

The Systematic Procedure of the Phenomenological Approach of Qualitative Research to Reconstruct the Generic Settlement Pattern of a Specific Context

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ABSTRACT

Phenomenological research is an inductive, descriptive research methodology derived from phenomenological philosophy which aim is to describe an experience that is presumed to have been had by the subject in a particular setting. This approach of research can be used to find out the generic settlement pattern of a specific context. The specific research essentially attempted to connect methodically, the various threads and fill up the gaps to identify the order that prevails in the settlement pattern of the Bengal Delta, thereby testing the hypothesis, that “Bengal Delta has a generic settlement pattern”. From the three stratified zones, 22 case study settlements were selected at random for the field survey, KII and FGD. On analysing all the data, historical interpretation of the settlement patterns and logically identifying the phenomenon behind the development, a ‘generic settlement pattern’ is revealed. The research has been conducted through a triangulation of literature review, phenomenological approach and qualitative data analysis. The analogical context is identified through the historical phenomenological interpretation of available literature. This article has described the systematic procedure of the phenomenological approach of research for the study on the generic settlement pattern of the Bengal Delta.

Keywords: Phenomenological research, Qualitative research, Research methodology, Bengal Delta, Generic settlement pattern

INTRODUCTION

Methodology enumerates the nature and types of processes that are followed in a standard format to attain an objective. The overall strategy that is followed in this study has been discussed here. The research “Study of Generic Settlement Pattern in the Bengal Delta” is intended to find out the root pattern of settlement in the Bengal Delta that has evolved through thousands of years. The evolving context is therefore assumed by analogy because, observing the persistence of the historic pattern prevailing till date, and an elementary literature review of settlements in a similar context allows it to be assumed as such. The topic is broadly related to the multidisciplinary domain of architecture, sociology and geography. Different relevant approaches for this type of social research are weighted/evaluated to determine the basic method of study and to fix the strategy of the present research (Holloway, 1997):

Phenomenological research is an inductive, descriptive research approach developed from phenomenological philosophy; it aims to describe an experience assumed to be lived by the person in a certain context. Certain descriptions of data may follow the historical and ethnological approach (Moustakas, 1994). This method is the most suitable approach to evaluate historic context and its persistence in the present context.

PHENOMENOLOGICAL APPROACH OF QUALITATIVE RESEARCH

A phenomenological study of a product emphasises the qualitative investigation of cause and effect focusing on the commonality of a lived experience within a particular group or community (Creswell, 2013). The fundamental objective of this approach is to arrive at a definition of the nature of the distinctive phenomenon (Eagleton, 1983; Kruger, 1988; Moustakas, 1994; Creswell, 2013). Phenomenological methods are epistemologically based on a paradigm of subjective knowledge and subjectivity and emphasize on the value of personal perspective and logical reinterpretation challenging the existing. As such, they are powerful in interpreting subjective experience, gaining insights into the motives and actions of people, and cutting through the clutter of stereotypes and traditional wisdom taken for granted (Husserl 1970). To achieve a deeper understanding of people's views of a certain phenomenon, qualitative approaches are used (Merriam, 2009). Qualitative research was defined by Yin (2014) as gathering data from a variety of resources, evaluating data, analysing evaluations to generate results.

The Phenomenological research has overlapped with other essentially qualitative approaches including ethnography, hermeneutics and symbolic interactionism (Kruger, 1988; Kvale, 1996; Holloway, 1997; Greene, 1997; Robinson and Reed, 1998; Maypole and Davies, 2001), which is considered as a valid methodological approach. The overall research is more aligned to the Phenomenological approach of qualitative research, as such, identified this approach as the best means for this study (Davidson, 2000). The present hypothesis has been evaluated through a triangulation of Phenomenological approach, Quantitative data analysis and Literature review. Basis of historical reconstruction was phenomenological (local geo-climatic context and human response) from secondary source analysis. The Case study settlements are being evaluated on the basis of the context along with the key informants' interviews (KII) who are the representatives of each settlement. Through the interview and observations, the phenomenon behind the evolution of a settlement pattern in the Bengal Delta is further clarified with onsite evidences. The focused group discussion (FGD) has been made to receive more in-situ knowledge/information about the evolution of the pattern of the case study settlements. At the outset (preliminary focus), the purpose of this study is to gather data on the development of the 'settlement pattern' and the 'phenomenon' influencing settlement formation, lastly, its prevalence in different scales and levels is tested to qualify the pattern to be 'generic'.

