

**EXPLORING THE NEED FOR CULTURE AND BUILT
ENVIRONMENT RELATIONSHIP IN CENTRALLY FUNDED
GOVERNMENT SOCIAL HOUSING SCHEMES: A CASE OF
RURAL HOUSING IN MANIPUR AND ASSAM**

**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY**

DWIJOMALA HANJABAM

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ASSAM**

BY

DWIJOMALA HANJABAM

DEPARTMENT OF PLANNING AND ARCHITECTURE

SUPERVISOR

DR. SACHIN YADAV

Submitted

**in partial fulfilment of the requirement of the Degree of Doctor of Philosophy in
Planning & Architecture of Mizoram University, Aizawl.**



Dr. Sachin Yadav
Assistant Professor

**Department of Planning and
Architecture, School of FAAFT**
Aizawl-796004
Mobile: +91-7831976275
Email: ysachin163@gmail.com

MIZORAM UNIVERSITY

(A Central University under the Act of Parliament)

Department of Planning & Architecture

School of Fine Arts, Architecture & Fashion Technology

CERTIFICATE

This is to certify that the thesis entitled “*Exploring the Need for Culture and Built Environment Relationship in Centrally Funded Government Social Housing Schemes: A Case of Rural Housing in Manipur and Assam*” submitted by **Dwijomala Hanjabam**, for the degree of **Doctor of Philosophy** in the Mizoram University, Aizawl, Mizoram, embodies the record of original investigations carried out by her under my supervision. She has been duly registered and the thesis presented is worthy of being considered for the award of the Ph.D. degree. This work has not been submitted for any degree in any other university.

(DR. SACHIN YADAV)
Supervisor

Dated: March, 2026

Declaration
Mizoram University
March, 2026

I, Dwijomala Hanjabam, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to do the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University/Institute.

This is being submitted to the Mizoram University for the degree of Doctor of Philosophy in Architecture and Planning.

(DWIJOMALA HANJABAM)
CANDIDATE

(DR. EMELINE ZODINGLIANI RENTHLEI)
HEAD

(DR. SACHIN YADAV)
SUPERVISOR

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CHAPTER 1. INTRODUCTION

1.1. Background

Architecture is a science-based profession that involves itself with problem-solving along with designing environmentally responsive, aesthetically pleasing as well as socially and culturally sensitive built form. Housing constitutes a major part of this built form that is also one of the largest repositories of human culture. Housing gives both physical as well as psychological protection and plays a major role in the wellbeing of its occupants. A house has five functions namely: (i) shelter-the most basic function of home and neighbourhood; (ii) utilitarian and practical function; (iii) territorial function; (iv) social function and; (v) symbolic, traditional and cultural function (Blauw PW, 1994). Housing is a complex term that cannot be limited to only a physical structure. With growing population, rising demands of housing and other allied infrastructure development to accommodate these demands, housing especially social housing have been reduced to a mere physical unit.

The focus of social housing is often limited to affordable building material and fast construction leaving no scope for quality of life, social and psychological needs and completely overlooking cultural and traditional context. The reduction in the cost of construction remains the only priority since there is a huge gap in the demand and supply, while these housing being left mostly in the hands of public funding.

India faces a major challenge with availability and provisioning of housing with rapid urbanization. Migration on the other hand brings a huge influx of population to cities from rural areas. “While urban India struggles with meeting the demand of housing, rural India struggles with the condition of physical structure, poor sanitary condition and basic infrastructure” (Hanjabam & Yadav, 2022). According to the Census of India (2011), 69% of the total population lives in rural area which makes housing shortage a much more alarming issue owing to the size of the rural population.

Housing has a very strong link to culture where culture is considered as a living heritage. Culture is expressed as subjective responses to the environment as well as in physical objects (Ng, 1998). While culture is not being prioritised in social housing segment or infrastructure development especially in cities, a number of international

organizations, policy makers and other development agencies have been working towards inclusion of culture in various sustainable development goals.

There are many definitions of culture that is being developed over time. One such definition is culture's role in influencing everything that people do in their society because of their value systems, ideas, attitudes and normative or expected patterns of behaviour (Hani et al., 2012). Hofstede as quoted by Belshek (2006) defines that culture is "the collective programming of the mind which distinguishes the members of one group from another" which continues to pass through several generations evolving through several generations (Hofstede & Usunier, 2003),(Belshek, 2006). Hence culture becomes an important element in the sustainability of housing and the community in which it thrives.

A house is an embodiment of culture. Family dwellings are not just units that satisfy the needs of its occupants as personal identities, but a house (home) connects with its community (Altman & Chemers, 1980). This can be strongly observed in various traditional settlements where each of the dwelling units forms a part of a system of settings that completes the entire community and settlement. And home as a concept is deeply influenced by the community it belongs to as "it mirrors a wide variety of environmental and cultural influences"(Gauvain & Altman, 1982).

The problems of disappearing relevance of cultural footprint, directly and indirectly impacting the social well-being of human settlement is a problem that needs to be "identified" and "discovered" and is not defined by architects, designers or policy makers (Rapoport, 2005). Designs were supposed to be user-centric, to create an environment to suit its various needs in terms of desires, requirements and activities. In short, design and responses to problems of development and arising out of development needs to be culture-specific. Architectural solutions should be based on understanding of the interaction between human society and the environment (Rapoport, 2005) where built environment is an important human created environment.

While social housing initiatives is focused at meeting the rising demands of housing shortage and focus on coming up fast paced and affordable solutions, it has also led to community design being disregarded completely. The need of a better home or just a house being paramount in most households, the need of a better environment beyond

just a shelter has taken a backfoot from user end as well as development agencies. The issue of housing is looked at a straight forward problem that needs to be addressed with a straight forward solution. Community design is a parameter that is completely left unaddressed in almost all social housing programmes funded by the government. Community design is identified as that movement to find out “how to make it possible for people to be involved in shaping and managing their environment” (Sanoff, 2000).

Community design is a term that includes planning, architecture, development, participation that involves the local community in developing both the physical and well as the social fabric (Sanoff, 2000). Settlements and community living have played a critical role in the evolution of the society ensuring that each member of the community’s needs is met. Liveability of settlements have also been connected to the well-being and quality of life of each of the inhabitants (Setijanti et al., 2015). The improvement that is promised in terms of providing housing to the beneficiaries of several housing schemes have led to a number of negative effects to the built environment as these schemes failed to address the complex layers and relationships of the built environment with culture, human behaviour, social interaction. Today’s minute change and failure to recognize the role of culture could lead to major changes in the complex systems of settlements in the future. These changes have been felt and observed in many urban cities of India and slowly beginning to affect the rural built environment too. As Rapoport highlights, “apparently benign, well-meaning ‘improvements’ may sometimes be more dangerous to a group than apparently much more malignant, destructive changes” (Rapoport, 2005).

An assessment done in housing and liveability of the 8 states Northeast India (2020) based on six indices namely: (i) housing; (ii) consumption propensity; (iii) liveability; (iv) socio-economic; (v) demographic and; (vi) infrastructure revealed that while housing supply has not reached a critical point in Northeast states, however the approach of housing needs due consideration in terms of sustenance and mismatch planning priorities (Hanjabam, 2020). Housing Ranking based on dilapidated housing, residences used for other activities, status of ownership and access to banking services conducted in urban areas of Northeastern states in the same study revealed that Assam ranked 1 in this index while Manipur ranked the last owing to a number of households without residences and a high number of dilapidated houses in the state (Hanjabam, 2020).

The proposed study however attempts to capture the essence of culture in social housing schemes of Pradhan Mantri Awas Yojana-Gramin (PMAY-G) in select rural settlements of Assam and Manipur and to understand the existing community settlement and the role of culture in it along with capturing the disconnect of the schemes and the culture of the place assessing liveability across all spectrums.

1.2. Research Rationale

Culture and traditions along with societal norms that have been followed over generations in many settlements play an important role in shaping of the built environment that is both sustainable and responsive to the needs of its people. The rising demand to meet the housing needs and lack of understanding and research of what culture is and its role in housing and other aspects of life has led to a number of decisions in the social housing segment that is both superficial and not appropriate to the needs of its people.

The attempts of Government to make “better environments” by providing shelter with cemented flooring, four walls, roofs are not undesirable, however whether the provisions of such facilities are enough to make better environments that “depends on lifestyle, rules, social arrangements, stage of acculturation, development of new social mechanisms, values, norms, ideals and so on” (Rapoport, 2005). While culture is being recognised as an important part in the definition of sustainable development as the initial definition of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations, 1987) has been found incomplete in representing the complexity of society. The importance of inclusion of culture in sustainability is in its ability to balance development which is influenced both from external as well as internal factors that evolve with the community (Sachs, 1999).

Many organizations both at national and international level such as United Cities and Local Governments (UCLG), United Nations (UN), Indian National Trust of Art and Cultural Heritage (INTACH) are recognising the need to include culture in framing policy documents, development goals and to make culture an integral part of the development process. The Sustainable Development Goals-2030 (SDG-2030) adopted by the General Assembly of the United Nations finds mentions of culture such as Target 4.7, 8.3, 8.9 and 12.b and 11.4(United Nations, 2015). Culture is now being

considered widely as the fourth pillar in sustainable development (Nurse, 2006). However, the translation of culture into policy documents and other development initiatives remains mostly absent.

Culture in cities' residential areas have disappeared and goals of sustainable development are being seen as issues that needs to be fixed. Development is an important process in the evolution of society that cannot be avoided. Culture manifest in different ways, in the way we act, interact, live and in the built environment. Traditional settlements were formed as a result of collective efforts of the community that took care of the needs of each of the members as well as the environment both physically and psychologically. The settlements in rural India still exist as a close-knit society with high interdependence to its surrounding and natural environment.

Policies in the field of government funded social housing schemes focus on affordability and mass production with an aim to provide basic shelter. The environment which is defined as the surrounding or conditions in which a person operates (Rapoport, 2005), shaping a society by cultural and traditional practices are still not addressed or considered necessary to become an important part in social housing schemes or even mapped as a critical part of city development plans. Rural housing schemes is expected to have a strong forward linkage with other sectors in the economy directly and indirectly, however there is a huge gap in understanding and documentation of traditional settlements and systems of settings that could form a strong base of formation of policy documents, development plans and other such development related documents. The research gap starts from lack of knowledge of existence of sustainable systems within these traditional settlements and practices of everyday activities.

1.3. Research Questions

The research takes the base of Amos Rapoport, an architect who has done extensive research in the field of culture and built-form study and a pioneer in the field of Environment-Behaviour Relations (EBR) with three basic questions of EBR namely:

- (i) “What biosocial, psychological and cultural characteristics of human being influence which characteristics of the built-environment?” (Rapoport, 2000).

- (ii) “What affects which aspects of which environment have on which group of people, under what circumstances and why?” (Rapoport, 2000).
- (iii) “Given these two-way interactions between people and environment, there must be mechanisms linking them, what are these mechanisms?” (Rapoport, 2000).

Based on the above question, the research will further focus on three key questions stated below:

- (i) How various facets of culture influence the built environment?
- (ii) Do both tangible and intangible cultural and traditional systems have a role in the sustainability of community?
- (iii) Can social housing schemes afford to take culture and traditions into account and to what extent can it be undertaken.

With the above questions as the backdrop of the study, the research aims and objects along with literature study and on ground survey has been conducted.

1.4. Aims and Objectives

Aim: To form a research base in the field of built form and culture study of Northeast India bringing out the diversity and uniqueness of traditional rural settlements demonstrating shelter and society as a closely knit sustainable system that will aid better implementation of central government schemes.

To fulfil this aim, the research has the following objectives:

Objective 1: To study the concept of dwelling and identify its relation as part of the system of community as a whole.

Objective 2: To understand the underlying relationship between environment, culture and housing.

Objective 3: To study cultural and traditional systems and its translation into space requirement that further shapes the built environment.

Objective 4: To study the existing government schemes, implementation strategy and its impact in rural areas

Objective 5: To develop a base for conducting further research in the field of culture study in architecture in Northeast India

1.5. Scope and Limitations

The research adopts a post-positivist approach and empirically test the hypothesis with five data bases collected from two states in 4 different settlements with sizable PMAY-G beneficiaries within the same settlement so as to identify a comparable and generalizable principle. The fifth data base is created by merging the data of the four settlements of the two states. The testing with five databases allows both a generalised as well as a comparable empirical analysis. The research further takes into account subjective and objective data to validate the role of both tangible and intangible cultural systems in the built environment backed with documentation of traditional systems of settlements and interaction with professional architects. The study interprets the definition of culture by Amos Rapoport and other available literature and study its relationship and impact on the dwelling unit and space requirement. The survey conducted during the research takes a comparative study of the dwelling units of beneficiaries of PMAY-G and their previous dwelling units which is more often the parental home that the beneficiary grew up in.

However, the research limits its scope by taking into account only the perspective and the perception of the PMAY-G beneficiaries and not from the perspective of the implementation agency and challenges faced by them in the process. The research limits its study to four settlements that is mostly homogenous in nature. The research adopts a bottom-up model where settlements were selected as per similarity in community structure, cultural set-up and socio-economic activities. Some of the on-ground limitations faced during the survey includes:

- (i) To be able to get information on cultural and traditional norms, the respondents had to be given example of systems and patterns and find linkages of space requirements by highlighting if activities, rituals and festivals were performed or celebrated in dedicated spaces.
- (ii) The research being conducted in rural area with the head of family being mostly man and with significant language barrier, the space and cultural requirement of female members were taken through the lens of male's

perspective. This problem was partly resolved through documentation of space requirements.

- (iii) Many respondents gave a ball-park figure of construction cost beyond the funding received from the PMAY-G scheme. However, this issue was solved by discussing with local architects on per square construction cost.
- (iv) Many respondents were not aware of the existence of typologies developed under “A Compendium of Rural Housing Typologies, Pahal Volume-II, Prakriti Hunar Lokvidya” for PMAY-G scheme which limited the study in understanding whether the acceptance or rejection of the typologies can be linked to culture or not.
- (v) Interaction with local authorities in charge of PMAY-G implementation were not able to give a clear statistic on houses that followed the Pahal Volume II typology. There was no way to verify whether typologies were followed through visual survey also as alterations were made on site based on likes and dislikes and skillsets available to beneficiaries.
- (vi) The district revision in 2016 has not been considered in the present study as Census of India 2011 still has the old districts data such as Kakching in Manipur now a separate district was part of Thoubal district.

The results of the research are subjected to generalization on the settlements selected. Hence, the findings of the study can be used by development authorities, policy makers and future researches in the field or in development of a research and documentation model to capture cultural data.

1.6. Methodological framework

The research was conducted in 5 major stages that involved both qualitative and quantitative analysis. Stage 1 focused on identifying research gaps in the domain and analysis of existing policy documents to formulate research questions, aim and objectives. Stage 2 focused majorly on secondary data collection, literature review and identification of survey areas along with drafting the questionnaire based on literature and analysis of existing theories. In Stage 3, data were collected from identified study area and settlements were documented. Stage 4 involved majorly of compiling data, sorting and proving of hypothesis. Outcomes were discussed and recommendations

were suggested in the conclusion Stage 5. The following sections discuss each stage in brief:

Stage 1: The primary focus of stage 1 was identifying research gaps in the domain and formulate research problem, questions, aim and objective. A preliminary literature review and policy analysis was undertaken at the initial stage to identify gaps in the domain of culture and built-environment relationship. The research was then streamlined to a more focused approach which is to study the relation of culture and social housing and formulating research questions.

Stage 2: A comprehensive study of the theoretical premise of the research study and available policy documents was undertaken in stage that led to preliminary addressing of research questions and objectives. Keyword co-occurrence analysis was conducted using VOSViewer tool to perform a systematic literature review. In this stage literature related to concept of home and dwelling unit, housing, rural housing, culture and housing, Maslow's theory, quality of life and housing, social housing and its approaches across the world and evolution of social housing in India post-independence were identified and reviewed. Based on this review, questionnaire and area of study were finalized. The collection of primary data was also started in this stage.

Stage 3: Major collection of data, documentation of settlements was conducted in this stage. Data collected from field survey and interaction with other stakeholders were tabulated and analysed using statistical tools. The primary survey was done systematically and the questionnaire was refined through a pilot survey. Both qualitative and quantitative data were collected through the questionnaire. Qualitative data helped in understanding the traditional settlement system, culture, space and activity relationship and use of spaces while quantitative data helped in understanding of building scenario, socio-cultural demographics, contextual physical attributes. In order to analyse the data, both qualitative and quantitative data are converted to scores.

Stage 4: Data collected through the questionnaire was analysed using statistical tools to prove the hypothesis with correlation test. Further the significance of the correlation by taking significance level of 5%. A two-tailed test was conducted using Pearson Correlation for all the 5 data sets. Further correlation was made with the qualitative and quantitative data to identify various relation of culture and housing using data

triangulation method. Study of policies in this step further aids the correlation study meeting Objective 2 and 4 that will lead to Objective 5.

Stage 5: The final stage is concluding the study with results derived from statistical analysis of Step 4 and recommendations are made to strengthen implementation of social housing in rural settlements enabling a more holistic and sustainable development. The study will make recommendations on attributes that can be studied for policy development and implementation strategy for any development schemes that concerns housing, settlement planning or infrastructure development.

Below is the diagrammatical representation of the methodology and stages followed.

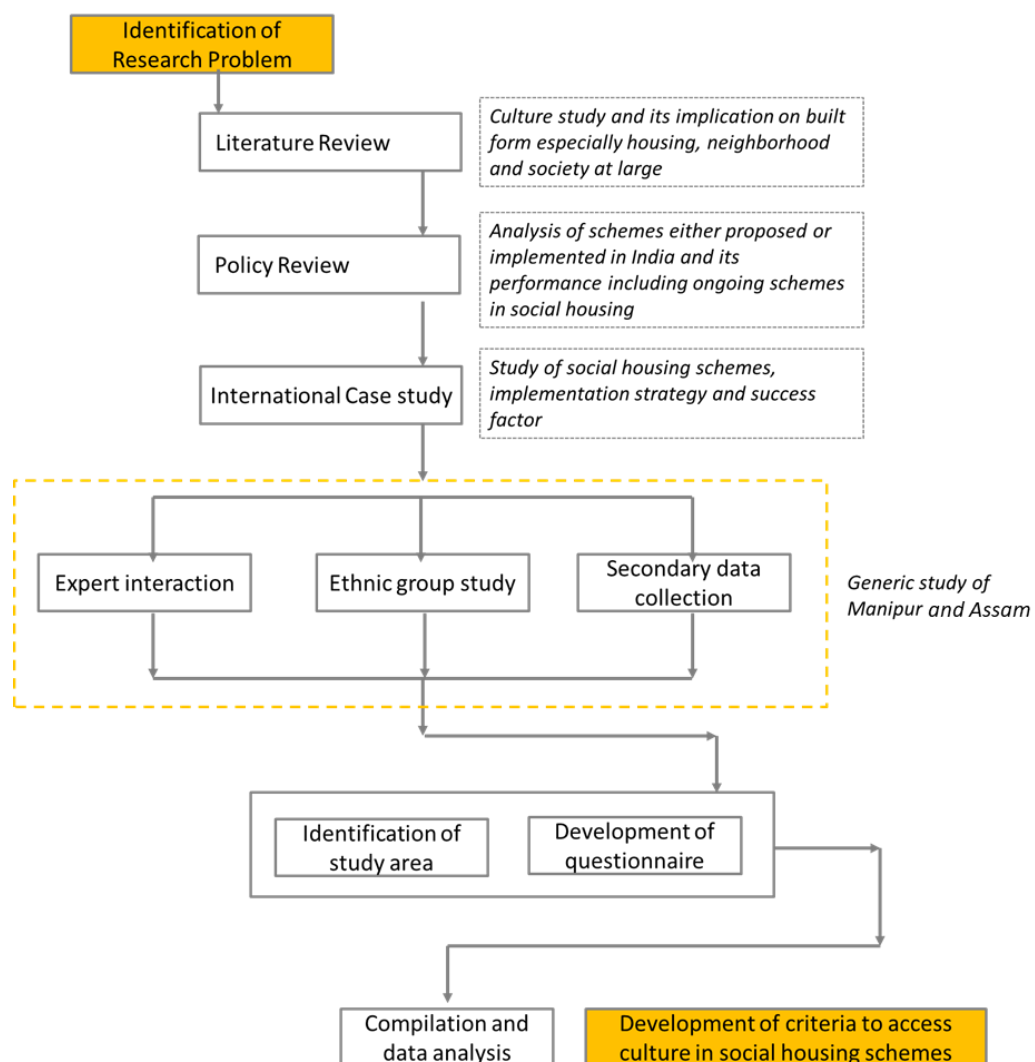


Figure 1: Methodological framework

1.7. Structured Methodology Towards Fulfilling Research Aims

This research adopts a mixed-method, post-positivist approach to explore the intersection of culture, environment, and rural housing, particularly within the framework of centrally funded housing schemes. The methodological design supports the study's aim to examine how cultural practices inform spatial needs and how these are addressed or neglected by housing policies like PMAY-G in Manipur and Assam. The research methodology is structured into five stages, encompassing conceptual framing, fieldwork, analysis, and synthesis.

The study utilizes an exploratory case study approach involving four rural settlements—two each from Manipur and Assam. This design allows comparative analysis between traditional dwelling systems and those emerging from government housing interventions. The methodology integrates policy reviews, spatial analysis, and community consultations to provide a comprehensive and grounded understanding of housing practices.

Table 1: Methodological approach

OBJECTIVES	METHODOLOGICAL APPROACH
Objective 1: To study the concept of dwelling and identify its relation as part of the system of community as a whole.	<i>Literature review, conceptual framework, settlement observation</i>
Objective 2: To understand the underlying relationship between environment, culture and housing.	<i>Field documentation, environmental and spatial analysis</i>
Objective 3: To study cultural and traditional systems and its translation into space requirement that further shapes the built environment.	<i>Activity-space analysis, cultural narrative documentation</i>
Objective 4: To study the existing government schemes, implementation strategy and its impact in rural areas	<i>Policy review, stakeholder interviews, performance assessment</i>
Objective 5: To develop a base for conducting further research in the field of culture study in architecture in Northeast India	<i>Toolkit development, analytical synthesis, future research base</i>

This multi-layered methodology, focused in local contexts and research frameworks, enabled an understanding of how cultural practices shape housing and the built environment. The methodological structure aims to form a base for future research and policy development in built environment research and development planning.

1.8. Organisation of the Thesis

The Thesis Report is organised into 6 sections. The following are the chapters and a brief outline of each of them:

Chapter 1: Chapter 1 gives a brief background and premise of the research, research gaps in the domain, research rationale and research questions. The chapter states the aims and objectives of the research and methodological framework of the research process.

Chapter 2: This section includes presents the context of the study, review of literature on various theories available. It describes and analyses key concepts in light of the current study such as concept of home or dwelling unit, housing and rural housing, relation of culture and housing, social housing and its approaches and its evolution in India. This chapter helps in development of questionnaire and identification of study area backed by the literature reviewed and policy analysed.

Chapter 3: This chapter presents the study context, develops an understanding of the socio-economic profile of Northeast region as an introduction to the selected settlements of Assam and Manipur. It gives an overview of the states and the housing profile of rural settlements. This section will also include the documentation of traditional settlement fabric and relation of various activities and space requirement in traditional rural settlements, existing system of settings and cultural profile.

Chapter 4: This chapter discuss the research methodology, the research design, strategy adopted. Study area, scope of work, sampling of study and data collection is discussed in detail in this section. The chapter also discusses the data collection and analysis and highlights the limitation of the study.

Chapter 5: This chapter focuses on the empirical results, discusses the details and methods of the statistical analysis. The chapter also highlights the findings and proves the stated hypothesis and provides answers to the research questions based on

qualitative and quantitative findings and concludes with significance testing. It includes a summary of the findings.

Chapter 6: This chapter is a conclusion of the research by highlighting the research findings and proposes and develops a format for future researches in the field including other development agencies and policy makers. It also has recommendations that can be used in future implementation models.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

The chapter includes literature review that establishes key concepts, the need for the research, identify gaps in the research, ongoing research trends across the world in the domain of culture and built-form. The chapter also helps in developing of a framework and determine various tools and methods to undertake the research. A keyword co-occurrence was conducted with keywords “Built-environment” and “Traditions” to help identify clusters of literature that can be studied and analysed. The following sections discusses them in detail sequentially.

2.2. Relevance of the research: Keyword Co-occurrence Analysis

Bibliometric analysis is a useful tool in research to ascertain the relevance of the study topic in the subject domain. A number of softwares such as VOSViewer, Leximancer, BibExcel, HistCite, Gephi etc. are used to run bibliometric analysis using various indexing sites such as Web of Science and Scopus. Keyword co-occurrence is one such tool that used in bibliometric analysis that gives an overview of various linkages between keywords, filtering of critical terms, thematic clusters and understand the status of research (Donthu et al., 2021). In keyword co-occurrence analysis, cluster of words are assumed to be related to each other (Donthu et al., 2021).

The term “Built environment is a general concept that can be related with all the structures built by man to support human activity” (Portella, 2014). While “Tradition is defined as (a) an inherited, established, or customary pattern of thought, action or behaviour (such as religious practice or a social custom); (b) the handing down of information, beliefs, and customs by word of mouth or by example from one generation to another without written instruction; (c) cultural continuity in social attitudes, customs, and institutions” (Merriam-Webster, n.d.-b). With this definition as the base, bibliometric analysis was performed for keyword co-occurrence analysis using Research Information System (RIS) files extracted from Elsevier’s Science Direct indexing site. The initial result using these two words were 5,331 results which were further filtered as Review Articles (384 results), Research Articles (3,867 results) and Book Chapters (440 results) under the subject area of Social Sciences (2,760 results), Environment Science (1,238 results), Art and Humanities (402 results) and

Psychology (271 results) that gave a final list of 3,370 results. Figure 2 shows the network visualization map of the above database.

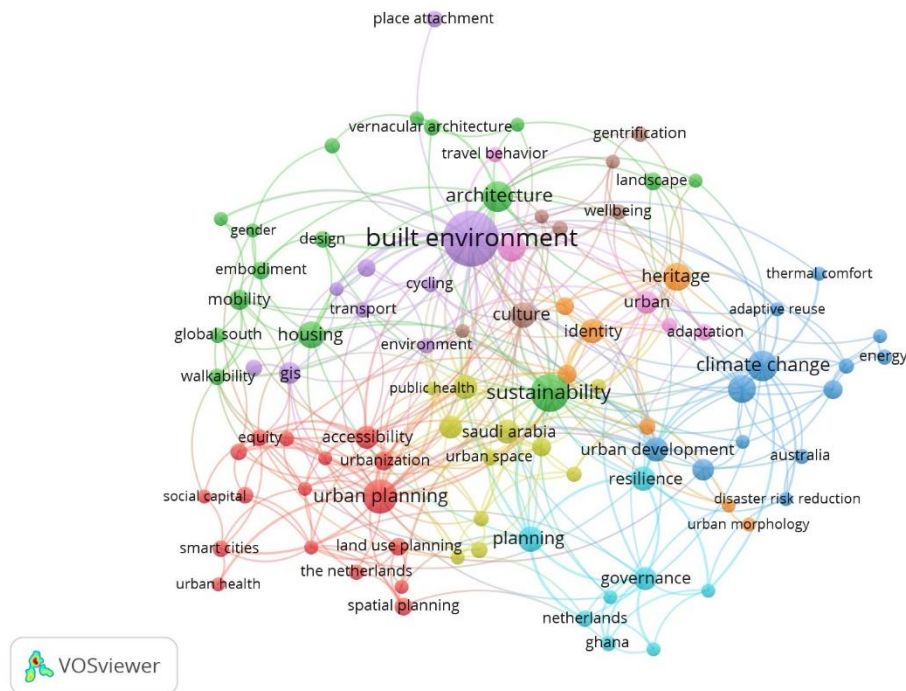


Figure 2: Network Visualization Map of keyword “BUILT ENVIRONMENT” and “TRADITION” using VOSviewer.

Nodes in a bibliometric analysis represents keywords, journals, publications and the size of nodes represent the frequency of keyword in case of keyword co-occurrence analysis (Van Eck & Waltman, 2014). In this type of analysis “the number of co-occurrences of two keywords is the number of publications in which both keywords occur together in the title, abstract or keyword list” (Van Eck & Waltman, 2014). On the other hand, a set of related nodes are called clusters (Van Eck & Waltman, 2014).

In the keyword co-occurrence analysis of “Built Environment” and “Tradition, the prominent nodes include built environment, sustainability, urban planning, climate change. It may also be noted that in the cluster of built environments, architecture, well-being, culture, housing can be seen in close proximity to the built environment. While the distance of the sustainability node is seen much further away from the built environment node, the appearance of the node in a substantial size in the network analysis can be considered a positive development in the research domain.

Overlay visualization as shown in Figure 3, shows the timeline of research development and increase in interdisciplinary research.

It is also noteworthy that in the cluster of sustainability, the appearance of culture in between built-environment and sustainability is a positive sign as shown in Figure 4. Housing node though small appears in the same cluster which could mean research in the field is getting linked to the theme of culture, built environment and sustainability. Several other clusters maps in the relevant field are shown in Figure 5.

Figure 5: Cluster analysis map using VOSviewer.

2.3. Concept of Dwelling and Home

While home as a concept is often associated with emotions, housing on the other hand is often considered as a property with transactional value. Després (1991) in the research article “The Meaning of Home” highlights the definition of home mostly revolving around the idea of sentimental and emotional value (Després, 1991). Apart from domestic roles and systems, home also plays an important role in transferring

these value systems that was acquired, nurtured, transmitted, reinforced over many generations (Després, 1991).

Home is defined in many ways across culture and regions. The paper, “A Cross Cultural Analysis of Home”, authored by Mary Gauvain and Irwin Altman highlights two very distinct definition i.e. (i) an idea of community or symbol displaying various relationships between residents, among communities and cultural uniqueness, (ii) the degree of accessibility that defines the community as a whole. The paper particularly stresses upon the lack of psychological research around the concept of a home and the challenges to find a systematic approach in the study of environment behaviour relationship and home as a social psychological setting(Gauvain & Altman, 1982).

Home is a concept that can be studied both in terms of the individuality that it represents and its relation to the community it belongs to. The dimension that the paper highlights is the assumption that, “home mirrors a wide variety of environmental and cultural influences” (Gauvain & Altman, 1982). The question then arises in the individuality vs society and would it be also right to assume that there will be no perfect balance in terms of these influences. However, the cultural influences whether at individual level or societal level is an undeniable fact even with existence of varying intensity.

The assumption then is, it is a highly dynamic system and these systems can be both long-term as well as short-term. The paper analyses three general areas of homes across various cultures which are (i) siting and exterior; (ii) entranceways and thresholds; and (iii) interior layouts and use. The study which was based on a number of case examples across regions were able to conclude a very strong role in the built environment. As sighted in one of the examples in the research, settlements in the kin-based hamlet of *Tarong* in the Philippines (Gauvain & Altman, 1982) arrange their houses in a way that it ensures social interaction and social well-being of the residents. The residents take pride in the shared space and keep it clean.

The research does not conclude of how or should culture influence built-environment or not but it identifies areas in which the research of housing and culture could go forward for a more systematic approach in this field that can be quantifiable and to understand how culture and families respond to normal life cycle changes. The

research opens up an important area of research where it highlights the need to understand the process that influence the design of homes across various cultures.

The chapter on Landscapes of Home (Duncan & Lambert, 2004) highlights that “Home is a complex and ambiguous word”(Duncan & Lambert, 2004). It also brings forth an important aspect of home being a poignant and influential word. The fact that we use the word home to describe the place we live, the state we belong, the country that we come from asserts the above statement furthermore. Philosopher Gaston Bachelard describes house as a “psychic state, a site and bringer-into-being of deep feelings of value and caring” (Duncan & Lambert, 2004). On the other hand, the article highlights Bell Hooks description of home as a place of warmth, caring and safety. While on the other hand, home has been described as that architectural piece “incorporates the memories and dreams of the inhabitants” (Duncan & Lambert, 2004). The paper also highlights that home and residential areas are places where one observes identities of both individual and community values. The chapter sites an example of many Korean families moving from traditional homes to modern apartments as a sign of upgrading social status, however these modern homes were updated or changed to make it more Korean (Duncan & Lambert, 2004).

The article “The Meaning of Home” by Després is literature review paper explores the theme of home in relation to housing from three theoretical perspectives that is psychology, social psychology and phenomenology based on research conducted between 1974 to 1989 in contemporary North American culture. Based on the literature review in the paper, the author takes two approaches in defining the meaning of home which are “(i) home as a concept defined by interviewing residents and; (ii) through different interpretative theories of human factors that have shaped the meaning of home” (Després, 1991). Based on the first category, the following definitions came up i.e. “(i) Home as security and control where the residents gets a sense of physical security and control, (ii) Home as a reflection of one’s ideas and values where residents sees and identifies themselves and how they want to be seen by others, (iii) Home as acting upon and modifying one’s dwellings where residents feel they have the control, (iv) Home as permanence and continuity where the home becomes a familiar environment and something that holds memories for a long time, (v) Home as relationships with family and friends where home is the centre of all emotional bonding where relations are accepted and nurtured, (vi) Home as a centre of activities

and serves as a place for all activities related to human needs, (vii) Home as a refuge from outside world, a place where exposure and intrusion from outside world can be limited to one's needs and requirements (viii) Home as indicator of personal status, (ix) Home as a material structure, the physical and material surrounding, (x) Home as a place to own" (Després, 1991). Apart from the above definition and meaning of home based on interaction with the residents, the paper presents four theoretical approaches that is "used to define the meaning of home which are: (i) the territorial model, (ii) the psychological model, (iii) the socio-psychological model and, (iv) the phenomenological and development model" (Després, 1991).

Territorial model adapted from various studies animal ecology and human behaviour primarily talks about boundaries that one creates around self, "self/other boundary mechanism that involves personalization or marking of a place or object, and communication that it is 'owned' by a person or a group" (Altman, 1975). It is also described that the need to own a home is a territorial behaviour (Sebba & Churchman, 1986).

While on the other hand, the psychological model defines home as a representation of belonging. It is seen as an extension of one's self. How we develop, modify and arrange belongings in the house is seen as an expression of the subconscious self. The author further writes that home allows maintenance of three levels of human self: the ego, the id and the superego (Després, 1991). Another psychological model is based on the Maslow's theory of personality in which a home plays an important role in fulfilling the hierarchy of human needs. Apart from the above two models, the most important model is considered as the "psychological need for privacy" (Després, 1991) where home is a refuge from the outside world.

The socio-psychological model on the other hand is a multi-level concept that includes the personal self that is, "awareness of one's body, thoughts, moods, emotions, perceptions, gestural expression and character of physical being" (Després, 1991). In this model, home is considered to play a critical role in the definition of one's identity acting as a connection between the self and the larger community. The home also acts an important role a symbol of one's identity in which it is said that even if the individual believes that it is not identifying or showing its status or social identify, the outsider often perceives the status by looking at the house. Therefore, home gives

social identity and often represents the social structure and cultural environment of the dwellers.

The phenomenological and development interpretation describes home as a process and the experience of the home is lived through various life's events. The history associated with their dwellings too played a strong role on their idea of home. The day-to-day experience, daily routines and activities that revolves in and around the house develops a sense of familiarity.

The paper concludes and brings forth an integrated approach for home environment study that includes: (i) meaning and study around the concept of home to include non-traditional homes and other housing types, (ii) various processes of the society to be considered and built form analyses to be included in research programs, (iii) human, socio-political and built-environment where the studies are conducted to be included in research reports and, (iv) to encourage study and research of the history of societal forces and meanings and experience of home.

The Meaning of Home: An exploratory study of environmental experience by Sixsmith (1986) explores the meaning of home to people through everyday experience of the home environment. The study revolves around three modes of experience which includes the personal home, the social home and the physical home. Many researchers have stress upon the fact that home is a social unit with a strong kinship. A more phenomenological approach towards the study of the meaning of home attest the fact that home as a place that is appropriated and is the roots of human beings. Recent studies of home have stressed upon home being an important site for cultural activity and cultural expression (Gauvain & Altman, 1982) on one hand and represents a person's individuality and his relation to the society it belongs.

The research method used the Multiple Sorting Task (MST) and during data collection, no pre-conceived definition of home was highlighted rather it was based on free expression of all the participants. Participants sorted their own meaning of home in various categories using a single criterion on 'what is home to me'. Based on the result of the study, 19 categories of home emerged that included more than physical structures such as family home/house, home town or country, religion, spiritual etc. The four main points that emerged from the study are (i) home included a wide range of places, (ii) it represented a place on several existential space that may or may not

have a physical component, (iii) a place home to one may not be home to another and, (iv) home may or may not be constant and may be transitory in nature. The research further investigated to find out that qualities that make a home and the meaning associated with home. The result of the survey led to 20 collective categories of home which are “(i) **Happiness**: feeling of happiness as an integral part of home, (ii) **Belonging**: sense of belonging with comfort, relaxation and familiarity, (iii) **Responsibility**: ownership and responsibility leading to stability, (iv) **Self-expression**: personalization and appropriation to express individuality, (v) **Critical experience**: deep associations and formative experience including stressful times, (vi) **Permanence**: continuity, (vii) **Privacy**: regulation of inter-personal boundaries, (viii) **Time perspective**: existence of home whether in past, present or future, (ix) **Knowledge**: associated with physical and social knowledge, (x) **Preference to return**: a point in space, (xi) **Type of relationship**: having personal choice and type of relationship, (xii) **Quality of relationship**, (xiii) **Friends and entertainment**: a place for social entertainment, (xiv) **Emotional environment**: a place where there is love; (xv) **Physical structure**: including physical characteristics, (xvi) **Extent of services**: presence of infrastructure seen as necessary part of home, (xvii) **Meaningful places**: not necessarily based on events, (xviii) **Architectural style**: meaningful connect due to its typology, (xix) **Work environment**: home available for work, sometimes the only place and, (xx) **Spatiality**: quality of space and convenience it offers”(Sixsmith, 1986). The above 20 points is an inclusive list of meanings of home that can become the basic of many research in this field(Sixsmith, 1986).

An Exploratory Multidimensional Scaling (MDS) technique was used to further understand the essence of home in this article. This technique uses an analytical tool that (a) reveals structures in the data; (b) represents in a comprehensible visual form; and (c) captures complex connections. The model produced a 20x19 cell based on frequency of meaning and distance matrix (Sixsmith, 1986). The 20 categories of homes were then could be arranged systematically in three experiential modes that is personal, social and physical. The meaning of home is unique to the individual and not necessarily pertaining to a set standard of aspects and qualities. The study provides a strong basis for future research in this field.

The Uniqueness of the Home by Sebba and Churchman highlights how over time the home was solely seen as a unit that served as a space for performing a certain set of

activities. This outlook led to focus on home and housing research towards analysing of multiple activities within the home and coming up with solutions such as designing based on anthropometry, minimizing inefficient spaces, ensuring home as convenient space etc. The paper highlights an important point that, “over centuries the home as undergone few changes in spite of the many social and technological developments which have occurred, suggest that the continuity in the home’s physical and societal character is not solely a function of the spaces needed for daily activities but is related to its psychological and social meaning”. The research posed an important question on, “What indeed is the ‘*function*’ of home?” which led to the following meanings of home: “(i) The home as a sole area of control for the individual; (ii) The home as the physical framework for the institution of the family; (iii) The Home as a place for self-expression and; (iv) The Home gives a feeling of security to its owners” (Sebba & Churchman, 1986). Similar to other research paper studied, the paper also brings forth the concept of control and territoriality. The control of oneself over the physical area is one important factor that comes under the idea of territoriality. In this concept, when home is viewed as a territory, the family is considered a group and the home or dwelling unit as “a socio-spatial system with a spatial representation for each social component” (Sebba & Churchman, 1986).

2.4. Housing

Housing is defined as houses collectively or providing of houses for a group or community (Merriam-Webster, n.d.-a). Housing plays an important role in the economic development of every country. Housing apart from being one of the most basic needs of human also indicates the living standard for its population. One of the upcoming research issues discussed in the paper “Housing Concept and Analysis of Housing Classification by Henilane (2016)” is that “housing has to be comfortable, economical and reasonably maintainable, as well as architectonically expressive and complaint with the environment” (Henilane, 2016). The research though focused in Latvia, aims to analyse literature related to the concept of housing so as to define housing that could be used in housing and related developmental housing.

In economic literature, housing has no common definition. However, some researchers define housing as a commodity (Smith, 1904), a tangible asset with a potential of earning a return (Ricardo, 1817), a capital asset where it functions as a machine when used by a worker or individual and a commodity when not used (Marshall, 1890).

Initially, housing was defined in relation to a physical commodity that the countries viewed only in context to the cost of construction depending on material cost, standard of housing and quality of the construction. Researcher also started realising that the concept of housing is a topic with no clarity and policy makers or government does not identify itself as a service provider. Dictionary defines housing as dwelling units or building for people to live in. A recent shift in the definition of housing is ensuring the house is comfortable, convenient and appropriate but also energy efficient and profitable too (Henilane, 2016). According to researches done of housing policy of 15 European union states housing is explained as “dwellings, low-cost dwellings, social housing, subsidized dwellings, sub-standard dwellings” (Henilane, 2016). In Europe, when one says dwellings, it is defined as “group of mutually related premises that is physically separated from the outer environment, and consists of walls, roofs, windows and doors, engineering communications and other technical elements”. The author defines housing “as a building or part of a building where a family can live all year round and also meets all statutory requirements, including also residential address” (Henilane, 2016).

A number of housing classification has been developed by the author based “on housing type, size, amenities, location, group of population living in the housing, type of ownership rights, construction period of the housing, energy efficiency indicators, construction materials used in the exterior wall of the housing etc” ref. The paper also presents analyses of Donner (2000) of the housing policy of the EU countries with an objective to ensure that tangible and intangible needs of the human life are met (Donner, 2000). Some of the analyses are presented in the following points: “(a)*To extend the sector of housing owners*: Many home owners look at housing as a key lifetime investment and a permanent property that is transferred to the next generation. Such investment in property is also looked at as a protection against unforeseen circumstances where the invested is considered similar to fixed deposit; (b)*To replace private housing rental sector with public (social) rental sector*: The author along with researcher Donner (1995) public sector alone is not capable to meet the demands of housing and the state role should be in ensuring that the demands of housing are met; (c)*To expand the supply of new housing construction*: With new housing supply in the market, it is imperative that low-income households would need additional subsidies to avail new housing; (d) *To redistribute the supply of existing housing in a more*

efficient way: The supply of housing in low-income segment in the private segment needs a strong regulatory framework to ensure a fair supply; (e) *To improve the existing housing standard by the construction of new housing*; (f) *To decrease housing expenditure against the housing income level*: The objective includes availability of housing and also to decrease housing expenditure along with increase of housing income; (g) *To improve housing conditions for households by covering their basic needs*” (Donner, 2000) and (Henilane, 2016).

The book chapter on Housing of Indira Gandhi National Open University (IGNOU) list down types of housing as per Census of India 2001. The two types mentioned below are relevant to the research are:

- i. **Census House**: “A building or a part of it used or recognised as a separate unit with independent entrance” (Census of India, 2011).
- ii. **Household**: “A group of people who normally live together and has a common kitchen” (Census of India, 2011).

The unit highlights factors that influence housing namely social, economic and political factors, influence of climate, materials and technology (Rao et al., 2019). Social norms govern traditional patterns and settlement structure including layout of rooms within the dwelling unit which is true for most Indian traditional settlements (Rao et al., 2019). Community and caste structure also defines housing in India (Rao et al., 2019). The section also highlights how housing in India has “serious political connotations” and it being classified as basic need becomes a key element of “political rhetoric”. Housing is further classified as public housing and rental housing. Social housing goes for low-income group provided by various housing agencies are known as “public housing” in India (Rao et al., 2019).

The United Nations Global Strategy to the Year 2000 highlights the core of housing as a basic right in the following paragraph:

“the right to adequate housing is universally recognised by the community of nations...All nations without exception, have some form of obligation in the shelter sector, as exemplified by their creation of ministries or housing agencies, by their allocation of funds to the housing sector, and by their policies, programmes and projects....All citizens of all States, poor as they may be, have a right to expect their

Governments to be concerned about their shelter needs, and to accept a fundamental obligation to protect and improve houses and neighbourhoods, rather than damage or destroy them”(UN General Assembly, 1992).

The definition of the term ‘housing’ is mostly considered as a physical infrastructure that is more than often looked as a long-term investment. While private sector looks at housing as purely commercial, public sector looks at housing as an obligation towards its citizen. The supply of housing is usually a challenge especially in the low-income social housing segment, and priority becomes meeting the sheer number of demands, most policy focus on numbers and leave out other aspect of making a house into a home.

2.5. Rural Housing

The “Rural Housing in India, Status and Policy Changes”, working paper series highlights housing is an important element in the overall growth and development of a country. Housing as discussed before is no more just a physical dwelling but an important factor too in the wellbeing of its residents. Hence, housing is now established as a fundamental human right including India. While India is still grappling with housing issues in urban areas especially metropolitan areas and Teir I cities, rural area and development in general especially housing still do not feature in the priority list of policy makers. The rural housing shortage is estimated to be about 43 million houses (Kumar et al., 2016) as mentioned in the paper. The paper also highlights that even with this huge amount of shortage, rural housing is still not prioritized and this neglected segment becomes more pronounced when one studies housing conditions and amenities such as congestion factor, type of housing construction, access to electricity, drinking water availability, sanitation etc. The paper identifies the challenges faced by rural housing in terms of enormity of the crisis and the government’s approach in the matter (Kumar et al., 2016).

According to Census of India 2011, there are 221 million houses in rural India and 110 million in urban India (Census of India, 2011). Census house listing data also gives an overview of permanent, semi-permanent and temporary where in only about 50% of the houses in rural area were permanent type. In terms of condition of house, the research paper focuses on the National Sample Survey (NSS) 69th round, Schedule 1.2 (2012) data sources where various status and conditions of the houses are discussed.

In terms of ownership of houses in rural area, almost everyone lives in owned houses which accounts to about 93.3%. The paper however highlights that ownership of houses should not be inferred as rural households are well to do because these ownerships are in various forms and don't fit into the category defined by census or NSS (National Sample Survey 69th Round, 2012).

An important data point that asserts the concerns of this thesis is the data where dwellings rooms are discussed. The paper highlights the disproportionate distribution of household size and dwelling rooms where houses with no room, one room and two rooms were much higher in number than compared to urban areas. This shows that houses are congested and inadequate. Separate kitchen is another data point in the survey where almost close to half of the surveyed houses did not have separate kitchen. The point that can be highlighted further is the requirement of space for animal and poultry rearing (Kumar et al., 2016). Apart from this, it can be further highlighted that rural households actively engage in various activities related to farming, weaving and other small scale cottage industries. To further attest this statement, the survey points out that 62.1% of rural households (National Sample Survey 69th Round, 2012) had a shed of some form. The survey report highlights that stating that: "this provides a clear policy direction for rural housing policy or programme must take into account the provisions for animal survey/poultry farm too as they are an integral part of rural housing" (Kumar et al., 2016).

The NSS survey also brings forth the condition of the houses which is then listed under three categories-good, satisfactory and bad. Rural areas had higher number of satisfactory and bad houses as compared to good houses which highlights the poor condition of houses in rural areas. The report also highlights the importance of sanitation facilities for a safe and sustainable housing. It also brings forth that access to sanitation is linked to one's dignity as much as it is to hygiene and cleanliness. The survey reports that 60.2% of the rural households did not have any latrine (National Sample Survey 69th Round, 2012).

The first five-year (1951-56) did not see much work in housing as India was newly independent and majority of its focus was directed towards the large influx of migrant from Pakistan as a result of partition. There was no significant development in rural housing during this plan. The second five-year plan (1956-61) was more like a

continuation to the first five-year plan where strategies from it from taken forward in the second five-year plan. In terms of rural housing, the **community development movement (CDM)** was launched that provided loans to individual through cooperatives to construct houses. The CDM was taken forward in the third five-year plan (1961-66) but with revisions such as providing financial as well as technical aid to construct affordable and sustainable houses. The third plan also introduced laws whereby landless agricultural labourers were provided housing sites. The fourth five-year plan (1969-74) recognized the challenge of rural housing due to lack of land and introduced the “crash scheme” that proposed to provide free of cost housing sites to the homeless in rural areas. During this plan, the **HSCAS (Housing-cum-construction scheme)** was introduced in center and then transferred to the state. There was no direct rural housing scheme in the fifth five-year plan (1974-79) but schemes such as **Minimum Needs Programme (MNP)** and **Integrated Rural Development Programme (IRDP)** were introduced. Schemes and programs such as the **Twenty Point Programme** (setting up of housing for the rural poor), the Village Housing Scheme (VHS) were introduced to help housing in various segment. **HUDCO** and **GIC** which were introduced during the sixth five-year plan (1980-1985) to provide housing finance in the urban area also reached rural areas. During this phase, around INR 353.5 crore were invested to construct 13 million dwelling units (NSS 69th Round, Schedule 1.2, 2012).

Rural housing was finally given due importance in the seventh five-year plan (1985-1990) with rising concern in high shortage in rural housing. Finances were given through banks and cooperatives. The government also dedicated a sum of INR 2,890 million towards research and development and other necessary intervention. During this plan, one of the major highlights in rural housing was the **Indira Awas Yojana (IAY)** that was launched as a sub-scheme to **Rural Landless Employment Guarantee Programme (RLEGP)**. Housing finance was further strengthened through the establishment of the **National Housing Bank (NHB)**. The eighth five-year plan (1992-97) saw the launch of India’s first National Housing Policy (1994). The objective of the policy was reduction of homelessness, improvement of the conditions of the dilapidated houses and providing basic services and amenities to all (Ref). The ninth five-year plan (1997-2002) saw some revisions in the existing IAY scheme in terms of financial aids and saw launch of some sub-schemes such as **Innovative Stream for**

Rural Household and Habitat Development (ISRHHD), establishment of **Rural Building Centers (RBC)** etc. During this plan, a scheme called the **Samagra Awas Yojana** was launched for development of sustainable habitat and rural human settlement. The plan also saw the launch of **Special Action Plan (SAP)** that had rural housing as one of its components (Kumar et al., 2016).

The research article “A systems approach to rural housing” highlights similar concerns to this research. It asserts that “in the past, the housing needs of societies were successfully met by traditional technologies evolved and perfected over centuries” (Jagadish, 1979) as discussed in previous sections. The research also brings forth how traditional houses were representations of “finest examples of house forms, achieving complete harmony between lifestyles and the built-environment” (Jagadish, 1979). Housing needs of rural areas are broadly classified into two categories in the paper as “(i) the felt needs of the house owners; and (ii) the development needs of the community” (Jagadish, 1979). The research also highlights the critical point of housing development in rural area which at some point might satisfy “the felt needs” of individual households but continuously “eroding the self-reliance of the community as a whole” (Jagadish, 1979). The table below lists the “felt needs” and “development needs of the community”.

Table 2: Felt needs and community development needs (Jagadish, 1979).

FELT NEEDS		DEVELOPMENT NEEDS OF COMMUNITY
a) Durable building elements	b) Shelter for livestock	a) Self-reliance in building technologies
c) Leak-proof roofs	d) Storage space for grain, fodder and firewood	b) Conservation of energy
e) Thermal comfort and ventilation	f) Design which enables growth	c) Local participation and employment generation
g) Security	h) Cost reduction	d) Environmental harmony
i) Aspirations towards better housing		e) Maximum use of local resources and skills

The paper asserts that “while the importance of cost reduction in house construction should never be minimised, its over-emphasis has led to a proliferation of low-cost structures which are totally inadequate as houses” (Jagadish, 1979). The author further asserts on the importance of rural context in developing housing solutions for rural areas. The research article “Rural Housing in India – An overview of policy

imperatives” (Rajkumar & Jangan Mohan, 2022) discusses the foundation of national housing policies and suggest the need for a separate rural housing policy.

The paper “Rural Housing: Questions of Resilience” (Scott & Gkartzios, 2014), follows an analytical framework to explore resilience of rural communities. The following four key questions forms the base of the research:

- (i) “What place based characteristics contribute to or weaken rural resilience, including housing supply and access to housing markets and community resourcefulness and stocks of social capital?” (Scott & Gkartzios, 2014)
- (ii) “What is the role of path dependencies in shaping existing rural housing policies in the resilience, adaptation and adaptability of rural communities?” (Scott & Gkartzios, 2014)
- (iii) “Can sub-optimal ‘locked-in’ development paths be identified within rural housing policies and practices that compromise place resilience, whereby formal and informal institutional culture and relationships may inhibit adaptive behaviour and capacity? Is rural community resilience weakened by entrenched interests or institutional apathy in the rural housing arena?” (Scott & Gkartzios, 2014)
- (iv) “Is a process of ‘de-locking’ necessary in path creation and transition towards a more sustainable rural settlement system?” (Scott & Gkartzios, 2014)

The above paper that primarily focus on rural Ireland highlights the fragmented pattern of housing through several policy interventions and monopoly and its effect on social system. It also highlights how rural resilience will require involvement from the community at large.

2.6. Culture and Housing

The linkages between culture and housing are a subject that is being studied but lacks translation into policies and development goals as there is no subject that is specified in a domain. Amos Rapoport in his book “Culture, Architecture and Design” raise an important question in the study of the relation of culture and design as “Why should there be such an extraordinary variety of built environments, especially houses and dwelling, and also settlement forms?” (Rapoport, 2005). Rapoport further asserts that

it possibly are the activities in and around the household that led to such varied form of built environment especially housing. The four components of activities identified in this book include: “(i) the activity itself; (ii) how is it carried out; (iii) how is it associated with other activities to form systems of activities; (iv) the meaning of activity” (Rapoport, 2005). These points form a strong base of the questionnaire that was developed for the purpose of this research.

