

Paradigms and Cadastral Research

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SUMMARY

Research is underpinned by a paradigm or the researchers' philosophical worldview. Thus to understand the decisions made in the design of a research project it is important to be aware of the underlying philosophical assumptions. Research in the cadastral field has undergone changes in recognition of the importance of social, cultural, economic, institutional and political issues surrounding the technical aspects of the cadastre, and, because of this, a greater variety of paradigms and research methods are used. Although there is literature addressing research approaches and methods, little attention has been given to discussing the philosophical base of research design.

This paper considers the implications of four different paradigms: postpositivism, social constructivism, advocacy and pragmatism. It introduces the main assumptions of the four and relates them to a research project in the cadastral field. The choice is then reflected upon in relation to the fieldwork component of the research. The aim of this paper is to contribute to the discourse in the cadastral research field by extending the discussion to include the philosophical aspects of research.

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1. INTRODUCTION

In recent years, geodetic surveyors conducting research in the cadastral field, have started concentrating on institutional, social, political and economic issues in recognition of the importance of these in resolving the technical difficulties that had been the main focus (Silva & Stubkjær 2002). To do this, there has been a move to develop the theoretical framework used in cadastral studies by adopting theories and methodologies from other disciplines. Mainly, researchers have used methods from the social sciences (Silva & Stubkjær 2002). A review by Silva and Stubkjær (2002) of research published during the previous 10 years shows that case study methodology is the most frequently used. Other methods included documentary research, questionnaires, interviews, comparative analysis and participant observation (Silva & Stubkjær 2002). Additional social science methods can be identified, albeit only a few instances, for example ethnography (Fourie 1994) and grounded theory (de Souza 2001). Methodology from the information systems discipline (van Oosterom et al. 2006) as well as systems theory (Barry 1999; Barry & Fourie 2002; Zevenbergen 2002; Augustinus and Barry 2006), has also been used. In recent years the use of systems theory has become more prominent in the cadastral development field and three doctoral research projects which this has been applied this have been identified by Çagdas & Stubkjær (2008).

Although research methods are discussed in journal articles, very little mention is made of the paradigm adopted for the inquiries. The explicit recognition of the paradigm adopted by a researcher is important due to the interconnectedness between paradigm, research methods and strategies of inquiry (Creswell 2009). Without this recognition it is difficult to understand the assumptions and choices that result in a research design. It also affects the final results and conclusions reached. This discussion will consider the implications of selecting any of four paradigms: postpositive, social construction, advocacy and pragmatic.

2. THE IMPORTANCE OF IDENTIFYING A PARADIGM

A paradigm can be defined as a “set of ideas, assumptions and beliefs that shaped and guided [the activity of a particular scientific community]” (Jackson 2003, p. 37). The paradigm thus provides a fundamental link between the different research activities in a disciplinary field. If the predominance of case studies in cadastral research is considered, where each research project is focussed on a locality, and generalisability becomes difficult, a shared paradigm becomes important. If there is no common paradigm, it is crucial that the assumptions of the different paradigms are made explicit to assist in developing a cohesive body of research.

There are four main factors that influence the choice of paradigm: the problem, the researcher, the methodology, and the desired outcome (adapted from Creswell 2009). Different problems require different approaches and dictate to a large extent which paradigm would be more suited. This is one of the reasons why adopting a single paradigm for the cadastral research

field may prove to be difficult. The researcher may also, as a personal preference, feel more comfortable with certain paradigms. It would be difficult, for example, for a researcher from a strong positivist background to attempt to use an advocacy approach. The interrelatedness of paradigm, problem and methodology means that the paradigm guides the selection of methodology, but the problem may require a certain methodology. Thus it would be unwise to select a paradigm that may be in conflict with the requirements of investigating a problem. Finally, the desired outcome can affect the choice. If the desired outcome is to empower participants or collaborators, it would be prudent to select a participative approach.

