TES Special Issue

Critical Realism as an Approach to Unfolding Empirical Findings:

Thoughts on Fieldwork in South Africa on SMEs and Environment

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Abstract: *The International Industry, Environment and Development literature only provides limited examples of systematic application of theoretical and methodological frameworks when investigating company motives for conducting environmental management. Concerning Small and Medium-sized Enterprises (SMEs), the Environment and Development literature contributions have tended to be pre-occupied with policy orientation and have been quite slack on fulfilling scientific requirements concerning the formulation of research designs, the collection of data and analysis. The author uses his PhD project on Environmental practices in manufacturing SMEs in South Africa as an example of how a match between research questions, methodology, theory and fieldwork design can be obtained. The author discusses the general implications of this 'fieldwork' premise and exemplifies how the application of a Critical Realist Perspective can make up for a part of this caveat in the social science field of Industry, Environment and Development.*[1]

Keywords: Fieldwork, methodology, Critical Realism, SMEs and Environment, South Africa

1. Introduction

My PhD project on 'Environmental Management in manufacturing Small, Micro and Medium-sized Enterprises (SMEs) in South Africa' took its point of departure in the fact that little research has been conducted on the greening of SMEs in developing countries. My focus was on the driving forces behind greening in small manufacturing firms in the South African manufacturing industry and the kinds of greening strategies that the firms employed. The emphasis of the project was thought to be on the problem analysis, with some descriptive and explanatory elements and, finally, recommendations at the policy level. It also had the ambition of providing a scientifically coherent approach to this issue. These elements are no different from many other research applications and project formulations, but the aims of my PhD project in addressing these different audiences were rather difficult to achieve. The fulfilment of the objectives would require a body of knowledge that did not exist.

Research often has the ambition of producing new knowledge, and conducting empirical investigations aimed at obtaining primary data is a well-known method used in acquiring such information. The international literature on Industry, Environment and Development is of recent origin and many researchers therefore (with some right) argue that they are

investigating new and/or unexplored areas. One set of issues concern, for example, the level of fieldwork experience in a context different from that of the researcher, which raises a number of challenges (language, cultural sensitivity, personal contacts and so on). Related, but distinct academic or scientific issues concern the amount of knowledge about a particular phenomenon, research objectives and the projected outcome. One could ask how, and to what extent, the amount of knowledge in a particular field impacts on the types of research which can be conducted, and the implications for the fieldwork conducted.

Research projects sometimes not only seek to describe and explain certain issues, the projects also want to end with recommendations about how to change the present situation and maybe even engage in implementing change. Fulfilling these aims can be a question of the resources available, but it also depends on the knowledge generated in the field. If few investigations have been conducted; if the existing information is of a certain character (for example only based on quantitative methods or mainly anecdotal); or if the information is old and outdated, the project needs to reflect these circumstances and the kind of methodologies which it will be relevant to apply both theoretically and empirically.

Different viewpoints have been articulated on this matter. Some have argued that research in a relatively new field has to move through various phases starting with explorative studies, and going on to descriptive, explanatory, analytical, and finally prescriptive studies. Others argue that such a sequence of knowledge creation is not necessary. An explanatory research project can be conducted in a new field, if the study is well defined, and focused on selected aspects of a phenomenon etc. Such project(s) can be complemented by other projects that further expand knowledge on the subject; deepen the complexity of our understanding and the dynamics involved, and add to knowledge creation.

On the other hand, we seldom encounter totally unknown phenomena. A certain amount of knowledge exists, and/or theories, frameworks and research designs have been developed which are relevant for the project we are undertaking. A literature review is one way of scrutinising the existing contributions and gain insights to the present 'state of art' in a field, older or younger. So, while we need to reflect on the amount and quality of knowledge available on the subject of our fieldwork maybe more importantly we also need to consider for example the relevance of a certain theory, formulating hypotheses and employing coherent research designs in the quest of answering the research questions.