Bracketing for Research

According to Miller and Crabtree (1992), the researcher must 'bracket' the hypothesis/suggestion/preconceptions and "enter into the individual's lifeworld and use the self as an experiencing interpreter". In this approach, the present study was carried out using an approach developed by Husserl (1931). The researcher begins with a specific example of the phenomenon he wants to understand in this approach, known as free imaginative variation, and then varies every possible way to differentiate its essential features from those that may be incidental or accidental to it.

The literature review provides a background knowledge base for inquiring and interpreting the human settlements globally and in the study context. In the present research, the informed assumption is made from background studies, by assuming that the present coastal area provides the analogous context of ancient Bengal Delta to study basic settlement patterns in the Bengal Delta. Accordingly, objectives were set to find the phenomenological causes and validate the "settlement" as being generic. Observing the persistence of a particular settlement pattern in the Bengal Delta, the hypothesis or assumption was set at the very beginning, the research question and objectives were derived from that (Ref. Sec. 1.5). The literature review helps narrow down the process and to focus on relevant prevailing information (called bracketing), find the gaps which were not addressed and set a yardstick for further research to get an answer to the hypothesis. The researcher took the bracketed information and ideas for further scrutiny in the study area's (Bengal Delta) analogical context as well as to investigate the gap that was not covered by that bracketed information or ideas (Rashid, 2022a).

Literature Review

Literature review brings out the gist of previous works on settlement formation and their evolution, identifies the gaps of research and critically reviews those studies concerning the research issue being investigated.

Reviews of the literature are intended to provide a summary of sources that have been explored when studying a particular topic and to show readers how the research fits into a broader field of study (Fink 2014) and find the gaps which were not explored. Through literature review, relevant authentic concepts are bracketed not for repetition but for verification in a particular context besides filling the gaps to validate the hypothesis. Literature review for the present research is to achieve the followings:

- a. To identify an analogical scenario and develop a framework for research.
- b. Bracketing the information/data for verification in the analogical context.
- c. To learn lessons from similar studies, identify the research gaps with respect to specific hypotheses and validate some previously reviewed concepts and ideas (Wood, 1991).
- d. Determine an appropriate analytical process to fill up the research gap.

For this study, authentic secondary sources of data included books, journal articles, documented conference proceedings, degree-awarded dissertations, government publications, publications by non-governmental organisations and valid internet sources.

Research Design

The research design aims to provide an appropriate framework for the study and find an answer to the hypothesis. It determines how the relevant information for the research can be obtained authentically; moreover, the research design process requires multiple interrelated decisions (Aaker, Kumar and George, 2000). The phenomenological approach of qualitative research is found suitable over the pure ethnographic approach as it deals with the explanation of some phenomenon of some remote past by confirmation of the traces in the present analogical context and therefore is applied through various deductive methods of systematic triangulation and bracketing.

To meet the objectives the research problem is broken down into segments, i.e. to explore the phenomenon causing certain settlement patterns to evolve in the Bengal Delta and validate the prevalence of that settlement pattern in the present context and justify it being 'generic' in nature as assumed i.e. the basis of all other settlement patterns in the Bengal Delta and therefore can be used as a guideline for future planning and design of settlements in this region for their sustainability (Rashid, 2020a).

Understanding of this process was possible only through historical reconstruction of the scenario and assess the phenomenological conditions causing the certain pattern to emerge. In the present research, it has been inferred from background studies that the coastal region provides the analogical context for the study of the remote evolving settlement pattern in Bengal when the whole of Bengal was an active delta. The objectives were then set to define the phenomena that may have caused a certain type of evolution of settlements and that still persists to justify the "settlement" as being "generic".

OUTLINE OF METHODOLOGY

The research has been conducted through a triangulation of literature review, phenomenological approach and qualitative data analysis. After analyzing the various related literature, some fundamental principles for phenomenological research were listed and collated. The analogical context is identified through the historic phenomenological interpretation of available literature and a historic settlement pattern is reconstructed for the phenomenological study in the present context to verify the prevalence frequency and intensity of the historic pattern. From the analogous context, various geographical locations of the Bengal Delta were stratified on the basis of their evolving stage, from the three stratified contexts 22 case study settlements were selected at random for the survey and KII and FGD. Case study settlements are being evaluated based on the context. For spatial order and uses of space, observation and expert opinions and key informants perceptions and evidential information were gathered. Some qualitative information and quantitative data are triangulated to logically support the argument (Moustakas, C. 1994). As mentioned before, basically the historical interpretation and Phenomenological Approach of the Qualitative research process are applied to support the

hypothesis, that the Bengal Delta has a generic settlement pattern (Rashid, 2020a). The research process has been used in the following sequence:

Literature Review

- Identifying the characteristics of settlement patterns in similar Rice-cultivation-based societies in the tropical belt.
- Understanding the global vis-a-vis indigenous settlement patterns in Bangladesh.
- Identify common attributes, factors and features of settlements in the above categories of studies and bracketing the relevant attributes for further study.