Four paradigms were selected for this discussion. These are not the only potential paradigms, but they provide a good representation of the development of paradigmatic approaches in the social sciences and related fields. In addition it is important to note that the whole area is subject to critique and development; there are continuing debates surrounding the different paradigms.

3. THE FOUR PARADIGMS

The four paradigms are representative of a range of views. The postpositive worldview is a more traditional empirical approach from the 19th century. It was a reaction against the assumption of positivism that absolute truth exists, especially in relation to findings about humans (Creswell 2009). Social constructivism is concerned with humans and their interaction with the world, and how this results in multiple subjective meanings or understandings (Creswell 2009). It arose out of sociology and qualitative research in the 1960s and is closely aligned with interpretivism. In the 1980s and 1990s advocacy became prominent as researchers argued that the structuralism of postpositivists excluded marginalised people and constructivists need to be more cognizant of the potential of research to help empower people (Creswell 2009). The inseparability of research and politics, and collaboration with participants are also dominant themes. One of the more recent developments in the social science field is the pragmatist philosophy where the focus is on the problem and finding practical solutions (Creswell 2009). This paradigm represents a distinct move away from concerns about meaning and truth, and “do not see the world as an absolute unity” (Creswell 2009, p.11). This paradigm is thus pluralist in nature and allows the inclusion of any paradigm, assumption and method and is eminently suitable to mixed method research.

It is important to note that other paradigms are used in cadastral research, for example critical realism (Whittal 2008), but for the purpose of this paper the four paradigms were chosen as examples of commonly used paradigms in the social sciences. These worldviews also provide an illustration of the development and changes in approaches over time.

It is possible to use quantitative, qualitative or mixed methods with any of the four paradigms, however some are better suited (Creswell 2009). For example, quantitative methods are used in postpositivism, with its assumptions about measurement, whereas social constructivism is typically associated with qualitative methods and pragmatism with mixed methods.

4. THE FOUR PARADIGMS AND A RESEARCH PROJECT IN THE CADASTRAL FIELD

The four paradigms were critiqued as part of a doctoral research project presently being conducted in the field. The project is an inquiry into off-register land transactions in social housing in secondary towns in South Africa. The example illustrates the reasoning behind the selection of paradigm.

Postpositivism is a deterministic philosophy that assumes effect probably follows cause. Its traditional scientific roots require that problems are reduced to parts (reductionism) and that these discrete components are tested, for example by using hypotheses and research questions. Emphasis is also placed on the objectivity of the researcher and the identification of bias (Creswell 2009).

The research usually starts with a theory and the development of hypotheses and research questions, followed by data collection. The data is then used to verify the theory and changes can be made to instruments before the study continues. The ultimate aim is to define or explain causal relationships (Creswell 2009).

For the research project this paradigm was viewed as unsuitable. There are advantages, for example data collection can be completed in a short time and statistical analysis can be applied. However this approach makes it difficult to identify perceptions, beliefs and motivations that inform the decisions people make. Identifying the right questions and presenting them to participants in a study so that the people living in the situation under study understand the questions in the same way that the research designers understand them is extremely difficult (Barry 1999). Postpositivism's reductionist assumptions have also proved incompatible with the present move towards holistic research in the cadastral field, especially as it relates to the poor, land tenure and land registration systems (Barry & Fourie 2002; Dale 1999; Davies & Fourie 1998; Steudler, Rajabifard & Williamson 2004). More importantly, it would be difficult to develop a theory because so few studies have been done in the area and little information exists. In addition, from impressions gained from reports and newspaper articles (Gordon 2008; Hweshe 2008; Smit 2008), the social, historical, economic and cultural influences seemed very pertinent to the decisions people make with regards to land transactions.

In contrast to postpositivists who rely on the observation and measurement of objective reality, social constructivists attempt to understand the subjective patterns of meaning constructed by individuals. They acknowledge that individuals hold a variety of views in relation to a situation and there is a focus on understanding these multiple meanings. There is also an assumption that these meanings are constructed through interaction and are negotiated socially and historically. Thus there is a focus on the historical and cultural aspects of the situation being studied. In addition researchers acknowledge the bias that their own background introduces into the interpretation of the research data. A qualitative approach is usually used in conjunction when the social constructivist paradigm is adopted (Creswell 2009).

