

**CULTURAL APPROPRIATENESS OF POST SIDR  
HOUSING RECONSTRUCTION  
A CASE OF SHARANKHOLA, BAGERHAT**



A Dissertation for the Degree of Masters in Disaster Management

By

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## **Cultural Appropriateness of Post-Sidr Housing Reconstruction: A Case of Sharankhola, Bagerhat.**

**Research question:** Are the post Sidr houses designed and built in Sharankhola with donor assistance using different reconstruction approaches culturally appropriate?

### **Abstract**

Bangladesh is one of the most disaster prone countries in the world. Among the natural hazards cyclones and the associated storm surges are considered as the major threat to our 710km coastal belt with around 28 million people living within the risk zone. One of the major impacts of cyclone and storm surge is on human habitat severely disrupting the livelihood of the affected population. The usual response from the Government and different humanitarian organizations is providing emergency temporary shelter assistance and eventually a transitional or core shelter assistance following a 'built back better' approach focusing on resilience building and risk reduction. Cyclone Sidr, which hit our coast line in late 2007, caused massive destruction of settlements and was followed by an unprecedented reconstruction initiative by the government and NGOs changing the rural landscape permanently within a few years. Most of the agencies provided a cyclone resistant core shelter with potential for future addition and alteration by the owners. Such a multi-agency intervention, without proper consideration of rural culture of responsive built environment and indigenous materials and technologies may lead to a culturally inappropriate settlement degrading our rural landscape and heritage. This research aims to analyze cultural elements of our coastal settlement in general and evaluate the post Sidr assisted reconstruction works in the backdrop of cultural appropriateness. Sharankhola, one of the most intervened areas after Sidr, is selected as the study area of this research. The later alterations and modifications by the users will be studied as an indication of cultural inadequacies. Observation, focus group discussions and household survey in the study area will be conducted to ascertain user feedback and consciousness about culture and the outcome of the assisted shelters.

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**Chapter One**  
**Statement of the Problem**

# Chapter One: Statement of the Problem

## 1.1 The Context

Bangladesh is one of the most disaster prone countries in the world. The geographic formation and location has made Bangladesh susceptible to frequent floods, cyclones and storm surges.

### 1.1.1 Bangladesh and Cyclone

Among the hazards that that put Bangladesh at risk, cyclones and the associated storm surges are considered as the major threat to our 710km coastal belt with around 28 million people living within the risk zone. The development of Bangladesh has time and again hampered by these natural calamities (Mallick et al 2008) and the most affected are the poorest section of our population. Climate change is aggravating the extreme events and cyclones of greater magnitude are making landfall on our coast more frequently than ever before (See figure 1.1). Altered frequencies and intensities of extreme weather, together with sea level rise, are expected to have adverse effects on natural and human systems (IPCC 4<sup>th</sup> assessment synthesis report) and Bangladesh is among the most vulnerable countries.

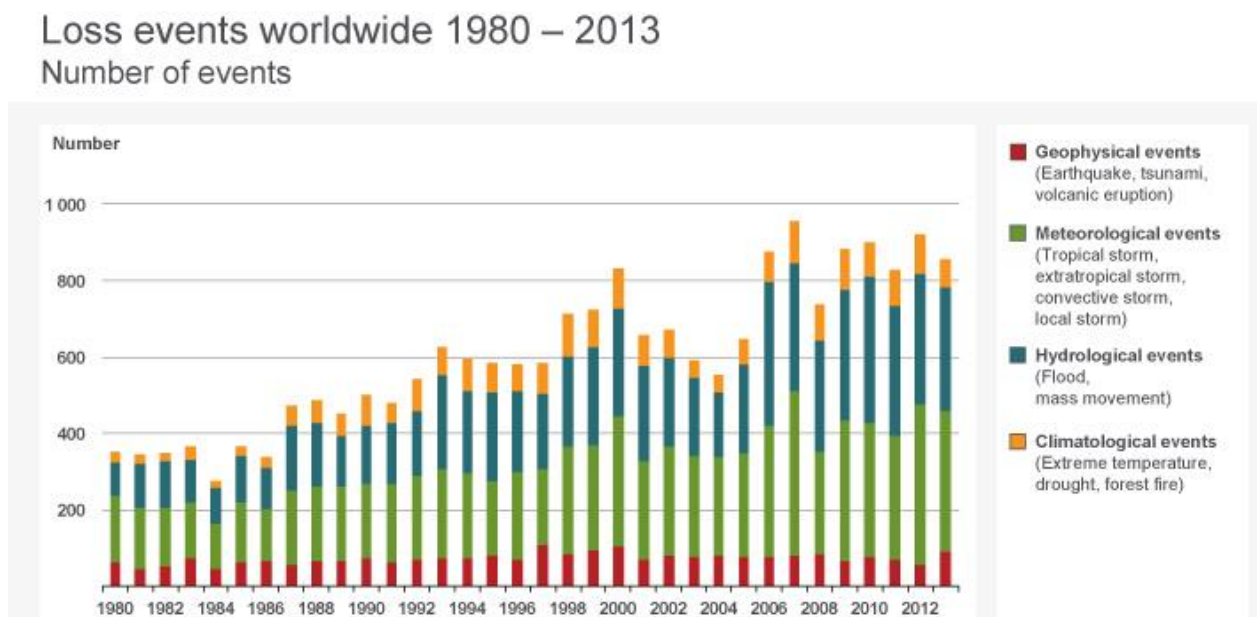


Figure 1.1 Source: [www.munichre.com](http://www.munichre.com)



### **1.1.2 Cyclone Sidr**

Cyclone Sidr hit the south-western coast of Bangladesh in the evening of 15 November 2007. The storm arrived as a category-4 super cyclone with peak winds at 250 kilometers per hour. The cyclone continued to travel in a north-northeast direction, affecting parts of central Bangladesh, where it was subsequently downgraded into a category-3 cyclone. Cyclone Sidr claimed 3,406 lives and 1,001 people were reported missing till 2008. More than 55,000 were injured and close to 9 million people in 30 districts were affected. (GoB, 2008)

### **1.1.3 Impact of Cyclone Sidr**

Loss of life, livestock, loss and damage of shelter, infrastructure and agriculture are among the primary impacts of cyclones in general. These impacts are greatly aggravated in our coastal region due to high population density, poverty and vulnerability of our population. According to Ali (as cited by Mallick et al 2008) only 1% of all the cyclones that form every year strike Bangladesh causing 53% of world-wide yearly casualty linked to cyclones. Moreover, associated storm surges cause embankment failure, salinity intrusion which adds to the damage, loss and sufferings. Efficient early warning system, awareness campaigns and large-scale evacuation to cyclone shelters have effectively reduced death toll in recent cyclones like Sidr and Aila. But these measures are unable to protect their most valuable asset, shelter, which often represent the greatest share of loss in the total impact of a disaster on the national economy (Lyons 2009 as cited by Ahmed I 2011)

#### **1.1.3.1 Damage and loss assessment by GoB**

Damage and loss caused by Cyclone Sidr were disproportionately concentrated in certain sectors of the economy (e.g. housing), and among certain districts and upazilas which were most severely affected. Unfortunately two of the hardest hit districts (Bagerhat and Barguna) are among the poorest areas of the divisions with the highest level of poverty) of the country (figure 1.3 shows 47 and 52 percent below poverty level population for Khulna and Barishal respectively). Preexisting vulnerability of this population aggravated the situation dramatically.

## Poverty scenario by divisions

Division	Poverty Headcount Rate* (%)	Population Share (%)	Population (million)	Number of Poor (million)
Barisal	52.0	6.4	9.1	4.8
Chittagong	34.0	19.3	27.4	9.3
Dhaka	32.0	32.2	45.9	14.7
Khulna	45.7	11.7	16.7	7.6
Rajshahi	51.2	24.0	34.2	17.5
Sylhet	33.8	6.3	9.0	3.1
<b>National</b>	<b>40.0</b>	<b>100.0</b>	<b>142.4</b>	<b>57.0</b>

Table 1.1 Source: GOB 2008

Given the cyclone category and the intensity of the storm and the demographic characteristics of the area, the number of casualties could have been much higher. Three factors served to reduce the number of potential fatalities. An efficient early warning system facilitated transfer 1.5 million people to around 2000 cyclone shelters, Sidr's first impact was diffused by Sundarban before it reached settlements and finally the favorable timing of landfall during a low tide that significantly reduced surge height. (GOB 2008)

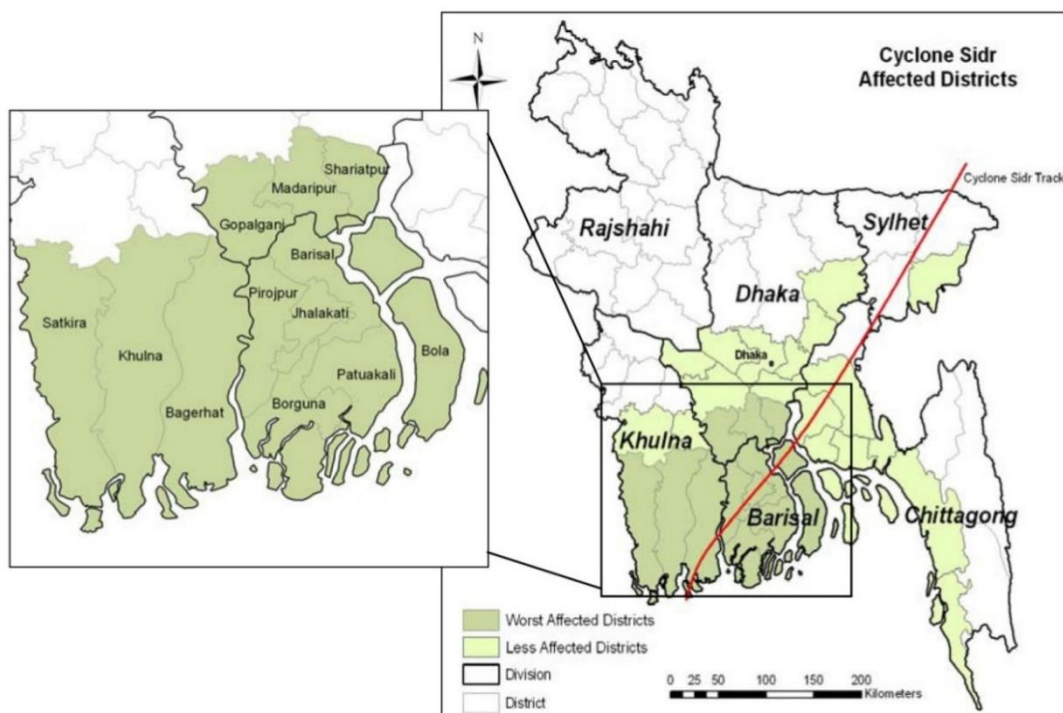


Figure 1.2 Path of cyclone Sidr and affected districts (source: GOB 2008)

### 1.1.3.2 Impact on Housing Sector

Cyclone Sidr destroyed homestead in three ways: storm surge, flooding and wind. Pucca houses were much more resistant to wind, often serving very well as local ad hoc shelters, but still sustaining destruction by flooding and surge. Storm surge was by far the most powerful agent of destruction in some areas resulting in total destruction to housing and non-engineered structures. Wind caused some direct destruction which was generally quickly repairable, as well as a substantial number of tree blow downs— a major cause of wind-related housing destruction.

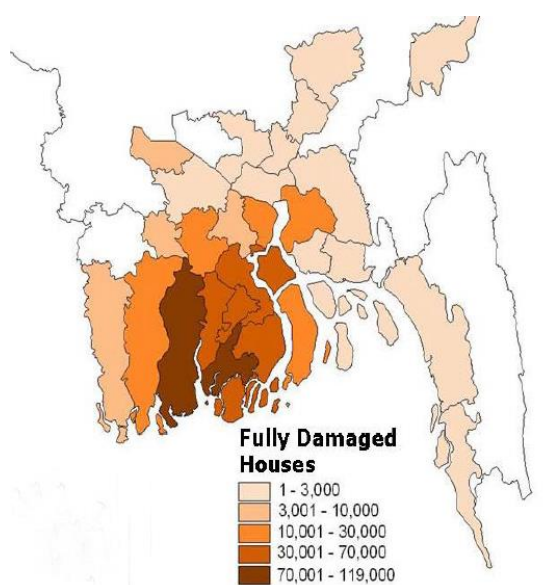


Table 1.1: household damage by district

District	Population 2007 est.	Damaged Households	
		Full (% of District)	Part (% of District)
Barguna	984,323	47%	53%
Jhalokati	805,308	48%	52%
Bagerhat	1,796,876	37%	41%
Pirojpur	1,288,839	27%	34%
Patuakhali	1,694,506	19%	47%
Shariatpur	1,255,468	13%	5%
Barisal	2,732,922	9%	19%
Bhola	1,975,616	5%	6%
Khulna	2,759,606	4%	14%
Madaripur	1,329,765	2%	3%
Satkhira	2,163,057	1%	3%
Gopalganj	1,351,717	11%	39%

#### **1.1.4 Response and rehabilitation after Sidr**

A primary need based response after a cyclone should usually ensure food security and temporary shelters. The next step ideally should focus on repair and reconstruction of housing. Life and livelihood of our coastal population revolves around their homestead and losing it makes them distressed and traumatized. To break out of this, the affected people begin reconstruction the day of disaster, with or without external assistance (Jha et al 2010). Usually the community comes forward aiding the victims. But without external assistance recovery becomes difficult and in cases of extensive loss and damage, the recovery is almost impossible with the limited local capacity and resource. This is the reason the GOs and NGOs focus on housing reconstruction as a key area of cyclone response and recovery. Post-Sidr scenario was no different. After the initial immediate response period, characterized by search and rescue, food, water and health care as well as emergency shelter assistance (which was of negligible volume), the GOs and NGOs concentrated heavily on reconstruction of the built environment. Large infrastructure projects were more a concern of public domain. The NGOs focused on housing and livelihood revival following ‘build back better’ concept.

#### **1.2 Rationale for selecting Sharankhola as a case**

The research looked for impact of outside intervention on local built environment. The author looked for the areas with most severe destruction of housing and the subsequent high intensity reconstruction to ensure vivid presence of intervention. Based on table 1.1, Sharankhola experienced the worst housing destruction and studies and report acknowledge it to be one of the most intervened upazilla especially in the housing reconstruction.

#### **1.3 Aims and objectives of the research**

Aim of this research is to conduct field survey using various research methods in the some selected villages of Sharankhola’s most affected part and ascertain the traditional house form and building technology of the area. The acquired knowledge is then to be compared with the completed reconstruction projects of the selected villages to evaluate their cultural appropriateness.

Objectives of this research are as follows.

- Review existing academic literature and shape a conceptual background to support the research aim
- Study and document traditional house form, materials, and technology of the area
- Study the process used in post-Sidr reconstruction in the selected study area
- Study the reconstructed end product and evaluate their cultural appropriateness based on evidence accumulated through field work and literature review

#### **1.4 Rationale of this research**

Bangladesh has been facing disasters like cyclone and flood throughout known history. According to multiple IPCC models and other predictions from the scientific community, this is only to get worse in decades to follow due to climate change induced extreme events. Moreover, due to extreme population density our built environment, both in urban and rural setting, is changing rapidly. The issue of tangible and intangible heritage and its conservation is marginalized here in the overwhelming presence of capitalism and globalization masked by pro-people issues like development and growth. Rural Bangladesh, with its cultural landscape is still a rich source of local knowledge that can be the true guide towards our identity and acculturation as a nation. The context, where the changing environment is occurring due to natural socio-cultural transformation (urban fringe areas or rural growth centers), reshaped settings can embed cultural values within. Post disaster scenario is very different. The change is sudden here, with frequent encroachment and invasion of out-of-context elements brought in and promoted by outsiders, who are rarely sensitive to context. Even if they are, they do not have the luxury of time and resource needed to follow that sensitive path. Valuable local knowledge can be lost amidst speedy recovery and 'build back better' momentum. The local people, the victims, whose culture and heritage we often disregard, usually are too busy meeting bare necessities, struggling to get out of misery and sufferings. Participatory approach has been suggested by many as a way to contextualize intervention, which has been misused as eyewash covering same old top-down flow of decision.

