# Application of Grounded Theory in the Study of Land Registration Systems Usage

## Lani ROUX and Michael BARRY, Canada

**Key words**: land registration system, land tenure, research methods, grounded theory

## SUMMARY

Grounded Theory method is a flexible, but systematic qualitative research method. It is suited to studying process and actions grounded in the experiences of participants. However the method has certain characteristics that distinguish it as grounded theory as opposed to other qualitative methods. Ensuring that these characteristics are present within a study can be difficult. This paper considers the difficulties encountered by the novice user and how these may be ameliorated. The discussion is confined to the context of a PhD research project investigating user behaviour, specifically the interactions of land holders with the land registration system in South Africa.

Four features of grounded theory are identified: (1) the *a priori* exclusion of existing theory, (2) cyclical and simultaneous data collection and analysis, (3) constant comparison analysis, and (4) theoretical sampling. Once the research started in the field, these features were affected by time limitations and the research context and thus required certain adaptations. These adaptations are discussed as well as the strategies used to main the integrity of the grounded theory method.

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# 1. INTRODUCTION

Various methodologies and methods used in the social sciences and other disciplines are applied in land tenure information systems (LTIS) and cadastral systems research. The most commonly used method is the case study (Çagdas and Stubkjær 2009, Silva and Stubkjær 2002). However, grounded theory is arguably the most comprehensive qualitative research method in the social sciences nowadays (Bryant & Charmaz 2007). It enables a thorough understanding of a phenomenon, especially if the phenomenon is a process, activity or interaction (Creswell 2007). Although grounded theory is sparsely used (if it has been used at all) in cadastral research, it has been used to investigate perceptions of land tenure security in Brazil (de Souza 2001). We describe how grounded theory may be applied in LTIS and cadastral systems studies. As the illustrative context, we use a research project dealing with the interactions of land holders with the land registration system in South Africa.

The paper proceeds as follows. It commences with a short overview of grounded theory. The land registration study is then briefly described. Following this is a description of some our experience in applying grounded theory in the field and how some of the difficulties in applying grounded theory were addressed.

# 2. GROUNDED THEORY

We provide a brief, practice focussed overview of grounded theory. What constitutes true grounded theory is stridently contested among researchers; the most notable disagreement being between the two men commonly credited with creating it, Barney Glaser and Anselm Strauss (Gasson 2009).

Grounded theory is an inductive methodology, specifically concerned with developing theory directly from empirical data (Creswell 2009). The principal dictum is that no preconceived theoretical ideas should guide or force the research. Unlike many other research methods, the project does not start with a literature review to develop a set of *a priori* hypotheses to be tested and perhaps further developed once data is collected. Rather, the hypotheses or theories in grounded theory emerge from the data collected in a particular study (Creswell 2007). However, at the start of the research project, literature may be used to identify gaps in research knowledge and thus formulate research questions. Towards the end of the research, a further examination of the literature occurs as the theory developed in the study needs to be compared or related to existing theories (Gasson 2009).

At present there are three main methodological streams of grounded theory. Classical or Glaserian grounded theory proponents contend that theory should emerge from constant comparison, which we describe below (Glaser 1978). Strauss and Corbin (1990) propose a more prescriptive methodology using a coding paradigm that consists of the core phenomenon and categories for causal conditions, strategies, contextual and intervening conditions, and consequences as portrayed in figure 1 (Creswell 2007). A more recent approach is that of Charmaz (2006, pg 10), who adopts a constructivist perspective to grounded theory and takes the position that grounded theories are not discovered, but that researchers "construct ...

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grounded theories through past and present involvements and interaction with people, perspectives, and research practices." We limit our discussion to the structured approach of Strauss and Corbin (1990) as it is the easiest introduction to grounded theory.

