

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/323350504>

# Research methodology for the development of a framework for managing post-disaster housing reconstruction

Article in *Procedia Engineering* · January 2018

DOI: 10.1016/j.proeng.2018.01.077

CITATIONS

6

READS

469

3 authors:



**Bilau Abdulquadi**

Federal University of Technology Minna

14 PUBLICATIONS 217 CITATIONS

[SEE PROFILE](#)



**Emlyn Witt**

Tallinn University of Technology

31 PUBLICATIONS 222 CITATIONS

[SEE PROFILE](#)



**Irene Lill**

Tallinn University of Technology

72 PUBLICATIONS 502 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



ASCENT [View project](#)



Post disaster waste management [View project](#)



7th International Conference on Building Resilience; Using scientific knowledge to inform policy and practice in disaster risk reduction, ICBR2017, 27 – 29 November 2017, Bangkok, Thailand

## Research methodology for the development of a framework for managing post-disaster housing reconstruction

Abdulquadri Ade Bilau<sup>a\*</sup>, Emlyn Witt<sup>a</sup>, Irene Lill<sup>a</sup>

*Department of Civil Engineering and Architecture, Tallinn University of Technology, Ehitajate tee 5, 19086 Tallinn, Estonia*

---

### Abstract

Following the increasing occurrence of large-scale disasters, several permanent housing reconstruction programmes have been initiated particularly in developing countries. However, stakeholders within the international development and humanitarian sector have identified permanent housing intervention as ineffective and *one of the least successful sectoral intervention* particularly in terms of implementation. As a result, stakeholders have increasingly demand for evidence-based studies that will provide insights and guidance to policy makers and practitioners on the measures that could be applied in achieving effective implementation of permanent housing reconstruction programmes. The paper presents the methodical framework including the epistemological foundation and selection of research methodology for which a PhD research that focus on developing a framework for effective management of permanent housing reconstruction programmes was conducted. The article seeks to enhance research methodology knowledge base especially within the disaster resilience - (re)construction management - field that would yield research output to enhance policy-making and practice on the management of housing reconstruction programmes.

© 2018 The Authors. Published by Elsevier Ltd.

Peer-review under responsibility of the scientific committee of the 7th International Conference on Building Resilience.

*Keywords:* framework development; post-disaster housing reconstruction; research methodology; research philosophies

---

### 1. Background

In the aftermath of major disasters, permanent housing reconstruction (PHR) programmes are initiated to reduce loss impact, mitigate disaster risk, facilitate long-term sustainable recovery of affected communities and to recreate a

---

\* Corresponding author. Tel.: +372-620-2459; fax: +372-620-2453.

*E-mail address:* [abdulquadri.bilau@ttu.ee](mailto:abdulquadri.bilau@ttu.ee)

more robust and resilient built environment. However, reconstruction after disasters have been a significant body of research [1] and PHR is a key component of most post-disaster reconstruction initiatives [2]. Nevertheless, some stakeholders' have found PHR to be one of the least successful humanitarian sectoral intervention in terms of implementation [3]. Besides, several authors have identified most PHR interventions particularly in developing countries to be ineffective due to the interventions failure to achieve stakeholders expectation owing to poor implementation [4, 5].

Considering the need to reduce vulnerability to natural hazard, loss impact, build resilience to disasters and to provide meaningful return for stakeholders investment, key stakeholders have emphasized the need for evidence-based studies that provides insights and guidance for policy makers and practitioners towards achieving effective implementation of PHR programmes [5]. The provision of measures for strategic and operational management will enable PHR in developing countries to achieve expected outcomes. The study therefore seeks to develop a framework for effective management of PHR programmes in developing countries.

Against this backdrop, there was the need to determine a research methodology through which the study can be appropriately conducted to achieve the study aim and objectives. However, authors were confronted by the challenge of designing or adopting a research methodology appropriate for data collection, synthesis and analysis towards finding valid and reliable results to a complex research problem that concerns the management of permanent housing implementation founded within a complex organizational, social, political and dispersed geographical contexts and involving different stakeholders. Besides, the research was also constrained by resources and time which limited the authors possibilities of exploring other possible alternatives in achieving the study outcomes. As a result, a pragmatic "what works" epistemological position was adopted in order to achieve the study aim and objectives.

