance on the issue Ethical network as a set of interconnected actors advancing and enacting ethical standard. Notion of sphere of influence of firms beyond their own boundaries	Engaging with stakeholders affected by the issue, consultation throughout research process and feedback	Qualifier. Concept of ethical network applied as a lens to understand informal work. Addresses questions of stakeholder involvement and empowerment issue.	High. FairWear network achievements in terms of regulation of homework + Increase public awareness of the issue + Empowerment of home workers who participated in network
3	Necessity for companies to adapt both normative and operational aspects to address environmental and social issues Emphasis on relationship aspects between buyer-supplier to achieve sustainability	Use of method to discuss potential actions and framework proposed Internal discourse workshops at VW, involvement of suppliers through workshop	Qualifier. Integration of different levels of SCM in view of environmental and social requirements from policy to strategy to the operational level and take into account collective learning processes.	High. Development of structured concept for integration of sustainability into SCs
4	Addresses the notion of paradigm shift in business strategies and the necessity to develop new products that fit within a system that promotes ecological efficiency Emphasis on collaboration between stakeholders in the network to reduce environmental impact	Create spaces of interaction for scenario development.	Builder. Extend SC perspective to incorporate stakeholders to address life-cycle environmental impacts and provide innovative solutions: value system management. Network view of the chain rather than linear.	Medium. Highlight how stakeholder involvement may be valuable in identifying ways to reduce environmental impacts in SC, method is useful for companies in attempting to redefine their business models and understand perspectives of their stakeholders

	Holistic understanding of the product chain and its relation to broader systems, processes and strategies			
5	Focus on finding innovative solutions to create more sustainable production/consumption systems Contextualisation, dialogue with stakeholders and negotiation as critical issues in achieving sustainable solutions in value chain systems. Systems thinking for innovative sustainable solutions	Requirement of involvement of wide range of relevant stakeholders as part of systems thinking – application through local community	Reporter. Multi-stakeholder processes for sustainability and understanding of the conditions that support their implementation	High. Method for co-development and co-delivery of innovative solution
6	Review and conceptual paper. Framework proposed based on recognition that SSCM relies on relationships between the different organisations in the SC	Necessity to have research rooted in different paradigms to advance the field of SSCM	Expander. Conceptual framework for life cycle management of sustainable products	Low. Framework developed conceptually and requires practical application.
7	Development of a new decision making framework for remanufacturing. Decision making framework proposed recognises the interrelation of environmental, social and economic impacts and the role played by relationship with suppliers	Engagement of company's managers to identify key aspects of remanufacturing but no engagement of wider stakeholders.	Qualifier. Reverse SC rather than forward SC and proposes a new decision-making framework.	Medium. Designed and tested a decision making tool for remanufacturing in the automotive sector but limited involvement of participant companies
8	Understand how to stimulate eco-design options through improved environmental information. Importance of communication aspects of the project across the SC	Engagement alongside 10 SMEs for this project: eco-design workshops	Reporter. Environmental Product Declaration as useful concept as part of EMS implementation	High. Possibility for smaller companies to use Environmental Product Declaration to improve communication about eco-efficiency of their products to larger companies in their SCs.
9	Necessity for companies to reconsider approach to defining	Workshops organised with the various stakeholders of the value chain (from suppliers to	Qualifier.	High. Model highly embedded in practice and supported development of

	CSR in their value chain through multi-stakeholder engagement	consumers)in a dialogical fashion to agree on meanings	Holistic of CSR in SCs through systems thinking and sensemaking perspective	better approach for one company involved
10	Linking the various elements of the SC and understanding their interdependence; linking environmental disaster to economic and social impacts	Not specified as intention to change practice but rather willing to inform the unique system – no methodological details on action research	Reporter. Linking systems thinking to risk management in sustainable SC. Identification of various implicated actors from production to consumption Identifying multiple tiers of the SC	Medium. Overview of factors impacting the local SC and how they have been addressed by the parties involved
11	Define improvement and factors affecting improvement of the commercialisation of paper mulberry bark that can contribute to poverty reduction. Acknowledging the interdependencies of the stakeholders in the SC, issues of debate and consensus Dialogue and systems thinking as foundations of multi-stakeholder and participatory approaches - reflection on design and the interactive nature enables investigation of institutional barriers and informal rules	Participatory process implemented with local stakeholders, democratic aspects and supporting joint-problem solving	Qualifier. Social and human aspects of SC and processes being studied. Reaching different tiers of the local SC. Reflections on power aspects and interdependencies between parties in the SC Participatory SC analysis as proposed approach	High. Identify factors affecting the industry and involving the different participants of the SC. Creation of local spaces for dialogue on these issues.

