

## Chapter 5

# Analytical strategy for measuring users' behaviour in sustainable housing research

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### **Abstract:**

**Introduction** - This chapter describes a research design structure that highlights the paradigm, theory, method, strategies and tactics applied to inspire and explore housing research. Inclusively, it covers data gathering to findings in concurrence with sustainable development principles.

**Purpose** - The goal is basically targeted towards creating housing research procedure that focuses on core values in the spatial organisation of cultured dwelling units in urban locales. It centres on the understanding of activities and activity-space relationships of housing inhabitants particularly in culture sensitive societies. A link which suggests that users' behaviour reveals cultural attributes in space use that could facilitate design thoughts.

**Design / Methodology / Approach** - Systematically, Groat and Wang (2002)'s research process that highlighted four major hierarchical components of paradigm, theory, method and techniques was used to project the concept described in this study. In a sequential arrangement, the components considered suggested suitable research philosophical paradigm then proceeded to argue on the theoretical basis in order to define appropriate analytical traits of sustainable housing research phenomenon. Thereafter, techniques and tactics that could guide data collection and data processing with a focus on the users were established while delineating validity and reliability strategies for authenticating possible outcomes.

**Findings** - At the end, this research discovered an effective scientific system of inquiry - linking paradigm with theoretical underpinning comprising of established seminal theories that include culture specificity of the built environment in Man Environment Relations (Rapoport, 1983). Others are Environment Behaviour Relations (Rapoport, 2000); the user centred theory of the built environment (Vischer, 2008) and the cultural paradigm related to the Etic and Emic theory of cross cultural research. After which the choice of ethnographic principles in the search for sustainable housing attributes was recommended as an appropriate strategy suitable for sustainable housing research enquiry. Ethnography was projected to explicitly provide the culture constituents [values, needs and desires] that influence user initiated interactions with space towards



users' housing satisfaction. Therefore, it provides researchers with a choice of suitable method to be adopted for sustainable housing research.

**Practical implication** - In ensuring the validity and reliability of housing study towards sustainable urban development in tune with United Nations' (UN) guidelines, the emerging research design, operationalized research process, parameters and variables are usually user and context sensitive. This chapter thus provides a direction to be explored systematically within the established research framework in examining such phenomenon.

**Originality/value** - This chapter contributes towards directing sustainable housing research procedures which are no longer devoid of users' mainstream socio-cultural values and behavioural functions.

**Keywords:** Housing research, Sustainable development, Mainstream values, Culture, Behavioural Studies.

## Introduction

As obtainable in any research voyage, setting the research process within scientifically proven domain increases its credibility, believability and trustworthiness, while authenticating the evidence in its outcome. Housing research methods require absolute credibility, validity and reliability that centre around the stakeholders particularly the end users. Thus, a research procedure that assures these research attributes should be essentially sorted in achieving sustainable housing research. Accordingly, the study opted for Groat and Wang (2002)'s research process that consists of four major hierarchical components- paradigm, theory, methods and techniques in promoting sustainable housing research strategy. In the process, a research procedure which reflects mainstream values in spatial configurations of sustainable housing research is revealed. The evolving methodological strategy first sequentially position sustainable housing research in suitable philosophical paradigm in order to identify the principles that direct its knowledge extension process, towards seeking solutions to housing research as a phenomenon being examined (Fellows and Liu, 2009). Thereafter, theories- a set of suggestions describing various traits of the phenomenon as explained by Berg and Lune, (2004) evolves to strengthen the research foundation and focus. Thus, relying on philosophical underpinning for validity and consistency, theory building hypothesised explicitly the descriptions about the natural features and socio-cultural world that would lead to findings which are subjected to and verifiable by the scientific process of research inquiry.

Additionally, in order to articulate the knowledge gap and research direction and also establish the research focus, first there is the need to hinge research on a recognised methodological framework. This is usually evident in the epistemological and ontological perspectives of the research. Groat and Wang's (2002), epistemological research picture shown in Figure 5.1 is considered appropriate as a methodological structure.



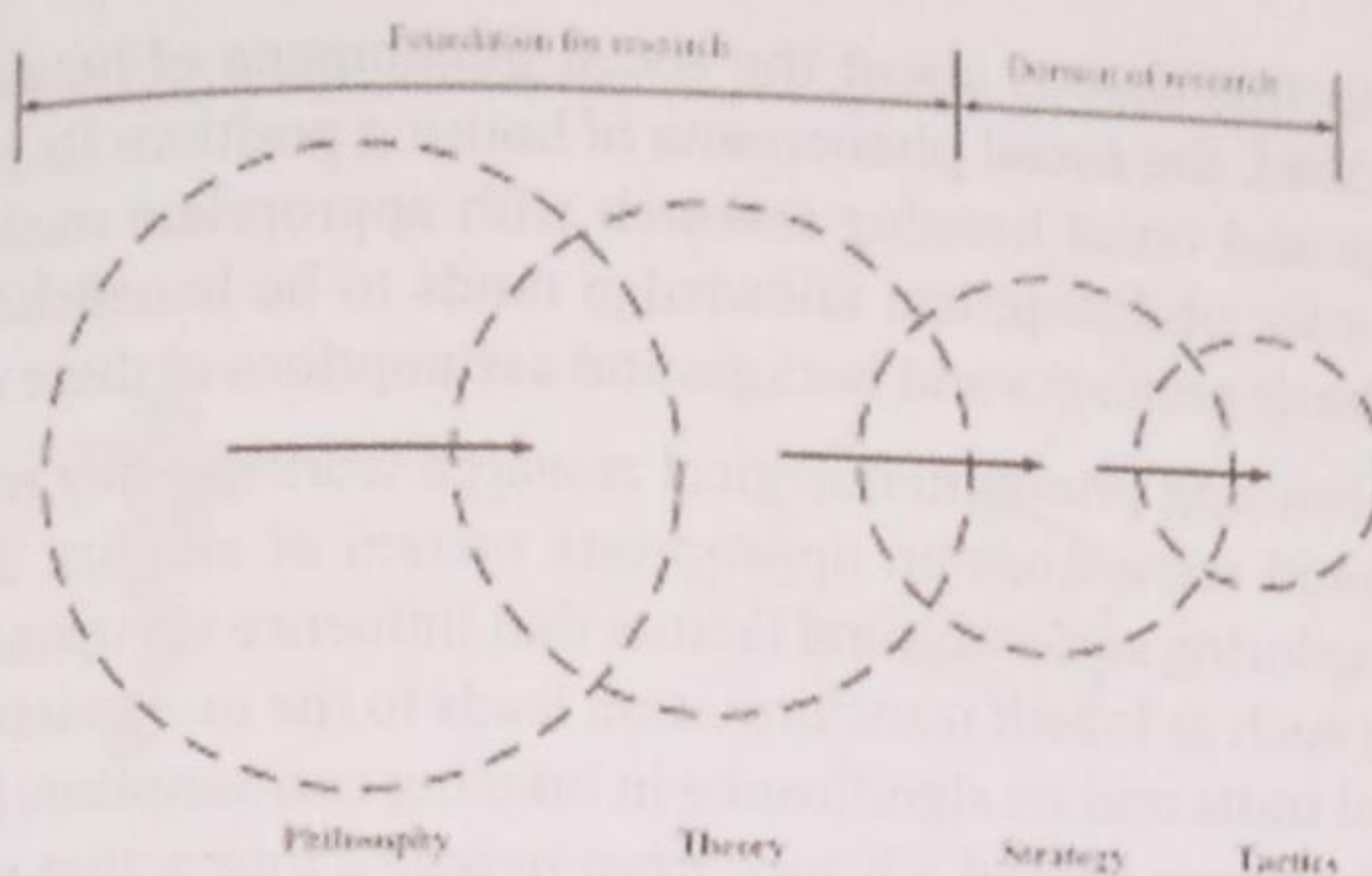


Figure 5.1 Methodological Research Structure

Source: Groat and Wang, (2002)