Since the development of Bangladesh is Dhaka centered, and rural heritage is more vulnerable near Dhaka and other large cities, the best source of indigenous knowledge in its unaltered state are the remote areas, where influence of development is minimum. Sharankhola is such an area where a substantial portion of housing are still being built following local tradition of house form (as will be seen from field works). To save this heritage from sudden change, a thorough documentation should be the first step, followed by finding appropriate process and product of reconstruction that can be used in case of emergencies. Evaluation and documentation of Success and/or failure of Post-Sidr recovery can act as a supporting precedence for the above two steps. Other academic and professional studies are in place on post-Sidr reconstruction in Sharankhola, some of these studies used user satisfaction as the key indicator or cultural appropriateness without using context and traditional practices as a key reference point. Some other works focused on documentation of reconstruction process, product and their increased resilience. The author would like to look into this vacuum in necessary knowledge and contribute though analyzing the traditional house forms of Sharankhola as benchmarks for comparison.

### **1.5 Scope and limitations of the research**

The research is case study based. It recognizes the traditional house form of the region in general and the study area in particular as a key product of local culture and all reconstruction works it evaluates for cultural appropriateness is matched, contrasted and compared against attributes and elements of this house form. Some other variables of culture, as will be shown in the literature review in chapter two (background), will be kept out of the scope of this research due to limitation of time and recourse.

As an academic exercise, this research will only be limited to a few villages selected on the ground of convenience and resource limitation. More elaborate research, based on more representative sampling will surely lead to a better understanding of the problem presenting a stronger argument.

### **1.6 Organization of this research**

This work is arranged in six chapters. Chapter one elaborates the statement of the problem, explaining aims, objectives, rationale, scope and limitations of the research. Chapter two elaborates the methodology used, while relevant literatures are discussed

in chapter three. Literature and field observation based overview is placed in the fourth chapter. Analysis and discussion of the the field work data is included at the end of chapter 5. Concluding remarks summarizing key findings and recommendations are placed in the final chapter followed by suggestions for future.

**Chapter Two**  
**Data Sources and Methodology**



## **Chapter Two: Data Sources and Methodology**

### **2.1 Introduction**

The chapter discusses the overall design of the research, explaining from the process of selection of sites, pilot study, household selection and survey process, etc.

### **2.2 The study area**

The details of the study area are discussed in chapter five. To explain the research design, the selected site is briefly described below. Sharankhola upazilla of Bagerhat zilla has been selected as the focus of this study due to extensive housing damage along with being the site for unprecedented volume of reconstruction works. Among four unions of sharankhola, the research was limited to Rayenda and Southkhali union as these two unions were most hardly hit and experienced maximum interventions. Also the study had to be narrowed down to cover within limited time and resource.

### **2.3 Pilot study**

Pilot study was done in September, 2015 for two days with the aid of transact walk, bike tours and photographic documentation. The understanding of the settings from this study informed the decisions regarding selection of villages and clusters within villages. Since the research was done in a totally unfamiliar locality, this study proved to be vital for designing and organizing the research.

### **2.4 The villages and the case study clusters**

Three villages were selected based on types of settlement and convenience. The villages are 1. Kadamtala specially for dense cluster type settlement and extensive in-situ reconstruction (cluster 1, chapter5) 2. Chalrainda specially for dense cluster of relocated settlement (see cluster 2, chapter 5) and also a few scattered in-situ reconstructions, and 3. Uttar Southkhali for relocated scattered settlement (see cluster3, chapter5). The three clusters are selected during pilot study on the basis of convenience and familiarity of the guide who provided bike support.

## **2.5 Methods**

### **2.5.1 Observation**

Observation was used in all three phases of field work. The focus was on observing building materials and technology (both traditional and new), space use pattern in traditional and agency built houses, social values and life style, etc. The type of observation can be called unstructured observation.

### **2.5.2 Photography and analysis**

Extensive photographic documentation was done by the author in all three phases of field work. These photographs have proven to be of valuable resource in data analysis and drawing conclusions in chapter six.

### **2.5.3 Mapping**

In all three clusters, the survey always began with mapping involving the community members. Satellite images are also compared to establish correct proportion of the setting. These maps (see chapter 5) express a clear picture of the setting indicating space use and neighborhood space relations and family/neighborhood boundaries.

### **2.5.4 Household survey**

The largest, most people centric and most time consuming part of the field work was household survey. This was conducted in two phases. Twenty-four households from three villages are selected based on types of settlement and types of reconstructed shelter (See Figure 5.11). The details of the findings are tabulated, manipulated into charts and diagrams and then analyzed and synthesized into concrete argument and recommendation in chapter five and six.

### **2.5.5 Focus group discussion**

A focus group discussion with five males and two female participants was conducted in Kadamtala village (cluster1). The topic of discussion was 'What type of house is appropriate for the people of Sharankhola'? The author participated as moderator. The location was selected at a nodal point of the cluster where two female participants could

talk freely from their verandah, while male participants gathered around the author at the nodal point.

### **2.5.6 Key informant interview**

Three persons were used for this study as key informant. Tuhin jomaddar was the provider of bike service. Rauf shikdar of Uttar Southkhali who was the central figure when their group purchased land here in order to be eligible to receive shelter assistance from GoB. The third person is Nazma Begum, who was a key person during BRAC's reconstruction works in Sharankhola. Interviews with key informants were informal and open ended. The main purpose was to cross check and triangulated various information received from other methods. K. H. Kabir of BRAC University, who was involved in BRAC's Sharankhola project and also post Aila project at Satkhira (see Chapter four) was a source of information about the overall reconstruction process and activity in the region. He also provided valuable information regarding traditional house forms and technology of the region.

## **2.6 Data analysis and triangulation**

Qualitative Information and insight received from observation, household survey, FDG, and interviews are analyzed and discussed in chapter five. Quantitative data is presented in tables and charts to be useful in the discussion. The information from various source and research methods are compared and contrasted to verify their authenticity and reliability (triangulation). A summary of key findings, Conclusion deducing from the findings and a set of recommendations is presented in the final chapter.

**Chapter Three**  
**Conceptual Background**

# Chapter Three: Conceptual Background

## 3.1 Some definitions and concepts

This chapter is based on literature review of relevant theories and concepts that would shape a framework work analysis and comparison of the field study and survey.

### 3.1.1 What is Culture?

Culture is one of the most complex word in English language, “a word which is employed in a variety of senses in everyday use without a tangible or generally agreed core meaning” (Throsby, 2001). A number of distinct disciplines use it for explaining important concepts of their own (Smith 2001) and “the term is multidimensional and often conceptualized differently according to context and discipline”(Daskon & McGregor, 2012). I would like to discuss the available literature on culture as a broad spectrum and focus on culture from the perspective of built environment.

“In the early use in English the word ‘culture’ was associated with ‘cultivation’ of animals and crops” (Smith 2001). During renaissance and enlightenment ‘culture’ was being used to express level of education, maturity or sophistication of individuals. At times it was used as a value-laded synonym for ‘civilization’ and technology. Later half of 19<sup>th</sup> century saw the use of ‘culture’ in support of arts and crafts against advent of industry and globalization. Kroeber and Kluckhohn (1952), critically reviewed concepts and definitions of culture categorized 164 varied definition into the following six broad groups:

1. Descriptive definitions: culture as a comprehensive totality making up the sum of social life, the complex whole that includes knowledge, belief, art, laws, morals, customs and any other capabilities and habits of man.
2. Historical definitions: culture as a heritage which is passed on over time through the generations.
3. Normative definitions: culture as a way of life or the material or social values of any group.
4. Psychological definitions: culture as a problem solving device, allowing to communicate, learn and fulfill material and emotional needs.
5. Structural definitions: expressing culture as an abstraction isolated from concrete behavior.

6. Genetic definitions: culture as a product of intergenerational interaction and transmission.

In conclusion of the book Kroeber and Kluckhohn arrived at the following definition: 'Culture consists of patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiment in artifacts; the essential core of culture consists of traditional (i.e. historically derived and selected) ideas and especially their attached values; culture systems may, on the one hand, be considered as products of action, on the other, as conditional elements of future action' (Kroeber et. al. 1952)

Introduction of Post Modernism in the 70's within this complex scenario certainly gave rise to many other types definition. A few recent definitions are given bellow.

'social heritage of a group (organized community or society). It is a pattern of responses discovered, developed, or invented during the group's history of handling problems which arise from interactions among its members, and between them and their environment. These responses are considered the correct way to perceive, feel, think, and act, and are passed on to the new members through immersion and teaching. Culture determines what is acceptable or unacceptable, important or unimportant, right or wrong, workable or unworkable. It encompasses all learned and shared, explicit or tacit, assumptions, beliefs, knowledge, norms, and values, as well as attitudes, behavior, dress, and language' ([www.businessdictionary.com](http://www.businessdictionary.com)). 'Culture' is "the collective programming of the mind which distinguishes the members of one group or category of people from another" (Hofstede 1994).

Rapoport pointed out three broad categories of definitions that can mostly cover the conceptual breadth of culture. They are "A way of life typical of a group, a system of symbols, meanings and cognitive schemata transmitted through symbolic codes, and a set of adaptive strategies for survival related to ecology, and resources" (Rapoport, 1987).

Analyzing the above it can be stated that culture is the embodiment of the evolved way of life for a particular society. It is the code to ensure uniqueness and identity. Analysis of culture therefore should not be 'an experimental science in search of law but an interpretive one in search of meaning' (Geertz 1973).

### 3.1.2 Defining Cultural Appropriateness

Although a very commonly used term, it should be convenient if cultural appropriateness is defined here, since it is one of the key components of the research question. Study of the available web materials leads to a general understanding that whatever is suitable, applicable and in harmony with and natural world for a specific cultural context and does not give rise to conflict, contrast or infringement can be termed appropriate for that specific culture. The term 'sustainable' is also closely associated with being culturally appropriate. Cultural appropriateness is a virtue, a social value that is defined by encyclopedia.com as 'Sensitivity to other cultures.... manifested through knowledge of different languages or manners of speech, norms, religious beliefs and practices, family structures and dynamics, community decision-making patterns, and class consciousness and socioeconomic realities' ([www.encyclopedia.com](http://www.encyclopedia.com)).

Another website defines it as 'sensitivity to the differences among ethnic, racial, and/or linguistic groups and awareness of how people's cultural background, beliefs, traditions, socioeconomic status, history, and other factors affect their needs and how they respond to services. Generally used to describe interventions or practices' ([www.definedterm.com](http://www.definedterm.com)).

The term appropriateness has also been widely used with 'technology' and it usually means 'technology that is suitable to the social and economic conditions of the geographic area in which it is to be applied, is environmentally sound, and promotes self-sufficiency on the part of those using it' ([www.merriam-webster.com](http://www.merriam-webster.com)). This is one of the key considerations of sustainable development as well and since culture is recognized as the driver and enabler of sustainable development (UNESCO, 2012) it can then follow that appropriate technology is expected to be culture and place specific.

Cultural appropriateness can also be explained as being responsive to a specific cultural setting. When we look at any traditional, vernacular built environment, responsiveness is usually embedded. The evolution of the environmental setting ensured that it responds to the needs and communicate the aspired meanings of the people of a particular culture. But when professionals design from outside, it becomes a critical issue and absence of thorough analysis of cultural context often leads to

decisions or outcomes with unsatisfactory responsiveness and communication potential. Of course one may argue that most professionally designed works are done in pluralistic urban context with “the presence of multiple groups and sub-cultures” while “traditional environments were for homogeneous groups and of much smaller scale” (Rapoport, 1987). Moreover, throughout the era of Modern Movement cultural specificity was rejected in favor of a universal order of built forms. Although the paradigm shifted with the introduction of ‘critical regionalism’, place theories and phenomenological concepts, a large group of development planners still argue in favor of generalized design approach emphasizing the possibility of users to adapt. However, it will be shown in the later chapters through case studies that in the absence of specific design guidelines, continuous monitoring and prolonged involvement of professionals after reconstruction and handover (which is impossible in most cases), adaptation by user from a generic design lead to eclectic outcomes diminishing cultural landscapes.

### **3.1.3 Culture, built environment and reconstruction**

The built environment has been a vivid product of culture and context, at least in rural or vernacular settings. The following statement of Paul Oliver is very much relevant to this research as the study area is rural as well as fringe. “Cultural traits and environmental contexts constituted the focus of vernacular traditions in building, which have often existed for centuries” (Oliver, 2006). However, the problem of understanding and deciphering culture-environment relationship and taking design decisions based on that is not a simple task for an outsider. According to Rapoport “concept of ‘culture’ has proved to be much too broad and abstract to be usable, at least in connection with the environment”(Rapoport, 2008).

In several of his writings he proposed the following diagram to dismantle culture into segments to establish a tangible relationship with built environment. This diagram intends to make culture useful overcoming its inherent limitation of being too generalized and too abstract. On the horizontal axis it sequentially dismantles culture into world views, values, etc. into more specific variables such as ideals, meanings, norms, standards, expectations, etc. On the vertical axis culture is dismantled into smaller segments such as kinship, family structure, roles, social network, status,



identity, institutions, etc. The diagram suggests hierarchical relationship of various elements with the built environment using varied width of arrows. The wider the arrow is, the stronger and more direct influence it has on built environment. (Rapoport, 2001, 2005, 2008)

Following the steps of the diagram enable us to realize the complexity of elements influence and shape our built environment and how all of these are encompassed under the umbrella of 'culture'. The diagram also dismantles the environment itself into various parts like space, time, meaning, communication, systems of settings, cultural landscape, and various fixed, semi-fixed and non-fixed features (see fig 1.1). Rapoport suggest a diverse relationship of various components of culture to these parts of the built environment and in varied degree of importance (Rapoport, 2005).