An important feature of grounded theory method is that data collection and the data analysis are parallel and cyclical; data analysis informs data collection and vice versa (Strauss and Corbin 1990). As soon as data are collected, the analysis starts with coding the data. Codes are key ideas in the data. Coding is the first level of abstraction and the data are segmented and labelled in a process of simultaneous categorisation and summarising, also referred to as open coding (Strauss and Corbin 1990). The purpose of grounded theory is to develop theory and conceptualisation is important from the first codes. Constructs may be considered abstractions of concepts, conceptual notions which serve to allow us to make sense of observable entities (Morgenson and Hofmann 1999). They are defined in association with relationships to other constructs. We infer constructs from variables which are observeable and measureable in the material world. For example quantitative analytical ability may be inferred from a series of tests of logical and mathematical tests. To assist conceptualisation, Glaser (1978) recommends a focus on actions and process when coding, and using gerunds (a non-finite verb ending in -ing such as swimming) as codes. Table 1 contains an example of coding from the research project about transacting in land.

| Segment of data | Code |
|---|---|
| "Yes and they [sellers] said we trust you, so we're are [all members of ethnic group A] so, then we can sell it,... " <br><br> (Interview 35, 8 August 2009) | Using identity to create trust |

**Table 1: Open coding an extract from an interview**

The analysis of the data guides the researcher to emerging ideas or themes and those ideas or themes are grouped to become categories. A category is defined as "a unit of information composed of events, happenings, and instances" (Creswell 2007). In turn, because these categories may be indicators of significant components of the theory, they determine the sampling strategy for further data collection. The open code in the example in table 1 indicates that there may be two categories that need to be explored in interviews: "Identifying" and "Trusting".

This sampling strategy, which is directed by the concepts identified during the analysis as theoretically significant, is called theoretical sampling (Strauss and Corbin 1990). Theoretical sampling is guided by the gaps or underdeveloped sections of the categories and the researcher specifically seeks out data that address this. It is not a strategy to obtain a representative sample, but a strategy to develop concepts and theory. The sampling strategy is

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also linked to the size of the sample. Data collection is finished once data saturation is reached. Saturation is the point when all the categories are complete and there are no new theoretical insights, thus no further sampling is required and the theory is complete.

Two techniques assist the researcher in achieving the conceptual density required for a complete theory: constant comparison and memoing. As new data are collected they are compared to existing data using a technique called constant comparison. Constant comparison is not confined to comparing data to data, but is also used to compare different segments of data coded in a similar way (see Table 2), and, as further abstraction occurs, categories to categories (Strauss and Corbin 1990). Towards the end of the research, once the theory is developed it is compared to other theories. Constant comparison is integral to grounded theory. The systematic comparison results in the identification of similarities and differences and these assist in expanding the categories with properties and dimensions.

Demonstrating the use of constant comparison, the example in table 2 shows that the "Identifying" category has a property related to ethnic group with extreme dimensions of inclusion and exclusion. Other properties related to "Identifying" may be family, place of origin and so forth. It may also be decided that the "Identifying" category is in fact a subcategory of "Trusting".

| Segment of data | Code | Category | Property | Dimension |
|---|---|---|---|---|
| "Yes and they [sellers] said we trust you, so we're are [all members of ethnic group A] so, then we can sell it,... "<br><br>(Interview 35, 8 August 2009, participant is a  member of ethnic group A) | Using identity to create trust | **Trusting:**<br><br>Identifying | Ethnic Group | Include |
| " [People from ethnic group A] are not faithful. Because you can pay them and then they come back and say I want my house back"<br><br>(Interview 70, 20 June 2009, participant is a member of ethnic group B) | Using identity to mistrust | **Trusting:**<br><br>Identifying | Ethnic Group | Exclude |

**Table 2: Constant comparison to create properties and dimensions**

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A second technique used in grounded theory is memoing. Memo writing is used throughout the coding to assist in exploring the codes and further conceptualisation, and is a record of the evolving theory (Creswell 2009). Thus memos include ideas about codes, preliminary hypotheses, as so forth.