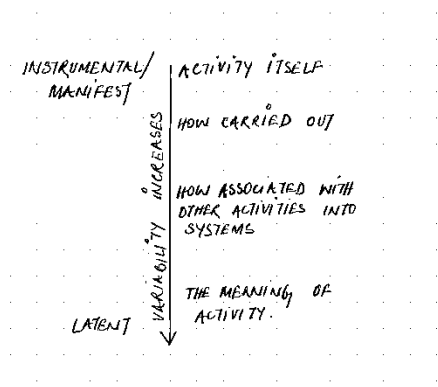


Figure 6: Activity and Culture (Rapoport, 2005)

Figure 6 (redrawn from the book) states that the variability of the built form is higher as one moves from instrumental to latent activities (Rapoport, 2005). The book also further asserts that “lifestyle and the latent aspects of activities can easily be linked to the built-environment and design”(Rapoport, 2005).

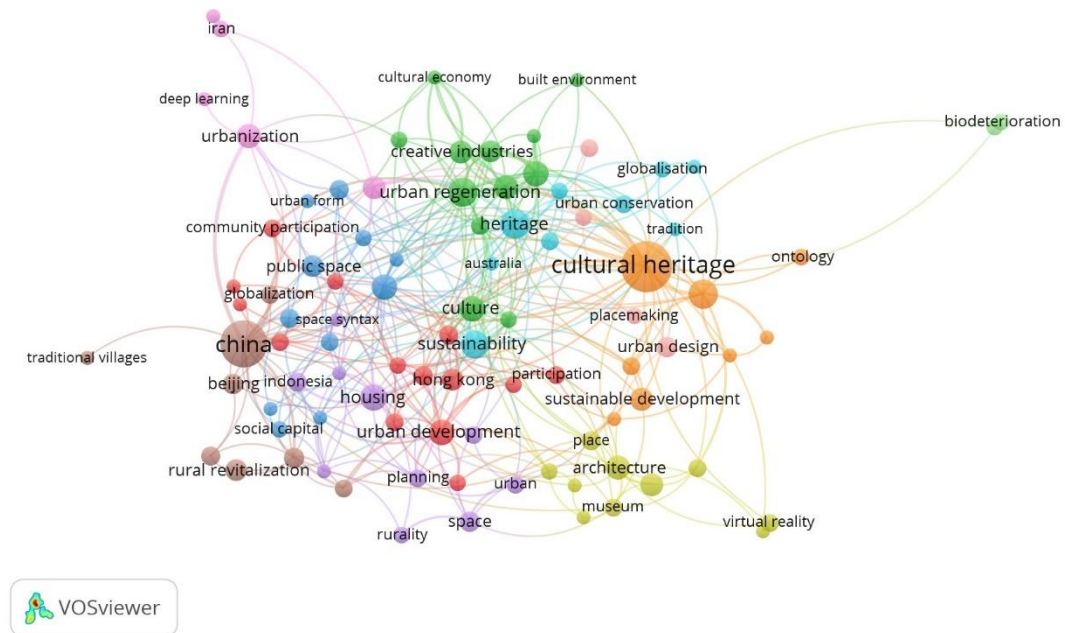


Figure 7: Keyword co-occurrence analysis of “Culture” and “Architecture”

Bibliometric analysis conducted with “Culture” and “Architecture” keywords with database from Science Direct filtered with review articles and research articles, which was further filtered with Habitat International (514 articles), Journal of Cultural

Heritage (257 articles), Journal of Rural Studies (237 articles) and City, Culture and Society (189 articles) led to 1,197 results that was analysed for keyword co-occurrence using VOSviewer gave an interesting insights on the culture and architecture research relationship as shown in Figure no. 7. The node of housing and culture can be seen linked in the Network Visualization Map, while the node of sustainability and culture which is almost the same size is seen in the same cluster in close proximity to each other which gives an initial understanding of the research field. From the overlay visualization map as shown in Figure no.8, it can be seen that rural areas, rural revitalization, social capital, cultural heritage appearing in the map from 2018 onwards.

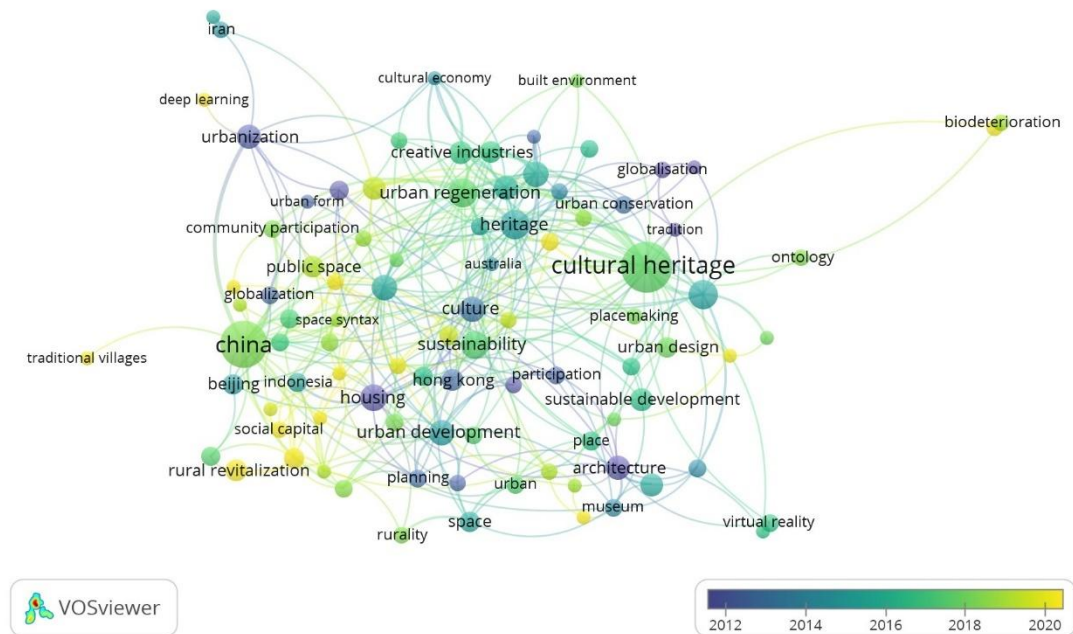


Figure 8: Overlay Visualization Map of keyword “Culture” and “Architecture”.

The paper titled “A capitals framework for rural areas: ‘Place-planning’ the global countryside” highlights that "Social and cultural capital are not indistinguishable, but they are intertwined. They are built upon at least four sub components – social networks, community capacity and active citizenship, inclusive places, and creativity and cultural practices – that are part of good rural places and key to effective planning"(Gkartzios et al., 2022).

The chapter on “Socio-Cultural Factors and House Form” from the book *House Form and Culture* highlights that “building a house is a cultural phenomenon, its form and organization are greatly influenced by the cultural milieu to which it belongs” (Rapoport, 1969). The author further states that “house form is not simply the result of physical factors or any single casual factor, but is the consequence of a whole range of socio-cultural factors seen in their broadest terms” (Rapoport, 1969). The Book *Primitive World and its Transformations* explains lifestyle as “the sum of the concepts of culture, ethos, word view and national character”(Redfield, 1953). The book further emphasizes them as: “(i) Culture: the total equipment of ideas and institutions and conventionalized activities of a people; (ii) Ethos: the organized conception of the ought; (iii) World View: the way people characteristically look out upon the world; (iv) National Character: the personality type of a people, the kind of human being which, generally, occurs in this society” (Redfield, 1953). Supporting this above statement, Rapoport states that “A house is a human fact, and even with the most sever physical constraints and limited technology man has built in ways so diverse that they can be attributed only to ‘choice’, which involves cultural values” (Rapoport, 1969).

Rapoport in the book *Culture, Architecture and Design* (2005) quotes Tylor’s (1871) original definition of culture as that “is the complex whole which includes knowledge, belief, art, law, morals, customs, and by another capabilities and habits acquired by man as a member of the society” (Tylor, 2010). Culture is defined with different explanations by Rapoport (2005) which is used later in the research in hypothesis testing are:

- (a) “as the way of life of a people, including their ideals, norms, rules, routinized behaviours, etc.”(Rapoport, 2005)
- (b) “a system of schemata transmitted symbolically across generations, through acculturation of immigrants” (Rapoport, 2005)
- (c) “as a means of ecological adaptations, the use of resources, and the principal attribute that enables humans to make a living by exploiting various eco-systems” (Rapoport, 2005).

The diagram below (Figure no. 9 redrawn from Amos Rapoport *Dismantling Culture* diagram) shows dismantling of culture and its various expressions to the built

environment. The book discusses at length the various expression and its translation into built environment.

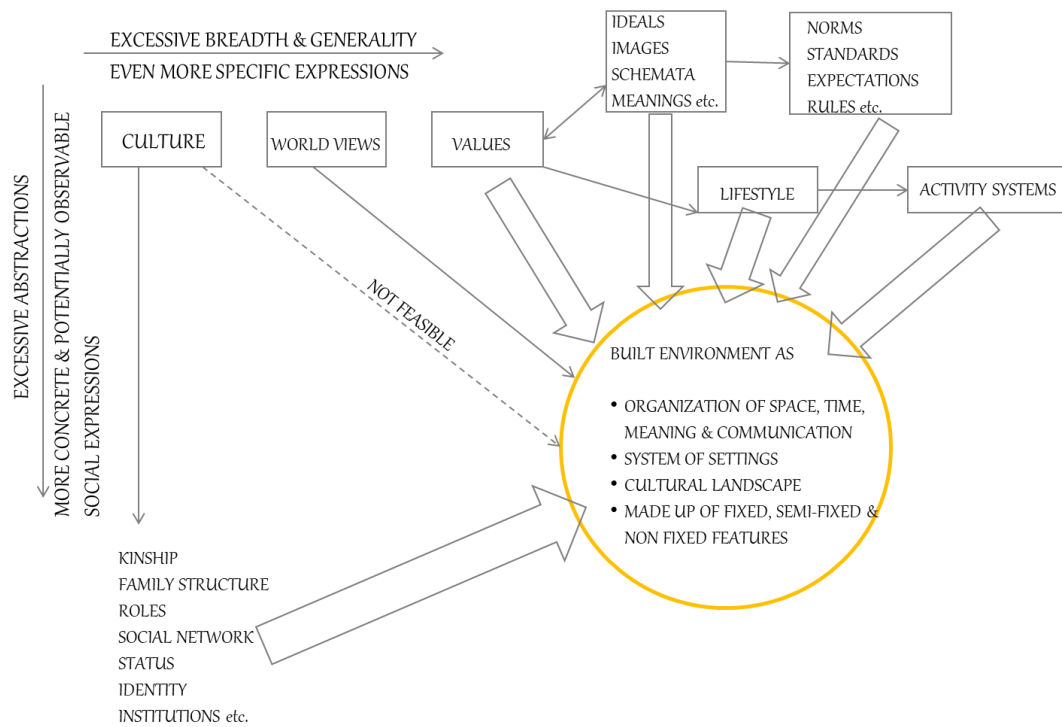


Figure 9: Dismantling Culture (Rapoport, 2005).

Cultural values are linked with “religious values, privacy, security and safety that determine societal factors” (Shehab & Kandar, 2021). The paper further highlights how “religious attitudes and ideas are held in high regard as traditions” (Shehab & Kandar, 2021). It also highlights socio-cultural values play a critical role in sustainable housing design.

2.6.1. Vernacular Architecture and Cultural Sustainability

Vernacular architecture refers to region-specific, non-expert buildings shaped by local geography, materials, climate, traditions, and culture, accounting for ~75% of global building stock yet chronically understudied beyond technical foci like materials, climate adaptation, conservation, energy efficiency, and thermal comfort (Pardo, 2023). Early 20th-century modernism relegated it to "primitive" stasis (Crysler, 2013), but recent paradigms affirm design—from materials to spatial organization—as

embedded in cosmology, social interactions, rituals, and performativity (Oliver, 2006). VOSviewer co-occurrence (echoing 2.2) highlights sustainability clusters but reveals gaps in intangible heritage-settlement planning, aligning with Chapter 2's culture-architecture overlays.

Dayaratne (2018) illustrates this through Sri Lankan vernacular: settlements harmonize with terrain/ecosystems via indigenous tech, labour, and Buddhist ethos—integrating water/food systems, walkability, multi-functionality, and recycling as lived sustainability, not novel metrics. Critiquing exogenous tech imposition, it urges recovering local epistemes, paralleling Northeast India's Meitei settlements where PMAY-G overlooks such synergies for generic typologies.

Globalization and professional conservation pose hazards of "museumification," which diminishes agency and dynamism (Pardo, 2023; Olukoya, 2021). Olukoya's (2021) Vernacular Value Model (VVM) redefines heritage as triadic—comprising form (tangible permanence), process (human-environment dialectics), and practice (intergenerational enactment)—through participatory discussion that integrates emic and etic perspectives. This substantiates the use of mixed-methods (surveys/interviews) for Meitei rituals/performativity, encapsulating intangible values such as activity-space mappings (cf. Rapoport, 2.6).

Lidón de Miguel et al. (2020) interpret hybridizations (cement blocks/corrugated roofs) as socio-spatial ruptures, not mere substitutions—demanding ethnographic depth on behavioural/layout shifts. In Manipur's PMAY-G context, this frames rapid scheme-driven changes against gradual vernacular evolutions, highlighting socio-cultural costs and need for culturally attuned planning.

Kovács (2020) contextualizes the commodification of the vernacular, transitioning from nameless elements to national spectacles, cautioning against the decontextualized preservation in the face of craft and lifestyle deterioration. It advocates for "cultural landscapes" instead of monuments, emphasizing ethical and aesthetic agency, and reinterpreting location for the Meitei community-environment interactions beyond the unit-centric approach of PMAY-G.

Rapoport (1969; 2005) anchors these: spatial diversity derives from cultural activities' facets (action, mode, systems, meanings), per Redfield's (1953) lifestyle-ethos-worldview continuum, rendering homes experiential palimpsests. This thesis leverages

such performativity for Meitei case studies (Ch3–4), empirically testing via PCC (rejecting H0) the ritual-built correlations overlooked in policy.

2.7. Social Housing and Approaches of Social Housing across the world.

Social housing is a generic term which differs from country to country; however, it is generally referred to that type of housing that is made affordable by the government or other development agencies. The paper “Defining Social Housing: A Discussion on Suitable Criteria” (2019) compiles definition of social housing through several research articles. The paper list down criteria after examining articles and descriptions of social housing which are “target group, form of tenure, type of provider, public intervention and subsidies” (Granath Hansson & Lundgren, 2019). Table number 2 highlights some of these definitions.

Table 3: Definition/Description of Social Housing

DEFINITION/DESCRIPTION	SOURCE
<i>“Housing that is aimed to house predominantly households in a weak negotiating position in the housing market, such as low-income households, physically and/or mentally handicapped, ethnic minorities, immigrants and asylum seekers. The social housing providers are supposed to give priority to households who are not able to provide housing services for themselves without assistance in general, there is a public framework in place which governs the position of social housing providers. in general, we observe three main tenures in European countries: owner-occupied housing, commercial-rented housing and social-rented housing. in some countries, a fourth tenure is also popular: cooperative housing”</i>	(Priemus, 2013)
<i>“The essential defining characteristic, as with market housing, is how the accommodation is allocated. social housing is not allocated by demand and by price but is rather allocated according to some politically or administratively defined and interpreted form of need. it is explicitly not allocated by market forces. it exists because governments have decided that some housing, at least, should not be allocated by market forces”</i>	(Lennartz et al., 2012)
<i>“Social housing is a form of government regulated housing provided and managed by the public agencies or non-profit organizations using public and/or private funds for the benefit of</i>	(Olusayo Oyebanji, 2014)

<i>many households, based on degree of need, made available at below-market price with the delivery of social service and not-for-profit motives on a short or long-term basis”</i>	
<i>“Social housing in this paper describes below-market rental housing for people on low incomes and for those with special needs”</i>	(Yates, 2013)
<i>“Social housing is that which is administratively allocated on the basis of need”</i>	(Haffner et al., 2010)

Social housing has been traditionally defined as “any housing that receives some form of public subsidy or social assistance”(Herda et al., 2017).It is more commonly known as “affordable housing” in India. Affordable being a generic term, the table below list applicable definitions in Indian context as shown in Table no.3.

Table 4: Definition of social housing (affordable housing) in India

ORGANIZATION	DEFINITION
Pradhan Mantri Awaas Yojana: Ministry of Housing and Poverty Alleviation, Government of India	• Size of dwelling unit: EWS: < 30 sqm (super built-up area); LIG: 30 – 60 sqm • Repayment of home loans in monthly instalments not exceeding 30% to 40% of the monthly income of the buyer
Various research institutes	• Provision of ‘adequate shelter’ on a sustained basis, ensuring security of tenure within the means of the common urban household • Affordable housing is that provided to those whose needs are not met by the open market
Private Sector	• income level (independent variable) • the size of dwelling unit (independent variable) • affordability (dependent variable)

A number of social housing experiments and innovations have been done to supply affordable and sustainable housing solutions. The following includes an overview of some of the examples of social housing experiments/solutions across the world.

2.7.1. Skeleton and Infill housing system

The Skeleton and Infill (SI) housing was developed by N. John Habraken based on the open building theory (Cao et al., 2018). The concept of housing of this kind kept into consideration of possibility of change and adapting it for future needs. Based on the SI concept many countries adopted it for some of its social housing project such as Kodan Skeleton and Infill Housing in Japan, Industrialised Building System in Malaysia etc. (Ke Liu & Leng, 2019).

2.7.2. Housing Solidarity Fund

The Social Housing in Santiago (Chile) project was designed for the displaced Mapuche Community that had been suffering because of several reasons such as (i) poor quality and poor land value; (ii) economic and health problems; (iii) imposed values and lifestyle leading to decline of culture and; (iv) loss of traditional systems. The project was part the “Housing Solidarity Fund” launched by the Ministry of Housing and Urban Development in collaboration with “A Roof of Chile” and the local municipality (*Ruca Dwellings / Undurraga Devés Arquitectos*, 2013).

The project was designed with the willingness of the community’s initiation to the modern lifestyle but the need to also remain rooted to their traditional belief system. The designers were taught “their history, traditions and world view” and the designs integrated “visible and the invisible world: territorial, political, social, culture and religious systems” (*Ruca Dwellings / Undurraga Devés Arquitectos*, 2013).

The Housing Solidarity Fund is a “market driven approach to satisfy home ownership demands by the poor, one which leaves micro-management of housing projects in the hands of the community organizations rather than the Regional Service of Housing and Urbanization” (United Nations Human Settlements Programme., 2008). The fund gives housing subsidies to Chilean families according to the Government’s “Social Protection Form” and it provides financial assistance to buy homes or to build their new home. (United Nations Human Settlements Programme., 2008).

2.7.3. Social Production of Habitat

Habitat International Coalition (HIC) is a “global, independent, and non-profit network for the defence, promotion and realization of human rights related to habitat and a safe place to live in peace and with dignity, both in urban and rural areas”. The Social

Production of Habitat supports in generation of habitats under the guidance of self-producers and social agencies (HIC Africa Strategic Plan 2023-2027, 2022).

The Social Housing Project in Tepetzintla, Mexico was designed governed by the Social Production of Habitat that addressed the traditional housing system along with integration of various “low-cost ecological technologies” and use of locally available bamboo. The construction was done by community labour (*Social Housing Production: Exercise I / Inhabitants of Tepetzintan + Comunal Architecture Workshop*, 2019).

2.7.4. You can build it as you like

The “You Can Build it as You Like” was a rural houses sub-programme (1983-1989) implemented under the Million Houses Programme (MHP) of the Government of Sri Lanka. The programme had detailed “an incremental building strategy that encouraged participants to build in accordance with their current situation, but with the hope of improving in the future” (Abeyasekera & Gunasekara, 2022).

The programme was implemented by National Housing Development Authority (NHDA) of Sri Lanka, monitored by a District Housing Committee and ground level work handled mostly by the Gramodaya Mandalayas (GM). The role of the GM included beneficiary selection, supervision of loan usage and recovery of loan. In order to get this loan, the people had to fulfil certain criteria that varied from district to district. Each district had a team of administrative and technical staff along with a Housing Officer. This staff were responsible to “help the individual develop a building plan, a list of building materials needed, and a budget for the project” (Abeyasekera & Gunasekara, 2022). The Housing Officers “played a crucial role in the implementation of this programme as the main point of contact and guidance for the beneficiary families” (Abeyasekera & Gunasekara, 2022). This decentralized programme was successful as it allowed “a personalised support and tailored housing solution”.

2.8. Social Housing and its evolution in India

India underwent major transformation after independence. A number of reforms were both in rural as well as urban areas. The Asian Development Bank Institute (ADBI) working paper no. 565 (2011) highlights that in addition to homelessness, a large number of houses needs replacement owing to its dilapidated condition, congested

living with growing family size and substandard living condition. (Tiwari & Rao, 2011). The paper further discusses housing policies and programmes starting from 1947.

2.8.1. 1947 to 1964: First, Second and Third Five Year Plan

Housing was still not considered as a constitutional right in this phase. The Rent Control Act was implemented as a pre-World War II measure to extreme increase in rents. The Industrial Housing scheme was formulated in this period along with Plantation Labourer Housing Act in 1951. Under the Industrial housing scheme, non-refundable loans were provided from their provident fund (Khaire & Jha, 2022). The year from 1950 to 1960 saw the formation of State Housing Boards under the then Ministry of Works, Housing and Supply. Central Public Works, National Building Organisation, Town and Country planning were mandated to look into various verticals to provide housing supply. The funding of housing still dependent on the central government (Tiwari & Rao, 2011). Due to lack of clear directive or policy often “lacking direction and continuity and at times overlapping in their scope and target participants” (Tiwari & Rao, 2011). However, this phase saw development of a strong institutional structure.

The Second Five Year Plan had various public housing project such as Village Housing Project Scheme, Rental Housing for State Government Employees, Land Acquisition and Development Scheme (Khaire & Jha, 2022).

2.8.2. 1965 to 1990: Fourth, Fifth, Sixth and Seventh Five Year Plan

The phase saw two key programmes namely “the Environmental Improvement of Urban Slums” and “the Sites and Services Scheme” as the initial direct delivery of houses to the beneficiaries were found ineffective (Tiwari & Rao, 2011). The Housing and Urban Development Cooperation (HUDCO) was established during the Fourth Five Year Plan as “a specialised public housing finance agency). A provision was also made to provide house sites for “houseless rural areas” (Khaire & Jha, 2022). The first mortgage company Housing Development Finance Corporation (HDFC) was set up in the Fifth Five Year Plan that was responsible for providing majority of finance for housing. However, the biasness towards rural housing continued that led to the need for recognising urban poverty and rural poverty as completely distinct and different (Tiwari & Rao, 2011). Decentralization was also attempted through the “Integrated

Development of Small and Medium Town (IDSMT). The National Housing Policy was drafted during the Seventh Five Year Plan. A number of schemes and programmes were implemented during this five-year plan such as Urban Basic Services for the Poor (UBSP), Building Materials and Technology Promotion Council (BMTPC), Night Shelter for Pavement Dwellers and Nehru Rozgar Scheme for Housing and Shelter Upgradation (SHASHU) (Khaire & Jha, 2022).

2.8.3. 1991 to 2007: Eight, Ninth and Tenth Five Year Plan

The phase saw a focus on government focusing on “Below Poverty Line (BPL) households, households headed by women and schedule caste and tribes as these houses required direct intervention and subsidies” (Tiwari & Rao, 2011). The National Slum Development Programs (NSDP) was launched not just as a means to provide essential amenities but to also develop means for skill enhancement. The launch of Housing and Habitat Policy saw a major involvement of private developers in housing supply (Khaire & Jha, 2022). The loan-based scheme “2 million Housing Program” was also launched during this phase in association with HUDCO and HDFC. It is also noteworthy that post 2000, the focus of development shifted from nations to cities (Tiwari & Rao, 2011). The Jawaharlal Nehru National Urban Renewal Mission (JNNRUM) was introduced to develop cities in a sustainable way with responsibility transferred to cities and its municipal councils and corporations. Basic Services for Urban Poor (BSUP) and Integrated Housing and Slum Development Programme (IHSDP) were set up under JNNRUM. Formats such as credit-based financing programme “Pooled Finance Development Fund (PFDP)” and promotion of Public Private Partnership was observed during this phase.

2.8.4. 2008 to 2022: Eleventh, Twelfth Five Year Plan and Niti Aayog

With the formulation of National Urban Housing and Habitat Policy, India’s housing programme set a goal to provide “Affordable Housing for All” with a special emphasis on urban poor. The Rajiv Awas Yojana (RAY) had a two-pronged strategy of slum redevelopment and a strategy to stop formation of new slums (Khaire & Jha, 2022). However, RAY was not considered successful and was replaced by the Housing for All programme (Tiwari & Rao, 2011).

A number of these programmes such as Smart Cities Mission, Model Tenancy Act, Affordable Rental Housing Complexes continue to focus on housing issues of India.

Pradhan Mantri Awas Yojana (PMAY), the latest programme has two clear development strategy that segments Urban and Rural India namely PMAY (Urban) and PMAY (Rural/Gramin) (Khair & Jha, 2022).

2.9. Conclusion

This chapter explains culture's central role in housing and built-environments, extending beyond physical structures to include social, psychological, and sustainable attributes. The analysis progresses from dwelling theories such as Gauvain and Altman's (1982) environmental-cultural influences and Desprs' (1991) territorial-psychological frameworks to housing typologies (Blauw 1994) and India's policy evolution (2.8).

The culture-housing interface receives particular emphasis. Rapoport's (2005) activity-culture model provides a foundation, supported by subsection 2.6.3: Dayaratne's (2018) indigenous sustainability, Olukoya's (2021) Vernacular Value Model (form-process-practice), and Lidón de Miguel/Kovács (2020) modernization analyses. VOSviewer clusters (2.2) identify persistent gaps in intangible elements within development paradigms, such as PMAY-G.

Incorporating over 25 theorists (Rapoport comprising approximately 10%), this synthesis establishes theoretical pluralism essential for testing H1 (culture-built correlation). It informs the five-stage methodology (Ch1.6) and necessitates quantitative approaches like PCC.

In summary, vernacular rituals hold critical implications for Northeast India. Chapter 3 provides the vital contextual foundation.

CHAPTER 3: THE STUDY CONTEXT

3.1. Northeast India

Northeast (NE) India consists of 8 states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim in the eastern most corner of India and is home to about 45.7 million people according to Census of India 2011. The rural population is 37.3 million which is about 82% of the total population. The region can be divided into the Eastern Himalayas, the Northeastern Hills, and the Brahmaputra and the Barak River valley plains geographically (Development and Growth in Northeast India: The Natural Resources, Water, and Environment Nexus, 2007). The region has a rich cultural heritage and is home to 200 tribes with its unique culture, traditions and built environment (Dikshit & Dikshit, 2014).

The region saw an increase in the number of inhabited villages. The last century (1991-2001) saw more than double in increase of villages which is a result of increase in rural population of NE (Dikshit & Dikshit, 2014). Table No. 4 shows growth in number of inhabited villages in the last century.

Table 5: Growth of inhabited villages from 1991 to 2001

States	No. of inhabited villages			Changes between 1901 to 2001 in %		
	1901	1951	2001	1901-1951	1951-2001	1901-2001
Arunachal Pradesh	(-)	2,451	3,865	(-)	+57.6%	(-)
Assam	10,133	17,842	25,124	+76%	+40.8%	+148%
Manipur	467	1,601	2,315	+242%	+44%	+395%
Meghalaya	2,865	4,059	5,782	+41.6%	+42.4%	+134.5%
Mizoram	239	632	707	+101.8%	+11.8%	195.8%
Nagaland	292	512	1,278	+75.3%	+149%	337.6%
Sikkim	125	99	450	-20.8%	+354.5%	+260.0%
Tripura	1,463	3,453	858	+136.0%	-75.2%	-41.3%

Source: Census of India and (Dikshit & Dikshit, 2014).

Agriculture is one of the primary economic activities of the region even though there are regions which heavily depend on forest resources and water. Villages in plain areas has a strong association with agriculture and forms a complete unit with the societal construct of the villages. Villages “consists of a cluster of houses with families having the same or varying ethnicity, caste, trade and professions, but largely dependent on agriculture” (Dikshit & Dikshit, 2014). Villages in Northeast differ based on their geographical variations such as plains, hills, near water bodies etc.

The Subnational Human Development Index (SHDI) between the year from 1990 to 2017 by Global Data Lab that is based on three criteria namely education, health and standard of living has gone down in the rank from 1990 for Northeast states except Arunachal Pradesh. The report by State Bank of India states “North-eastern States which have rapidly catch up in HDI value and were well performed among other regions have slowed down in recent period and even the HDI value is declining” (Human Development Index Across Indian States: Is the Glass Still Half Empty? 2019).

While the World Bank Report on Development and Growth in Northeast India highlights some of the institutional environment of the region that “(a) the central government has taken large roles, partially due to weak state capacity; (b) institutional arrangements are very complex but at the same time incomplete; (c) natural resource knowledge base is incomplete and partly inaccessible; (d) local stakeholders question current approaches and their benefits to local population.” (Development and Growth in Northeast India: The Natural Resources, Water, and Environment Nexus, 2007).

3.2. Manipur

The state of Manipur is one of the 8 Northeastern states with a total area of 22,327 sq. km. According to Census of India (2011), the state has a total population of 2.8 million with 2 million people living in the rural area. Manipur is broadly divided into five physiographic zones namely “(i) the Northern Hills; (ii) the Western Hills; (iii) the Eastern Hills; (iv) the Southern Mountainous margin and; (v) the Central Lowland of Manipur-the Imphal high-altitude plain” (Dikshit & Dikshit, 2014).

3.2.1. People of Manipur

Administratively and physically Manipur can be broadly divided into the Hill and the Valley. The Valley was mostly inhabited by the *Meiteis* (along with *Meitei Pangal*) and some tribal population while the Hill is majorly inhabited by various tribes which broadly falls under *Naga*, *Kuki* and *Maring*.

- (i) The origin of the *Meiteis* has certain contradictory explanations ranging from that originating from a Tartar Colony from China, an original race based on Mahabharata or the Shang Kingdom of Pong, China. (Brown, 1873)

- (ii) The **Naga** is believed to have come from the North from the Kachar district of Assam. This is further attest by the fact that Naga tribe has attachments for the site in which their village is situated in contrast to the migratory nature of other tribes.(Brown, 1873)
- (iii)The **Kuki** tribe on the other hand is believed to have originated from the South and the East. (Brown, 1873)
- (iv)The **Maring** from the East since they closely resemble the Burmese.(Brown, 1873)
- (v) The **Meitei Pangal** (Muslims) is believed to be brought as battle captives. (Brown, 1873)

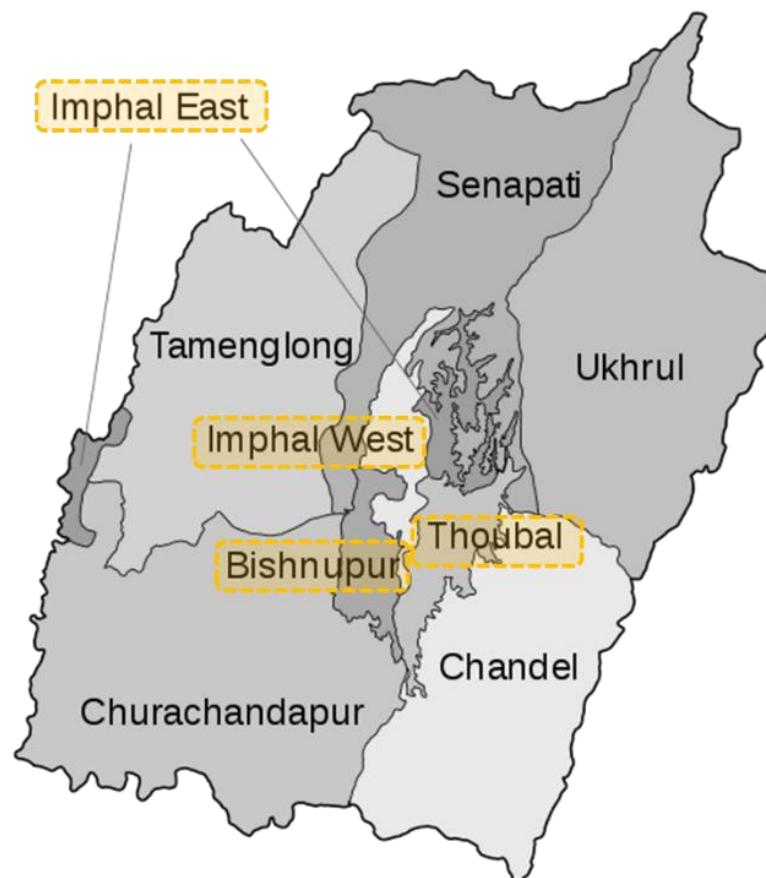


Figure 10:Erstwhile Districts of Manipur till Census 2011

The people of the hills and plains differ socially and territorially (Dikshit & Dikshit, 2014). Figure number 10 shows spatial distribution of people across Manipur.

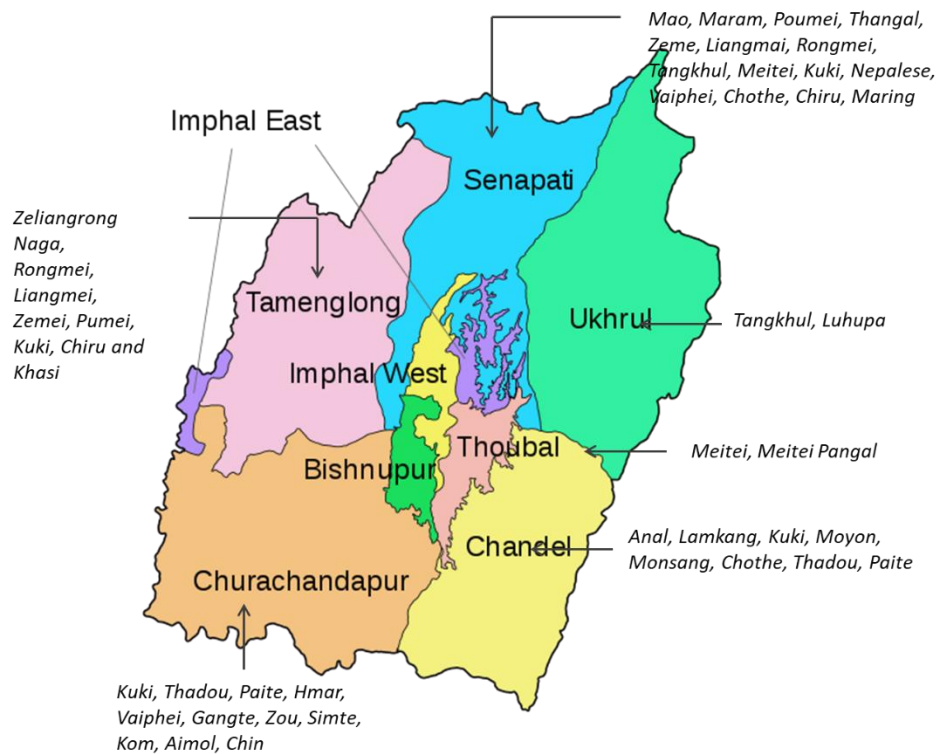


Figure 11: People of Manipur

3.2.2. Settlement Fabric of Imphal Valley

While villages in the hills are smaller houses and not located close to agricultural land but forest lands, the settlement pattern of villages in the plain areas of Manipur are cluster of houses surrounded by paddy fields. Each house has its own open space, ponds, kitchen gardens. A Meitei settlement pattern of the valley comprises of a systematic arrangement of spaces that caters to various household and associated economic activities. The Statistical account of the Native State of Manipur and the Hill Territory under its rule ((Brown, 1873), includes a detailed account of the settlement and dwelling unit as quoted in the excerpt below:

“Houses of Manipuris: The houses do not differ essentially from those of the Bengalese in Kachar; the shape is somewhat different, but the material used is the same. The houses of the better sort are constructed of wood, bamboo etc., while those of

*the poorer classes are entirely, as regards the framework, of bamboo. The walls are usually of reeds plastered over with mud and cow-dung. The dwelling-houses of the Manipuris are of all the same form, but those of the rich are larger and constructed of better materials than those of the poor. The roofs of all are thatched with grass. All the dwelling-houses face to the eastward, in which direction they have a large open verandah. In this verandah the family sits during the day, and in it all the work of the household is carried on, except cooking, which is performed inside. In the south side of the verandah is the seat of honor, here a mat or cloth is laid for the head of the family, upon which no one intrudes. Inside the house is without partitions. The bed of head of the family is placed in what is called the **Luplengka**, close to the wall on the south side about the middle. It is usually screen by mats. The daughters usually sleep on the north side. There are no windows in the houses; the only light admitted being by two doors, one opening into the open verandah, the other to the north, near the north-west corner of the house. The fire place is on the floor towards the north-west corner.”(Brown, 1873).*

The traditional settlement of the rural areas surrounding the capital city of Imphal (mostly plains) composed of a well-coordinated system of built and un-built spaces that functions together as a complete system. While these systems have seen major changes in urban areas due to rising demand and pressure on land, rural areas of the plains of Manipur have more or less been successful in retaining this system. The dwelling area is composed of a dwelling unit or living quarter traditionally known as “yum” (“yumjao” in case of larger house of more affluent household) that face east in almost all cases, a “mangol” which is the front verandah of the house which was and still primarily use as a place to entertain guest (the concept of a living room came much later and casual guest are still entertained in this area in most rural households) and perform other day to day household activities, “shumang” which is a large open space in front of the house that is used for both carrying out household activities, for performing rites and rituals and celebration of festivals. Regardless of the size or

existence of *shumang*, a Tulsi plant is placed in the center of all Meitei households where morning prayers are offered to the sun god.



Figure 12: *Shumang and different settings of Tulsi Plant*

Most houses have a semi-covered space called “*Shangoi*” at the eastern end of the *shumang* facing the house that is used for activities such as weaving, basketry etc. and used for rituals and religious functions too. “*Pukhri*” or rain fed pond was and is an integral part of the dwelling system that served the need for water during dry seasons. *Pukhri* is located mostly in the front part of the plot but many households have one at the back of the house. Kitchen garden, cow or animal shed is an integral part of this set-up too. The settlement fabric of a typical village of the plain is a combination of clusters of such dwelling systems known as “*Leikai*” which is constituted a group of “*kolup*”. The first level cluster formation is “*kolup*” which is usually a group of houses



Figure 13: A *Leikai* surrounded by agricultural land (Source: Author)

belonging to one family and married sons moving out of the family to build an independent household. Depending in the size of the *kolup*, the number of *shumang* varies.



Figure 14: Cluster of kolups in Rural Manipur (Source: Author)

The use of *shumang* is restricted to the family and it is the first level of open space in the settlement fabric. A group of *kolup* ranging anywhere between 30 to 50 in number forms a *Leikai*. A *Leikai* typically has an open ground the size of a small football ground known as “*Laimang*” which is typically associated with a Sylvan deity and a temple dedicated to it or “*Lampak*” if not associated with a deity. This space is a community level open space which is used for celebration of community festivals, sports activity, functions as well as becomes a playground for children on other time.



Figure 15: Traditional Settlement Fabric of a Meitei settlement (Source: Author)

3.2.3. Settlement fabric around Loktak lake and associated wetlands

The above discussed settlement pattern is a typical example of settlement in rural area of the plains of Manipur with agriculture as their main economic activity. The settlement in and around the Loktak Lake (the largest fresh water lake in Northeast India) and its associated wetlands depend on the lake for its livelihood. Almost all households fish in the lake and these fishes are processed (smoked, sundried, fermented) and sold, making it an important economic activity of the area. Houses still follow the traditional layout; however, some changes are made to accommodate fishing and its associated activity. Fishing and processing of fishes forms an integral part of culture of the region. However, the female participation in the entire process is much higher such as: (i) processing (83.33%); (ii) wholesaling (45.5%) and: (iii) retailing (77.10%) of the smoked fish in Manipur (Upadhyay et al., 2021).



Figure 16: Settlement around Loktak Lake and plan of dwelling unit showing activity areas. (Source: Author)

Houses face east, many still has *shumang*, *mangol* and the Tulsi plant is still seen in most households depending on the religious belief of the household. Kitchen garden even in smallest of patch can be seen in most households. The kitchen area on the other hand has become a primary space for smoking the fish which happens almost throughout the day and performed by women. “Women do much of the primary and secondary processing of fish for home use and sale in the market”(Chanu et al., 2015). One cannot see a cultural or space adaptation for these activities like a separate space that would be a safer option mainly due to lack of finances or research innovation that can only be provided by an external agent.

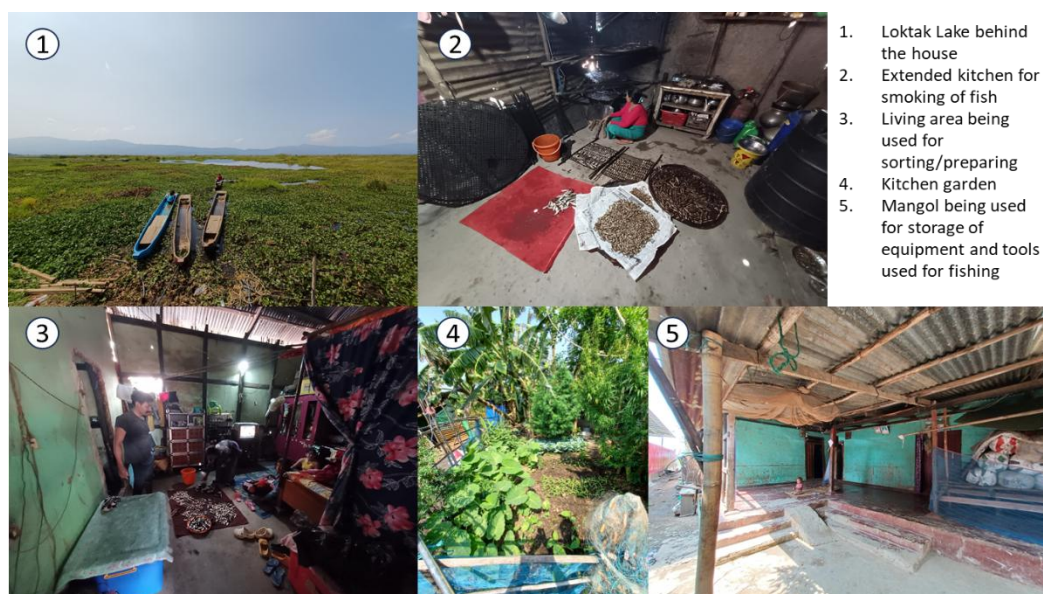


Figure 17: Scenes of dwelling units around Loktak Lake (Source: Author)

3.3. Existing Cultural Policy of Manipur

The Manipur Cultural Policy was framed in line with emerging cultural developments across the world. Along with due consideration of the ancient historical context, the policy aims to align itself with ever evolving cultural context of society, traditions and customs.

The central theme of the policy looks at cultural as two different modules, “(i) the first module where culture is composed of values, beliefs, norms, ideology, which are all mental products like literary works, performing art forms and (ii) the second module views culture as referring to the total ways of life, interpersonal relationship and attitudes together with the behavior of ordinary people in their ordinary business of life”. The policy also aligns with the National Policy on education 1986 to be able to re-define culture based on “universalism and scientific temper and activities”. It also proposes that the state will act as a catalyst in “development and progress of culture”.

Some of the objectives that can be highlighted in order to link/interpret in the ongoing research are:

- i. Equal attention will be given to “the plains and the hills, the urban and the rural, the several communities, ethnic and tribal groups”

- ii. Encouraging a “synthesis between change-oriented technologies and the community of cultural traditions”
- iii. To develop a strategy for “coordination amongst various departments such as culture, education, information and public relations, tribal development etc. for strengthening the cause of culture”
- iv. To preserve the “cultural heritage and its different efforts of culture”
- v. The state to play a “catalytic role in the development of culture commensurate with the broad social needs and its intrinsic value.

The suggested plan of action includes:

- i. High priority to be given “to provide funds to preserve, promote and enrichment of diverse manifestations of its culture”
- ii. Formation of “Manipuri Cultural Advisory Board comprising of not more than 30 experts and eminent persons from various fields of culture”
- iii. To make cultural factors an integral part, “strategies of development to be devised in the context of the historical, social and cultural realities of our society”

3.4. Assam

Assam is the commercial capital of Northeast India owing to its location, with all the states except Sikkim sharing its boundary. It is also a transportation and logistic hub. The state has a total area of 78,438 sq.km. with a total population of 31.2 million out of which 86% is rural population that is about 26.8 million according to Census of India 2011. Assam occupies 70% of the Brahmaputra Plains while the remaining 30% includes the Northern Himalayas (or the Eastern Hills) and the Deccan Plateau (Dikshit & Dikshit, 2014). The state offers a wide range of economic activity ranging from tea plantation, mining of mineral resources, crude oil etc., however, agriculture is the largest contribution to the economy and the workforce (Assam State Portal, Government of Assam)

3.3.1. People of Assam

Racially the people of Assam can be broadly classified as Mongoloid, Indo-Iranian and Aryans (Assam State Portal, Government of India). Assamese speaking populace mainly occupy the Brahmaputra plains while Bengali speaking populace inhabit the Barak plains (Dikshit & Dikshit, 2014).

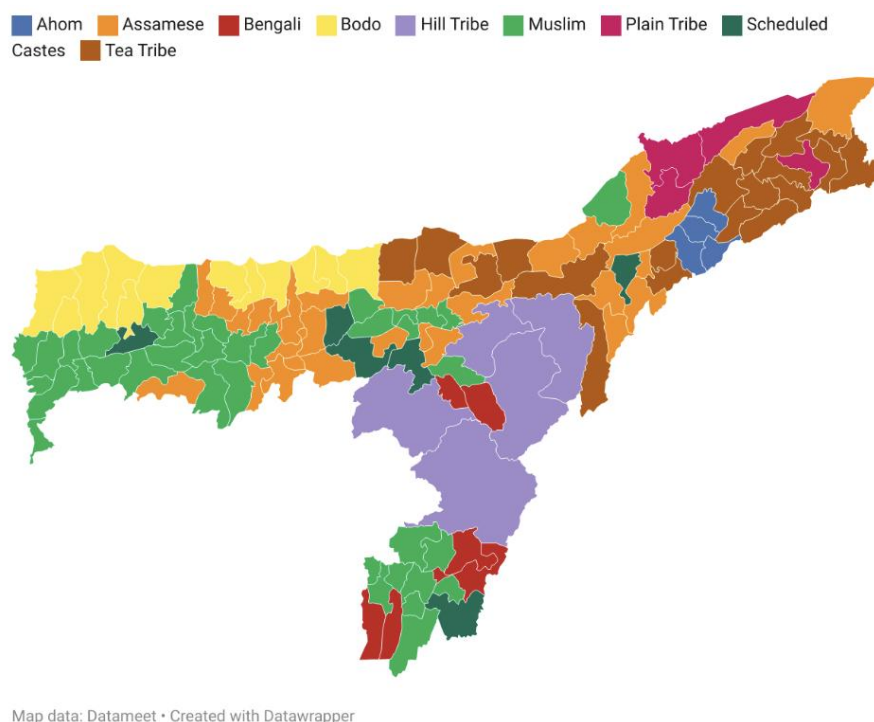


Figure 18: People of Assam (Map showing single largest demographic group of each district. (Source: The Wire & Census of India 2011))

Assam has a small tribal population compared to other states of the Northeast and most of it is concentrated in Karbi-Anglong and North Cachar region. According to the Schedule Castes, Schedule Tribes (Amendment) Act 1976, there are 23 schedule tribes in Assam. Among the largest group of tribals in Assam, the bilingual group speak “Bodo” as their first language and Assamese as their second and are believed to be the “earliest colonisers of the Brahmaputra Valley” (Dikshit & Dikshit, 2014). They are concentrated mostly in Kokrajhar District, in the north of Brahmaputra River (Dikshit & Dikshit, 2014). The subgroups include “Bodo-Kachari, Rabha, Kachari-Sonowal, Lalung, Dimasa-Kachari, Deori, Garo, Mech and Hojai each with their distinct economic activity (Dikshit & Dikshit, 2014).

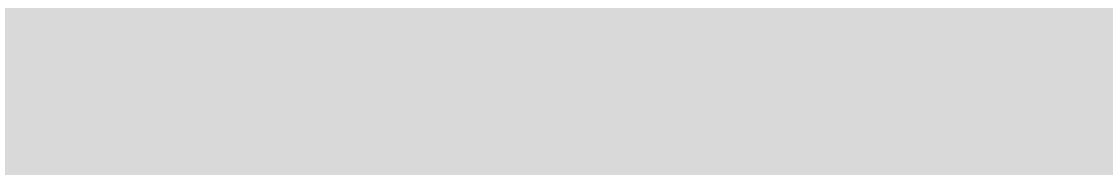
3.3.2. Settlement Fabric of the plains of Assam

The villages of Assam's River valley are fairly large as compared to the villages of the hills. Villages are surrounded by paddy fields; however, the settlements are clustered around the transportation spine as shown in Figure no. 18. Bamboo groves are observed in the periphery of villages (Dikshit & Dikshit, 2014). Clustering of houses based on similar community is a common phenomenon in the villages. The excerpt below from "The History of Civilization of the People of Assam to the Twelfth Century AD" written in 1959 describes a dwelling system which is more or less can still be seen in rural areas of Assam.

"Normally the members of the same family may have lived under the same roof, and with the increase in members, new houses were required to be raised. The family houses generally consisted of one dwelling quarters with as many rooms as essential, often with a kitchen attached; one small house or rather a shelter for the cattle; one store house for paddy and other articles, and, for those who could afford it, a guest house and a small one for daily worship" (Choudhury, 1959).

Every settlement lives in a tightly knit community. The dwelling is not limited to the living quarter but includes a composition of built and unbuilt spaces as stated in the excerpt above. Each household has a living quarter with a verandah in the front of the house that is used for entertaining guest. This space also acts as a space for various household activities.

The front yard and the back yard of the dwelling unit has large trees and betel nut trees that acts as natural boundary creating a private enclosure. The house has a large open space in front of the house with a small temple referred to as Namghar in one corner of the open space.



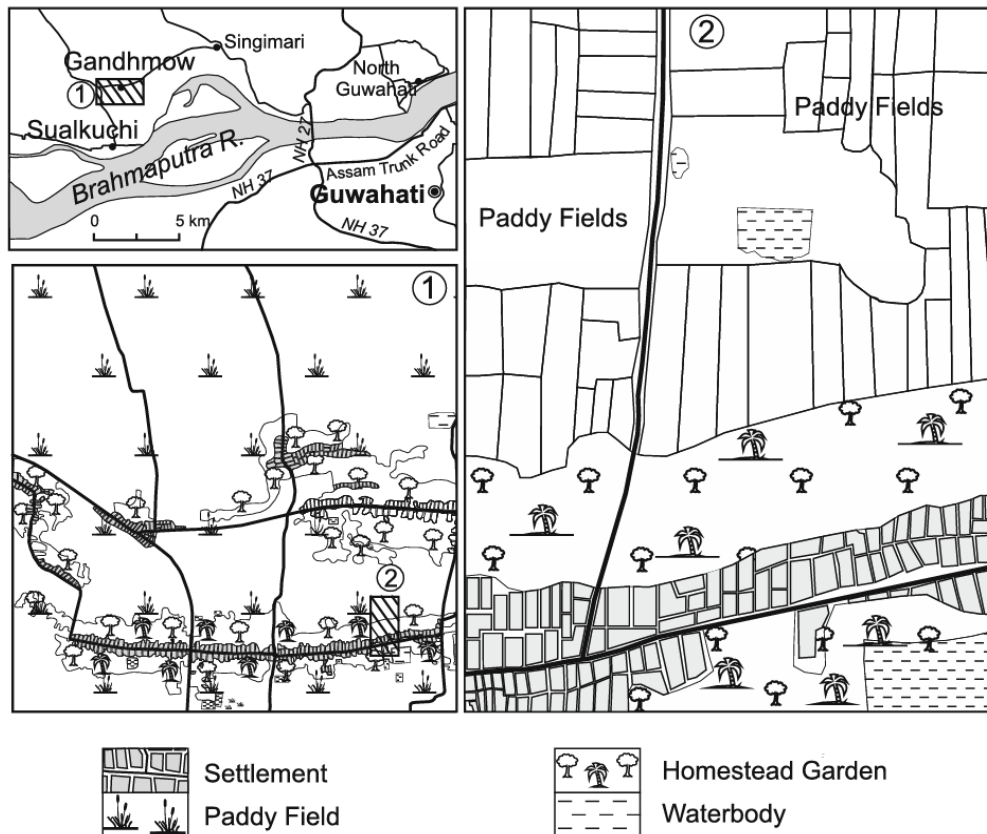


Figure 19: Layout of a village in Assam (Dikshit & Dikshit, 2014)

One side of the open space is usually earmarked for a cow shed, a weaving space and a space for storing grains. The dwelling system has several small patches of land where daily used vegetables are grown. The backyard has a bath and toilet built away from

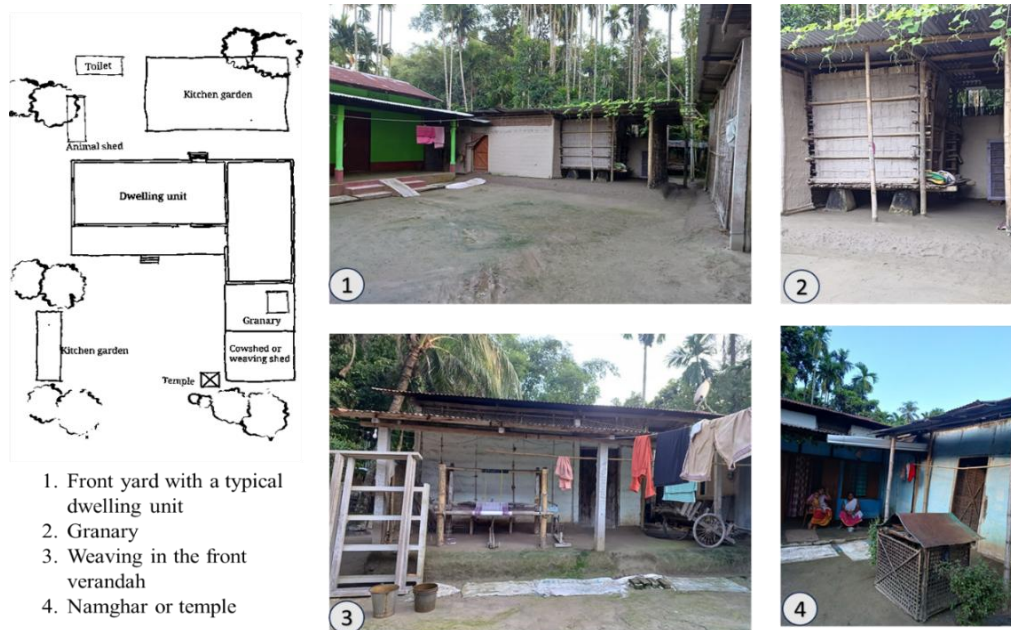


Figure 20: Built and Unbuilt spaces of dwelling system of Assam

the house, smaller animals like goats or ducks or chickens are reared in the backyard side as illustrated in Fig. no. 19. Weaving is an activity that women of the households take up when not involved in farming activity. No individual ponds are seen however the settlement has larger ponds. Villages based on the community has either a “Namghar” (temple) or a mosque and is centrally located.