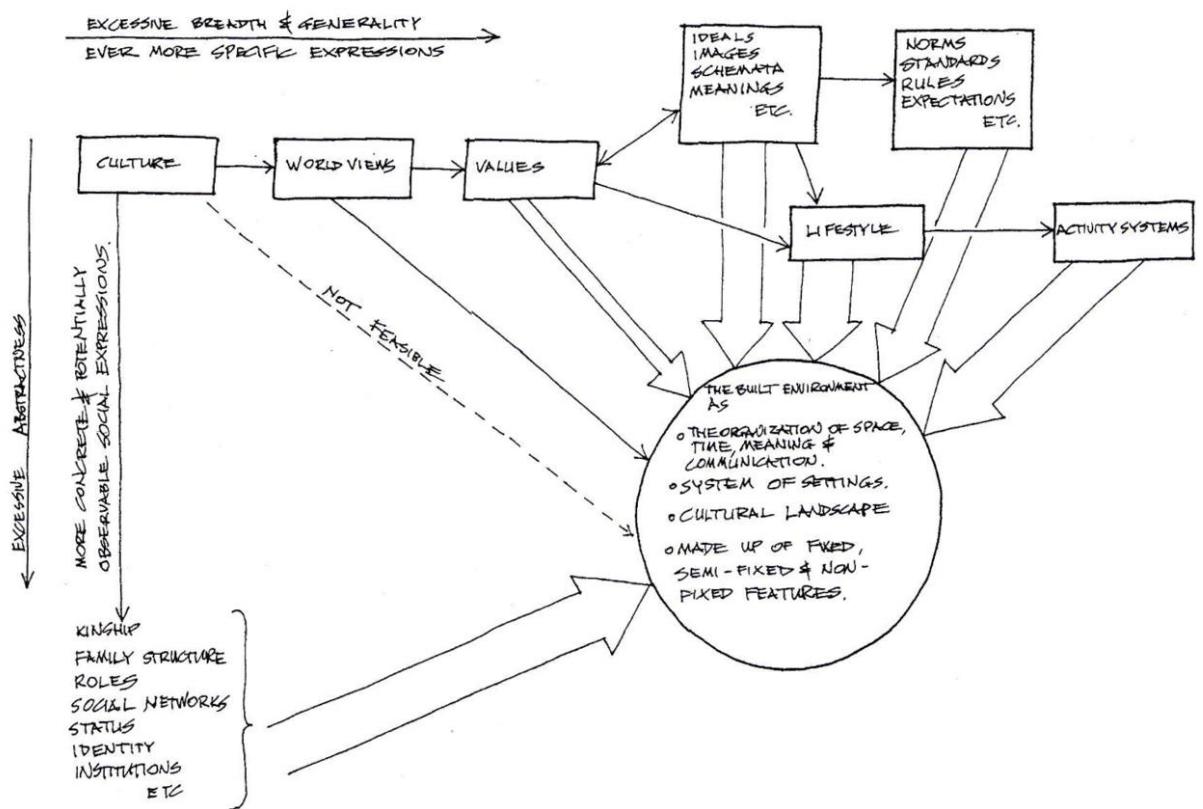


Fig 1.1 Dismantling of 'culture' and relating its expressions to the built environment (the width of arrows corresponds approximately to the hypothetical feasibility and ease of relating the various elements. (Rapoport, 2005)

### **3.1.4 Culture as livelihood asset**

“In simple term livelihood refers to ‘what people do to make their living’, focusing primarily on employment and income generating activities.” Since risk reduction is a product of vulnerability and asset base of a household, and its diversity play a key role in post disaster recovery, we should look into types of assets commonly used in vulnerability analysis particularly the widely used Sustainability Livelihood Framework (SLF) originally introduced by DFID. This framework divided a household’s asset base into five categories: human, natural, physical, social, financial capital, in combination of which a household is able to sustain livelihood and demonstrate resilience. Contribution of culture and its subfields (shown fig 1.1) such as values, activity systems or lifestyle on livelihood of vulnerable community have not been clearly defined or recognized in this framework. “despite the numerous strengths of the SLF, which contrasts with ready-made ‘blueprint’ interventionist instruments, the neglect of cultural factors, and the specific role of culture and traditions in the context of achieving SLs (sustainable livelihoods), is a serious shortcoming” (Daskon & Binns, 2009). The wide acceptance of this framework throughout past two decades and its use by the development organizations in vulnerability analysis and designing risk reduction strategies have kept ‘culture’ in the side line. On the contrary, development organizations and research institutes has been treating culture and as a socially shaped constrain, a hindrance to development and progressiveness(Daskon & McGregor, 2012).

Pierre Bourdieu’s work on cultural capital and its embedded (internalized values and ideas), objectified (tangible cultural goods/objects) and institutionalized (social structure, institutions, entitlements) state (1986) provided a basis to consider culture as a form of capital in social science and development literature. Emphasis on cultural diversity focusing on tangible and intangible heritage by UN organizations (UNESCO,1995, 2001, 2003, UNDP, 2004) has encouraged academic debate on behalf of culture as not only a form of capital but also as a prime force behind sustainable development, which in turn is an accepted key precondition of risk reduction and building back better(UNISDR, 2015).

### **3.1.5 Culture, development and risk reduction**

UNESCO (1995) compared two prevailing views towards development, one being “a process of economic growth, a rapid and sustained expansion of production” and the other is “a process that enhances the effective freedom of the people involved to pursue whatever they have reason to value”. It is a contrast between capitalist growth oriented stand and human centered approach. Davis et al. (2015) argued that “assisting group involved in post disaster assistance, whether for relief or reconstruction, is automatically concerned with long-term development”. The awareness of the importance of culture, tradition, local knowledge and context specific development initiative is growing globally indicating a shift from top-down, prototype based technical answers to complex societal problems. Local knowledge embedded in vernacular built environments are increasingly being recognized as relevant and potential resource base to revive rural economy in post disaster rehabilitation scenario. However, a number of evaluative studies of post disaster reconstruction revealed lack of sensitivity towards culture and context as one of the root cause of increased vulnerability rather achieving reduced risk through a ‘build back better’ exercise (Barenstein, 2008; Hakim, 2009; Jigyasu, 2010; Md. Nadiruzzaman & Paul, 2013).

### **3.2 Relevant international and national documents and policies in post Sidr scenario**

This section considers the policies and guidelines in some of the key documents of DRR and reconstruction relevant in post Sidr scenario. ‘Shelter After Disaster’, the 1982 publication by UNDRO is considered as the pioneering document of the field that directly addressed the reconstruction issues in detail. The second edition of the publication (Davis, Thompson, & Frederick Krimgold, 2015) is considered here. OHCHR and UNHABITAT published ‘Right to Adequate Housing’ in 2009 portraying universal housing right and its essential features (OHCHR & Un-Habitat, 2009). The World Conference on Disaster Reduction, held from 18 to 22 January 2005 in Kobe, Hyogo, Japan, adopted Hyogo Framework for Action (HFA) 2005-2015. This can be considered as one of the most influential and agreed upon international

declaration in the post Sidr DRR scenario and has been the blueprint for DRR activities world-wide ([www.preventionweb.net](http://www.preventionweb.net)) until the declaration of its second phase, the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030. IFRC, the lead organization of Shelter Working Group (see chapter 3) formulated guidelines for owner-driven housing reconstruction (IFRC, 2010). The Shelter Working Group formulated a minimum standard for post Sidr reconstruction which was then endorsed by GoB to be followed by all the agencies involved in reconstruction. Sphere standards, although published in 2011 is also discussed here as a benchmark for comparison, since it is a widely accepted international document that established minimum standards for post disaster reconstruction. The key proposition of the some of these documents are presented below followed by a critical discussion regarding how much the issues related to culture and context has been accommodated and recognized.

### **3.2.1 Hyogo Framework for Action**

This framework has established five priorities for action. Among them the following priorities directly or indirectly recognize the right to adequate and appropriate housing.

1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.
2. Identify, assess and monitor disaster risks and enhance early warning.
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
4. Reduce the underlying risk factors.
5. Strengthen disaster preparedness for effective response at all levels.

Risk reduction has been established to be a local and national level priority. One of the major risk factor during disasters is weak built environment which should be identified, assessed and monitored. Culture of safety is to be promoted which should take into account the housing situation at all levels. Addressing the underlying risk factors according to 4<sup>th</sup> priority should deal with poverty and vulnerability which eventually direct initiatives towards sustainable and resilient built environment.

### **3.2.2 Sphere Project for Minimum Standards**

According to the Sphere Project (2011) adequate housing should ensure the following:

- sufficient space and protection from cold, damp, heat, rain, wind or other threats to health, including structural hazards and disease vectors
- the availability of services, facilities, materials and infrastructure •
- affordability, habitability, accessibility, location and cultural appropriateness •
- sustainable access to natural and common resources; safe drinking water; energy for cooking, heating and lighting; sanitation and washing facilities; means of food storage; refuse disposal; site drainage; and emergency services
- the appropriate siting of settlements and housing to provide safe access to healthcare services, schools, childcare centres and other social facilities and to livelihood opportunities

The minimum standards established in Sphere constitute the core content towards adequate housing. Non-displaced disaster victims should be assisted on the site of their original homes with temporary or transitional shelter or with recourse to repair. Temporary communal settlement is suggested for displaced victims. Five standards are set by Sphere:

**Standard1:** Shelter and settlement strategies contribute to the security, safety, health and wellbeing of both displaced and non-displaced affected populations and promote recovery and reconstruction where possible.

**Standard2: Settlement Planning**

The planning of return, host or temporary communal settlements enables the safe and secure use of accommodation and essential services by the affected population.

**Standard3: covered living space**

People have sufficient covered living space providing thermal comfort, fresh air and protection from the climate ensuring their privacy, safety and health and enabling essential household and livelihood activities to be undertaken.

#### **Standard4: Construction**

Local safe building practices, materials, expertise and capacities are used where appropriate, maximizing the involvement of the affected population and local livelihood opportunities.

#### **Standard5: Environmental impact**

Shelter and settlement solutions and the material sourcing and construction techniques used minimize adverse impact on the local natural environment.

### **3.2.3 UN-HABITAT and the Right to Adequate Housing**

According to this document, each human has a right to live somewhere in security, peace and dignity. The right to adequate housing contains freedom which includes:

- Protection against forced evictions and the arbitrary destruction and demolition of one's home
- The right to be free from arbitrary interference with one's home, privacy and family
- The right to choose one's residence, to determine where to live and to freedom of movement

The right to adequate housing also contains entitlements such as security of tenure, housing, land and property restitution, equal and non-discriminatory access to adequate housing and participation in housing related decision making at the national and community level.

(OHCHR & Un-Habitat, 2009)

### **3.2.4 IFRC Guidelines of Owner Driven Housing Reconstruction**

In their publication (2010) IFRC defined their preferable and heavily advocated reconstruction approach ODHR as follows

“ODHR programmes assist identified families and communities to rebuild homes that are safe and meet or exceed established technical requirements, in an integrated approach centred on the affected families as informed decision-makers”. The guidelines they presented can be considered as an immediate policy backdrop for the reconstruction intention of IFRC and the shelter cluster they have lead during post Sidr reconstruction.

- Participatory process of decision making
- Appropriate technical support

- Appropriate financial assistance
- Government recognition of ODHR and reconstruction policy advocacy
- Disaster Risk Reduction (DRR) by understanding risk and building safer environments
- Participation and technical support requires regular access to the families
- Reconstruction extends beyond housing
- Addressing security of tenure-related vulnerabilities
- Informed decision-making by all parties
- Responsible resettlement

(IFRC, 2010)

### **3.2.5 World Bank post disaster reconstruction guiding principles**

The World Bank proposed following ten guidelines for reconstruction in 2010

- A good reconstruction policy helps reactivate communities and empowers people to rebuild their housing, their lives, and their livelihoods.
- Reconstruction begins the day of the disaster.
- Community members should be partners in policy making and leaders of local implementation.
- Reconstruction policy and plans should be financially realistic but ambitious with respect to disaster risk reduction.
- Institutions matter and coordination among them improves outcomes.
- Reconstruction is an opportunity to plan for the future and to conserve the past.
- Relocation disrupts lives and should be kept to a minimum.
- Civil society and the private sector are important parts of the solution.
- Assessment and monitoring can improve reconstruction outcomes.
- To contribute to long-term development, reconstruction must be sustainable.

(Jha, Barenstein, Phelps, Pittet, & Sena, 2010)

### **3.3 Types of assisted shelters**

As per typologies established by reconstruction practices, the shelters can be classified in following four categories.

- Emergency shelter

- Transitional housing
- Core housing
- Permanent housing

These types of assistance are explained in various documents published by IFRC (GFDRR, 2014; IFRC, 2010, 2012), based on which, the following definitions are formulated. The distinction between these typologies are primarily based one types of materials used, process of construction and time of assistance with in the post disaster phase.

### **3.3.1 Emergency shelter**

Emergency shelter is provided as a post disaster response to ensure that affected families have a safe living space till a more permanent solution can be reached. These type of assistance are usually temporary tents, shacks, etc.

### **3.3.2 Transitional shelter**

Transitional shelters are rapid, post-disaster shelters made from materials that can be upgraded or reused in more permanent structures, or that can be relocated from temporary sites to permanent locations. They recognise that the affected population often start post-disaster shelter themselves, and that this resourcefulness and self-management should be supported (IFRC, 2013)

### **3.3.3 Core housing:**

It can be defined as a small house built with strong cyclone-resistant materials to which the homeowner can make additions suited to personal needs such as storage spaces, verandas and extra rooms. This progressive approach to shelter provision ensures that it acts as a step toward strong, cyclone and flood-resistant housing that would reduce a household's vulnerability to future storms. (GFDRR, 2014)

## **3.4 Post-disaster reconstruction and commonly used approaches**

Post-disaster housing reconstruction can be undertaken through different approaches, which vary principally in terms of a household's degree of control over the reconstruction process.



As per World Bank guideline five reconstruction approaches may be pursued after a disaster. These approaches are not mutually exclusive and should be understood as fluid categories that are often found in combination. In addition to the construction of permanent houses, these approaches apply to projects of substantial repair and retrofitting and to transitional shelter.

**Cash Approach:** The cash approach (CA) is unconditional financial assistance is given without technical support. Usually more appropriate for repairing and retrofitting works (Barenstein, J D 2012)

**Owner-Driven Reconstruction:** ODR means a Conditional financial assistance accompanied by regulations and technical support aimed at ensuring that houses are built back better (Barenstein, J D 2012)

**Community-Driven Reconstruction:** Financial and/or material assistance is channeled through community organizations that are actively involved in decision making and in managing reconstruction.

**Agency-Driven Reconstruction in-Situ:** Refers to an approach in which a governmental or nongovernmental agency hires a construction company to replace damaged houses in their pre-disaster location.

**Agency-Driven Reconstruction in Relocated Site:** Refers to an approach in which a governmental or nongovernmental agency hires a construction company to build new houses in a new site. (Jha et al 2010 )

### **3.5 Reconstruction after cyclone Sidr**

Analysis of available GOB and development agency reports, journal articles and unpublished dissertations shows a dominance of Agency-driven in-situ approach in case full construction and cash approach (cash grant or donation of building material) in case repairs and partial reconstruction in post Sidr reconstruction. Relocation approach was considered in case of landless households a large percentage of who used to live in at risk land beyond sea walls or surge protection embankments. The ladder of citizens participation (Arnstein,S. 1969) can be referred here to give a brief

picture of participatory atmosphere. The available reports in various agency and GOB websites suggest a range of participation from manipulation to consultation at the most. Very rarely it reached at the level of partnership, let alone the level of delegated power or citizen control (Alam, 2010; Flinn & Beresford, 2009; GoB, 2008; Kabir, 2009).

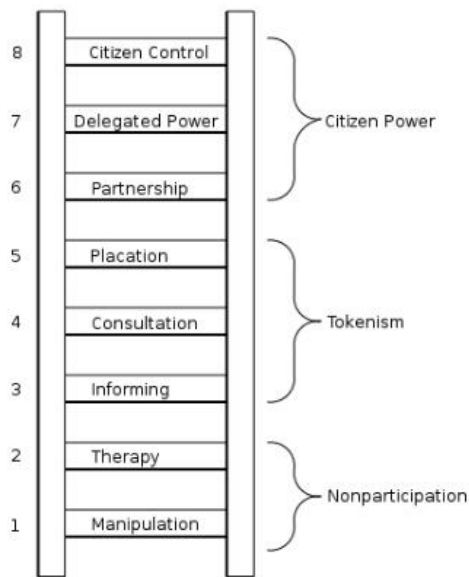


Fig1.2: Ladder of citizens participation (Arnstein, 1969)

On site realities discussed in various research works reveal a grim post occupancy scenario in various parts of Sidr affected Southern Bangladesh. Literature review affirms participatory exclusion, elite capture, nepotism, corruption (M Nadiruzzaman & Wrathall, 2015), poor construction quality, wrong selection of materials that increased vulnerability (Md. Nadiruzzaman & Paul, 2013), unsustainable and out of context intervention (Hakim, 2009) among several other shortcomings. Very few of the reconstruction projects went for studying local house forms and construction methods (Kabir, 2009) and a varied degree of user satisfaction for different approaches chosen by different agencies (Tithi, 2010). However, these studies rarely pointed out the prevailing local building culture and house forms or analyzed their strength and weaknesses or inquired into the reasons the agencies avoided utilizing any such existing local knowledge.