After open coding, when data have been broken into segments and categories formed, axial coding is used to rebuild the relationships between categories (Strauss and Corbin 1990). The process of connecting categories is done using one category as an axis. For example one category may be "Transacting off-register" that serves as the axis, and this is related to "Trust" which is a factor that may lead to the decision to transact off-register. Other categories, for instance "Local power structures", are also related in this way to "Transacting off-register".

The axial coding, as well as the open coding and analysis, is guided by the coding paradigm recommended by Strauss and Corbin (1990). The coding paradigm is based on pragmatist and interactionist social theory (Kelle 2007). The coding paradigm consists of the phenomenon, causal conditions, strategies used by the actors during the process in response to the phenomenon, contextual (the properties of the context in which the phenomenon occurs) and intervening conditions and consequences (Strauss and Corbin 1990). The coding paradigm guides the researcher through the analysis and coding. It is this aspect of the methodology of Strauss and Corbin that Glaser finds objectionable, since Glaser believes that it forces the categories, instead of the researcher trusting the categories to emerge from the data (Kelle 2007).

Selective coding is the final type of coding used. During selective coding one category is selected as the core phenomenon; the core phenomenon being most significant category in the process (Corbin and Holt 2004). The other categories are then related to this core phenomenon using the coding paradigm. Selective coding seems similar to axial coding, but is actually at a higher level of abstraction. Part of selective coding is validating the relationships between the categories and further refining the categories by going back to the data (Strauss and Corbin 1990).

An example of the coding paradigm is illustrated in figure 1. The core phenomenon selected during selective coding may be "Securing tenure" and an intervening condition, "Trusting", with a subcategory of "Identifying" which has a property called "Ethnic group" which has a dimension that ranges from "included" to "excluded" (see figure 1). A very simple example of the continuation of the process might be that the strategy of a buyer in response to including a seller within his or her ethnic group, and the trust it generates, may be to transact off-register (informally). The consequence of the strategy will not be explored in this illustrative example, because it depends on a variety of other factors that will not be explored in this paper.
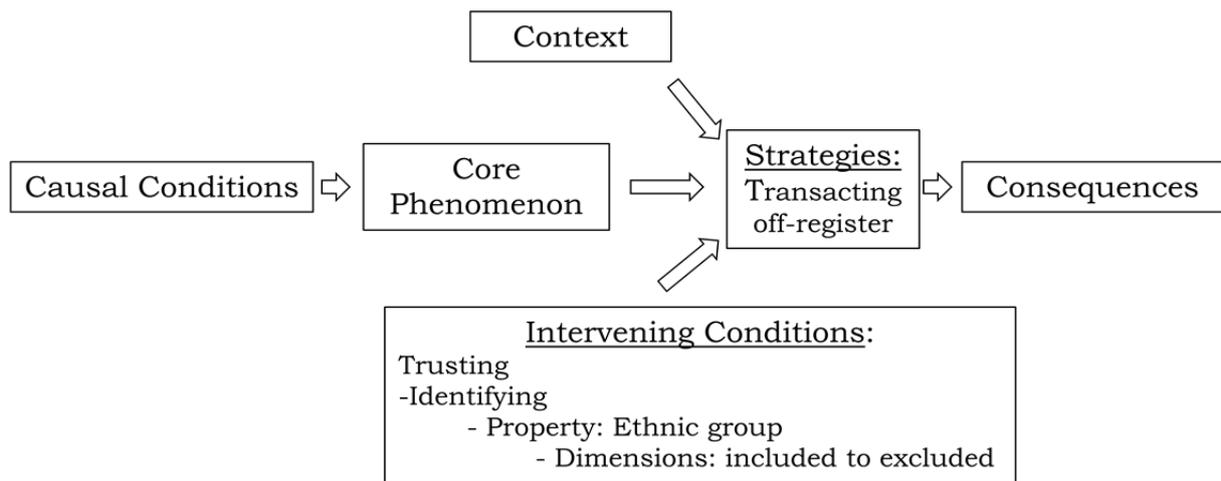
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**Figure 1: Theoretical model using the prescribed categories of Strauss & Corbin (1990)**