Figure 21: Satellite image of rural settlement of Assam

3.5. Existing Cultural Policy of Assam

The Cultural Policy of Assam (2001) is among the few policies in India that includes “way of life and social organization of a particular society or group” in its definition of culture and recognises the culture of Assam as a “living culture for the last 5000 years” (Cultural Policy of Assam, 2006). It further defines “culture as an all-encompassing concept involving the body politic of the whole state” (Cultural Policy of Assam, 2006). Some of the salient feature of culture of the state and can be linked to society and built-environment include:

- i. “Community goods prevail over individual gains; what affects the individual also affects the community”
- ii. “Social institution has a bigger influence than codified laws in determining social conduct”
- iii. “The family as an institution is very sacrosanct and the foundation of a good citizen.”

- iv. “Agriculture is the primary activity of the people. Closeness to nature and concern of preservation of the environment is a noted feature”.

The policy has a list of objectives to preserve and protect culture. Some of the objects that concerns to society, communities and built environment are:

- i. “Preserve and promote the living culture of the ethnic and indigenous tribes and communities of the state”
- ii. “Promote cultural and emotional among the people of the state”
- iii. “Promote those qualities and values that sets the culture of the state as one of the brightest jewels in India’s cultural milieu”

The cultural policy’s vision and objective, though mentions preservation and promotion of communities and living culture fails to have any meaningful or implementable strategies that targets these objectives and limits itself to only art and culture concerning tangible heritage.

3.6. Pradhan Mantri Awas Yojana-Gramin (PMAY-G)

With India’s independence in 1947, housing was a major challenge for the newly formed Government of India. Housing and rehabilitation of mass influx of refugees from Pakistan was another added challenge that had to be handled at the earliest. Poverty alleviation was one of the main focus areas of the time. The first instance of a scheme that catered to rural housing was the Indira Awaas Yojana (IAY) that was implemented to provide housing “to the weaker section of the society free of cost” (Hussain & Yaseen, n.d.). This scheme was launched as part of the National Rural Employment Programme (NREP). IAY was the only scheme that was completely funded by the Government of India for rural housing during that time. The programme included several facilities such as drinking water, sanitary facility, smokeless *chullahs*, tree plantation around the habitat that was provided along with the dwelling unit (Hussain & Yaseen, n.d.).

Although considered a successful programme, a number of gaps were identified that were highlighted during a series of evaluations and performance audit by the Controller and Auditor General of India in 2014 (Pradhan Mantri Awaas Yojana-Gramin PMAY-G: A Door to Dignity Fulfilling the Aspirations of Houseless and Poor People of Rural India, n.d.). Non-assessment of housing shortage, lack of transparency

in beneficiary selection, low quality house, lack of technical supervision and weak implementation and monitoring system impacted the outcome of IAY.

As a measure to bridge the gap in rural housing program and to align it to the “Housing for All 2022 Mission”, IAY was restructured into Pradhan Mantri Awas Yojana-Gramin (PMAY-G) from April 1, 2016. The main aim of PMAY-G was to provide pucca¹ house with basic facilities to all “houseless households and to those household still living in kutch² and dilapidated house” by 2022. The immediate objective of PMAY-G was “to construct and handover one crore houses to households living in kutch/dilapidated houses in three years between 2016 to 2019” (Pradhan Mantri Awaas Yojana-Gramin PMAY-G: A Door to Dignity Fulfilling the Aspirations of Houseless and Poor People of Rural India, n.d.).

In order to improve the living conditions and provide safe and hygienic environment, the minimum size of the house under PMAY-G was increased from 20 sqm to 22 sqm initially. However, with the Prakriti Hunar Lokavidya (PAHAL): A compendium of Rural Housing Typologies, the size of houses varies based on region and location across the country. The unit assistance was also increased from INR 70,000 to INR 1.2 lakhs in plains and from INR 75,000 to INR 1.3 lakhs in hilly states, difficult areas and Integrated Action Plan (IAP) districts. Apart from financial assistance the beneficiary is also entitled to 90/95 person days of employment under unskilled labour category from the Mahatma Gandhi National Rural Employment Guarantee Scheme or any other dedicated source of funding. In order to alleviate poverty and assure dignity of life, provision of piped potable water, electricity connection, LPG gas connection are provided or attempted through different government schemes (Pradhan Mantri Awaas Yojana-Gramin PMAY-G: A Door to Dignity Fulfilling the Aspirations of Houseless and Poor People of Rural India, n.d.)

The cost of unit assistance is planned to be shared between the Central and State Governments in the ratio 60:40 in plain areas and 90:10 for Northeastern and Himalayan States. 95% of the funds from budgetary grant for PMAY-G including 4%

¹ “A pucca house is one, which has walls and roof made of the following material. Wall material: Burnt bricks, stones (packed with lime or cement), cement concrete, timber, ekra etc.” defined by Census of India

² “The walls and/or roof of which are made of material other than those mentioned above, such as unburnt bricks, bamboos, mud, grass, reeds, thatch, loosely packed stones, etc. are treated as kutch house” defined by Census of India

allocation towards administrative expenses are released to state and union territories for the construction of new houses 5% of the budgetary grant is to be retained by the centre as reserve funds for special projects. The annual allocation to the states is to be based in the Annual Allocation Plan (AAP) approved by Empowered Committee and funds to the states/UTs are to be released in two equal instalments.

One of the important lacunas in IAY planned to be overcome by PMAY-G was selection of beneficiary. In order to ensure that selection is objective and verifiable and that the assistance is targeted at those genuinely deprived, PMAY-G instead of selecting a beneficiary from among the Below Poverty Level (BPL) households, selects beneficiaries using housing deprivation parameters and Socio Economic and caste Census (SECC) 2011 data which is to be verified by the Gram Sabhas. Using this data a permanent waitlist of the households which are houseless is to be generalised to ensure that the states have a ready list of households to be covered under the scheme in coming year (Pradhan Mantri Awaas Yojana-Gramin PMAY-G: A Door to Dignity Fulfilling the Aspirations of Houseless and Poor People of Rural India, n.d.)

In order to ensure better quality control, setting up of a National Technical Support Agency (NTSA) is envisaged. Lack of skilled masons in one of the major constraints in the construction of quality houses and to overcome this pan-India training and certification programme has been launched by States/UTs. In order to ensure timely progress of construction with acceptable quality, it has been envisaged to tag PMAY-G beneficiary with a field level government functionary and a rural mason.

There is a bouquet of house design typologies inclusive of disaster resilient features that is suitable to local geo-climatic conditions. These designs are developed through an elaborate public consultative process. This exercise will ensure and beneficiary does not over-construct the house in initial phases leading to incomplete house and need of borrowing money by the beneficiary to complete the house.

Programme implementation and monitoring of the houses being constructed under PMAY-G is to be carried out through an end-to-end e-governance model using – Awaasoft and Awaasapp. These two Information Technology (IT) applications help identify and deviation in achievements of targets and assist in mid-course correction in the implementation of the programme. All payments to beneficiaries are to be through DBT to beneficiaries Bank/Post office accounts registered in Awaasoft MIS.

The programme implementation is to be monitored not only electronically, but also through community participation (social audit), members of Parliament (DISHA committee), Central and State Government officials and National Level Monitors etc. (Pradhan Mantri Awaas Yojana-Gramin PMAY-G: A Door to Dignity Fulfilling the Aspirations of Houseless and Poor People of Rural India, n.d.)

PMAY-G aims to provide pucca houses with basic amenities to all houseless households and households living in kutcha and dilapidated house in rural areas by 2022. For houses to become homes, adoption of habitat approach through convergence is proposed. Fairness and transparency in identification and selection of beneficiaries is the cornerstone for realising the goal of Housing for All. To ensure that assistance is targeted at those who are genuinely deprived and the selection is objective and verifiable, the housing deprivation parameters in the SECC data will be used for identification of the households and then verified by Gram Sabhas. There will be multi-layered prioritization within the universe of eligible PMAY-G beneficiaries.

3.6.1. Selection of beneficiaries

The eligibility of the beneficiaries is based on the “Socio-Economic and Caste Census” parameters which is further verified by the Gram Sabhas. All houseless households with no house, one or two-room that has kutcha walls and kutcha roofs filtered through an exclusion process are eligible. The following criteria listed under PMAY-G compulsory inclusion are: “(i) households without shelter; (ii) destitute/living on alms; (iii) manual scavengers; (iv) primitive tribal groups and; (v) legally released bonded labourer” (*Pradhan Mantri Awaas Yojana - Gramin*, 2024). Further, a “multi-layered” prioritization is also used to draw the list of beneficiaries. Social category of SC/ST, Minorities and others, including houseless households are ranked higher than houses with a greater number of rooms (*Pradhan Mantri Awaas Yojana - Gramin*, 2024).

3.6.2. Exclusion criteria of PMAY-G beneficiaries

The exclusion list includes the: “(i) households that own motorised two/three/four wheeler or motorised fishing boat; (ii) households that own mechanised three/four-wheeler agricultural equipment; (iii) Kisan credit card owner with a credit card limit of INR 50,000 or above; (iv) households with any member with a government job; (v) households with non-agricultural enterprises registered with the Government; (vi) households with any family member earning more than INR10,000 per month; (vii)

households with any member paying income tax or professional tax; (viii) households that own a refrigerator; (ix) households that own a landline phone; (x) households that own 2.5 acre or more of irrigated land with at least one irrigation equipment; (xi) households that own 5 acres or more of irrigated land for two or more crop seasons and; (xii) households that own at least 7.5 acres of land or more with at least one irrigation equipment” (*Pradhan Mantri Awaas Yojana - Gramin*, 2024).

3.7. PAHAL-II: Manipur

A study was conducted under the PMAY Scheme to as a measure to encourage traditional and local construction techniques that are unique to the region popularly known as PAHAL or Prakriti Hunar Lokvidya (PAHAL). A number of typologies were developed with variations even at the state level which was based on study conducted of the region. The need and importance of the acceptance of these typologies and its cultural and social appropriateness were highlighted (Katharpi & Doloi, 2018). Under the PAHAL compendium, Manipur is divided into three zones namely Zone A, Zone B and Zone C which is discussed in the below section.

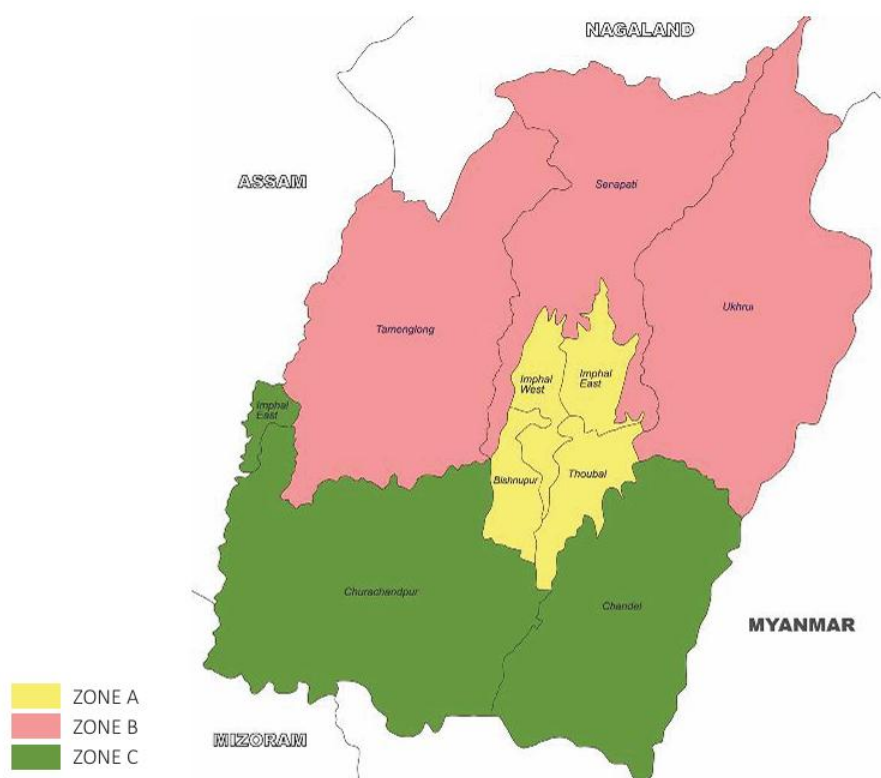


Figure 22: Zones of Manipur divided under PAHAL Scheme

3.8.1. Zone A Profile of Manipur

Zone A as described in the PAHAL document comprises of Imphal West and East, Bishnupur and Thoubal which includes both the valley areas and adjoining hills. The traditional construction that is practiced is adobe house where the predominant ethnic group includes Meiteis and some Kabuis according to the document. The document includes proposed material that can be used including cost-breakup. The total built-up area of MN-01A is 68.25 sqm (734.64 sq.ft.) and MN-01B is 66.00 sqm (710.42 sq.ft) with estimated cost of INR194,532 and INR197,263 respectively (Prakriti Hunar Lokvidya-PAHAL II, n.d.).

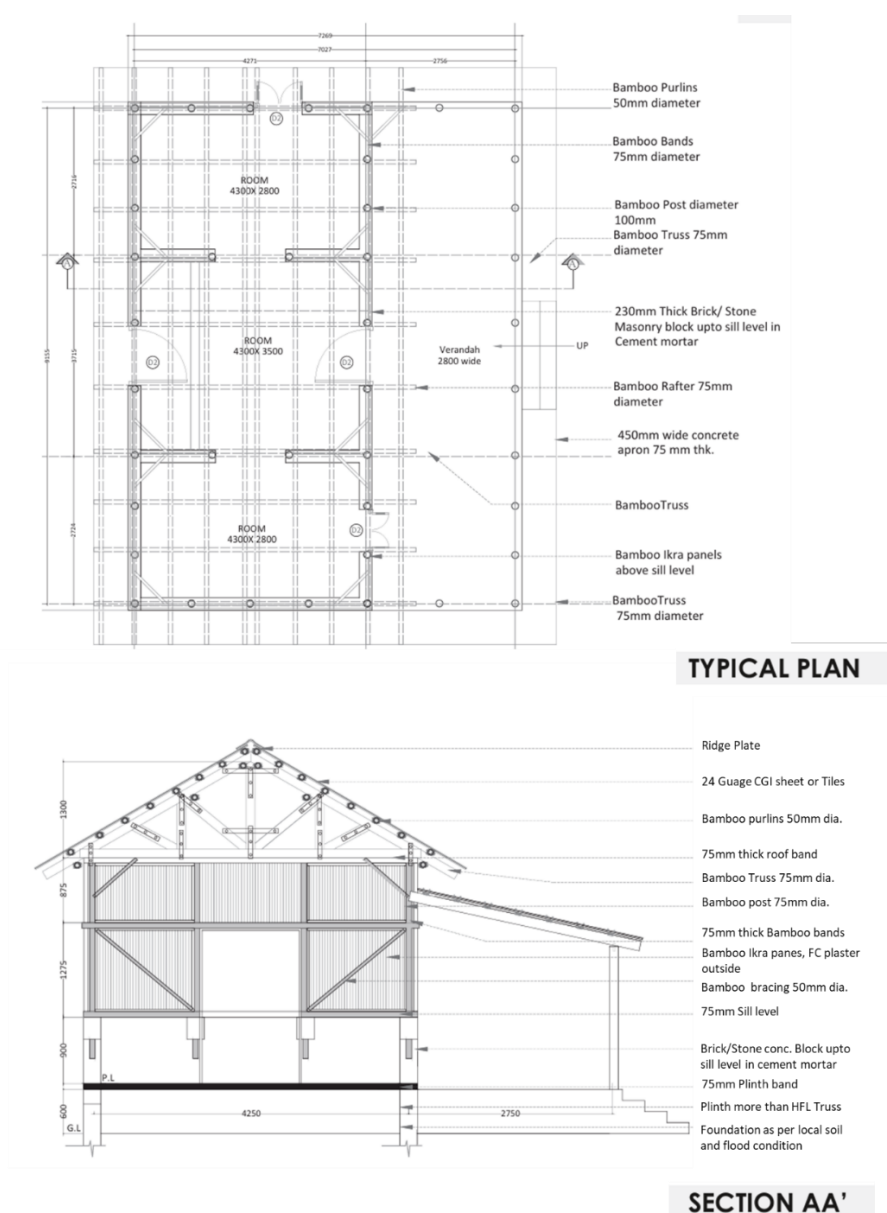


Figure 23: Proposed Type MN-01A for Zone A (PMAY-G, Ministry of Rural Development, Government of India)

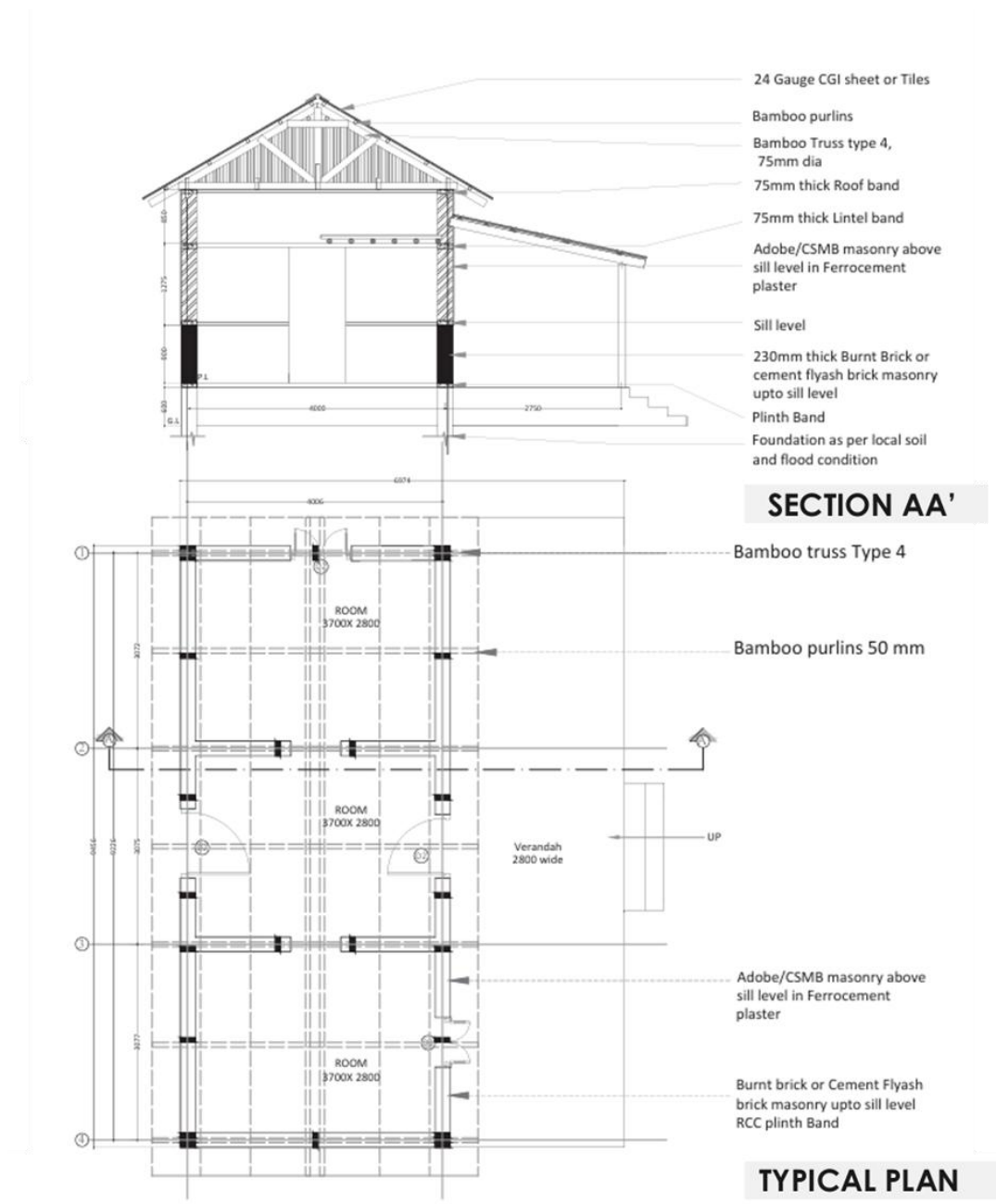


Figure 24: Proposed Type MN-01B for Zone A (PMAY-G, Ministry of Rural Development, Government of India)

3.8.2. Zone B Profile of Manipur

According to the PAHAL compendium Zone B comprises of Tamenglong, Senapati and Ukhul district which constitutes the higher hill areas towards the north and northeast part of Manipur. The traditional construction primarily used is timber with the predominant community being Naga and its various subgroups. The proposed size of the dwelling unit is 29.98 sqm (322.70 sq.ft.) with an estimated cost of INR180,541.

The PAHAL-II document highlights the plan of the house as L shape, however the plan and the section denote a rectangular house.

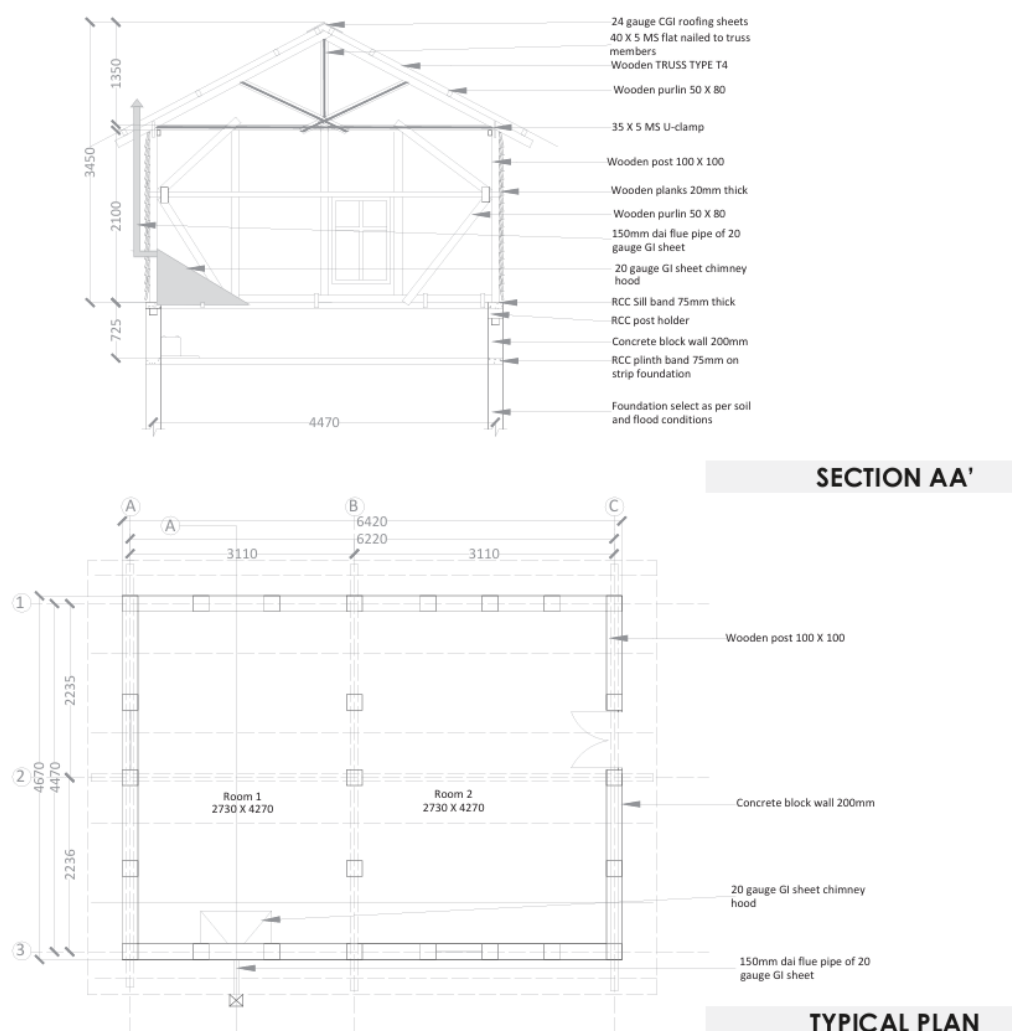


Figure 25: Proposed Type MN-02 for Zone B (PMAY-G, Ministry of Rural Development, Government of India)

3.8.3. Zone C Profile of Manipur

The Zone C as per the PAHAL compendium comprises of Churachandpur and Chandel with lower elevation hills as compared to Zone B. The traditional construction material primarily used as highlighted by the compendium is bamboo and the predominant community being Kuki and its sub-group.

The proposed unit in this zone is described as L-shape however the plan and section illustrated in the document is rectangular in shape. The built-up area is 70.39 sqm (757.67 sq.ft.) with a total cost of INR207,300.

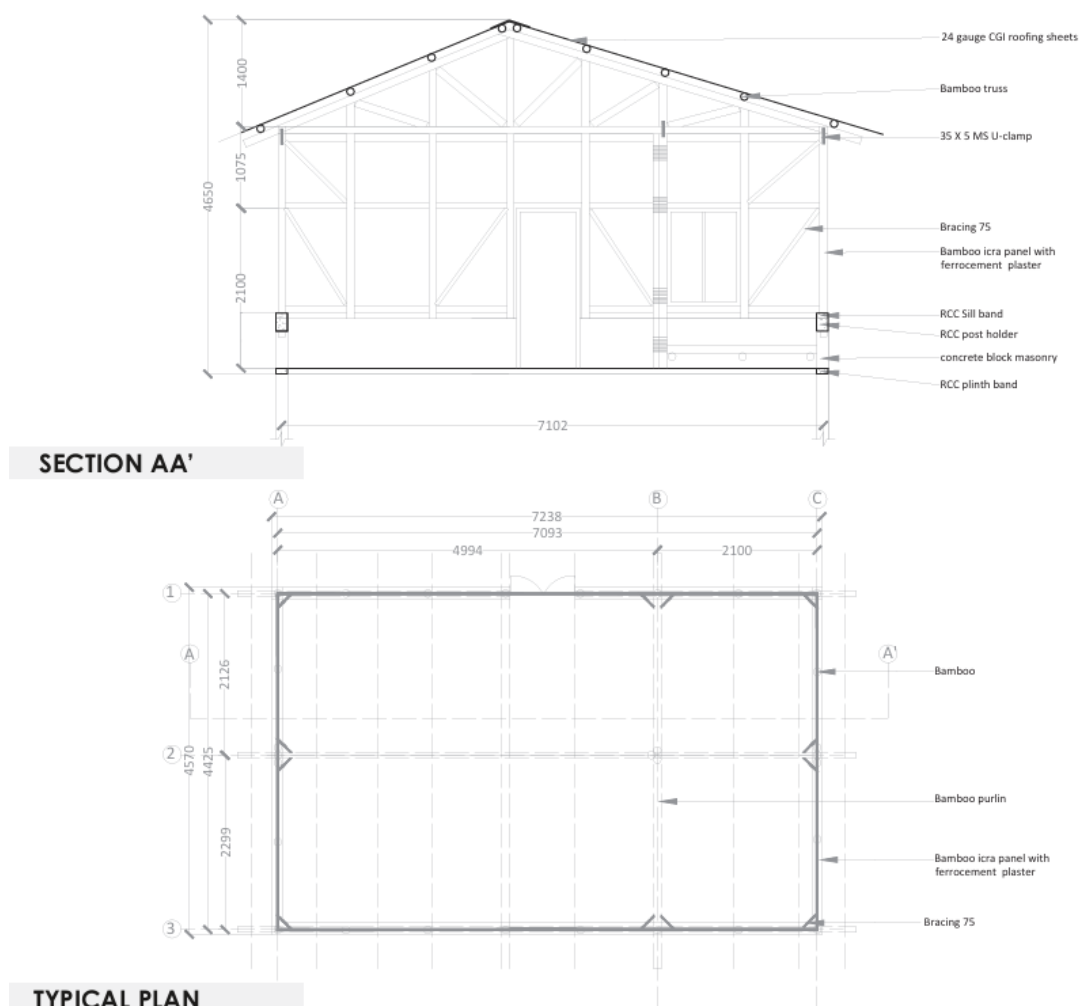


Figure 26: Proposed Type MN-04 for Zone C (PMAY-G, Ministry of Rural Development, Government of India)

3.8. PAHAL-II: Assam

Assam is divided into 5 zones according to physiographic profile of the region according to the PAHAL compendium. The typology developed were based on geographical features of the region namely plains, hilly areas and flood prone areas with the consideration of locally available building material and construction technology.

The following section discusses the characters of each zone along with the proposed typology.

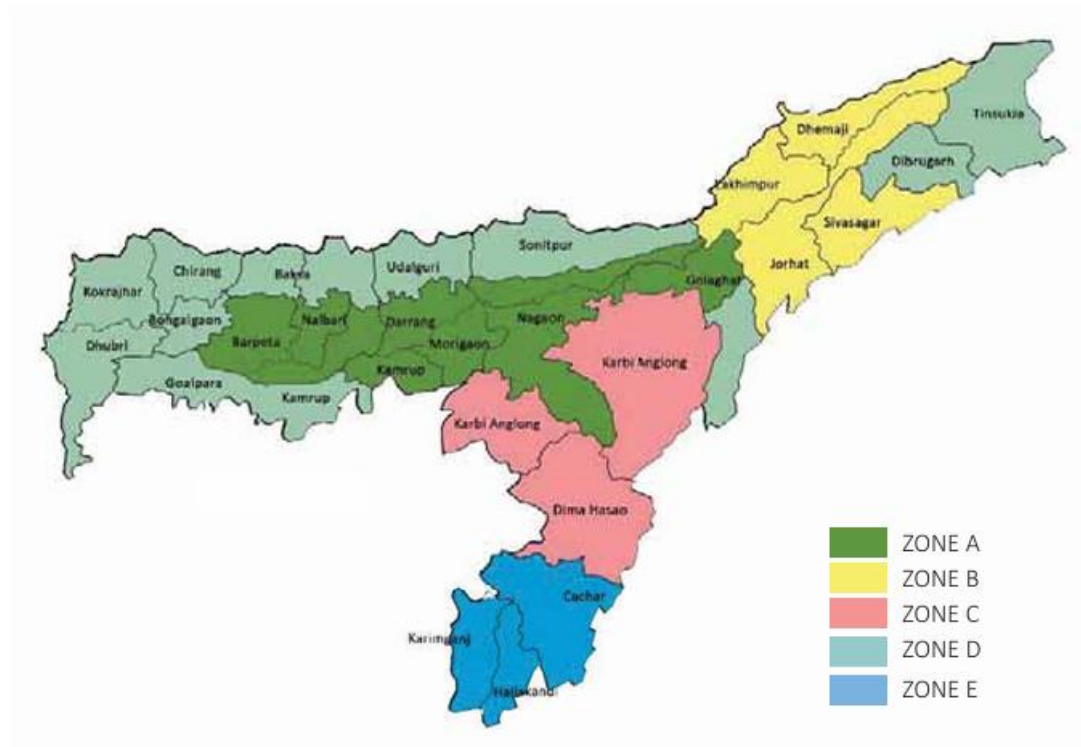


Figure 27: Zones of Assam as per the PMAY-G PAHAL II Compendium

3.8.4. Zone A Profile of Assam

Areas that are prone to flooding and areas that are flooded are the primary components of Zone A. All of the land in this zone is located on the flood plains of the Brahmaputra River. Some of the most important areas include Marigaon, Nalbari, and Nagaon.

Moreover, there is hardly any forest cover in this region. There is a total built-up area of 52.05 square meters (560.27 square feet) in the typology that was produced for this zone, and the estimated cost is 167,268 Indian currency. A key type of construction material that is observed in the region is brick masonry, which is incorporated into the design of the building.

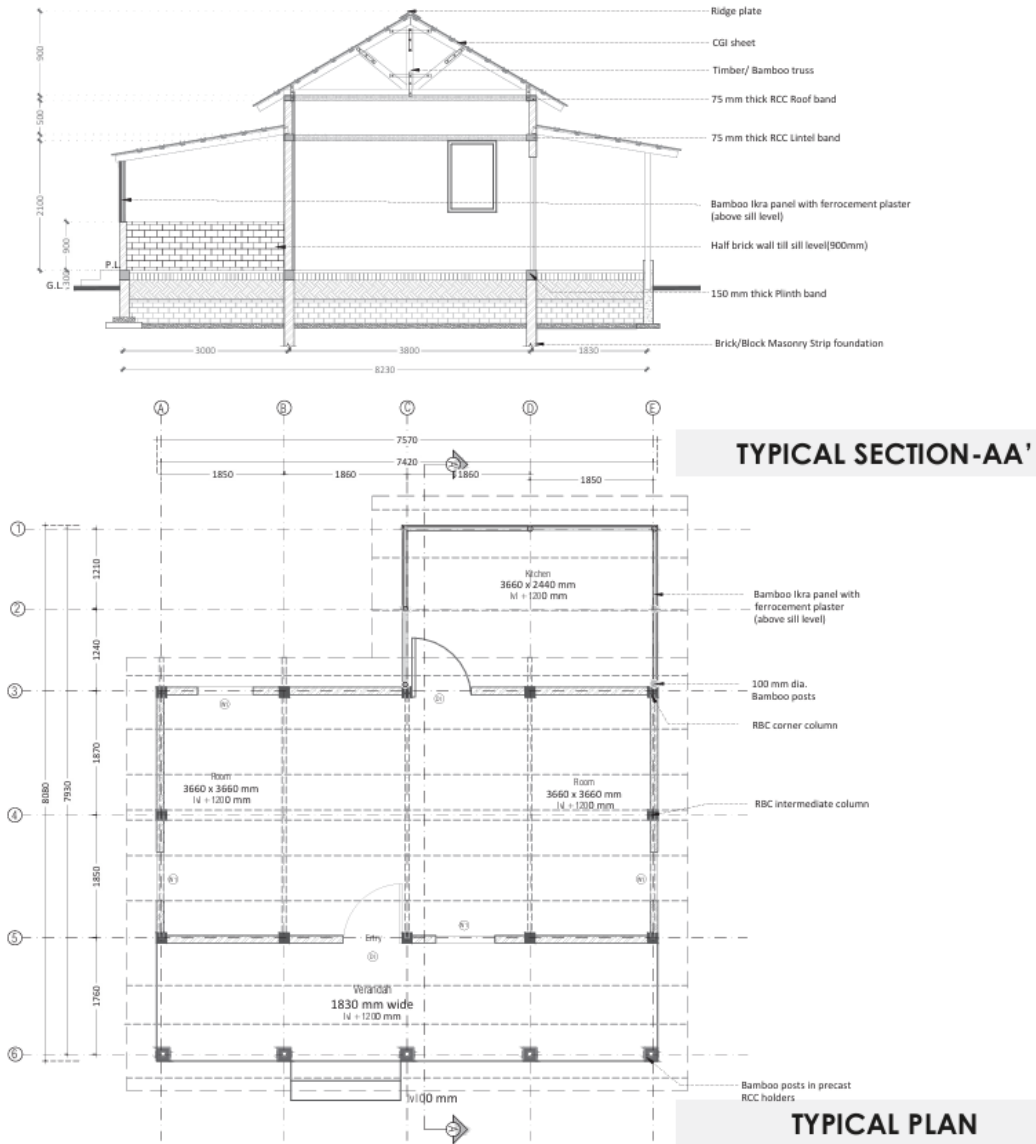


Figure 28: Proposed Type AS-01 for Zone A (PMAY-G, Ministry of Rural Development, Government of India)

3.8.5. Zone B Profile of Assam

Zone B comprises of the district of Dhemaji, Lakhimpur, Jorhat and Saivasagar and is a high vulnerability flood zone with the likelihood of flood inundation. The zone is observed to have good bamboo construction. The proposed design is a stilted house design with half-brick wall up to sill level. The total built-up area is 53.74 sqm (578.46 sq.ft.) with a total cost estimate of INR 155,808.

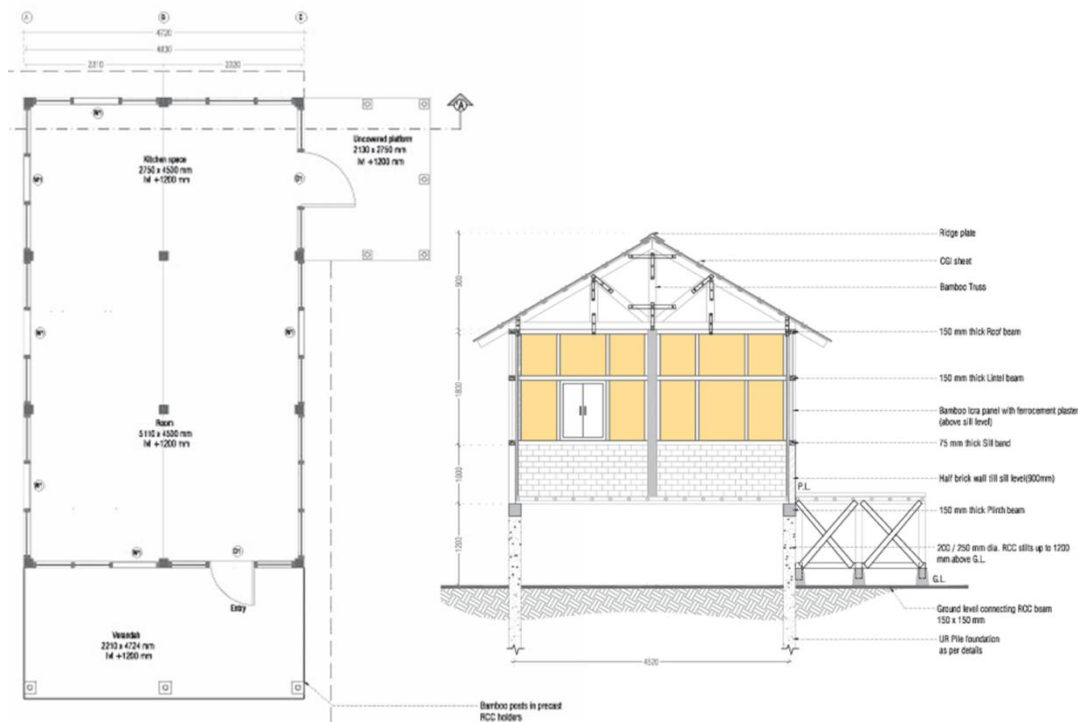


Figure 29: Proposed Type AS-02 for Zone B (PMAY-G, Ministry of Rural Development, Government of India)

3.8.6. Zone C Profile of Assam

Zone C comprises of the tribal belt of Karbi Anglong and Dima-Hasao. The area comprises of hilly areas and is vulnerable to landslides. The traditional dwelling units are built majorly with timber and bamboo where wooden posts are used as structural members. Interwoven bamboo mats are commonly used as materials for walls. The total built up area of the proposed typology is 79.53 sqm (856 sq.ft.) with a total estimated cost of INR176,949.

An alternative typology proposed in this zone is based on to traditional typology of Karbi tribe as per the PAHAL compendium. The building material proposed for this typology includes naturally available material such as timber and bamboo that grows in abundance in this zone. The built-up area is 29.32 sqm (315.60 sq.ft.) and the estimated cost of construction is INR128,714.

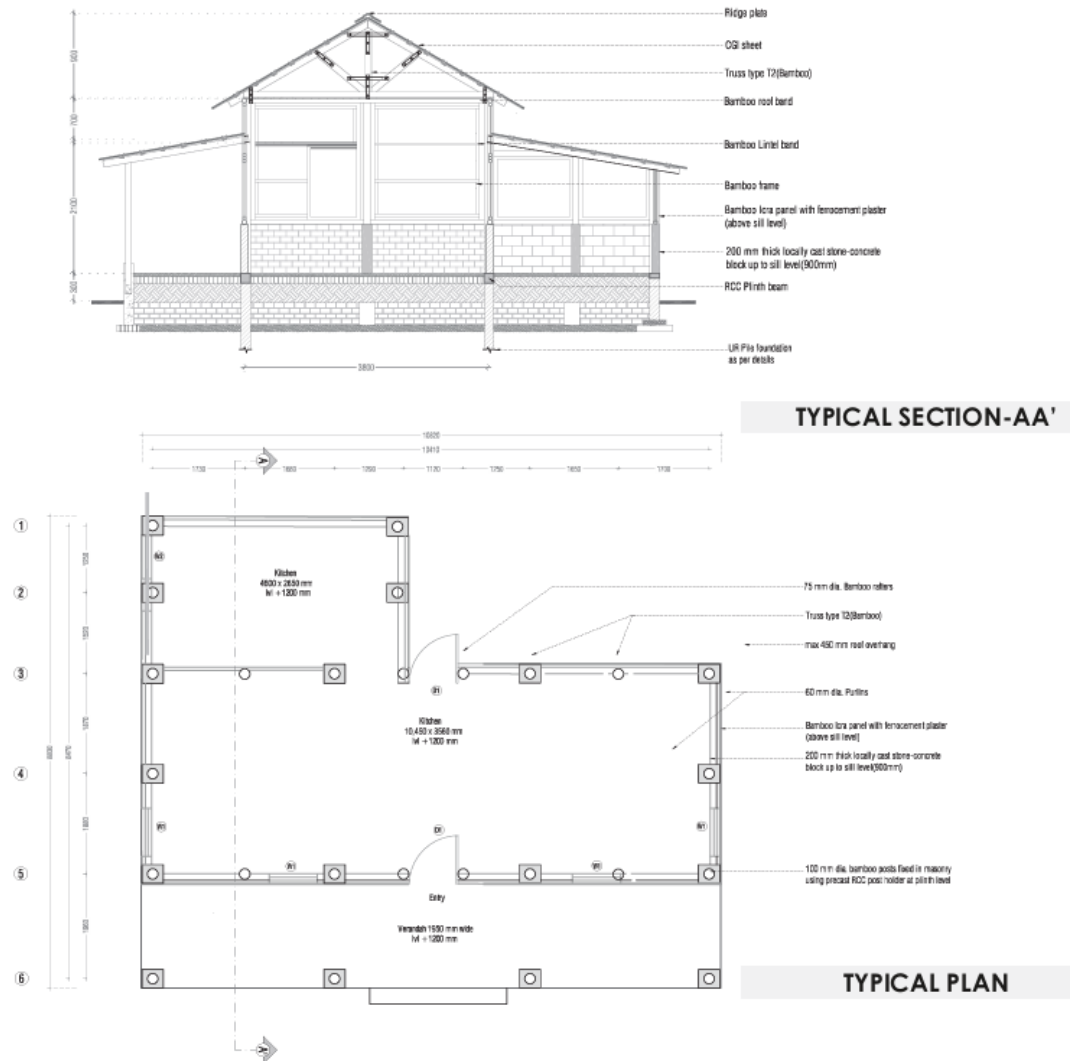


Figure 30: Proposed Type AS-03 for Zone C (PMAY-G, Ministry of Rural Development, Government of India)

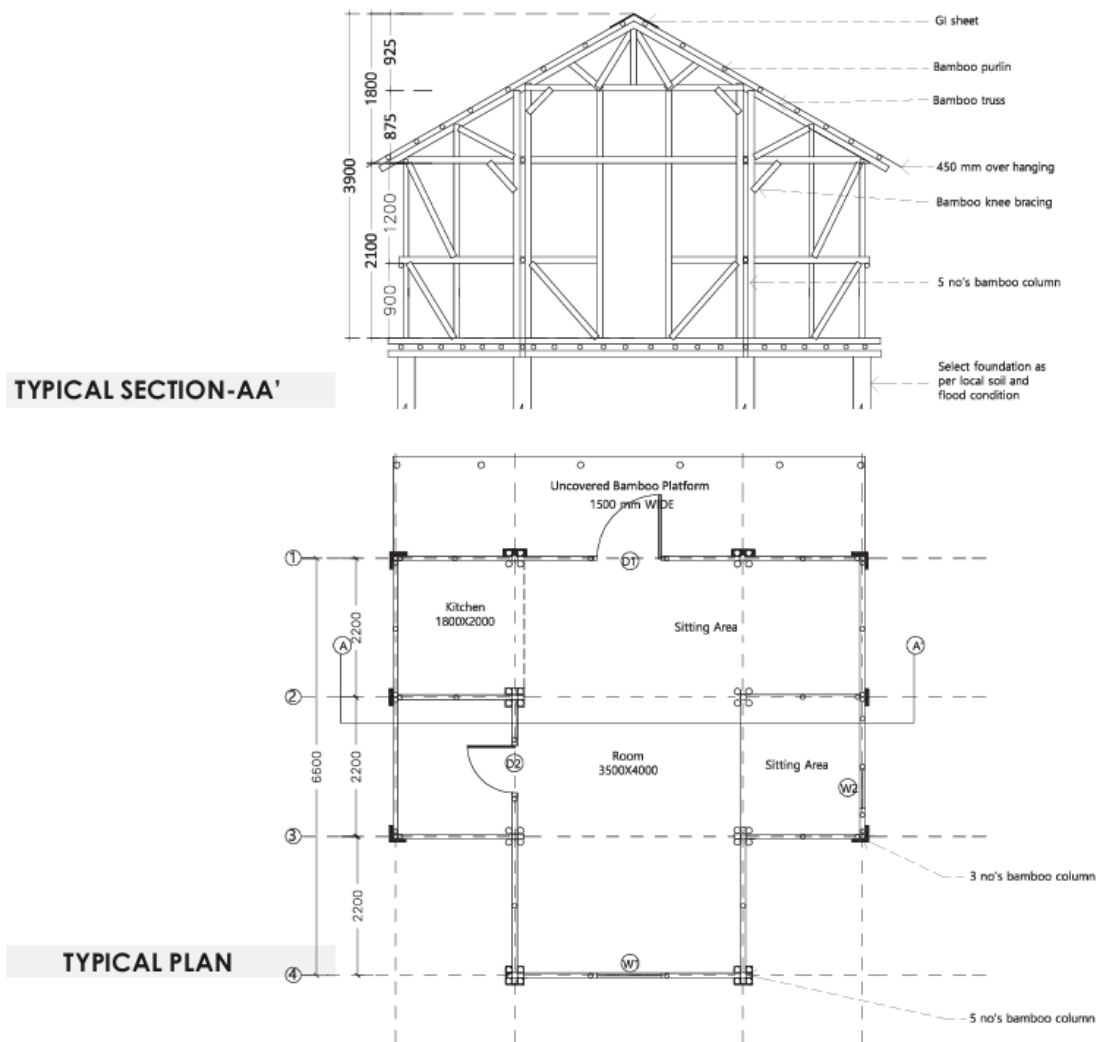


Figure 31: Proposed Type AS-06 for Zone C (PMAY-G, Ministry of Rural Development, Government of India)

3.8.7. Zone D Profile of Assam

The zone comprises of Kokrajhar, Chirang, Baksa, Udalgiri, Sonitpur, Bongaigaon, Dhubri, Goalpara, Kamrup and south Golaghat. Most part of the zone has low vulnerability to flood. The proposed typology in this zone is based on Assam type house construction of wooden frames and infill bamboo mat plastered walls. The built-up area of the proposed design is 72.26 sqm (777.80 sq.ft.) with a cost estimate of INR 186,404.

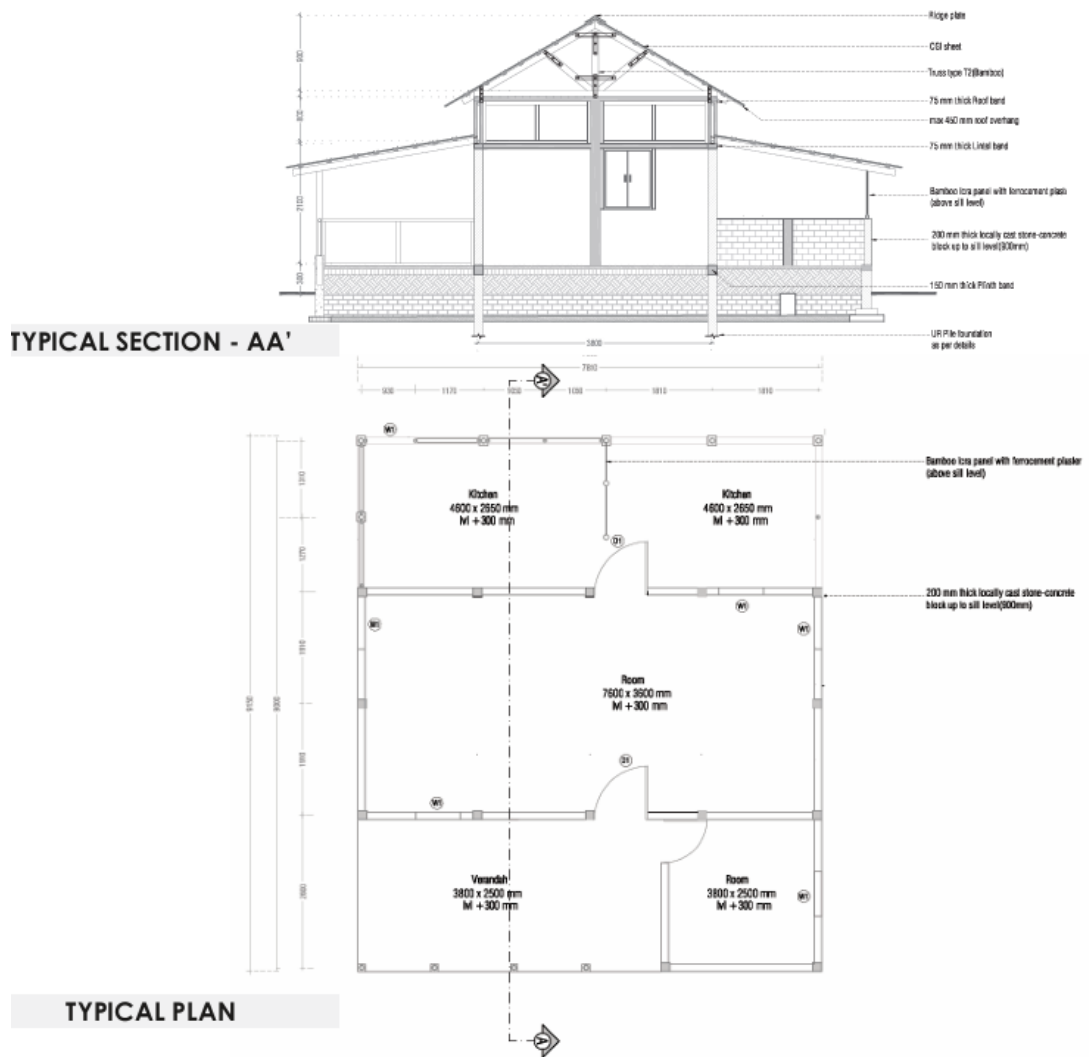


Figure 32: Proposed Type AS-04 for Zone D (PMAY-G, Ministry of Rural Development, Government of India)

3.8.8. Zone E Profile of Assam

Zone E comprises of Cachar, Karimganj and Hailakandi with lower vulnerability to flooding, however the zone has a higher vulnerability to storms and cyclone. Brick is a readily available building material as per the PAHAL compendium. The proposed built-up area is 94.35 sqm (1015 sq.ft.) with a total estimated cost of INR197, 247. The structure is modelled around the traditional house form of the region.

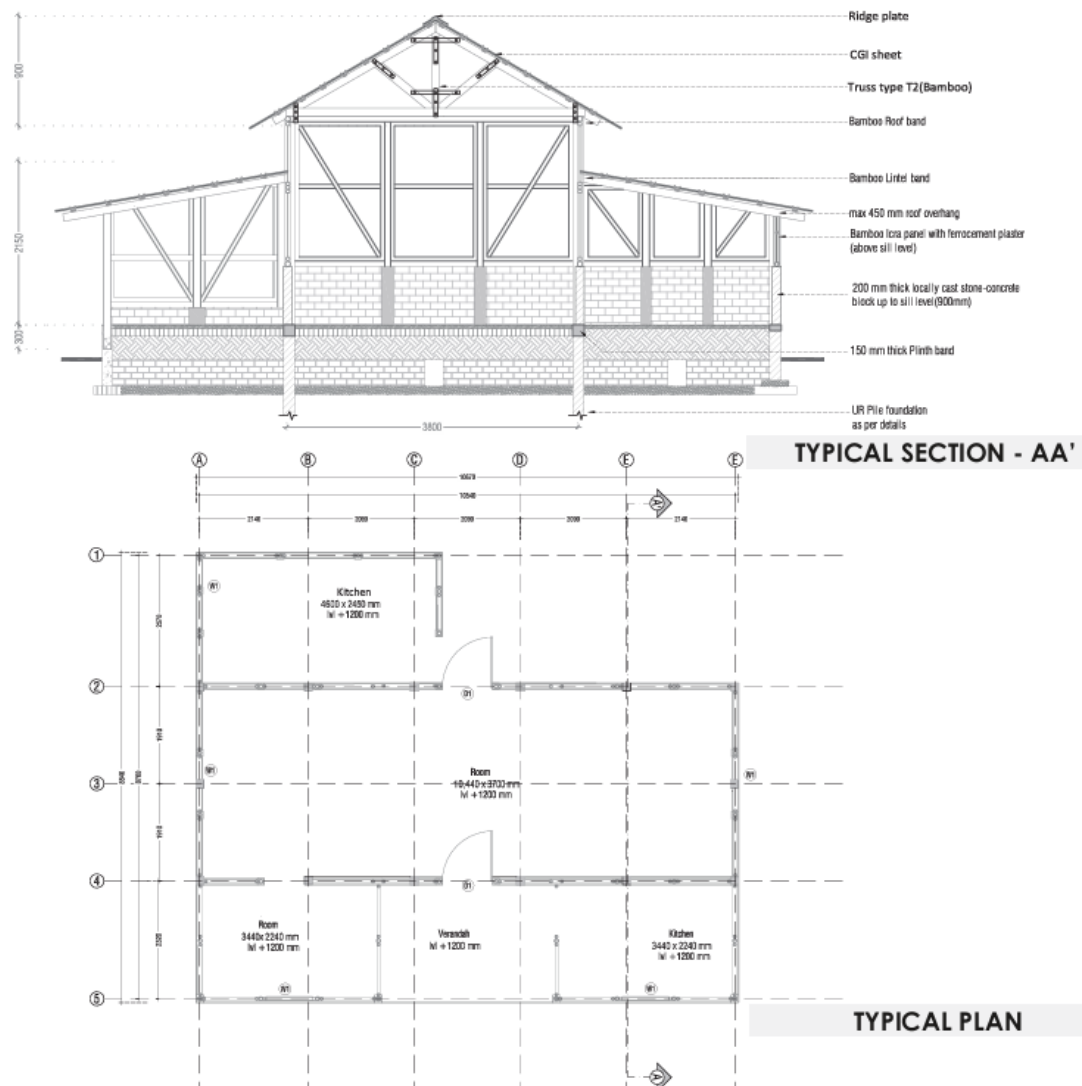


Figure 33: Proposed Type AS-05 for Zone E (PMAY-G, Ministry of Rural Development, Government of India)

On site interaction with beneficiaries and local agents on ground have highlighted that a number of beneficiaries have not chosen the typologies as many admitted that they were unaware of existence of such a document, the design did not conform to their cultural norms, not happy with the choice of building material as well as one lack of more funds.