## 2. Research methodological considerations

Research methodology is the theory and analysis of undertaking a research [6]. It justifies for the procedural framework applied in producing research data and analyses towards knowledge creation [7]. Different research models have been used in different disciplines, for the built environment discipline the procedural frameworks mostly utilized conducting research has been is the research onion considering the detailed information it provides to guide researchers [8], see [6] for details. However, the research methodology and design for conducting a research should be guided by the research questions, study aims and objectives. This study aims at developing a framework for effective management of permanent housing reconstruction programmes. See Table 1.

Table 1. Research questions and objectives

S/N	Research Questions	Research objectives
1	What are the management issues that affect post-disaster housing reconstruction effectiveness	To identify the issues affecting effective management of Post-disaster housing reconstruction;
1.1	What are the impacts of disasters on affected communities?	To assess the impact of disasters on built environment of affected communities;
1.2	What are the responses of stakeholders towards effective housing reconstruction and recovery of affected communities?	To evaluate stakeholders response towards effective Post-disaster housing reconstruction and community recovery;
2	What are the measures to be applied to manage identified issues affecting permanent housing reconstruction programmes effectiveness.	To identify the measures for effective management of PDHR and;  To develop a framework for effective management of Post-disaster housing reconstruction programmes

### 2.1. Research Philosophy

Research philosophy concerns the source, nature and knowledge development [9]. It helps to determine the appropriate method by which a research can be conducted [10]. According to Amaratunga and Baldry [11], a research should be founded on philosophical view-point without which the study quality can be determined. The researcher's

understanding of his research philosophical position helps to identify workable research design, methods alternatives and to identify the suitable and practicable method for conducting his study [11-13]. The research philosophy is classified into ontology, epistemology and axiology and subsequently discussed.

### 2.1.1. Ontology

Ontology is described as "*the study of being*" [14]. It is concerned with the nature of reality of the assumptions we make about reality [15]. That is, ontology is associated with the question "whether social entities need to be perceived as objective or subjective" "how things really are" and "how things really work"[16], suggesting realism and idealism as the two ontological assumptions. Whereas, realists are of the belief that reality is independent of human cognition and consciousness and predetermined by nature, idealists believe in the contrary. Idealists recognize that observers may have opposing views since the reality is as a result of human mind [17].

### 2.1.2. Epistemology

Epistemology concerns the requirements for approaching a research to yield an acceptable and valid knowledge in a field of study [13, 18] and it could be objective or subjective. While objective epistemology considers the outside world as being hypothetical impartial, subjective epistemology views the world "*in the realm of clarifications from reflection*" [19].

Positivists develop knowledge from the philosophical perspective that the reality exists in the outside world [20]. They hold the view that the researcher is independent of the subject under observation [12], and as a result conduct research using quantitative methods through experiments, simulations and surveys that can be statistically analyzed and replicated [21]. For positivist research it is crucial to formulate hypothesis for knowledge verification [22].

Interpretivist or social constructivist views knowledge as being socially constructed, context-dependent and complex in nature [23]. Besides, interpretivists recognize the significance of history and practice in knowledge development (*ibid*). They hold the philosophical view that research participants' plays a veritable role in the research process and that the researchers' background and experience influences the object under study [23], since the researchers' background shapes the researchers' interpretation of the discussion with participants on the specific context being understudied [20].

Realism like positivism assumes a scientific approach to knowledge development [6], except that the realists' philosophical position is anti-positivist where triangulation through survey is applied in seeking the truth [10, 12]. For the realists, it is important to provide interpretations for the socially constructed environment [10].

Pragmatist researchers develop knowledge without commitment to a particular research philosophy and reality. "*Pragmatists do not see the world as an absolute unity*" [20]. They believe research occurs in varying context, be it historical, social or political and that the world view can be dependent and independent of the mind. As a result, the pragmatists apply pluralistic research approach for data collection and analysis for knowledge development [20, 24]. Pragmatists are mostly concerned with the utilisation of available research approach to understanding and solving the research problem [25]. Pragmatists focus more on the research problem and the application of workable research approaches to finding solution to the problem [20], and they choose research methods and techniques considering on the suitability of the methods towards achieving the research purpose. However, the rationale for the use of the pluralistic research methods should be established (*ibid*).