The benefits of this approach are that a deeper understanding of attitudes, beliefs and motivations of individuals can be obtained. The drawbacks are the time required to complete the fieldwork, the difficulty in obtaining access to individuals for in-depth interviews and the complexity of the analysis.

The advocacy or participatory paradigm arose out of a concern that other worldviews do not address social justice issues, especially when considering marginalised or disenfranchised individuals in society. These inquirers also feel that research is political in nature and that it is possible to affect change through research. There is thus an emphasis on participatory research and the formulation of an action agenda. Collaboration with participants ranges from the design of questionnaires to the collection and analysis of data. The inquiry includes not only the aim to empower individuals but also to ensure that they are not further marginalised. Qualitative and quantitative approaches are used in advocacy research (Creswell 2009).

Advocacy research has been used in the cadastral field, mainly in the form of action research (Abbott 2002; Huchzermeyer & Karam 2006; Majale 2008). The advantage of this approach is that marginalised communities should be empowered by the knowledge they gain from the research results and the process of the research itself. The disadvantages are that the researcher may not be able to obtain the support and cooperation of the community under study, and different groups within the community may have different agendas. This might also result in insurmountable ethical issues. Moreover, in the authors' experience politicians, officials, warlords, gangs, street committees and other groups representing a community or factions within a community may act as gatekeepers and strive to censor the research or prevent the research taking place.

The advocacy approach was considered for the research project, since participants would be drawn from marginalised communities that may be empowered through the research. However, because of the differentiation within communities, schisms related to politics etc., the data gathered by community members may be affected by the relationship between the participant interviewer and respondent. This could have been beneficial, in that trust between the parties would result in richer data or detrimental, if the no trust exists. The disadvantages of the advocacy approach are that the researcher may not be able to obtain the support and cooperation of the community and different groups within the community may have different agendas. Another reason was time constraints. It takes a considerable amount of time in the field to introduce and complete a participative research project in the cadastral field, and the researcher did not want to commit to a process that will be difficult to complete successfully and conscientiously. Also, because of previous unwise interventions before a phenomenon is clearly understood in the cadastral field (Barry & Mayson 2000; Bassett, Blanc-Pamard & Boutrais 2007; Gulyani & Bassett 2007; Toulmin 2009) it may be better to understand the phenomenon, from the perspective of the participants, before recommendations or changes are made or a participatory project attempted.

Although there are different forms of pragmatism, in general, pragmatists are focussed on understanding and finding solutions for research problems. Because mixed methods are often

used, a rationale needs to be developed of the methods chosen and the research design and this is strongly informed by what the researcher wishes to achieve. This research is real-world focussed and not over concerned with questions related to the relationship between reality as perceived by the researcher versus the sense of reality as perceived by the different participants in the research, philosophy and theory. The main aim is to use any method, technique or paradigm that would achieve applications and solutions to research problems as they are understood by the researcher (Creswell 2009).

The benefit of this approach is the flexibility in strategy and method. Thus the strengths of each approach can be used to alleviate weaknesses in other approaches. However, attention must be given to the careful design of the research methodology and a balance needs to be achieved between focussing on the practical application without losing sight of the implications. Another important potential difficulty is that different methods may provide opposing results and this need to be considered in the design of the methodology and the interpretation of the results.

After the evaluation of the four different paradigms, it was decided to use a pragmatist paradigm. The problem under investigation required the use of mixed methods, thus qualitative and quantitative strategies. The buying and selling of houses represent a process and understanding this process will have to be grounded in the data obtained from participants. To model this process grounded theory was included in the methodology. The advantage of using grounded theory is that it is a well established method and it has been used successfully in cadastral research to investigate the perceptions of land tenure security (de Souza 2001). In addition, systems theory was included to obtain a holistic understanding of the process of selling within the social, cultural, economical and historical contexts as well as the impact of the organisations surrounding the phenomenon. Both these methods were included in the methodology as part of different case studies.