Field Survey and Case Studies

The study is conducted in some areas from the coastal region of Bangladesh which is assumed to represent different zones, stages and where the character of the historic Bengal Delta is evident, which is still active and in a formative stage as it was thousands of years back (Rashid, 2020b).

Table 1: Zoning and Sampling in the study area.

	Districts of Bangladesh	Sample Size	Basin	Delta
Zone A	<ul style="list-style-type: none"> • Borguna • Patuakhali • Bhola 	10	[Western Zone] at Ganga-Padma Basin	Old Delta (representing consolidated geo-morphological evolution stage)
Zone B	<ul style="list-style-type: none"> • Lakshmipur • Noakhali • Feni 	6	[Central Zone] at Surma-Kushiyara Basin	New Delta (Direct analogical context)
Zone C	<ul style="list-style-type: none"> • Chattogram • Cox's Bazar 	6	[Eastern Zone] Basin of Chittagong Region	Foot Hills (representing Delta Periphery)

The field survey is conducted on spontaneous settlements (10 from Zone A and 6 from the other two zones) recording the physical observation and mapping, photographs, reconstructed drawings with the help of key informants and other sources, drawings/sketches of evolving patterns from physical evidence, public discussions/ interviews/ questionnaire survey to confirm or verify or cross-check the data/information Table 1).

Homesteads of relevant settlements are also studied as the physical and social unit from where the settlements evolve. Data collection methods such as observations, semi-structured questionnaire surveys and KII, FGD and Case studies were adopted for evaluation and cross-checking.

- Following the literature review and field study, the Empirical Data Analysis is done.
- Commonalities or common denominators as analysed in literature review and case (field) studies, to identify the core pattern of the settlements, were reevaluated by another method to confirm the persistence of a suggested pattern i.e. the hypothesis.
- The identified pattern is checked at random at various scales and levels for final validation of the hypothesis i.e. the settlement pattern is generic.

The systematic steps of the phenomenological approach for the specific research are reflected in Figure 2.