The study aims at developing a framework for effective management of post-disaster housing reconstruction with particular emphasis on developing countries. From the study aim, the researcher seeks to collect and analyze data to provide knowledge that brings about effective management of PHR programmes drawing from historical, social and political contexts and complex organizational systems. Therefore, it is deemed suitable to approach the study through the pragmatic lenses of "what works" in finding appropriate answer to the research questions. For some of the research objectives, the researcher's background plays a significant role in the study. Besides, the study output is determined by the research participants' background and experience who are in this case experts in the built environment with wide-ranging experience in the management of post-disaster reconstruction and recovery field, thus, the interpretivists' epistemological views would be applied for most of the objectives. However, for one of the objectives, a combination of methods is to be applied to ensure triangulation. Thus, a pragmatic approach is applied for the study. See Table 2.

### 2.1.3. Axiology

Axiology concerns the nature of values and the researchers basis for value judgment [26]. A researcher personal value, beliefs and experiences can be expressed in the cause of a research and the researcher can also be positioned to be unbiased about the value concept in a research [13]. The two value axiology position relates to positivism (value-neutral) and interpretivism (value-laden). The research which is based on a pragmatism applies both values depending on the research objectives, see Table 2.

Table 2. Research objectives and the adopted philosophical position

S/N	Research objectives	Ontology	Epistemology	Axiology
1.0	What are the management issues affecting PDHR ineffectiveness	Knowledge is derived from existing social phenomena. <i>Idealism</i> was applied	Data were collected through multiple-case studies of qualitative literature and validated through experts opinion survey, thus an Interpretive approach were applied	The study was not independent of the researcher at the initial knowledge drawing stage, thus <i>Value-laden</i>
1.1	What are the impacts of disasters on the built environment?	Knowledge were drawn from an enquiry of reports from existing social phenomena. <i>Idealism</i> was used	This study was conducted to identify the impacts of disasters on the built environment, data drawn from existing reports and analyzed using <i>Interpretivist</i> qualitative content analysis.	This study was not independent of the researcher, thus, <i>Value-laden</i>
1.2	What are the responses by stakeholder in reconstruction affected communities?	Knowledge is derived from existing social phenomena. <i>Idealism</i> was applied	The study was conducted with the assumption that <i>the reality is as a result of human mind</i> , data collection was from stakeholders' opinion. Thus, an <i>Interpretivist</i> approach was applied.	The study was not independent of the researcher thus <i>Value-laden</i>
2.0	What are the measures that could be applied to manage identified issues affecting PDHR programmes effectiveness.	The knowledge is derived from both existing social phenomena and with the assumption that knowledge can be drawn from outside the social phenomena, therefore <i>realism</i> applies.	The study seeks to identify the measures for managing identified issues affecting PDHR effectiveness. To identify the measures, data were collected through evidence-focused reviews and experts' opinions survey using the Delphi method. A <i>Pragmatists</i> research approach was applied.	The researchers experience and opinion were required at the initial stage of drawing knowledge but the researchers opinion and experience were not required at the knowledge validation stage. That is the study was not independent of the researcher at the initial knowledge drawing stage, thus <i>Value-laden</i> . but at the knowledge validation stage, the study became independent of the researchers knowledge and experience thus <i>Value-free</i>

### 2.2. Research approach

Research approach could be inductive, deductive or abductive [6]. From data collection point of view, the deductive approach concerns theoretical development that is rigorous evaluated though a number of propositions related to the theory [6], and it is more predisposed to by positivist research [15]. Similarly, the inductive approach concerns making sensible meaning of the data collected and analyzed from a given phenomenon through the identification of themes and patterns for the formulation of a theory presented in the form of conceptual framework [6]. The inductive approach is predisposed to interpretivists research [15], often concerned with context being understudy and the utilisation of small sample size is deem to be appropriate [6]. Also, the abductive approach relates to research data collection for exploring a given phenomenon, themes and patterns identification, conceptual framework development and for testing the validity of results [6]. The abductive approach applies for this study.

### 3. Research strategy and design adopted

A research strategy is a researchers plan for answering research questions [6]. It is the procedural framework between the research philosophical positioning and the choice of methods to be applied for data collection and analysis

[27]. The researchers choice of research strategy should be led by the research aim and objectives and the philosophical positions for which the study is based [6]. However, in defining a research strategy due consideration should be given to the research approach, depth of existing knowledge in the study area and accessibility to data source and the availability of resources that would facilitate the conduct of the study (ibid). Different research strategy may be applied for conducting research. This include systematic reviews, case study, surveys, Delphi method, ethnography, field experiments, grounded theory and narrative research among others.