Being a new field of investigation goes some way to explaining that the Industry, Environment and Development field is characterised by limitations such as; the lack of knowledge on causes and effects of greening; on driving forces and barriers; and on analytical frameworks. This situation impacts on what kind of aims can be fulfilled and what kind of knowledge can be generated. However, it does not explain or justify that the Industry, Environment and Development field has also been marked by lack of scientific rigour (Gladwin 1993), as coherent scientific approaches obviously should be applied. From a Critical Realist perspective, I propose an approach that enables a coherent scientific and methodological set-up and secures a fit between the knowledge in the field, the fieldwork and the analysis of the empirical findings. I start out by giving a sketch of the Industry, SMEs, Environment and Development literature. I highlight the key element in a Critical Realist perspective, and outline how an approach can be framed. Finally, I discuss the lessons learnt.

2. Literature on Industry, SMEs, Environment and Development

The point of departure in my research was to embark on a literature review of the Industry, Environment and Development area. Apart from confirming the limited amount of knowledge available, the review also indicated that the knowledge concerning environmental practices of SMEs was limited too. But, more importantly, the review revealed that the majority of the contributions had a normative perspective and were focused on prescription.

A major area of interest has been how to achieve sustainable development within industry (and in individual firms). A key element has been to employ a 'win-win' perception, which is the understanding that pursuing and improving environmental performance (always) goes hand in hand with improving economic performance in companies. Instead of taking the point of departure in a theoretical framework, which conceptualises the possible re-

lationship between environmental and economic performance, the contributions have assumed that, for example, the implementation of an Environmental Management System (EMS) automatically leads to a 'win-win' situation. Few studies have provided more open frameworks and considered the factors which potentially could impact on the environmental practices of SMEs; their relationship with suppliers, customers and regulators; and how the context influences these matters (see for example Whalley 2000, Scott 2000).

Another set of contributions has assessed drivers of and barriers to greening, but has applied frameworks which entailed 'factors' picked more or less at random and without being connected to a theoretical understanding of causes and effects of why SMEs green. The contributions have taken for granted that SMEs across sectors have a serious environmental impact. Accordingly, these contributions have gone on to prescribe how to mitigate this impact - in spite of the limited knowledge about, for example, what kind of environmental practices SMEs conduct or on why SMEs green or not green. A number of contributions have taken their departure in the perception that 'SMEs are lacking resources and capabilities to perform environmental management' (Hillary 1995, Petts 2000). Not surprisingly, these kinds of contributions have ended up concluding that particular barriers to environmental performance are related to the size of the firms – a tautological argument.

Yet other authors have discussed the reasons why SMEs engage in environmental management – and especially not engage – based on the views of SME stakeholders like service providers, government staff and NGO's (Hobbs 2000, Gerstenfeld and Roberts 2000). Other authors have generalised data from one context like the UK as 'European experiences' and further to SMEs in (all) other contexts, including developing countries (Gerstenfeld and Roberts op.cit, Smith, Kemp and Duff 2000).

The empirical foundations of the contributions are often flawed, for example in using a sample of arbitrarily selected SMEs without specifying the selection criteria or by interviewing randomly picked stakeholders (consultants, government officials, NGO's) with few or no considerations concerning how and whether the data collection methods supported the aim and type of investigation. Furthermore, findings based on fragile scientific premises have been widely generalised. Examples include arguments that findings on SMEs in the UK could be extended to SMEs in South Africa, or that if 40% of SMEs say that environmental regulation is of little concern to them, then environmental regulation is an unimportant driver of environmental management in SME. Yet others have used quantitative data like a survey to generalise about drivers and barriers, though limited knowledge on causes and effects exists (see for example Gerrans and Hutchinson 2000).

In practical terms, this seemed to be related to the policy orientation of many investigations and an obligation to provide policy makers information on this 'new phenomenon' of SMEs and the environment. While the policy orientation is quite legitimate, the scientific outcome is problematic, as the contributions show a lack of scientific rigour and produce dubious accounts of SMEs and their environmental management. The main problem rests with the incongruence that we on the one hand have little knowledge concerning SMEs and their environmental impact and on the other hand should argue that the activities of SMEs are a major environmental problem. If the environmental management of SMEs has been rudimentarily dealt with, how can we then state that SMEs constitute a (major) environmental problem?