### Philosophical Stance for Sustainable Housing Research

Social, economic and physical dimensions in housing research are proportionate to UN's indices of sustainable development in urban growth and renewal particularly with regards to sustainable housing and urban development. Essentially, philosophical approach suitable in relating the indices of these dimensions is usually subjective because housing attributes as defined by UN for sustainable development are focused on environmental quality. As such the philosophical standpoint in sustainable housing research should be directed towards qualitative realm in both epistemology and ontology (knowledge and nature).

### Apposite Research Metaphysical Paradigm

Scientists postulate studies within structured assumptions known as paradigms (Denzin and Lincoln, 2008) or system of inquiry (Groat and Wang, 2002) which clearly relates the study's ontological assumptions (nature of reality) that is a subject of the research nature. Similarly, it relates the study's epistemology (nature of knowledge) that defines its theory base as well as the appropriate research strategy (Willig, 2001). Therefore, since sustainable housing research is phenomenological in nature where salient issues of social lifestyles are to be examined, interpreted and reflected in the design, then emancipatory and interpretive paradigms are most appropriate. Consequently, sustainable housing research should be structured in between the two extremes of objective and subjective approaches, adopting the epistemological knowledge position of emancipatory and phenomenological/interpretive paradigms. This is because epistemological position assumes the subject knowledge as a reflection of contextual field information and human projec-



tions which in this case is about the social phenomena of housing and its liveability. Indeed, the social phenomena of housing positions its philosophical knowledge and bond housing research with appropriate methods being employed. Surely, philosophical knowledge tends to be beneficial in understanding the basic concepts and background assumptions of these methods.

As a result, housing phenomenological research work like any research engagement should stem from an appropriate system of enquiry. The goal of focusing on exploring socio-cultural factors that influence occupants' liveability in housing such as layout transformation leads to the understanding of the role of cultural traits and its significance in housing consumption. In essence, design considerations should advance from people's interaction with spaces aptly referred to as users' behaviour. This paradigm centres on the occupants' interactive experiences with their dwellings over time adjusting to satisfy preferences and changing needs.

Evidently, this phenomenological approach recognizes several realities, assuming the impossibility of generalization in all situations but rather affirming that research design should originate from the researcher and the respondents' influence as outlined by Guba and Lincoln (1994) in (Groat and Wang, 2002). Likewise, historically situating sustainable housing research, taking into cognizance and emphasizing the indigenous content of settlements being investigated aligns it with the emancipatory paradigm. Furthermore, explicitly exposing unnoticed social, physical and cultural dynamics in the built environment aimed at transforming existing situation positions housing research in the sphere of emancipatory system of inquiry. Therefore, even though people think and act differently in space transactions, they usually have a common point of cognitive convergence that defines the group's behaviour as illustrated in Figure 5.2. Consequently, sustainable housing research fits into both emancipatory and phenomenological research paradigms as presented in Figure 5.3.