In order to better understand the complexity of the PHR context, the issues affecting effective permanent housing implementation and the measures that could be applied in managing the issues affecting permanent housing implementation, the importance of drawing evidence from multiple sources was identified. As a result, the multi-strategy were applied for the study, see [24]. The research strategy includes content analysis of case studies literature and exploratory case studies, evidence-focused review and experts opinion survey through the Delphi method. These research methods were applied for data collection and analysis for the research towards achieving valid and reliable results and to ensure triangulation [22].

### 3.1. Case study research

Amaratunga and Baldry [11] describe a case study *as a research strategy that focuses on understanding the dynamics present within single settings*. Yin [28], define case study research method as *“an empirical inquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident”*. Case study research can be categorized into descriptive, explanatory, and exploratory. While the descriptive case studies analyze and present the sequence of an events under study, explanatory case studies answers to the question ‘how’ or ‘why’ and exploratory case studies provides answers to the ‘what’ or ‘who’ questions [29], and it could be qualitative or quantitative [28], reliant on multiple evidence sources and small sample selection that gives room for in-depth study of a real-life context [30] draw on inductive methods of research. A distinguishing feature of the case study approach is the comprehension a study's processes of occurrence within given context. The case study is conducted interviewing participants or studying life historical documents to draw the distinctive attribute and common characteristics of the persons in a given classification [22]. To this end, this research strategy is considered appropriate for providing preliminary answers to research question 1.0. while it provides answers to the research objective 1.2, see (Table. 1 and 2). In which case, historical case studies literature were explored to identify the management issues affecting effective implementation of PHR programmes. Besides, an exploratory case study of a post-disaster context using semi-structured interviews were conducted with representatives of stakeholders involved in the housing reconstruction and recovery programme in response to objective 1.2. Data collected were coded and thematically analyzed.

For objective 1.1, qualitative content analysis of media reports of a case study were applied in assessing the disaster impact on the built environment. Prior to data analysis, the impacts of disasters on the built environment were classified into themes and impacts of disasters identified from the reports were coded and analysed accordingly using NVivo 10.

### 3.2. Evidence-focused review

Systematic reviews have become an essential part of scientific research [31], especially for research aimed at enhancing an intervention's effectiveness in terms of policy making and management practice [32]. It is a research method prominent in the medical sciences to evaluate health-care interventions' effectiveness and to support evidence-informed management decisions in medical practice [33]. Considering the importance of *“what works”* for policy and management decision-making [32], some humanitarian and international development partners have recently adopted the systematic review as a basis for interventions [34-36].

Systematic review follows a *“fixed process involving the identification, assessment and synthesis of available evidence to generate a robust, empirically derived answer to a focused research question”* [34]. However, Maynard et al. noted that standard systematic review process are well founded in research fields such as in health-care, evidence were evidence are drawn from randomized control trials (RCTs), cohort and or case studies[36]. Whereas, in international development and humanitarian sector reviews are mostly evidence-focused with evidence and insights

drawn from case-studies' evaluations, opinion surveys and other academic research projects, thus, the need for flexible review process. Considering the research question in focus and that this study is founded within the international development and humanitarian sector [35], the flexible evidence-focused review method was adopted one of the research techniques applied for this research. The stages of evidence-focused review is as in Fig. 1.

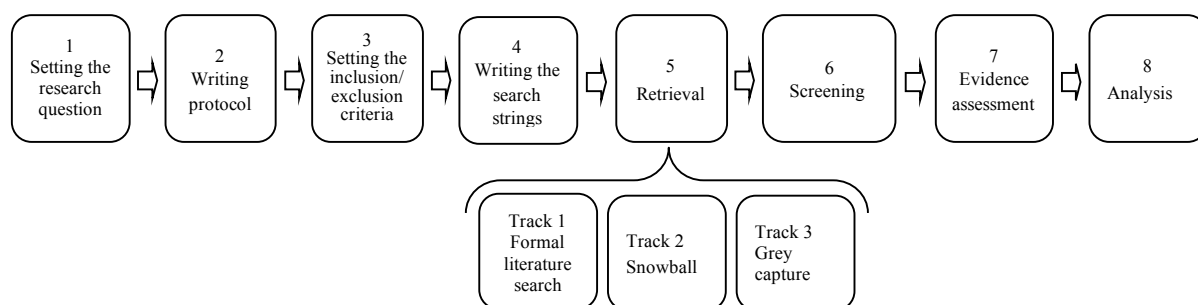


Fig. 1. Stages of evidence-focused review

Source: Hagen-Zanker and Mallett [35]