The literature review of research in the cadastral field also supported the decision. As mentioned above, many different methods and approaches are used and a debate is forming surrounding the appropriate theoretical framework for cadastral research. The author would thus argue that current research needs to add to this debate. Pragmatism allows the inclusion of different paradigms, methods and techniques and through adopting a pragmatist paradigm it will be possible to test these and add to the development of a theoretical framework through practice.

5. RESEARCH IN PRACTICE

The field study was started in May 2009. The decision to conduct the research using pragmatist assumptions was proved to be ideal. The initial findings indicate that interpretivist assumptions hold true for understanding the behaviour of individuals which is affected by social interactions within the communities and with organisations.

It was also found during open ended interviews with participants that the initial questions would lead to issues not considered by the researcher. Thus a postpositivism philosophical

worldview would have resulted in a great deal of pertinent data being excluded from the research. If such an objective approach was taken, by for example comparing the name on the title deed to the name of the person currently occupying a house, many problems would have been encountered. The off-register sale of houses is only one of many reasons why the title deeds do not show the name of the occupier. Some of the reasons identified during the research were incomplete registered sales, inheritance, initial maladministration of allocation of title deeds, corruption in the allocation of houses, rentals, family houses (house is occupied by a family member, but is still owned by the title deed holder), “looking after” occupiers (a non-family member looking after a house for security reasons while owner is away because of work or vacation) and so forth.

Although it was decided not to follow an advocacy approach, in the field elements of advocacy entered the research. Asking individuals questions make them aware of certain issues. A simple example is: Have you applied for building permission at the municipality for the extension to your house? This question alerted people to the fact that there is something called “building permission” that they can apply for at the municipality. Thus in terms of advocacy, change was introduced into the community by the provision of information related to title deeds, housing, services etc. In this way, the research provided benefit to participants and alleviated ethical concerns about research involving marginalised communities.

The pragmatist paradigm proved to be useful in that it included the strengths of the other paradigms without setting limitations. It was possible to use assumptions from an interpretivist perspective, but also move beyond describing and interpreting. The limitations of the postpositivist approach were circumvented and some of the strengths of an advocacy approach introduced. However, the assumptions, methodology and methods will have to be clearly described when presenting the analysis and findings of the project.

6. CONCLUSIONS

It is important when designing research to make the paradigm held by the researcher explicit, because by doing this the assumptions and decisions made in relation to the research design, including methods and techniques, would be clearly understood. When selecting a paradigm four aspects need to be considered: the research problem under investigation, the worldview held by the researcher, the methodology and the outcomes of the research.

The theoretical framework used in the cadastral research field is still being developed and researchers need to make a contribution. This paper considered a particular project in relation to four paradigms and argues that the pragmatist paradigm proved most suitable. It illustrated how the strengths and weaknesses of the different paradigms can be exploited by using a pragmatist paradigm. This argument can be extended to include other research in the cadastral field, and thus suggest that using a pragmatist approach can provide a initial framework for research that may provide useful indicators in the development of a theoretical framework for cadastral research.