3.9. Conclusion

The chapter brings forth Northeast India's rural housing challenges, particularly the misalignment between vernacular specificities and PMAY-G typologies. Manipur's Meitei settlements (3.2; Figs.12-17) integrate Shumang rituals, Tulsi orientations, kolups, and Loktak adaptations into resilient forms. However, PAHAL-II designs (Figs.23-26) for Zones A–C fail to accommodate these, imposing standardized layouts.

Parallel patterns emerge in Assam (3.4; Figs.19-21,27-33), where plains kinship spaces contrast AS-typologies. State policies (3.3/3.5) and PMAY mechanics (3.6-3.8) emphasize quantitative targets over cultural nuances.

These observations align with literature gaps (Ch2.6.3), emphasizing H1's applicability. The selected sites enable comparative analysis of pre/post-PMAY manifestations. Chapter 3 thus prepares the empirical phase in Chapter 4, where surveys quantify cultural-physical interdependencies.

CHAPTER 4: RESEARCH APPROACH AND DATA ANALYSIS

The research aimed at getting data from a homogenous community in the rural area with a good mix of new construction under PMAY-G scheme and existing traditional fabric. The state identified for the study were Assam and Manipur. Both qualitative and quantitative data were collected along with contextual study of the rural traditional settlement. Four locations were identified in the plain areas of the two states with comparable cultural attributes. Further there is a high level of similarity in their economic activity, cultural values, dwelling system and community setup and systems. Baksa and Kokrajhar district were identified in Assam and Bishnupur and Thoubal district in Manipur for the purpose of this research. While traditional norms of construction in terms of space allocation, building orientation played a major role in the construction of houses, Assam's approach to building dwelling unit was the economic status and budget of construction. The combination of both having similar cultural context but different in terms of approaches gave a pragmatic base to understand the need of culture in social housing schemes and its sustainability and acceptance in rural areas where the social system is very unique. The following sections describe the four study areas.

4.1. Case Study Approach

The case study area was selected with a target to capture the complexity of cultural context as culture is defined “as a complex whole that includes knowledge transferred through generations, belief system, laws, customs and any other habits developed by man as part of the society” (Tylor, 2010). Two of the study area selected, focused on availability of cluster of houses under PMAY-G scheme with same ethnicity, while two study area with multi-ethnicity with availability of cluster of houses built under PMAY-G scheme were identified so as to not limit the existence of culture within community belonging to same ethnicity. This further enabled purposive sampling with a theory-based strategy in order to ascertain “manifestations of a theoretical construct so as to elaborate and examine the construct and its variations” (Palinkas et al., 2015).

The research aimed to explore the relation of culture and built environment in centrally funded government housing schemes. The beneficiaries of PMAY-G scheme which is the ongoing scheme that funds rural housing are distributed widely. Cases in Manipur and Assam were selected as these cases were similar in culture and ethnic composition.

Case specific research is a more preferable choice when the research question is a how question (in this case “How various facets of culture influence the built environment?”) (Hollweck, 2015). The research also focuses on providing an evidence-based result that will benefit implementation of social housing schemes and other policy and development initiatives that directly impacts the life and culture of rural population.

4.2. Bishnupur

Bishnupur was one of the three administrative division of the valley of Manipur that was followed in 1901, however, with the growth of population, Manipur had 9 districts as per the 2011 Census of India. Bishnupur has a very strong historical and cultural background along with unique geographical setup that shaped and defined the built environment. Historically, a major part of the district was under the “*Moirang clan*” which was one of the 7 clans of the then Kingdom of Manipur. Bishnupur also was a strong confluence of culture in the early ages as “Bishnupur was a gateway of travelers going out of the State or entering it via Cachar in Assam” (District Census Handbook Bishnupur, 2011).

The district has a geographical size of 496 sq.km with three sub-division namely Nambol, Bishnupur and Moirang. The district has a total of 49 villages and 7 towns as per Census 2011. The district falls entirely in the valley of Manipur with few hillocks dotting the place. Loktak lake, which is the largest fresh water lake in Northeast India forms a major portion of the district.

4.2.1. Demographic profile

As per Census of India 2011, the district has a total population of 23,73,99 which is about 12% of the total population of the state with a density of 821 persons per sq.km. Out of the total population of the district 63.1% is rural population. The district recorded a 13.9% decadal growth which is the lowest among other districts of the state (District Census Handbook Bishnupur, 2011)..

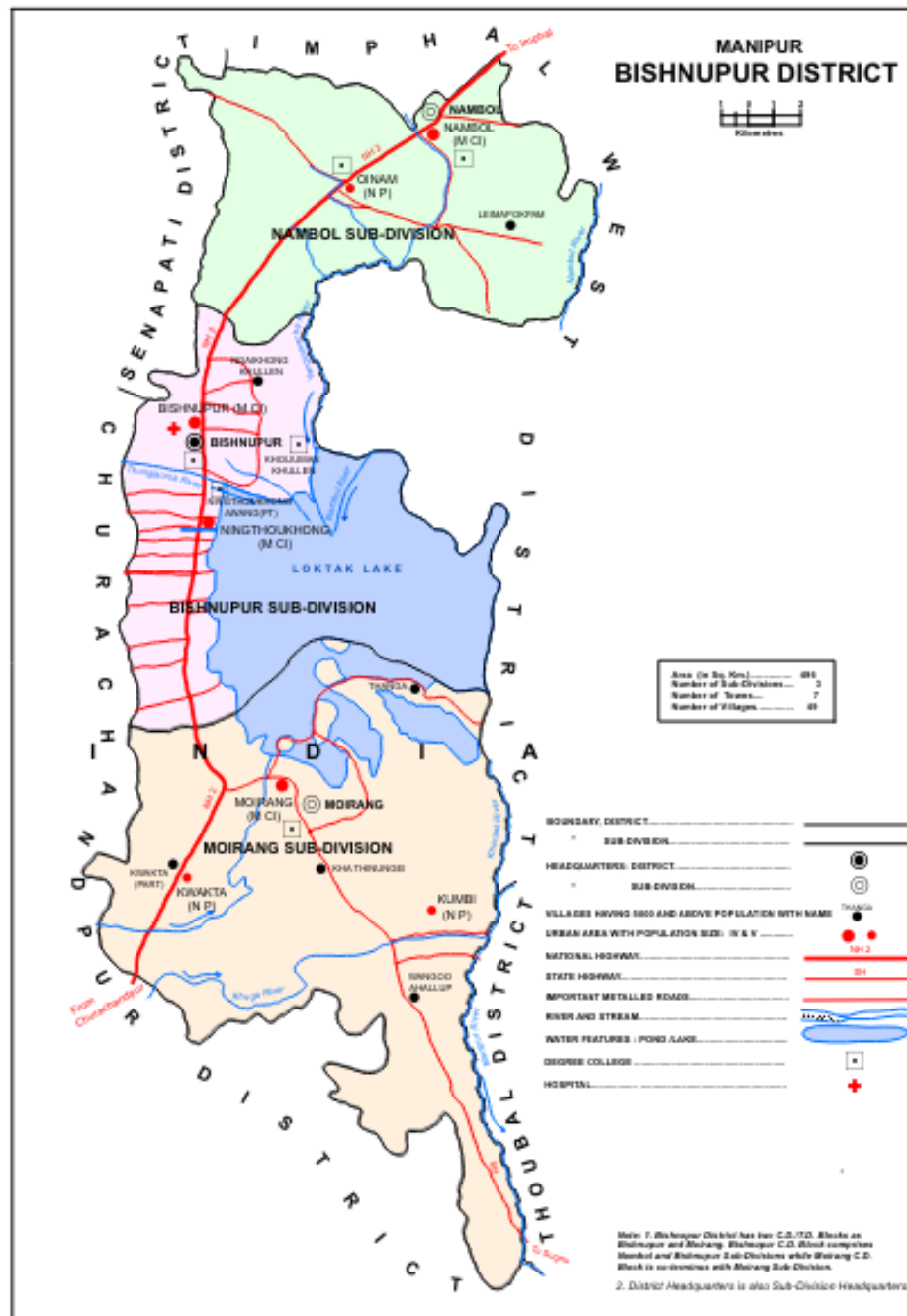


Figure 34: District Map of Bishnupur (Census of India 2011)

4.2.2. House and Household Characteristics

The district has a total of 46,413 households with 29,199 rural households (Census, 2011). The average household size of rural areas of the district is 5.1. Majority of the occupied residential census houses were used as residence, however some of the houses were still being used as shops, work sheds as well as resident-cum other uses among other. The district has 48 inhabited villages and 1 uninhabited village. The house has only 5% dilapidated houses. 68% of the total houses had brick as the material

of the wall while rural areas of the district had 72% brick wall. Around 20% of the houses had thatch/grass/bamboo walls. In terms of roofing material, 80% of the houses had Galvanised Iron (GI) sheet which is a very common roofing material across the state (Census of India, 2011).

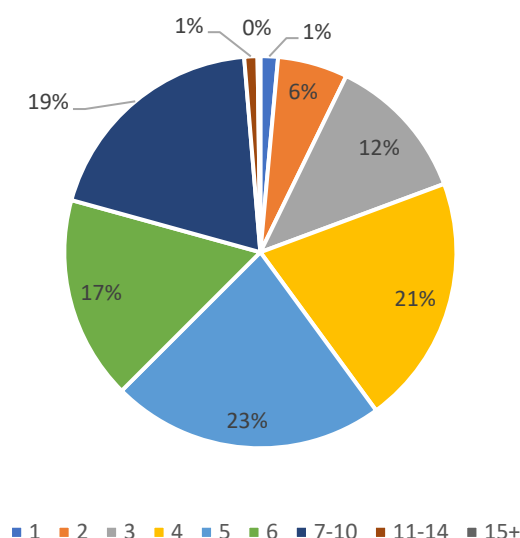


Figure 35: Household size distribution of Bishnupur district (Census 2011)

4.2.3. Economic Profile

The district has a total worker (main + marginal workers) of 1,09,937 out of which 45% of the workers are involved in cultivation and agriculture, while 11% of the workers are involved in household industry. The largest source of fish is the Loktak Lake. About 22,000 ha of water was brought under fish culture operation by the end of 2019-20 (Economic Survey Manipur, 2020-21, 2021). Fish farming is an important economic activity of the district, however a majority of these farms operate at “a very low level of economic efficiency” (N. D. Singh et al., 2015). The district has also received Rural Infrastructure Development Fund (RIDF) to construct 105 of 1 hectare unit ponds and Rashtriya Krishi Vikas Yojana (RKVY) which is a 100% centrally funded scheme to construct mini hatcheries, mini farmers training and 4.40 ha. of farms and ponds at Fish Farm, Haotak (Annual Administrative Report, 2011). The fishes caught are then sold raw or dried and processed and sold in and around the state. In terms of agriculture, cultivation is one of the most important activities. Rice is the main crop and owing to fertile land, there is a surplus harvest that gets sold

in other districts. The district has no large size land holding as there is a cap on land holding of more than 2.5 ha. (District Census Handbook Bishnupur, 2011).

4.2.4. Socio-cultural context and built-environment

The district, owing to its activity has shaped evolution of the built environment. The Census of India 1981 Survey Report of Village (Part Xc) of the village of Ithing in Bishnupur highlights the socio-cultural character that is representative to most households of the district as seen in current scenario too. Fishing and agriculture being the two main economic activities has more or less influenced the lifestyle and the built environment. Limited land for settlement along the water edges of Loktak Lake and hillocks have let to houses defying the norm of houses facing each even though it is the most favourable direction to face according to cultural norms.



Figure 36: Traditional fish traps made of bamboo

Houses either face east, north or south but never west. Most villages in the district either have temples of Hindu Gods or Sylvan Gods and Goddesses or both that becomes the hub of celebration of religious and community festivals. The Mandap which is a square shaped covered only from the top space in front of the temple of Hindu god is used for celebration of religious festivals such as Rath Yatra, Ras Lila, Jhulon etc. Marriages and Shraad (a ritual following the death of a person) are performed in the Mandap if the front open space or “*shumang*” is not large enough to accommodate the invited guest. “*Laimang*” is the open ground in front of the Sylvan God temple that is found in a number of localities in the district. “*Lai Hairoaba*”, an annual celebration of the Sylvan Gods is held in this space. This space also becomes a

space where the annual *Yaoshang* Sports associated with *Yoashang* festival (celebration of arrival of spring that coincides with the Hindu festival of Holi) is held in the *Laimang* which is an important community festival. The entire village participates in celebration of these festivals.

In terms of house forms, the census document of 1981 highlights no change in house of new construction even though newer materials have been used which highlights the cultural norms that are strictly being followed by households in the district. (K. Singh et al., 1981)

“The only difference in the house types is that houses of well-to-do persons have more timbers as against those of the poor where bamboos dominate. In shape and external appearance, the houses of both the rich and the poor look alike. The people of this village give due attention while constructing a residential house right from the selection of building materials till the finishing of the house. They believe that a residential house is meant for the welfare of its inmates. Therefore, before constructing a house, a person will usually consult an astrologer for finding a suitable date for commencing construction of the house.” Census of India, 1981.

The district has a dwelling system of a rectangular house with sloping roof and front open yard with Tulsi plant planted in the centre on a raised platform. The house and the space around functions as spaces to accommodate activities associated with fishing, agriculture, weaving or any other activity that generates income for the household. In terms of family composition, the household mostly has the father as the head of the family, the wife and unmarried children. Married sons usually start a separate household and of the sons take care of the ageing parents and unmarried daughters. Married woman leaves the parental home to move to the husband's home.

4.3. Thoubal

The district of Thoubal lies on the eastern valley of Manipur and was among one of the largest districts in the state till 2016. The district has a total area of 514 sq.km. While still considered as a valley district, it is not entirely plain. The district is dotted

with several lakes and has many rivers flowing through it (District Census Handbook Thoubal, 2011). The district being close to the capital city of Imphal has seen a fair amount of development and the presence of Asian highway passing through it has boost further development in the district. The district has a total of 103 villages and 9 towns.

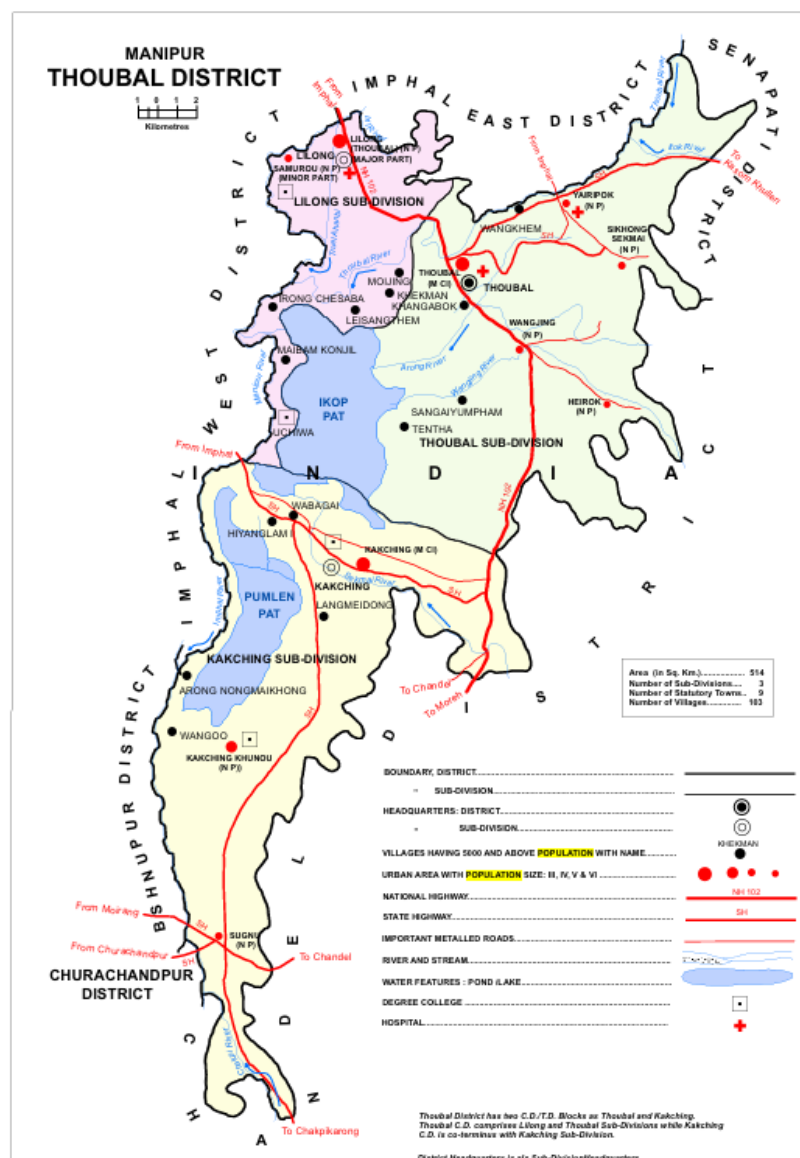


Figure 37: District Map of Thoubal (Census 2011)

4.3.1. Demographic profile

According the Census of India (2011), the district has a total population of 4.2 lakhs out of which 64% lives in the rural area. The district recorded a decadal growth from 2001 to 2011 of 15.9% while rural area's decadal was 16.3% (District Census Handbook Thoubal, 2011). In terms of ethnic groups, the district has more 63% Hindus

(mostly Meitei community), 25% Muslims (Pangan) and about 1% Christian among others (Census, 2011). The district has the highest number of Schedule Cast (SC) in the state with 42% share (Economic Survey Manipur, 2020-21, 2021).

4.3.2. House and Household Characteristic

The district has a total of 85,965 households of which 54,888 households constitute the rural area (Census, 2011). The average household size of the rural area is 4.9. 95% of the houses in the district live in either good or liveable houses as per Census 2011. 80% of the census houses are used as residences while some residences are used as shops, work sheds and other subsidiary activities. With 69% share, brick is the most common material used for walls, while 20% has thatch/bamboo as the material of the wall. GI sheets are the most common roofing material used in the district with 78% share.

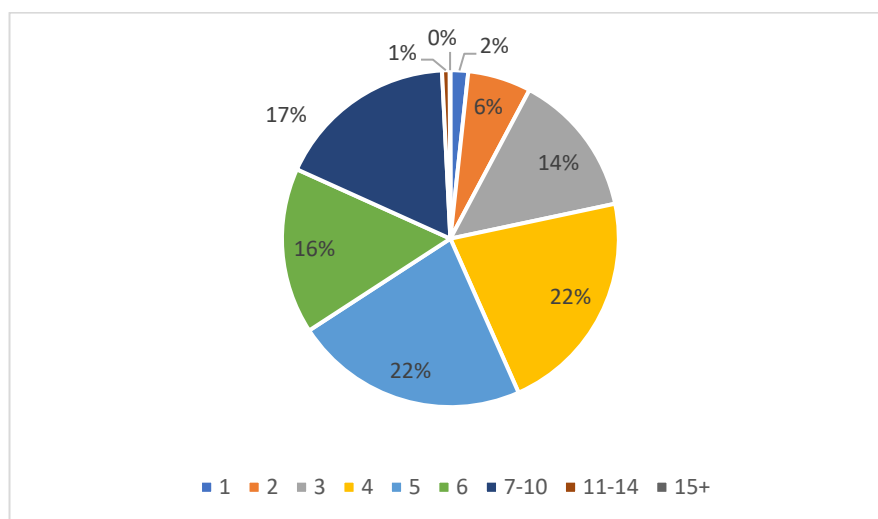


Figure 38: Household size distribution of Thoubal district (Census 2011)

4.3.3. Economic profile

Agriculture is one of the most important sources of livelihood for the district with more than 70% of the population involved directly and indirectly (Economic Survey Manipur, 2020-21, 2021). Animal husbandry is another important economic activity of the district. The district has a total of 1,27,102 workers out which 42.14% is involved in cultivation and agriculture work. 13.55% of the workers are involved in household industries. Thoubal is the second highest producer of rice in the state. A number of Mushroom Development Programme are currently concentrated in the district including training programmes being set up (Economic Survey Manipur, 2020-

21, 2021). Thoubal also received funding under the “Assistance to Pisciculturist Scheme” along with some farmers getting benefit from the Blue Revolution Programme (Neel Kranti Mission). The district also has the highest number of handicraft and handloom units.

4.3.4. Socio-cultural context and built-environment

The district has similar character that of Bishnupur in terms of Meitei community and has not much difference to the built environment. A number of houses had a small temple in the front edge of the house dedicated to Sylvan deity. The settlement is mostly agrarian in nature with agricultural land surrounding the settlement. Meitei-Pangal or Muslims are second largest community in the district. The two communities share a close connection and has strong linkages in terms of culture too. The first Muslim settlers are believed to have come to Manipur as war helpers during 1597 to 1652 and later were given Meitei wives to settle down in the land (Brown, 1873). They are settled mostly along river banks in Thoubal. A flower that was brought by some settlers known as *Kusumlei* forms an integral offering to God as part of the *Cheiraoba* (Meitei Lunar New Year) festival (Mustaque Ahmed & KUMAR Singh, 2007). Houses of the Pangal community are built similar to the Meitei community facing east, however the houses have no space allocated for a deity unlike the Meitei household. Women don't usually go to the mosque for prayers but a space is allocated within the house for prayers. Women are involved in weaving too. Festivals and rituals are conducted in the household space if not conducted in the mosque.



Figure 39: A traditional Pangal House in Thoubal District

4.4. Baksa

Baksa is a district that was carved out from 4 districts of Assam in 2003. The region was ruled by several kings including the British as it was on the path to entering the Northeast region. The district has a total area of 2400 sq.km. Baksa shares international border with Bhutan and has gentle slope starting from foothills of Bhutan to the Brahmaputra River valley. A number of perennial river flows through the region to join the Brahmaputra River. The district is of the alluvial plains of Brahmaputra River system and River Manas sub-basin. The region is a mix of small hillocks and plains (Ground Water Information Booklet Baksa District, Assam, 2013).

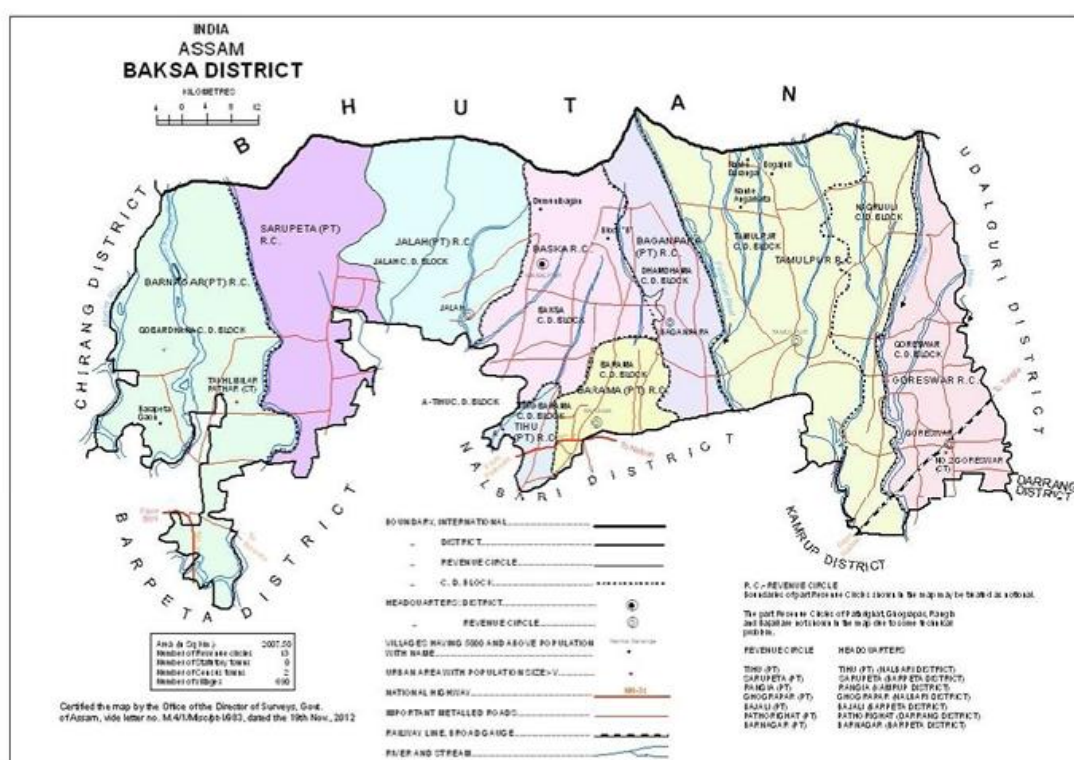


Figure 40: District Map of Baksa

4.4.1. Demographic profile

Baksa has a total population of 9.5 lakhs with 99% of its population living in rural area. The district recorded a decadal growth rate from 2001 to 2011 as 11%. The ethnic composition of the region includes Bodo, Rabha and Garo with Bodo being the largest ethnic group of the district. The district has a high number of Hindus with 35% composition while Muslims share a small number. Scheduled Tribes account for about 58% of the composition while Scheduled Caste is about 13% (District Census Handbook Baksa, 2011).

4.4.2. House and Household Characteristics

The district as has total of 1,91,701 households with 1,89,249 households in the rural area. The average household size of rural Baksa is 4.9 members. 69% of the census rural houses are used as residence while the remaining are used as shops, work sheds, place of worship etc. A large number of the rural population still lives in houses where the walls are Grass/Thatch/Bamboo etc. while 70% of house has GI sheets for roofing material (Census of India, 2011).

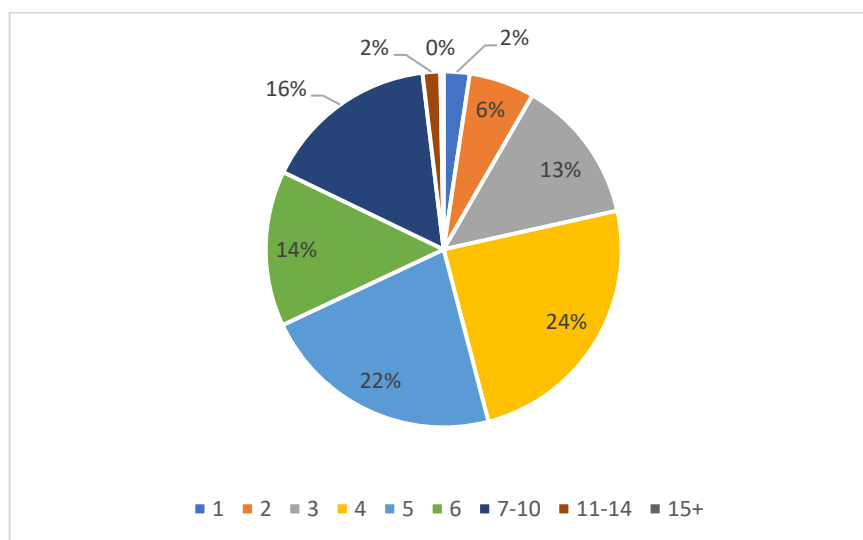


Figure 41: Household size distribution of rural Baksa

4.4.3. Economic Profile

Baksa is an agrarian society with 75% of the population involved in agriculture and allied activities with paddy was the main crop (Sectoral Projections for the Year 2016-17, 2016). Sericulture, piggery, poultry, dairy etc. are other sector that are other activities. The district has also started producing horticulture crops such as areca nut, coconut, banana, pineapple etc. The districts have seen a number of development initiatives through various organizations and development agencies. National Bank of Agriculture and Rural Development (NABARD) have implemented several programmes such as the Integrated Tribal Development Project, Micro-enterprise development project etc. (Potential Linked Credit Plan: NABARD, 2023).

4.4.4. Socio-cultural context and Built Environment

Baksa over time has developed as a multi-ethnic district. Some of the ethnic groups that inhabits the region includes Kaibarttas, Kalitas, Brahmin, Rabhas and Bodo being

one of the major groups. Most villages developed along one main village with houses on both sides. Houses have a sufficient size plot with an open courtyard in the front along with sheds for weaving, cow shed, granary and patches of kitchen gardens. Traditional houses are constructed on mud foundation with walls made of bamboo or reeds plastered with mud. The following excerpt from the Village Monograph Series of Census of India describes a typical village house from 1961:

“A typical house is usually one-storied only with a roof of thatch fastened by cane and generally with two main slopes except in the case of the houses having a verandah, which have one more slope of the roof. The sizes of the slopes are between 6 feet to 8 feet in length. The doors are made of plank or of woven split bamboo, the size being approximately 5 feet by 3 feet. The arrangements of windows and ventilators are very poor, the latter being almost absent while only one or two windows either of wood or split bamboo hung over rings of canes are used but without any specific size or measurement.”(Pakyntein, 1961).

The compound either have bamboo fencing and a number of trees such as betel nuts, bamboo and other trees are grown at the edges to give privacy to the compound especially from the roadside.



Figure 42: A typical Assamese settlement

In some other cases, two or three dwelling unit exist within the same compound which are usually married sons moving out to separate households. Rituals of marriages, funerals, child birth are held in the premises of the dwelling compound. The courtyard becomes an important ceremonial space during such rituals. Members of the community forms a close-knit society.

4.5. Kokrajhar

Kokrajhar is known as the gateway to Northeast India. The district was previously part of Goalpara district. Kokrajhar is also part of the Bodoland Territorial Area District (BTAD) with Kokrajhar town as the headquarter. The district has a total area of 3296 sq.km. in which 3279 sq.km. is rural. Kokrajhar lies on the northern banks of the Brahmaputra River with a major portion of the district are plain except the northern part which forms the foothills of Bhutan Hills. The Brahmaputra River renders it as one of the most fertile plains of the region. The region also has abundant tributaries flowing to the mighty river (Census of India 2011 Assam Series-19 PART XII-A District Census Handbook Kokrajhar, 2011).

4.5.1. Demographic profile

The district has a total population of 8,87,142 out of which 8,32,201 lives in rural area which is 93.8% of the total population. 5.11% was the decadal growth recorded from 2001 to 2011. Bodo constitutes a majority of the population. 31.41% of the population are Scheduled Tribes while 3.33% are Scheduled Caste. The Scheduled Tribe which is Boro/Boro-Kachari constitutes 80.76%, Rabha 7.99% and Garo 3.74% (Census, 2011). Hindus constitutes 60% of the district population, while Muslims constitute 26% and Christians 11%.

4.5.2. House and Household Characteristics

The district has a total household of 1,80,618 out of which 1,69,007 households are in rural area constituting 94% of the total household. The average household size of Kokrajhar is 4.9. 82% of the census houses in rural area are used as residence while the remaining are used as factory/work sheds, places of worship, lodges etc. 65% of the census houses in the rural area use grass/ thatch/ bamboo etc. as material for walls while 19% of the houses' wall are made from mud brick or burnt bricks. 69% of the

rural houses use GI sheets as roofing material while 16% use thatch. About 8% of the houses use plastic as the roofing material (Census of India, 2011).

4.5.3. Economic profile

Agriculture is one of the primary occupations of the district with paddy as one of the major crops. The districts also produce a wide variety of cereals. Rearing of livestock like such cattle, goats, buffaloes, sheep are common in most households. The Government is encouraging the people to take up fishing. The district has 38.45% of workers (main + marginal). 62.46% of the workers are involved in cultivation and agricultural activities while 3.64% are involved in household industry. The district also has a number of industries coming up. The district also has a number of weavers along with handloom production centres.

4.5.4. Socio-cultural context and built environment

Kokrajhar has a large Bodo community however its position as a gateway to Northeast India has led to a number of changes in the societal and cultural composition. Indigenous community includes the Kalitas, Brahmins, Koch, Baniyas, Keot, Kaibartas, Kumars, Muslims. Santals, Mundas, Orias and Bhumis are the tea plantations people while the district is also home to Bengalis, Marwaris and Nepalese (Census of India 2011 Assam Series-19 PART XII-A District Census Handbook Kokrajhar, 2011). A number of Boros are follow the Hindu religion under various sects such as Saktism, Shaivism and Vaishnavism.

In the family structure, the father is the head of the family and holds the custody of the property. In Boro community, every aspect of life and economic activities revolved around religious and cultural belief systems (Sharma, 2013). Boro household consists a cluster of structures where the main dwelling unit is located on the north of the compound and granary on the east. The dwelling unit has three segments or rooms where “the first room is known as ‘*khopra*’ which is used for dinning and third room is ‘*ishing*’ which is used for cooking and the altars of the Bathou Brai (chief deity) and *Mainao* (goddess of wealth) are placed there for worship” (Census of India 2011 Assam Series-19 PART XII-A District Census Handbook Kokrajhar, 2011). The front part of the yard has a guest house called locally as “chouro no” which is used by young boys of the family. These typical dwelling systems have been replaced by typical houses that suit the need of the family.

Villages in most rural areas of the district has no set patter. Cluster of houses surrounded by paddy fields are observed. Based on the religion followed, festivals are celebrated. Each household have their own prayer area within the compound. The following excerpt describes a typical Boro dwelling system as recorded in the Village Monograph of Census of India in 1961:

“In general, two or three dwelling structures are found standing around the courtyard of the houses which are distributed among the different categories of the family members. These dwelling houses of the Bodos usually consist of two rooms viz. 'khofra' and 'akhong', the outer or sitting room and the inner or sleeping room respectively. In most of the houses the cattle sheds are seen just at the entrance to the compounds, standing separately a few feet from the main house” (Pakyntein, n.d.).

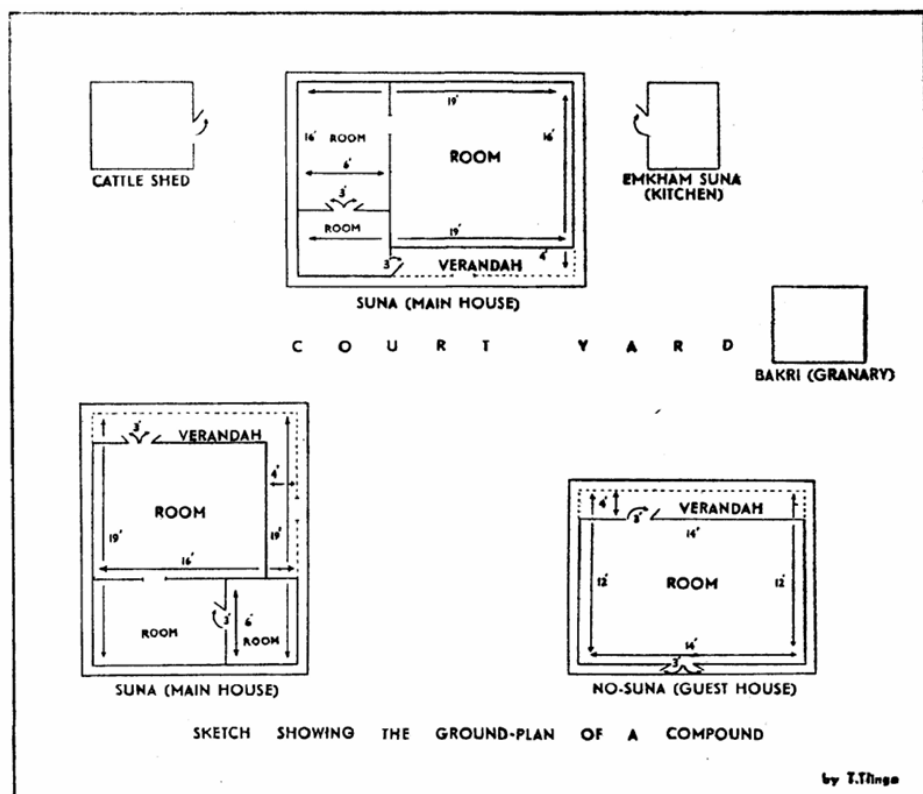


Figure 43: Bodo Settlement (Genesis of a village in west Assam: a study of Boro Bhatarmari)

Ceremonies and rituals performed in association with childbirth, marriage, death etc. are mostly held in the premise of the household. Spaces are earmarked for a small

prayer house in the yard depending on the religion and belief system of the household. Space for weaving by the women folks are earmarked in the compound with a temporary shed. The open spaces in and around the dwelling unit are also used for various activities related to agriculture. There are also community level cultural and religious festivals that are held in dedicated cardinal directions of the village such as “Kherai worship”.



Figure 44: Worship house and Sijou plant.

4.6. Scope and sampling for the study

The survey was conducted in two districts of Manipur (Bishnupur & Thoubal) and two districts of Assam (Baksa & Kokrajhar). A household survey questionnaire was developed to collect data from the selected area. The respondent was selected from the PMAY-G beneficiary list of one Panchayat in each of the four districts.

The research has adopted a **purposive sampling** to arrive at the selected panchayats as the samples were spread across a wide geographic region. It is a type of sampling used in qualitative research for “the identification and selection of information-rich cases related to the phenomenon of interest” (Palinkas et al., 2015) in this case the role of culture in centrally funded social housing schemes. A purposive sampling adopts a sampling strategy that “will most likely yield appropriate and useful information with an attempt to effectively use limited research resources” (Bourgeault et al., 2010). The sampling is based on emerging concepts (in this case dwelling units forms a part of a system of settings that completes the entire community and settlement) with an aim to “explore the dimensional range or varied conditions along which the properties of concepts vary” (Campbell et al., 2020). While for the household survey, the sample

size was selected from the shortlisted Panchayats using a random sampling from the beneficiaries obtained from PMAY-G, Ministry of Rural Development database.

The two districts were selected to fall in one zone in each of the state as per the zones divided by PAHAL compendium under which Panchayats were identified purposively with each of the zones. The sample size for the household survey was determined using Slovin's formula with a 5% margin of error as the number of households to be surveyed was very large and limitation of research resources. The following table shows the total number of completed houses under PMAY-G scheme.

Table 6: Sample size for the study

State	District	Panchayat name	Total completed houses	Sample size
Manipur	Bishnupur	Kha Thinungei	58	51
Manipur	Thoubal*	Hayel Hangoon	72	61
Assam	Baksa	Athiabari**	308	174
Assam	Kokrajhar	Titaguri**	497	222
Total				508
<i>*Kakching district was part of Thoubal district till 2016. For the purpose of this research the previous district has been considered as per Census of India, 2011.</i> <i>**Completed houses till Financial Year 2022-23</i>				

The sample size was calculated using Slovin's formula which is $n = N / (1 + Ne^2)$ where "n" is sample size, "N" is population size and "e" is the acceptable margin of error which is taken as 5%. In total 508 households were surveyed from the four Panchayats.

4.7. Research Design

The research adopts an explanatory, post-positivist mixed-methods design with case studies to test the hypothesis rigorously: H0 (null): No correlation between culture and built-environment; H1 (alternate): Significant correlation exists (validated via two-tailed PCC at $p < 0.05$, rejecting H0).

4.7.1. Hypothesis Statement

The research tests a clear hypothesis: Null Hypothesis (H0): There is no correlation between culture and built-environment in rural communities. Alternate Hypothesis

(H1): There is a correlation between culture and built-environment in rural communities.

4.7.2. Hypothesis Validation

Validation occurs through empirical hypothesis testing using a two-tailed Pearson Correlation Coefficient (PCC) test at a 5% significance level ($p < 0.05$). Survey data from 508 households across four districts were analyzed in Jamovi software; strong PCC values (0.50–1.00) rejected H_0 , confirming H_1 with statistical significance.

4.7.3. Research Stages

The study follows five sequential stages in a mixed-methods, post-positivist explanatory design:

- **Stage 1:** Gap identification via preliminary literature review and policy analysis to formulate questions, aims, and objectives.
- **Stage 2:** Comprehensive literature review (including VOSviewer keyword co-occurrence), questionnaire drafting, and initial data collection.
- **Stage 3:** Primary fieldwork—surveys ($n=508$), settlement documentation, and stakeholder interactions in four case study sites (Bishnupur, Thoubal in Manipur; Baksa, Kokrajhar in Assam).
- **Stage 4:** Data compilation, scoring (qualitative/quantitative to numerical scales), descriptives, and correlation analysis.
- **Stage 5:** Inference, recommendations, and toolkit development.

4.7.4. Mathematical Tools

- Descriptive statistics (means, frequencies) for demographics, culture/built-environment scales.
- Pearson Correlation Coefficient (PCC): $r = \frac{\text{cov}(X,Y)}{\sigma_X \sigma_Y}$, measuring monotonic association between culture variables (e.g., activities, rituals) and built-environment factors (e.g., spaces, orientation).
- Significance testing (p-values) and data triangulation for robustness.

4.7.5. Correlation Methods

PCC was applied across five databases (four district-specific, one combined), converting qualitative data (e.g., activity-space links) to scores. Strong positive correlations (e.g., Table 10: $r > 0.50$, $p < 0.05$) linked culture to built-environment, further triangulated with qualitative narratives and professional views. This ensures rigor via interdependence analysis, avoiding causation claims.

Table 7: Culture and Built Environment Variables

Aspect	Culture Variables	Built-Environment Variables	PCC Example (Overall)
Household Activities	Economic tasks, rituals	Dedicated spaces (e.g., weaving sheds)	$r = 0.65-0.85$
Socio-Cultural Norms	Orientation, community spaces	Layout, materials	$r > 0.50$

The literature review highlighted the definition of culture and the concept of a home and dwelling unit and how culture influences various aspects of the built environment i.e. “(i) the activity itself; (ii) how is it carried out; (iii) how is it associated with other activities to form systems of activities; (iv) the meaning of activity” (Rapoport, 2005). The research particularly draws on the assumption that various activities (defined as part of culture) influence and shapes the built environment.

As part of culture, various activities and their space allocation within the past dwelling unit were captured and whether the past dwelling followed traditional norms and regulations were captured in the questionnaire.

Culture definition (Amos Rapoport)	Questionnaire approach	
<i>the activity itself</i>	Farming	Weaving
<i>how is it carried out</i>	Fishing	Animal Rearing
<i>how is it associated with other activities to form systems of activities</i>	Other source	Support
<i>the meaning of activity</i>	Native	Norms

The research hence attempts to capture data that represents culture based on the definitions and research question discussed in the literature review section through a

series of questions in the questionnaire developed for household survey for beneficiaries of PMAY-G scheme. During the survey, the research discussed at length with the respondents on existence of social systems, day to day activities, religious belief system that were not captured as part of the data for qualitative analysis. In this research, qualitative data collected during the survey was used to analyse the quantitative data.

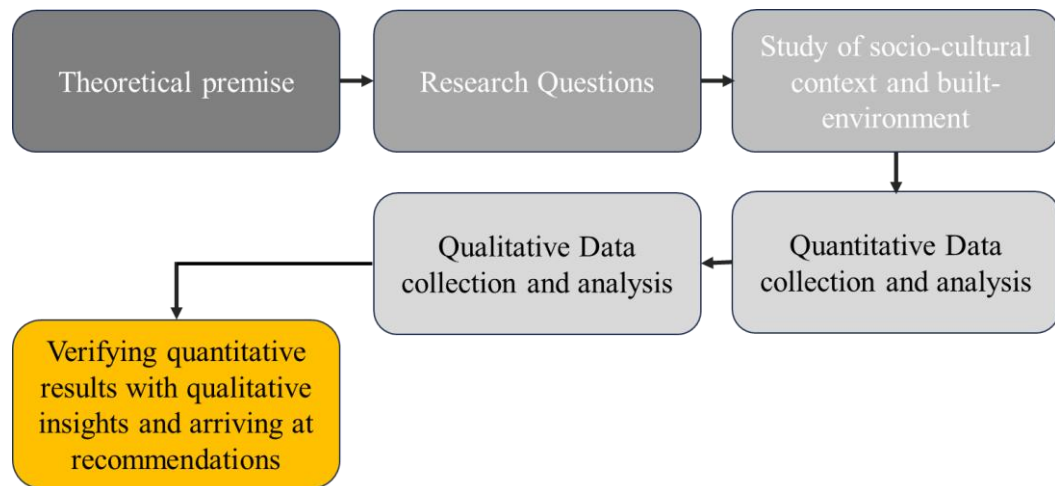


Figure 45: Explanatory Research Design Flow

4.8. Quantitative Analysis

The theoretical premise presented in the literature review chapter and definition of culture as (i) “as the way of life of a people, including their ideals, norms, rules, routinized behaviours, etc.”(Rapoport, 2005); (ii) “a system of schemata transmitted symbolically across generations, through acculturation of immigrants” (Rapoport, 2005) and; (iii) “as a means of ecological adaptations, the use of resources, and the principal attribute that enables humans to make a living by exploiting various eco-systems” (Rapoport, 2005) was translated into a questionnaire with four sections which are:

- i. Part A captured the basic household data such as household size, age profile and duration of stay in the present location.
 - a. This was done to as to understand the profile of the people that will give an initial assessment of activity pattern that mostly centres around specific age group

- b. Duration of stay was assessed with the possibility of including people that have moved home but may have adopted certain cultural nuances of the current location and surrounding.
- ii. Part B captured the characteristics of the dwelling unit mostly the parental home before the PMAY house to ascertain space allocation, activity pattern and economic activity/income source of family members.
 - a. The key reason of inclusion of this data point is during pilot survey it was noted that traditional built environment had very clear reflection of spaces that responded to activities.
 - b. The definition of culture and activity as defined in literature review section was captured in this section of the questionnaire.
- iii. Part C captured the socio-cultural behaviour setting such as neighbourhood profile, ethnic group, community interaction, social support system, cultural festivals and rituals. Cultural norms in building of dwelling unit (if any) were also captured in this part.
 - a. Neighbourhood profile
 - b. Ethnicity
 - c. Support system from neighbours and community that gives the sense of social-cultural behaviour
 - d. Building system to understand the translation of activities into space
- iv. Part D attempted to understand the beneficiary's acceptance or non-acceptance of typologies developed under the PAHAL compendium and the reason for the decision so as to confirm if cultural and social conformity is considered an important criterion in building of a home. This section also captured construction process and support system.

Numerical values were assigned to responses collected as most of the questions were nominal questions to be able to conduct statistical analysis and hypothesis testing. For example, "yes" were assigned 1 and "no" were assigned zero, while number of activities were assigned as 1 each where total sum of activities represented the status of activities performed in and around the house.

4.9. Qualitative Data Analysis

Qualitative data includes words, beliefs, sentiments, ideas, actions and behaviours. The benefit of such form of analysis is the wealth of information it offers about certain cases, people, or organizations. For the purpose of these study a number of photographic documentations, understanding of space utilization through interaction with the respondents and discussion on day to day lives and other cultural practices were undertaken. The understanding of house design choices, reason behind these choices, choice of building material (which is in most cases is linked to aspirations, of the key issue with traditional construction material is its association with poverty and widely considered as a material for the poor (Kulshreshtha et al., 2020). PART D of the questionnaire captured qualitative data points that is used to understand the relation of culture and built-environment.

4.10. Professional view

Practising architects' view on significance of culture in residential design were collected through a series yes/no/maybe of 12 questions on cultural and traditional norms, existence of science/rational behind these norms, awareness of PMAY typologies etc. This section was included as an attempt to bridge the gap between policy documents, research and on ground work. It also gives an understanding of actual work as practising architects interact with clients in along the entire duration of designing and building a house.

4.11. Data Analysis

The data collected through the household survey was analysed to understand the relationship of built culture and built environment. Data collected under various heads as discussed in previous sections were tabulated under various heads based on the definition of “culture” and “built environment”. The study adopted correlation coefficient test to statistically prove the relation between culture and built environment for hypothesis testing. Correlation is described as “as the degree of association between two variables where study of interdependence leads to the investigation of correlations”(Asuero et al., 2006). In short, correlation measures the “monotonic” association between two variables. In such an association, “as the variable of one value increases, so does the other variable or vice versa” (Schober & Schwarte, 2018).

The research has adopted Pearson Correlation Coefficient (PCC) test to test the variable. PCC is measured as a ration between “the covariance of two variables and the product of their standard variation” (Melnychuk et al., n.d.). PCC is also a useful tool and may help in broadening research based on semantic and qualitative analysis (Melnychuk et al., n.d.).

4.11.1. Demographic and social profile of the household surveyed.

The sample for capturing data of households built under PMAY-G Scheme to understand the relevance of culture in built environment was collected from four districts from Assam and Manipur. A total of 508 households were surveyed, the details of which is given in Table no.5.

Five databases were created, two from Manipur (Thoubal: 61 & Bishnupur: 51) and two from Assam (Kokrajhar: 222 & Baksa: 174) and a combined data from the four databases.

This allowed a comparative analysis as well and in a more comprehensive study of the theoretical premise. Beneficiaries surveyed from the state of Assam were mostly man (the head of the family) 53% in Kokrajhar and 61% in Baksa with an average of 57% while households surveyed in Manipur had a high joint (husband-wife) ownership with 96% in Bishnupur and 84% in Thoubal with an average of 90%.

Table 8: Demographic profile of the households surveyed.

Sample Profile	Assam		Sample Profile	Manipur	
	Kokrajhar	Baksa		Bishnupur	Thoubal
Sample size	222	174	Sample size	51	61
Household size (avg.)	4.8	4.9	Household size (avg.)	5.1	5.1
0 to 2 members	5%	0%	0 to 2 members	2%	0%
3 to 5 members	76%	71%	3 to 5 members	57%	59%
6 and above	19%	29%	6 and above	41%	41%
Ethnicity					
Assamese	37%	68%	Meitei	100%	26%
Boro	55%	32%	Meitei-Pangal	Nil	74%
Bengali	5%				
Nepali	3%				
Beneficiary profile					
Man	53%	61%	Man	Nil	3%
Woman	40%	19%	Woman	4%	13%
Joint (Husband-wife)	7%	20%	Joint (Husband-wife)	96%	84%

In terms of ethnicity, 57% of the households surveyed belonged to the Boro community and 37% were Assamese while the remaining 8% of the households belonged to Bengali and Nepali. All households surveyed in Bishnupur were Meiteis while 74% of the households surveyed in Thoubal district belonged to Meitei-Pangal and 26% belonged to Meitei community. The average household size of Kokrajhar was 4.8 and Baksa was 4.9 while both districts in Manipur had a household size of 5.1. Majority of the household surveyed in both Assam and Manipur were in households with 3 to 5 members. The summary of the demographic and social profile is reported in Table number 6.

4.11.2. Descriptives of Statistics of Measurement scale of “Culture” and “Built Environment”

The relation of culture and built environment as per the definition discussed in Section 4.8 has data sets collected under various questions of the questionnaire that represents culture as per the definition of culture by Amos Rapoport as “as the way of life of a people, including their ideals, norms, rules, routinized behaviours, etc.”(Rapoport, 2005, Pg.78), such as (i) duration of settlement (PART A, Q.5); (ii) Nature of support (PART C, Q.16); (iii) nature of economic activity/income source of family members (PART B, Q.9) and ; (iv) cultural norms and regulations followed if any (PART C, Q.19).

4.11.3. Indicator Definition Matrix for Culture and Built-Environment Variables

The composite variables of Culture and Built Environment used in Tables 8, 10, and 11 are constituted by discrete, operationalised indicators derived from the literature review (Chapter 2), settlement documentation (Chapter 3), and questionnaire development (Section 4.7).

The following matrix explicitly defines each indicator, its conceptual basis, and its measurement approach, providing the analytical foundation for interpreting the descriptive statistics and correlation results presented hereafter.