While one issue was a lack of knowledge on SMEs, Environment and Development, even more important was the flaws in the literature. The next step in my process was to reflect on and sort out consequences with regard to the research strategy and especially research design. Firstly, the aims of my project had to be adjusted by leaving out the original ambition of making policy recommendations. Secondly, I decided to focus on one type of project; thirdly, the issue concerning coherence was stressed; and fourthly, I also came to recognise the need for clear definition of concepts and for a theoretical framework. I deal with the three issues later in the main part of the article and return to the first issue in the final section.

One way of characterising project types is by dividing them into five 'ideal types', the explorative, the descriptive, the explanatory, the predictive and the action orientated (Andersen & Gamdrup 1990, p. 41). The explorative type of research aims at

presenting information on a phenomenon and how it is constituted. The descriptive type seeks to explain how it has developed, the character of the phenomenon and relations to a specific context. The explanatory analysis has the ambition of answering why the phenomenon has developed in a certain way, identifying hidden causes of this development and addressing the main reasons, which should be addressed. The predictive type aims at coming up with suggestions, proposals, and recommendations concerning how the phenomenon can be changed, improved and the implications of these suggestions. Finally, the action orientated type seeks to implement the changes in collaboration with the target group or problem owners.

Andersen argues that a research project should clarify the research type at an early stage. The advice is to concentrate on 'one type', though all projects often entail descriptive elements, in addition to the focus on explanation, problem solving and maybe intervention too (Andersen 1999, p. 23-29 and p. 55). But the decision concerning the focus should also depend on the amount of knowledge that we have of a particular phenomenon. The newer the field and the less knowledge, the more it points to a descriptive and/or explanatory type of project. The older and well researched area; the better is the foundation for a problem analysis type and maybe even problem solving.

My conclusion was the project type should be the explanatory, and more specifically a concrete or intensive research type (see the next section). The key research question was to identify the driving forces of greening in SMEs in South Africa. The explanatory nature of the PhD project was indicated with two supporting research questions addressing 'How' and 'Why' SMEs mobilise resources and capabilities for environmental practices. The 'How' dimension was important as the present knowledge was limited and I could not base my work on existing investigations, but had to establish this foundation myself.

The second and related outcome was the importance of addressing the issue of 'scientific coherence' that is an obvious requirement with in social and any other sciences. Andersen argues that a key priority is to secure a tight relationship between four elements, the 'problem type', the research question(s), the methodological approach and the theory used/applied. However, this approach has to be supplemented with considerations anchored in a research strategy and a research design, which reflect coherence between the philosophy of science, a social ontology and the level of social theory. Ensuring a fit between these three methodological elements is not only a bigger task compared to ensuring a fit between the four elements outlined by Andersen. It is also in my opinion the critical task, which is needed in order to establish a foundation, which can provide us with new knowledge. Here additional methodological considerations are necessary.

A crucial issue seems to be the position that we take as researchers concerning how we can establish explanations of phenomena relating to SMEs, Environment and Development. With many contributions drawing on rational, positivist perspectives, which were compromised for the reasons outlined above, what then would be another option? One such option is provided among others from the so-called the Critical Realist perspective (CRP).[2] Seen from a Critical Realist position the problem(s) with in the SMEs, Environment and Development literature stems from different, but related issues. One element is the emphasis on empirical investigations which however in some cases lack thorough methodological considerations. Another element is the lack of a coherent theoretical framework, and a third critique is the use of certain types of explanation, especially generalisation, which are problematic due to the lack of methodological and theoretical considerations.

3. The Critical Realist Perspective (CRP)

Ontologically, the basic understanding of Critical Realism is that reality exists and that it is possible to conceptualise it and make theories in order to describe it. Simultaneously, the CRP does not make claims of totally comprehensive understanding of a certain problem or establishing a 'grand perspective'. Furthermore, the CRP regards all knowledge as fallible, in the sense that a scientific account of a phenomenon is a partial account of certain aspects, deliberately chosen and due to change.

A central point of the Critical Realist ontology is the division of reality into different domains with specific propensities. At the domain of the empirical we can make observations of 'experiences', meaning the visible observations of the phenomena, we study.