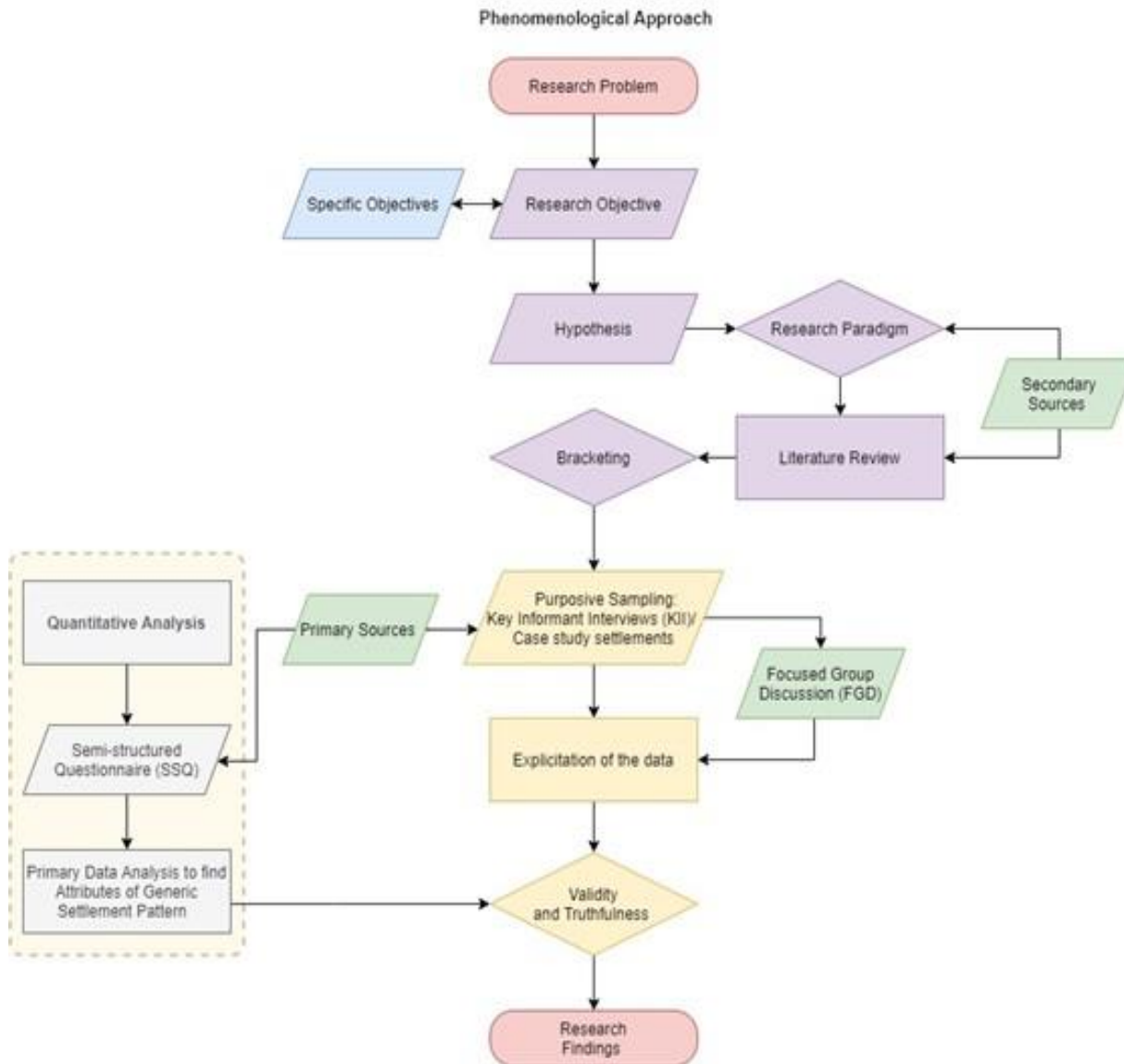


Figure 2: Research flow chart (Source: Author).

METHODOLOGICAL PROCEDURE

Holloway (1997) notes that phenomenology-using researchers are reluctant to recommend techniques. Hycner (1999) confirms this by suggesting that “there is a fair reluctance on the part of phenomenologists to concentrate too much on particular measures.” He continues to suggest that a method should not be imposed on a phenomenon (Hycner, 1999). Phenomenological research begins with a synopsis of the research paradigm, followed by a description of the position of the participants in the research, accompanied by methods of data collection, where data storage methods are illustrated. According to Adrian Van Kaam (1955) and P. F. Colaizzi (1978), to convey the overall meaning, the researcher developed a combination of textural and structural descriptions. The purpose of collecting data from three different zones is a form of ‘data triangulation’ to contrast the data and ‘validate’ the data if it produces similar findings (Holloway, 1997).

Research Participants/Informants

Generally, non-random purposive sampling is used in qualitative research sampling since the researcher wants to choose particular individuals for the sample that meet the study requirements (Polkinghorne, 1989). For phenomenological studies, Polkinghorne (1989) suggested interviewing 4 to 25 people. Key informants are usually selected from those that would be considered to have the best-specialized information on specific topics. In the present case, KII were senior knowledgeable persons or local community heads.



Figure 3: KII in progress for the present research.

Following Welman and Kruger (1999), to classify the primary participants (case study settlements, KII and FGD), purposive sampling was chosen by the researcher. The researcher selected the sample based on his informed judgement and the purpose of the research (Greig and Taylor, 1999), looking for those who “have had experiences relating to the phenomenon to be researched” (Kruger, 1988). For the present research, the primary participants are the Key informants of the selected case study settlements. The purposive case study settlements are selected to study the phenomenon of the generation of the generic pattern. The researcher used snowball sampling to trace key informants. Snowballing is a way to extend the sample by asking one informant or participant to suggest others for interviewing (Crabtree and Miller, 1992; Babbie, 1995).

Key Informant Interviews (KII)

KIIs include interviews with individuals who have especially knowledgeable viewpoints on an aspect of the event being evaluated. They are loosely structured, depending on the set of issues to be addressed. Interviewers spontaneously frame questions, scan for information and take notes that are further expanded (USAID 1996). KIIs are qualitative and in-depth. In the present study, key informants are chosen from those who are expected to have specialized information on particular topics (Table 1).

Focused Group Discussions (FGD)

The FGD has been made to receive more in-situ knowledge/information about the evolution of the pattern of the case study settlements. Nine (9) FGD sessions were conducted in the field to substantiate the findings of the qualitative analysis and to get greater insight into the phenomenon working behind the settlement pattern. Nine FGDs have been carried out by including three participants in each zone. The FGD respondents included government officials, NGO workers, and formal and informal leaders to convey the voice of each group. The checklists of the FGD included various issues about which the group has a clear understanding i.e. about the local settlement establishment and evolution.