From the model the theory is described. The theory may take the form of a narrative statement, a diagram or a series of hypotheses (Creswell 2007). A hypothesis is a statement of a concept, expressed in a form suitable for testing (Grover and Glazier 1986). To be tested it must be stated in a form that empirical work can validate it and falsify it. Popper asserts that a theory is not valid unless it is falsifiable. In Popper's view any social theory such as Marxism can be validated if you extract data that supports it; if it is stated in such a way that it cannot be falsified then it is not a valid theory (Popper 2002, Gorton 2006). This is a widely accepted tenet although it has strident critics (e.g. Ghoshal 2005).

Drawing on figure 1, one hypothesis - simplistically presented for illustrative purposes - might be:

*Trust created by sharing an ethnic group leads to the decision not to use the land registration system to secure tenure.*

In summary, some of the important features of grounded theory include: (1) the *a priori* exclusion of existing theory, (2) cyclical and simultaneous data collection and analysis, (3) constant comparison analysis, and (4) theoretical sampling. Below it is shown how these characteristic impacted the research project.

## 3. THE RESEARCH PROJECT

The research project investigates why parties to land transactions in social housing estates in the Western Cape Province, South Africa decided to use or not use land registration in secondary market transactions and how land transactions are conducted.

The South African government used the Reconstruction and Development programme (RDP) from 1994 to 2004 as the primary social housing strategy to alleviate the populations' housing needs. The construction of more than 2 million houses was facilitated, and of these 90% of

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new RDP owners received ownership. Researchers and the press reported houses being sold off-register or informally (Gordon 2008, Smit 2008, Payne *et al.* 2008, Payne 2002, Hweshe 2008, Mabandla 2009).

Off-register sales have a number of important consequences. In South Africa when a sale is registered a new owner is given legal protection of his or her rights; unregistered transactions are not recognised by the courts. If the sale is off-register, the new owner is vulnerable to losing their land to the seller (who remains the registered owner and can reclaim the property in the absence of documents to prove the buyer is the owner), powerful local groups and the state. Other problems for the new owner include exclusion from social support programmes and municipal services, and being unable to access housing related credit (e.g. a mortgage). Off-register sales may also result in a frozen formal land market. Because the continuity of title is interrupted it becomes impossible to trade in land in the formal market, and impossible to mortgage the land. From the perspective of government, it becomes difficult to collect tax and collect debt, because land title records are used to identify owners for property taxation and other land administration processes. Furthermore, the government housing subsidy system is dependent on land records to assist in qualifying beneficiaries for the housing programmes.

Very little research exists that addresses the experiences of the users of the land registration system. The research that is available tends to be land market focussed (Shisaka Development Management Services 2004, Gordon 2008, Marx and Rubin 2008, Urban LandMark 2007). Related to the lack of research is the dearth of theory. This is an additional reason for the decision to include grounded theory in the design of the methodology – grounded theory is suited and was designed to develop theory (Creswell 2007). As mentioned above, grounded theory is also suitable to study a process, action or interaction (Creswell 2009) and transacting in land is a process, a way of reaching a goal.

The next section discusses some of the problems encountered and some adaptations that were required because of the context of the research and the time and funding available.

## 4. GROUNDED THEORY IN PRACTICE

All four features of grounded theory method identified above, that is (1) the *a priori* exclusion of existing theory, (2) cyclical and simultaneous data collection and analysis, (3) constant comparison analysis, and (4) theoretical sampling was difficult to follow during the fieldwork.

The basic structure of the fieldwork was as follows. The local authorities were approached first, because there is little information about RDP projects in towns outside the metropolitan areas of South Africa. The local authorities are directly involved in the development of social housing estates. They are the holders of project information and an important source of community information. Interviews were conducted with housing officials to get information about the projects and their experiences with land transactions in the social housing estates. These interviews also helped to identify community leaders and determine if any community organisations needed to be approached for access to the areas. This initial interview phase was

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followed by an intensive phase of interviews with residents and other community members. Documentary evidence was also collected and included newspapers, municipal council minutes and land records. This pattern of data collection was followed in the three municipal areas where the four RDP projects are situated.