Figure 1. The connection between action research, pragmatism and sustainability

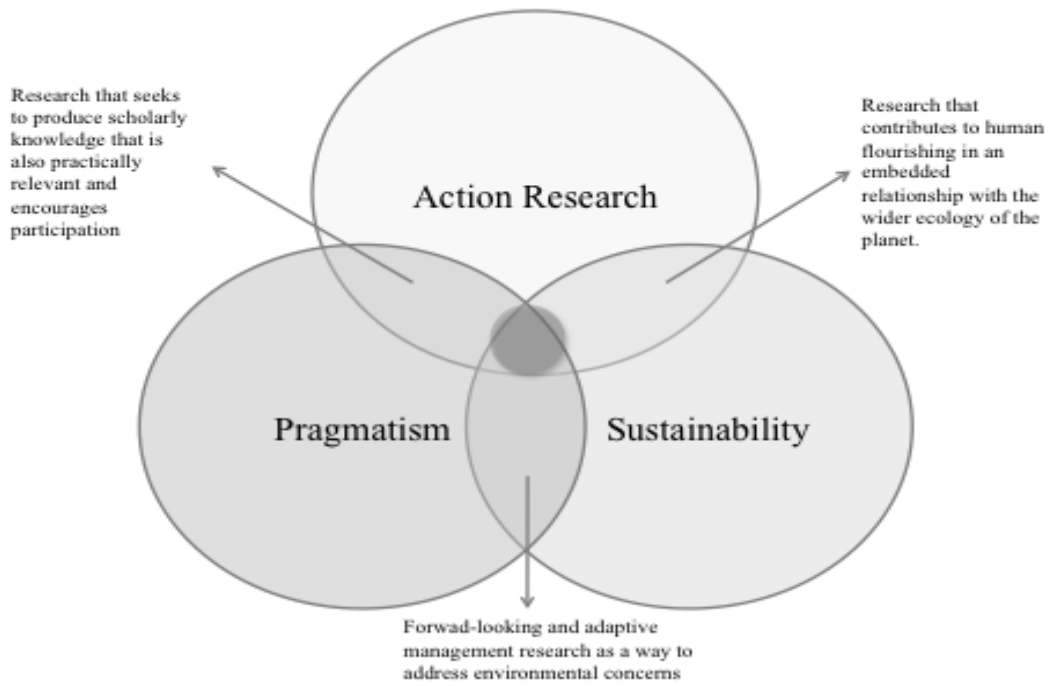


Figure 2. Number of action research articles over time

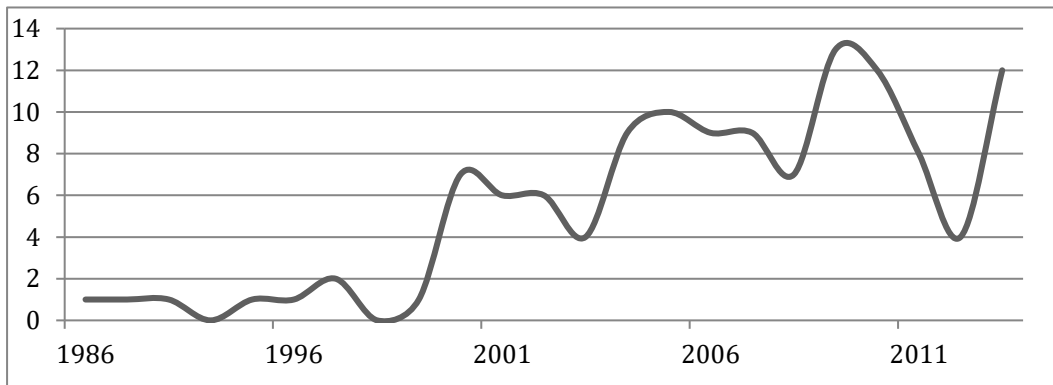
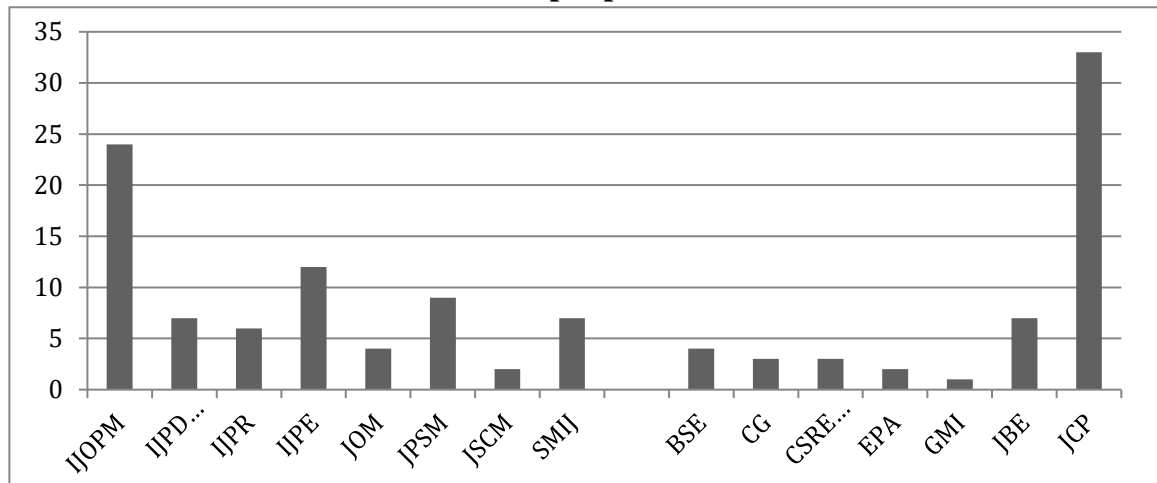


Figure 3. Number of action research studies per publication



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