Table 9: Culture Variable — Indicator Definitions

Indicat or No.	Cultural Indicator	Definition	Measurement	Source Basis
C1	Number of rituals and festivals observed	Count of rituals/festivals actively practised within the household annually	Numerical count (survey Q)	Rapop ort (2005) ; Sectio n 3.2.2
C2	Daily household activities	Range of livelihood/domestic activities (weaving, farming, animal rearing, fishing, food processing) performed within dwelling compound	Activity checklist (scored)	Sectio n 3.2.2; 3.3.2
C3	Use of traditional/dedicated spaces	Whether dedicated spaces for cultural activities (e.g.,Shangoi, weaving shed, cow shed,Shumang) exist and are used	Binary + frequency score	Sectio n 3.2.2; 4.4.4
C4	Intergeneration al cultural transmission	Whether cultural practices, building knowledge, and spatial norms are passed across generations within the household	Ordinal scale (never/sometimes/al ways)	Hofste de (via Belshe k, 2006); Ch2
C5	Community participation in festivals/rituals	Degree of participation in community-level cultural events (Laimang,Namghar,Lampak)	Ordinal scale	Sectio n 3.2.2; 3.3.2
C6	Orientation and spatial beliefs	Whether household observes culturally prescribed orientations (e.g., east-facing yum, Tulsi placement, Shumang position)	Binary (yes/no)	Sectio n 3.2.2

C7	Use of traditional building materials	Whether traditional materials (bamboo, timber, mud, ekra) are used/preferred in construction	Ordinal scale	Section 3.7; 3.8 PAHAL profile
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The built-environment variable captures physical, spatial, and qualitative attributes of the dwelling unit and its immediate compound, grounded in Blauw's (1994) five housing functions and Rapoport's (2005) system of settings:

"A house has five functions namely (i) shelter—the most basic function of home and neighbourhood (ii) utilitarian and practical function (iii) territorial function (iv) social function and (v) symbolic, traditional and cultural function." (Section 1.1, Blauw, 1994)

Indicator No.	Built-Environment Indicator	Definition	Measurement	Source Basis
BE1	Dwelling unit size	Total built-up area of primary dwelling unit (sqm)	Continuous (sqm)	PMAY-G minimum 22 sqm; Section 3.6
BE2	Housing quality	Quality of construction materials (walls, roof, floor: pucca/semi-pucca/kutchra)	Ordinal scale (1–3)	Census of India definitions; Section 1.1
BE3	Availability of dedicated activity spaces	Presence of spaces for weaving, animal rearing, grain storage, food processing within compound	Binary + count score	Sections 3.2.2; 3.3.2; 4.4.4
BE4	Compound organisation	Spatial organisation of compound (orientation, built-unbuilt ratio, kitchen garden, pond)	Descriptive score (structured observation)	Sections 3.2.2; 3.3.2
BE5	Presence of ritual/sacred spaces	Existence of Shumang, Tulsi platform, worship space, Namghar, or equivalent	Binary (yes/no)	Sections 3.2.2; 3.3.2; 4.5.4

BE6	Provision for community interaction	Availability of shared or semi-public spaces (Laimang, verandah, Mangol) within or adjacent to dwelling	Binary + scale	Section 3.2.2
BE7	Congruence with past dwelling	Degree to which current dwelling reflects spatial organisation of beneficiary's previous (traditional) dwelling	Ordinal scale (1–5)	Section 4.12; r=0.808 correlation

The composite Culture score (C1–C7) and composite Built-Environment score (BE1 to BE7) are normalised aggregates of the above indicators. Table 8 below presents the descriptive statistics—mean, standard deviation, and skewness—of these composite scores across the four study settlements, providing a settlement-wise overview of cultural richness and built-environment responsiveness prior to correlation analysis.

Table 10: Descriptive statistics of "culture" and "built-environment"

Mean					
Variable	Kokrajhar	Baksa	Bishnupur	Thoubal	Overall
Culture	14.1	13.4	14.3	14.5	13.9
Built-environment	7.34	7.19	6.9	6.79	7.18
Standard Deviation					
Variable	Kokrajhar	Baksa	Bishnupur	Thoubal	Overall
Culture	1.36	1.31	1.18	1.1	1.36
Built-environment	1.38	1.55	1.71	1.28	1.47
Skewness					
Variable	Kokrajhar	Baksa	Bishnupur	Thoubal	Overall
Culture	-1.05	-0.639	-0.764	-0.354	-0.768
Built-environment	-0.6	-0.728	-0.514	-0.178	-0.606

The jamovi project (2022). jamovi. (Version 2.3) [Computer Software]. Retrieved from <https://www.jamovi.org>.

R Core Team (2021). R: A Language and environment for statistical computing. (Version 4.1) [Computer software]. Retrieved from <https://cran.r-project.org>. (R packages retrieved from MRAN snapshot 2022-01-01).

While data to represent built environment included: (i) spaces allocated for economic activity in the past dwelling (PART B, Q.12) and; (ii) past dwelling space allocation (PART B, Q.10). The following data in Table no. 7 reports the descriptive statistics of “culture” and “built-environment”. The descriptive statistics of all the database

reported values within acceptable range. All data sets of all the four districts including the overall combined data were all in comparable range.

4.12. Status of houses built under PMAY-G Scheme

The sum of INR 1,30,000/- received through 3 instalments were not sufficient for the construction of the house. 100% of the houses surveyed had to take out loan or build sub-standard house due to lack of funds. In Baksa district, most houses were constructed with brick, however the size of the house was limited to 250 to 350 sq.ft. while the proposed typology in PAHAL-II compendium has a built-up area of 777 sq.ft. The houses consisted of 2 rooms with a small verandah in the front with exposed brick wall and GI Sheet roof. The houses were constructed by local construction workers referred by relatives or people who have built houses under the scheme.



Figure 46: Houses constructed under PMAY-G Scheme in Baksa District, Assam

The average construction cost was about INR1,400 to INR 1,500/ sq.ft. (amount confirmed by practising architect in the region) that amounted to a sum of about INR4,50,000 for the complete construction of the house. A number of houses were not fully completed due to lack of funds. The following are some of the observations of the district:

- A number of households have benefitted from PMAY-G scheme and has facilitated married sons to get a separate dwelling unit.
- The dwelling unit observed in villages in Baksa district are built in the same ancestral land.

- The traditional generic norms followed have taken a back step since the new PMAY-G houses have to be accommodated in land available or carved out from existing land parcel that belongs to the family.
- Almost all houses under PMAY-G Scheme were of the same plan built with brick and mortar with GI sheet roofing.
- The houses did not follow traditional norm or direction or had no allocated space for temple which is a practice seen in most households.
- Houses built under the scheme functioned only a dwelling unit (physical shelter) and no space allocation were seen for activities such as weaving which was an integral part of most households.

Kokrajhar district had wide variety of houses built under the scheme, however none of the houses surveyed were built as per the PAHAL typology. Most respondents had to let go of cultural norms in order to meet the budget constraints. Houses were built on

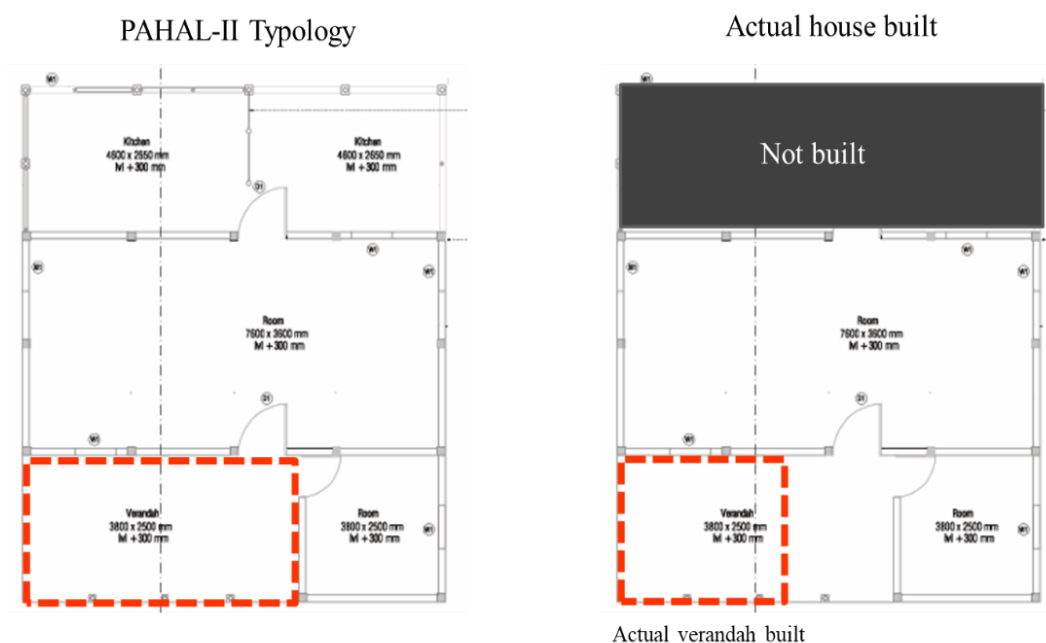


Figure 47: Comparison of proposed typology and actual built home under PMAY-G Scheme

personal preference and budget availability. Choice of building material was purely based on the cost factor. Observations made in Baksa coincided with Kokrajhar too.

Although the majority of the houses that were constructed were between 200 and 300 square feet in size, there were also some larger houses that were built in the district that were up to 600 square feet in size. In the majority of homes, there were no more than two rooms, which included a single hallway and a modest kitchen.

Due to its small size, the verandah accomplished nothing more than acting as a passageway leading to the primary entrance. Weaving and any other activity of a similar nature that the respondent identified as being a component of the economic activity or those related to the generating of income were not among the activities that were observed.



Figure 48: Houses built under PMAY-G Scheme in Kokrajhar district, Assam.

Houses observed in Bishnupur under PMAY-G scheme were mostly made with traditional building material; however, these choices were not due to culture but due to lack of fund. In terms of layout, most houses conformed to cultural norm of facing east and allocation of space within the house followed traditional norms. Larger houses were also observed but these were rare and built with support from family and access to loans.

In most cases, a lack of information and direction was the primary reason why PAHAL compendium typologies were not followed anywhere. Nevertheless, when presented with the design, the majority of respondents believed that the budget that was allotted would not be sufficient, nor did it conform to the requirements of the culture. Due to a shortage of funds, a number of residences were also not finished that were being built. In cases when the house was constructed using conventional building materials, members of the family and other relatives assisted in the construction of the house. When asked about their preference, a very large number of households expressed a desire to have a brick house.



Figure 49: Houses constructed under PMAY-G Scheme in Bishnupur District, Manipur

It was found that the construction technology and the selection of building material in the Thoubal district were comparable; nevertheless, the size of the buildings in the Thoubal district was significantly greater than the houses in the Bishnupur district. The majority of respondents stated that they had taken out a loan and utilized a significant percentage of their savings in order to construct the property. There are not many houses that have chosen to construct with materials that are less expensive and can be completed more quickly.



Figure 50: Houses constructed under PMAY-G Scheme in Thoubal District, Manipur

4.13. Correlation Analysis between Culture and Built-environment

The indicators constituting the culture and built-environment composite variables are defined in Section 4.11.3. The research adopted a data triangulation method with an aim to use qualitative data collected from the survey and professionals to validate the findings of the research. The data representative of “culture” and “built-environment” as discussed in section 4.10.2 were analysed using the “Jamovi Project 2022, Version 2.3” [Computer Software] to run a correlation test using Pearson product moment correlation coefficient test. The Pearson’s correlation has three assumptions: (i) both the variables used are distributed normally; (ii) variables are measured at intervals or as a ration and; (iii) there is a linear relationship between the variables.(Schober & Schwarte, 2018). The values of the coefficient are highlighted in Table no.8. Correlation tests were run for the data collected from the four districts and another one for the overall data.

Table 11: Scale of Pearson Correlation Coefficient.

(Refer Section 4.11.3 for indicator definitions)

Correlation coefficient (r) value	Correlation Interpretation
0	No correlation
below +0.29	Weak correlation
± 0.30 and ± 0.49	Moderate correlation
± 0.50 and ± 1	Strong correlation
1	Perfect correlation

Correlation test for Kokrajhar district revealed a Pearson Coefficient value of 0.606 which shows a strong correlation between culture and the built-environment. The following table no.9 extracted from Jamovi reports the result of the test. Baksa reported the strongest correlation. This could be attributed to close knit community and less exposure to outside culture. The results highlighted that there is a strong correlation between culture and built environment.

Table 12: Correlation of Culture and Built-environment

	Kokrajhar	Baksa	Bishnupur	Thoubal	Overall
Pearson's r	0.606	0.821	0.649	0.73	0.644
df	220	172	49	59	506
p-value	< .001	< .001	< .001	< .001	< .001
95% CI Upper	0.683	0.864	0.784	0.829	0.693
95% CI Lower	0.516	0.766	0.454	0.585	0.591

4.13.1. Indicator-wise Correlation Analysis

While Section 4.13 presents the overall correlation between the composite Culture and Built-Environment scores at an aggregated level, an indicator-wise analysis provides a more granular and analytically meaningful understanding of how specific cultural dimensions relate to particular aspects of the built environment. Drawing on the detailed correlation matrix (Jamovi output, $n = 508$; $df = 506$) and the indicator definitions established in Section 4.10.3, this subsection examines the six most significant relationships between individual variables, each tested using a two-tailed Pearson Correlation Coefficient (PCC) at a 5% significance level ($p < 0.05$).

Table 13: Indicator wise correlation analysis

Correlation Matrix		Culture	No of Rituals and festivals within Household	Built environment
No of Rituals and festivals within Household	Pearson's r	0.792	—	
	df	506	—	
	p-value	< .001	—	
Built environment	Pearson's r	0.676	0.568	—
	df	506	506	—
	p-value	< .001	< .001	—
Past dwelling	Pearson's r	0.319	0.3	0.808
	df	506	506	506
	p-value	< .001	< .001	< .001
Activities	Pearson's r	0.832	0.619	0.528
	df	506	506	506
	p-value	< .001	< .001	< .001

i. Culture and Number of Rituals and Festivals within the Household ($r = 0.792$, $p < .001$)

The correlation between the composite Culture score and the Number of Rituals and Festivals within the Household is very strong ($r = 0.792$, $p < .001$; $df = 506$). This is the second highest highlighted correlation in the matrix and establishes that households with a richer collection of ritual and festival practices also score significantly higher on the composite culture index. This finding validates the thesis's conceptual framework drawn from Rapoport (2005) that culture is fundamentally expressed through performative activities and their associated meanings. Rituals and festivals, classified under indicator C1, are not peripheral events but among the most effective and measurable carriers of cultural identity within the surveyed households.

In the context of Meitei settlements of Manipur, this is evident by the active use of the *Shumang* for domestic rituals, the placement of the Tulsi plant for daily morning prayers, and the central role of the *Laimang* ground for community festivals as documented in Section 3.2.2. In Assam, the *Namghar* and *Sijou* worship spaces (Section 3.3.2; Figure 44) serve analogous ritual functions. The strong r value of 0.792 empirically confirms that the density and variety of ritual practice is the most reliable cultural indicator available for predicting the cultural richness of a household, directly justifying its inclusion as a primary variable in the culture–built environment analysis.

ii. Number of Rituals and Festivals and Built Environment ($r = 0.568$, $p < .001$)

The correlation between the Number of Rituals and Festivals within the Household and the Built-Environment score ($r = 0.568$, $p < .001$; $df = 506$) is particularly significant as it independently establishes that intangible cultural practices without the mediation of the broader composite culture score have a direct and moderate-to-strong relationship with physical built-environment characteristics. In practical terms, this means that the more rituals and festivals a household observes, the more likely its built environment is to contain culturally responsive spatial features such as a dedicated *Shumang*, a *Shangoi*, a compound with sufficient unbuilt space for community gathering, or a designated worship area.

This finding is especially relevant in the context of PMAY-G scheme evaluation. The absence of such spaces in scheme-built houses documented in Section 4.12 is not a culturally neutral omission but a statistically demonstrable disconnection, given that rituals and festivals (indicator C1) are shown to be a strong predictor of built-environment requirements (indicators BE3, BE5, and BE6). The r value of 0.568 therefore provides empirical support for the recommendation that any culturally responsive housing framework must begin with a systematic documentation of ritual and festival practices as a basis for spatial planning.

iii. Activities and Culture ($r = 0.832$, $p < .001$)

The highest highlighted correlation in the entire matrix is between household Activities and the composite Culture score ($r = 0.832$, $p < .001$; $df = 506$). This very strong positive relationship confirms that daily household activities such as weaving, animal rearing, farming, fishing, food processing, basketry are the single most powerful and direct expression of culture within the built environment. This finding provides robust empirical validation for Rapoport's (2005) activity-based definition of culture, where the physical environment is understood as a system of settings shaped by activity systems and their associated meanings.

In the Meitei settlements of Manipur, this relationship is spatially manifested in the *Shangoi*, a semi-covered space at the eastern end of the *Shumang* used specifically for weaving, basketry, and related activities and the integral cow shed and kitchen garden within the dwelling compound (Section 3.2.2). In the Assamese settlements, the earmarking of one side of the open compound for a weaving space, cow shed, and grain store (Section 3.3.2) similarly demonstrates this activity-space co-dependence.

The very strong r value of 0.832 confirms that activity spaces are not merely functional additions to the dwelling but the primary architectural expression of cultural identity, and their systematic exclusion from PMAY-G designs constitutes a fundamental cultural disconnect supported by statistical evidence.

iv. Activities and Number of Rituals and Festivals ($r = 0.619$, $p < .001$)

The correlation between household Activities and the Number of Rituals and Festivals ($r = 0.619$, $p < .001$; $df = 506$) is moderate-to-strong, indicating that households with a higher volume and diversity of daily cultural activities also tend to observe a greater number of rituals and festivals. This interdependence between tangible cultural expression (activities, indicator C2) and intangible cultural practice (rituals, indicator C1) reinforces the thesis's foundational argument that culture operates as an integrated and mutually reinforcing system rather than as a set of isolated indicators.

This finding has a direct implication for housing design and policy. It suggests that a household that actively practises weaving, animal rearing, or traditional food processing is also likely to maintain a richer ritual and festival life and therefore requires a built environment that accommodates both. Any housing framework that addresses only the tangible (activity spaces) or only the intangible (ritual spaces) will therefore provide only a partial response to the cultural requirements of the household. The r value of 0.619 provides the empirical basis for designing an integrated spatial response that addresses tangible and intangible cultural dimensions simultaneously, which is the foundational principle of the toolkit proposed in Section 5.7.

v. Built Environment and Past Dwelling ($r = 0.808$, $p < .001$)

The strong correlation between the Built-Environment score and the characteristics of the beneficiary's Past Dwelling ($r = 0.808$, $p < .001$; $df = 506$) is among the most analytically significant findings in the matrix. It establishes that the built-environment quality and spatial organisation of current PMAY-G houses are strongly associated with the characteristics of the beneficiaries' previous (typically traditional) dwelling units. An r value of 0.808 is in the very strong range, indicating that approximately 65.3% of variance in built-environment perception can be explained by past dwelling experience.

This finding confirms that the comparative survey design of this research which specifically captured data on both current PMAY-G houses and beneficiaries' previous homes was methodologically sound and analytically productive. It suggests that beneficiaries' cultural spatial preferences, shaped by their lived experience of traditional dwelling systems, persist as a powerful frame of reference against which current housing is evaluated. Field observations in all four study settlements documented beneficiaries who, despite receiving standardised PMAY-G houses, informally recreated cultural spatial elements placing Tulsi plants at the entrance, constructing informal cow sheds adjacent to scheme houses, and maintaining kitchen gardens demonstrating that past dwelling spatial memory remains a powerful behavioural driver even within the constraints of scheme-built housing.

These indicator-wise results collectively provide the detailed, disaggregated evidence base required to move beyond a broad acceptance of H1 towards a nuanced understanding of which cultural dimensions most powerfully drive built-environment outcomes. The following section (Section 4.14) consolidates these findings into the formal hypothesis testing outcome.

4.14. Hypothesis testing

Hypothesis testing was conducted for an evidence-based inference. “Hypothesis testing or significance testing is a method for testing a claim or hypothesis about a parameter in a population, using data measured in a sample” (Privitera, 2023). It involves assessing the probability of obtaining the observed sample statistic under the assumption that the hypothesized parameter is true. This process determines the likelihood of the sample data arising if the hypothesis of the research is correct. The research adopts a Null Hypothesis (H0) and an Alternate Hypothesis (H1) hypothesis testing method. The following statements are H0 and H1:

- **Null Hypothesis (H0):** *There is no correlation between culture and built-environment in rural communities*
- **Alternate Hypothesis (H1):** *There is a correlation between culture and built-environment in rural communities*

Since the P-value is less than 0.05, it indicates that the observed correlation is statistically significant, hence the null hypothesis can be rejected as culture and built-

environment shows a strong correlation. The Pearson correlation coefficient value as reported for all the four districts including the overall value in Table no. 9 shows that there is a strong correlation between “culture and “built-environment” as all the values lies between ± 0.50 and ± 1 as per the scale of Pearson Coefficient Value highlighted in Table no.8. Based on this value, the Null Hypothesis (H0) can be rejected and the Alternate Hypothesis (H1) can be accepted.

4.15. Correlation between Culture and PMAY-G Houses

It was observed that PMAY-G houses did not conform to cultural norms mostly due to lack of funds. This can also be statistically observed from correlation analysis done between “culture” and “PMAY-G houses” which were recorded in terms of no. of spaces in the dwelling unit, space availability for activities such as weaving, fish processing, granary etc. The Pearson correlation coefficient value (r) came to 0.008 which is very low and p-value of 0.858 which is higher than 0.05 attesting the on-ground observation of houses built under PMAY-G houses were not in accordance with cultural norms or needs of the households.

Table 14: Correlation between "Culture" and "PMAY-G houses"

Pearson's r	0.008
df	506
p-value	0.858
95% CI Upper	0.095
95% CI Lower	-0.079
N	508

The dwellings built under the PMAY-G scheme has no correlation to culture as well as left with no choice due to cost constraint. Almost all dwelling unit are built in similar design as per the local construction worker know how.

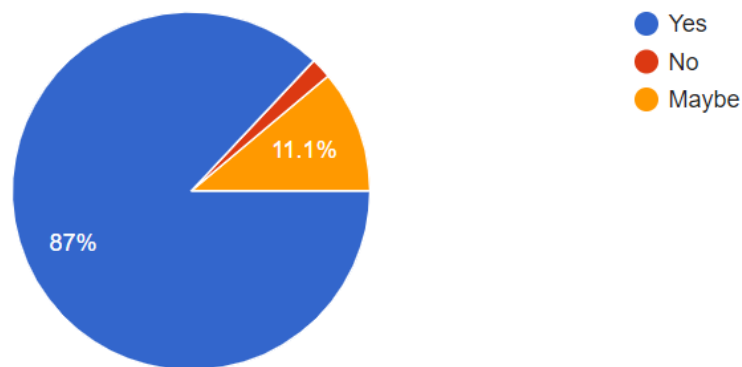
Traditional orientation of the units and traditional norms has been observed to be compromised to fit in the available land to build. It was also observed that open spaces that were once used for rituals and ceremonies are disappearing.

4.16. Professional Architect's Outlook

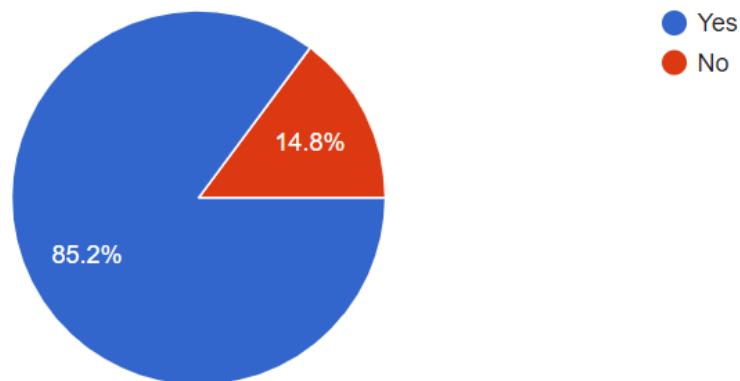
A brief questionnaire was shared with 100 architects across the country to understand their view on relevance of cultural and traditional norms and their awareness of the PMAY-G programme and PAHAL typologies. This exercise was conducted as almost

all architects are involved with the design and building of residences and are involved with the entire process. They are more informed of the ground realities and have to constantly negotiate with clients' needs and practical and feasible solutions. The following are the results of each of the question:

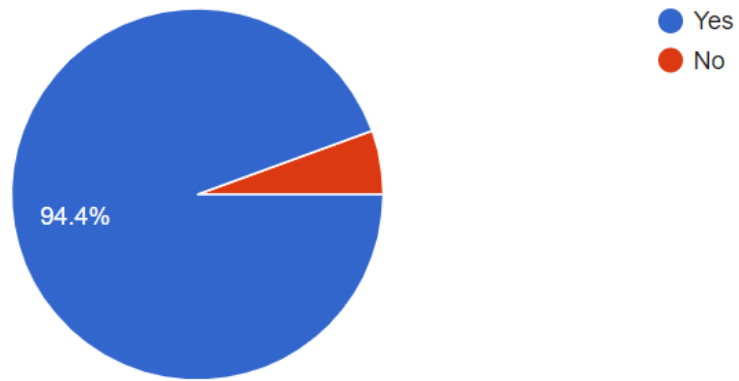
- i. Do you follow any traditional norms or customary rules while designing a residence?



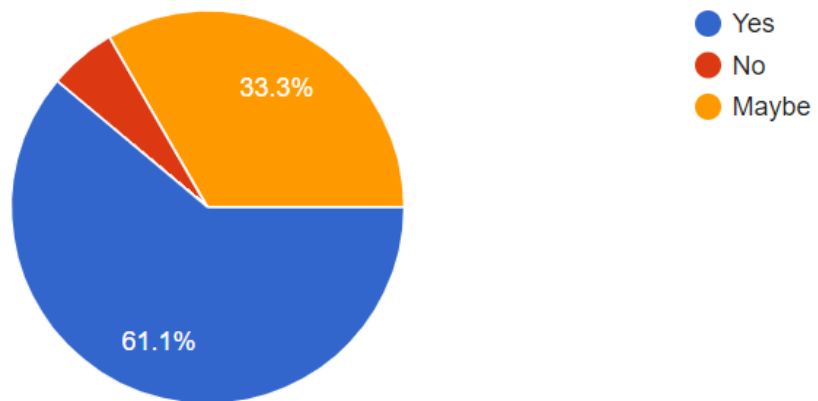
- ii. Do you think it is necessary to follow these traditional norms?



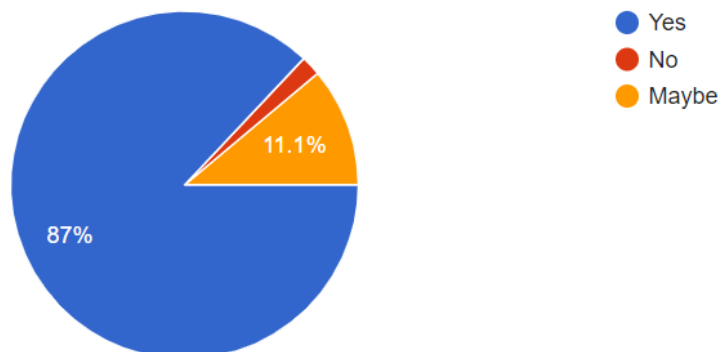
- iii. Should culture play any role in architectural practice?



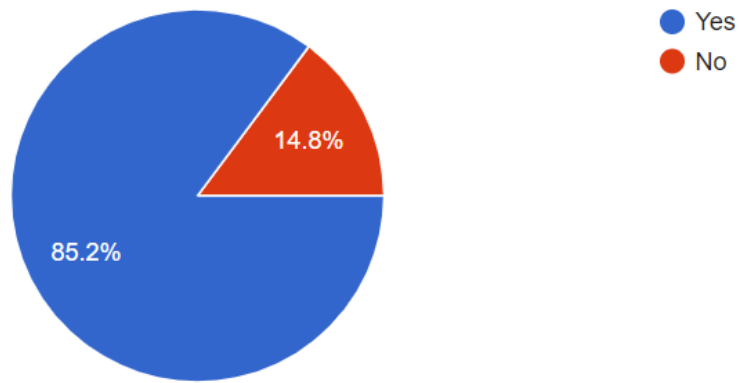
- iv. Would you choose a more appropriate design if the client is ok to not follow traditional norms



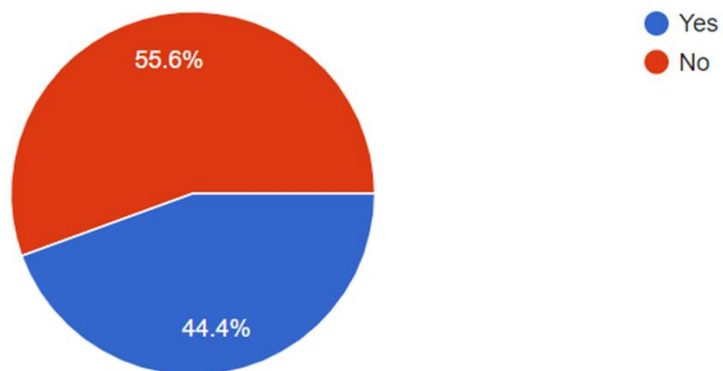
- v. Do you think there is any science/rational behind the traditional norms that is followed in designing of a residence?



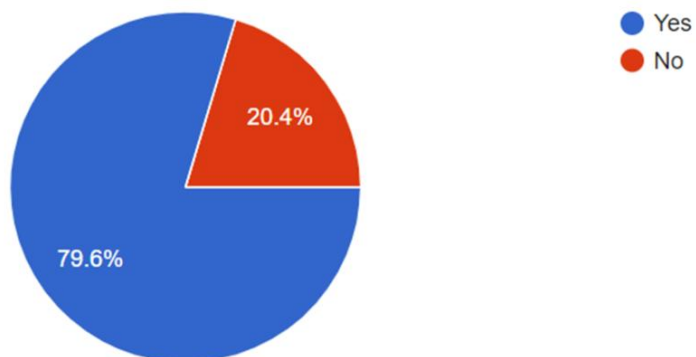
- vi. Are you aware of the Pradhan Mantri Awaas Yojana (PMAY) Scheme?



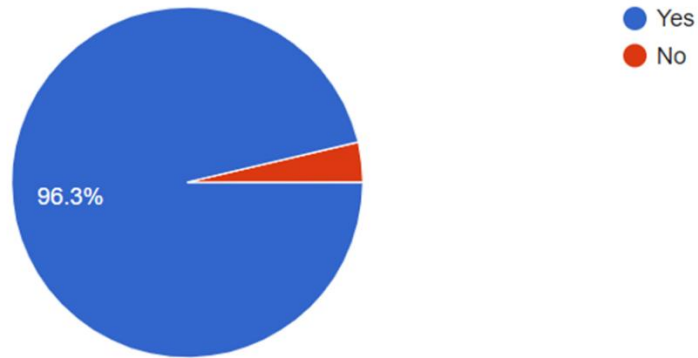
- vii. If yes, are you aware that PMAY has come up with prototypes based on traditional construction style and design that is cost effective and can be referred by the beneficiaries?



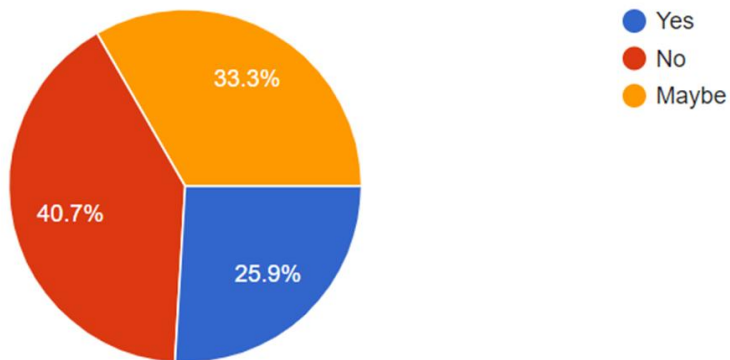
- viii. The PMAY design prototype has various prototypes that claims to be according to local architecture. Do you think it would benefit the beneficiary?



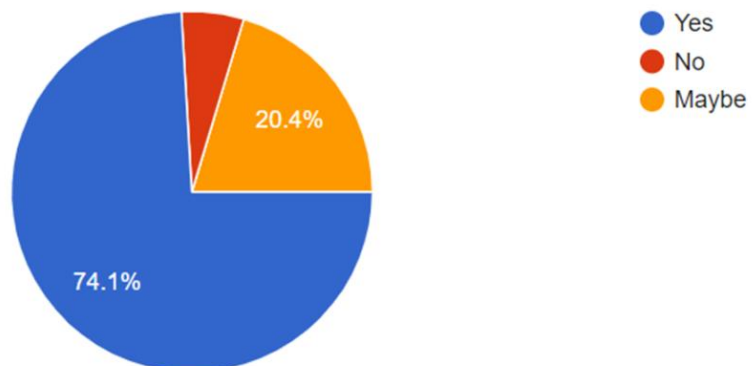
- ix. Do you think culture should be given importance in design of houses?



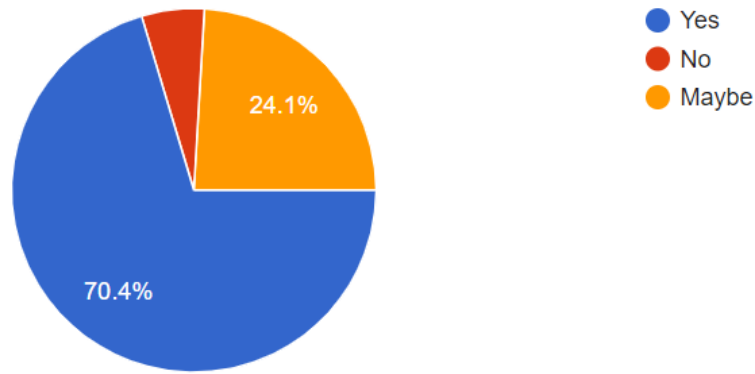
- x. Does culture, customary practices or traditional norms hinder an architect's creativity?



- xi. Do you think the traditional systems (not just building design but other day to day systems) were/are sustainable?



- xii. Do you think that the traditional building fabric encourages more community interaction than the current development system?



4.17. Conclusion

The data analysis revealed that culture influences human behaviour that in turn shapes the built-environment. Traditional system and environment contributed largely to a sustainable environment in which culture which is linked to value system played a critical role. Interaction with architects practicing in the field also revealed that there is either science or rationale behind several cultural norms and practices that has shaped traditional built environment from which important lessons can be drawn. The concept of considering culture as the fourth pillar of sustainability becomes noteworthy in this regard.

The chapter further demonstrates the efficacy of the post-positivist mixed-methods design (4.7; Fig.45) in validating H1, with H0 rejected through Pearson correlations ($r > 0.50$, $p < 0.05$; Tables 9 to 11). The five analytical stages (4.11) facilitated comprehensive descriptives (Tables 7-8) and PMAY assessments (4.12; Figs.46–50), revealing 68% incompleteness rates. Site profiles (4.2 to 4.5) provide insights: Meitei norms in Bishnupur/Thoubal versus Assamese in Baksa/Kokrajhar. Subsection 4.13.1 quantifies Manipur specificities (e.g., rituals $r = 0.72$). Professional perspectives reinforce findings (4.16). Correlations (4.15) highlight PMAY's moderate negatives against traditional strengths. Emphasis on PCC and triangulation supersedes basic visuals.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

The concluding chapter includes discussion of the findings of the research through which conclusion of the research is derived. The chapter also gives recommendations in the form of strategies that can be adopted with an overview of future scope of research. An attempt is made to formulate a framework of study of culture that can be adopted in various policy documents, projects and implementation strategies.

5.1. Summary of Research Findings

The research was initiated with an aim to assert the importance of culture and value system that is being sidelined in the name of development. Cities continue to lose its cultural fabric to accommodate developmental needs while rural areas are losing it due to lack of understanding of the importance of culture and economic condition. It was also noted that a blanket policy or funding mechanism might not be the appropriate approach for a diverse cultural footprint like India. Further, research on sustainability and exposure to several social value systems highlighted culture in the core of these systems. Accordingly, the research questions were identified namely: (i) Bio-social, psychological and cultural characteristics influencing built-environment; (ii) Circumstances that influences built-environment; (iii) Two-way interaction between people and environment; (iv) Various facets of culture that influence built-environment and; (v) Tangible and intangible culture's role in sustainability of a community. Accordingly, the relationship of culture and built-environment was evaluated through primary survey, theoretical premise through literature survey and interaction with professionals and stakeholder on ground. The main purpose of the study was to evaluate the social housing scenario in rural communities and its implementation at ground level. The research also focused on studying its impact on culture and built environment.

The study developed the definition of culture from Amos Rapoport's definition of culture backed with a thorough literature review and information pertaining to the definition was collected through a household survey from the two states of Manipur and Assam. A mixed method including both qualitative and quantitative data were adopted. Firstly, a generic study of "Housing scenario in Northeast" was conducted to assess housing and liveability using a statistical ranking method of all the Northeastern states (Hanjabam, 2020). A keyword co-occurrence analysis was performed to

understand the status of research in the field of “culture” and “built-environment”, following which various concepts such as concept of dwelling and home, housing, rural housing, culture and housing, approaches of social housing and evolution of social housing were studied in detail. Based on initial housing assessment and literature review led to defining scope of research and formulation of hypothesis. A comprehensive research methodology was outlined along with research design to streamline the research. Data of households were collected from four districts namely Kokrajhar and Baksa in Assam and Bishnupur and Thoubal in Manipur.

The data collected were analysed and tested for correlation with Pearson’s Correlation Matrix using Jamovi and the null hypothesis was rejected, thereby accepting the alternate hypothesis stating that there is a relation between culture and built environment. There was a strong correlation observed between culture and activities concerning income generation and household and its translation into the built environment across all the households surveyed.

The study reported that none of the houses built under PMAY-G catered to the economic and household activity which in turn was an important element of culture. Almost all household only served as a physical construct satisfying only the need of a shelter while other facets of home discussed in section 2.3 were not met. It was also observed that there is a disconnect between the programme and on ground implementation. While on the other hand, traditional dwelling system that the beneficiaries were once part of (data collected under past dwelling unit) catered to the need of households both economically and culturally. It was also observed that traditional dwelling units were sustainable in its truest sense. The following sections discusses each of these findings in detail.

5.1.1. Comparative discussion of findings in relation to existing literature

The major findings of this research are discussed below in comparative relation to existing literature across different geographical and cultural contexts, identifying both similarities and divergences.

- i. Finding 1: Strong Correlation Between Culture and Built Environment ($r = 0.644$ overall, $p < .001$)**

The core finding of this research—that a statistically significant and strong positive correlation exists between culture and built-environment in rural communities of Manipur and Assam—is consistent with and reinforced by a substantial body of international literature. Rapoport (1969) established in *House Form and Culture* that the built environment is not merely a product of climate or technology but primarily a cultural phenomenon, arguing that "the form of a dwelling, its groupings, and the relation of the houses to the settings" are shaped by cultural forces above all others. The strong PCC values recorded in this research (Baksa: $r = 0.821$; Thoubal: $r = 0.730$) empirically validate Rapoport's foundational claim within the specific context of Northeast Indian rural settlements, extending his theoretical framework to a hitherto undocumented region.

This finding also aligns with Gauvain and Altman (1982), who concluded from cross-cultural home studies that "*home mirrors a wide variety of environmental and cultural influences*" (Section 2.3), including their analysis of kin-based hamlets in the Philippines where house arrangement reflects social interaction needs—a pattern closely paralleled by the *Kolup* clustering system documented in Meitei settlements (Section 3.2.2). A divergence, however, is noted in the degree of formalisation: while Gauvain and Altman's studied communities demonstrated cultural-spatial alignment through informal social convention, the Meitei and Assamese communities in this study exhibit culturally prescribed spatial systems (*Shumang, Shangoi, Namghar*) with near-universal observance across settlements, suggesting a more deeply institutionalised culture-space relationship in Northeast India.

ii. Finding 2: PMAY-G Houses Show No Correlation with Culture ($r = 0.008$, $p = 0.858$)

The finding that PMAY-G houses have virtually no correlation with cultural norms ($r = 0.008$) is one of the most significant findings of this research. This divergence from cultural expectations is not unique to India. The Mexico Social Housing Project in Tepetzintla (Section 2.7.3), designed under the Social Production of Habitat framework, similarly identified that standardised housing schemes fail to address traditional housing systems and community participation:

"The Social Housing Project in Tepetzintla, Mexico was designed governed by the Social Production of Habitat that addressed the

traditional housing system along with integration of various low-cost ecological technologies and use of locally available bamboo." (Section 2.7.3)

The critical difference is that the Tepetzintla project explicitly incorporated traditional systems through community-led design, whereas PMAY-G, despite its PAHAL-II typology compendium, failed to achieve on-ground cultural responsiveness—none of the 508 households surveyed followed PAHAL typologies. This finding converges with Scott and Gkartzios (2014) on rural resilience, who argued that housing policies driven by standardised development templates undermine path-dependent cultural practices and community social capital, a pattern clearly evidenced in the disruption of the traditional *Kolup–Leikai* system in Meitei villages and the compound-based dwelling organisation in Assamese settlements.

A notable divergence from the Sri Lankan *"You Can Build It As You Like"* programme (Section 2.7.4) is also instructive. That programme's decentralised, incremental, and beneficiary-led approach—with Housing Officers providing personalised support—resulted in housing outcomes that better reflected local needs. In contrast, PMAY-G's centralised delivery model with fixed cost ceilings (INR 1,30,000) produced uniformly inadequate outcomes:

"100% of the houses surveyed had to take out loan or build sub-standard house due to lack of funds." (Section 4.12)

This comparison suggests that the financial and administrative architecture of PMAY-G, rather than cultural indifference alone, structurally prevents culturally appropriate outcomes.

This is further reinforced by Duncan and Lambert's (2004) observation that Korean families relocating to modern apartments modified their interiors to retain Korean spatial and cultural characteristics—a parallel to the observed behaviour of PMAY-G beneficiaries who, despite receiving standardised houses, attempted to recreate cultural spatial elements informally (e.g., placing Tulsi plants in front of PMAY-G units, building informal cow sheds adjacent to scheme houses).

A divergence from international housing literature is noteworthy: most global social housing studies treat past dwelling experience as a socioeconomic variable (quality of

previous housing). This research, however, demonstrates that past dwelling experience in the Northeast Indian context is primarily a *cultural-spatial memory variable*—it encodes orientation norms, activity-space relationships, and community interaction patterns that beneficiaries actively seek to reproduce, regardless of financial constraints

iii. Finding 3: Activities are the Strongest Predictor of Culture in Built Environment ($r = 0.832$)

The finding that household activities (weaving, animal rearing, farming, fishing, food processing) exhibit the strongest correlation with both culture ($r = 0.832$) and built environment is consistent with Rapoport's (2005) activity-based definition of culture:

"Culture is expressed through activities and their meanings—the action being taken, the way it is carried out, the way activities are grouped into systems, and the importance they hold within the culture." (Section 2.6)

This finding also resonates with the NSS (2012) data discussed in Section 2.5, which reported that 62.1% of rural households required sheds for animal and poultry rearing, directly linking economic activity to spatial provision. The divergence from global contexts is significant here: in European social housing scholarship (Henilane, 2016; Donner, 2000), the focus is primarily on amenity standards, ownership models, and energy efficiency—entirely divorced from activity-based cultural requirements. This divergence highlights the unique contribution of this research: that in the context of Northeast Indian rural communities, the *activity-space relationship* is the primary unit of culturally responsive housing design, a principle not addressed in Western housing literature and largely absent from Indian housing policy frameworks.

iv. Finding 4: Past Dwelling is Strongly Associated with Built-Environment ($r = 0.808$)

The strong correlation between past dwelling characteristics and current built-environment preferences ($r = 0.808$) is consistent with Despres' (1991) phenomenological model of home, which describes home as:

"a process and the experience of the home is lived through various life's events. The history associated with their dwellings too played a strong role on their idea of home." (Section 2.3)

Finding 5: Cultural Policies of Manipur and Assam Lack Implementable Strategies

The finding that both the Manipur Cultural Policy and the Assam Cultural Policy (2001) fail to translate cultural preservation objectives into housing or built-environment strategies is consistent with international observations on the gap between cultural policy and physical planning. The United Cities and Local Governments (UCLG) framework and UNESCO's work on culture as the fourth pillar of sustainable development (Nurse, 2006) advocate for culture's integration into development policy, yet:

"The translation of culture into policy documents and other development initiatives remains mostly absent." (Section 1.1)

This finding is particularly significant in the Assam context, where the Cultural Policy (2001) defines culture as encompassing *"the body politic of the whole state"* and recognises it as a *"living culture for the last 5000 years"* (Section 3.5), yet provides no spatial planning or housing directives. This diverges from the Mexican Social Production of Habitat model, which explicitly linked cultural documentation to physical design guidelines, and from the INTACH conservation framework in India, which focuses exclusively on tangible heritage. The gap identified here—between cultural policy articulation and built-environment implementation—constitutes the most significant policy-level contribution of this research.

5.2. Traditional built-environment and sustainability

A traditional settlement is defined as those settlements that are “formed by people living and working in them by employing the wisdom, knowledge, and practices handed to them from generation to generation”(Dayaratne, 2018). Settlements undergo a series of evolution along with changes in the natural as well as the man-made environment (Hanjabam & Yadav, 2024). Sustainability remains the core of any traditional settlement and is not limited to only environment sustainability but includes both social and economic sustainability.

Traditional settlements in all the districts presented a sustainable model that was captured in the questionnaire. Each dwelling system as discussed in Chapter 4

presented a sustainable model such as use of traditional building material, various spaces that catered to the need of the household, kitchen garden, cow shed, space for weaving or activities related to agriculture and fishing, open space system that catered to ceremonies and religious rituals which was an integral part of the system. The definitions of dwelling as discussed in the literature review section were observed strongly on all the places where survey was conducted.

It was also observed that construction of new houses either through PMAY-G scheme or expansion of family led to the disruption of the dwelling system. The new houses that were built on the existing open space (an integral part of the dwelling system) did not follow basic cultural norms such as orientation which is one of the most common norms followed in building a house. This was a common observation in all the surveyed locations. New houses built under the scheme had no dedicated space for activities such as fishing, agriculture, weaving and a number of subsidiary activities.

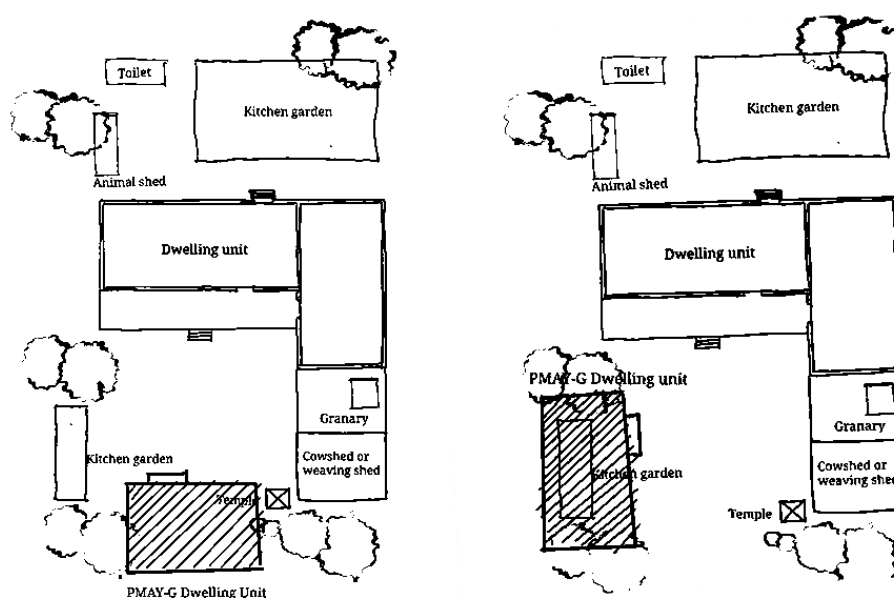


Figure 51: Dwelling unit position in relation to existing dwelling unit

These traditional settlements at all locations responded to the needs of the settlements and had a very strong community dependency and social fabric within the society. The presence of open space, kitchen gardens, water bodies, weaving or grain storage space, sheds for animal rearing etc. makes these traditional settlement a good example of sustainable development on the four pillars. This further demonstrates that dwelling

unit should not be looked at in isolation but part of a larger system of settings with culture and value system of the community as the binding force.

5.3. Survey, policy formulation and implementation

Census of India is one of the most comprehensive surveys conducted in the country every 10 years and a database that is used for various policy formulation, government schemes and researches in various fields. Another key survey conducted for the first time is the “Socio-economic and Caste Census” in 2011 which became the data base for selecting beneficiaries. For PMAY-G, “Housing Deprivation Parameters” are used to identify beneficiaries which are further verified by the Gram Sabhas. The National Sample Survey is another comprehensive survey conducted under four broad categories: (i) Household surveys on socio-economic surveys; (ii) surveys on land holdings, livestock and agriculture; (iii) establishment and enterprise survey and; (iv) village surveys (Concepts and Definitions Used in NSS, 2001). The survey captures a number of data that be used to assess households and built environment such as (i) principal source of water; (ii) distance to the principal source of; (iii) housing characteristics and micro-environment such as plinth level, number of floors, use of house etc.; (iv) existence of animal shed or poultry farm with either attached or detached from the house; (v) number of rooms including floor area of the dwelling unit and; (vi) ventilation of dwelling unit which can play a vital role in the decision making and implementation of schemes on ground. As an example, one can see a variation in built-up area of households recorded of rural Assam in the NSS and PAHAL II typologies.

The NSS 69th round under Block 3 covers a varied information on household characteristics such as “household size, gender and age of the head of the household, highest level of education separately among the male and female members of the household, principal industry and occupation, religion, social group, household type, land possessed, tenurial status of dwelling, area type in which the dwelling unit is located, maximum distance to the place of work normally travelled by any earner of the household, monthly household consumer expenditure, amount spent and sources of finance for those households which have spent some amount on construction/first-hand purchase of houses/flats for residential purpose during last 365 days, etc.” (National Sample Survey, 69th Round, 2012).

In the NSS 47th Round under Survey on Literature and Culture, participation of members of the household under 5 years in various cultural activities such as clubs, cultural group, radio and tv programmes, dance and drama, sculpture and art and religious activities. The survey also records if any travel were conducted within 365 days for any educational, religious or religious purpose. Another noteworthy data that is captured in the survey includes consumer expenditure of the households on cultural items.

It was noted that the definition of culture being not standardized across various departments and documents could have led to these data not being utilized in drafting of policy documents or implementation strategies. There is a gap in the data collected and in the implementation of these data.

5.4. Sustainable development Goals (SDG) and Culture Worldview

The Sustainable Development Goals 2030 (SDG-2030), a global agenda adopted by the General Assembly of the United Nations in the year 2015 has 17 development goals and 169 targets (A Compilation of Success Stories and Lessons Learned in SDG Implementation, 2020). Inclusion of culture in the SDGs is still not full-fledged, however some targets can be considered a positive towards cultural integration such as:

- i. **Target 4.7:** ensuring that all learners acquire the knowledge and skill to promote sustainable development through education for global citizenship and the appreciation of cultural diversity and **culture's contribution to sustainable development.**
- ii. **Target 8.3:** promoting development-oriented policies that support productive activities with creativity and innovation.
- iii. **Target 8.9 and 12.b:** the need to device and implement policies to promote sustainable tourism including local cultures and products and to develop suitable monitoring tools.
- iv. **Target 11.4:** highlights the need to strengthen efforts to protect and safeguard the world's cultural and natural heritage.

The SDG Goal 11 of making cities and human settlements inclusive, safe, resilient and sustainable is another goal in which culture and settlements can be looked at more

closely. The goal aims to: (i) ensure access to adequate, safe and affordable housing, basic services and transport systems for all; (ii) enhance inclusive and sustainable urbanization; (iii) improve resilience in context of disasters; (iv) Strengthen efforts to protect and safeguard the world's culture and natural heritage and; (v) provision of universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with special needs. These goals however lean more towards urban settings and rural areas are left to interpretation.

The United Cities and Local Governments (UCLG) was established in 1913 as a collaborative network of mayors and administrators in Ghent, Belgium, to engage in joint decision-making processes (Bille & Schulze, 2006). In order to ensure that everyone grows at the same time, local and regional governments are represented, defended, and given more voice by UCLG, a global network of cities, local, regional, and metropolitan governments and their association (Culture 21: Actions Commitments on the Role of Culture in Sustainable Cities ACTIONS, n.d.). The policy statement mandates that national, local, and regional governments, as well as international organizations, create a cultural policy and include the cultural dimension into all public policies (Culture 21: Actions Commitments on the Role of Culture in Sustainable Cities ACTIONS, n.d.). It also asks for the integration of the cultural dimension into development plans.

In India, the Indian National Trust for Art and Cultural Heritage (INTACH) places a high priority on intangible cultural aspects while focusing on the preservation and protection of the built and natural heritage. In place of Agenda 21 for culture and its nine commitments and action points—namely, (i) cultural rights; (ii) heritage, diversity, and creativity; (iii) culture and education; (v) culture and environment; (vi) culture, equity, and social inclusion; (vii) culture, urban planning and public spaces; (viii) culture, information, and knowledge; and (ix) governance of culture—the INTACH Heritage Academy has proposed a new agenda called "Culture for Cities." These are the action items that INTACH hopes to advance (INTACH, n.d.). It may also be noted that, a number of these initiatives focus on cities and rural areas are still not considered a priority.

The importance of culture is being recognized across several platforms, however, its translation into on ground work is still far-fetched. It is still and only a popular catchphrase and still a long way till it gets integrated well into the system.

5.5. Definition of Culture and its interpretation

As discussed in Section “Culture and Housing” in section 2.6, the definition of culture varies across regions. With such a wide range of definition and interpretation, the understanding of culture and its implementation on policies and schemes are all mismatched. In the United Nations’ publication on “Some Aspects of Cultural Policy in India, culture in India is described as a “complex, intricate and multilayered and multi-dimensional fabric”(Vatsyayan, 1972). The document further highlights that India as a country appears to have an existence of “a self-conscious awareness of this attribute of culture in man and the need to cherish and nurture it assiduously at all times, both in moments of crisis and peace” (Vatsyayan, 1972). Some of the facets of Indian culture as highlighted that can still be linked to present day context are:

- i. Indians conceive culture as individual’s relation to his immediate environment and also to its historical past
- ii. A recognition of culture being a continuous process and the need to adapt and assimilate
- iii. Culture represented the quality of life and was judged and measured by it
- iv. Culture was “the ultimate value” in which an individual measured himself and the society around.

Culture and religion are an intertwined concept in India. Milestones in agricultural activities are celebrated with religious rituals. Change of season were marked by religious festivals and many other such events can be marked as an important cultural element. The mission statement of Ministry of Culture’s mission statement includes preservation, promotion and dissemination of all forms of art and culture. The department undertake several activities such as maintenance and conservation of heritage sites, promotion of art, administration of libraries, observation of important anniversaries of eminent personalities and events, promotion of both institutional and individual’s initiative of cultural activities, cultural agreements with foreign countries and creating cultural awareness (Ministry of Culture, Government of India). It can be

highlighted that India as a country still don't recognize the everyday culture of various regions and settlements as a culture that needs documentation and consideration. Lack of awareness of culture and its relation to the built-environment has led to fallback in implementation of various policies and schemes on ground.