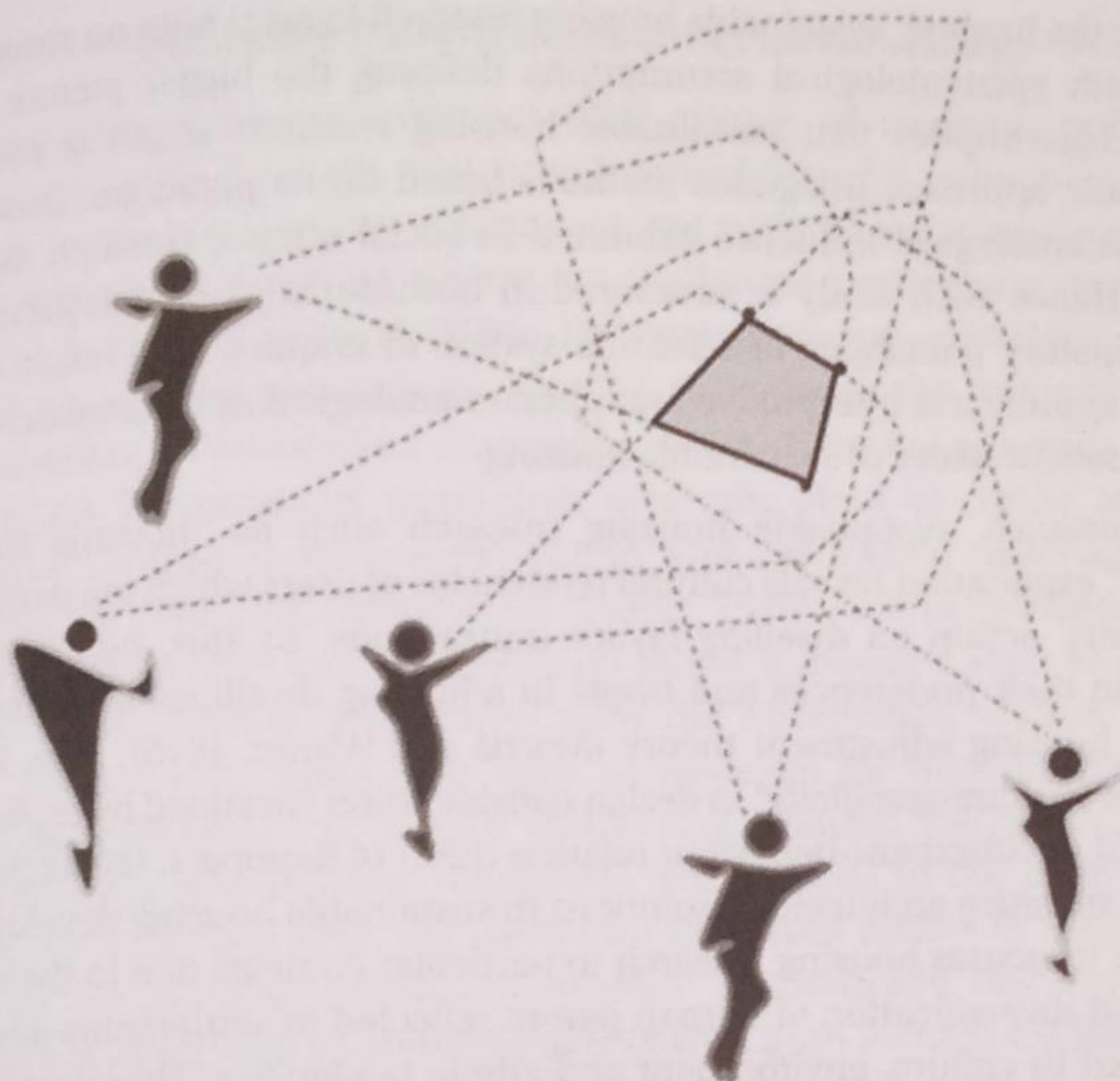


Figure 5.2 People's cognition with common converging point

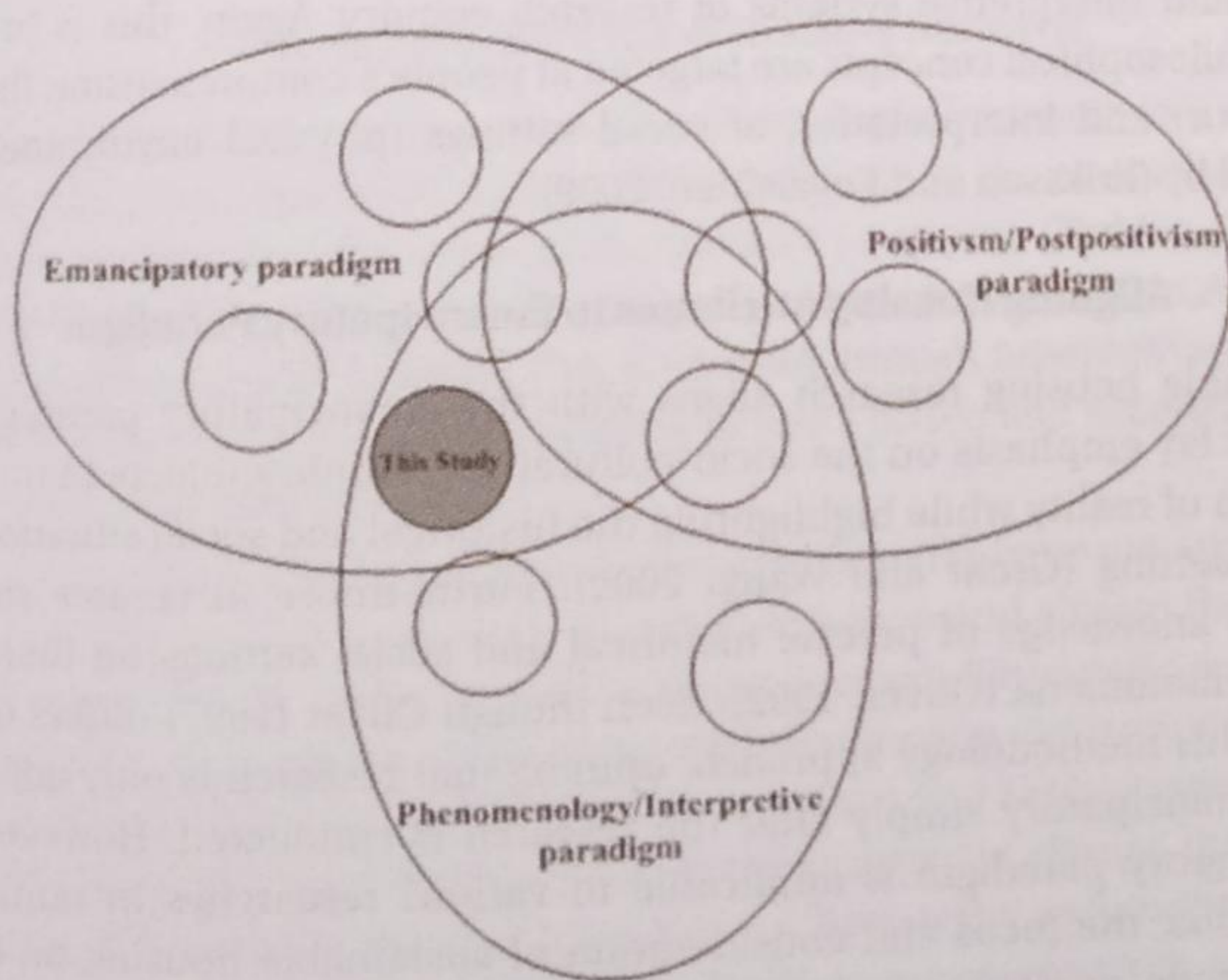


Figure 5.3 Clusters of systems of inquiry showing the location that fits sustainable housing research

Source Groat and Wang, (2002)



From the forgone, sustainable housing research focus is built on strong footings with epistemological assumptions defining the bigger picture of the study. This implies that sustainable housing research which is rooted in pragmatic approach integrates methods based on its paradigm. Because of the epistemological influence exhibited in social science research (Morgan, 2007). Hence such study is structured in both domains of interpretive and emancipatory paradigms of scientific system of enquiry. As a result, the research approach is interpretive and phenomenological as the research investigates salient issues of sustainable housing.

For instance, sustainable housing research such as “housing transformation” exploration reveals cultural tendencies of users which are deduced as occupants’ action on dwelling layout transactions. By this, households respond to their preferences and needs in adjusting dwellings as conceptualized in housing adjustment theory (Morris and Winter, 1975). Also, various contexts “*culture-specificity*” in design consideration sustained by explanatory theory of environment-behaviour relation (EBR) of Rapoport, (2000) provides socially sensitive architectural solutions to sustainable housing development. Because it focuses housing research to particular contexts due to the subjectivity and diversification of human nature reflected in settlements and often attributed to culture, environment and ethnic tendencies. Therefore, typical housing phenomenon that assesses users’ experience and focuses on culture specific environment is elucidated through the bi-processes of phenomenological and interpretive systems of research enquiry. Again, this is because these philosophical concepts are targeted at people’s comprehension (human behaviour) and interpretation of social settings (physical environment) as affirmed by (Eriksson and Kovalainen, 2008).

### **Aligning Housing Attributes to Emancipatory Paradigm**

Sustainable housing research aligns with the emancipatory paradigm, as the later lay emphasis on the socio-cultural and ethnic subjects in the construction of reality while highlighting the historical and social situation of a study’s setting (Groat and Wang, 2002). Furthermore, it creates socially valuable knowledge of precise historical and social settings on identified salient phenomena (Oliver, 1992). Even though Oliver (1997) differs on the idea of this methodology approach, opining that research is only adjudged to be emancipatory simply after the research is conducted. However, the emancipatory paradigm is applicable to various researches in numerous fields. Thus, the focus and consideration of sustainable housing on social backgrounds, exploring physical and cultural issues places it in the emancipatory domain of research inquiry.