Data-gathering Methods

The specific ‘phenomena’ that the researcher focused on, is the generation of a settlement pattern and more particularly the evolution and development of a generic pattern. The main research question of this study is: what do you think is the core settlement pattern in the Bengal Delta? However, Bentz and Shapiro (1998) advise that the researcher must allow the information to appear: ‘Doing phenomenology’ means ‘collecting rich phenomenon descriptions and their circumstances’. For this reason, along with some other informative questions, the main interview questions that were put to KIIs were:

- When, why and how the case study settlement was originated?
- What are the major components that the informant experiences during evolution?
- How do different phenomena play roles in the process of evaluation of the settlement? (providing informant some hints)

Jon Kabat-Zinn (cited in Bentz and Shapiro, 1998) states that “inquiry does not mean looking for answers”. For this study, in-depth phenomenological interviews with key informants from 22 case study settlements were conducted aiming at finding the clues. Through the interview and observations, the phenomenon behind the evolution of a settlement pattern in the Bengal Delta is searched. Memoing’ (Miles and Huberman, 1984) is another major source of evidence used in this study. It is the field notes of the researcher that document what the researcher observes, sees, encounters and feels in the process of documenting and focusing on the course. Thus a story of the settlement evolution process is drawn. Field notes are a secondary data storage tool in qualitative research. (Lofland and Lofland, 1999).

Data-storing Methods

Field notes and memoing are “a step towards data analysis” (Lofland and Lofland, 1999). Morgan (1997) notes that since field notes require interpretation, they are “part of the analysis rather than the compilation of data”. During the analysis process, the writing of field notes compels the researcher to further explain each interview context (Miles and Huberman, 1984; Caelli, 2001).

For this specific research, all interviews are written and audio-recorded. Each interview was assigned a code, for example, “KII-A1.” Where ‘KII’ represents ‘Key informant Interview’ and ‘A1’ represents the code for the case study settlement. Right after the field survey of each case study settlement the recorded interview, survey memo and notes (scanned by the cell phone camera with CamScanner application), GPS location and all the photographs are uploaded in an online drive. A licensed Google storage drive was used for this data storing purpose.

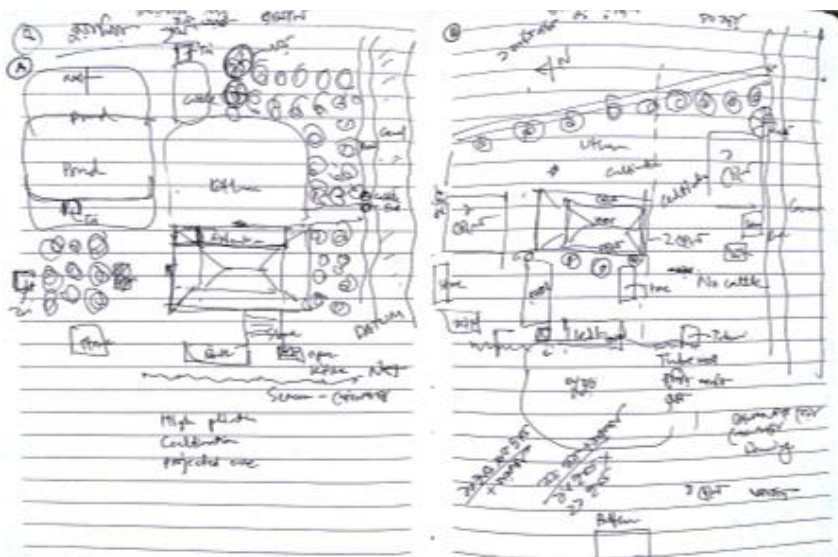


Figure 4: Sample of memoing during the survey (Source: Author).

Explication of the Data

The “term ‘analysis’ usually means a ‘breaking into parts’ and therefore often means a loss of the whole phenomenon, whereas ‘explication’ implies an investigation of the constituents of a phenomenon while keeping the context of the whole” (Hycner, 1999). Analysis is regarded by Coffey and Atkinson (1996) as “systematic procedures to identify essential features and relationships”. It is a way to transform the data by interpretation. For the present study, the Hycner (1999) method has been used for explication. This explication method has five phases, which are:

1. Bracketing and phenomenological reduction: This applies here to the bracketing of the particular opinions aligned with the assumption of the study (Miller and Crabtree, 1992). Each interview record is carefully analysed for familiarization with the interviewee/informant's words and to develop a holistic sense/picture together with the interviewer's observations (Holloway, 1997; Hycner, 1999).