These experiences constitute parts of the 'events', which we can identify at the domain of the actual, which in turn is the outcome of 'mechanisms' at the domain of the real.

Epistemologically, the aim of Critical Realism is to explain the relationship between experiences, events and mechanisms. The perspective emphasises questions of 'how and why' a particular phenomenon came into being, got its specific character and so on. The emphasis is on the explanation of the constitution of empirical phenomenon and not to give predictions.

We need different kinds of reasoning; inductive; deductive; abductive, and even retroductive in order to make analysis of the various domains of reality and identify the relationship between experiences, events and mechanisms (Danermark et al 1997, p. 123-172).

Investigating conditions within social science is according to the CRP based on premises and characteristics like 'openness' (closure does not exists), double-hermeneutic relations between the researcher and the object (both make interpretations when they engage), our understanding and analysis is theory-laden and concept-dependent (the theories and concepts that we use impact on our study, but they don't determinate the outcome), and the context (time and space) influences the phenomenon we study.

Establishing Critical Realism as a philosophical position has so far led to an emphasis on issues in the philosophy of science. Issues of linking the abstract dimensions to those of a concrete nature and how to conduct empirical investigation based on a Critical Realist position have been more rare. In this light, the CRP provides a kind of scientific platform, which needs to be extended on a number of accounts when one is going to conduct fieldwork. Different applications of the CRP have elaborated on this and especially Sayer's work (Sayer 1992) is a contribution to the development of Critical Realism, called a '(Critical) Realist Approach' (hereafter CRA).

Sayer underlines the focus on scientific/methodological coherence and emphasises the relevance of different methods of data collection for different types of projects. He advances four types of research: intensive or concrete; abstract; generalisation; and synthesis. The intensive/concrete involves theoretical and empirical analysis; the abstract only theoretical; the generalisation only empirical while the synthesis is interdisciplinary analysis coverings different perspectives and fields (Sayer op.cit. 1992, p. 237 ff).

Sayer outlines two different kinds of research designs that are relevant when doing fieldwork. The intensive and the extensive research designs (Sayer op.cit 1992 p. 242ff) can be employed in relation to research, which seeks to link the theoretical (or 'abstract' in a Critical Realist terminology) and the empirical (or 'concrete' in the Critical Realist terminology).

The 'intensive research design' is used in research where we want to obtain in-depth knowledge of specific phenomena, such as how and why a firm mobilises resources and capabilities for environmental practices. Intensive research mainly applies qualitative methods and analysis. The extensive research design is appropriate for example when we want to establish an overview of the environmental practices in manufacturing SMEs in a geographical area like South Africa (Sayer op.cit 1992, p. 242). The extensive research typically uses more quantitative methods and analysis (Sayer op.cit 1992, p. 244).

Sayer indicates a preference for intensive research designs. One issue then is what a CRA has to offer in regard to fieldwork compared to a case study approach, for example as argued by Yin (1989)? Yin also argues that a qualitative and in-depth design is preferable to quantitative designs. I considered the case study approach highly relevant at the outset of my project, however a closer – and critical – assessment of Yin's design revealed that it was not consistent with a CRP. A main difference is Yin's argument that generalisation is possible on the basis of a case study, while critical realists including Sayer reject this (see Jeppesen 2004, section 5.1).

4. A Critical Realist Approach to Studies of SMEs and Environmental Practices

I included the two designs mentioned above in my PhD project in order to illustrate the arguments made by Sayer (and other Critical Realists) concern-

ing the importance of: a) establishing a coherent scientific framework; b) applying it, and c) securing how to formulate the lines of argumentations, which the particular project type aims to implement. One of the first/most important aims of the PhD project was then to gather primary data in order to fill the knowledge gap and investigate how SMEs conducted environmental management. The information should provide me with the overview of the kind of environmental practices that the SMEs were carrying out as a means to go into depth about the issue of the driving forces of greening in the small firms. As few investigations had taken place in the South African context, limited knowledge existed in the field and on South Africa. In order to establish the empirical foundation for the analyses in my project I needed to collect empirical information, which not only were non-existing in South Africa, but also to a certain extent absent internationally.