### **Sustainable Housing Research: A Phenomenology**

Phenomenology possesses the potential virtues of clarifying subjective experiences with concrete and broad articulation by emerging the researcher in the participants' experience, not without exposing researchers to the struggle of resolving enormous challenges particularly during the research process (Churchill, 2006). Phenomenological paradigm equally focuses on specific phenomena, seeking to increase the perception and understanding of researchers on precise issues. Phenomenology is usually approached by means of qualitative methods. More so, while adopting qualitative method questionnaire survey and participant observation are strategies for soliciting information (Lester, 1999). The phenomenological paradigm connected with sustainability issues in housing such as housing transformation affords researchers with the observation of how participants interact with space over time as evidence for their expression of meanings to situations of interest (Starks and Trinidad, 2007). Adeptly taking to the fore participants' viewpoints with regards to the phenomenon (Lester, 1999). In this case, the viewpoint expressed relates to their experiences in the housing interaction process. Theoretically, the interpretive paradigm is engrained in phenomenology with both focused on structuring social reality (Berger and Luckmann, 1966). Therefore, it is recognised as an appropriate research paradigm for sustainable housing research.

### **Interpretive Attribute of Housing Research**

An interpretive dimension enhances phenomenological research as a source of theory, policy and execution (Lester, 1999), believing in the researcher's interpretative cogency and the worth of the product - outcome (Teddlie, 2005). Interpretive paradigm strives for the comprehension of man-environment relations in culture specific settings. This is ensured through interpretive paradigm in order to develop a subjective meaning of one's action and experiences with the environment (Creswell, 2013).

Concisely, phenomenological and interpretive paradigms are appropriate for sustainable housing research meant to enhance and situate the empirical work historically within specific cultural context. Essentially, a phenomenological study seeks to understand the phenomena determined by contextual interpretation of researcher's observation and respondents' experience anticipated to activate cultural determinants for design thoughts in sustainable housing research. This is entrenched in the assumptions of the methods, thus strengthening existing links between research questions, participants, objectives and the study outcome.



For this purpose, it becomes appropriate to employ mixed method research design. As such, the quantitative method seems evidently easier to adopt in seeking data from households and dwelling occupants as it complements the overriding qualitative method of ethnographic studies in which participant observation is used to identify patterns resulting from users' interaction with housing spaces. Subsequently, information gathered through these varieties of sources could be subjected to both qualitative and statistical analysis such as ethnographic analysis, psychometric analysis and content analysis. Advantageously, a correlation of the findings from different sources through triangulation is likely to reveal the mainstream ideals for design considerations from the occupants' viewpoint that might offer design solutions. Beyond these, responsive housing design with sustainable developmental features evolve.

### **Analogical Inference in Achieving Suitable Research Method**

In furtherance to the solidly laid philosophical stance and established theoretical base in a typical sustainable housing research, the epistemological research domain echoes the research method. Subsequently, applicable strategy (method) and tactics (techniques) would stem from the theoretical composition of the research. Sustainable housing research tends towards qualitative perspective particularly in the context that deals with the interpretations of contemporary situations, emphasizing the researcher's role in the field as vital to the outcome. These are considered features of qualitative research (Groat and Wang, 2002). Since such study seeks to comprehend a phenomenon with research questions focused on investigating social and urban physical settings, it should be categorised as a case study research. Because qualitative research that involves field study in understanding a social phenomenon adopts the case study strategy (Yin, 2014). The case study strategy remains tremendously widespread in social research, particularly when dealing with sets of specifically related ideas and preferences with in-depth inquiry in order to give the methodological process a detailed and distinctive character (Denscombe, 2007). Additionally, Woodside (2010) asserts that case study inquiries forecast, regulate and relate the understanding of groups and settings as well as families and cultures. Such empirical queries enable the understanding of the intricate social phenomenon that lies in real life situations (Yin, 2014). Hence, case study research aligns with research that tends towards discovery and synonymous with qualitative studies. Besides, multiple sites' study approach is considered appropriate in sustainable housing research that involves perceptions and thoughts of participants drawn from different backgrounds. This is to facilitate the development of common themes on spatial issues



related to different indigenous settings. In addition, the case study approach if subjected to further detailed strategies could be regarded as mixed method approach in spite of existing overlaps (Khan, 2008). Thus, the inclusion of quantitative and qualitative information in sustainable housing research situates it in a mixed-mode research dimension.

Systematically, sustainable housing research better combines various settings as a result of diverse human and ethnic communalities while seeking the understanding of physical setting and inhabitants' behaviour. This operational methodology is a qualitative research that adopts multi-case studies strategy, with multi-phase sampling technique using mixed-method approach in data eliciting and processing as well as in the interpretation.

### **Investigative Tactics and Techniques**

Afterwards, the understanding of the research process and path should be swiftly expatiated due to the need for further clarification and detailing the procedure as experienced while creating a research design. The research design explains the process of data collection, analysis and interpretation, in this situation by applying the mixed-method approach. Tactics and techniques involve specific instruction of explicit, compelling and prescribing character used to elaborate methods towards achieving specific goals by thinking and acting using instruments or/and tools in a systematic way within established rules and procedures (Jonker and Pennik, 2010). Essentially, research procedure sensibly, and successively link empirical data and research objectives to the conclusions (Yin, 2010). Thus, sequence and concurrency in explaining or exploring the operation are possible research procedural tactics in examining various objectives and relating the findings. Towards this realisation, undertaking an ethnographic study of communities comprising of indigenous groups should establish the core space use attributes in their housing layouts. Tactically, such investigative process should reflect both cultural and spatial tendencies sought in sustainable housing research which projects the liveability of inhabitants. Accordingly, this aligns with the benchmark for selection of technique(s) commonly used in such research inquiry which include; consideration of norms and criteria, personal preferences, context, principle of equifinality as well as internal and external developments as outlined by (Jonker and Pennink, 2010). The process thereby advances an outcome that directs development of design issues by providing a guide for future schemes. Advantageously, experts' validation of the outcome is another tactic that ensures believability and usability of findings while confirming the appropriateness in operationalization of the theories extended from the research framework.



In sum, sustainable housing research phenomenon could be investigated using a focused group observation, comparisons between traditional and urban housing provisions towards ensuring that users' demands are understood. Also, developing themes, statistical and qualitative queries followed by synthesis in establishing outcome are tactical approaches in extending an in-depth study. In this regard, the case study approach ensures focus on existing relationships and practises in social settings that are usually consistent and related (Denscombe, 2007).

### Identifying Appropriate Methodological Framework

From the foregone, the framework of housing research could be developed based on the four components of epistemological research framework outlined by Groat and Wang (2002). This methodological framework is considered effective in directing sustainable housing research because it elaborates on the philosophical and theoretical dimensions as well as the appropriate method. The research design further outlines the strategies employed in the research domain.

Furthermore, it relates numerous tactics that enhance research quality even though it is optional as not all qualitative studies employ several strategies. However, combined strategies where multiple research approaches are adopted using multiple sources of data gathering and multiple analytic procedures enrich the sustainable solutions in housing research. These are the strengths of case study strategy as it invites, encourages and permit researchers to use a variety of sources, types of data and a range of methods in investigating a phenomenon (Denscombe, 2007). It thus fits the circumstances and specific needs of sustainable housing research. Above all, this procedure could better be pictorially and intensely shown graphically describing the step by step practices performed towards establishing the research goal. The typical research design that pictorially displays this methodological process is shown in Table 5.1.