2. Delineating units of meaning: This is a step in describing the evidence needed for the study to make a considerable amount of judgmental decisions while intentionally bracketing their conclusions to prevent inappropriate subjective judgments (Holloway, 1997; Creswell, 1998; Hycner, 1999).
3. Clustering the units of meaning to shape themes: The researcher again constrained his presuppositions to stay true to the phenomena. These clusters usually consist of clustering units of meaning together (Moustakas, 1994; Creswell, 1998) and the researcher identified important themes, often referred to as units of significance (Sadala and Adorno, 2001).
4. Summarising each interview and case study: At this point, the study conducts a ‘validity check’ by returning to the informant and case study settlement to determine if the essence of the survey has been correctly ‘captured’ (Hycner, 1999).
5. General and particular themes and a composite summary: The researcher concluded the interpretation by writing a summary, which represented the context from which the hypothesis originated (Moustakas, 1994; Hycner, 1999).

Validity and Quantification

In this specific research, the phenomenological research design contributed toward truth. The researcher bracketed himself consciously to understand (Mouton and Marais, 1990), in terms of the perspectives of the participants interviewed and the case study settlements the phenomenon that was causing “the pattern of the settlement”. The survey of the case study settlements made bracketing the researcher during the transcription of the interview further contributed to the truth. Besides the explicitation of survey and interview findings, the FGD among each category of case study settlements has been made to receive more in-situ knowledge about the evolution of the pattern of the case study settlements.

FIELD SURVEY

The term field is used in research to refer to the setting from where first-hand data collection takes place. Typically, this refers to observation, physical surveys, in-person interviewing and field study. In the present research, the Field Survey is carried out in an assumed analogical context to identify the evolving settlement pattern of the regions through some systematic investigation and mapping including direct (physical and ethnographic) observations (Table 1).

Sampling Method

According to Webster (1985), sampling is a method or procedure for choosing a suitable sample or representing a population to determine the characteristics of the entire population (Webster, 1985). The purposive sampling technique is also known as judgment sampling. The researcher determines what should be known and sets out to identify individuals who are willing and able to provide the data by their knowledge or experience regarding the process of developing a settlement. In each study area, some purposive sampling has also been done (Table 2 and section 5.2).

Stratified sample

Table 2: Sample size for case study settlements

	Sample Size
Zone-A	10 nos.
Zone-B	6 nos.
Zone-C	6 nos.
Total	22 nos.

Note: More samples were taken in Zone-A because of the diversity available there.

For homestead, the following formula is applied:

$$n_h = 10n_s$$

Where, n_s = desired sample size of the settlement

n_h = desired sample size of the homestead

So, $n_h = 10 \times 22 = 220$ (10 homesteads in each settlement)

Selection technique

The samples are selected by the following methods:

Stage 1: Collecting information about the chars/ unions near the Bay of Bengal in the selected zones through published maps and statistics. A list of settlements was prepared for each zone.

Stage 2: Selecting a char/ union by simple random sampling method. Then physically approach that char for a reconnaissance survey.

Stage 3: Selecting settlements based on some categories identified with the help of local informants.

Stage 4: After approaching a settlement, randomly select any homestead for a questionnaire survey (for quantitative data). Then select the other 9 homesteads sequentially by using the following formula.

$$n^{\text{th}} = n/10 \text{ [where } n = \text{total number of homesteads in the settlement]}$$

Case Studies

This research utilized a case study approach to determine the evolution pattern of case study settlements. Different settlements from different zones of the coastal region of the Bengal Delta were selected as case studies. The case study refers to both the procedure and the effects of the investigation (Stake, 2005). According to Yin (2012), the uniqueness of a case study, which is referred to as an “empirical analysis of the contemporary phenomenon,” is set within its real-world setting specifically where the boundaries between context and phenomenon are not evident (Ref. Sec.3, Table 1)

The study is conducted in some areas from the coastal region of Bangladesh from eight (08) coastal districts (adjacent to the Bay of Bengal) which represent different zones, stages and characteristics of the Bengal Delta, and which are still active and in a formative stage. From the literature review, these areas are assumed to represent the scenario of the Bengal Delta of thousands of years back (Rashid, 2022a, 2022b).

Observation

The qualitative researcher aims to be as unobtrusive as possible to investigate the natural context so that neither the intervention of the researcher nor the methodology conflicts with the situation. This is why one of the preferred methods is participant observation (Woods, 2006). The selected settlement cases of this research are directly observed to get an understanding of the social and spatial qualities of the settlements. Some relevant ethnographic information were also received through observation of the case study settlements. The attributes of the settlement pattern by physical and social layout are identified by direct and ethnographic observation and enumerations.

Sketches, Photographs and Google Earth Images

The task is to capture as much detail and interaction as possible, through making notes, tape-recording, sketch maps, and photography. The benefits are that they are the recording elements that can be studied later in detail.