**Chapter Four**  
**Post-Sidr Reconstruction Scenario**

## **Chapter Four: Post-Sidr Reconstruction Scenario**

### **4.1 Introduction**

This section is primarily based on published and unpublished secondary materials on reconstruction after cyclone Sidr. Since an extensive reconstruction work involving the highest number of Government institutions, NGOs and INGOs, and donor agencies had to be involved in this rehabilitation process, there exists an abundance of damage and need assessment, project proposals, and evaluation reports on the topic in concern. However, most of the documents studied were limited to specific timeframe, particular project by a particular agency, or focus area not directly relevant to housing. It required synthesis of the materials to present an overall scenario in this section. Some of the academic unpublished research works presented area specific case studies and evaluative analysis. A comprehensive report on the works of members of Shelter Cluster(Kabir, 2009)and the overall reconstruction process and product was a useful backdrop in drawing the post-Sidr picture. Moreover, to establish a benchmark for comparative analysis in chapter 6, a literature, field study, and key informant interview based description on housing tradition of the Southern Bangladesh precedes the post-Sidr overview in the following sub-section.

### **4.2 Housing tradition of the Sidr Affected Southern Bangladesh**

The settlement pattern in Southern Bangladesh except for the hilly terrains of Chittagong division is mostly dispersed around the cultivation lands. This will be further analyzed in chapter six using satellite images. The common house forms, their combinations and used materials are briefly discussed here.

#### **4.2.1 Bamboo and thatched house**

Homestead with mud plinth, bamboo structure with bamboo mat as wall, and thatch roofing is a common house form through Bangladesh. Southern region is no exception. However, subtle local variants are present in the form of golpata roofing, higher mud plinth and combination of CI sheets and bamboo mat in Khulna and Bagerhat zilla. Ultra poor households usually have to rely on used CI sheets and whatever materials they can acquire from surrounding natural setting, especially from Sundarbans.

#### 4.2.2 houses of ultra-poor and land-less households with used and mixed materials

This is also a common scenario. Landless population builds temporary houses with whatever materials they can gather from surrounding natural resources and used and salvaged materials in various combination. Although these houses cannot be considered an established house form, they possess valuable knowledge regarding culture, life-style, building practices and social values. These houses can easily be identified as the most vulnerable to disasters as well and post Sidr reports (GoB, 2008; Kabir, 2009) and field survey by the author has also identified these type of houses as among the mostly damaged or fully destroyed ones.



Fig 4.1 Thatched roof mud house in khulana with raised mud



plinth and bamboo structure. Source: (trip-suggest.com)

Fig 4.2: Used and salvaged materials in an ultra-poor household  
With a thatched kitchen at the study area. Source: author



Fig 4.3: Thatch roof kitchen with bamboo posts and wooden walls in the study area. Source: author

#### **4.2.2 Wooden house**

The most formal and elaborate house form found in this region is the wooden frame houses with CI sheet roofs. Walls are usually of CI sheet, wood, or a combination of both having decorative use of color and wooden details. Household survey and FDG will show a strong indication that families in the study area aspires to own a house like this (see chapter 5). It holds a symbolic meaning, a sense of belonging and identity for them. These houses. These houses can be of single or two storied (with internal ladder). A central two story structure is surround by single story verandah or rooms in one, two, three, or all four sides. This enveloping rooms are called ‘paschati’ that provides additional protection for the house against cyclonic wind or storm surge. The second story can be used as a place of refuge during cyclone or storm surge. It can also store valuable belongings away from the water. Household interviews also revealed a number of such houses unharmed by Sidr and these saved not only the lives of the family members but also that of some close relatives and neighbors along with lifeline supplies and valuables. Such houses have remained a symbol of pride and stability in the coastal villages. Ample examples of personalization in the form of paint and decorations are also found in these houses.



Fig 4.4a: A two storied wooden house in In Kuakata with Dutch gable Roof (chouchala) over main structure and ekchala over pashchati. Source: [www.flickr.com](http://www.flickr.com), uploaded by sekitar



Fig 4.4b: This house, built by the current owner's father 30 years ago, survived Sidr's wrath withstanding partial damage. twelvefamily members of Hares Mollah and 10 from two neighboring houses took refuge in the upper level and survived wind and surge unharmed. He is now planning new house on the occasion of his elder son's wedding. It will be another two story wooden house of the same style with improved look



Fig 4.5: An owner built two storied house in the study area constructed after Sidrshowing fulladherence to tradition and local knowledge. Source: Author, pilot study, September 2015. The house used a jerkinhead hipped roof locally called 'takdeaghar' with enclosed pashchati in front and back. Source: Author



Fig 4.6: Decorations and details. Source: Author





Fig 4.7: Another example in the study area showing space use and the cultural setting. Both these houses survived the impact of Sidr saving lives of family member in the upper level. Source: Author



Fig 4.8: A Muslim Aid built house in the featured cultural setting. Source: Author



Fig 4.9: A rural house with paschati in Cox's Bazar. Source: BashirulHaq 1999

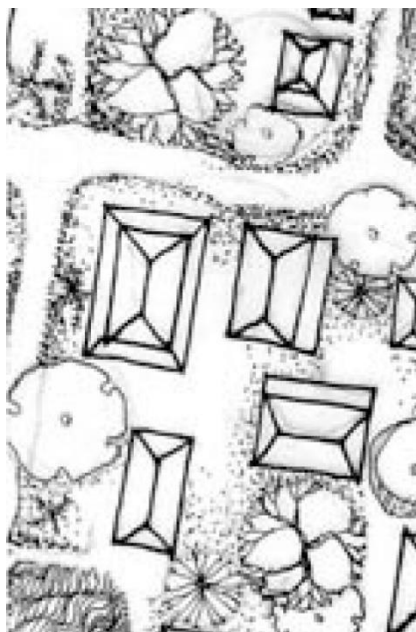


Fig 4.10a: Settlement houses having paschati particularly facing the direction of the cyclonic wind. This is a testament of use of local knowledge by the community. Source: Bashirul Haq 1999

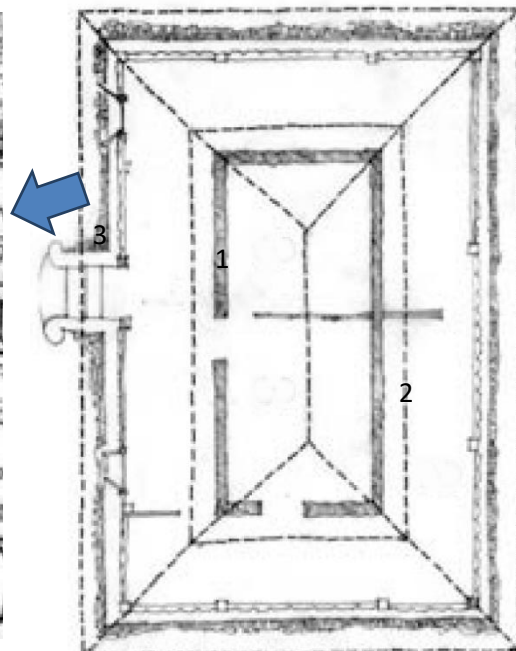


Fig 4.10b: Plan, showing paschati in all sides with guest facilities (3) in the front and cooking in the rear (2) with sleeping areas in the middle rooms (1) Source: BashirulHaq 1999



Fig 4.11a: A courtyard surrounded by traditional houses.  
b: A two storeid house with 'tak dea chauchal', c: a typical village settle in Barishal.  
Source: Author

The above collection of images shows the extent of use of this house form in Khulna and Barishal division. Architect BashirulHaq (1999) documented the presence of

paschati (both enclosed and semi-open) being used as living and cooking space in as far as Cox's Bazar region. The book also show use of local knowledge of climate by the people to orient 'pashchati' in the direction of cyclonic wind (see fig 4.4, 4.5, 4.6, 4.7). All these examples have the potential to prove the extensive existence of this wooden house form in Khulna and Barishal division, both of which are the most affected divisions in cyclone sidr. Fig 4.9 shows its popularity as far as Cox's Bazar. Some these examples survived the impact of Sidr saving valuable life and livelihood. It can be argued here that in spite of reducing availability of quality wood and increasing cost could not keep this distressed community from nurturing and pursuing their aspiration of live as their forefathers did. Even the advent of new technology did not sweep the tradition out, rather it began to evolve naturally as seen in the brick house of 4.11a. However, further evidence on this issue will be discussed in chapter five and six.

### **4.3 Process of reconstruction**

This section will briefly describe the overall post Sidr housing program explaining the process followed and the end product reached in the affected region.

#### **4.3.1 Strategic plan**

Government of Bangladesh proposed two possible ways of assistance, by building core shelters or by building demonstration model houses while supporting a higher percentage of self-recovery. The Shelter Cluster, after brainstorming with all the member agencies agreed to go for core shelters or as per some agencies 'transitional shelter'. There was a confusion of these use of terminologies from the beginning. The GoB could not put forward a bold policy and many agencies continued their previous tradition of delivering shelter as relief product rather than a people centric place building. GoB (2007) proposed the following ten guiding principles for reconstruction.

- Employ a disaster-resilient construction practice to reduce multiple risks and impact. Make a core unit that is disaster resilient and amenable to further extensions;
- Empower homeowners to enable them to develop their own housing recovery strategy;
- Focus on the most affected and vulnerable groups of people to ensure non-discrimination.
- Ensure efficient coordination for equity in distribution of housing support.

- To achieve speedy and efficient construction, invest in improvement of local technology, utilize local materials and engage local entrepreneurs.
- Coordinate planning among various departments such as water, health, cyclone shelter, livelihood and community infrastructure for a synergistic impact.
- Promote and practice transparency and accountability, with an added emphasis on telling people about their rights, sharing information about the timetable for construction, source of funds, and engage the community in monitoring and evaluation.
- Work toward decentralization in planning, implementation, monitoring and technical assistance, bringing the entire process as close as possible to the affected people.
- Bring a gender perspective to planning, implementation, monitoring and technical assistance.
- Have an integrated strategy to support landless people as well as people living beyond the embankment through the GoB's commitment to providing khash land.

#### **4.3.2 Program objective**

Affected community was divided into land-less and land-owners and policies were formulated to make the reconstruction process inclusive. For selection of beneficiary, GoB relied on local government institutions. NGOs used their own sequence of delegation having formulated their objective synthesizing GoB directives and donor requirements. In order to provide speedy response, GoB opted for pre-existing barrack style row housing for Land-less and resilient core shelters for land-owners. Due to obligation from donors, NGOs rarely could be involved in rehabilitating the land-less households. Their main objective was to utilize donor fund through speedy provision of core/ transitional shelters on location of the damaged houses.

### 4.3.3 Coordination

Such a massive reconstruction work needed efficient coordination. GoB assigned local governments for coordinating project process and product funded through public channel. On the other hand, Shelter Cluster or Shelter Working Group was formed with representative members from GoB, NGOs, INGOs, and Donor agencies to coordinated private sector activities. “from 2008, in overall terms the monitoring of field performances of shelter strategy was handled by the Shelter Working Group (SWG), under the aegis of the GoB”(GFDRR, 2014).The following diagram will give and overall

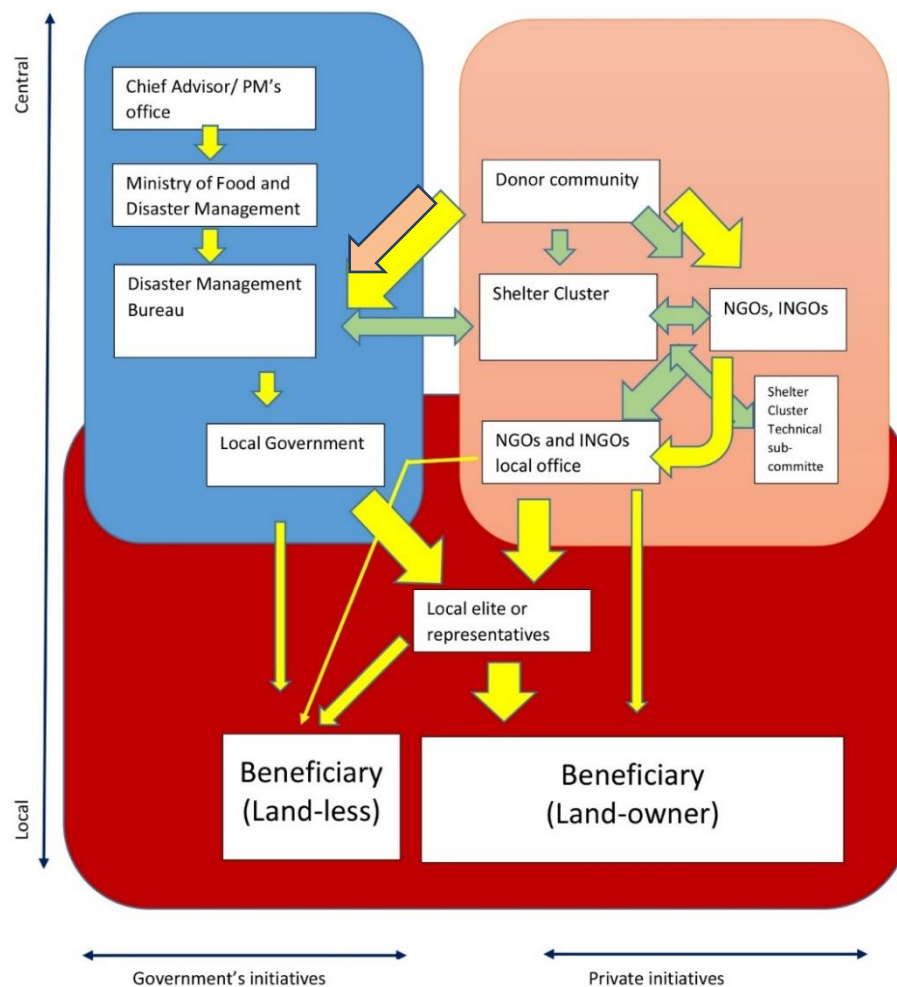


Fig. 14.12: A diagram showing reconstruction process. Yellow arrow is flow of fund, green is influence and advice. The width of the arrows represents proportion of flow.

#### **4.3.4 Implementation**

Majority of the NGOs response was similar the typical Donor/contractor driven approach they usually follow. Very few agencies gave effort to partner with Government institutions and donors to work for the landless. Local government coordinated the NGO activities to avoid overlapping of work. Local elites (elected representatives or not) played an important role in selection of beneficiaries. Dissatisfaction was expressed by a number of households about Nepotism, elite capture and corruption. Some promises were severely delayed, aggravating the sufferings (i.e. fund for 1600 houses by Government of India). Lack of coordination of local team with shelter cluster resulted in variations from agreed upon minimum standards. Approach was fundamentally top-down, level of participation of the beneficiaries were from negligible to minimum as was revealed from both literatures and

#### **4.4 Minimum standard set by Shelter Cluster**

Shelter Cluster, with the help of Shelter technical working group facilitated to establish a minimum standard for core shelter construction, which was then endorsed by GoB. This was acknowledged by a number of NGOs as the main guideline for designing their reconstruction prototype. Many NOGs found this as a useful reference for designing their prototype shelter (Kabir, 2009). The different aspects of the proposed core shelter are summarized below as found in Shelter Cluster's report (Kabir, 2009).

##### **4.4.1 House size**

Considering scarcity of available land, resource constraints or other limitations the minimum house size was set to be 10ft x 10ft (100 sft). However, 10ft x 20ft was suggested as preferable.

##### **4.4.2 Roof**

Sloping roof made of CSI sheet (.35mm minimum thickness) with seasoned and treated hard wood rafters and purlins or steel frame coated with metallic anti-corrosive paint. All CI sheets were to be tied firmly with superstructure by galvanized iron by J-bolts and /or by any other recommended device. Minimum ceiling height was to be 8 feet.

### **4.4.3 Structure**

Structural analysis was done by experts considering cyclonic wind load in earthquake zone one. Availability or ease of transport, and cost efficiency was a prime consideration here. The different structural options as follows.

#### **4.4.3.1 Wooden structure**

All wooden structural joineries were to have adequate double-pinned lap joints. All frames were to have horizontal or diagonal bracings as appropriate. Lap joints were to be without reduction of timber sections.