However, this part of the research process turned my attention to the fact that Sayer bases his outline of the research designs on the assumption that we as researchers are studying fields that have been thoroughly investigated by other researchers earlier. Accordingly, as mentioned earlier, he argues that an intensive - or concrete - research type is the preferable one. As this is precisely not the situation concerning SMEs, Environment and Development, I had to rethink the approach. Eventually, my conclusion was that Sayer's intensive and extensive designs have to be supplemented by a third – so-called explorative design (Jeppesen 2004, pp. 92ff). The explorative design is aimed at investigating the field where we need to establish an understanding of the area investigated, the perceptions of the phenomenon under scrutiny and what constitutes 'issues or problems in the field' according to involved parties (like government employees, researchers, industry associations, firms, consultants and NGOs). The explorative study could involve a literature review, investigations of the history, political, economic and social conditions, environmental regulation and knowledge on Industry, SMEs, Environment and Development and interviews with key persons.[3]

The consequences for my research process was firstly to focus the first field trip on a broad based collection of information in South Africa related to the explorative and the extensive designs. It included desk studies of existing material (on the history of South Africa, political, economic, social and environmental conditions, industrial development, environmental regulation); interviews with government officials at national, provincial and local level, consultants, NGOs, researchers and owners of SMEs. The intentions were to get the 'context' in place and gain a feeling of how the issue of SMEs and Environment was dealt with. Interestingly, when I talked to government officials, consultants and researchers who worked on industrial development, but not related to environmental issues, the answer was that SMEs did not care about the environment or worked with such issues. However, talking to other respondents who worked in the field of SMEs and Environment, the feedback was quite different and the main message was that the environmental practices had gained increasing attention among SMEs.

The other part of the first field trip was used to conduct the extensive study in order to get an overview of environmental practices among manufacturing SMEs in South Africa (and to try to clarify the ambiguity that the explorative study indicated). I decided to undertake a survey of all SMEs in one of the major urban and industrialised areas of South Africa. The information was gathered by myself and a team of student assistants using a structured questionnaire, which was filled in through face-to-face interviews with owners and managers of SMEs.

In my data processing and analysis of the material gathered, I gradually came to understand Sayer's point about the usefulness – and particularly limitations - of the extensive study. The findings of the survey were clear and highlighted correlations between the size of the firms and their level of practices (the micro firms had the lowest level of practices, the small a higher level and the medium-sized the highest level of practices) and between sectors and level of practices. In discussions with my supervisors I had the ambitions of – and was challenged to provide explanations of why South African SMEs conducted the observed kinds of environmental practices. As the findings showed some of the 'patterns', but not anything concerning causes and relations, the need of a qualitative design that could provide such information came out clearly.

I prepared my second round of fieldwork in South Africa in order to conduct an intensive study. Here, I decided to employ qualitative methods, mainly

interviews and observations. Again, my assessment of the international literature gave little foundation for a possible theoretical framework. The studies were using loosely defined concepts and predominantly contained case studies from a First World context. The implications hereof were a more thorough assessment of the firm level perspectives, which conceptualised factors like resources, skills, capabilities and competencies, and a construction of a theoretical-analytical framework. Finally, I constructed what I called an interview framework consisting of the areas of information that I wanted to cover with the respondents. In South Africa, I identified a group of thirteen companies from the survey sample of which I engaged with three selected companies in order to get an in-depth understanding of the 'why'. I interviewed owners, middle managers and employees in the three firms, two or three times each and what the owners perceived as the most important external institutions (clients, suppliers, government institutions, service providers or NGOs). This eventually provided me the data foundation that enables to do the final analysis of the empirical work and the implications for my theoretical framework and the CRA.

5. Lessons Learnt

I gained three main lessons from my scientific undertakings doing a PhD. Firstly, taking a Critical Realist approach when conducting research with in the field of SMEs, Environment and Development is not the only possible way of securing a coherent scientific framework, which helps the process of knowledge production. Still, I think that a CRA is useful and helps avoiding a number of the pitfalls, which normative, rational, positivist contributions have. Applying a CRA means addressing a number of important elements in the research process and establishes the relations between the data that we want to generate during our fieldwork, the theories to be used and the research questions to be answered. And, just for clarification, the CRA also needs further refinement.