Sketches sometimes help to capture the spirit of data obtained by the interviews. In this research, the sketches and satellite images from Google Earth and Satellite.pro are used to analyse and document the pattern of the case study settlements. The history of the development of the study site during the last decade was also taken from the Earth Engine software. The changes and the physical relationships of different parts of a settlement are analysed through this. The photographs are used for documenting the patterns of the spaces, the sequences of social and functional activities, and different influences that exist in the present condition of the settlement.

QUANTITATIVE ANALYSIS

Quantitative Analysis is required to find out the occurrence and frequency of attributes of the settlement pattern and cross-check the data received by the phenomenological tools. For quantitative analysis, a Semi-Structured Questionnaire (SSQ) survey has been conducted among 220 participating homesteads on the same case study settlements that were selected for KII. Primary data regarding demographic, socio-economic, infrastructure, and disaster response collected from the survey were also documented (Ref. Sec. 3, Table 1)

Primary Sources of Data

According to Yale (2017), primary data sources are sources that provide first-hand information concerning the specific issue under investigation. To validate the hypothesis four data collection methods such as semi-structured questionnaire survey and Key Informant Interviews (KII), Focused Group Discussions (FGD) and Case studies were adopted.

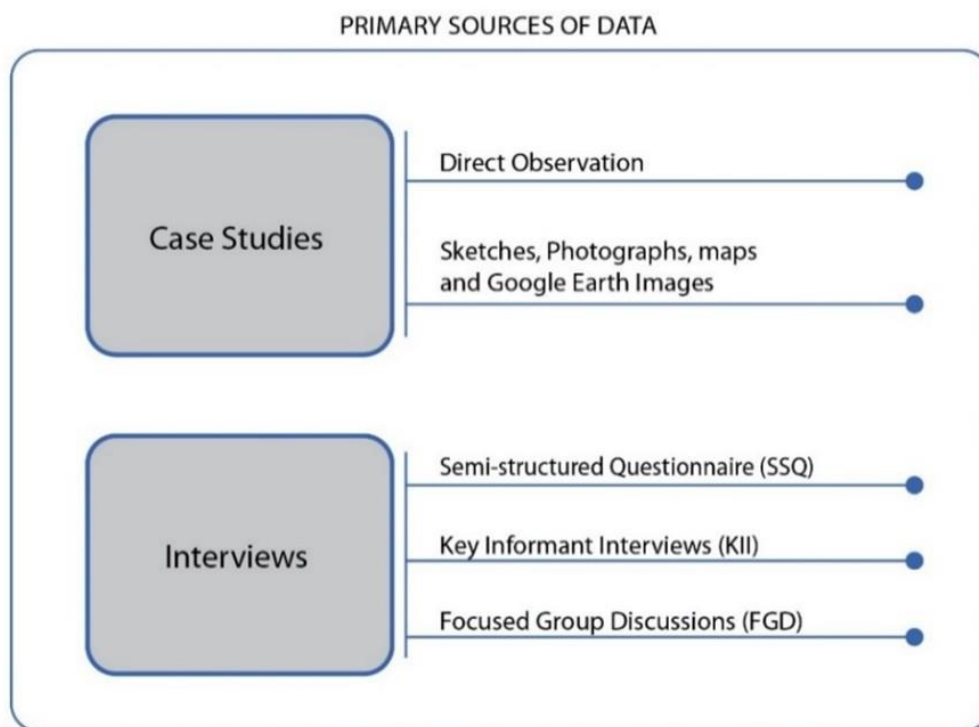


Figure 5: Primary sources of data by field survey (Source: Author)

Semi-Structured Questionnaire (SSQ)

The semi-structured questionnaire is a method of a guided interview where some of the questions are fixed (Oppenheim,1992). During the interview, the interviewees share their viewpoints and ask the interviewers questions, which allows them to provide quantitative and qualitative data with more valuable knowledge, such as their thoughts on sensitive issues (Keller and Conradin 2020). After selecting the sample settlements, a few set of questionnaires was prepared. An important use of semi-structured interview schedules in fieldwork is for cross-checking KII and FGD data. (Section 5.1.1).

Empirical Data Analysis

After the literature review and field survey Empirical Data Analysis is carried out:

- a. To identify the boundaries and features of each legible settlement through an interpretative Phenomenological approach and quantitative data analysis.
- b. To identify the pattern of each case study groups and make a comparison with others to find out the root characteristics of settlement pattern vis-a-vis the local context.
- c. To draw a comparison with the settlement pattern of other Rice Cultivation Based societies elsewhere.
- d. To draw a comparison between the study areas.
- e. Identify the common basic pattern.