At the start of the fieldwork the *a priori* exclusion of existing theory was problematic, since the researcher is naturally aware of existing theory. It was necessary to make a concerted effort to focus on the data and emerging themes. Unexpectedly, the decision to include four different projects in three different municipalities assisted in this. As the fieldwork moved from one estate to another, the differences in culture, condition, environment and findings, forced a re-evaluation of the assumptions and developing theory.

The cyclical collection and analysis of data proved to be the most difficult aspect of grounded theory in this research project. This also impacted the use of constant comparison. It takes time to collect data, analyse data and make decisions about theoretical sampling. This time was not available because of the limitations on time in the field and the specific context of the research. Both these resulted in an approach requiring intensive data collection. Thus the in-depth coding and analysis of data became infeasible, and instead of cyclical and in parallel the data collection and analysis was staggered.

The time limitations were compounded in the following ways. In this case the researcher is based in Canada but the fieldwork is conducted in South Africa. Because of funding constraints, the researcher could only spend six months of the year for two continuous years in South Africa. Although this time seems long, in practice it was limited.

Part of the impact on time was the encounter with bureaucracy in local authorities. It took time to arrange meetings, present the research to municipal councils (committees and councils tend to meet only once a month), get approval from municipal councils and so forth. Other unforeseen delays were for example municipal worker strikes during which bureaucracy was further slowed. These factors introduced a significant limitation on the time available for fieldwork within the social housing estates.

A further limitation on time was the environment of the social housing estate. The method used in the social housing estate was essentially going door-to-door and asking residents about their ownership. Because of safety issues (which also forms part of the Risk Assessment agreement with the university), research in the social housing estate was conducted during daylight hours. During weekdays, although some night shift working residents were interviewed, most of the residents interviewed were unemployed or employed on a part time basis. One of the categories that emerged from the data is the assistance of an external agent in a land transaction. This external agent tended to be an employer. Thus to include permanently employed residents, interviews were conducted on Saturdays until lunch time. The lunch time cut off was determined in discussion with the facilitators/interpreters assisting the research. After lunch time on a Saturday the social housing estates studied tend to become rowdy.

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The fieldwork component in the social housing estates was conducted in continuous periods of time. This was partly because of logistics, but also to make the research visible. This is important for two reasons. The participants would not feel singled out as they see the researchers' progress down the street and across the area over a period of time, and residents spread word of the research. This use of the social network to advertise the research is useful, because as residents see and hear of others participating in the research, they themselves feel more comfortable to participate. An indication of this in action is that as the research progressed, residents would approach the researchers in the street and ask questions about their own experiences with ownership.

Although Glaser (1998) recommends not using a recorder in interviews it was decided to record in this case, initially because of the inexperience of the researcher. The interviews were conducted in English, isiXhosa and Afrikaans. The researcher is not proficient in isiXhosa and an interpreter was used to ensure that participants could comfortably communicate in their mother language. The recordings provided a record that could be used to listen to the interview again and rethink any data that may have been misunderstood. Although it was attempted to ensure clear understanding during the interviews, mistakes were made due to circumstances and the demanding nature of the interview process. In instances where there were misunderstandings, follow up interviews were conducted with the participants. The recording also proved useful in cases where the participant recited an extended complicated story, which the researcher and the facilitator thought would be prudent not to interrupt. The interpreter translated the basic components during the interview, but later had the opportunity to carefully and in detail re-translate the interview. The facilitators who assisted in the research were local residents and are therefore not expert interpreters. The tape recordings provided an opportunity to re-translate. The translation of for example, "the municipal lawyer" (a private practising lawyer who does legal work for the municipality) and "the lawyer at the municipality" (a law firm with offices close to the municipality) may make a dramatic difference in a story. The transcriptions of the recordings take a long time and thus reduced the time available for analysis.