5.6. Recommendations

The findings of the research suggest that there is a strong correlation between culture and the built-environment. It was also observed that culture even though considered an important element in the development process as well as an integral part of everyday life, is a topic that has not been represented well especially in policies and development schemes concerning settlement and built-environment. Lack of awareness of the importance of culture was seen across all levels. There is also a lack of documentation of any form of culture and its influence in the built-environment. Another important aspect observed during the course of the research was a wide gap between schemes and on ground reality. The recommendations are suggested in the form of strategies in the following sections.

6.6.1. State Ownership and role in on ground programme implementation

The findings suggest that centrally funded schemes which is applicable to an extensive geography of the country will only be able to address in specificity only with an active involvement by state government and local authorities. Currently, PMAY-G scheme's is implemented by the state and local authorities but these are only limited to selection of beneficiaries and disbursal of funds. The following strategies for a more specific and contextual implementation of development schemes are:

- a. **Strategy (Recommendation 1):** State level recognition and documentation of traditional dwelling system and settlement system along with cultural footprint of various social and racial groups in line with National Sample Survey etc. or the "Village Survey Monographs" by Census of India in 1961. However, with India developing in such a scale and speed, documentation of such level can only be conducted by the state or local authorities with support from Central Government. Figure number 50 shows the table of contents of a "Village Monograph Report" of a village in 1961.

	PAGES
FOREWORD	i—ii
PREFACE	iii
HOLALU IN PICTURES	
CHAPTER I—THE VILLAGE	viii—xx
Introduction—Location—Physical aspects—Flora and Fauna—Size—Residential pattern—Transport and Communication—Important public places—Burial grounds—Sources of water—Market—History of the village—Legend and monuments	1—5
CHAPTER II—THE PEOPLE AND THEIR MATERIAL EQUIPMENTS	
Ethnic composition and a note on important communities—Houses and house types—Dress—Hair style and other body decorations—Ornaments—Household goods—Food and Drinks—Beliefs and practices connected with birth, marriage and death	6—18
CHAPTER III—ECONOMY	
Economic resources : Land, Livestock and other resources—Factors influencing economic life in the village : Land improvement, industrialisation, urbanisation, improvements in communications, Expansion of marketing facilities, Expansion of sources of finance—Economic activities and nature of changes : (A) Livelihood classes (B) Workers (C) Non-workers (D) Ownership of economic resources—Primary and secondary occupations—Changes in traditional occupations :—Description of different occupations : Practices connected with (A) Agriculture (B) Animal Husbandry (C) Village industries (D) Trade and Commerce—Indebtedness—Co-operation—Income and Expenditure	19—37
CHAPTER IV—SOCIAL AND CULTURAL LIFE	
Population trends—Population by age and sex—Birth and deaths—Marital status—Public health and medical facilities—Veterinary aid—Literacy and Education—Migration—Family structure—Size of households—Intra-family relationship—Inheritance of property—Leisure and recreation—religious institutions, Festivals and Fairs—Statutory Panchayat—Voluntary organisations—National Extension service—Reform measures	38—47
CHAPTER V—CONCLUSION	48—49

Figure 52: Table of contents of Village Monograph, Census of India, 1961

- b. **Strategy (Recommendation 2):** A state technical advisory team including representations from local professionals across various diagonals that can review the process of project formulation and implementation including hand-holding of beneficiaries in the construction process.
- c. **Strategy (Recommendation 3):** Involvement of stakeholders across all verticals that includes professional and non-professional members. The Institute of Engineers, Manipur State Centre and *Lainingthou Sanamahi Temple* Board organised a one-day workshop in May, 2024 on “Scientific and Social Outlook on Yumsharol”, “yumsharol” being the traditional building system of Meiteis that provided an important cross-over between traditional knowledge and professionals. A number of architects participated in the workshop. Such model can be adopted during the programme formulation and implementation stage to vet the cultural appropriateness of projects. Figure no. 51 highlights the details of the workshop held. Such an initiative will not only highlight the role of culture in various schemes but will also lead to better acceptance of projects. Conservation and preservation of cultural activities and practices that makes settlement a sustainable system will stay intact too.

ONE DAY WORKSHOP ON "SCIENTIFIC AND SOCIAL OUTLOOK ON YUMSHAROL"

Organized by:  *In association with:* 

The Institution of Engineers (India) MANIPUR STATE CENTRE
Govt. Polytechnic Campus, Takyel, Imphal - 795 001

LAININGTHOU SANAMAH TEMPLE BOARD (LSTB)
Haying Khongbal Uphong Yumpham, Imphal West - 795001

Under the aegis of:
Civil Engineering Division Board (CVDB), IEI

Date & Time	Venue
Saturday, 25 th May, 2024 8:30 am	Lainingthou Sanamahi Shanglen, Haying Khongbal Uphong Yumpham, Sanamahi Road, Imphal West - 795001

For further details, please contact:

- Er. Hurem Bharat Meitei, Convener : +91-80763 60235
- Er. Th. Subhokumar Meitei, Co-Convener : +91-87873 52295
- Er. L. Denin Singh, IEI Manipur State Centre : +91-88374 29892
- Office Assistant, LSTB : +91-87875 67485 / +91-87873 38203

www.ieimanipur.org

For Online Registration and Payment details, please refer Next Page

ABOUT THE WORKSHOP

The workshop aims to preserve traditional building methods in the face of changing social dynamics and modern construction concepts. The goal is to promote this age-old practice alongside modern constructional practices. With the progress of contemporary technology and vertical expansion of buildings, the rigorous adherence to specific standards outlined in the ancient texts offered a challenge to Engineers, Architects, Masons, constructional practitioners and all segments of the society. The program is targeted to Engineers, Architects, Masons, constructional practitioners, students of UG, PG, PhD and all the sections of the society.

Registration Details:

- Professionals/Engineers/Others: Rs. 600/- (inclusive of 18% GST)
- IEI Corporate Members: Rs. 500/- (inclusive of 18% GST)
- Student Participants: Rs. 400/- (inclusive of 18% GST)

Registration Forms can be obtained from any of the following locations:

- LAININGTHOU SANAMAH TEMPLE BOARD (LSTB), Haying Khongbal Uphong Yumpham, Sanamahi Road, Imphal West - 795001.
- NONGPOK THONG, Keishampat Leimajam Lekai, near Yaipha Thouni Shanglen Community Hall, Imphal West - 795001
- THE INSTITUTION OF ENGINEERS (INDIA), MANIPUR STATE CENTRE, Govt. Polytechnic Campus, Takyel, Imphal West - 795001

(For Offline Registrations, Participants can submit duly filled Registration Form at any of the above locations.)

For Online Registration, please follow the link or Scan the QR Code below:

<https://forms.gle/MHSnd3bmsS6Fupt5>

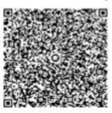


Both Online & Offline Registration Starts from 9:00 am, 6th May, 2024 till 9:00 pm, 20th May, 2024

For Online Payment, please Scan the QR Code or refer the UPI ID below:

Account Holder Name: HUREM BHARAT MEITEI, Convener of the Workshop

Bank: Bank of Baroda Branch: NIT Manipur



Hbmeitei
8076360235@barodampay

Participants are kindly requested to bring along the "Participants Copy" of the registration form on the day of the Workshop

* PROGRAMME SCHEDULE *	
One Day Workshop on "SCIENTIFIC AND SOCIAL OUTLOOK ON YUMSHAROL"	
Organized by: The Institution of Engineers (India) MANIPUR STATE CENTRE or Lainingthou Sanamahi Temple Board (LSTB)	
Under the aegis of Civil Engineering Division Board (CVDB), IEI	
On Saturday, the 25 th of May 2024 (Kalei gi 17 ni punbe; Maliyapham Palcha 2422) at 08:00 am onwards at Lainingthou Sanamahi Shanglen, Haying Khongbal, Uphong Yumpham, Sanamahi Road, Imphal - 795001.	
Moderator: Ngangam Shyamkumar, Superintending Engineer, PHED (Retd.)	
11:30 am	Technical Session - I : "From shadringaida nongpacha thouram sing" by Dr. Walkhom Ramesh , HoD (Manipuri), G.P. Women's College, Imphal
12:30 pm	Technical Session - II : "Meitei Yumsharol" by Keisham Romscha Mangang , Senior Board Member, LSTB, Imphal (Retd. EE, PHED)
01:30 pm	Tea Break
02:00 pm	Technical Session - III : "Meitei/Meitei Yumsharol Miteng ama" by Er. Thingam Subhokumar Meitei , MIE, Chartered Engineer (Civil Engg.) & Committee Member, IEI Manipur State Centre, Imphal
03:00 pm	Open Discussion
04:00 pm	Votelectory and Certificate Distribution



Figure 53: Details of workshop held on Manipur Yumsharol

6.6.2. Documenting culture in usable formats

While documentation of culture happens through various mediums and platforms, lack of usable format leads to these documentations as mere reference material. Deriving a format that is both comprehensive as well as adaptable to various backgrounds will make culture usable.

- a. **Strategy (Recommendation 4):** The definition of culture being interpreted in various ways have hampered the documentation of culture in a usable format. In the dismantling of culture by Amos Rapoport, "lifestyle" that leads to various forms of activities is considered one of the most "concrete expressions of culture" (Rapoport, 2005). Hence documentation of activity system both as

household level, community and settlement at large will be one of the most useful ways to make culture usable.

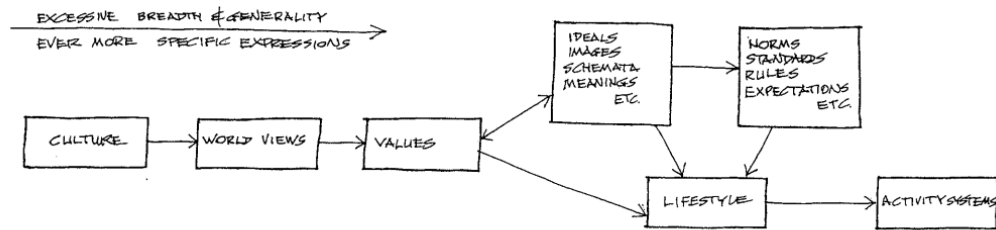


Figure 54: Dismantling culture (Rapoport, 2005)

- b. **Strategy (Recommendation 5):** A uniform format of culture across various policy documents starting from guidelines issued at central government level to state level implementation documents will make culture into a usable format. For example, a definition that is applicable to built-environment, city planning and design which can be defined by National Institution for Transforming India (NITI Aayog) which is a “public policy think tank” of the Government of India that directs various department on inclusion of culture in the development policy such as Ministry of Housing and Urban Affairs, Ministry of Planning, Ministry of Rural development, Ministry of Culture and Ministry of Development of North Eastern Region.

The strategies listed above are not exhaustive, however such steps could become an important milestone in the understanding of culture and its conservation that lead to a more sustainable future. Recognising culture and its influence on various layers of built-environment will ensure a more acceptable schemes which in turn will lead to people’s active involvement in development process due to its more personal approach. With the above measures, culture not only could be taken into account but also become a more sustainable approach to social housing schemes and a better future for the whole.

5.7. Proposed Toolkit for culture and housing documentation

Cultural patterns are deeply embedded in spatial practices, construction choices, and everyday activities, and ignoring these elements often leads to the failure of well-intentioned housing schemes. Systematic documentation allows policymakers,

architects, and planners to recognize these cultural nuances and incorporate them meaningfully into housing and infrastructure development. The benefits of such an approach extend far beyond shelter, influencing policy effectiveness, social cohesion, environmental sustainability, and long-term resilience.

CULTURE AND HOUSING DOCUMENTATION FORMAT

For Use in Housing Studies, Research, and Policy Development

Based on the framework of Amos Rapoport (2005)

SECTION A: GENERAL INFORMATION

Item	Details
Location (Village/City/Region)	
Community / Ethnic Group	
Household Name/ID (if applicable)	
Climate and Geography	
Settlement Type	☐ Rural ☐ Urban ☐ Tribal ☐ Semi-urban
Household Size	Adults: ____ Children: ____ Elders: ____
Occupation(s) of Members	
Type of Dwelling	☐ Traditional ☐ Semi-permanent ☐ Modern/Concrete

SECTION B: CULTURAL ACTIVITIES AND USE OF SPACE

(Based on Rapoport's Four Components of Activity)

1. The Activity Itself

Activity	Description	Ritual/Cultural Importance
Cooking		
Sleeping		
Social gathering		
Worship/Prayer		
Traditional occupation		
Others (specify):		

2. How is the Activity Carried Out?

- Where is it performed (space)?
- When is it performed (time of day/year)?
- By whom (age, gender, role)?
- What tools/objects are used?

(Repeat this for major household activities)

3. Association with Other Activities

- What other activities are done in combination or sequence?
 - Are shared spaces used for multiple functions?
 - Is the space temporary/permanent/movable?
 - Does this affect the design or layout of the house?
-

4. Meaning of the Activity

- Symbolic/Cultural value:
 - Is it related to status, belief, identity, tradition?
 - Stories or local narratives associated with it?
 - Has this meaning changed over time?
-

SECTION C: BUILT FORM & CULTURAL EXPRESSION

Feature	Description / Notes
House Orientation	(Based on sun, wind, religious belief, traditional norms etc.)
Layout Description	(Attach sketch if possible)
Material and Construction	(Mud, bamboo, stone, RCC, mixed, etc.)
Decorative/Symbolic Elements	(Motifs, religious icons, murals)
Outdoor-Indoor Transitions	(Verandahs, courtyards, open kitchens, etc.)
Change over Time	(Additions, shift to concrete, loss of detail)

SECTION D: CULTURAL INFLUENCES ON HOUSING DECISIONS

Question	Notes/Response
Are there community norms on house design/layout?	
Are there gender-based spatial practices?	
How is property inherited (matrilineal/patrilineal/common)?	
Are there rituals during construction/house entry?	
Are there taboo areas (sacred spaces, etc.) in the house?	
Who decides design/material/location of house?	

SECTION E: CONTEMPORARY CHALLENGES & ASPIRATIONS

- Conflicts between tradition and modern housing schemes
- Youth or urban influences on traditional house design
- Accessibility to resources/materials for traditional housing
- Adaptation to climate, disasters, and modern needs
- What does the community want in future housing?

SECTION F: POLICY AND RESEARCH RELEVANCE

- Are existing housing schemes sensitive to cultural aspects?
- What cultural elements are being lost due to modern policies?
- Suggestions for integrating culture into housing development:
 - *Design flexibility*
 - *Material subsidies*
 - *Participation of community elders*
 - *Documentation of oral traditions*

ANNEXURE (Optional)

- Sketches of house plans/layouts
- Photographs of activity spaces
- Interview quotes from household members
- Maps of the settlement

5.8. Fulfilment of Research Objectives

The research successfully addressed each of its stated objectives through a structured methodological framework combining field surveys, literature analysis, and empirical testing.

Table 15: Realization of Research Objectives

Objectives	Realization of Research Objectives
Objective 1 To study the concept of dwelling and identify its relation as part of the system of community as a whole.	Objective 1 was met by examining the concept of dwelling not as an isolated unit but as a spatial expression of community structure and social relations, particularly within traditional settlements. This was further supported by literature review of various concepts around dwelling, home and housing in Section 2.3, 2.4, 2.5 and 2.6.
Objective 2 To understand the underlying relationship between environment, culture and housing.	Objective 2 was addressed through a detailed exploration of how environmental conditions, cultural practices, and social values converge to shape housing patterns and spatial organization. The socio-cultural context and built-environment study in section 4.2.4, 4.3.4, 4.4.4 and 4.5.4 further attested that dwelling forms part of the system of the community.
Objective 3 To study cultural and traditional systems and its translation into space requirement that further shapes the built environment.	Objective 3 was fulfilled by identifying how cultural and traditional systems manifest in space usage, layout preferences, and the transformation of built form over time. This was done through field visit and study of activity system and its translation to space through a detailed questionnaire. Chapter 3 and Chapter 4 highlights the study context of Manipur and Assam through profiling of the four districts identified for the research.
Objective 4 To study the existing government schemes, implementation strategy	Objective 4 was achieved by evaluating the Pradhan Mantri Awas Yojana–Gramin (PMAY-G) scheme’s implementation across selected rural settlements in Assam and Manipur, highlighting both its alignment and

and its impact in rural areas	disconnect with local cultural contexts. Apart from this existing cultural policy of both Assam and Manipur were analysed along with a study of PAHAL-II strategy and typology study.
Objective 5 To develop a base for conducting further research in the field of culture study in architecture in Northeast India	Finally, Objective 5 was met by generating a comprehensive dataset, identifying research gaps, and proposing a culturally grounded framework that can serve as a foundation for further academic inquiry in the domain of culture and architecture in Northeast India. 5 recommendations were made under Section 5.6.1 and 5.6.2 along with a toolkit for documenting culture in housing study in Section 5.7

Collectively, the research objectives were met through an integrated approach that combined theoretical grounding with on-ground realities. The findings reaffirm the essential role of culture in shaping sustainable and context-responsive housing in rural India.

5.9. Contribution of the Research

The conclusion of culture and its influencing impact on the built-environment and community life of rural settlements could become an important starting point for replicability of such research across various regions at both national and international level. Further, the research will highlight the important of culture and social value system that has led to a number of sustainable settlements. The research could highlight the need to look at different formats of development of urban and rural areas of India as both represents two unique characters. The research further asserts the statement of activity system as an important element in understanding culture which would become an important point of type of data that can be collected for culture to be usable.

5.10. Limitation and Potential for Future Research

The research being based on two states of Northeast India might limit the replicability of it. This calls for more extensive research that includes representative data from each state or region. The calculation of correlation between culture and built-environment

based on activity system, more parameters could be developed that can capture culture. The thesis further uses statistical tools to analyse these correlation, however future researches in this area could employ a more documentation-based study that will help in identification of parameters to define culture.

For the purpose of this research, in the expert's opinion section, only architects were considered. Inclusion of other experts such as social scientist, geographers, planners, designers and cultural experts from both mainstream as well as unconventional backgrounds among others might lead to a more comprehensive understanding of culture. Further, study could extend to urban areas and understand the viability of inclusion of culture in central and state funded schemes.

*****END OF REPORT*****

REFERENCES

- Abeyasekera, A. L., & Gunasekara, V. (2022). “*Square-rule Paper Engineers*”: *People, Power, and Participation in Sri Lanka’s Million Houses Programme*. www.accountabilityresearch.org.
- Altman, I. (1975). *The Environment and Social Behavior: Privacy, Personal Space, Territory, Crowding*. Brooks/Cole Publishing Company.
- Altman, I., & Chemers, M. M. (1980). *Culture and Environment*. Cambridge University Press, Cambridge.
- Annual Administrative Report* (2011), Fisheries Department, Government of Manipur
- Asadpour, A. (2020). *Defining the Concepts & Approaches in Vernacular Architecture Studies*. *Nature: National Academic Journal of Architecture*, 7(2), 241.
- Asuero, A. G., Sayago, A., & González, A. G. (2006). The correlation coefficient: An overview. In *Critical Reviews in Analytical Chemistry* (Vol. 36, Number 1, pp. 41–59). <https://doi.org/10.1080/10408340500526766>
- Belshek, J. Ali. (2006). The influence of culture on the negotiation styles of British students. *Annual Review of Education, Communication and Language Sciences*, (3).
- Bille, T., & Schulze, G. G. (2006). *Chapter 30 Culture in Urban and Regional Development* (pp. 1051–1099). [https://doi.org/10.1016/S1574-0676\(06\)01030-1](https://doi.org/10.1016/S1574-0676(06)01030-1)
- Blauw PW. (1994). The social and housing function of home and neighborhood. *Housing Soc. Serv. Policy*, 22(34).
- Bourgeault, I., Dingwall, R., & De Vries, R. (2010). *The SAGE Handbook of Qualitative Methods in Health Research*. SAGE Publications Ltd. <https://doi.org/10.4135/9781446268247>
- Brown, R. (1873). *Statistical Account of the Native State of Manipur and the Hill Territory under its rule*.
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing*, 25(8), 652–661. <https://doi.org/10.1177/1744987120927206>
- Cao, X., Li, X., Yan, Y., & Yuan, X. (2018). Skeleton and infill housing construction delivery process optimization based on the design structure matrix. *Sustainability (Switzerland)*, 10(12). <https://doi.org/10.3390/su10124570>
- Census of India*. (2011).
- Census of India 2011 Assam Series-19 PART XII-A District Census Handbook Kokrajhar*. (2011).

- Chanu, N. K., Singh, K. R., & Singh, N. M. (2015). Study on the Indigenous Smoked Fish of Meitei Community Ngaphak. *International Journal of Research Studies in Biosciences (IJRSB)*, 3(7), 1–4. www.arcjournals.org
- Choudhury, P. C. (1959). *The History of Civilization of the People of Assam to the Twelfth Century A.D.* Historical & Antiquarian Studies in Assam, Gauhati.
- Concepts and Definitions Used in NSS.* (2001).
- Crysler, C. G., Cairns, S., & Heynen, H. (Eds.) (2012). *The SAGE Handbook of Architectural Theory*. SAGE Publications.
- Cultural Policy of Assam, Pub. L. CAD.181/2003/23 (2006).
- Culture 21: Actions Commitments on the role of culture in sustainable cities ACTIONS.* (n.d.).
- Das, B. K., & Mukhopadhyay, S. (2018). Amphibious housing for flood-prone areas. In *Proceedings of ISVS Conference*.
- Davis, S. H. (1993). *Indigenous views of land and the environment* (World Bank Discussion Paper No. 188). World Bank.
- Dayaratne, R. (2018). Toward sustainable development: Lessons from vernacular settlements of Sri Lanka. *Frontiers of Architectural Research*, 7(3), 334–346. <https://doi.org/10.1016/j.foar.2018.04.002>
- Després, C. (1991). The Meaning of Home: Literature Review and Directions For Future Research and Theoretical Development. *Journal of Architectural and Planning Research*, 8(2), 96–115.
- Development and Growth in Northeast India: The Natural Resources, Water, and Environment Nexus.* (2007).
- Dikshit, K. R., & Dikshit, J. K. (2014). *North-East India: Land, People and Economy*. <http://www.springer.com/series/8560>
- District Census Handbook Baksa.* (2011).
- District Census Handbook Bishnupur.* (2011).
- District Census Handbook Thoubal.* (2011).
- Donner, C. (2000). *Housing policies in the European Union : theory and practice*. Donner.
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285–296. <https://doi.org/10.1016/J.JBUSRES.2021.04.070>
- Duncan, J. S., & Lambert, D. (2004). Landscapes of Home. In *A Companion to Cultural Geography* (pp. 382–403). <https://doi.org/https://doi.org/10.1002/9780470996515.ch25>

- Economic Survey Manipur, 2020-21*. (2021). Government of Manipur.
- Foruzanmehr, A. (2015a). Thermal comfort in Indian vernacular architecture. *Journal of Vernacular Architecture*.
- Foruzanmehr, A. & Vellinga, M. (2011). Vernacular architecture and sustainability.
- Gauvain, M., & Altman, I. (1982). A Cross-Cultural Analysis of Homes. *Archit. & Behavior, Georgi Publishing Company, Switzerland*, 2, 27–46.
- Gkartzios, M., Gallent, N., & Scott, M. (2022). A capitals framework for rural areas: ‘Place-planning’ the global countryside. *Habitat International*, 127. <https://doi.org/10.1016/j.habitatint.2022.102625>
- Granath Hansson, A., & Lundgren, B. (2019). Defining Social Housing: A Discussion on the Suitable Criteria. *Housing, Theory and Society*, 36(2), 149–166. <https://doi.org/10.1080/14036096.2018.1459826>
- Ground Water Information Booklet Baksa District, Assam*. (2013).
- Haffner, M., Hoekstra, J., Oxley, M., & Heijden, H. Van Der. (2010). Universalistic, particularistic and middle way approaches to comparing the private rental sector. *International Journal of Housing Policy, Taylor & Francis Group*.
- Hani, U., Azzadina, I., Sianipar, C. P. M., Setyagung, E. H., & Ishii, T. (2012). Preserving Cultural Heritage through Creative Industry: A Lesson from Saung Angklung Udjo. *Procedia Economics and Finance*, 4, 193–200. [https://doi.org/10.1016/s2212-5671\(12\)00334-6](https://doi.org/10.1016/s2212-5671(12)00334-6)
- Hanjabam, D. (2020). Assessing Housing and Liveability in Northeast India. *International Journal of Housing and Human Settlement Planning*, 6(2), 27–32. www.journalspub.com
- Hanjabam, D., & Yadav, S. (2022). Culture and Built-Form Relationship in Social Housing of Manipur. In H. Doloï & A. Bora (Eds.), *Proceedings of the 5th International Conference on Smart Villages and Rural Development (COSVARD 2022)* (pp. 174–184).
- Hanjabam, D., & Yadav, S. (2024). Community living, social values, and the built environment: A Study focus on Indigenous Community of Meiteis of Manipur. *International Journal of Housing and Human Settlement Planning*, 10(1). <https://doi.org/10.37628/IJHHSP>
- Henilane, I. (2016). Housing Concept and Analysis of Housing Classification. *Baltic Journal of Real Estate Economics and Construction Management*, 4(1), 168–179. <https://doi.org/10.1515/bjreecm-2016-0013>
- Herda, G., Rani, S., Caleb, R., Gupta, R., Behal, M., Gregg, M., & Hazra, S. (2017). *Sustainable Social Housing in India MaS-SHIP Mainstreaming Sustainable Social Housing in India Project Technical Report*. www.mainstreamingsustainablehousing.org
- HIC Africa Strategic Plan 2023-2027*. (2022).

- Hofstede, G., & Usunier, J.-C. (2003). Hofstede's Dimensions of Culture and their Influence on International Business Negotiations. *International Business Negotiations*, 137–148.
- Hollweck, T. (2015). Robert K. Yin. (2014). Case Study Research Design and Methods (5th ed.). . *Canadian Journal of Program Evaluation*, 30(1), 108–110. <https://doi.org/10.3138/cjpe.30.1.108>
- Human Development Index Across Indian States: Is The Glass Still Half Empty?* (2019).
- Hussain, M., & Yaseen, G. (n.d.). *Rural Housing and Accommodation: A Case Study of Indira Awaas Yojana (IAY) Scheme in Kashmir*.
- Jagadish, K. S. (1979). A systems approach to rural housing. *Prec. Indian Acad. Sci*, 2(3), 305–318.
- Jamovi Project (2022). *Jamovi* (Version 2.3) [Computer Software]. <https://www.jamovi.org>
- Januszewski, W. (2021). Balance of the built environment in structural terms. *BUILDER*, 284(3), 15-19. <https://doi.org/10.5604/01.3001.0014.7364>
- Khan, M. L., Devi, A., Bonal, K., Tripathi, R. S. & Arun, A. (2008). The Sacred Groves and Their Significance in Conserving Biodiversity: An Overview. *International Journal of Ecology and Environmental Sciences*, 34(3).
- Kovács, G. (2020). Beyond vernacular architecture. *Journal of Cultural Heritage Management*.
- Ke Liu, & Leng, J. (2019). A Study of Sustainable Social Housing Community Design in Britain and China. *KnE Social Sciences*. <https://doi.org/10.18502/kss.v3i27.5549>
- Khaire, M., & Jha, S. K. (2022). Examining Homeownership Bias in Indian Housing Policy Using Frame Analysis. *Environment and Urbanization ASIA*, 13(1), 113–125. <https://doi.org/10.1177/09754253221079527>
- Kulshreshtha, Y., Mota, N. J. A., Jagadish, K. S., Bredenoord, J., Vardon, P. J., van Loosdrecht, M. C. M., & Jonkers, H. M. (2020). The potential and current status of earthen material for low-cost housing in rural India. *Construction and Building Materials*, 247, 118615. <https://doi.org/10.1016/J.CONBUILDMAT.2020.118615>
- Kumar, A., Deka, A., & Sinha, R. (2016). *Rural Housing in India: Status and Policy Challenges Content Analysis of Parliament Questions View project*. <https://doi.org/10.13140/RG.2.2.16047.43687>
- Lidón de Miguel, M., et al. (2020). Transformations in vernacular architecture. *Sustainability*.

- Lennartz, C., Haffner, M., & Oxley, M. (2012). Competition between social and market renting: A theoretical application of the structure-conduct-performance paradigm. *Journal of Housing and the Built Environment*, 27(4), 453–471. <https://doi.org/10.1007/s10901-012-9276-7>
- Marshall, A. (1890). *Principles of Economics*. MacMillan and Co.
- Melnychuk, O., Bekhta, I., & Tkachivska, M. (n.d.). *Pearson Correlation Coefficient in Studying the Meaning of a Literary Text*.
- Merriam-Webster. (n.d.-a). *Housing*. Merriam-Webster.Com Dictionary.
- Merriam-Webster. (n.d.-b). *Tradition*. Merriam-Webster.Com Dictionary. Retrieved May 12, 2024, from <https://www.merriam-webster.com/dictionary/tradition>
- Mustaque Ahmed, M., & KUMAR Singh, P. (2007). *Traditional Knowledge System of the Muslim community in Manipur*. <https://www.researchgate.net/publication/237443204>
- National Sample Survey 69th Round. (2012).
- Ng, C. F. (1998). CANADA AS A NEW PLACE: THE IMMIGRANT'S EXPERIENCE. *Journal of Environmental Psychology*, 18(1), 55–67. <https://doi.org/https://doi.org/10.1006/jevp.1997.0065>
- Nurse, K. (2006). *Culture as the Fourth Pillar of Sustainable Development*.
- Olukoya, O. (2021). Vernacular Value Model (VVM). *International Journal of Heritage Studies*.
- Oliver, P. (1997). *The Encyclopedia of Vernacular Architecture of the World*, 10(2), 69-75. International Association for the Study of Traditional Environments (IASTE). <https://www.jstor.org/stable/23566265>
- Oliver, P. (2007). *Built to Meet Needs: Cultural Issues in Vernacular Architecture*. Routledge. <https://doi.org/10.4324/9780080476308>
- Olusayo Oyebanji, A. (2014). *The Development of a Public-Private Partnerships (PPP) Framework for Sustainable Social Housing Provision (SSHP)*.
- Pakynitein, E. H. (n.d.). *Village Survey Monographs, 1 Titaguri (Jonagaon), Part VI, Vol-III, Assam*.
- Pakynitein, E. H. (1961). Village Survey Monographs, 5 Nasatra, Part VI, Vol-III, Assam. In *PRG. 165.5 eN* (Vol. 1).
- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research. *Administration and Policy in Mental Health and Mental Health Services Research*, 42(5), 533–544. <https://doi.org/10.1007/s10488-013-0528-y>
- Pardo, A. (2023). Vernacular architecture research trends. *Journal of Architectural Research*.

- Portella, A. A. (2014). Built Environment. In A. C. Michalos (Ed.), *Encyclopedia of Quality of Life and Well-Being Research* (pp. 454–461). Springer Netherlands. https://doi.org/10.1007/978-94-007-0753-5_240
- Potential Linked Credit Plan: NABARD*. (2023). www.nabard.org
- Pradhan Mantri Awaas Yojana - Gramin*. (2024). <https://www.myscheme.gov.in/schemes/pmay-g>
- Pradhan Mantri Awaas Yojana-Gramin PMAY-G: A Door to Dignity Fulfilling the aspirations of houseless and poor people of Rural India*. (n.d.).
- Prakriti Hunar Lokvidya-PAHAL II*. (n.d.).
- Priemus, H. (2013). The future of social housing. The Dutch case. *International Journal of Co-Operative Management*, 6(2), 13–24.
- Privitera, G. J. (2023). Introduction to Hypothesis Testing. In *Statistics for the Behavioral Sciences* (Chapter 8). SAGE Publications, Inc.
- Rajkumar, G., & Jagan Mohan, K. (2022). Rural Housing in India-An Overview of Policy Imperatives. *Peer Reviewed and Refereed Journal*, (3), 11. www.census2011.co.in
- Rao, P. S. N., Roy, S., Gupta, S. C., Dhar, V., Farooque, N. A., & Pattaniak, B. K. (2019). *Housing* (Unit 1). Indira Gandhi National Open University.
- Rapoport, A. (1969). *House form and Culture*. Prentice-Hall, Inc.
- Rapoport, A. (2000). Theory, Culture and Housing. *Housing, Theory and Society*, 17(4), 145–165. <https://doi.org/10.1080/140360900300108573>
- Rapoport, A. (2005). *Culture, Architecture, and Design* (A. D. Seidel, Ed.). Locke Science Publishing Company, Inc.
- Redfield, R. (1953). *The Primitive World and Its Transformations*. Cornell University Press.
- Ricardo, D. (1817). *On the Principles of Political Economy and Taxation*. John Murray.
- Ruca Dwellings / Undurraga Devés Arquitectos*. (2013, December 10). ArchDaily. <https://www.archdaily.com/456299/ruca-dwellings-undurraga-deves-arquitectos>
- Sachs, I. (1999). Social sustainability and whole development: exploring the dimensions of sustainable development. In *Sustainability and the social sciences: a cross-disciplinary approach to integrating environmental considerations into theoretical reorientation* (pp. 25–36). ZedBooks.
- Sanoff, H. (2000). Community Participation Methods in Design and Planning. In *Landscape and Urban Planning* (Vol. 50, Number 4). Wiley. [https://doi.org/10.1016/s0169-2046\(00\)00063-3](https://doi.org/10.1016/s0169-2046(00)00063-3)

- Schober, P., & Schwarte, L. A. (2018). Correlation coefficients: Appropriate use and interpretation. *Anesthesia and Analgesia*, 126(5), 1763–1768.
<https://doi.org/10.1213/ANE.0000000000002864>
- Scott, M., & Gkartzios, M. (2014). Rural Housing: Questions of Resilience. *Housing and Society*, 41(2), 247–276. <https://doi.org/10.1080/08882746.2014.11430630>
- Sebba, R., & Churchman, A. (1986). The Uniqueness of the Home. In *Arch. & Comport./Arch. & Behav* (Vol. 3, Number 1).
- Sectoral Projections for the year 2016-17*. (2016).
- Setijanti, P., Defiana, I., Setyawan, W., Silas, J., Firmaningtyas, S., & Ernawati, R. (2015). Traditional Settlement Livability in Creating Sustainable Living. *Procedia - Social and Behavioral Sciences*, 179, 204–211.
<https://doi.org/10.1016/j.sbspro.2015.02.423>
- Sharma, C. K. (2013). *Genesis of a village in west Assam: a study of Boro Bhatarmari*. Tezpur University.
- Shehab, A. M. A., & Kandar, M. Z. (2021). Socio-Cultural Values Influences on the Housing Design towards Sustainable Community in the Gaza Strip. *International Journal of Academic Research in Business and Social Sciences*, 11(10). <https://doi.org/10.6007/ijarbss/v11-i10/11133>
- Singh, K., Satyanarayana, B., & Birendra Singh, R. K. (1981). *Census Of India 1981 Manipur Survey Report On Village Ithing*.
- Singh, N. D., Krishnan, M., Sivaramane, N., Ananthan, P. S., & Satyasai, K. J. S. (2015). Determination of Efficiency of Fish Farms in North-East India Using Data Envelopment Approach. *Agricultural Economics Research Review*, 28(2), 329. <https://doi.org/10.5958/0974-0279.2016.00011.2>
- Sixsmith, J. (1986). The meaning of home: An exploratory study of environmental experience. *Journal of Environmental Psychology*, 6(4), 281–298.
[https://doi.org/10.1016/S0272-4944\(86\)80002-0](https://doi.org/10.1016/S0272-4944(86)80002-0)
- Smith, A. (1904). *An Inquiry Into the Nature and Causes of the Wealth of Nations* (E. Cannan, Ed.; Cannan, Vol. 1). Methuen & Co. Ltd.
- Social Housing Production: Exercise I / Inhabitants of Tepetzintan + Comunal Architecture Workshop*. (2019, July 2). ArchDaily.
<https://www.archdaily.com/920082/social-housing-production-exercise-i-inhabitants-of-tepetzintan-plus-comunal-architecture-workshop>
- Srivastava, A. & Das, B. K.** (2023). Vernacular Architecture of India: An Overview. *ISVS e-journal*, 10(7), 264-275.
- Tiwari, P., & Rao, J. (2011). *ADB Working Paper Series Housing Markets and Housing Policies in India* Asian Development Bank Institute.
<http://www.adb.org/publications/major-challenges-facing-small-and-medium-sized->

- Tylor, E. B. (2010). *Primitive Culture*. Cambridge University Press.
<https://doi.org/10.1017/CBO9780511705960>
- UN General Assembly. (1992). *Global Strategy for Shelter to the Year 2000*.
- United Nations. (1987). *Report of the World Commission on Environment and Development: Our Common Future Towards Sustainable Development*.
- United Nations. (2015). *Transforming our world: the 2030 Agenda for Sustainable Development Transforming our world: the 2030 Agenda for Sustainable Development*.
- United Nations Human Settlements Programme. (2008). *Housing finance mechanisms in Chile*. UN-HABITAT.
- Upadhyay, A., Pandey, D. K., & Singh, Y. J. (2021). Profitability, efficiency and gender equity in smoked fish value chain of North Eastern Region of India. In *Article in JOURNAL OF ENTOMOLOGY AND ZOOLOGY STUDIES*.
<https://www.researchgate.net/publication/346589725>
- Van Eck, N. J., & Waltman, L. (2014). Visualizing Bibliometric Networks. In *Measuring Scholarly Impact* (pp. 285–320). Springer International Publishing.
https://doi.org/10.1007/978-3-319-10377-8_13
- Vatsyayan, K. M. (1972). Some Aspects of Cultural Policy in India. In *Studies and documents on cultural policies* (pp. 9–97). United Nations, Scientific and Cultural Organization.
- Yates, J. (2013). Evaluating social and affordable housing reform in Australia: lessons to be learned from history. *International Journal of Housing Policy*, 13(2), 111–133. <https://doi.org/10.1080/14616718.2013.785717>

ANNEXURE-1

EXPLORING THE NEED FOR CULTURE AND BUILT ENVIRONMENT RELATIONSHIP IN CENTRALLY FUNDED GOVERNMENT SOCIAL HOUSING SCHEMES

A CASE OF RURAL HOUSING OF MANIPUR AND ASSAM

This questionnaire is only for the purpose of PhD fieldwork for the ongoing PhD work of Dwijomala Hanjabam of Department of Planning and Architecture, Mizoram University.

PART A: Basic Household Data

1. Name of the Respondent:
2. House Address:
3. Household size:
4. Age profile of family members:

	Age category	Number of male	Number of female	Family relation	Total
a.	Below 10 years				
b.	10 to 18 years				
c.	19 to 35 years				
d.	35 to 65 years				
e.	Above 65 years				

5. How long have you lived in this area?

a.	Less than 5 years		d.	Native to the area	
b.	Less than 10 years		c.	Other (specify)	
c.	More than 10 years				

6. If shifted from other location, where is your place of origin?

.....

7. Why did you shift here?

.....

8. What is the major source of income of your household?

.....

Interviewer Notes/Remarks/Observations

.....

.....

.....

PART B: Dwelling unit characteristics and activity

9. Nature of economic activity/income source of family members:

	Members	Nature of activity	Within household and premise/away from house
a.			
b.			
c.			
d.			

10. Past dwelling unit space allocation:

a.	Bedroom	
b.	Living room	
c.	Kitchen	
d.	Toilet	
e.	Bathroom	
f.	Any other	

11. Current dwelling unit constructed under PMAY-G scheme:

a.	Bedroom	
b.	Living room	
c.	Kitchen	
d.	Toilet	
e.	Bathroom	
f.	Any other	

12. Space requirement for various activities

	Activity	Scale of activity (strike out the irrelevant one)	Whether present/not present	Space requirement
a.	Weaving or other handloom activity	For own consumption/for selling	Yes/No	
b.	Animal/Livestock Rearing	For own consumption/for selling	Yes/No	
c.	Farming related activity	For own consumption/for selling	Yes/No	
d.	Household	For own consumption/for selling	Yes/No	
e.	Ceremony/rituals/festivals celebration space	For own consumption/for selling	Yes/No	
f.	Kitchen garden	For own consumption/for selling	Yes/No	

Interviewer Notes/Remarks/Observations

.....

.....

PART C: Socio-cultural behaviour set-up

13. Neighbour profile:

a.	Relatives	
b.	Belong to same community	
c.	None of the above	

14. Ethnic group:

.....

15. Do u get support from neighbours and community in day-to-day life?

.....

16. Nature of support

a.	Exchange/borrowing of household items	
b.	Exchange of kitchen items	
c.	Childcare	
d.	Any other (please specify)	

17. Where do you celebrate community level festivals

	Name of festival	Community space	Neighbourhood space	Household space	Any other
a.					
b.					
c.					
d.					

18. Where do you hold rites and rituals (example: birth, marriage, death, any other)

	Name of rites/rituals	Community space	Neighbourhood space	Household space	Any other
a.					
b.					
c.					
d.					

19. Any cultural or unspoken building norms that is followed in building design or space allocation

.	Items	Yes/No	Specification
a.	Orientation of building (E, W, N, S facing etc.)		
b.	Location of spaces		
c.	Window, door orientation		
d.	Decorative element, use of material, symbolic representation		
e.	Any other		

Interviewer Notes/Remarks/Observations (on activity pattern of the household)

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PART D: Dwelling unit built under PMAY-G scheme

20. Name of Beneficiary:

21. Year of sanction:

22. Year of completion:

23. House allotted to:

a.	Woman-Unmarried	
b.	Woman-Married	
c.	Woman-Widow	
d.	Joint-Husband & Wife	
e.	Man	

24. Are you aware of the PAHAL typology for constructing the dwelling unit? Yes/No

25. If yes, what is the reason behind your decision?

a.	Cost-efficient	
b.	Assistance from officials	
c.	Like the design	
d.	Use of material	
e.	Space organization and functionality	
f.	Any other	

Any comment/remark:

.....

.....

.....

.....

26. If no, what is the reason behind your decision?

a.	Not Cost-efficient	
b.	Did not like the design	
c.	Did not like the space organization	
d.	Lack of space for day to day activity	
e.	Mismatch of available plot size and design	
f.	No scope for future expansion	
h.	Any other	

Any comment/remark:

.....

.....

.....

27. Who were involved in construction of your house?

a.	Local construction worker	
b.	Local construction worker who also build other houses in the locality/relatives/friends	
c.	Skilled labour	
d.	Neighbours, friends and relatives	
e.	Any other	

28. Reason behind choice of building material?

a.	Locally available	
b.	Cost efficient	
c.	Longevity	
d.	Everyone else is using	
e.	Any other	

Any comment/remark:

.....

.....

.....

ANNEXURE-2

Data of Baksa

Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H1	5	Boro	Woman-Married	1	1	0	0	1
H2	4	Boro	Woman-Married	1	1	0	1	0
H3	5	Boro	Man	1	1	0	1	0
H4	6	Boro	Man	1	0	0	1	0
H5	3	Boro	Man	0	1	0	1	1
H6	3	Assamese	Man	1	1	0	1	1
H7	6	Boro	Man	1	0	0	1	0
H8	3	Boro	Man	0	1	0	1	0
H9	6	Assamese	Man	1	0	0	1	1
H10	5	Assamese	Man	0	0	0	1	1
H11	6	Assamese	Man	1	1	0	1	0
H12	5	Assamese	Man	1	1	0	1	0
H13	6	Assamese	Joint(Husband and Wife)	0	1	0	1	0
H14	6	Assamese	Woman-Widow	1	1	0	1	1
H15	5	Assamese	Man	1	0	0	1	0
H16	3	Assamese	Woman-Widow	1	1	0	1	0
H17	6	Assamese	Man	0	0	0	1	1
H18	6	Assamese	Man	1	1	0	1	1
H19	6	Boro	Woman-Widow	1	0	0	1	0
H20	6	Boro	Woman-Widow	0	1	0	0	1
H21	5	Assamese	Woman-Widow	1	1	0	0	1
H22	6	Boro	Woman-Widow	1	1	0	0	0
H23	3	Boro	Woman-Widow	1	0	0	0	0
H24	4	Assamese	Man	1	1	0	0	0
H25	5	Assamese	Joint(Husband and Wife)	0	1	0	0	0
H26	5	Assamese	Joint(Husband and Wife)	0	1	0	0	0
H27	6	Assamese	Man	1	1	0	0	0
H28	5	Boro	Man	0	0	0	0	1
H29	6	Assamese	Joint(Husband and Wife)	1	1	0	0	1
H30	5	Assamese	Man	1	1	0	1	1

Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H31	5	Assamese	Woman-Unmarried	1	1	0	1	1
H32	3	Assamese	Woman-Married	1	1	0	1	0
H33	5	Assamese	Man	1	0	0	1	0
H34	5	Assamese	Joint(Husband and Wife)	1	1	0	1	0
H35	5	Assamese	Woman-Widow	1	0	0	0	0
H36	3	Assamese	Woman-Widow	0	1	0	0	1
H37	6	Assamese	Woman-Widow	0	1	0	0	1
H38	5	Assamese	Woman-Married	1	1	0	0	1
H39	5	Boro	Woman-Married	1	1	0	0	0
H40	5	Assamese	Joint(Husband and Wife)	1	1	0	0	1
H41	5	Assamese	Woman-Widow	1	1	0	0	0
H42	3	Assamese	Woman-Married	1	1	0	0	1
H43	6	Assamese	Woman-Married	1	0	0	0	0
H44	5	Assamese	Woman-Married	1	1	0	0	0
H45	5	Assamese	Woman-Married	1	1	0	0	0
H46	4	Assamese	Woman-Married	1	1	0	0	0
H47	5	Assamese	Woman-Married	0	1	0	1	0
H48	3	Assamese	Woman-Married	0	1	0	1	0
H49	6	Assamese	Woman-Married	1	1	0	1	0
H50	5	Assamese	Woman-Married	1	1	0	1	0
H51	6	Assamese	Joint(Husband and Wife)	1	1	0	1	0
H52	3	Assamese	Woman-Married	1	1	0	1	0
H53	3	Assamese	Woman-Married	1	0	0	1	0
H54	6	Assamese	Man	1	0	0	1	0
H55	3	Assamese	Woman-Married	0	0	0	1	0
H56	4	Assamese	Woman-Married	0	0	0	1	0
H57	5	Assamese	Woman-Married	0	0	0	1	0
H58	4	Assamese	Woman-Married	0	1	0	1	0
H59	6	Assamese	Woman-Married	0	1	0	1	0
H60	4	Assamese	Woman-Married	0	1	0	0	0
H61	6	Assamese	Woman-Married	1	1	0	0	0
H62	3	Assamese	Woman-Married	1	1	0	0	0
H63	5	Assamese	Joint(Husband and Wife)	1	1	0	0	0
H64	5	Assamese	Woman-Married	1	1	0	0	0
H65	5	Assamese	Woman-Married	1	1	0	0	0
H66	6	Assamese	Woman-Widow	0	1	0	0	0
H67	5	Assamese	Woman-Married	0	1	0	0	0
H68	6	Assamese	Joint(Husband and Wife)	0	1	0	1	0
H69	5	Assamese	Woman-Widow	0	1	0	1	0
H70	5	Assamese	Man	1	1	0	1	0

Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H71	3	Assamese	Man	1	1	0	1	0
H72	5	Assamese	Man	1	1	0	1	0
H73	4	Boro	Joint(Husband and Wife)	1	1	0	1	0
H74	5	Assamese	Joint(Husband and Wife)	1	1	0	1	1
H75	3	Assamese	Woman-Married	1	1	0	1	0
H76	3	Assamese	Joint(Husband and Wife)	1	1	0	1	0
H77	3	Assamese	Woman-Married	1	1	0	1	0
H78	3	Assamese	Man	1	0	0	1	1
H79	6	Assamese	Woman-Married	0	0	0	1	1
H80	6	Assamese	Woman-Widow	0	0	0	1	0
H81	5	Assamese	Woman-Married	0	1	0	1	0
H82	6	Assamese	Woman-Married	1	1	0	1	1
H83	3	Boro	Woman-Widow	1	1	0	1	1
H84	5	Assamese	Joint(Husband and Wife)	1	1	0	1	0
H85	5	Assamese	Joint(Husband and Wife)	1	1	0	1	0
H86	5	Assamese	Joint(Husband and Wife)	1	1	0	1	0
H87	6	Boro	Joint(Husband and Wife)	1	1	0	0	1
H88	4	Assamese	Woman-Married	0	1	0	0	0
H89	6	Assamese	Joint(Husband and Wife)	0	1	0	0	0
H90	5	Assamese	Woman-Married	0	0	0	1	1
H91	5	Assamese	Woman-Married	0	1	0	1	1
H92	3	Assamese	Joint(Husband and Wife)	1	0	0	1	0
H93	5	Boro	Joint(Husband and Wife)	1	1	0	1	1
H94	5	Boro	Joint(Husband and Wife)	1	1	0	1	1
H95	5	Boro	Man	1	1	0	1	0
H96	3	Boro	Woman-Married	1	1	0	1	0
H97	4	Assamese	Woman-Married	1	0	0	0	0
H98	3	Assamese	Woman-Married	1	0	0	0	0
H99	3	Assamese	Woman-Married	1	1	0	0	0
H100	3	Assamese	Woman-Married	0	1	0	1	0

Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H101	4	Assamese	Woman-Married	0	1	0	1	1
H102	6	Assamese	Woman-Married	0	1	0	1	1
H103	5	Boro	Woman-Married	0	1	0	1	1
H104	6	Assamese	Woman-Married	0	1	0	1	1
H105	3	Assamese	Joint(Husband and Wife)	0	1	0	1	0
H106	5	Assamese	Woman-Married	1	1	0	1	0
H107	5	Assamese	Woman-Married	1	1	0	0	0
H108	5	Assamese	Woman-Married	1	1	0	0	0
H109	6	Assamese	Woman-Married	1	0	0	0	1
H110	5	Assamese	Joint(Husband and Wife)	1	0	0	1	1
H111	6	Boro	Woman-Married	1	1	0	1	1
H112	5	Assamese	Joint(Husband and Wife)	1	1	0	1	0
H113	5	Assamese	Joint(Husband and Wife)	1	1	0	1	1
H114	3	Assamese	Woman-Married	1	1	0	1	0
H115	5	Assamese	Woman-Married	1	1	0	1	1
H116	5	Assamese	Woman-Married	1	1	0	1	0
H117	5	Assamese	Woman-Married	1	1	0	0	0
H118	4	Assamese	Joint(Husband and Wife)	1	1	0	0	0
H119	6	Assamese	Woman-Married	1	1	0	0	0
H120	4	Assamese	Woman-Widow	0	1	0	0	0
H121	6	Assamese	Woman-Widow	0	1	0	0	0
H122	6	Assamese	Woman-Married	1	1	0	0	0
H123	6	Boro	Man	1	1	0	0	0
H124	6	Assamese	Joint(Husband and Wife)	1	1	0	0	0
H125	5	Boro	Woman-Widow	1	0	0	0	0
H126	6	Assamese	Woman-Widow	1	0	0	0	0
H127	4	Assamese	Man	1	0	0	0	0
H128	5	Assamese	Man	1	1	0	0	0
H129	5	Assamese	Joint(Husband and Wife)	1	1	0	0	1
H130	5	Assamese	Woman-Married	1	1	0	0	0
H131	6	Assamese	Woman-Widow	1	1	0	0	0
H132	5	Assamese	Man	1	1	0	1	0
H133	6	Assamese	Woman-Widow	1	1	0	1	1
H134	5	Assamese	Man	1	0	0	1	1
H135	5	Assamese	Joint(Husband and Wife)	1	1	0	0	0
H136	3	Assamese	Joint(Husband and Wife)	0	1	0	0	0
H137	5	Boro	Woman-Married	0	1	0	0	1
H138	5	Assamese	Woman-Married	1	1	0	0	1
H139	5	Assamese	Woman-Married	1	1	0	0	0
H140	3	Boro	Woman-Married	1	1	0	1	0

Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H141	6	Boro	Joint(Husband and Wife)	1	1	0	1	0
H142	6	Boro	Woman-Married	1	0	0	1	1
H143	6	Boro	Woman-Married	1	0	0	1	0
H144	6	Assamese	Man	1	1	0	1	0
H145	5	Assamese	Woman-Married	1	1	0	0	1
H146	6	Boro	Woman-Married	1	1	0	0	1
H147	3	Boro	Joint(Husband and Wife)	1	1	0	0	0
H148	5	Assamese	Woman-Married	0	1	0	0	1
H149	5	Assamese	Woman-Married	0	1	0	0	1
H150	5	Boro	Woman-Married	0	1	0	0	0
H151	6	Boro	Woman-Married	1	1	0	0	0
H152	5	Boro	Woman-Married	1	1	0	1	0
H153	6	Boro	Woman-Married	1	1	0	1	0
H154	5	Boro	Woman-Married	1	0	0	1	0
H155	5	Boro	Woman-Married	1	0	0	1	0
H156	3	Boro	Woman-Married	1	0	0	1	1
H157	5	Boro	Woman-Married	1	0	0	1	1
H158	5	Boro	Man	1	0	0	1	1
H159	6	Boro	Woman-Married	1	1	0	0	1
H160	3	Boro	Woman-Married	1	1	0	0	0
H161	3	Boro	Woman-Married	1	1	0	0	0
H162	5	Boro	Joint(Husband and Wife)	0	1	0	0	0
H163	3	Boro	Woman-Married	0	1	0	0	0
H164	5	Boro	Woman-Married	1	1	0	1	1
H165	5	Boro	Woman-Married	1	1	0	1	1
H166	6	Boro	Joint(Husband and Wife)	1	1	0	1	1
H167	5	Boro	Joint(Husband and Wife)	1	0	0	1	0
H168	6	Boro	Woman-Married	1	0	0	1	1
H169	5	Boro	Woman-Married	1	0	0	0	0
H170	6	Boro	Man	1	1	0	0	1
H171	3	Boro	Man	1	1	0	0	0
H172	5	Boro	Woman-Married	0	1	0	0	0
H173	3	Boro	Woman-Widow	0	1	0	0	0
H174	5	Boro	Woman-Married	0	1	0	0	0