While a part of my argument is that what we can accomplished with a research project depends on the amount of knowledge that exists in the particular field, which the research is situated in, the more important message is that we as researchers need to make a critical assessment of the way that our particular field is constituted; how we view our contribution(s); and how we do this in coherent and stringent manner. Conducting research with in the field of SMEs, Environment and Development from a social science position is presently based on the condition that limited knowledge exists. But, the conclusion is not that we should advocate a 'puritanical view' on research methodology, arguing that the knowledge creation only can take place through a step-by-step approach moving from exploration, description, and explanation to understanding, analysis and prescription. We don't need to confine ourselves to historical, explanatory research and hence limit the potential use of the results. Different types of research, e.g. action research, and the application of research in practice are important (see e.g. Wad 1998 for a discussion of this issue).

Secondly, an important condition is the limited resources and priorities that are given to environmental issues in the countries and contexts that we research. One implication seems to be that we need to reflect thoroughly on our ambitions with the research and an aim itself should be to make a contribution, which is useful to future research in the context, whether it might be internationally or locally funded research. One element here is that we apply analytical perspectives that are sensitive to the context like a CRA in order not to fall in the trap of ethnocentrism.

Thirdly, it is important that the work is useful, applicable and relevant for policy formulation in the local context. To me, a precondition for this is that the processes of conducting the research and for example making input and suggestions for policy interventions are as separate as they can be. The research has to be conducted in its own right, with the particular set of scientific conditions attached to it. The practice orientation is another process, where relevant parts of the research findings are translated into suggestions concerned possible policy interventions. However, the inputs should be presented as e.g. scenarios of what could happen under certain circumstances and not as closed recommendations.

My contributions to the issues of driving forces of greening in small firms in South Africa have mainly been at the methodological and analytical levels. Still, the empirical investigations also provided insights to the environmental practices and greening strategies of South African SMEs. For example, my findings

concerning the environmental practices of the SMEs in South Africa related to the ambitions of improving these practices from the Department of Trade and Industry and the Department of Environmental Affairs and Tourism. First of all, one point would be that the environmental practices differ substantially between Micro, Small and Medium-sized firms and between the manufacturing sectors. So, the issue is not just to say that SMEs lack resources and capabilities to carry out environmental management and hence reproduce the myths in the international literature, but instead to suggest that the policies should target the SMEs according to the level of environmental practices that the firms carry out. While the PhD project mainly has academic interest, it contained ample information, which could be of relevance to companies, government and trade associations and with out reproducing the prejudices on the lack of resources and capabilities for environmental management among small firms, which the international literature carries. The point is that the 'translation' of the scientific work should take place as a separate phase, in a dialogue with policy makers. However, if these processes are too tightly related, the risk is that practical part affects the scientific part and hampers coherence etc.

Notes

1 The paper is based on experiences from a PhD-project on 'Environmental Practices and Greening Strategies of Small Manufacturing Firms in South Africa. A Critical Realist Approach' See Jeppesen 2004. The PhD-project has been funded by the Danish University Consortium on Environment and Development, Industry and Urban Areas (DUCED-I&UA) and the Copenhagen Business School.

2 Roy Bhaskar and Rom Harré are among the founders of 'Critical' Realism. They launched a critique of the 'rational' and 'positivist' scientific requirements entailed in the natural sciences as well as major parts of social science (see Archer et al 1998 for an introduction and discussion of Critical Realism). The aim was to construe a new ontology and a new realist philosophy of science (Bhaskar and Lawson 1998, p. 3) as an alternative to the positive, rational as well as social-constructionist perspectives. The work has concentrated on the philosophy of science level and ontological, epistemological and methodological issues. Less emphasis has been placed on how actually to link the abstract and concrete levels in the research process. Authors like Sayer (op.cit, 1992 and 2000) and Danermark et al (1997) have focused on this aspect of Critical Realism.

3 For an elaborate assessment of this issue, see Jeppesen 2004 (chapters 3-5).

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