In addition, meta-synthesis tactically clarify and aids the understanding of a phenomenon by creating a whole concept from its essentials (Walsh and Downe, 2005). Besides, an analytic evaluation of literature reinforces established findings of the subject towards instituting the theoretical framework that places the research gap. Qualitatively interpretive procedure enhances the explicit sense of the subject matter (Erwin *et al.*, 2011). Similarly, convergent parallel design consists of parallel data gathering where quantitative data could be embedded in a predominant qualitative data that explains the phenomenon (Creswell, 2012). Impliedly, the outcome of one objective most likely determines the consideration of a subsequent objective in sequence. Ethnography could be an option in cultural



studies as a common method employed by anthropologists to inquire about modern society and social matters (Patton, 2005). Ethnography describes culture while understanding lifestyle from the native's view, seen through their artefacts (in this case housing) or behaviour (activities) fundamentally through participant observation and interviews, hence learning from people rather than studying the people (Spradley, 1980). This trait of ethnography fits the concept of comprehending sustainable attributes and features in housing research.

Several housing studies have applied quantitative and qualitative methods separately. However, combining multiple methods of quantitative and qualitative approach enhances research validity because their individual strengths are beneficial and utilised in resolving the weaknesses of each and thus the outcome is optimised. For instance, the mixed method can qualitatively showcase the activity and activity space interaction at the root, sub-urban and urban housing settings. Accordingly results from researcher's observations could triangulate with a questionnaire survey appropriately conducted in order to evaluate the influence of cultural factors of occupants. In the process, explicit findings may evolve through analytically developed categories by searching for patterns and themes (Miles *et al.*, 2013) and also by adopting descriptive and conceptual categorisation strategy (Jennifer, 2002) which forms the basis for theory development (Glaser and Strauss, 1967). Effectively, reflecting core social space uses in housing research that satisfies users' needs and desires as envisaged in sustainable housing design.

Sustainable housing researches require synthesis between socio-cultural determinants uncovered with spatial patterns in creating the direction of influence and establishing core elements of space for design considerations. Thereby, developing design criteria for experts' validation towards ensuring sustainable housing provisions that result in evidence-based design solutions. In the end, sustainable designs emerge from evidence-based design outcome with design indices grounded on explicit indigenous attributes related to a product of the synthesis and convergence of socio-cultural and spatial themes into domains.

### **Formation of the Research Procedural framework**

The evidence from the discussion has posited sustainable housing research in the qualitative realms. However, an in-depth scientific system of inquiry that involves the adoption of several methods and techniques is essential for qualitative research procedure. Amid the steps that constitute the procedure, precise skilful and detailed processes are found as mid-range sub-methods and sub-techniques. These explain specific skills in soliciting data,



documentation and analytical procedures worthy of utilisation. Therefore, in facilitating in-depth procedural framework in sustainable housing inquiry researchers could further clarify the procedure using skills that include technique, operational method, operational strategies, operational tactics, detailing instruments and trustworthiness at every stage of the procedure. These steps form a dependable chain-link sequence which analogically pictures the research design while explicitly describing the stages of researcher's engagements and outcomes.

Procedurally, the research goal is achieved effectively when the research operation adopts appropriate techniques. Impliedly techniques in this context refer to the series of steps used to realise the research objectives towards achieving the research operation, while operational methods consist of the process adopted in accomplishing these steps. The concept behind the applied methods form the operational strategies while the operational tactics are mid-range steps that explain the technical skill used within the applied methods. Specifically, outlined tasks across the framework are achieved using instruments as tools. Afterward, the credibility of every sequence of the task is appropriately ensured with skills rooted in the trustworthiness towards a valid outcome that relates the output of every procedural circuit. Significantly, trustworthiness sustains process validity in every qualitative research. A typical procedural chart in a housing research detailing techniques and tactics is illustrated in Table 5.1.

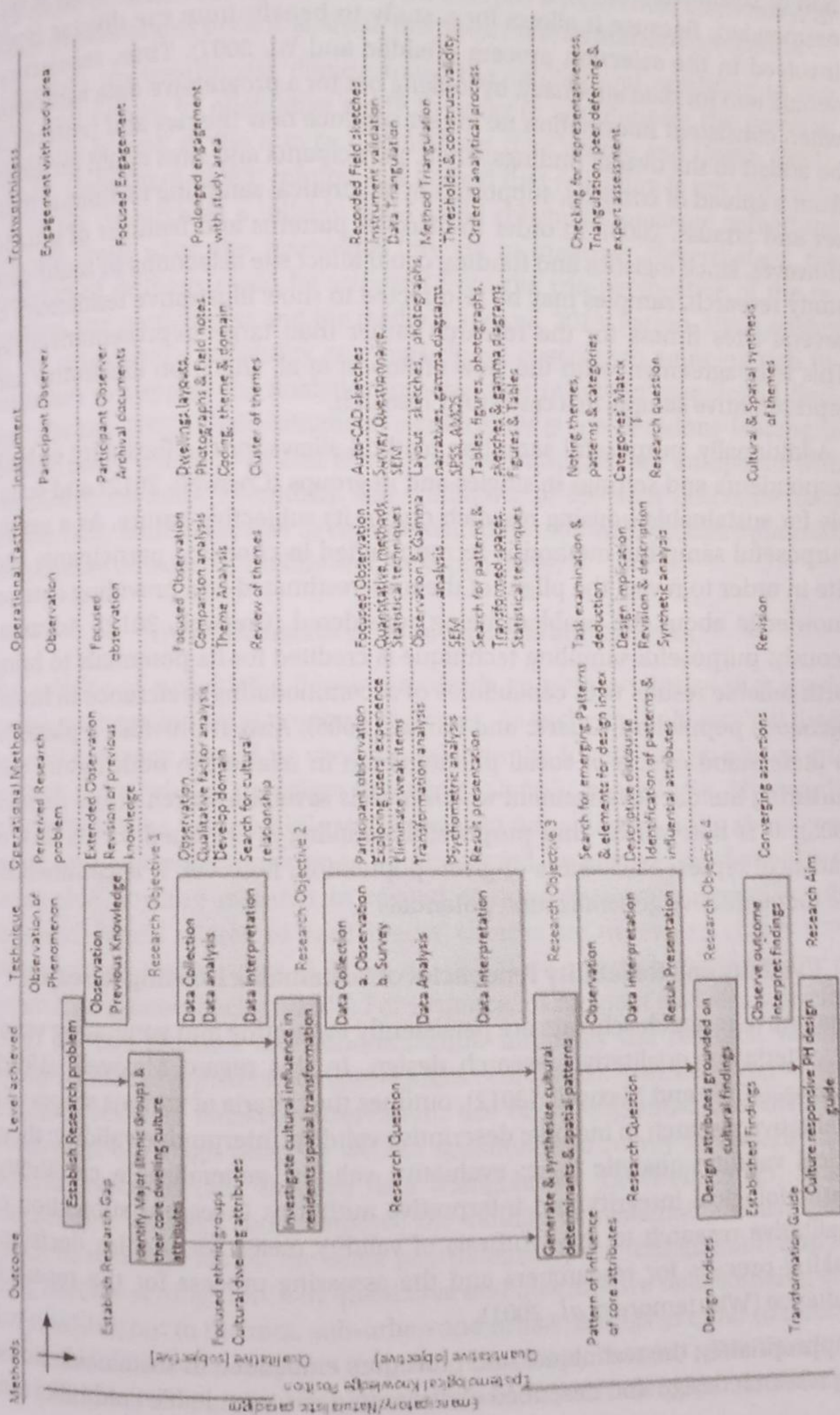
### **Inhabitants' setting and Population Sampling System**