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/Rituals
H1	1	10	0.5	14.5	1	1	0	0	1	4	7	1
H2	1	10	0.5	14.5	1	1	0	1	0	5	8	1
H3	1	8	0.25	12.25	1	1	0	1	0	3	6	0
H4	1	10	0.5	13.5	1	0	0	1	0	5	7	1
H5	1	10	0.25	14.25	0	1	0	1	0	4	6	0
H6	1	10	0.5	15.5	1	1	0	1	0	6	9	1
H7	1	10	0.5	13.5	1	0	0	1	0	6	8	1
H8	1	10	0.5	13.5	0	1	0	1	0	5	7	1
H9	1	10	0.5	14.5	1	0	0	1	1	5	8	0
H10	1	10	0.5	13.5	0	0	0	1	0	4	5	0
H11	1	10	0.5	14.5	1	1	0	1	0	6	9	1
H12	1	10	0.5	14.5	1	1	0	1	0	5	8	1
H13	1	10	0.5	13.5	0	1	0	1	0	5	7	1
H14	1	10	0.5	15.5	1	1	0	1	0	6	9	1
H15	1	10	0.5	13.5	1	0	0	1	0	6	8	1
H16	1	10	0.5	14.5	1	1	0	1	0	5	8	1
H17	1	10	0.5	13.5	0	0	0	1	0	5	6	1
H18	1	10	0.5	15.5	1	1	0	1	0	6	9	1
H19	1	8	0	11	1	0	0	1	0	2	4	0
H20	1	10	0.5	13.5	0	1	0	0	1	6	8	1
H21	1	10	0.5	14.5	1	1	0	0	0	6	8	0
H22	1	10	0.5	13.5	1	1	0	0	0	5	7	1
H23	1	10	0.5	12.5	1	0	0	0	0	6	7	1
H24	1	8	0	11	1	1	0	0	0	2	4	0
H25	1	10	0.5	12.5	0	1	0	0	0	5	6	1
H26	1	10	0.5	12.5	0	1	0	0	0	6	7	1
H27	1	10	0.5	13.5	1	1	0	0	0	5	7	1
H28	1	10	0.5	12.5	0	0	0	0	0	5	5	1
H29	1	10	0.5	14.5	1	1	0	0	0	6	8	1
H30	1	10	0.5	15.5	1	1	0	1	0	5	8	1
H31	1	10	0.5	15.5	1	1	0	1	1	5	9	1
H32	1	10	0.5	14.5	1	1	0	1	0	6	9	1
H33	1	8	0.25	11.25	1	0	0	1	0	3	5	0
H34	1	10	0.5	14.5	1	1	0	1	0	6	9	1
H35	1	10	0.5	12.5	1	0	0	0	0	5	6	1
H36	1	10	0.5	13.5	0	1	0	0	0	6	7	1
H37	1	8	0.5	11.5	0	1	0	0	0	2	3	1
H38	1	8	0.25	12.25	1	1	0	0	0	3	5	0
H39	1	10	0.5	13.5	1	1	0	0	0	6	8	1
H40	1	10	0.5	14.5	1	1	0	0	1	5	8	1

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/Rituals
H41	1	10	0.5	13.5	1	1	0	0	0	6	8	1
H42	1	10	0.25	14.25	1	1	0	0	1	5	8	0
H43	1	10	0.5	12.5	1	0	0	0	0	6	7	1
H44	1	10	0.5	13.5	1	1	0	0	0	6	8	1
H45	1	10	0.25	13.25	1	1	0	0	0	4	6	1
H46	1	10	0.5	13.5	1	1	0	0	0	4	6	1
H47	1	10	0.5	13.5	0	1	0	1	0	6	8	1
H48	1	10	0.25	13.25	0	1	0	1	0	6	8	0
H49	1	10	0.5	14.5	1	1	0	1	0	6	9	1
H50	1	8	0.25	12.25	1	1	0	1	0	4	7	1
H51	1	10	0.5	14.5	1	1	0	1	0	6	9	1
H52	1	10	0.25	14.25	1	1	0	1	0	6	9	1
H53	1	10	0.5	13.5	1	0	0	1	0	6	8	1
H54	1	10	0.25	13.25	1	0	0	1	0	6	8	1
H55	1	8	0.25	10.25	0	0	0	1	0	2	3	1
H56	1	10	0.5	12.5	0	0	0	1	0	4	5	1
H57	1	10	0.5	12.5	0	0	0	1	0	6	7	1
H58	1	10	0.5	13.5	0	1	0	1	0	6	8	1
H59	1	10	0.25	13.25	0	1	0	1	0	5	7	1
H60	1	10	0.5	12.5	0	1	0	0	0	6	7	1
H61	1	10	0.25	13.25	1	1	0	0	0	5	7	1
H62	1	10	0.5	13.5	1	1	0	0	0	5	7	1
H63	1	10	0.5	13.5	1	1	0	0	0	6	8	1
H64	1	8	0.25	11.25	1	1	0	0	0	3	5	1
H65	1	10	0.5	13.5	1	1	0	0	0	5	7	1
H66	1	10	0.5	12.5	0	1	0	0	0	5	6	1
H67	1	10	0.25	12.25	0	1	0	0	0	5	6	0
H68	1	10	0.5	13.5	0	1	0	1	0	6	8	1
H69	1	8	0.25	11.25	0	1	0	1	0	2	4	1
H70	1	10	0.5	14.5	1	1	0	1	0	5	8	1

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/Rituals
H71	1	10	0.5	14.5	1	1	0	1	0	6	9	1
H72	1	8	0.25	12.25	1	1	0	1	0	2	5	1
H73	1	8	0	12	1	1	0	1	0	3	6	1
H74	1	8	0.25	13.25	1	1	0	1	1	2	6	1
H75	1	10	0.5	14.5	1	1	0	1	0	6	9	1
H76	1	10	0.5	14.5	1	1	0	1	0	5	8	2
H77	1	10	0.25	14.25	1	1	0	1	0	6	9	0
H78	1	10	0.5	14.5	1	0	0	1	1	6	9	1
H79	1	10	0.5	13.5	0	0	0	1	1	5	7	1
H80	1	10	0.25	12.25	0	0	0	1	0	6	7	1
H81	1	8	0.25	11.25	0	1	0	1	0	2	4	2
H82	1	10	0.25	15.25	1	1	0	1	1	5	9	0
H83	1	10	0.5	15.5	1	1	0	1	1	6	10	1
H84	1	10	0.5	14.5	1	1	0	1	0	5	8	1
H85	1	10	0.25	14.25	1	1	0	1	0	5	8	1
H86	1	8	0.25	12.25	1	1	0	1	0	2	5	1
H87	1	10	0.25	14.25	1	1	0	0	1	5	8	1
H88	1	10	0.5	12.5	0	1	0	0	0	5	6	1
H89	1	8	0.25	10.25	0	1	0	0	0	2	3	2
H90	1	10	0.5	13.5	0	0	0	1	1	5	7	1
H91	1	10	0.5	14.5	0	1	0	1	1	6	9	1
H92	1	10	0.25	13.25	1	0	0	1	0	5	7	1
H93	1	10	0.5	15.5	1	1	0	1	1	6	10	1
H94	1	10	0.25	15.25	1	1	0	1	1	5	9	0
H95	1	10	0.5	14.5	1	1	0	1	0	5	8	1
H96	1	8	0.25	12.25	1	1	0	1	0	3	6	1
H97	1	10	0.25	12.25	1	0	0	0	0	4	5	0
H98	1	10	0.5	12.5	1	0	0	0	0	6	7	0
H99	1	10	0.25	13.25	1	1	0	0	0	5	7	0
H100	1	10	0.5	13.5	0	1	0	1	0	6	8	1

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/Rituals
H101	1	8	0.25	12.25	0	1	0	1	0	2	4	1
H102	1	10	0.25	14.25	0	1	0	1	0	6	8	0
H103	1	10	0.5	14.5	0	1	0	1	0	6	8	1
H104	1	10	0.5	14.5	0	1	0	1	1	6	9	1
H105	1	10	0.5	13.5	0	1	0	1	0	6	8	1
H106	1	10	0.5	14.5	1	1	0	1	0	6	9	1
H107	1	10	0.5	13.5	1	1	0	0	0	6	8	1
H108	1	10	0.5	13.5	1	1	0	0	0	6	8	2
H109	1	10	0.5	13.5	1	0	0	0	1	6	8	1
H110	1	6	0.25	10.25	1	0	0	1	1	6	9	1
H111	1	10	0.25	15.25	1	1	0	1	1	2	6	1
H112	1	10	0.5	14.5	1	1	0	1	0	4	7	1
H113	1	10	0.5	15.5	1	1	0	1	1	6	10	1
H114	1	10	0.5	14.5	1	1	0	1	0	6	9	1
H115	1	6	0.25	11.25	1	1	0	1	1	2	6	1
H116	1	10	0.5	14.5	1	1	0	1	0	5	8	2
H117	1	10	0.25	13.25	1	1	0	0	0	6	8	2
H118	1	9	0.25	12.25	1	1	0	0	0	2	4	1
H119	1	10	0.5	13.5	1	1	0	0	0	5	7	1
H120	1	10	0.25	12.25	0	1	0	0	0	6	7	1
H121	1	10	0.5	12.5	0	1	0	0	0	6	7	1
H122	1	10	0.25	13.25	1	1	0	0	0	5	7	1
H123	1	10	0.5	13.5	1	1	0	0	0	5	7	1
H124	1	10	0.5	13.5	1	1	0	0	0	5	7	1
H125	1	8	0.25	10.25	1	0	0	0	0	3	4	0
H126	1	10	0.5	12.5	1	0	0	0	0	5	6	0
H127	1	10	0.25	12.25	1	0	0	0	0	5	6	0
H128	1	10	0.75	13.75	1	1	0	0	0	6	8	1
H129	1	10	0.25	14.25	1	1	0	0	1	6	9	1
H130	1	8	0.25	11.25	1	1	0	0	0	2	4	1

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/Rituals
H131	1	10	0.5	13.5	1	1	0	0	0	5	7	1
H132	1	10	0.25	14.25	1	1	0	1	0	6	9	1
H133	1	6	0.5	11.5	1	1	0	1	1	2	6	1
H134	1	10	0.25	14.25	1	0	0	1	1	6	9	1
H135	1	10	0.5	13.5	1	1	0	0	0	6	8	1
H136	1	10	0.5	12.5	0	1	0	0	0	5	6	1
H137	1	10	0.5	13.5	0	1	0	0	1	6	8	1
H138	1	10	0.5	14.5	1	1	0	0	1	5	8	1
H139	1	10	0.5	13.5	1	1	0	0	0	5	7	1
H140	1	6	0.25	10.25	1	1	0	1	0	3	6	1
H141	1	10	0.5	14.5	1	1	0	1	0	5	8	1
H142	1	10	0.25	14.25	1	0	0	1	1	5	8	1
H143	1	10	0.5	13.5	1	0	0	1	0	6	8	1
H144	1	10	0.5	14.5	1	1	0	1	0	5	8	1
H145	1	6	0.25	10.25	1	1	0	0	1	2	5	0
H146	1	10	0.25	14.25	1	1	0	0	1	6	9	0
H147	1	10	0.25	13.25	1	1	0	0	0	5	7	1
H148	1	7	0.25	10.25	0	1	0	0	1	2	4	1
H149	1	7	0.25	10.25	0	1	0	0	1	4	6	1
H150	1	8	0.25	10.25	0	1	0	0	0	3	4	1
H151	1	10	0.5	13.5	1	1	0	0	0	5	7	1
H152	1	10	0.25	14.25	1	1	0	1	0	5	8	1
H153	1	10	0.5	14.5	1	1	0	1	0	6	9	1
H154	1	10	0.25	13.25	1	0	0	1	0	5	7	1
H155	1	10	0.5	13.5	1	0	0	1	0	6	8	1
H156	1	10	0.5	14.5	1	0	0	1	1	5	8	1
H157	1	7	0.25	11.25	1	0	0	1	1	2	5	1
H158	1	10	0.5	14.5	1	0	0	1	1	6	9	1
H159	1	10	0.5	14.5	1	1	0	0	1	6	9	1
H160	1	10	0.5	13.5	1	1	0	0	0	6	8	1

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/Rituals
H161	1	10	0.5	13.5	1	1	0	0	0	6	8	1
H162	1	8	0.25	10.25	0	1	0	0	0	3	4	1
H163	1	10	0.25	12.25	0	1	0	0	0	6	7	1
H164	1	10	0.5	15.5	1	1	0	1	0	6	9	1
H165	1	10	0.25	15.25	1	1	0	1	0	6	9	1
H166	1	10	0.5	15.5	1	1	0	1	0	6	9	1
H167	1	10	0.5	13.5	1	0	0	1	0	6	8	1
H168	1	10	0.25	14.25	1	0	0	1	0	6	8	1
H169	1	10	0.5	12.5	1	0	0	0	0	6	7	1
H170	1	10	0.25	14.25	1	1	0	0	0	5	7	1
H171	1	10	0.5	13.5	1	1	0	0	0	6	8	1
H172	1	10	0.5	12.5	0	1	0	0	0	5	6	1
H173	1	10	0.5	12.5	0	1	0	0	0	6	7	1
H174	1	10	0.25	12.25	0	1	0	0	0	4	5	1

Culture is sum of activities captured under:

1. Farming
2. Weaving
3. Fishing
4. Animal Rearing
5. Other Source
6. Support
7. Native
8. Norms

While Built Environment is capture under:

1. Space allocated for activities within the premise
2. No. of liveable rooms in the past dwelling unit.

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H1	5	Boro	18.5	12	8
H2	4	Boro	19.5	14	9
H3	5	Boro	15.25	9	6
H4	6	Boro	18.5	13	8
H5	3	Boro	18.25	10	6
H6	3	Assamese	21.5	16	10
H7	6	Boro	19.5	15	9
H8	3	Boro	18.5	13	8
H9	6	Assamese	19.5	13	8
H10	5	Assamese	17.5	9	5
H11	6	Assamese	20.5	16	10
H12	5	Assamese	19.5	14	9
H13	6	Assamese	18.5	13	8
H14	6	Assamese	21.5	16	10
H15	5	Assamese	19.5	15	9
H16	3	Assamese	19.5	14	9
H17	6	Assamese	18.5	12	7
H18	6	Assamese	21.5	16	10
H19	6	Boro	13	6	4
H20	6	Boro	19.5	15	9
H21	5	Assamese	20.5	14	8
H22	6	Boro	18.5	13	8
H23	3	Boro	18.5	14	8
H24	4	Assamese	13	6	4
H25	5	Assamese	17.5	12	7
H26	5	Assamese	18.5	14	8
H27	6	Assamese	18.5	13	8
H28	5	Boro	17.5	11	6
H29	6	Assamese	20.5	15	9
H30	5	Assamese	20.5	14	9
H31	5	Assamese	20.5	15	10
H32	3	Assamese	20.5	16	10
H33	5	Assamese	14.25	8	5
H34	5	Assamese	20.5	16	10
H35	5	Assamese	17.5	12	7
H36	3	Assamese	19.5	14	8
H37	6	Assamese	13.5	6	4
H38	5	Assamese	15.25	8	5
H39	5	Boro	19.5	15	9
H40	5	Assamese	19.5	14	9

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H41	5	Assamese	19.5	15	9
H42	3	Assamese	19.25	13	8
H43	6	Assamese	18.5	14	8
H44	5	Assamese	19.5	15	9
H45	5	Assamese	17.25	11	7
H46	4	Assamese	17.5	11	7
H47	5	Assamese	19.5	15	9
H48	3	Assamese	19.25	14	8
H49	6	Assamese	20.5	16	10
H50	5	Assamese	16.25	12	8
H51	6	Assamese	20.5	16	10
H52	3	Assamese	20.25	16	10
H53	3	Assamese	19.5	15	9
H54	6	Assamese	19.25	15	9
H55	3	Assamese	12.25	6	4
H56	4	Assamese	16.5	10	6
H57	5	Assamese	18.5	14	8
H58	4	Assamese	19.5	15	9
H59	6	Assamese	18.25	13	8
H60	4	Assamese	18.5	14	8
H61	6	Assamese	18.25	13	8
H62	3	Assamese	18.5	13	8
H63	5	Assamese	19.5	15	9
H64	5	Assamese	14.25	9	6
H65	5	Assamese	18.5	13	8
H66	6	Assamese	17.5	12	7
H67	5	Assamese	17.25	11	6
H68	6	Assamese	19.5	15	9
H69	5	Assamese	13.25	7	5
H70	5	Assamese	19.5	14	9
H71	3	Assamese	20.5	16	10
H72	5	Assamese	14.25	8	6
H73	4	Boro	15	10	7
H74	5	Assamese	15.25	9	7
H75	3	Assamese	20.5	16	10
H76	3	Assamese	19.5	15	10
H77	3	Assamese	20.25	15	9
H78	3	Assamese	20.5	16	10
H79	6	Assamese	18.5	13	8
H80	6	Assamese	18.25	14	8

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H81	5	Assamese	13.25	8	6
H82	6	Assamese	20.25	14	9
H83	3	Boro	21.5	17	11
H84	5	Assamese	19.5	14	9
H85	5	Assamese	19.25	14	9
H86	5	Assamese	14.25	8	6
H87	6	Boro	19.25	14	9
H88	4	Assamese	17.5	12	7
H89	6	Assamese	12.25	7	5
H90	5	Assamese	18.5	13	8
H91	5	Assamese	20.5	16	10
H92	3	Assamese	18.25	13	8
H93	5	Boro	21.5	17	11
H94	5	Boro	20.25	14	9
H95	5	Boro	19.5	14	9
H96	3	Boro	15.25	10	7
H97	4	Assamese	16.25	9	5
H98	3	Assamese	18.5	13	7
H99	3	Assamese	18.25	12	7
H100	3	Assamese	19.5	15	9
H101	4	Assamese	14.25	7	5
H102	6	Assamese	20.25	14	8
H103	5	Boro	20.5	15	9
H104	6	Assamese	20.5	16	10
H105	3	Assamese	19.5	15	9
H106	5	Assamese	20.5	16	10
H107	5	Assamese	19.5	15	9
H108	5	Assamese	19.5	16	10
H109	6	Assamese	19.5	15	9
H110	5	Assamese	16.25	16	10
H111	6	Boro	17.25	9	7
H112	5	Assamese	18.5	12	8
H113	5	Assamese	21.5	17	11
H114	3	Assamese	20.5	16	10
H115	5	Assamese	13.25	9	7
H116	5	Assamese	19.5	15	10
H117	5	Assamese	19.25	16	10
H118	4	Assamese	14.25	7	5
H119	6	Assamese	18.5	13	8
H120	4	Assamese	18.25	14	8

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H121	6	Assamese	18.5	14	8
H122	6	Assamese	18.25	13	8
H123	6	Boro	18.5	13	8
H124	6	Assamese	18.5	13	8
H125	5	Boro	13.25	7	4
H126	6	Assamese	17.5	11	6
H127	4	Assamese	17.25	11	6
H128	5	Assamese	19.75	15	9
H129	5	Assamese	20.25	16	10
H130	5	Assamese	13.25	7	5
H131	6	Assamese	18.5	13	8
H132	5	Assamese	20.25	16	10
H133	6	Assamese	13.5	9	7
H134	5	Assamese	20.25	16	10
H135	5	Assamese	19.5	15	9
H136	3	Assamese	17.5	12	7
H137	5	Boro	19.5	15	9
H138	5	Assamese	19.5	14	9
H139	5	Assamese	18.5	13	8
H140	3	Boro	13.25	10	7
H141	6	Boro	19.5	14	9
H142	6	Boro	19.25	14	9
H143	6	Boro	19.5	15	9
H144	6	Assamese	19.5	14	9
H145	5	Assamese	12.25	7	5
H146	6	Boro	20.25	15	9
H147	3	Boro	18.25	13	8
H148	5	Assamese	12.25	7	5
H149	5	Assamese	14.25	11	7
H150	5	Boro	13.25	8	5
H151	6	Boro	18.5	13	8
H152	5	Boro	19.25	14	9
H153	6	Boro	20.5	16	10
H154	5	Boro	18.25	13	8
H155	5	Boro	19.5	15	9
H156	3	Boro	19.5	14	9
H157	5	Boro	13.25	8	6
H158	5	Boro	20.5	16	10
H159	6	Boro	20.5	16	10
H160	3	Boro	19.5	15	9

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H161	3	Boro	19.5	15	9
H162	5	Boro	13.25	8	5
H163	3	Boro	18.25	14	8
H164	5	Boro	21.5	16	10
H165	5	Boro	21.25	16	10
H166	6	Boro	21.5	16	10
H167	5	Boro	19.5	15	9
H168	6	Boro	20.25	15	9
H169	5	Boro	18.5	14	8
H170	6	Boro	19.25	13	8
H171	3	Boro	19.5	15	9
H172	5	Boro	17.5	12	7
H173	3	Boro	18.5	14	8
H174	5	Boro	16.25	10	6

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Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H1	9	Bengali	Woman-Married	1	1	0	0	1
H2	2	Bengali	Joint(Husband and Wife)	1	0	1	1	0
H3	4	Bengali	Joint(Husband and Wife)	0	1	0	1	1
H4	4	Bengali	Joint(Husband and Wife)	0	1	0	1	0
H5	4	Boro	Woman-Widow	0	0	0	1	0
H6	5	Boro	Woman-Married	0	1	0	1	0
H7	5	Bengali	Man	0	0	0	1	0
H8	6	Bengali	Joint(Husband and Wife)	1	1	1	1	0
H9	6	Bengali	Joint(Husband and Wife)	1	1	0	1	0
H10	5	Bengali	Woman-Widow	1	1	0	1	0
H11	5	Assamese	Woman-Married	1	1	0	1	1
H12	5	Assamese	Man	1	1	0	1	1
H13	5	Assamese	Man	0	1	0	1	0
H14	5	Assamese	Man	0	1	0	1	0
H15	4	Assamese	Woman-Widow	0	1	0	1	1
H16	4	Assamese	Woman-Married	0	1	0	1	0
H17	4	Bengali	Woman-Widow	0	1	0	1	1
H18	5	Bengali	Woman-Widow	0	1	0	1	1
H19	5	Assamese	Man	0	1	0	1	1
H20	9	Assamese	Man	0	1	0	0	0
H21	2	Assamese	Man	0	0	1	0	0
H22	4	Assamese	Woman-Widow	1	1	1	0	1
H23	4	Assamese	Man	1	0	1	0	0
H24	4	Assamese	Woman-Widow	1	1	1	0	0
H25	5	Assamese	Woman-Married	1	1	1	0	0
H26	5	Assamese	Man	1	1	1	0	1
H27	6	Assamese	Man	1	1	1	0	1
H28	6	Assamese	Man	1	1	0	0	0
H29	5	Boro	Man	1	1	0	0	0
H30	4	Boro	Woman-Married	1	0	1	1	0
H31	4	Assamese	Man	1	1	1	1	1
H32	4	Assamese	Man	1	0	0	1	0
H33	5	Assamese	Man	1	1	1	1	0
H34	5	Assamese	Woman-Married	1	0	1	1	0
H35	7	Assamese	Man	1	0	1	0	0

Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H36	9	Assamese	Man	1	1	0	0	1
H37	2	Assamese	Woman-Widow	0	1	0	0	1
H38	4	Assamese	Man	1	1	0	0	1
H39	4	Assamese	Man	1	0	0	0	0
H40	4	Assamese	Man	0	0	0	0	0
H41	5	Assamese	Woman-Widow	0	1	0	0	0
H42	5	Assamese	Man	1	1	0	0	0
H43	6	Assamese	Man	1	1	0	0	0
H44	6	Assamese	Man	1	1	1	0	1
H45	5	Assamese	Man	1	0	0	0	0
H46	5	Assamese	Man	1	1	0	0	1
H47	5	Assamese	Man	1	0	0	1	0
H48	3	Assamese	Man	1	1	0	1	0
H49	6	Boro	Woman-Married	1	1	0	1	0
H50	5	Assamese	Woman-Widow	0	1	0	1	1
H51	6	Assamese	Man	1	1	0	1	0
H52	3	Assamese	Man	0	0	0	1	0
H53	3	Boro	Man	1	1	0	1	1
H54	6	Boro	Man	0	0	0	1	0
H55	3	Assamese	Man	1	1	0	1	0
H56	6	Assamese	Woman-Married	0	1	0	1	0
H57	5	Assamese	Woman-Widow	1	1	0	1	1
H58	5	Assamese	Woman-Married	1	0	0	1	0
H59	5	Assamese	Man	1	0	0	1	0
H60	7	Assamese	Woman-Widow	1	0	1	0	0
H61	4	Assamese	Woman-Married	1	1	0	0	1
H62	4	Assamese	Man	1	0	0	0	0
H63	4	Assamese	Joint(Husband and Wife)	0	1	0	0	0
H64	5	Boro	Joint(Husband and Wife)	0	1	0	0	0
H65	5	Assamese	Joint(Husband and Wife)	0	1	0	0	1
H66	9	Assamese	Woman-Married	0	1	1	0	0
H67	2	Assamese	Woman-Married	0	0	0	0	0
H68	4	Assamese	Woman-Widow	0	1	0	1	1
H69	4	Boro	Man	1	0	0	1	0
H70	4	Boro	Man	1	0	0	1	0

Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H71	5	Boro	Joint(Husband and Wife)	1	0	0	1	0
H72	5	Boro	Woman-Married	1	0	0	1	0
H73	6	Boro	Woman-Married	1	0	0	1	0
H74	6	Boro	Man	1	1	0	1	1
H75	7	Boro	Woman-Married	1	0	0	1	0
H76	4	Assamese	Woman-Widow	1	1	0	1	0
H77	4	Assamese	Woman-Widow	1	1	0	1	0
H78	4	Assamese	Woman-Married	1	1	0	1	1
H79	5	Assamese	Woman-Married	1	1	1	1	0
H80	5	Assamese	Woman-Married	1	0	1	1	0
H81	7	Assamese	Woman-Widow	1	1	0	1	1
H82	7	Assamese	Woman-Married	1	0	1	1	0
H83	5	Assamese	Man	1	1	0	1	1
H84	5	Assamese	Woman-Married	1	0	1	1	0
H85	4	Assamese	Man	1	1	1	1	0
H86	4	Assamese	Woman-Married	1	1	0	1	0
H87	4	Assamese	Joint(Husband and Wife)	1	1	0	0	1
H88	5	Assamese	Man	1	1	1	0	0
H89	5	Assamese	Joint(Husband and Wife)	1	0	1	0	0
H90	9	Assamese	Woman-Married	1	1	0	1	1
H91	2	Assamese	Woman-Married	0	0	1	1	0
H92	4	Assamese	Man	0	0	1	1	0
H93	4	Assamese	Woman-Married	0	0	1	1	0
H94	4	Assamese	Woman-Married	1	0	0	1	0
H95	5	Assamese	Woman-Married	1	0	0	1	0
H96	5	Assamese	Woman-Widow	1	0	0	1	0
H97	6	Boro	Joint(Husband and Wife)	1	0	0	0	0
H98	6	Boro	Woman-Married	1	0	0	0	0
H99	5	Boro	Man	1	1	0	0	1
H100	5	Boro	Woman-Married	1	0	0	1	0
H101	9	Boro	Woman-Married	1	1	0	1	0
H102	2	Assamese	Man	1	1	1	1	0
H103	4	Assamese	Woman-Married	1	1	0	1	1
H104	4	Assamese	Man	1	1	0	1	0
H105	4	Assamese	Man	1	0	0	1	0

Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H106	4	Assamese	Man	1	1	0	1	1
H107	4	Assamese	Man	1	0	0	0	0
H108	4	Boro	Woman-Widow	1	0	0	0	0
H109	4	Assamese	Woman-Widow	1	0	0	0	0
H110	4	Assamese	Man	1	0	0	1	0
H111	5	Boro	Woman-Married	1	0	0	1	0
H112	5	Assamese	Woman-Widow	1	0	0	1	0
H113	4	Boro	Woman-Married	1	0	0	1	0
H114	4	Boro	Man	1	1	0	1	1
H115	4	Boro	Woman-Married	1	0	0	1	0
H116	5	Boro	Man	1	1	1	1	0
H117	5	Boro	Woman-Married	1	1	1	0	0
H118	4	Boro	Woman-Married	1	1	1	0	1
H119	4	Boro	Joint(Husband and Wife)	1	1	1	0	0
H120	4	Boro	Woman-Widow	1	0	0	0	0
H121	5	Boro	Man	0	1	0	0	1
H122	5	Boro	Man	1	0	1	0	0
H123	4	Boro	Woman-Widow	1	0	0	0	0
H124	4	Boro	Woman-Married	1	1	0	0	1
H125	5	Boro	Woman-Married	1	0	0	0	0
H126	5	Boro	Woman-Widow	1	1	0	0	0
H127	5	Boro	Man	1	1	0	0	0
H128	5	Boro	Woman-Widow	1	1	1	0	1
H129	4	Boro	Man	1	1	0	0	0
H130	4	Boro	Woman-Married	1	0	0	0	0
H131	4	Boro	Woman-Married	1	1	0	0	1
H132	5	Boro	Man	1	0	0	1	0
H133	5	Boro	Woman-Married	1	1	0	1	1
H134	4	Boro	Man	1	0	0	1	0
H135	4	Boro	Woman-Married	1	1	0	0	0
H136	4	Boro	Woman-Married	1	1	0	0	0
H137	5	Boro	Woman-Married	1	1	0	0	1
H138	5	Boro	Woman-Married	1	1	0	0	0
H139	5	Boro	Man	1	0	0	0	0
H140	4	Boro	Woman-Unmarried	1	1	0	1	1
H141	4	Boro	Man	1	0	1	1	0
H142	4	Boro	Woman-Married	1	0	1	1	0
H143	5	Boro	Man	1	0	1	1	0
H144	5	Boro	Woman-Married	1	0	1	1	0
H145	4	Boro	Woman-Married	1	1	1	0	1

Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H146	4	Boro	Woman-Married	1	0	1	0	0
H147	4	Boro	Joint(Husband and Wife)	1	1	1	0	0
H148	5	Boro	Woman-Widow	1	1	0	0	0
H149	5	Boro	Woman-Married	1	1	0	0	1
H150	5	Boro	Woman-Married	1	1	1	0	0
H151	5	Boro	Man	1	0	1	0	0
H152	5	Boro	Woman-Married	1	1	0	1	1
H153	4	Boro	Man	1	0	1	1	0
H154	4	Boro	Woman-Married	1	1	0	1	1
H155	4	Boro	Woman-Married	1	0	1	1	0
H156	5	Boro	Man	0	1	0	1	0
H157	5	Boro	Woman-Married	0	1	0	1	0
H158	5	Boro	Woman-Married	0	1	0	1	1
H159	4	Boro	Woman-Married	0	1	0	0	0
H160	4	Boro	Woman-Married	1	0	0	0	0
H161	4	Boro	Man	1	1	0	0	1
H162	5	Boro	Man	1	0	0	0	0
H163	5	Boro	Woman-Married	1	0	0	0	0
H164	9	Boro	Woman-Unmarried	1	0	1	1	0
H165	2	Boro	Woman-Married	1	0	0	1	0
H166	4	Boro	Woman-Married	1	0	0	1	0
H167	4	Boro	Man	1	1	0	1	1
H168	4	Boro	Woman-Married	1	0	0	1	0
H169	5	Boro	Joint(Husband and Wife)	1	1	0	0	0
H170	5	Boro	Woman-Married	1	1	0	0	0
H171	6	Boro	Woman-Married	1	1	0	0	1
H172	6	Boro	Joint(Husband and Wife)	1	1	0	0	0
H173	9	Boro	Man	1	0	0	0	0
H174	2	Boro	Man	1	1	0	0	1
H175	4	Boro	Man	1	0	0	0	0
H176	4	Boro	Woman-Widow	1	0	0	1	0
H177	4	Boro	Woman-Married	1	0	0	1	0
H178	5	Boro	Woman-Married	1	1	0	1	1
H179	5	Nepali	Man	1	0	0	1	0
H180	6	Nepali	Man	1	1	0	1	0

Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H181	6	Nepali	Man	1	1	0	1	0
H182	5	Boro	Man	1	1	0	1	1
H183	4	Nepali	Man	1	1	0	0	0
H184	4	Boro	Man	1	0	0	0	0
H185	4	Boro	Woman-Unmarried	1	1	0	0	1
H186	5	Nepali	Man	1	0	0	0	0
H187	5	Boro	Woman-Widow	1	0	1	0	0
H188	5	Boro	Woman-Widow	1	0	1	1	0
H189	6	Assamese	Woman-Married	1	1	0	1	1
H190	6	Boro	Man	1	0	1	1	0
H191	5	Boro	Man	1	1	1	1	0
H192	6	Assamese	Man	1	1	1	1	0
H193	6	Boro	Man	1	1	1	0	1
H194	4	Boro	Man	1	1	0	0	0
H195	4	Boro	Woman-Married	1	0	0	0	0
H196	4	Boro	Man	1	1	1	0	1
H197	5	Boro	Woman-Married	1	0	1	0	0
H198	5	Assamese	Man	1	0	0	0	0
H199	9	Boro	Woman-Widow	1	1	1	0	1
H200	2	Boro	Woman-Widow	1	0	1	1	0
H201	4	Boro	Woman-Widow	1	1	1	0	0
H202	4	Boro	Woman-Married	1	1	0	0	0
H203	4	Boro	Man	1	1	0	0	1
H204	5	Boro	Man	1	1	0	0	0
H205	5	Boro	Woman-Widow	1	0	0	0	0
H206	6	Nepali	Man	1	1	0	1	1
H207	6	Boro	Man	1	0	0	1	0
H208	9	Boro	Woman-Unmarried	1	0	0	1	0
H209	2	Boro	Woman-Married	1	0	0	1	0
H210	4	Boro	Woman-Married	1	0	1	1	0
H211	4	Boro	Woman-Married	1	0	0	0	0
H212	4	Boro	Woman-Married	1	0	1	0	0
H213	5	Boro	Woman-Married	0	1	0	0	1
H214	5	Boro	Woman-Married	0	0	0	0	0
H215	6	Boro	Woman-Married	1	1	0	0	0
H216	6	Boro	Man	1	1	0	0	0
H217	4	Boro	Woman-Married	1	1	0	0	1
H218	5	Boro	Man	0	1	0	0	0
H219	5	Boro	Woman-Married	1	0	0	0	0
H220	5	Nepali	Woman-Married	1	1	0	0	1
H221	6	Boro	Man	1	0	0	0	0
H222	6	Boro	Woman-Married	1	0	0	0	0

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/ Rituals
H1	1	10	0.5	14.5	1	1	0	0	0	6	8	1
H2	1	10	0.5	14.5	1	0	0	1	0	5	7	1
H3	3	7	0.5	13.5	0	1	0	1	0	4	6	0
H4	1	10	0.5	13.5	0	1	0	1	0	5	7	1
H5	0	10	0.25	11.25	0	0	0	1	0	5	6	0
H6	1	10	0.5	13.5	0	1	0	1	0	6	8	1
H7	3	10	0.5	14.5	0	0	0	1	0	6	7	1
H8	1	10	0.5	15.5	1	1	1	1	0	6	10	1
H9	2	10	0.5	15.5	1	1	0	1	0	5	8	0
H10	2	10	0.5	15.5	1	1	0	1	0	5	8	0
H11	1	10	0.5	15.5	1	1	0	1	0	6	9	1
H12	1	10	0.5	15.5	1	1	0	1	0	4	7	1
H13	2	10	0.5	14.5	0	1	0	1	0	4	6	1
H14	1	10	0.5	13.5	0	1	0	1	0	6	8	1
H15	1	10	0.5	14.5	0	1	0	1	0	6	8	1
H16	1	10	0.5	13.5	0	1	0	1	0	5	7	1
H17	1	10	0.5	14.5	0	1	0	1	0	5	7	1
H18	1	10	0.5	14.5	0	1	0	1	0	2	4	1
H19	1	8	0.25	12.25	0	1	0	1	0	5	7	0
H20	2	10	0.5	13.5	0	1	0	0	0	4	5	1
H21	2	10	0.5	13.5	0	0	1	0	0	4	5	0
H22	0	10	0.5	14.5	1	1	1	0	0	3	6	1
H23	1	10	0.5	13.5	1	0	1	0	0	6	8	1
H24	2	7	0.25	12.25	1	1	1	0	0	3	6	0
H25	3	8	0.5	14.5	1	1	1	0	0	5	8	1
H26	1	10	0.5	15.5	1	1	1	0	0	6	9	1
H27	1	10	0.5	15.5	1	1	1	0	0	5	8	1
H28	3	10	0.5	15.5	1	1	0	0	0	4	6	1
H29	2	10	0.5	14.5	1	1	0	0	0	4	6	1
H30	1	10	0.5	14.5	1	0	1	1	0	5	8	1
H31	1	10	0.5	16.5	1	1	1	1	0	5	9	1
H32	1	10	0.5	13.5	1	0	0	1	0	3	5	1
H33	1	10	0.25	15.25	1	1	1	1	0	5	9	0
H34	1	10	0.5	14.5	1	0	1	1	0	6	9	1
H35	1	10	0.5	13.5	1	0	1	0	0	5	7	1
H36	1	10	0.5	14.5	1	1	0	0	0	6	8	1
H37	1	10	0.5	13.5	0	1	0	0	0	5	6	1
H38	2	7	0.25	12.25	1	1	0	0	0	5	7	0
H39	1	8	0.5	10.5	1	0	0	0	0	4	5	1
H40	3	10	0.5	13.5	0	0	0	0	0	5	5	1

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/ Rituals
H41	0	10	0.5	11.5	0	1	0	0	0	6	7	1
H42	0	10	0.25	12.25	1	1	0	0	0	5	7	0
H43	0	10	0.5	12.5	1	1	0	0	0	4	6	1
H44	0	10	0.5	14.5	1	1	1	0	0	5	8	1
H45	3	10	0.25	14.25	1	0	0	0	0	6	7	1
H46	1	10	0.5	14.5	1	1	0	0	0	6	8	1
H47	3	10	0.5	15.5	1	0	0	1	0	6	8	1
H48	0	10	0.25	13.25	1	1	0	1	0	5	8	0
H49	2	10	0.5	15.5	1	1	0	1	0	6	9	1
H50	1	10	0.25	14.25	0	1	0	1	0	6	8	1
H51	2	10	0.5	15.5	1	1	0	1	0	6	9	1
H52	3	10	0.25	14.25	0	0	0	1	0	6	7	1
H53	1	10	0.5	15.5	1	1	0	1	0	6	9	1
H54	3	10	0.25	14.25	0	0	0	1	0	6	7	1
H55	1	10	0.5	14.5	1	1	0	1	0	6	9	1
H56	2	10	0.25	14.25	0	1	0	1	0	6	8	1
H57	1	10	0.5	15.5	1	1	0	1	0	6	9	1
H58	0	10	0.5	12.5	1	0	0	1	0	5	7	1
H59	0	10	0.25	12.25	1	0	0	1	0	5	7	1
H60	3	10	0.5	15.5	1	0	1	0	0	5	7	1
H61	1	10	0.25	14.25	1	1	0	0	0	5	7	1
H62	3	6	0.5	10.5	1	0	0	0	0	2	4	1
H63	0	10	0.5	11.5	0	1	0	0	0	6	7	1
H64	2	10	0.5	13.5	0	1	0	0	0	6	7	1
H65	1	10	0.5	13.5	0	1	0	0	0	6	7	1
H66	2	10	0.5	14.5	0	1	1	0	0	5	7	1
H67	3	7	0.25	10.25	0	0	0	0	0	5	5	0
H68	3	8	0.5	14.5	0	1	0	1	0	6	8	1
H69	3	10	0.25	15.25	1	0	0	1	0	6	8	1
H70	3	10	0.5	15.5	1	0	0	1	0	6	8	1
H71	2	10	0.5	14.5	1	0	0	1	0	6	8	1
H72	0	10	0.25	12.25	1	0	0	1	0	5	7	1
H73	0	10	0.5	12.5	1	0	0	1	0	5	7	1
H74	1	10	0.25	15.25	1	1	0	1	0	5	8	1
H75	3	10	0.5	15.5	1	0	0	1	0	5	7	1

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/ Rituals
H76	1	10	0.5	14.5	1	1	0	1	0	5	8	2
H77	0	8	0.25	11.25	1	1	0	1	0	2	5	0
H78	1	10	0.5	15.5	1	1	0	1	0	5	8	1
H79	1	10	0.5	15.5	1	1	1	1	0	6	10	1
H80	2	10	0.25	15.25	1	0	1	1	0	6	9	1
H81	1	10	0.5	15.5	1	1	0	1	0	6	9	2
H82	3	6	0.25	12.25	1	0	0	1	0	4	6	0
H83	1	10	0.5	15.5	1	1	1	1	0	6	10	1
H84	1	10	0.5	14.5	1	0	1	1	0	6	9	1
H85	1	10	0.25	15.25	1	1	1	1	0	6	10	1
H86	0	10	0.5	13.5	1	1	0	1	0	6	9	1
H87	0	10	0.25	13.25	1	1	0	0	0	6	8	1
H88	1	10	0.5	14.5	1	1	1	0	0	5	8	1
H89	3	10	0.5	15.5	1	0	1	0	0	5	7	2
H90	1	10	0.5	15.5	1	1	0	1	0	5	8	1
H91	0	10	0.5	12.5	0	0	1	1	0	6	8	1
H92	2	10	0.25	14.25	0	0	1	1	0	5	7	1
H93	1	10	0.5	13.5	0	0	1	1	0	6	8	1
H94	2	10	0.25	14.25	1	0	0	1	0	6	8	0
H95	3	10	0.5	15.5	1	0	0	1	0	6	8	1
H96	3	6	0.5	11.5	1	0	0	1	0	4	6	1
H97	3	10	0.25	14.25	1	0	0	0	0	5	6	0
H98	3	10	0.5	14.5	1	0	0	0	0	5	6	0
H99	2	10	0.25	15.25	1	1	0	0	0	6	8	0
H100	0	10	0.5	12.5	1	0	0	1	0	4	6	1
H101	0	7	0.5	10.5	1	1	0	1	0	6	9	1
H102	3	8	0.25	15.25	1	1	1	1	0	6	10	0
H103	1	10	0.5	15.5	1	1	1	1	0	5	9	1
H104	1	10	0.25	14.25	1	1	0	1	0	5	8	1
H105	0	10	0.5	12.5	1	0	0	1	0	4	6	1
H106	1	10	0.25	15.25	1	1	0	1	0	6	9	1
H107	1	10	0.5	12.5	1	0	0	0	0	6	7	1
H108	2	10	0.5	13.5	1	0	0	0	0	6	7	2
H109	3	8	0.25	12.25	1	0	0	0	0	2	4	1
H110	3	10	0.5	15.5	1	0	0	1	0	5	7	1

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/ Rituals
H111	3	10	0.25	15.25	1	0	0	1	0	5	7	1
H112	3	10	0.5	15.5	1	0	0	1	0	5	7	1
H113	2	10	0.5	14.5	1	0	0	1	0	5	7	1
H114	0	8	0.5	12.5	1	1	0	1	0	2	5	1
H115	0	10	0.25	12.25	1	0	0	1	0	6	8	1
H116	1	10	0.5	15.5	1	1	1	1	0	6	10	2
H117	1	10	0.25	14.25	1	1	0	0	0	6	8	2
H118	1	10	0.5	15.5	1	1	0	0	0	5	7	1
H119	0	10	0.5	13.5	1	1	1	0	0	5	8	1
H120	2	8	0.25	11.25	1	0	0	0	0	2	4	1
H121	1	10	0.5	13.5	0	1	0	0	0	5	6	1
H122	2	10	0.25	14.25	1	0	1	0	0	5	7	1
H123	3	10	0.5	14.5	1	0	0	0	0	5	6	1
H124	1	10	0.5	14.5	1	1	0	0	0	5	7	1
H125	3	8	0.25	12.25	1	0	0	0	0	2	4	0
H126	3	10	0.5	15.5	1	1	0	0	0	5	7	0
H127	2	10	0.25	14.25	1	1	0	0	0	5	7	0
H128	0	10	0.5	14.5	1	1	1	0	0	5	8	1
H129	0	10	0.25	12.25	1	1	0	0	0	5	7	1
H130	3	10	0.5	14.5	1	0	0	0	0	6	7	1
H131	1	10	0.5	14.5	1	1	0	0	0	6	8	1
H132	3	10	0.25	15.25	1	0	0	1	0	6	8	1
H133	0	10	0.5	14.5	1	1	0	1	0	6	9	1
H134	2	10	0.25	14.25	1	0	0	1	0	6	8	1
H135	1	10	0.5	13.5	1	1	0	0	0	6	8	1
H136	2	10	0.5	14.5	1	1	0	0	0	6	8	1
H137	1	10	0.25	14.25	1	1	0	0	0	6	8	1
H138	3	10	0.5	15.5	1	1	0	0	0	6	8	1
H139	3	10	0.25	14.25	1	0	0	0	0	6	7	1
H140	1	10	0.5	15.5	1	1	0	1	0	5	8	1
H141	2	8	0.5	13.5	1	0	1	1	0	2	5	1
H142	0	10	0.25	13.25	1	0	1	1	0	5	8	1
H143	0	10	0.5	13.5	1	0	1	1	0	5	8	1
H144	1	10	0.25	14.25	1	0	1	1	0	5	8	1
H145	1	10	0.5	15.5	1	1	1	0	0	5	8	0
H146	3	8	0.25	13.25	1	0	1	0	0	3	5	0
H147	0	10	0.25	13.25	1	1	1	0	0	5	8	1
H148	2	10	0.5	14.5	1	1	0	0	0	6	8	1
H149	1	10	0.25	14.25	1	1	0	0	0	6	8	1
H150	2	10	0.5	15.5	1	1	1	0	0	6	9	1

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/ Rituals
H151	3	10	0.5	15.5	1	0	1	0	0	6	8	1
H152	3	8	0.25	15.25	1	1	0	1	0	6	9	1
H153	1	10	0.5	14.5	1	0	0	1	0	6	8	1
H154	1	10	0.25	15.25	1	1	0	1	0	6	9	1
H155	2	10	0.5	15.5	1	0	1	1	0	6	9	1
H156	0	10	0.5	12.5	0	1	0	1	0	6	8	1
H157	0	8	0.25	10.25	0	1	0	1	0	2	4	1
H158	1	10	0.5	14.5	0	1	0	1	0	5	7	1
H159	3	10	0.5	14.5	0	1	0	0	0	6	7	1
H160	3	10	0.5	14.5	1	0	0	0	0	5	6	1
H161	0	10	0.5	13.5	1	1	0	0	0	5	7	1
H162	2	10	0.5	13.5	1	0	0	0	0	6	7	1
H163	1	8	0.25	10.25	1	0	0	0	0	5	6	1
H164	2	10	0.5	15.5	1	0	1	1	0	5	8	1
H165	3	10	0.25	15.25	1	0	0	1	0	6	8	1
H166	3	10	0.5	15.5	1	0	0	1	0	6	8	1
H167	1	10	0.5	15.5	1	1	0	1	0	6	9	1
H168	3	7	0.25	12.25	1	0	0	1	0	6	8	1
H169	2	10	0.5	14.5	1	1	0	0	0	5	7	1
H170	3	10	0.25	15.25	1	1	0	0	0	5	7	1
H171	1	10	0.5	14.5	1	1	0	0	0	5	7	1
H172	3	10	0.5	15.5	1	1	0	0	0	5	7	1
H173	0	10	0.5	11.5	1	0	0	0	0	6	7	1
H174	0	8	0.25	11.25	1	1	0	0	0	2	4	1
H175	3	10	0.5	14.5	1	0	0	0	0	5	6	1
H176	3	10	0.25	15.25	1	0	0	1	0	6	8	1
H177	3	10	0.5	15.5	1	0	0	1	0	6	8	1
H178	0	10	0.5	14.5	1	1	0	1	0	6	9	1
H179	2	8	0.25	12.25	1	0	0	1	0	2	4	0
H180	1	10	0.5	14.5	1	1	0	1	0	5	8	0
H181	2	10	0.25	15.25	1	1	0	1	0	5	8	0
H182	1	10	0.5	15.5	1	1	0	1	0	6	9	1
H183	3	10	0.5	15.5	1	1	0	0	0	5	7	1
H184	3	10	0.5	14.5	1	0	0	0	0	5	6	1
H185	3	8	0.25	14.25	1	1	0	0	0	3	5	0

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/ Rituals
H186	2	10	0.5	13.5	1	0	0	0	0	6	7	1
H187	3	10	0.25	15.25	1	0	1	0	0	5	7	1
H188	1	10	0.5	14.5	1	0	1	1	0	5	8	1
H189	1	10	0.25	15.25	1	1	1	1	0	6	10	0
H190	3	8	0.25	14.25	1	0	1	1	0	3	6	0
H191	1	10	0.5	15.5	1	1	1	1	0	6	10	1
H192	1	10	0.25	15.25	1	1	1	1	0	6	10	1
H193	0	10	0.5	14.5	1	1	1	0	0	5	8	1
H194	2	10	0.25	14.25	1	1	0	0	0	5	7	0
H195	1	10	0.5	12.5	1	0	0	0	0	6	7	1
H196	1	10	0.5	15.5	1	1	1	0	0	5	8	1
H197	3	10	0.5	15.5	1	0	1	0	0	5	7	1
H198	3	10	0.5	14.5	1	0	0	0	0	6	7	1
H199	1	10	0.25	15.25	1	1	1	0	0	5	8	0
H200	3	8	0.25	14.25	1	0	1	1	0	2	5	0
H201	2	10	0.25	15.25	1	1	1	0	0	6	9	0
H202	3	10	0.5	15.5	1	1	0	0	0	6	8	1
H203	1	10	0.5	14.5	1	1	0	0	0	6	8	1
H204	3	10	0.25	15.25	1	1	0	0	0	6	8	0
H205	3	8	0.25	12.25	1	0	0	0	0	2	4	0
H206	1	10	0.25	15.25	1	1	0	1	0	6	9	0
H207	3	10	0.5	15.5	1	0	0	1	0	6	8	1
H208	3	10	0.5	15.5	1	0	0	1	0	6	8	1
H209	3	10	0.5	15.5	1	0	0	1	0	6	8	1
H210	1	10	0.5	14.5	1	0	1	1	0	5	8	1
H211	3	7	0.25	11.25	1	0	0	0	0	1	4	0
H212	3	10	0.5	15.5	1	0	1	0	0	6	8	1
H213	1	10	0.25	13.25	0	1	0	0	0	6	7	0
H214	0	10	0.5	10.5	0	0	0	0	0	6	6	1
H215	2	10	0.5	14.5	1	1	0	0	0	6	8	1
H216	1	10	0.25	13.25	1	1	0	0	0	2	4	0
H217	2	10	0.5	15.5	1	1	0	0	0	6	8	1
H218	3	10	0.25	14.25	0	1	0	0	0	6	7	0
H219	3	10	0.5	14.5	1	0	0	0	0	6	7	1
H220	1	10	0.5	14.5	1	1	0	0	0	6	8	1
H221	3	10	0.5	14.5	1	0	0	0	0	6	7	1
H222	2	7	0.5	10.5	1	0	0	0	0	1	4	1

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H1	9	Bengali	20.5	15	9
H2	2	Bengali	19.5	13	8
H3	4	Bengali	17.5	10	6
H4	4	Bengali	18.5	13	8
H5	4	Boro	16.25	11	6
H6	5	Boro	19.5	15	9
H7	5	Bengali	20.5	14	8
H8	6	Bengali	21.5	17	11
H9	6	Bengali	20.5	13	8
H10	5	Bengali	20.5	13	8
H11	5	Assamese	21.5	16	10
H12	5	Assamese	19.5	12	8
H13	5	Assamese	18.5	11	7
H14	5	Assamese	19.5	15	9
H15	4	Assamese	20.5	15	9
H16	4	Assamese	18.5	13	8
H17	4	Bengali	19.5	13	8
H18	5	Bengali	16.5	7	5
H19	5	Assamese	17.25	12	7
H20	9	Assamese	17.5	10	6
H21	2	Assamese	17.5	9	5
H22	4	Assamese	17.5	10	7
H23	4	Assamese	19.5	15	9
H24	4	Assamese	15.25	9	6
H25	5	Assamese	19.5	14	9
H26	5	Assamese	21.5	16	10
H27	6	Assamese	20.5	14	9
H28	6	Assamese	19.5	11	7
H29	5	Boro	18.5	11	7
H30	4	Boro	19.5	14	9
H31	4	Assamese	21.5	15	10
H32	4	Assamese	16.5	9	6
H33	5	Assamese	20.25	14	9
H34	5	Assamese	20.5	16	10
H35	7	Assamese	18.5	13	8

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H36	9	Assamese	20.5	15	9
H37	2	Assamese	18.5	12	7
H38	4	Assamese	17.25	12	7
H39	4	Assamese	14.5	10	6
H40	4	Assamese	18.5	11	6
H41	5	Assamese	17.5	14	8
H42	5	Assamese	17.25	12	7
H43	6	Assamese	16.5	11	7
H44	6	Assamese	19.5	14	9
H45	5	Assamese	20.25	14	8
H46	5	Assamese	20.5	15	9
H47	5	Assamese	21.5	15	9
H48	3	Assamese	18.25	13	8
H49	6	Boro	21.5	16	10
H50	5	Assamese	20.25	15	9
H51	6	Assamese	21.5	16	10
H52	3	Assamese	20.25	14	8
H53	3	Boro	21.5	16	10
H54	6	Boro	20.25	14	8
H55	3	Assamese	20.5	16	10
H56	6	Assamese	20.25	15	9
H57	5	Assamese	21.5	16	10
H58	5	Assamese	17.5	13	8
H59	5	Assamese	17.25	13	8
H60	7	Assamese	20.5	13	8
H61	4	Assamese	19.25	13	8
H62	4	Assamese	12.5	7	5
H63	4	Assamese	17.5	14	8
H64	5	Boro	19.5	14	8
H65	5	Assamese	19.5	14	8
H66	9	Assamese	19.5	13	8
H67	2	Assamese	15.25	10	5
H68	4	Assamese	20.5	15	9
H69	4	Boro	21.25	15	9
H70	4	Boro	21.5	15	9