The limited time combined with the extensive number of interviews meant that the transcription of the interviews did not keep up with the fieldwork. More importantly in-depth analysis of the interviews was not possible (also not an unusual predicament, see Corbin and Holt (2004)).

As discussed above, the data collection and analysis of grounded theory needs to be done in parallel. To alleviate this problem, analysis was done in cycles. After each day, the researcher noted down ideas or themes that needed to be explored further; this was a combination of coding and memoing. The following day's interviews would then include these themes. The following cycle of analysis and coding were done to greater depth, partly in South Africa and partly back in Canada. The second phase of fieldwork in the second year, thus included follow up interviews with participants and additional exploration of categories identified during the analysis.

Another characteristic of grounded theory is theoretical sampling. This was problematic.

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Because the analysis could not keep pace with the data collection, the sampling was not stringently guided by the analysis. Again this was somewhat alleviated by the above mentioned initial coding and memoing. The nature of the research context also made it impossible to identify participants that may inform specific theoretical aspects before an interview is conducted. Thus many interviews were conducted during the research that may not be strictly necessary for the requirements of the methodology. Although an advantage was that if new categories were identified once out of the field, these additional interviews may prove useful for the exploration of these categories.

In grounded theory the aim is to conceptualise and not to describe, after all, the aim is to generate theory. This is difficult. Especially because being immersed in the stories of participants, it is hard to bring abstraction into the data. For this research both are used. It was found useful to describe the data to ensure that the stories are understood. This description also highlighted any discrepancies in the participant stories. These discrepancies may be assumptions of prior knowledge by the participant or researcher, or gaps in a story. They may also indicate a certain lack of veracity on the part of the participant. The questions that were generated from these discrepancies were brought up in the follow up interviews.

The conceptualisation was assisted by following Glaser's (1978) suggestion to focus on actions and process by coding using gerunds. By using this technique a new perspective is gained on the data. For example, if the data from the four housing estates are considered in terms of description there are great differences, however the similarities become apparent when conceptualising the data.

## 5. CONCLUSIONS

Grounded theory is a method used to generate theory from data. The analysis of the data guides the data collection by means of theoretical sampling. Intrinsic to the method is the constant comparison of segments of data, categories and so forth. Throughout the analysis, the open coding, the axial coding and the selective coding, there is a return to the data to ground the theoretical ideas. The coding paradigm of Strauss and Corbin (1990) provides guidance and a structured approach to analysis that assists the researcher. By following the methodology of grounded theory, the research results in a theory from which hypotheses may be drawn.

This paper demonstrated that grounded theory is a useful methodology to generate theory in the cadastral field. However, the researcher needs to remain flexible and reflexive as difficulties arise during the process and adapt to the research environment while maintaining the integrity of the methodology.

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## REFERENCES

Bryant, A. & Charmaz, K., 2007. 'Introduction: Grounded Theory Research: Methods and Practices' in Bryant, A. & Charmaz, K. (eds.) *The SAGE handbook of Grounded Theory.* London: SAGE, pp. 1-28.

Çagdas, V. & Stubkjær, E., 2009. 'Doctoral research on cadastral development', *Land Use Policy,* vol. 26, pp. 689-889.

Charmaz, K., 2006. *Constructing Grounded Theory: A practical guide through qualitative analysis.* London: SAGE.

Corbin, J. & Holt, N. L., 2004. 'Grounded Theory' in Lewin, C. (ed), *Research Methods in the Social Sciences.* London**:** SAGE, pp. 49-56.

Corbin, J. & Strauss, A., 1990. 'Grounded Theory Research: Procedures, Canons, and Evaluative Criteria', Qualitative Sociology, vol. 13, no. 1, pp. 3-21

Creswell, J.W., 2007. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches.* Thousand Oaks, CA:SAGE.

Creswell, J.W., 2009. *Research Design: Qualitative, Quantitative and Mixed Method Approaches*, 3rd ed. Thousand Oaks, CA:SAGE.

de Souza, F.A.M., 2001. 'Perceived security of land tenure in Recife, Brazil', *Habitat International*, vol. 25, no. 2, pp. 175-90.