#### **4.4.3.2 Pre-cast concrete structure**

Pre cast reinforced concrete pillars were to be cured for at least 14 days before transportation. The specifications for the RCC pillars were given in details with minimum concrete strength of 3000psi.

### **4.4.4 Envelop**

Materials for wall was an open choice, ranging from brick, CI sheet, wood to bamboo mat. No suggestion was present regarding elevation details or opening provisions.

### **4.4.5 plinth and foundation**

Foundation depth were suggested to be 1ft 6 inches from Finished Ground Level. Earthen plinth with five inches brick outer wall was preferred as a suitable plinth. Minimum height was specified as 2 feet. Soil for plinth was to be stabilized using 5 percent cement.

## **4.5 The reconstructed built environment**

No plan, however honest the objectives and intentions are, work as expected especially in context like Bangladesh. Lack of coordination has been recognized as a key issue in all the previous response and rehabilitation scenario. The overwhelming task of unprecedented complexity in the post-Sidr context took the situation out of hand in many occasions. Shelter Cluster could not ensure their set standards in many of the member agencies work, let alone works done by non-member agencies or other private initiatives. Corruption and bureaucracy, especially in government sector diminished the quality of response and fund management by local government. However, there existed a basic strategy of reconstruction that was followed by a



number of major agencies. It is briefly discussed below followed by a comparison with the minimum standard and user feedback.

#### **4.5.1 Selection of site**

In case of both public and NGO assistance, most of the shelters were constructed in the location of the destroyed house. Land-ownership or secure tenure was a precondition for most NGOs. Local government was the major actor in providing some assistance to landless families, for whom khas or fallow land was donated. On rare occasions, private philanthropist or donors purchased land to provide housing for landless families, some of the result of which will be further discussed in chapter six.

#### **4.5.2 Shelter options**

Shelter providers were often unclear of the following issues and therefore produced various types and qualities of the houses. The dilemma was between transitional and core housing, temporary and permanent housing. The minimum standard was unsuitable for a lot of families and they preferred larger footprint, especially when they needed to invest a portion of their own fund. Some agencies opted for more permanent solution adding verandah to the basic core (i.e. Muslim Aid and BRAC). Some of the designs are presented here.

#### **4.5.3 Construction materials and methods**

Quality materials in large quantity was one of the biggest challenge. Improving on the local construction techniques and training of local builders was considered rarely. Sustainable availability of the materials used remain another key issues even in successful examples. Using pre-cast concrete columns and steel rafter and purlin was recognized by many agencies as a more durable and convenient approach as they could be mass produced and supplied rapidly. Local market could not ensure steady supply of quality materials. To resolve this, some of the larger agencies manufactured and supervised their own supply and at times far away from site. This is can be considered as a lost opportunity of capacity building of local construction industry.

#### **4.5.4 Adherence to Shelter Cluster guidelines**

Minimum house size proved to be too small for a large number of beneficiaries. Studies show that most of the agencies/NGOs adhered to minimum or provided a larger solution. Angle of the roof inclination is a critical issue of wind resistance which was unspecified in the standards. As a result, there was variations and some houses exceeded acceptable limit. Use of thicker CI sheet was maintained by NGOs. Lack of practical and photographic guidelines regarding joineries and details in the standards resulted in some weak joineries and

inappropriate details in cases. Existing plinth height of a number of traditional houses were found be much higher than SC minimum standard of two feet. Moreover, some of the agencies failed to maintain even the prescribed plinth height, while some others constructed on the existing plinth without boulder brick work or earth stabilization with cement. Use of thinner CI sheet than standard was another alarming issue that can potentially increase the risk in future cyclones.

#### **4.5.5 User feedback**

Reports prepared by NGOs usually present their own success story with high rate of user satisfaction along with minor issues to be used as lessons learned. Household surveys, when conducted ensuring trust and neutrality, can reveal a story closer to the reality. Criticism and lack of satisfaction are found in a few unpublished works in the study area (Md. Nadiruzzaman, 2012; Tithi, 2010) especially regarding participation, poor quality of construction and poor environmental performance (M Nadiruzzaman & Wrathall, 2015). Rumana (2009), in her report also acknowledges the lower level of participation throughout the process. A similar reality was found in the household, focus group discussion and key informant interviews of this research (see chapter six). Moreover, a large number of victims did not receive any assistance due to power dynamics, lack of social connection, landlessness or lack of fund for beneficiary participation. User interventions and change in the recent year, as will be elaborated in following chapters is also an indication of nonconformity with local culture and aspirations.

#### **4.6 Some success stories amidst apparent chaos**

The above section gives a picture not new to the post-disaster response scenario of a developing country with limited means. Post-Sidr scenario was unprecedented with 1.5 million housing loss. Shortcomings, failure of meeting deadlines, and a coordination nightmare is expected and understandable. It should also be recognized that “for the first time ever, housing was taken up on a systematic basis as a component of the recovery programme, as opposed to repair and reconstruction of individual houses supported on a random basis” (GFDRR, 2014). Amidst this reality, a few examples of successful projects can be identified, which went beyond minimum standards incorporating local knowledge and experts’ innovations. Although not without rooms of improvements, projects like this will remain a source of knowledge and inspirations for future disaster recoveries. Some of these projects were conceived after cyclone Aila in 2009, although a lot of input came from failures and lessons learn from post-Sidr recovery process.

#### 4.6.1 IFRC core shelter promoted through SC

This was the basic design intention of Shelter Working Group while proposing core shelter as a design option and the minimum standard for it.



Fig. 14.13: Core shelter with additional height for mezzanine



Fig 14.14 a and b: User adaptation resulted in a house for very close to tradition.

These core shelters were designed based on basic pashchati house forms found in the locality. The core itself was high enough to incorporate a matcha by households. Later additions to the core structure would result in a house form very much closer to the traditional wooden house form of the region discussed earlier in this chapter.

#### 4.6.2 Disaster resilient housing in Shyamnagar, Satkhira

This In-situ reconstruction project was jointly funded by UNDP and BRAC to reconstruct a small settlement (around thirty households) in syamnagar, a heavily affected upazilla of Satkhira district after cyclone Aila. The reason to include here is the to demonstrate an encouraging outcome with limited means only by following an extensive participatory process and by allowing local wisdom and aspirations to guide the design outcome.



Fig 4.13: a and b shows the dream house models built the the affected people in their locality assisted by a team of professional from BRAC University. Source: Khondaker Hasibul Kabir



Fig 4.14: another participatory workshop attended by the affected people and local building professionals arranged at BRAC University. Khondaker Hasibul Kabir

The project followed an elaborate process of participatory fact findings through detailed surveys and participatory workshops. Study of local wisdom, building tradition and aspirations of the beneficiaries were identified before going into design solutions. As per K. H. Kabir, one of the key professionals of this project, even after arriving at a concrete design decision ample scope for user adaptation and modification was retained to ensure cultural responsiveness. A key decision was to build a two story structure with open and flexible ground level to allow surge water to run freely without disrupting life and valuables in the upper living floor. This in turn reflects the local knowledge of traditional wooden house presented in the previous section. All the materials selected including the roof tiles were easily available and constructed in the locality. Extensive guidance of landscaping was given to bring the sense of place of the original village ensuring resilience from future cyclones. The post occupancy feedback was highly satisfactory and the plantation, landscaping and addition to the core structure by the house owners has dramatically increased the level of harmonization with the local culture and environmental settings.



Fig 4.15: Two pictures in the left shows the settlement after completion. The elevations on the right indicates future possible adaptation by the owners, some of which are already seen in the bottom left picture where a later addition of an open paschat is visible around the resilient core structure.

#### 4.6.3 CDMP and UNDP initiative at Sutarkhali village, Sutarkhali, Khulna

UNDP's Comprehensive Disaster Management Program (CDMP) to the initiative to rehabilitate cyclone Aila displaced families from Bainpara village to a newly developed housing at Sutarkhali village in Khulna. The settlement along with the housing units was designed by House Building Research Institute (HBRI) using their own innovations and technologies. The 10'x15' units had concrete structure and Ferro cement roofing and were designed to withstand 260 kmph wind and a following tidal surge. Structures were also made salinity resistant. Although use of new technologies unavailable in the locality arose some criticism, the initiative, due to its sensitive layout and attention to livelihood and place use gained much appreciation. This project has been heavily publicized by government entities as a model for build back better.



Fig. 4.16 Post-Aila resilient housing in relocated site at Sutarkhali village, Khulna



Fig 4.17: The resilient houses incorporated rainwater harvesting and solar panel  
Source: [www.bdnews24.com](http://www.bdnews24.com)

## 4.7 From regional perspective to case studies

This chapter discussed the overall scenario focusing on process and product of post-Sidr housing reconstruction and set a backdrop to be used in analysis and synthesis of the survey findings in the subsequent chapters. The good practices and success stories will also help us ascertain how tolerable should we be and how much should we dream of in our reality.

**Chapter Five**  
**Case Studies**

## Chapter Five: Case studies

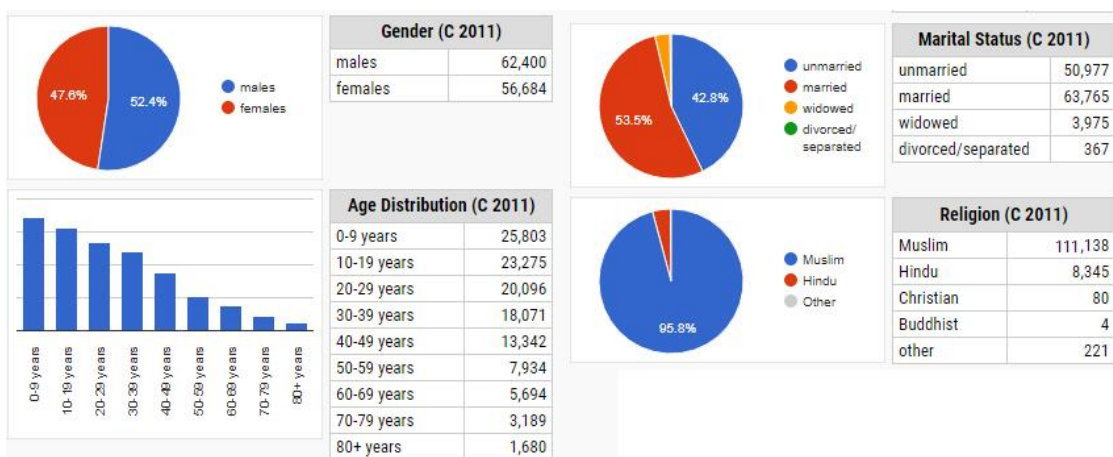
### 5.1 The study area

Sharankhola Upazilla is situated in the Southern fringe of Bangladesh adjacent to the Sundarbans. It is one of the nine upazillas of Bagerhat district and one the remotest. It takes a two and half to three-hour journey from Bagerhat Sadar town by road, combining bus, bikes, and using a ferry. Road network was found to be in dilapidated condition during first and second visit in 2015 and a repair work was (see fig 5.1)



Fig 5.1a: dilapidated road condition, b: ferry crossing

Done just before author's third visit in 2016. The upazilla covers 756.61sqkm area with a population of 1,40,00 during study period (as per 2011 census data adding .42% growth rate) and a density of 157.42/sqkm. The following diagrams summarizes the demographic features of the upazilla.





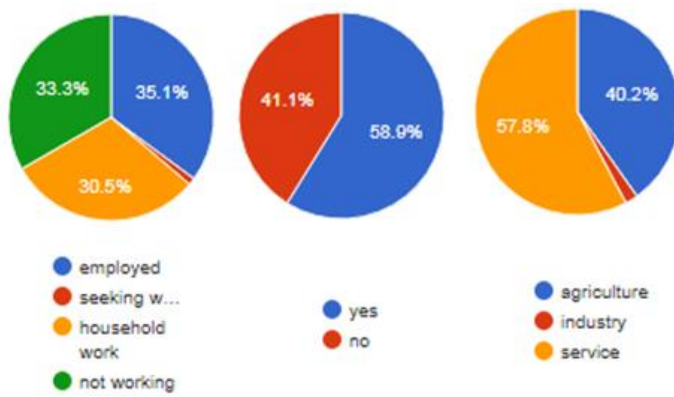


Fig5.2: Demographic data of Sharankhola, based on 2011 census (source: [www.citypopulation.info](http://www.citypopulation.info))



Fig 5.4: Location (source: Google Map)

### 5.1.1 Socio-cultural context

Historically the study area was a part of the Sundarbans and as a result the area is rich in tree species. Every household is surrounded by thick vegetation (see fig 5.1). The economy is predominantly agricultural. Local and High Yielding variety of paddy, wheat, jute, vegetables, spices, pulses, oilseeds, and sugarcane are the main crops. Besides crops, livestock and fishery are main source of household income. Due to the proximity of the Sundarbans, a large percentage of households depend collecting and trading resources collected from the forest. Proximity to sea enabled a large community to be engaged in deep sea fishing as



Fig 5.5: Thick vegetation and heavy rainfall. Photograph taken by author during pilot study in 2015

well. People here are friendly and open to outsiders. They have strong social networks and being a remote area, impact of urbanization is almost non-existent. “Most of the touch of urban culture found during the studies are the impact of post-Sidr response and rehabilitation activities” asserted by Tuhin Jomadder, one of the key Informant of the study. Migration to urban areas is a common story here. As per Tuhin Jomadder, post-Sidr rehabilitation activities and information inflow has encouraged rural-urban and rural-abroad migration in the region.

### 5.1.2 Settlement pattern

A central road linked all four unions of Sharankhola Upazila to national highways up to the Sundarbans range. The embankment at the bank of Baleswar river acts as a peripheral road for Southkhali village. The settlement pattern of the villages of Raynda union can be divided in two types as per Hasan's (1985) rural settle typology; household close to main road and near bazar areas are 'highly dense clusters on artificially built mounds' and households in other areas are 'scattered and built on artificially raised lands'. In Southkhali union, most household followed the latter typology. Scattered settlements on raised or unraised mound were present before Sidr beyond areas protected by the Baleshwari river embankment, mostly built by landless population. Most of those houses were washed away and resulting a large portion of the casualties due to Sidr.



Fig 5.6: Settlement pattern and selected villages for case study(Google Map)

### 5.1.3 Local house forms and use of materials

The predominant local house form, found in field study, is in alignment with the regional tradition presented in the previous chapter. Mud wall with golpata roof, bamboo frame, bamboo mat or CI sheet wall with golpata/thatch roof are two types mostly used by landless population. For middle income to elite land owners, wooden house is the first choice. However, a number of wooden houses are found to be accompanied by temporary structures of bamboo frame and golpata or CI sheet roofs, which are used as kitchen, store, cow-shed or toilet. A small portion of pre-Sidr houses were brick built with CI sheet roofing. Flat roofed brick or R.C.C building were rare inside residential clusters. Observation, Household survey and KII indicated the gradual economic progress of a household is reflected in the upgradation of the house form and materials from temporary and low-cost to more permanent in nature, retaining the basic planning and form.

The household survey and FDG both showed strong aspiration of the people to own a decorated wooden house and a number of respondent recognized it as a symbol of prestige. Few respondent, especially from youth segment, seemed inclined to urban style flat roofed buildings. However, field observation has identified multiple existence of two storied R.C.C structure with CI roofing following the evolutionary



Fig 5.7: R.C.C construction following wooden precedence. (pilot study, 2015)

Path of the wooden houseform (see fig 5.7, 5.8 and 5.9). This residences of elite families proves the significance of the house form as a symbol of prestige and social aspiration.