For objective four, the preliminary qualitative evidence measures were drawn from a comprehensive evidence-focused review of six (6) academic databases and grey literature. Data drawn from the review were thematically analyzed and synthesized to produce charts representing the process measures for managing each of the identified issues affecting post-disaster housing reconstruction effectiveness

Although, systematic evidence-focused reviews is considered a robust research method to eliciting well-founded answer to a focused research question, Mallett et al. noted that evidence-focused reviews is "*not an end in themselves since it can only promote*" evidence-informed policymaking or management practice in research areas "*with a strong and well-developed evidence base*" [34]. Besides, Davies et al. [32] observed that systematic reviews is just one the processes by which best-evidence on "*what works*" are drawn for policies and management practice decisions. As a result, follow-up experts opinion survey using the Delphi method was considered appropriate in drawing best practice measures for effective management of issues affecting PHR reconstruction programmes.

### 3.3. Experts' opinions survey

Delphi is a research method that applies anonymity of opinion of a panel of experts to forecast future trends founded on reliable evidence or data drawn from historical or an ongoing phenomenon to bring about knowledge that could be applied for policy and decision-making [37]. The Delphi research method is suitable for filling knowledge gaps about a phenomenon and it is specifically appropriate for identifying and ranking "*management issues in new product development projects*", eliciting data from practitioners for the development an effective implementation system and for the development of a descriptive knowledge framework of a phenomenon [38]. It is appropriate for a research with geographically dispersed experts [39], with communication facilitated using different communication channels including emails, telephone calls, internet means of communication such as Skype among others. The importance of anonymity of respondents is to prevents bias or unnecessary influence of the process [37].

Delphi questions focus on identifying problems and eliciting solutions, with questions for subsequent rounds generated from the response of preceding questions. The process come to end on receiving answers to the research question [38].

The Delphi process typically take up to two or more rounds [38, 40], however, studies have shown that the Delphi studies have also been completed after one round [41, 42]. The Delphi process is completed after the achievement of consensus with "*a statistical aggregation of the responses in the final round determines the result*" [40].

The Delphi research method is particularly suitable for finding appropriate answers to the research questions. This is considering the aim of the study being to develop a framework for managing post-disaster housing reconstruction programmes with particular focus on developing countries. Besides, the research seeks to identify the issues affecting

effectiveness of PHR and to identify the measures that could be applied in managing identified challenges. Answers to these research objectives can be favourably achieved through the Delphi research method.

Experts panellists for the study were identified using the purposive-snowball sampling [43]. This was considering the specific features of the experts required for the research to be conducted. The features considered for experts selection was areas and country(ies) of experience, knowledge and expertise in post-disaster reconstruction and recovery projects in the built environment and stakeholder group/institution to which the participant belong. This was done so that participants can provide appropriate answers to the different issues from which questions were based. Experts panellists drawn for the studies were drawn from different geographical locations with wide-ranging experience in developing countries such as Bangladesh, Haiti, India, Indonesia, Iran, Maldives, Malaysia, Nepal, Pakistan, and Sri Lanka working with multi-lateral donor agencies, reconstruction management agencies, International Non-Government Organisations (NGOs) as policy-makers, practitioners and researchers.

Sample size for Delphi method studies varies markedly from one studies to the other. While some studies have had 4 participants, other studies have had as much as 171 panel of experts [38]. Thus, Delphi sample size is designed to fit the research questions and circumstance surrounding the studies (ibid). For this study, letter of invitation for experts participation were sent through email along with an carefully designed interview guide to 35 pre-identified experts. However, only 17 of the experts invited accepted the invitation and participated in the first round.