REFERENCES

- Abbott, J 2002, 'An analysis of informal settlement upgrading and critique of existing methodological approaches', *Habitat International*, vol. 26, no. 3, pp. 303-15.
- Augustinus C and Barry M 2006. Land Management Strategy Formulation in Post Conflict Societies. *Survey Review*, 38(302), 668-681.
- Barry M B 1999. *Evaluating Cadastral systems in Periods of Uncertainty: A Study of Cape Town's Xhosa-speaking Communities*. PhD thesis, University of Natal, Durban.
- Barry, M & Fourie, C 2002, 'Analysing cadastral systems in uncertain situations: a conceptual framework based on soft systems theory', *International Journal of Geographical Information Science*, vol. 16, no. 1, pp. 23-40.
- Barry, M & Mayson, D 2000, 'Informal settlement characteristics in a rural land restitution case: Elandsloof, South Africa', *Sociological Research Online*, vol. 5, no. 2.
- Bassett, TJ, Blanc-Pamard, C & Boutrais, J 2007, 'Constructing Locality: The Terroir Approach in West Africa', *Africa*, vol. 77, no. 1.
- Çagdas, V & Stubkjær, E 2008, 'Doctoral research on cadastral development', *Land Use Policy*, vol.26, no.4, pp.869-889.
- Creswell, JW 2009, *Research Design: Qualitative, Quantitative and Mixed Method Approaches*, Third edn, Sage Publishers, Thousand Oaks, Calif.
- Dale, P 1999, 'Is technology a blessing or a curse in land administration?', paper presented to UN-FIG Conference on Land Tenure and Cadastral Infrastructure for Sustainable Development, 25-27 October 1999, Melbourne, Australia.
- Davies, CJ & Fourie, CF 1998, 'A Land Management Approach for Informal Settlement in South Africa', *South African Journal of Surveying and Mapping*, vol. 24, no. 5, pp. 239-46.
- de Souza, FAM 2001, 'Perceived security of land tenure in Recife, Brazil', *Habitat International*, vol. 25, no. 2, pp. 175-90.
- Fourie, C 1994, 'A new approach to the Zulu land tenure system: an historical anthropological explanation of the development of an informal settlement.', PhD thesis, Rhodes University, South Africa.
- Gordon, R 2008, *Urban Land Markets: Review of data on how the poor access, hold and trade land - Additional Analysis*, Urban LandMark, Pretoria.
- Gulyani, S & Bassett, EM 2007, 'Retrieving the baby from the bathwater: slum upgrading in Sub-Saharan Africa', *Environment and Planning C-Government and Policy*, vol. 25, no. 4, pp. 486-515.
- Huchzermeyer, M & Karam, A (eds) 2006, *Informal Settlements: A Perpetual Challenge?*, UCT Press, Cape Town.
- Hweshe, F 2008, 'Thinking of selling your subsidised home?', *Cape Argus*, 11 November 2008.
- Jackson, MC 2003, *Systems Thinking: Creative Holism for Managers*, John Wiley & Sons Ltd, Chichester.
- Majale, M 2008, 'Employment creation through participatory urban planning and slum upgrading: The case of Kitale, Kenya', *Habitat International*, vol. 32, no. 2, pp. 270-82.

- Silva, MA & Stubkjær, E 2002, 'A review of methodologies used in research on cadastral development', *Computers, Environment and Urban Systems*, vol. 26, no. 5, pp. 403-23.
- Smit, W 2008, *Analysis of Qualitative Survey on Accessing, Holding and Trading Land: Synthesis Report*, Urban Landmark, Pretoria.
- Steudler, D, Rajabifard, A & Williamson, IP 2004, 'Evaluation of land administration systems', *Land Use Policy*, vol. 21, no. 4, pp. 371-80.
- Toulmin, C 2009, 'Securing land and property rights in sub-Saharan Africa: The role of local institutions', *Land Use Policy*, vol. 26, no. 1, pp. 10-9.
- van Oosterom, P, Lemmen, C, Ingvarsson, T, van der Molen, P, Ploeger, H, Quak, W, Stoter, J & Zevenbergen, J 2006, 'The core cadastral domain model', *Computers Environment and Urban Systems*, vol. 30, no. 5, pp. 627-60.
- Whittal, J 2008, 'Fiscal Cadastral Systems Reform: A Case Study of the General Valuation Project 2000 in the City of Cape Town', PhD thesis, University of Calgary.
- Zevenbergen, J 2002, 'Systems of Land Registration: Aspects and Effects', PhD thesis, Technische Universiteit Delft.

BIOGRAPHICAL NOTES

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