Fig 5.8: a (kadamtala), b (Uttar Southkhali) and c (Chalrainda) shows extensive use the traditional house form in all the selected villages of the study area. Source: Author



Fig 5.9: A political elite's residence, showing cultural appropriateness

#### 5.1.4 Impact of Sidr and the aftermath

As per Gob report (2008b) and fig 5.10 Bagerhat suffered the most in terms of fully damaged housing (118,899 houses, 22%), followed by Barguna (95,412), Jhalakathi (69685), Pirojpur (63,896) and Patuakhali (53,291). The MoFDM official report shows that total 537,775 houses are fully damaged and 854,344 houses are partially damaged in worst affected and badly affected 12 districts (Figure 5.10). Out of 12 districts' fully damaged houses 22% occurred in Bagerhatdistrict, making it one of two most affected zillas by Sidr and Sharankhola is its most affect Upazilla. Among Sharankhola's four unions, Southkhali is the most affected followed by rayenda union. Due the lack of economic capacity of theses economically underdeveloped and marginalized areas, immediate external intervention was necessary. As a result,

Sharankhola, became a major center of reconstruction interventions. This put the cultural landscape and heritage of the villages at terrible risk.

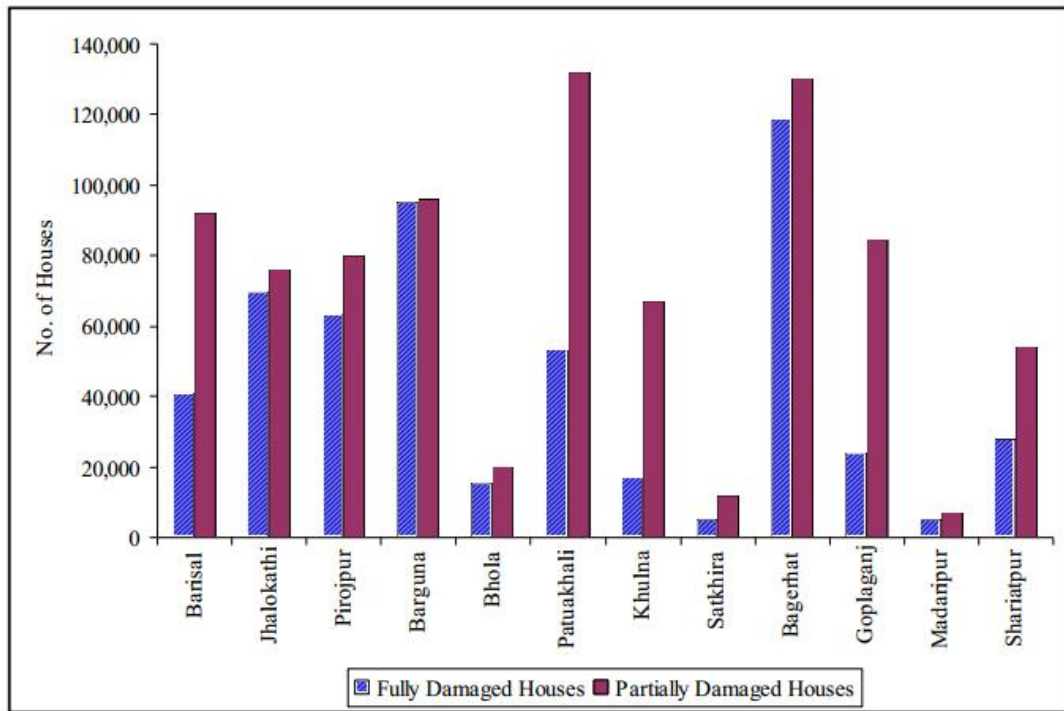


Fig. 5.10: Worse housing damage by district (GoB, 2008)

## 5.2 Pilot study and selection of cases

The pilot study was done in September, 2015 to as a reconnaissance survey to decide on selection of study area, the villages and the household clusters in the villages to be precise. Bike driver Md. Al-amin of Gulbunia village acted as a guide and key informant. BRAC's local personnel Ms. Nazma Begum (during the time of reconstruction activities) and Muslim Aid's local staffs were also sources of valuable information. Initially interviews with these people helped in the short listing of two unions from four, Rayenda and Southkhali based on intensity of Sidr impact and subsequent response and intervention. A day long bike trip with Al-amin enabled the author in finalizing the villages and household clusters as the focus of survey. Proximity to the author's guest house in rayenda bazar, familiarity of the guide with the households and ease of communication from main road was major considerations.

The selected villages are Uttar Kadamtala (ward no 6) and Chalrainda (ward no 8) of Rayenda union and Uttar Southkhali (ward no 5) of Southkhali union.

### 5.3 The survey

Following the pilot study, the survey was conducted in two phases. Phase 1 was a two-day study of Kadamtala village in November, 2015. Phase 2 was conducted taking three days in May, 2016 covering households of Chalrainda and Uttar Southkhali villages. Eight households were selected from each villages using the following diagram to ensure equitable representation of data from the two types of settlement and the two types of reconstruction approach used as shown in the following diagram.

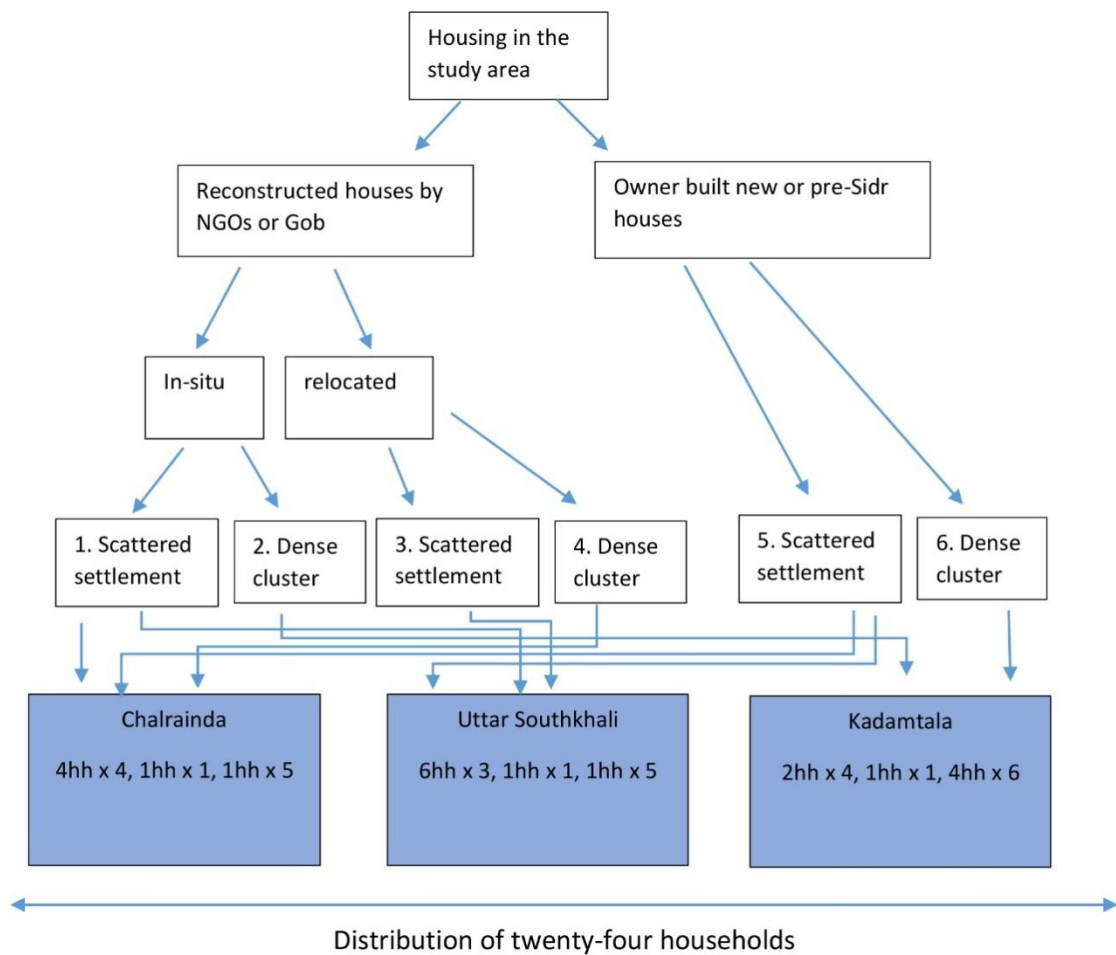


Fig. 5.11: Household selection process



### 5.3.1 Observation

Observation and photography was done by the author during pilot study and the two survey phases. Photographic evidences have been already presented in previous sections. Amidst such an extensive external intervention, the study area was found to be quiet profound in some areas. The village specific observational findings are presented below.

#### 5.3.1.1 Chalrainda village

It is the Southernmost village of Rayenda union ending with Tafalbarikhal and bordering with Southkhali union in the South. Some relocated projects are found here like Destini's Asrayan and Muslim Aid's 'Shahjalal Village' were among few, both of which are dense settlements. However, Pre-sider settlements were found to be scattered with the absence of dense clusters.



Fig. 5.12: relocated projects in Chalrainda village

### 5.3.1.2 Uttar Southkhali village

Pre-Sidr state of Uttar Southkhali was similar to Chalrainda, even more scattered at places except for few households near Tafalbari bazar. This village is bounded by the embankment of Baleshwari river, beyond which a major destruction was caused by Sidr. As a result, a number of families chose to relocate along the embankment purchasing small lands from their relatives and friends. Most of the houses here were provided by GoB with fund from Saudi Arabia. Some funds from personal channel were also utilized here. The image from Google Earth shows this intervention in the landscape as a linear development unaligned with pre-Sidr settlement fabric. However, the single room core houses did not result in a dense cluster, while easy accessibility from embankment created an urban like setting.



Fig 5.13: Study area in Uttar Southkhali village

### 5.3.1.3 Kadamtala village

Kamatala village in Rayenda union is situated around a nodal point of the main axial road towards Southkhali. The housing clusters here are dense and most of the destroyed houses were reconstructed in the previous location and at times using the original plinth. A significant percentage of Intervention was done by BRAC and Muslim Aid in the selected neighborhood of Kadamtala. A large portion of the pre-Sidr wooden houses also survived and are coexisting with variety of shelters built by different NGOs. A large number of decorated, two storied wooden house are found here, some recent and some withstood the impact of Sidr unharmed. Observation indicates an eclectic landscape, not so suitable for user modification due to lack of available space around.



Fig. 5.14a and b: traditional and NGO built house coexisting



Fig. 5.15a and b: lack of space restricted owners from modification. So eclecticism prevails

Use of varying plinth height by the agencies, all of which are lower than pre-Sidr practice of the settlement, along with lower height of the shelters unsuitable for mezzanine created a strange landscape (see figure 5.14 and 5.15). However, some clusters, with enough space for plantation seem to be reviving its settlement since all the shortcomings are being hidden within vegetation (see figure 5.14b and 5.15)

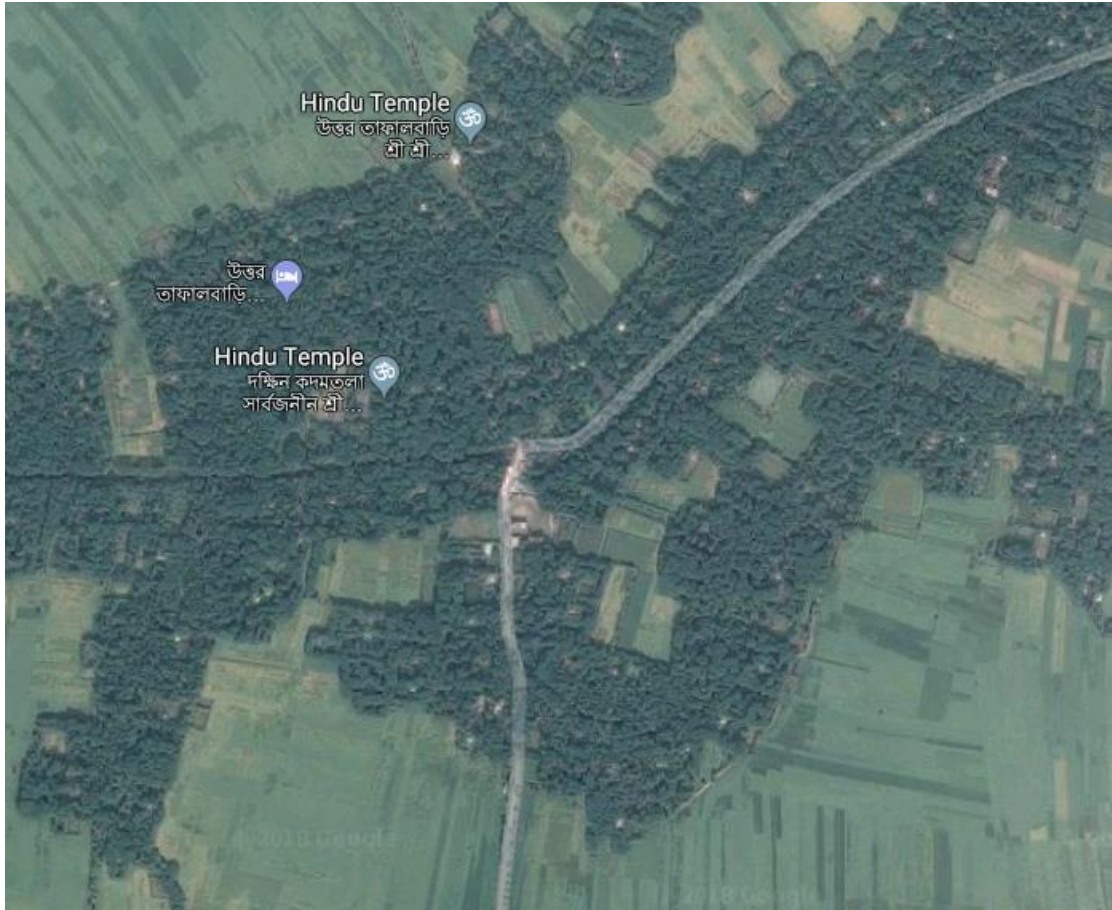


Fig. 5.15: dense cluster settlement with thick vegetation. (Source: Google Map)

### 5.3.2 Cluster mapping

Before beginning household survey in each cluster, an informal map was drawn using observation and opinion from members of community present. These maps are very useful tools to identify space relations and neighboring dynamics vital for rural homestead. Destiny Asrayan, since a combination of two identical five storied building, could be clearly understood from satellite image.

Cluster1,  
Kadamtala



Fig. 5.16. Layout of cluster1, Kadamtala village. 60% of the houses in this cluster have been replaced in-situ. Seven Muslim Aid built and one BRAC built core house is found here in combination with traditional single and two storied houses creating a hybrid sense of place.



Cluster 2,  
Shahjalal Village,  
Newcastle Para,  
Chalrainda

Fig. 5.17: Layout of Shahjalal Village, New Castle Para, Chalrainda, a Relocated settlement constructed by Muslim Aid and funded by Channel S. This urban style row house planning aroused a mixed feeling among the beneficiaries as found in the survey. Among 25 houses, seven were found locked and as per neighbors, the families started living elsewhere, while retaining the ownership of one house at Shahjalal Village as well

Cluster 3  
Uttar  
Southkhali  
village



Fig. 5.18: Relocated settlement in Uttar Southkhali village beside the embankment of Baleshwari river. These lands were purchased by the distressed families from their relatives and neighbors in a row housing like pattern resulting in a settlement somewhat alien to the existing landscape. The dig and build process was used to raise the land and bhita. Some fallow low land (unsuitable to be ponds) beside the embankment lay unused. Trenches also run along the sides restricting movement between neighbors typical in rural setting.