Preparing the instrument for data collection, an interview guide was develop and pilot tested following which the content of the interview guide were refined based on the feedback received. The interview guide was designed to elicit measures for managing the different issues affecting effective implementation of PHR programmes.

Data for the first Delphi round were collected through in-depth semi-structured interviews which were conducted using differing communication medium (emails, internet communication via Skype, telephone and face-to-face) based on the experts preference. The interviews which took an average of an hour were audio recorded with the permission from the interviewees. The subsequent data collection round will follow a structured questionnaire survey using a 5-point likert-scale to draw consensus on the answers provided from the previous interview round.

Recorded interviews were transcribed with relevant answers to the questions as identified and codified under pre-identified themes. from the analysis of the data, new themes of similar answers emerged. The data analysis were conducted with the aid of NVivo 11 which facilitated data coding and for assessing data analysis outputs.

#### **4. Conclusion**

Considering that there is no unanimous agreement as to the most appropriate approach for conducting disaster resilience research, there the need to formulate research design and strategy unique for every study. The consequence being the need for greater explanation of research methodological choices taken in such research in the discipline to ensure research rigour which is what this study have tried to do. To this end, this paper has reviewed the research methodology and explained the research philosophies, strategies and data collection and analysis of the methods applied for the development of a framework for managing post-disaster housing reconstruction programmes in developing countries. In the paper, we have presented the argument for assuming the pragmatist philosophical position towards achieving the research aim by selecting the multi-strategy approach of reviewing through multiple case-study literature and exploratory case study, conducting evidence-focused review and the application of the experts' opinions survey through the Delphi method in order to achieve the research aim.

#### **Acknowledgement**

This research was supported by the Advancing Skill Creation to Enhance Transformation (ASCENT) project co-funded by the Erasmus+ Programme of the European Union. The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

#### **References**

- [1] Haigh, R.P., R.D.G. Amaratunga, and K.P. Keraminiyage, *An exploration of the construction industry's role in disaster preparedness*,