Gasson, S., 2009. 'Employing a Grounded Theory Approach for MIS Research' in Dwivedi, Y.K., Lal, B., Williams, M. D., Schneberger, S. L. and Wade M. (eds) *Handbook of research on Contemporary Theoretical Models in Information Systems.* Hersey PA: Information Science Reference, pp. 34-56.

Ghoshal, S., 2005. 'Bad Management Theories are Destroying Good Management Practices'. *Academy of Management Learning and Education*, 4(1), 75-91.

Glaser, B., 1978. *Theoretical Sensitivity: Advances in the Methodology of Grounded theory.* Mill Valley, CA: Sociology Press.

Glaser, B., 1998. *Doing Grounded Theory - Issues and Discussions.* Mill Valley, CA: Sociology Press.

Gordon, R., 2008. *Review of data on how the poor access, hold and trade land: Additional Analysis*, Cape Town: Urban LandMark. Available at: http://www.urbanlandmark.org.za/research/x41.php. [Accessed March 10, 2009]

Gorton, W. A., 2006. *Karl Popper and the Social Sciences.* Albany: State University of New

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York Press.

Grover, R. and Glazier, J., 1986. 'A conceptual framework for theory building in library and information science'. *Library and Information Science Research*, vol. 8, 227-242.

Kelle, U., 2007. 'The Development of Categories: Different Approaches in Grounded Theory' in Bryant, A. & Charmaz, K. (eds.) *The SAGE handbook of Grounded Theory.* London: SAGE, pp. 191-213.

Marx, C. & Rubin, M., 2008. *Appendix B: South Africa case study report: The social and economic impact of land titling in selected settlements in Ekurhuleni Metropolitan area - Synthesis Report*, South Africa: CUBES WITS Centre for Urban and Built Environment Studies

Morgenson, F. P. & Hofmann, D. A., 1999. 'The Structure and function of collective constructs: Implications for multilevel research and theory development'. *Academy of Management Review*, vol. 24, no.2, 249-265.

Payne, G., 2002 'Introduction' in Payne, G. (ed.) *Land, Rights and Innovation: Improving Tenure Security for the Urban Poor*. London: ITDG Publishing.

Payne, G., Durand-Lasserve, A. & Rakodi, C., 2008. *Social and Economic Impacts of Land Titling Programmes in Urban and Peri-Urban Areas: International Experience and Case Studies of Senegal and South Africa*, Oslo and Stockholm: SIDA and Norwegian Ministry of Foreign Affairs.

Popper, K., 2002. *Conjectures and Refutations*. 3rd edition, Routledge Classics, London.

Shisaka Development Management Services, 2004. *The Workings of Township Residential Property Markets*. Johannesburg, South Africa: FinMark Trust. Available at: www.finmark.org.za. [Accessed December 14, 2010]

Silva, M.A. & 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*, Cape Town: Urban LandMark. Available at: http://www.urbanlandmark.org.za/research/x41.php. [Accessed March 10, 2009]

Strauss, A. & Corbin, J., 1990. *Basics of Qualtitative Research: Grounded theory procedures and techniques*. Newbury Park, CA: SAGE.

Urban LandMark, 2007. *How the Poor Access, Hold and Trade Land*. Pretoria: Urban LandMark. Available at: http://www.urbanlandmark.org.za/research/x41.php. [Accessed March 10, 2009]

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## NEWSPAPER ARTICLES

Hweshe, F., 2008. Thinking of selling your subsidised home? *Cape Argus*, 4. Available at: http://www.capeargus.co.za/index.php?fSectionId=3571&fArticleId=vn20081111120633292 C364682 [Accessed November 11, 2008].

Mabandla, V., 2009. Official slams profiteers who sell or let subsidised RDP dwellings. *Cape Argus*. Edition1. Available at: http://www.capeargus.co.za/index.php?fArticleId=5118415 [Accessed August 12, 2009]

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