### 5.3.3 Space planning of agency reconstructed projects among surveyed households

#### 5.3.3.1 BRAC

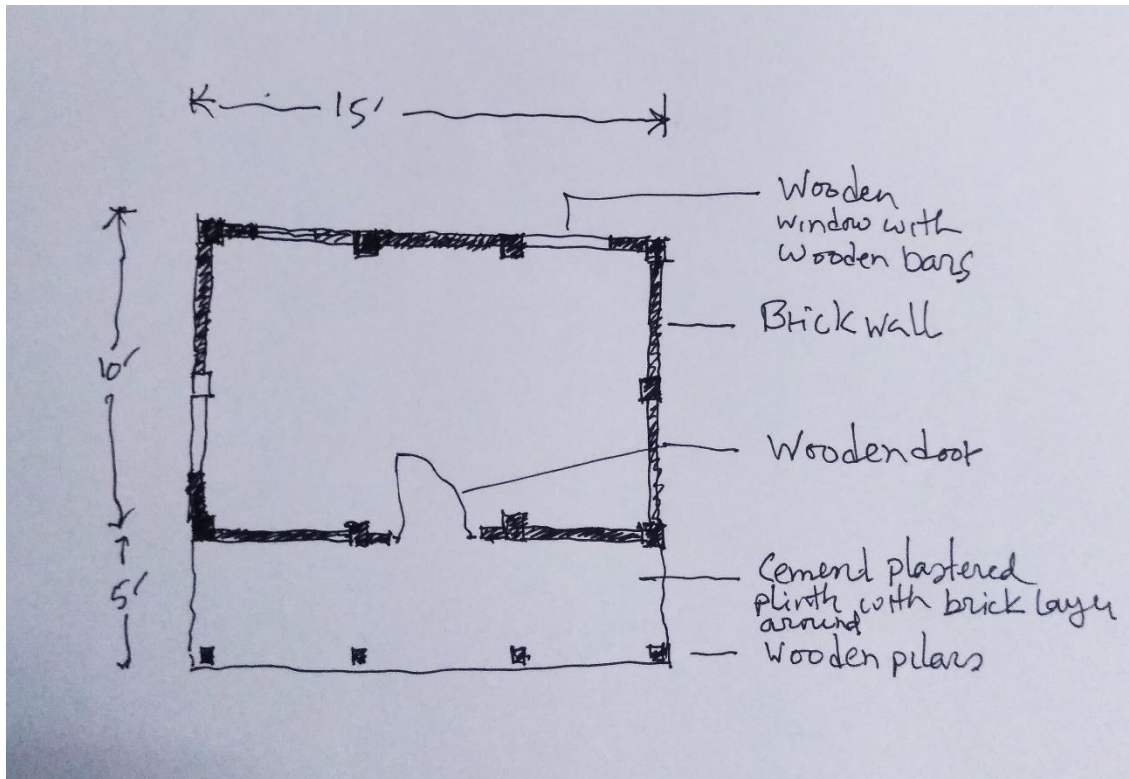


Fig. 5.19a, b and c: the plan and view of BRAC's prototype, 5.19c is showing the type of adaptation resulted in from the prototype.

BRAC built 1300 houses distributed in all four unions of Sharankhola. The Department of Architecture, BRAC University was involved in initial design and demonstration house building. Some of the This is a modified state of Shelter Cluster advocated core shelter prototype. Addition of verandah was appreciated by the beneficiaries, quality of construction found in the study area was also satisfactory.



However, the house form is still not aligned with tradition and user modification attempting to add paschati does not seem a good fit.

### 5.3.3.2 Muslim Aid

A similar modified core like the previous example with dochala roof. This permanent construction is well appreciated by users. It can permit adaptation when brick and R.C.C is used. However, use of traditional material seemed problematic and the users could not properly add to the core as seen during household studies. This single story brick shelters achieved a reasonable quality of construction. But nowhere in the study area, an example of adaptation was found that could harmonize with the cultural context.

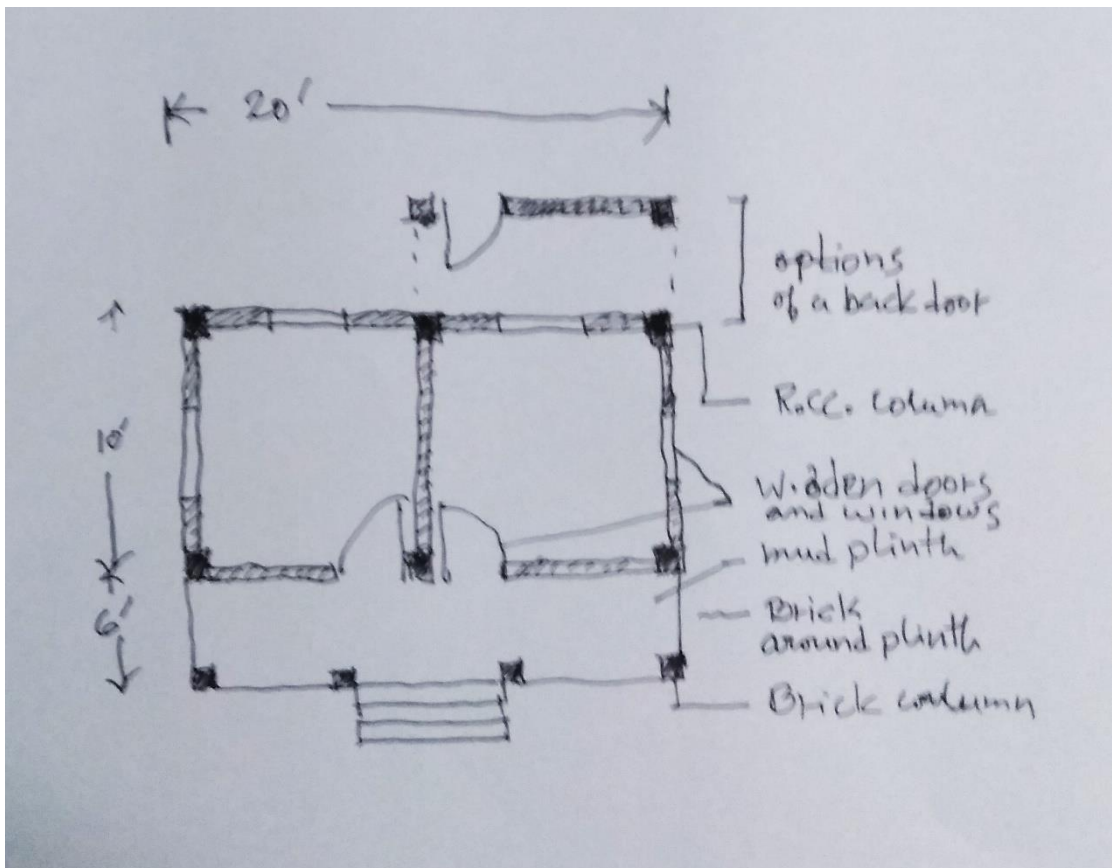


Fig. 5.20 a, b and c: Plan, original state and altered state of Muslim Aid shelters

### 5.3.3.3 GoB/ DSK

The worst user feedback was received from these CI sheet boxes delivered by Gob and Dsk funded by Government of Saudi Arabia. These shelters were much more inexpensive compared to the previous two. Users frequently complained about heat gain and discomfort. However, due to the neutrality of form and elevation, use of mud plinth and not providing a verandah resulted in some modifications that lead closest to the traditional house form.

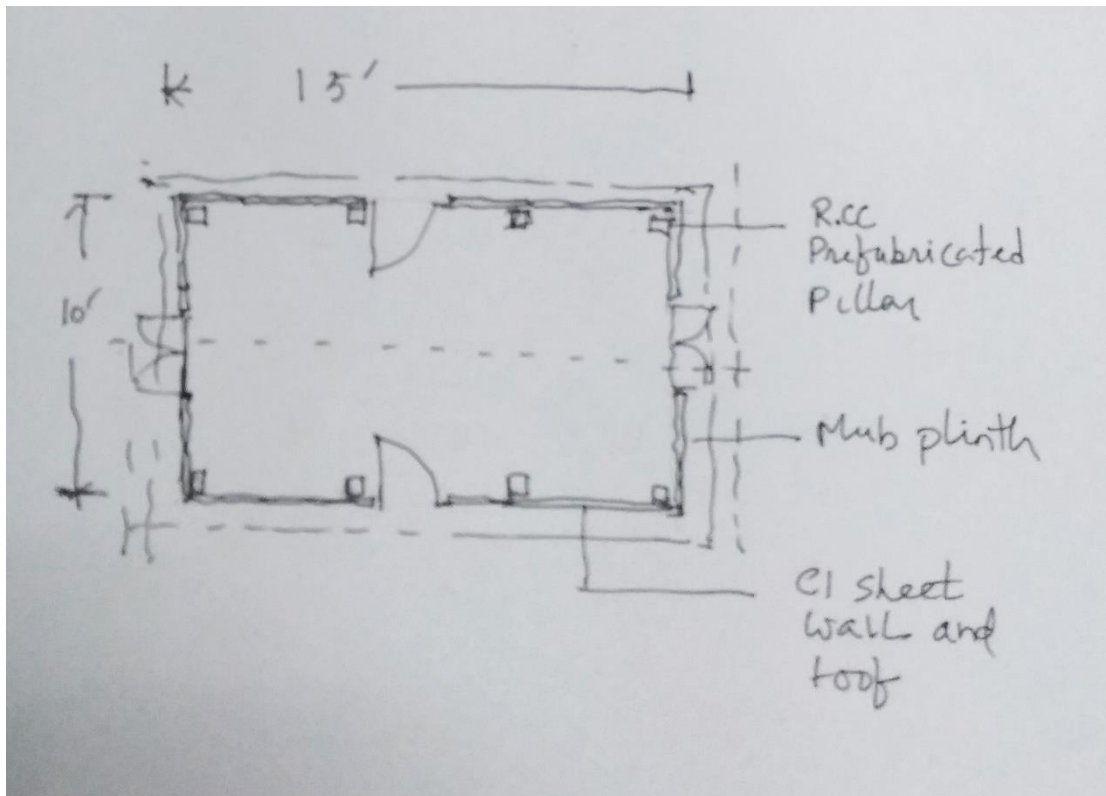
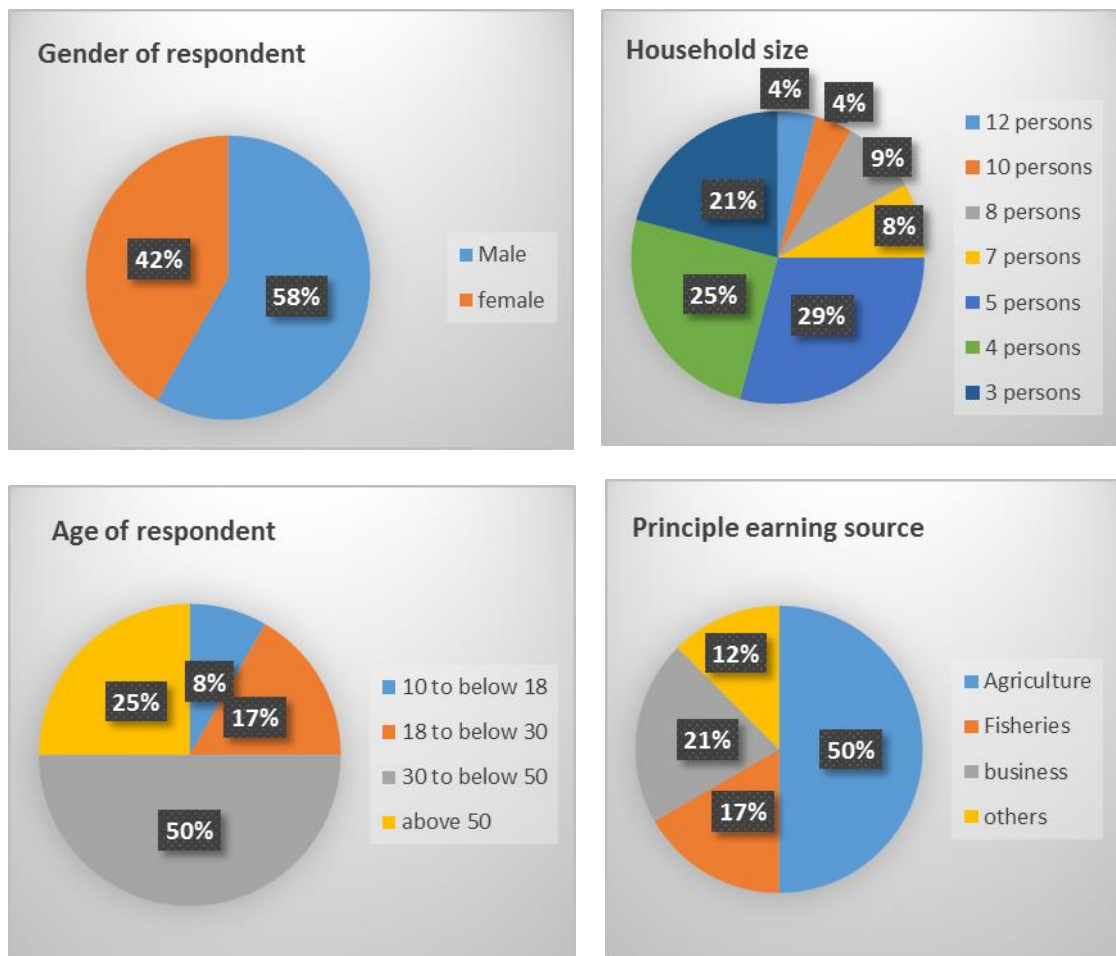


Fig. 5.21 a, b and c: showing plan, original shelter and a modified example of Gob provided shelter.

### 5.3.4 The household survey

the survey was conducted in two phases. Phase 1 was a two-day study of Kadamtala village in November, 2015. Phase 2 was conducted taking three days in May, 2016 covering households of Chalrainda and Uttar Southkhali villages. Twenty-four households, eight from each village was selected for interviews. Household head was the first choice for interview. In his or her absence, his spouse or any other member of the family who was interested to participate was selected. A structure questionnaire was used which is attached in Appendix 1. To bring out reliable information, a lot of discussion beyond the structure was used at times. A declaration was made while introducing the research about its pure academic objectives so that no false expectation is aroused within the community. A synopsis the information regarding the interviewees are presented below.



Fig

5.22: Respondent and Household information



Fig. 5.22a, b, c and d: Household survey

### 5.3.5 Survey findings

The survey was designed to ascertain user's qualitative perspective of their culture, traditional house form and the way they evaluate agency-driven post-Sidr reconstruction in their villages. The direct answers, tabulated and manipulated, resulted in the following findings. These are presented here following each question.

Question1: How did you survive cyclone Sidr?

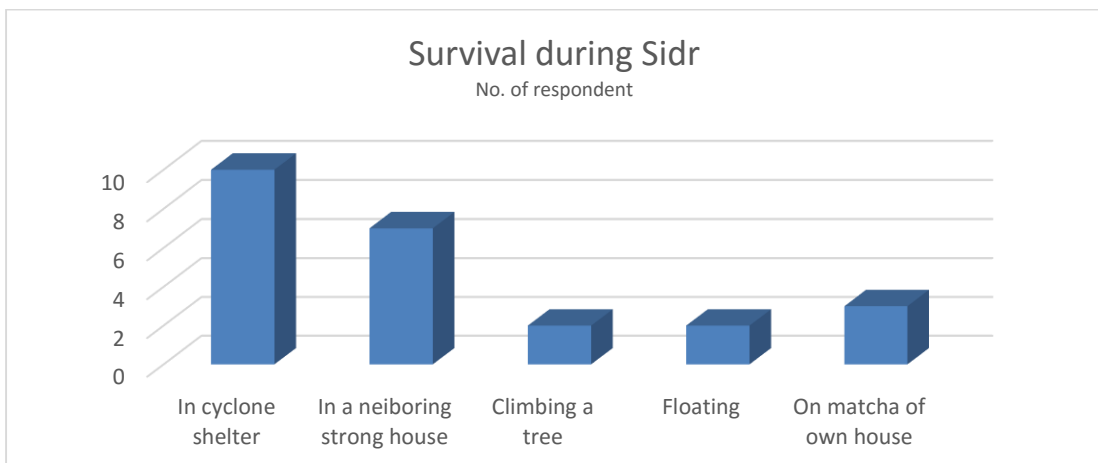


Fig. 5.23

Question2: How was your pre-Sidr house?