As the urban settings host rural migrants, sustainable urban development can no longer ignore the influence of root and sub-urban space use practices in urban housing design. In this regard, it is worthy to note that typical root settings are traditional, with space arrangement based on culture thus cultural groups could be considered first for ethnographic evaluation. In the process, the activity-space relationship in the layouts of these indigenous groups would be revealed.

Sample sizing in a qualitative study mainly relies on the study's focus, sample frame's reliability and available resources that includes time (Patton, 2002). Despite researchers' efforts in suggesting sample size thresholds for interviews in ethnography, grounded theory, ethnoscience and phenomenology, qualitative studies unlike quantitative studies lacks test for adequacy for sample size approximation (Morse, 1995). Rather it depends on the sample that fits the research question or samples leading to data saturation in the field. Scholars in these situations insist on the consistent sample, bearing in mind sample variations and adopting theoretical and purposive sampling methods.



Table 5.1 Typical Sustainable Housing Research Procedural Chart





Therefore, in advancing an in-depth examination of the essential phenomenon of sustainable housing research mixed-method sampling strategy is recommended. Because it allows for a study to benefit from the diverse levels involved in the selection process (Teddlie and Yu, 2007). Thus, researchers should aim for data adequacy, by looking out for a progressive data saturation when consistent information no longer produce new themes and patterns to be added to the overall findings. Then, participants and sites could be drawn from a spread of contexts, supported by theoretical sampling technique (Glaser and Strauss, 2009), in order to discover patterns and features of groups. However, since logistics and funding could affect site selections in multi-case study research, samples may be re-directed to show illustrative tendencies of several sites fitness for the research rather than target representativeness. This is in agreement with the view of Robert et al. (2002) on illustrative and representative sample in a case study research.

Additionally, purposeful sampling method allows for the flexibility of both respondents and settings in singles and in groups (Creswell, 2012) and suitable for sustainable housing research due to its subjective nature. As a result, purposeful sampling method is recommended in choosing participants and site in order to reveal the plight of the underestimated and providing data on knowledge about the problem being considered (Creswell, 2012). Advantageously, purposeful sampling technique is credited for its potentials to bring forth reliable results with capabilities of accommodating preference in heterogeneous population (Guarte and Barrios, 2006). Also, it provides a platform to understand effects of social phenomenon in relation to both nature and nurturing human advancement which reveals several research areas. (Patton, 2005). It is noteworthy that purposeful sampling is critiqued for its lack of statistical representativeness of given population, however, it is commendable for qualitative generalization potentials.

### **Validity and Reliability Tendencies of Sustainable Housing Research**

Qualitative research scholars are persistently evaluating and generating validity criteria for qualitative research design, In this regard Maxwell, (1992); Thorne, (1997) and Maxwell, (2012), outlines the criteria at various stages of a qualitative research to include; descriptive validity; interpretive validity; theoretical validity; analytic logic; evaluative validity; generalizable credibility; methodological integrity and interpretive authority. Incessant subjection of qualitative research to the synthesis of validity measures enables decision-making process for researchers and the assessing process for the research audience (Whittemore *et al.*, 2001).

Appropriately, the techniques and procedure embedded in sustainable housing research design and described earlier would ensure suitable credibility and



plausibility in the research process. As a result, meaningful and acceptable findings could be achieved. These techniques and procedures cover steps taken to ensure dependability in data, analysis, methods, findings and interpretations.

Research trustworthiness demonstrates the validity and reliability of any study and crucial in qualitative study in order to authenticate the research procedure as well as the accuracy of findings (Le Compte and Goetz, 1982). Equally, Golafshani (2003) refuted and upheld that reliability is not critical in qualitative research as a reliable scale could constantly measure something different from what the researcher intends to measure. Nevertheless, the precision of findings could be achieved from the trio-perspective of the researcher, the participants and the reader (Creswell, 2013; Patton, 1999) relying on the researcher's capability as a participant observer in sourcing rich information to support the analytical process that results in meaningful findings (Patton, 2002). Field situations significantly guide decisions leading to the improved outcome as real site evaluation strategies are compared with standard thresholds. Eventually, the credibility of research outcomes rests substantially with the reader to comprehend the study and adjudge important and suitable outcome (Cutcliffe and McKenna, 1999).

### **Trustworthiness in Data, Methods and Analysis**

The validity of sustainable housing research requires strategies that would ensure trustworthiness at progressive phases. As such, multiple seminal theories and concepts should be used to underpin the foundation to ensure grip and link to knowledge paradigm as well as scientific procedures. Afterwards, Jick (1979) relates that multiple strategies as in this situation bring about consistent and convergent outcomes. In this regard, to ensure transferability of sustainable housing research to related settings phenomenological conditions and details related to participants' choices are necessary. This is consistent with the suggestion of Elo *et al.*, (2014) on ensuring transferability of research to related backgrounds. For instance, participant and site selection based on stratification and randomization improves the research validity through effective representativeness (Miles *et al.*, 2013). Also, adopting several strategies such as focused observation, use of photographs, checklist and assessment of design plans as well as questionnaire survey in seeking data validates research data through data triangulation (Creswell, 2012). Space triangulation strategy could improve the validity of sustainable housing research in seeking data on the same phenomena. Space triangulation implies using diverse settings for both qualitative and quantitative data sourcing and also reaching out to the root, sub-urban and urban settings in order to discover commonalities across space (Berg and Lune, 2004; Denzin, 1989; Kimchi *et al.*, 1991). Therefore, examining space and activity relationships across sam-



pled indigenous communities with such information developed from the field and subjected to member checking straightaway validates the evidence for further analysis. In this situation, the researcher keeps touch with participants in order to re-examine extracts and also ensure their involvement at that stage of field engagement otherwise they might develop less interest later after the entire analytic process of the information sourced (Stake, 2010). Beyond this, triangulation could be used to validate method and results (Erzberger and Kelle, 2003) as triangulation strengthens research (Denzin, 1978). A combined process led result outcome such as the one established in a sustainable housing research from several sources triangulates evidence and increases reliability (Blum and Amy, 2005).