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H71	5	Boro	20.5	15	9
H72	5	Boro	17.25	13	8
H73	6	Boro	17.5	13	8
H74	6	Boro	20.25	14	9
H75	7	Boro	20.5	13	8
H76	4	Assamese	19.5	15	10
H77	4	Assamese	13.25	7	5
H78	4	Assamese	20.5	14	9
H79	5	Assamese	21.5	17	11
H80	5	Assamese	21.25	16	10
H81	7	Assamese	21.5	17	11
H82	7	Assamese	16.25	10	6
H83	5	Assamese	21.5	17	11
H84	5	Assamese	20.5	16	10
H85	4	Assamese	21.25	17	11
H86	4	Assamese	19.5	16	10
H87	4	Assamese	19.25	15	9
H88	5	Assamese	19.5	14	9
H89	5	Assamese	20.5	14	9
H90	9	Assamese	20.5	14	9
H91	2	Assamese	18.5	15	9
H92	4	Assamese	19.25	13	8
H93	4	Assamese	19.5	15	9
H94	4	Assamese	20.25	14	8
H95	5	Assamese	21.5	15	9
H96	5	Assamese	15.5	11	7
H97	6	Boro	19.25	11	6
H98	6	Boro	19.5	11	6
H99	5	Boro	21.25	14	8
H100	5	Boro	16.5	11	7
H101	9	Boro	16.5	16	10
H102	2	Assamese	21.25	16	10
H103	4	Assamese	20.5	15	10
H104	4	Assamese	19.25	14	9
H105	4	Assamese	16.5	11	7

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H106	4	Assamese	21.25	16	10
H107	4	Assamese	18.5	14	8
H108	4	Boro	19.5	15	9
H109	4	Assamese	14.25	7	5
H110	4	Assamese	20.5	13	8
H111	5	Boro	20.25	13	8
H112	5	Assamese	20.5	13	8
H113	4	Boro	19.5	13	8
H114	4	Boro	14.5	8	6
H115	4	Boro	18.25	15	9
H116	5	Boro	21.5	18	12
H117	5	Boro	20.25	16	10
H118	4	Boro	20.5	13	8
H119	4	Boro	18.5	14	9
H120	4	Boro	13.25	7	5
H121	5	Boro	18.5	12	7
H122	5	Boro	19.25	13	8
H123	4	Boro	19.5	12	7
H124	4	Boro	19.5	13	8
H125	5	Boro	14.25	6	4
H126	5	Boro	20.5	12	7
H127	5	Boro	19.25	12	7
H128	5	Boro	19.5	14	9
H129	4	Boro	17.25	13	8
H130	4	Boro	20.5	14	8
H131	4	Boro	20.5	15	9
H132	5	Boro	21.25	15	9
H133	5	Boro	20.5	16	10
H134	4	Boro	20.25	15	9
H135	4	Boro	19.5	15	9
H136	4	Boro	20.5	15	9
H137	5	Boro	20.25	15	9
H138	5	Boro	21.5	15	9
H139	5	Boro	20.25	14	8
H140	4	Boro	20.5	14	9
H141	4	Boro	15.5	8	6
H142	4	Boro	18.25	14	9
H143	5	Boro	18.5	14	9

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H144	5	Boro	19.25	14	9
H145	4	Boro	20.5	13	8
H146	4	Boro	16.25	8	5
H147	4	Boro	18.25	14	9
H148	5	Boro	20.5	15	9
H149	5	Boro	20.25	15	9
H150	5	Boro	21.5	16	10
H151	5	Boro	21.5	15	9
H152	5	Boro	21.25	16	10
H153	4	Boro	20.5	15	9
H154	4	Boro	21.25	16	10
H155	4	Boro	21.5	16	10
H156	5	Boro	18.5	15	9
H157	5	Boro	12.25	7	5
H158	5	Boro	19.5	13	8
H159	4	Boro	20.5	14	8
H160	4	Boro	19.5	12	7
H161	4	Boro	18.5	13	8
H162	5	Boro	19.5	14	8
H163	5	Boro	15.25	12	7
H164	9	Boro	20.5	14	9
H165	2	Boro	21.25	15	9
H166	4	Boro	21.5	15	9
H167	4	Boro	21.5	16	10
H168	4	Boro	18.25	15	9
H169	5	Boro	19.5	13	8
H170	5	Boro	20.25	13	8
H171	6	Boro	19.5	13	8
H172	6	Boro	20.5	13	8
H173	9	Boro	17.5	14	8
H174	2	Boro	13.25	7	5
H175	4	Boro	19.5	12	7
H176	4	Boro	21.25	15	9
H177	4	Boro	21.5	15	9
H178	5	Boro	20.5	16	10
H179	5	Nepali	14.25	6	4
H180	6	Nepali	19.5	13	8

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H181	6	Nepali	20.25	13	8
H182	5	Boro	21.5	16	10
H183	4	Nepali	20.5	13	8
H184	4	Boro	19.5	12	7
H185	4	Boro	17.25	8	5
H186	5	Nepali	19.5	14	8
H187	5	Boro	20.25	13	8
H188	5	Boro	19.5	14	9
H189	6	Assamese	21.25	16	10
H190	6	Boro	17.25	9	6
H191	5	Boro	21.5	17	11
H192	6	Assamese	21.25	17	11
H193	6	Boro	19.5	14	9
H194	4	Boro	19.25	12	7
H195	4	Boro	18.5	14	8
H196	4	Boro	20.5	14	9
H197	5	Boro	20.5	13	8
H198	5	Assamese	20.5	14	8
H199	9	Boro	20.25	13	8
H200	2	Boro	16.25	7	5
H201	4	Boro	21.25	15	9
H202	4	Boro	21.5	15	9
H203	4	Boro	20.5	15	9
H204	5	Boro	21.25	14	8
H205	5	Boro	14.25	6	4
H206	6	Nepali	21.25	15	9
H207	6	Boro	21.5	15	9
H208	9	Boro	21.5	15	9
H209	2	Boro	21.5	15	9
H210	4	Boro	19.5	14	9
H211	4	Boro	12.25	5	4
H212	4	Boro	21.5	15	9
H213	5	Boro	19.25	13	7
H214	5	Boro	16.5	13	7
H215	6	Boro	20.5	15	9

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H216	6	Boro	15.25	6	4
H217	4	Boro	21.5	15	9
H218	5	Boro	20.25	13	7
H219	5	Boro	20.5	14	8
H220	5	Nepali	20.5	15	9
H221	6	Boro	20.5	14	8
H222	6	Boro	11.5	6	5

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Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H1	8	Meitei	Joint(Husband and Wife)	1	1	0	0	1
H2	4	Meitei	Joint(Husband and Wife)	1	0	0	0	0
H3	7	Meitei	Joint(Husband and Wife)	1	1	1	1	0
H4	4	Meitei	Joint(Husband and Wife)	0	1	1	0	0
H5	7	Meitei	Joint(Husband and Wife)	0	0	1	0	0
H6	7	Meitei	Joint(Husband and Wife)	0	1	1	1	0
H7	7	Meitei	Joint(Husband and Wife)	1	0	1	0	0
H8	7	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H9	4	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H10	7	Meitei	Joint(Husband and Wife)	0	1	1	1	0
H11	3	Meitei	Joint(Husband and Wife)	1	0	0	1	1
H12	6	Meitei	Joint(Husband and Wife)	1	1	0	1	0
H13	5	Meitei	Joint(Husband and Wife)	1	1	0	1	0
H14	7	Meitei	Joint(Husband and Wife)	1	1	0	1	0
H15	5	Meitei	Joint(Husband and Wife)	1	1	0	1	1
H16	5	Meitei	Joint(Husband and Wife)	1	0	0	1	0
H17	7	Meitei	Joint(Husband and Wife)	1	1	0	1	0
H18	4	Meitei	Joint(Husband and Wife)	1	0	0	1	1
H19	7	Meitei	Joint(Husband and Wife)	0	1	1	1	1
H20	7	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H21	4	Meitei	Joint(Husband and Wife)	1	0	1	0	0
H22	4	Meitei	Joint(Husband and Wife)	0	1	1	0	1
H23	4	Meitei	Joint(Husband and Wife)	1	0	1	0	0
H24	7	Meitei	Joint(Husband and Wife)	0	1	1	0	0
H25	7	Meitei	Joint(Husband and Wife)	1	1	0	0	0
H26	5	Meitei	Joint(Husband and Wife)	0	1	0	0	0
H27	4	Meitei	Joint(Husband and Wife)	0	1	1	0	0
H28	5	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H29	7	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H30	4	Meitei	Joint(Husband and Wife)	1	0	0	1	0
H31	7	Meitei	Joint(Husband and Wife)	0	1	0	1	0
H32	4	Meitei	Joint(Husband and Wife)	1	0	0	1	0
H33	7	Meitei	Man	1	1	0	1	0
H34	3	Meitei	Joint(Husband and Wife)	0	0	1	1	0
H35	4	Meitei	Joint(Husband and Wife)	1	0	1	0	0

Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H36	7	Meitei	Man	1	1	1	0	1
H37	3	Meitei	Joint(Husband and Wife)	1	1	1	0	1
H38	3	Meitei	Joint(Husband and Wife)	1	1	1	0	1
H39	6	Meitei	Joint(Husband and Wife)	0	0	1	0	0
H40	4	Meitei	Joint(Husband and Wife)	0	0	1	0	0
H41	3	Meitei	Joint(Husband and Wife)	0	1	1	0	0
H42	4	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H43	4	Meitei	Joint(Husband and Wife)	0	1	0	0	0
H44	5	Meitei	Joint(Husband and Wife)	1	1	0	1	0
H45	4	Meitei	Joint(Husband and Wife)	0	0	0	0	0
H46	5	Meitei	Joint(Husband and Wife)	0	1	0	0	0
H47	4	Meitei	Joint(Husband and Wife)	1	0	1	0	0
H48	6	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H49	7	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H50	2	Meitei	Joint(Husband and Wife)	1	1	1	1	1
H51	3	Meitei	Joint(Husband and Wife)	1	1	1	1	0

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/Rituals
H1	1	10	0.8	14.75	1	1	0	0	0	5	7	1
H2	2	10	0.8	13.75	1	0	0	0	0	4	5	1
H3	1	10	0.5	15.5	1	1	1	0	0	6	9	0
H4	1	10	0.5	13.5	0	1	1	0	0	3	5	1
H5	0	10	0.8	11.75	0	0	2	0	0	2	4	0
H6	1	10	0.8	14.75	0	1	2	0	0	6	9	1
H7	2	10	0.8	14.75	1	0	2	0	0	4	7	1
H8	1	10	0.8	14.75	1	1	2	0	0	5	9	1
H9	2	10	0.8	15.75	1	1	2	0	0	5	9	0
H10	2	10	0.8	15.75	0	1	1	0	0	4	6	0
H11	2	10	0.5	15.5	1	0	0	1	0	5	7	1
H12	1	10	0.3	14.25	1	1	0	1	0	5	8	1
H13	1	10	0.8	14.75	1	1	0	1	0	5	8	1
H14	2	10	0.8	15.75	1	1	0	1	0	5	8	1
H15	1	10	0.8	15.75	1	1	0	1	0	6	9	1
H16	2	10	0.8	14.75	1	0	0	1	0	5	7	1
H17	1	10	0.8	14.75	1	1	0	1	0	4	7	1
H18	2	10	0.5	15.5	1	0	0	1	0	5	7	1
H19	1	10	0.8	15.75	0	1	2	0	0	2	5	0
H20	2	10	0.8	15.75	1	1	1	0	0	4	7	1
H21	2	10	0.5	14.5	1	0	2	0	0	5	8	0
H22	0	10	0.8	13.75	0	1	1	0	0	5	7	1
H23	1	10	0.8	13.75	1	0	2	0	0	5	8	1
H24	2	10	0.5	14.5	0	1	2	0	0	3	6	0
H25	2	8	0	12	1	1	0	0	0	0	2	1
H26	2	10	0.5	13.5	0	1	0	0	0	5	6	1
H27	2	10	0.8	14.75	0	1	1	0	0	5	7	1
H28	1	10	0.8	14.75	1	1	1	0	0	5	8	1
H29	2	10	0.8	15.75	1	1	1	0	0	5	8	1
H30	2	10	0.5	14.5	1	0	0	1	0	5	7	1
H31	2	10	0.5	14.5	0	1	0	1	0	6	8	1
H32	1	10	0.8	13.75	1	0	0	1	0	5	7	1
H33	1	7	0.3	11.25	1	1	0	1	0	2	5	0
H34	2	10	0.5	14.5	0	0	1	1	0	5	7	1
H35	1	10	0.5	13.5	1	0	2	0	0	5	8	1

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/Rituals
H36	1	10	0.8	15.75	1	1	1	0	0	6	9	1
H37	2	8	0.3	14.25	1	1	2	0	0	2	6	1
H38	2	9	0.3	15.25	1	1	1	0	0	2	5	0
H39	1	10	0.8	12.75	0	0	1	0	0	3	4	1
H40	2	10	0.8	13.75	0	0	2	0	0	5	7	1
H41	0	10	0.8	12.75	0	1	2	0	0	3	6	1
H42	0	10	0.8	13.75	1	1	1	0	0	5	8	0
H43	0	10	0.5	11.5	0	1	0	0	0	3	4	1
H44	0	10	0.8	13.75	1	1	0	1	0	4	7	1
H45	2	10	0.8	12.75	0	0	0	0	0	4	4	1
H46	2	10	0.5	13.5	0	1	0	0	0	4	5	1
H47	2	10	0.5	14.5	1	0	2	1	0	3	7	1
H48	0	10	0.5	13.5	1	1	1	1	0	5	9	0
H49	2	10	0.8	15.75	1	1	2	1	0	5	10	1
H50	1	8	0.3	14.25	1	1	1	1	0	2	6	1
H51	1	10	0.8	15.75	1	1	2	1	0	5	10	1

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H1	8	Meitei	19.75	13	8
H2	4	Meitei	17.75	10	6
H3	7	Meitei	21.5	15	9
H4	4	Meitei	16.5	9	6
H5	7	Meitei	13.75	6	4
H6	7	Meitei	20.75	16	10
H7	7	Meitei	18.75	12	8
H8	7	Meitei	19.75	15	10
H9	4	Meitei	20.75	14	9
H10	7	Meitei	19.75	10	6
H11	3	Meitei	20.5	13	8
H12	6	Meitei	19.25	14	9
H13	5	Meitei	19.75	14	9
H14	7	Meitei	20.75	14	9
H15	5	Meitei	21.75	16	10
H16	5	Meitei	19.75	13	8
H17	7	Meitei	18.75	12	8
H18	4	Meitei	20.5	13	8
H19	7	Meitei	17.75	7	5
H20	7	Meitei	19.75	12	8
H21	4	Meitei	19.5	13	8
H22	4	Meitei	18.75	13	8
H23	4	Meitei	18.75	14	9
H24	7	Meitei	17.5	9	6
H25	7	Meitei	12	3	3
H26	5	Meitei	18.5	12	7
H27	4	Meitei	19.75	13	8
H28	5	Meitei	19.75	14	9
H29	7	Meitei	20.75	14	9
H30	4	Meitei	19.5	13	8
H31	7	Meitei	20.5	15	9
H32	4	Meitei	18.75	13	8
H33	7	Meitei	13.25	7	5
H34	3	Meitei	19.5	13	8
H35	4	Meitei	18.5	14	9

Respondent	HH Size	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H36	7	Meitei	21.75	16	10
H37	3	Meitei	16.25	9	7
H38	3	Meitei	17.25	7	5
H39	6	Meitei	15.75	8	5
H40	4	Meitei	18.75	13	8
H41	3	Meitei	15.75	10	7
H42	4	Meitei	18.75	13	8
H43	4	Meitei	14.5	8	5
H44	5	Meitei	17.75	12	8
H45	4	Meitei	16.75	9	5
H46	5	Meitei	17.5	10	6
H47	4	Meitei	17.5	11	8
H48	6	Meitei	18.5	14	9
H49	7	Meitei	20.75	16	11
H50	2	Meitei	16.25	9	7
H51	3	Meitei	20.75	16	11

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Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H1	8	Meitei	Joint(Husband and Wife)	1	1	0	0	1
H2	4	Meitei	Joint(Husband and Wife)	1	0	0	0	0
H3	7	Meitei	Joint(Husband and Wife)	1	1	1	1	0
H4	4	Meitei	Joint(Husband and Wife)	0	1	1	0	0
H5	7	Meitei	Joint(Husband and Wife)	0	0	1	0	0
H6	7	Meitei	Joint(Husband and Wife)	0	1	1	1	0
H7	7	Meitei	Joint(Husband and Wife)	1	0	1	0	0
H8	7	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H9	4	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H10	7	Meitei	Joint(Husband and Wife)	0	1	1	1	0
H11	3	Meitei	Joint(Husband and Wife)	1	0	0	1	1
H12	6	Meitei	Joint(Husband and Wife)	1	1	0	1	0
H13	5	Meitei	Joint(Husband and Wife)	1	1	0	1	0
H14	7	Meitei	Joint(Husband and Wife)	1	1	0	1	0
H15	5	Meitei	Joint(Husband and Wife)	1	1	0	1	1
H16	5	Meitei	Joint(Husband and Wife)	1	0	0	1	0
H17	7	Meitei	Joint(Husband and Wife)	1	1	0	1	0
H18	4	Meitei	Joint(Husband and Wife)	1	0	0	1	1
H19	7	Meitei	Joint(Husband and Wife)	0	1	1	1	1
H20	7	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H21	4	Meitei	Joint(Husband and Wife)	1	0	1	0	0
H22	4	Meitei	Joint(Husband and Wife)	0	1	1	0	1
H23	4	Meitei	Joint(Husband and Wife)	1	0	1	0	0
H24	7	Meitei	Joint(Husband and Wife)	0	1	1	0	0
H25	7	Meitei	Joint(Husband and Wife)	1	1	0	0	0
H26	5	Meitei	Joint(Husband and Wife)	0	1	0	0	0
H27	4	Meitei	Joint(Husband and Wife)	0	1	1	0	0
H28	5	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H29	7	Meitei	Joint(Husband and Wife)	1	1	1	0	0
H30	4	Meitei	Joint(Husband and Wife)	1	0	0	1	0
H31	7	Meitei	Joint(Husband and Wife)	0	1	0	1	0
H32	4	Meitei	Joint(Husband and Wife)	1	0	0	1	0
H33	7	Meitei	Man	1	1	0	1	0
H34	3	Meitei	Joint(Husband and Wife)	0	0	1	1	0
H35	4	Meitei	Joint(Husband and Wife)	1	0	1	0	0

Respondent	HH Size	Ethnicity	Beneficiary	Farming	Weaving	Fishing	Animal Rearing	Other source
H36	6	Meitei Pangal	Joint(Husband and Wife)	1	1	0	1	1
H37	6	Meitei Pangal	Joint(Husband and Wife)	1	0	0	0	1
H38	6	Meitei Pangal	Joint(Husband and Wife)	1	0	0	0	0
H39	7	Meitei Pangal	Joint(Husband and Wife)	1	1	0	1	0
H40	5	Meitei Pangal	Joint(Husband and Wife)	1	1	0	1	1
H41	5	Meitei	Woman-Widow	1	0	0	1	1
H42	5	Meitei Pangal	Joint(Husband and Wife)	1	0	0	1	0
H43	5	Meitei Pangal	Joint(Husband and Wife)	1	1	0	1	0
H44	5	Meitei Pangal	Joint(Husband and Wife)	1	0	0	0	1
H45	5	Meitei Pangal	Joint(Husband and Wife)	1	0	0	1	0
H46	4	Meitei Pangal	Joint(Husband and Wife)	0	1	0	0	0
H47	5	Meitei	Joint(Husband and Wife)	0	0	0	0	0
H48	6	Meitei Pangal	Joint(Husband and Wife)	1	1	0	1	1
H49	6	Meitei Pangal	Joint(Husband and Wife)	0	1	0	0	0
H50	5	Meitei Pangal	Joint(Husband and Wife)	1	1	0	1	1
H51	5	Meitei	Joint(Husband and Wife)	1	0	0	1	0
H52	5	Meitei Pangal	Man	1	1	0	1	1
H53	5	Meitei Pangal	Joint(Husband and Wife)	1	0	0	1	1
H54	4	Meitei	Woman-Married	1	0	0	1	1
H55	5	Meitei Pangal	Joint(Husband and Wife)	1	0	0	1	0
H56	3	Meitei	Joint(Husband and Wife)	1	0	0	0	0
H57	4	Meitei	Woman-Widow	1	0	0	1	1
H58	3	Meitei	Joint(Husband and Wife)	1	1	0	0	1
H59	4	Meitei	Man	1	1	0	1	1
H60	4	Meitei	Joint(Husband and Wife)	1	0	0	1	0
H61	4	Meitei	Joint(Husband and Wife)	1	1	0	0	1

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/Rituals
H1	2	10	0.3	15.25	1	1	0	0	0	5	7	1
H2	2	10	0.8	14.75	1	1	0	0	0	4	6	1
H3	2	8	0.3	13.25	1	0	0	1	0	3	5	0
H4	2	10	0.3	15.25	1	1	0	1	0	5	8	0
H5	2	10	0.3	15.25	1	0	0	1	0	3	5	0
H6	2	10	0.3	15.25	1	1	0	1	0	4	7	0
H7	2	8	0.3	13.25	1	1	0	1	0	2	5	0
H8	2	10	0.3	14.25	1	0	0	1	0	5	7	1
H9	2	10	0.3	14.25	1	0	0	1	0	5	7	1
H10	2	10	0.8	14.75	1	0	0	0	0	7	8	1
H11	2	10	0.8	14.75	0	1	0	1	0	7	9	1
H12	2	10	0.8	12.75	0	0	0	0	0	5	5	1
H13	1	10	0.3	15.25	1	1	0	1	0	6	9	0
H14	2	10	0.3	14.25	1	0	0	1	0	4	6	0
H15	2	10	0.3	14.25	1	0	0	1	0	4	6	0
H16	2	10	0.3	14.25	1	0	0	1	0	5	7	1
H17	2	10	0.3	15.25	1	1	0	0	0	5	7	1
H18	2	10	0.3	14.25	1	0	0	0	0	4	5	1
H19	2	10	0.3	14.25	1	0	0	0	0	5	6	0
H20	2	10	0.3	15.25	1	1	0	1	0	5	8	1
H21	2	10	0.5	15.5	1	0	0	1	0	6	8	0
H22	2	10	0.3	15.25	1	0	0	1	0	5	7	1
H23	2	7	0.3	12.25	1	1	0	1	0	2	5	0
H24	2	10	0.3	13.25	1	0	0	0	0	5	6	1
H25	2	10	0.3	12.25	0	0	0	0	0	5	5	1
H26	2	10	0.3	13.25	0	0	0	1	0	6	7	1
H27	2	10	0.5	13.5	0	0	0	1	0	6	7	1
H28	2	10	0.5	13.5	1	0	0	0	0	5	6	1
H29	2	10	0.8	14.75	1	1	0	0	0	7	9	1
H30	2	10	0.3	13.25	1	0	0	0	0	4	5	1
H31	2	10	0.3	16.25	1	1	0	1	0	5	8	1
H32	2	8	0.3	12.25	1	0	0	1	0	2	4	1
H33	2	10	0.3	15.25	1	0	0	1	0	5	7	1
H34	2	10	0.3	15.25	1	1	0	1	0	4	7	1
H35	2	10	0.3	13.25	1	0	0	0	0	5	6	1

Respondent	Support	Native	Norms	Culture	Farming	Weaving	Fishing	Animal Rearing	Other source	Past dwelling	Built environment	Ceremony/Rituals
H36	2	10	0.3	16.25	1	1	0	1	0	5	8	1
H37	2	10	0.5	14.5	1	0	0	0	0	6	7	1
H38	2	10	0.5	13.5	1	0	0	0	0	6	7	1
H39	2	10	0.5	15.5	1	1	0	1	0	5	8	0
H40	1	10	0.5	15.5	1	1	0	1	0	4	7	1
H41	2	10	0.3	15.25	1	0	0	1	0	4	6	1
H42	2	10	0.3	14.25	1	0	0	1	0	4	6	0
H43	2	10	0.3	15.25	1	1	0	1	0	4	7	1
H44	2	10	0.3	14.25	1	0	0	0	0	4	5	1
H45	2	10	0.3	14.25	1	0	0	1	0	4	6	1
H46	2	10	0.5	13.5	0	1	0	0	0	5	6	1
H47	2	10	0.8	12.75	0	0	0	0	0	6	6	1
H48	1	10	0.5	15.5	1	1	0	1	0	6	9	1
H49	2	10	0.3	13.25	0	1	0	0	0	5	6	1
H50	2	10	0.3	16.25	1	1	0	1	0	5	8	1
H51	2	10	0.3	14.25	1	0	0	1	0	5	7	1
H52	2	10	0.3	16.25	1	1	0	1	0	5	8	0
H53	2	10	0.3	15.25	1	0	0	1	0	6	8	0
H54	2	10	0.3	15.25	1	0	0	1	0	5	7	0
H55	2	8	0.3	12.25	1	0	0	1	0	2	4	0
H56	2	10	0.3	13.25	1	0	0	0	0	6	7	1
H57	2	10	0.3	15.25	1	0	0	1	0	6	8	0
H58	2	10	0.3	15.25	1	1	0	0	0	6	8	0
H59	2	10	0.3	16.25	1	1	0	1	0	6	9	0
H60	2	10	0.3	14.25	1	0	0	1	0	6	8	0
H61	2	10	0.3	15.25	1	1	0	0	0	6	8	1

Respondent	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H1	Meitei Pangal	20.25	13	8
H2	Meitei Pangal	18.75	11	7
H3	Meitei Pangal	16.25	8	5
H4	Meitei Pangal	20.25	13	8
H5	Meitei Pangal	18.25	8	5
H6	Meitei Pangal	19.25	11	7
H7	Meitei Pangal	15.25	7	5
H8	Meitei Pangal	19.25	13	8
H9	Meitei Pangal	19.25	13	8
H10	Meitei Pangal	21.75	16	9
H11	Meitei Pangal	21.75	17	10
H12	Meitei	17.75	11	6
H13	Meitei Pangal	21.25	15	9
H14	Meitei	18.25	10	6
H15	Meitei Pangal	18.25	10	6
H16	Meitei Pangal	19.25	13	8
H17	Meitei Pangal	20.25	13	8
H18	Meitei Pangal	18.25	10	6
H19	Meitei Pangal	19.25	11	6
H20	Meitei Pangal	20.25	14	9
H21	Meitei Pangal	21.5	14	8
H22	Meitei	20.25	13	8
H23	Meitei Pangal	14.25	7	5
H24	Meitei Pangal	18.25	12	7
H25	Meitei	17.25	11	6
H26	Meitei Pangal	19.25	14	8
H27	Meitei	19.5	14	8
H28	Meitei Pangal	18.5	12	7
H29	Meitei Pangal	21.75	17	10
H30	Meitei Pangal	17.25	10	6
H31	Meitei Pangal	21.25	14	9
H32	Meitei Pangal	14.25	7	5
H33	Meitei Pangal	20.25	13	8
H34	Meitei	19.25	12	8
H35	Meitei Pangal	18.25	12	7

Respondent	Ethnicity	Culture + Past Dwelling	Built Environment + Past dwelling + Ritual	Built environment + Ritual
H36	Meitei Pangal	21.25	14	9
H37	Meitei Pangal	20.5	14	8
H38	Meitei Pangal	19.5	14	8
H39	Meitei Pangal	20.5	13	8
H40	Meitei Pangal	19.5	12	8
H41	Meitei	19.25	11	7
H42	Meitei Pangal	18.25	10	6
H43	Meitei Pangal	19.25	12	8
H44	Meitei Pangal	18.25	10	6
H45	Meitei Pangal	18.25	11	7
H46	Meitei Pangal	18.5	12	7
H47	Meitei	18.75	13	7
H48	Meitei Pangal	21.5	16	10
H49	Meitei Pangal	18.25	12	7
H50	Meitei Pangal	21.25	14	9
H51	Meitei	19.25	13	8
H52	Meitei Pangal	21.25	13	8
H53	Meitei Pangal	21.25	14	8
H54	Meitei	20.25	12	7
H55	Meitei Pangal	14.25	6	4
H56	Meitei	19.25	14	8
H57	Meitei	21.25	14	8
H58	Meitei	21.25	14	8
H59	Meitei	22.25	15	9
H60	Meitei	20.25	14	8
H61	Meitei	21.25	15	9

BIO-DATA

Name: Dwijomala Hanjabam

Father's name: H. Dwijamani Sharma

Date of Birth: 01/07/1985

Address: Department of Planning and Architecture, Mizoram University

Contact: 8761829442

Email: dwijohanjabam@gmail.com/dwijomala@mzu.edu.in

Educational Qualification

- **Bachelor of Architecture** (Sir J J College of Architecture, Mumbai University), 2008
- **Masters of Architecture** (Urban Design) (CEPT University), 2010

Work Experience

- **Mizoram Central University**, Department of Planning and Architecture. (*Assistant Professor*)-September 2019-current
- **School of Planning and Architecture**, Bhopal. (*Assistant Professor-contract*) July 2018-September 2019
- **Royal Global University**, Guwahati, Assam. (*Assistant Professor*) August 2015-June 2018
- **AIKTC School of Architecture**, New Mumbai. (*Assistant Professor*) Jan 2014-May 2015
- **Fortress Financials Advisory Services** (*Associate Consultant*)-2014
- **Ernst and Young LLP** (*Executive-Transaction Real Estate Advisory Services*)-2010-2014

LIST OF PUBLICATIONS

1. **Hanjabam, Dwijomala** (2020). Assessing Housing and Liveability in Northeast India. *International Journal of Housing and Human Settlement Planning*, 6(2), 27–32. www.journalpub.com, eISSN: 2455-8516
2. **Hanjabam, Dwijomala, & Yadav, Sachin** (2022). Culture and Built-Form Relationship in Social Housing of Manipur. In H. Doloi & A. Bora (Eds.), *Proceedings of the 5th International Conference on Smart Villages and Rural Development (COSVARD 2022)* (pp. 174–184), ISBN 978 0 7340 5692 4
3. **Hanjabam, Dwijomala, & Yadav, Sachin** (2023). Policy Analysis and Way Forward for A Sustainable Rural Community. *Proceedings of 6th International Conference on Smart Village and Rural Development (COSVARD 2023)*, 43–51, ISSN 2982-0723
4. **Hanjabam, Dwijomala, & Yadav, Sachin** (2024). Community living, social values, and the built environment: A Study focus on Indigenous Community of Meiteis of Manipur. *International Journal of Housing and Human Settlement Planning*, 10(1). <https://doi.org/10.37628/IJHHSP>
5. **Hanjabam, Dwijomala; Yadav, Sachin & Paliwal, Shivani**, Sustainable Community: Sustainability is not just Environmentalism, 9th International Conference on Sustainability (SUSCON-IX) (*Exploring Sustainability Through Collaboration, Co-creation and Compassion*”, Springer Nature,), Publication Agreement signed.
6. **Hanjabam, Dwijomala; Yadav, Sachin**; Vernacular Settlement as the Smallest Unit in Sustainable Built Environment Research, *Science and Technology Journal*, Vol.13, Issue: 1, Jan 2025, ISSN: 2321-3388, pg. 32-42, <https://doi.org/10.22232/stj.2025.13.01.04>

CONFERENCE & LECTURE DELIVERED

1. **Hanjabam, Dwijomala;** Yadav, Sachin & Paliwal, Shivani, Sustainable Community: Sustainability is not just Environmentalism. *The 9th International Conference on Sustainability (SUSCON-IX) held at Indian Institute of Management, Shillong, 3rd to 5th November, 2022.*
2. **Hanjabam, Dwijomala, & Yadav, Sachin.** Culture and Built-Form Relationship in Social Housing of Manipur. *The 5th International Conference on Smart Villages and Rural Development organised by the Smart Village Lab, Melbourne University (Hybrid mode), 12th to 13th December, 2022.*
3. **Hanjabam, Dwijomala;** Lecture delivered on Sustainable Communities as a Resource Person for *National Online Faculty Development Program, Sustainable Development Goals-IV, AGENDA 2030*, organised by Council of Architecture, Training and Research Centre, Bhopal in collaboration with School of Architecture, Rajiv Gandhi Proudhyogiki Vishwavidyalaya, Bhopal from 21st March to 25th March, 2022.
4. **Hanjabam, Dwijomala;** Culture, Built Environment and Sustainability: The Study of Housing Morphology of Rural Manipur, Northeast India, Speaker at *the Global Seminar Series on Smart Villages (GSSV), Harnessing Strengths, Expertise and Practices in Creation of Smart Villages, A Sustainable Planet Initiative (SPI)*, organised by The Smart Village Lab, Melbourne University on 1st May, 2023.
5. **Hanjabam, Dwijomala, & Yadav, Sachin.** Policy Analysis and Way Forward for A Sustainable Rural Community. *The 6th International Conference on Smart Villages and Rural Development organised by the Smart Village Lab, Melbourne University (Hybrid mode), 4th and 5th December, 2023*
6. **Hanjabam, Dwijomala;** Yadav, Sachin & Paliwal, Shivani, Vernacular Settlement as the Smallest Unit in Sustainable Built Environment Research. *The International Conference on Rethinking Built Environment (INCORBE 24)* organized by School of Fine Arts, Architecture & Fashion Technology held at Department of Planning and Architecture at Mizoram University, Aizawl, from 6th to 8th March, 2024.

PARTICULARS OF THE CANDIDATE

NAME OF CANDIDATE:	Dwijomala Hanjabam
DEGREE:	Doctor Of Philosophy
DEPARTMENT:	Planning And Architecture
TITLE OF THE THESIS:	Exploring the Need for Culture and Built Environment Relationship in Centrally Funded Government Social Housing Schemes: A Case of Rural Housing in Manipur and Assam
DATE OF ADMISSION:	8 th December 2020
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PH. D REGISTRATION NO.:	MZU/Ph.D./2133 Of 8.12.2020
EXTENSION:	(N.A)

Head
Department of Planning and Architecture

ABSTRACT

**EXPLORING THE NEED FOR CULTURE AND BUILT
ENVIRONMENT RELATIONSHIP IN CENTRALLY FUNDEED
GOVERNMENT HOUSING SCHEME**

A Case of Rural Housing in Manipur and Assam

A Thesis submitted

in partial fulfilment of the requirements for the Degree of

Doctor of Philosophy

in

Planning & Architecture

By

DWIJOMALA HANJABAM

Regd. No.: MZU/Ph.D./2133 of 8.12.2020

**DEPARTMENT OF PLANNING AND ARCHITECTURE
SCHOOL OF FINE ARTS, ARCHITECTURE AND FASHION
TECHNOLOGY**

MIZORAM UNIVERSITY

TANHRIL, AIZAWL-796004

July, 2025

Abstract

Introduction

This research explores the intricate relationship between culture, community, and the built environment in the context of social housing in rural India. Anchored in the discipline of architecture as both a science and an art, the study argues that housing is far more than a physical structure—it is a complex socio-cultural construct that reflects and sustains human identity, community cohesion, and cultural continuity. While contemporary social housing initiatives in India, particularly under schemes like the Pradhan Mantri Awas Yojana-Gramin (PMAY-G), prioritize affordability and rapid construction, they often overlook the critical dimensions of culture, tradition, and lived experience that shape rural settlements.

Drawing from the theoretical framework of Environment-Behaviour Relations (EBR) as proposed by Amos Rapoport, the research investigates how tangible and intangible cultural systems influence spatial needs, settlement patterns, and the quality of life in selected rural communities of Assam and Manipur. It adopts a post-positivist approach and employs both qualitative and quantitative methods to compare traditional dwellings with PMAY-G houses across four culturally homogenous settlements. Data triangulation, statistical analysis, and field documentation reveal a significant disconnect between standardized housing schemes and the nuanced cultural contexts of the communities they aim to serve.

The study demonstrates that traditional settlements function as integrated socio-spatial systems where culture and community shape the built form in sustainable and meaningful ways. Conversely, top-down housing interventions often fail to recognize these interdependencies, resulting in compromised liveability, eroded cultural practices, and weakened community bonds. The findings not only confirm that culture is an integral part of the built environment but also underscore its critical role in ensuring the sustainability, relevance, and long-term acceptance of housing solutions.

By highlighting the inadequacies in current policy frameworks and implementation strategies, this research contributes to the growing discourse on culture as the "fourth pillar" of sustainable development. It proposes a model for integrating cultural data

into housing design and settlement planning, advocating for bottom-up approaches that can bridge the gap between tradition and transformation in the rapidly changing rural landscapes of Northeast India.

Research Rationale

Culture, customs, and societal standards that have been observed for generations in many communities shape a sustainable and responsive physical environment. Due to increased housing needs and a lack of understanding and research into culture and its role in housing and other elements of life, social housing policies have been shallow and unsuitable for its residents.

Government efforts to create “better environments” by providing shelter with cemented flooring, four walls, and roofs are not unwelcome, but whether they are enough “depends on lifestyle, rules, social arrangements, stage of acculturation, development of new social mechanisms, values, norms, ideals and so on” (Rapoport, 2005). Culture is becoming an important part of the definition of sustainable development because the initial definition, “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations, 1987), fails to capture society's complexity. Culture helps sustainability balance development driven by external and internal elements that change with the community (Sachs, 1999).

Government-funded social housing policies emphasize affordability and mass manufacturing to offer basic shelter. The environment, defined as the surroundings or conditions in which a person operates (Rapoport, 2005), shaping a society by cultural and traditional practices, is still not addressed or considered necessary to be an important part of social housing schemes or city development plans. Rural housing schemes should have a strong forward linkage with other sectors of the economy directly and indirectly, but there is a huge gap in understanding and documenting traditional settlements and systems of settings that could form the basis of policy documents, development plans, and other development-related documents. The research gap originates from a lack of knowledge on sustainable systems in traditional villages and daily activities.

Research Questions

The research takes the base of Amos Rapoport, an architect who has done extensive research in the field of culture and built-form study and a pioneer in the field of Environment-Behaviour Relations (EBR) with three basic questions of EBR namely:

- (i) “What biosocial, psychological and cultural characteristics of human being influence which characteristics of the built-environment?” (Rapoport, 2000).
- (ii) “What affects which aspects of which environment have on which group of people, under what circumstances and why?” (Rapoport, 2000).
- (iii) “Given these two-way interactions between people and environment, there must be mechanisms linking them, what are these mechanisms?” (Rapoport, 2000).

Based on the above question, the research will further focus on three key questions stated below:

- (i) How various facets of culture influence the built environment?
- (ii) Do both tangible and intangible cultural and traditional systems have a role in the sustainability of community?
- (iii) Can social housing schemes afford to take culture and traditions into account and to what extent can it be undertaken.

With the above questions as the backdrop of the study, the research aims and objects along with literature study and on ground survey has been conducted.

Aims and Objectives

Aim: To form a research base in the field of built form and culture study of Northeast India bringing out the diversity and uniqueness of traditional rural settlements demonstrating shelter and society as a closely knit sustainable system that will aid better implementation of central government schemes.

To fulfil this aim, the research has the following objectives:

Objective 1: To study the concept of dwelling and identify its relation as part of the system of community as a whole.

Objective 2: To understand the underlying relationship between environment, culture and housing.

Objective 3: To study cultural and traditional systems and its translation into space requirement that further shapes the built environment.

Objective 4: To study the existing government schemes, implementation strategy and its impact in rural areas

Objective 5: To develop a base for conducting further research in the field of culture study in architecture in Northeast India

Research Methodology

This mixed-method, post-positivist study examines culture, environment, and rural housing in centrally subsidized housing developments. The study's methodology examines how cultural practices shape spatial needs and how housing policies like PMAY-G in Manipur and Assam meet or ignore them. The research methodology includes conceptual framework, fieldwork, analysis, and synthesis.

Table 1: Methodological approach

OBJECTIVES	METHODOLOGICAL APPROACH
Objective 1: To study the concept of dwelling and identify its relation as part of the system of community as a whole.	<i>Literature review, conceptual framework, settlement observation</i>
Objective 2: To understand the underlying relationship between environment, culture and housing.	<i>Field documentation, environmental and spatial analysis</i>
Objective 3: To study cultural and traditional systems and its translation into space requirement that further shapes the built environment.	<i>Activity-space analysis, cultural narrative documentation</i>
Objective 4: To study the existing government schemes, implementation strategy and its impact in rural areas	<i>Policy review, stakeholder interviews, performance assessment</i>
Objective 5: To develop a base for conducting further research in the field of	<i>Toolkit development, analytical synthesis, future research base</i>

culture study in architecture in Northeast India	
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The study uses an exploratory case study of four rural settlements—two from Manipur and Assam. This design lets you compare conventional and government-implemented housing systems. The methodology combines policy evaluations, spatial research, and community consultations to understand housing practices thoroughly.

Literature review

A comprehensive literature review identified essential concepts, the necessity for the research, gaps in the research, and global cultural and built-form research trends. It was essential in developing a framework and research tools and procedures. A keyword co-occurrence with “Built-environment” and “Traditions” identified literature clusters for study and analysis. Concepts such as dwelling and home, housing, rural housing and culture and housing were explored that further helped in determining the course of the research along with developing questionnaire for the field work.

The "built environment" refers to all human-made buildings that support human activity (Portella, 2014). “Tradition is (a) an inherited, established, or customary pattern of thought, action, or behavior (such as religious practice or a social custom); (b) the handing down of information, beliefs, and customs by word of mouth or by example from one generation to another without written instruction; (c) cultural continuity in social attitudes, customs, and institutions” (Merriam-Webster, n.d.). For keyword co-occurrence analysis, bibliometric analysis was performed using this definition.

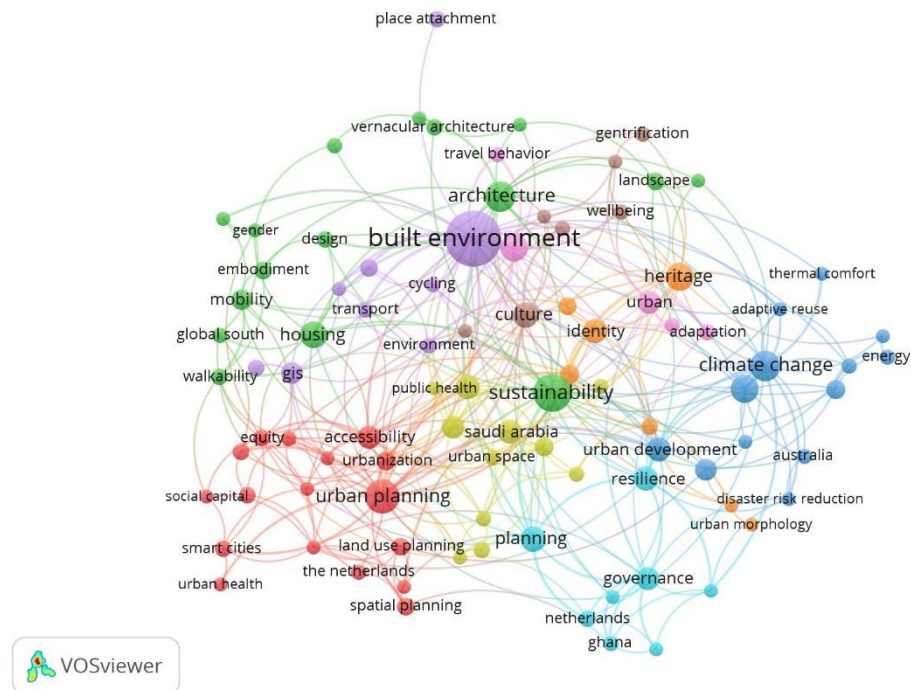


Figure 1: Network Visualization Map of keyword “BUILT ENVIRONMENT” and “TRADITION” using VOSviewer.

It may be noted that in the cluster of built environments, architecture, well-being, culture, housing can be seen in close proximity to the built environment. While the distance of the sustainability node is seen much further away from the built environment node, the appearance of the node in a substantial size in the network analysis can be considered a positive development in the research domain.

Since culture and housing are not domain-specific, their relationship is being investigated but not translated into policies and development goals. In his book “Culture, Architecture and Design,” Amos Rapoport asks, “Why should there be such an extraordinary variety of built environments, especially houses and dwelling, and also settlement forms?” (Rapoport, 2005). Rapoport adds that household activities may have shaped the built environment, notably housing. This book lists four components of activities: “(i) the activity itself; (ii) how is it carried out; (iii) how is it associated with other activities to form systems of activities; (iv) the meaning of activity.” (Rapoport, 2005). These points underpin the research's questionnaire.

Research Approach and Data Analysis

Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, and Sikkim make up Northeast (NE) India, which has 45.7 million people according to the 2011 Census of India. The rural population is 37.3 million, 82% of the total. Bishnupur and Thoubal in Manipur and Baksa and Kokrajhar in Assam were surveyed. A household survey questionnaire was created for the designated area. The respondent was chosen from one Panchayat in each of the four districts' PMAY-G beneficiaries.

The research selected panchayats via purposive sampling because the samples were distributed across a large territory. This qualitative research uses “the identification and selection of information-rich cases related to the phenomenon of interest” (Palinkas et al., 2015) to examine culture in centrally funded social housing schemes. Purposive sampling “will most likely yield appropriate and useful information with an attempt to effectively use limited research resources” (Bourgeault et al., 2010). The sample uses developing concepts (dwelling units are part of a system of settings that completes the community and settlement) to “explore the dimensional range or varied conditions along which the properties of concepts vary” (Campbell et al., 2020).

The study employed “explanatory sequential design” to analyse quantitative data with qualitative data. According to Rapoport (2005), culture affects “(i) the activity itself; (ii) how is it carried out; (iii) how is it associated with other activities to form systems of activities; (iv) the meaning of activity” (Rapoport, 2005). The research assumes that cultural activities shape the built environment.

Culture definition (Amos Rapoport)	Questionnaire approach	
<i>the activity itself</i>	Farming	Weaving
<i>how is it carried out</i>	Fishing	Animal Rearing
<i>how is it associated with other activities to form systems of activities</i>	Other source	Support
<i>the meaning of activity</i>	Native	Norms

The household survey data was analysed to understand built culture and environment. As described in previous parts, data was tabulated under multiple heads depending on “culture” and “built environment”. The correlation coefficient test was used to prove the culture-built environment relationship for hypothesis testing. Asuero et al. (2006) define correlation as “the degree of association between two variables where study of interdependence leads to the investigation of correlations”. In summary, correlation

evaluates the “monotonic” relationship between two variables. In this association, “as the variable of one value increases, so does the other variable or vice versa” (Schober & Schwarte, 2018).

Research uses Pearson Correlation Coefficient (PCC) test to test variable. From Melnychuk et al. (n.d.), PCC is the ratio of “the covariance of two variables and the product of their standard variation”. PCC can also expand semantic and qualitative research (Melnychuk et al., n.d.). The research used data triangulation to validate its conclusions with qualitative survey and professional data. The data collected on “culture” and “built-environment” were analysed using “Jamovi Project 2022, Version 2.3” [Computer Software] to execute a Pearson product moment correlation coefficient test. Pearson's correlation assumes that both variables are regularly distributed, recorded at intervals or as a ratio, and linearly related (2018) Schober & Schwarte. Two correlation tests were done on the four district's data and the overall data. Further, hypothesis testing was conducted for an evidence-based inference.

Correlation between Culture and PMAY-G Houses

It was observed that PMAY-G houses did not conform to cultural norms mostly due to lack of funds. This can also be statistically observed from correlation analysis done between “culture” and “PMAY-G houses” which were recorded in terms of no. of spaces in the dwelling unit, space availability for activities such as weaving, fish processing, granary etc. The Pearson correlation coefficient value (r) came to 0.008 which is very low and p -value of 0.858 which is higher than 0.05 attesting the on-ground observation of houses built under PMAY-G houses were not in accordance with cultural norms or needs of the households. The dwellings built under the PMAY-G scheme has no correlation to culture as well as left with no choice due to cost constraint. Almost all dwelling unit are built in similar design as per the local construction worker know how. Traditional orientation of the units and traditional norms has been observed to be compromised to fit in the available land to build. It was also observed that open spaces that were once used for rituals and ceremonies are disappearing.

Data research showed that culture shapes human behaviour and the built environment. Traditional systems and environments led to a sustainable environment where culture and value systems were important. Interaction with architects in the field demonstrated

that various cultural norms and practices that have moulded traditional built environments have science or rationale, which may be learned from. Culture as the fourth sustainability pillar is notable.

Conclusion

The research was started to emphasize the importance of culture and values that are being overlooked for progress. Cities are losing their culture to accommodate growth, while rural areas are losing it owing to a lack of knowledge of culture and economics. A blanket policy or funding method may not work for a diverse cultural footprint like India. Thus, culture and built environment were examined through primary survey, theoretical premise through literature survey, and fieldwork with professionals and stakeholders.

Culture and religion are an intertwined concept in India. Milestones in agricultural activities are celebrated with religious rituals. Change of season were marked by religious festivals and many other such events can be marked as an important cultural element. The mission statement of Ministry of Culture's mission statement includes preservation, promotion and dissemination of all forms of art and culture. The department undertake several activities such as maintenance and conservation of heritage sites, promotion of art, administration of libraries, observation of important anniversaries of eminent personalities and events, promotion of both institutional and individual's initiative of cultural activities, cultural agreements with foreign countries and creating cultural awareness (Ministry of Culture, Government of India). It can be highlighted that India as a country still don't recognize the everyday culture of various regions and settlements as a culture that needs documentation and consideration.

It was also noted that the definition of culture being not standardized across various departments and documents could have led to data collected by various government agencies not being utilized in drafting of policy documents or implementation strategies. There is a gap in the data collected and in the implementation of these data. The importance of culture is being recognized across several platforms, however, its translation into on ground work is still far-fetched. It is still and only a popular catchphrase and still a long way till it gets integrated well into the system.

Recommendations

The findings of the research suggest that there is a strong correlation between culture and the built-environment. It was also observed that culture even though considered an important element in the development process as well as an integral part of everyday life, is a topic that has not been represented well especially in policies and development schemes concerning settlement and built-environment. The recommendations are suggested in the form of strategies in the following sections.

1. **State-led Documentation of Traditional Systems:** Promote state-level recognition and systematic documentation of traditional dwelling and settlement systems, drawing inspiration from earlier efforts like the 1961 Village Survey Monographs, with active support from the central government.
2. **Formation of State Technical Advisory Teams:** Establish multidisciplinary technical advisory teams at the state level—including local professionals—to oversee housing projects, support beneficiaries during construction, and ensure context-sensitive implementation.
3. **Inclusive Stakeholder Engagement Models:** Encourage collaborative frameworks that involve both professionals and local cultural stakeholders to evaluate and vet projects for cultural relevance, enhancing community acceptance and sustainability.
4. **Activity-based Cultural Documentation:** Develop documentation approaches centred around everyday activity systems at household, community, and settlement levels to capture culture in its most tangible and usable form.
5. **Standardization of Cultural Definitions in Policy:** Integrate a unified definition and documentation format for culture across all levels of development policy—led by bodies like NITI Aayog—to ensure its consistent application in planning, design, and governance.

Contribution of the research

The conclusion of culture and its influencing impact on the built-environment and community life of rural settlements could become an important starting point for replicability of such research across various regions at both national and international

level. Further, the research will highlight the important of culture and social value system that has led to a number of sustainable settlements. The research could highlight the need to look at different formats of development of urban and rural areas of India as both represents two unique characters. The research further asserts the statement of activity system as an important element in understanding culture which would become an important point of type of data that can be collected for culture to be usable.

Limitations and potential for future research

The research's focus on two Northeast Indian states may limit its applicability. This requires more detailed research with state or regional data. Based on activity system, more metrics might capture culture in culture-built-environment correlation calculations. The thesis analyses these correlations using statistical tools, but future research could use documentation to identify culture characteristics.

In this study, only architects' expert opinions were examined. Social scientists, geographers, planners, designers, and cultural experts from mainstream and alternative backgrounds may help us understand culture better. Urban locations could be studied to determine if culture can be included in central and state-funded projects.

References

- Asuero, A. G., Sayago, A., & González, A. G. (2006). The correlation coefficient: An overview. In *Critical Reviews in Analytical Chemistry* (Vol. 36, Issue 1, pp. 41–59).
<https://doi.org/10.1080/10408340500526766>
- Bourgeault, I., Dingwall, R., & De Vries, R. (2010). *The SAGE Handbook of Qualitative Methods in Health Research*. SAGE Publications Ltd.
<https://doi.org/10.4135/9781446268247>
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing*, 25(8), 652–661.
<https://doi.org/10.1177/1744987120927206>
- Merriam-Webster. (n.d.). *Tradition*. Merriam-Webster.Com Dictionary. Retrieved May 12, 2024, from <https://www.merriam-webster.com/dictionary/tradition>
- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research. *Administration and Policy in Mental Health and Mental Health Services Research*, 42(5), 533–544. <https://doi.org/10.1007/s10488-013-0528-y>
- Portella, A. A. (2014). Built Environment. In A. C. Michalos (Ed.), *Encyclopedia of Quality of Life and Well-Being Research* (pp. 454–461). Springer Netherlands.
https://doi.org/10.1007/978-94-007-0753-5_240
- Rapoport, A. (2000). Theory, Culture and Housing. *Housing, Theory and Society*, 17(4), 145–165. <https://doi.org/10.1080/140360900300108573>
- Rapoport, A. (2005). *Culture, Architecture, and Design* (A. D. Seidel, Ed.). Locke Science Publishing Company, Inc.
- Sachs, I. (1999). Social sustainability and whole development: exploring the dimensions of sustainable development. In *Sustainability and the social sciences: a cross-disciplinary approach to integrating environmental considerations into theoretical reorientation* (pp. 25–36). ZedBooks.
- Schober, P., & Schwarte, L. A. (2018). Correlation coefficients: Appropriate use and interpretation. *Anesthesia and Analgesia*, 126(5), 1763–1768.
<https://doi.org/10.1213/ANE.0000000000002864>
- United Nations. (1987). *Report of the World Commission on Environment and Development: Our Common Future Towards Sustainable Development*.