- response and recovery. 2006.
- [2] Ahmed, I., *An overview of post-disaster permanent housing reconstruction in developing countries*. International Journal of Disaster Resilience in the Built Environment, 2011. **2**(2): p. 148-164.
  - [3] ALNAP, *ALNAP Annual Review 2002, Humanitarian Action: Improving Performance through Improved Learning.*, 2002, ODI: London.
  - [4] Lyons, M., *Building Back Better: The Large-Scale Impact of Small-Scale Approaches to Reconstruction*. World Dev, 2009. **37**(2): p. 385-98.
  - [5] Lloyd-Jones, T., *Mind the Gap! Post-disaster reconstruction and the transition from humanitarian relief*2006: RICS.
  - [6] Saunders, M., P. Lewis, and A. Thornhill, *Research methods for business students*, 2012, Pearson Education Limited: Essex.
  - [7] Carter, S.M. and M. Little, *Justifying Knowledge, Justifying Method, Taking Action: Epistemologies, Methodologies, and Methods in Qualitative Research*. Qualitative Health Research, 2007. **17**(10): p. 1316-1328.
  - [8] Omotayo, T. and U. Kulatunga. *The research methodology for the development of a kaizen costing framework suitable for indigenous construction firms in Lagos, Nigeria*. Association of Researchers in Construction Management (ARCOM).
  - [9] Bajpai, N., *Business research methods*2011: Pearson Education India.
  - [10] Kulatunga, K.J., D. Amaratunga, and R. Haigh, *Researching construction client and innovation: methodological perspective*. 2007.
  - [11] Dilanthi, A. and B. David, *Case study methodology as a means of theory building: performance measurement in facilities management organisations*. Work Study, 2001. **50**(3): p. 95-105.
  - [12] Mark, E.-S., T. Richard, and L. Andy, *Management research: An introduction*, 1991, London. Sage.
  - [13] Saunders, M., P. Lewis, and A. Thornhill, *Research Methods for business students 4th edition Pearson education limited*. 2009.
  - [14] Crotty, M., *The foundations of social research: Meaning and perspective in the research process*1998: Sage.
  - [15] Easterby-Smith, M., R. Thorpe, and P. Jackson, *R. 2008*. Management research. **3**.
  - [16] Denzin, N.K. and Y.S. Lincoln, *The landscape of qualitative research: Theory and issues*, 1998, London: Sage.
  - [17] Johnson, P. and J. Duberley, *Understanding management research: An introduction to epistemology*2000: Sage.
  - [18] Collis, J. and R. Hussey, *Business Research: Palgrave Macmillan*. 2009.
  - [19] Eriksson, P. and A. Kovalainen, *Qualitative methods in business research*, 2008, London: Sage Publications.
  - [20] Creswell, J.W., *Research design: Qualitative, quantitative, and mixed methods approaches*2013: Sage publications.
  - [21] Holden, M.T. and P. Lynch, *Choosing the appropriate methodology*. The marketing review, 2004. **4**(4): p. 397-409.
  - [22] Amaratunga, D., et al., *Quantitative and qualitative research in the built environment: application of "mixed" research approach*. Work Study, 2002. **51**(1): p. 17-31.
  - [23] Charreire Petit, S. and I. Huault, *From practice-based knowledge to the practice of research: Revisiting constructivist research works on knowledge*. Management learning, 2008. **39**(1): p. 73-91.
  - [24] Dainty, A., *Chapter One Methodological pluralism in construction management research*. 2008.
  - [25] Rossman, G.B. and B.L. Wilson, *Numbers and words: Combining quantitative and qualitative methods in a single large-scale evaluation study*. Evaluation review, 1985. **9**(5): p. 627-643.
  - [26] Sexton, M. *A supple approach to exposing and challenging assumptions and path dependencies in research*.
  - [27] Denzin, N.K. and Y.S. Lincoln, *Handbook of qualitative research*. 2005. **3**.
  - [28] Yin, R.K., *Case Study Research: Design and Methods, Essential guide to qualitative methods in organizational research*. Applied Social Research Methods Series, 2009. **219**.
  - [29] Laws, K. and R. McLeod. *Case study and grounded theory: Sharing some alternative qualitative research methodologies*.
  - [30] Amaratunga, N., R. Haigh, and B. Ingirige, *Post-disaster housing reconstruction in Sri Lanka: what methodology?* SAGE, 2015. **5**(3): p. 21.
  - [31] Mulrow, C.D., *Rationale for systematic reviews*. BMJ: British Medical Journal, 1994. **309**(6954): p. 597.
  - [32] Davies, H.T.O., S.M. Nutley, and P.C. Smith, *Viewpoint: Editorial: What Works? The Role of Evidence in Public Sector Policy and Practice*. Public Money & Management, 1999. **19**(1): p. 3-5.
  - [33] Petticrew, M., *Systematic reviews from astronomy to zoology: myths and misconceptions*. British Medical Journal, 2001. **322**(7278): p. 98.
  - [34] Mallett, R., et al., *The benefits and challenges of using systematic reviews in international development research*. Journal of development effectiveness, 2012. **4**(3): p. 445-455.
  - [35] Hagen-Zanker, J. and R. Mallett, *How to do a rigorous, evidence-focused literature review in international development, A Guidance Note*. London: Overseas Development Institute, 2013.
  - [36] Maynard, V., E. Parker, and J. Twigg, *The Effectiveness and Efficiency of Interventions Supporting Shelter Self-Recovery Following Humanitarian Crises*. 2017.
  - [37] Gray, P. and A. Hovav, *Methods for studying the information systems future* 2011, Springer. p. 299-316.
  - [38] Skulmoski, G.J., F.T. Hartman, and J. Krahn, *The Delphi method for graduate research*. Journal of information technology, 2007. **6**: p. 1.
  - [39] Adler, M. and E. Ziglio, *Gazing into the oracle: The Delphi method and its application to social policy and public health*1996: Jessica Kingsley Publishers.
  - [40] Hollowell, M.R. and J.A. Gambatese, *Qualitative Research: Application of the Delphi Method to CEM Research*. Journal of Construction Engineering and Management, 2010. **136**(1): p. 99-107.
  - [41] de la Cruz, M.P., A. del Caño, and E. de la Cruz, *Downside risks in construction projects developed by the civil service: the case of Spain*. Journal of Construction Engineering and Management, 2006. **132**(8): p. 844-852.
  - [42] Del Cano, A. and M.P. de la Cruz, *Integrated methodology for project risk management*. Journal of Construction Engineering and Management, 2002. **128**(6): p. 473-485.
  - [43] Flick, U., *An introduction to qualitative research*2014: Sage.