### Plausibility of Findings

The credibility of procedural contexts and interpretive process that lead research findings to decisions are enriched by coherent concepts and theories. Miles *et al.* (2013), described numerous strategies for validating findings during interpretation such as noting of patterns and themes; clustering and building of a logical trail of evidence which is suitable for sustainable housing research. Patterns and themes would generate meaning from the outcome of the mixed methods research recommended. In addition, developing categories using clustering approach helps in the appreciating the phenomenon. Whereas developing concepts from attributes of similar kind and patterns towards creating foremost themes describes important claims for assertions. Again Miles *et al.* (2013), recommended strategies for ensuring trustworthiness in deducing conclusions while confirming research findings such as, through searching for representativeness, converging conclusion from triangulation and detecting contrasting evidence. Above all, peer debriefing and expert evaluation of the sustainable housing indices derived from researches further strengthens the validity of the evidence in the research output.

### Qualitative Gap: A Subjective Interpretation Space

Concisely, in-depth analytical process of interpreting research findings into claims, theories and assertions are considered subjective both from the positivists' and the constructivists' viewpoint. Thus, qualitative researchers commonly experience "*qualitative jump*" at this stage- a subjective gap that usually occurs when interpretations advance from implicit to explicit themes, domains and categories (Khan, 2008). Assertions and inferences are deduced from findings of analytical processes through this means. The process is a similitude to the operation of the synaptic gap in the human neural system where information is transferred from the axon to the dendrite. During this operation, stimulus generates diverse probable reactions out of which the organs chooses those to give



a response. Therefore, several possible valid inferences could emerge from a scientific research process. However, the trail of interpretation relies on the depth of argument by the researcher, the deeper the trail the richer the output but the higher the tendency of the message letting off some meaning. Thus, researchers could get drowned in subjective views hence require imaginative cognition to deduce appropriate research products from interpreting research findings. This is common with housing research where subjective views of both the researcher and the researched characterise the process.

### **Developing Sustainable Housing Measurable Determinants**

In describing sustainable housing parameters, first, there is the need to define the socio-cultural and spatial attributes of housing in the region in order to establish cultural attributes that are connected with the residents. Towards achieving this, attributes are broadly considered under cultural and spatial dimensions in order to create a focus that defines human-space transactions and the operational paradigm of the study. For instance, spatial dimension could include functional households' activity spaces in the building, whereas the socio-cultural dimension may include social principles, lifestyle, identity and households' chores that are exerted on the spatial dimension. Several scholars have aligned with these dimensions, for example, Daramola (2006) advocates that a functional kitchen space should blend with the occupants' lifestyle. Also, Rapoport (1969) acknowledged that house forms are influenced by socio-cultural factors of religion, family structure, privacy, cooking and dining as well as sleeping behaviours. Likewise, courtyards in traditional cultures are considered spaces for women's regular chores (Boyowa, 2005; Muhammad and Said, 2015). In a related study, Kotharkar and Deshpande (2012) listed family structure, occupation, privacy, cooking, eating habits and sacred places as cultural and social determinants of roots' housing configuration. Thus, these provide social meaning of activities that culturally influence house form and are noteworthy in a sustainable housing research particularly in cultured communities. In addition to previous studies, preliminary reconnaissance engagement with the region of study provides acquaintance with housing attributes familiar to the region. However, it is worth acknowledging that each of these functional spaces may likely evoke diverse social meaning to the households.

### **Conclusion**

Remarkably, cultural turn in 21<sup>st</sup> century sustainable housing research is evident in the appropriate methodological strategy as outlined and advocated by this study. Significantly, culture is a gift bestowed on us as humans and reflecting on our romance with the environment that requires comprehension in defining sustainability in housing research. Remarkably, UN has seen the need to con-



sider socio-cultural issues in attaining sustainable solutions in resolving housing problems. It evaluates inhabitants and their environments by relating their mainstream values as compatible with the natural global viewpoint. So, sustainable housing research could take advantage of seminal underpinnings from reputable theories such as culture specificity of built environment in Man Environment Relations (Rapoport, 1983); Environment Behaviour Relations (Rapoport, 2000); user centred theory of the built environment (Vischer, 2008); Indegineity (Isah, 2016) as well as cultural paradigm related to the Etic and Emic theory of cross cultural research. Appropriately, ethnographic principles are considered ideal in search for sustainable housing solutions to explicitly describe the socio-cultural influence and user design initiatives towards housing satisfaction. It offers researchers the potential to see housing attributes or features, satisfaction as well as space interaction through the eyes of the end users- the inhabitants of urban settings and ecosystems from a myriad of diverse backgrounds as humans are endowed with cultural diversity. It is, therefore, an effective method for sustainable housing research that reveals users' behaviour as solutions to emergent urban housing challenges.

### References

- Berg, B. L. and Lune, H. (2004). *Qualitative Research Methods for the Social Sciences*. Pearson: Boston.
- Berger, P. L. and Luckmann, T. (1966). *The Social Construction of Reality*. Garden City, New York: Anchor.
- Blum, D. K. and Amy, P. E. (2005). Strategies to win: Six Steps for Creating Problem Statements in Doctoral Research. *Journal of College Teaching and Learning*. 2(11), 47-52.
- Boyowa, A. C. (2005). Changing Urban Housing Form and Organization in Nigeria: Lessons for Community Planning. *Planning Perspectives*. 20(1), 69-96.
- Creswell, J. W. (2012). *Educational Research Planning, Conducting and Evaluating Quantitative and Qualitative Research*. (4th ed.) Boston, United States of America: Pearson Education Inc.
- Creswell, J. W. (2013). *Research design: Qualitative, Quantitative and Mixed Methods Approaches*. London: Sage Publications.
- Cutcliffe, J. R. and McKenna, H. P. (1999). Establishing the credibility of Qualitative research findings: the plot thickens. *Journal of Advanced Nursing*. 30(2), 374-380.
- Churchil, S. D. (2006). *Phenomenological Analysis: Impression Formation during a Clinical Assessment Interview*, in *Qualitative Research Methods*, Fischer, C. T. (2006). (ed), Elsevier Inc, UK, USA.
- Daramola, S. (2006). Affordable and functional housing in a developing economy: A case study of Nigeria. *Journal of Land Use and Development Studies*. 15(2), 23-28.
- Denscombe, M. (2007). *The Good Research Guide for Small-Scale Social Research Projects* (3<sup>rd</sup> ed.) Portland, Open University Press McGraw-Hill.