Finally, analysis of commonalities in the literature review and case (field) studies are grouped to generalize the findings.

ANALYSIS

According to Judd et al. (1989), data analysis involves several steps, including analysing, editing, modifying, and modelling the collected information. These steps are crucial for identifying the relevant data that will support decision-making and allow researchers to propose well-founded conclusions.

Stage 1: Organizing and Preparing Creswell (2009) highlights that the first stage in data processing is organizing and preparing the data. This includes activities such as collecting field notes, transcribing interviews, and organizing all materials so they are ready for analysis. This preparation is essential to ensure that the data is structured and accessible for further examination.

Stage 2: Familiarization Srivastava and Thomson (2009) refer to the initial step as familiarization. During this stage, the researcher thoroughly reads and analyzes the transcribed interviews and other collected data. The purpose is for the researcher to become "immersed" in the information, understanding the depth and breadth of the data, and gaining an initial sense of potential patterns or themes.

Pattern Identification Data analysis is crucial for identifying, interpreting, and evaluating patterns within the collected data. The researcher systematically allows the data to reveal emerging topics, challenges, and principles. Braun and Clarke (2006) emphasize the importance of creating a thematic structure, which involves identifying key themes that accurately reflect the data's content and context.

Framework Development Once the researcher has identified the main problems, ideas, and patterns expressed by the participants, they develop a framework. This framework organizes and categorizes the key themes and insights derived from the data. It provides a structured way to interpret and present the findings, ensuring that the analysis is coherent and comprehensive.

Hypothesis Evaluation The analysis of collected data, including field surveys and literature reviews, plays a critical role in evaluating the research hypothesis. This process involves assessing the validity of phenomenological bracketing, which is the researcher's attempt to set aside preconceptions and focus on the data itself. The researcher judges whether the hypothesis is compatible with the emerging data, ultimately determining its truthfulness and relevance.

Validation To validate the findings, researchers often select random samples from various settlements at different scales and levels. This step ensures that the results are reliable and applicable across different contexts. It adds credibility to the research and supports the generalizability of the conclusions.

By following these detailed steps, researchers can conduct a thorough and rigorous data analysis that yields meaningful insights and supports informed decision-making.

Qualitative Analysis

The analysis focuses on various types of settlements, characterized by their age of establishment and the age of the landmass they occupy. These settlements represent different stages in the evolutionary process, providing a diverse range of examples for study. By examining these varying stages, researchers can gain insights into the progressive development and transformation of settlements over time.

Each type of settlement is aligned with the bracketed concept of settlement evolution and its key components. This alignment allows for a comprehensive understanding of the factors that influence the growth and change of settlements. The bracketed idea serves as a framework, guiding the analysis and ensuring that the evolutionary stages and components are systematically considered.

The research methods employed in this study are designed to validate the hypothesis by closely examining these different types of settlements. Through detailed analysis and comparison, researchers can assess whether the observed patterns and trends support the proposed hypothesis. This methodological approach enhances the credibility and robustness of the findings, providing strong evidence to validate the hypothesis.

By integrating the analysis of settlements at various stages of evolution with the bracketed idea of settlement evolution, the research methods offer a thorough and systematic way to evaluate the hypothesis. This process ensures that the conclusions drawn are well-founded and reflective of the diverse factors influencing settlement development.

Quantification of Data

Some quantitative data collected in the process is used to get information about the attributes of different settlement components. These help to find out different elements of settlement patterns and the inter-relationships among them. The collected quantitative data about the physical attributes of settlements are analysed to find their inter-relationship. Besides the data analysis colour pattern analysis has been used to find the relationship between the components of a settlement. A comparative analysis of the attributes that play a role in the development of settlement patterns in different case study zones is found by the quantitative study. The validity of findings from the phenomenological analysis is cross-checked by the analysis of quantitative data.

CONCLUSION

The study intends to identify a 'generic' pattern of settlement in the Bengal Delta. The investigation is carried out by triangulating the phenomenological method, quantitative data analysis and relevant literature review. The settlement patterns in similar (analogous) contexts were studied from the secondary and primary sources to determine a research framework and to identify the research gap. Phenomenology (local geo-climatic context and human response) was the basis for the historical reconstruction of settlement patterns. Based on the context, the case study settlements are analysed along with the KIIs. Contemporary and traditional tools were used for data collection, storage and analysis. Through the interview and observations, the phenomenon behind the evolution of a settlement pattern in the Bengal Delta is clarified. This specific research essentially attempts to connect methodically, the various threads and fill up the gaps to identify the order that prevails in the settlement pattern of the Bengal Delta, thereby testing the hypothesis.

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