- Denzin, N. K. (1989). *Interpretive interactionism. Applied social Research Methods series*. Newbury Park: Sage.
- Denzin, N. K. and Lincoln, Y. S. (2008). *Strategies of qualitative inquiry*. Thousand Oaks: Sage Publication.
- Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K. and Kyngäs, H. (2014). *Qualitative Content Analysis A Focus on Trustworthiness*. SAGE Open. 4(1), 2158244014522633.
- Eriksson, P. and Kovalainen, A. (2008). *Qualitative methods in Business Research*. Thousand Oaks: Sage Publications.
- Erwin, E. J., Brotherson, M. J. and Summers, J. A. (2011). Understanding Qualitative Metasynthesis Issues and Opportunities in Early Childhood Intervention Research. *Journal of Early Intervention*. 33(3), 186-200.
- Erzberger, C. and Kelle, U. (2003). Making inferences in mixed methods: The rules of integration. *Handbook of mixed methods in social and behavioural research*. 457-488.
- Fellows, R. F. and Liu, A. M. (2009). *Research methods for construction* John Wiley and Sons: US.
- Glaser, B. G. and Strauss, A. L. (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago: Aldine.
- Glaser, B. G. and Strauss, A. L. (2009) *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Transaction Publishers.
- Golafshani, N. (2003). Understanding Reliability and Validity in Qualitative Research. *The Qualitative Report*. 8(4), 597-607.
- Groat, L. and Wang, D. (2002). *Architectural Research Methods*. Canada: Wiley Publishers.
- Guarte, J. M. and Barrios, E. B. (2006). Estimation Under Purposive Sampling. *Communication in statistics- Simulation and Computation*, 35(2), 277-284.
- Guba, E. G. and Lincoln, Y. S. (1994). Competing Paradigms in Qualitative Research. *Handbook of Qualitative Research*. 2, 163-194.
- Isah A. D. (2015). Culture Integration and Spatial Morphology in Public Housing Transformation in Northern States of Nigeria. Unpublished Ph.D. Thesis, Universiti Teknologi Malaysia.
- Isah, A. D. (2016). Urban Public housing in Northern Nigeria: The search for idigeneity and cultural practices in design, Springer International Publishers, Switzerland.
- Jennifer, M. (2002). Linking Qualitative and Quantitative Data analysis. In Bryman, A. & Burgess, R.G. (Eds.) *Analysing Qualitative Data*. 29 West 35<sup>th</sup> Street, New York, NY 10001: Routledge; Taylor & Francis
- Jick, T. D. (1979). Mixing Qualitative and Quantitative Methods: Triangulation in action, *Administrative Science Quarterly*. 602-611.
- Jonker, J. and Pennink, B. W. (2010). *The Essence of Research Methodology, A Concise Guide for Master and PhD Students in Management Science*, London, New York, Springer Heidelberg Dordrecht.
- Khan T. H. (2008). Living with Transformation: A Study of Self-built Houses in Dhaka, Unpublished PhD Thesis, University of Hong Kong.



- Kimchi, J., Polivka, B. and Stevenson, J. S. (1991). Triangulation: Operational definitions. *Nursing Research*. 40(6), 364-366.
- Kotharkar, R. and Deshpande, R. (2012). A Comparative Study of Transformations in Traditional House Form: The Case of Nagpur Region, India. *Journal of International Society for the study of Vernacular Settlements*. 2(2), 17-33.
- LeCompte, M. D. and Goetz, J. P. (1982). Problems of reliability and validity in ethnographic research. *Review of educational research*. 52(1), 31-60.
- Lester, S. (1999). An introduction to phenomenological research. *Stan Lester Developments*. 1-4.
- Maxwell, J. A. (1992). Understanding and validity in qualitative research. *Harvard Educational Review*. 62(3), 279-301.
- Maxwell, J. A. (2012). *Qualitative Research Design: An Interactive Approach*: Washington DC, Singapore: Sage Publications.
- Miles, M. B., Huberman, A. M. and Saldaña, J. (2013). *Qualitative data Analysis: A Methods Sourcebook*. SAGE Publications, Incorporated.
- Morgan, D. L. (2007). Paradigms lost and pragmatism regained methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*. 1(1), 48-76.
- Morris, E. W. and Winter, M. (1975). A theory of Family Housing Adjustment. *Journal of Marriage and the Family*. 79-88.
- Morse, I. J. M. (1995) *Completing a qualitative project: Details and dialogue*, Thousand Oaks, CA: Sage.
- Muhammad, I. B., & Said, I. (2015). Behavioural use of courtyard in a Nupe cultural landscape of Nigeria *Interdisciplinary Behaviour and Social Sciences* 227-232: CRC Press.
- Oliver, M. (1992). Changing the social relations of research production? Disability, *Handicap & Society*. 7(2), 101-114.
- Oliver, M. (1997). Emancipatory research: realistic goal or impossible dream. *Doing Disability Research*. 2, 15-31.
- Patton, M. Q. (1999). Enhancing the quality and credibility of qualitative analysis. *Health Services Research*. 34(5 Pt 2), 1189.
- Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods*. (3<sup>rd</sup> ed.) Thousand Oaks, California 91320: Sage Publications, Inc.
- Patton, M. Q. (2005). *Qualitative Research*. Wiley Online Library.
- Rapoport, A. (1969). *House Form and Culture*. Englewood Cliffs: Prentice-hall.
- Rapoport, A. (1983). Development, culture change and supportive design. *Habitat International*. 7(5), 249-268.
- Rapoport, A. (2002). Theory, culture and housing. *Housing, theory and society* (Incomplete). 17(4), 145-165.
- Robert, G. B., Christopher, J. P., Keith, E. and Christine, P. (2002). Four studies from one or one study from four? Multi-site case study research. In Alan, B. & Robert, G. B. (Eds.) *Analysing Qualitative Data*. 29 West 35<sup>th</sup> Street, New York, NY 10001: Routledge; Taylor & Francis
- Stake, R. E. (2010). *Qualitative Research: Studying how things work*. New York, London: Guilford Press.



- Starks, H. and Trinidad, S. B. (2007). Choose your method: A comparison of Phenomenology, Discourse analysis, and Grounded theory. *Qualitative Health Research*. 17(10), 1372-1380.
- Spradley, J. P. (1980). *Participant Observation*, United States: Holt, Rinehart and Winston.
- Teddle, C. (2005). Methodological Issues Related to Causal Studies of Leadership A Mixed Methods Perspective from the USA. *Educational Management Administration & Leadership*. 33(2), 211-227.
- Teddle, C. and Yu, F. (2007). Mixed Methods Sampling A Typology With Examples. *Journal of Mixed Methods Research*. 1(1), 77-100.
- Thorne, S. (1997). The art (and science) of critiquing qualitative research. In Morse, I. J. M. (Ed.) *Completing a Qualitative Project: Details and Dialogue* (pp. 117-132). Thousand Oaks, CA: Sage.
- Vischer, J. C. (2008). Towards a user-centred theory of the built environment. *Building Research & Information*. 36(3), 231-240.
- Walsh, D. and Downe, S. (2005). Meta-synthesis method for qualitative research: A literature review. *Journal of Advanced Nursing*. 50(2), 204-211.
- Whittemore, R., Chase, S. K. and Mandle, C. L. (2001). Validity in qualitative research. *Qualitative Health Research*. 11(4), 522-537.
- Willig, C. (2001). *Introducing Qualitative Research in Psychology Adventures in Theory and Method*. Buckingham, 325 Chestnut Street Philadelphia, PA 19106, USA: Open University Press.
- Woodside, A. G. (2010). *Case Study Research: Theory, Methods and Practice: Theory, Methods, Practice*. United Kingdom: Emerald Group Publishing.
- Yin, R. K. (2014). *Case study research: Design and methods*. Thousand Oaks, California Sage publications.