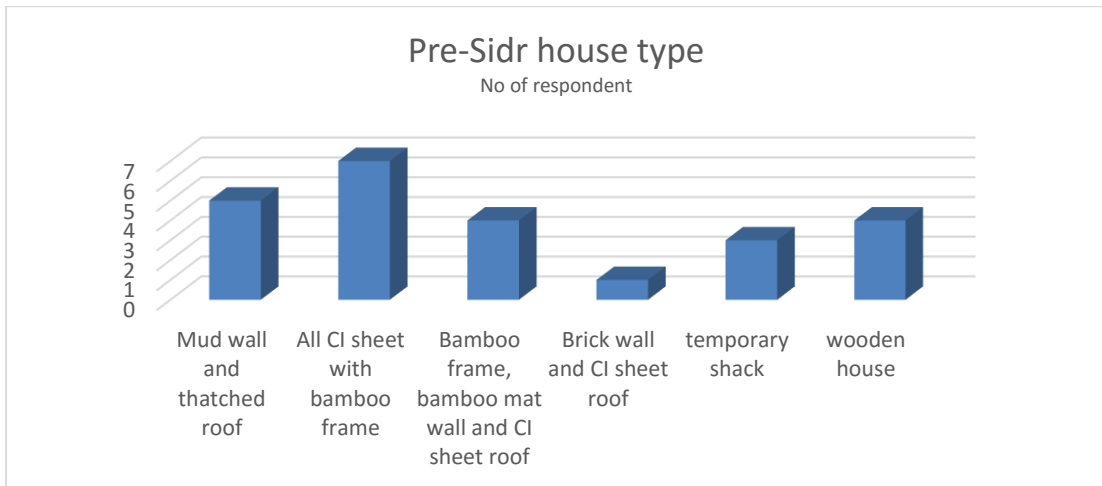
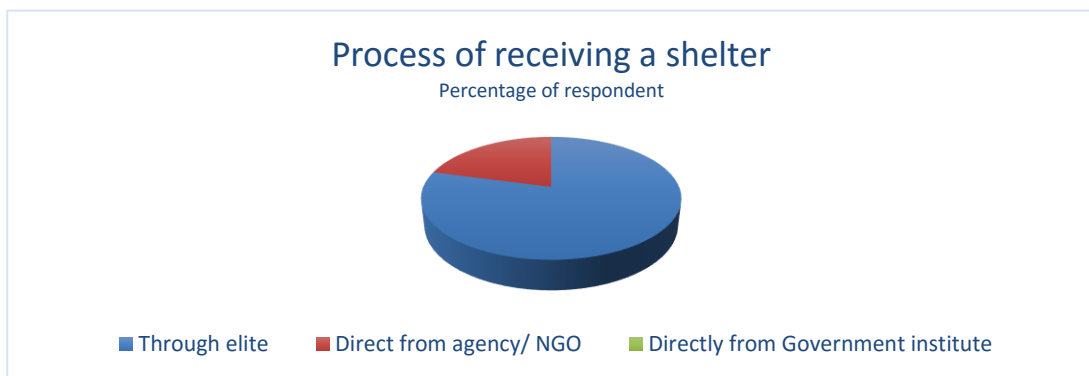


Table 5.24

Question 4: Housing received through any local elite or directly from agency or Gob?



Question 3: How reconstruction/ repair was done after Sidr?

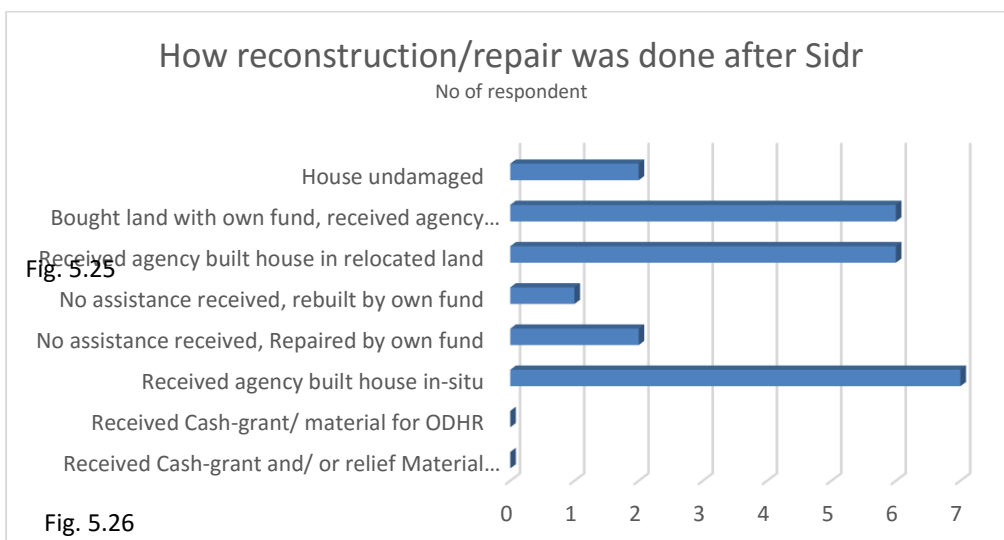


Fig. 5.26

Question 5: Were the beneficiaries' opinion considered in deciding on the following issues?

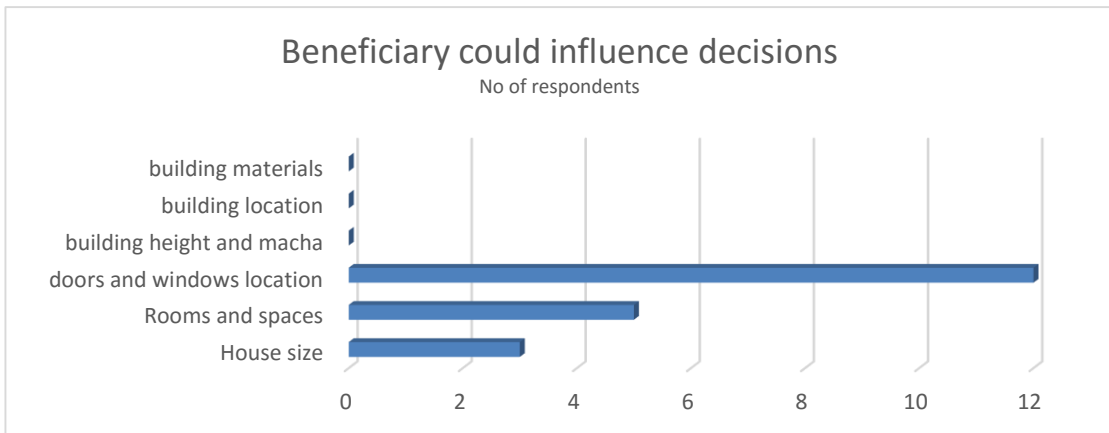


Fig. 5.27

Question 6: Do you think everyone who deserved a house received one?

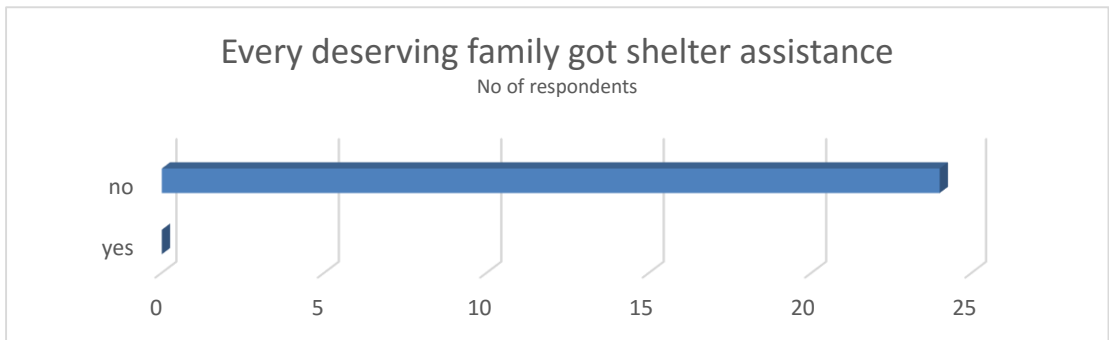


Fig. 5.28

Question 7: How satisfied are you with the assisted shelter?

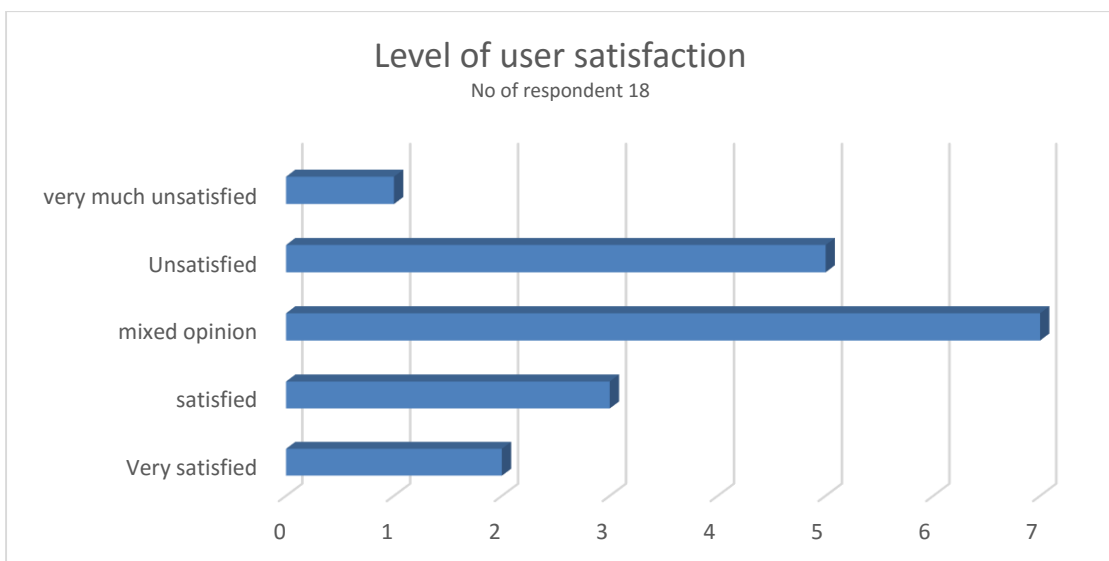


Fig. 5.29

Question 8: What are the reasons for lack of satisfaction?

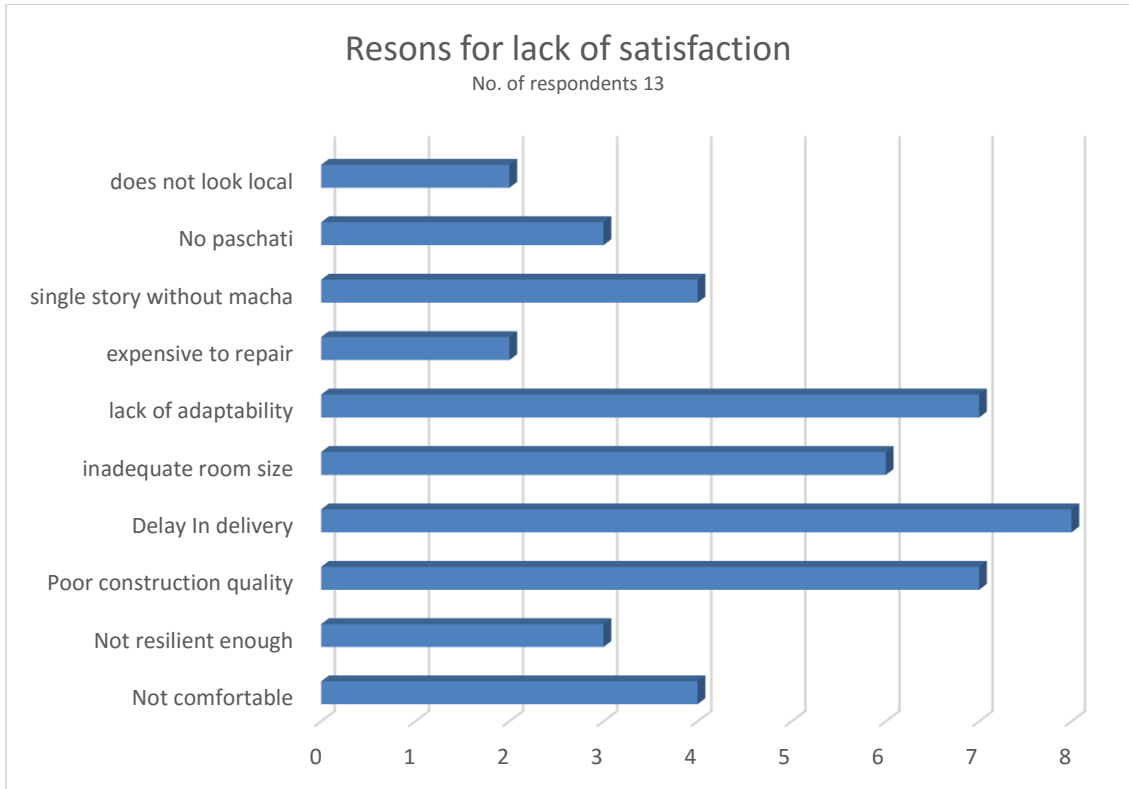


Fig. 5.30

Question 10: If you have enough money to build a new house what kind of house would you prefer?

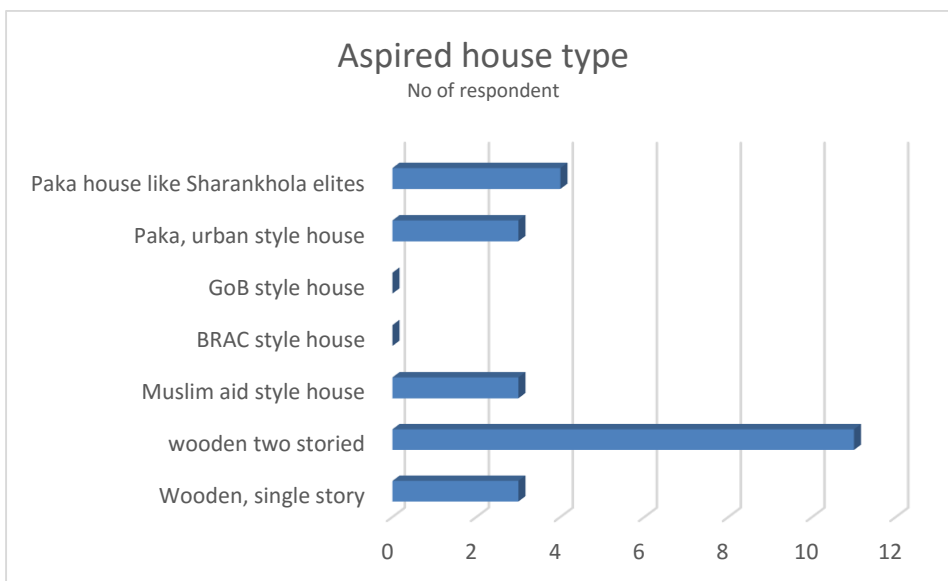


Fig. 5.31

### 5.3.5 Focus group discussion

A focus group discussion was conducted with seven participants in Kadamtala village, cluster 1. The topic of discussion was ‘What type of house is appropriate for the people of Sharankhola’. The participants



FGD Participants:

Md. Abdul JabbarHowladar  
Md. Salam Howladar  
Md. Lal Mia  
Mosammat Amina Begum  
Jamal Talukdar  
AleyaKhatun



Fig. 5.32: Focus Group Discussion in Kadamtala

The objective was to agree upon the following two focus areas.

1. Some must-have for a good house in Sharankhola
2. some preferable features of a house.

For cyclone resilience Pakaghar was the better choice as per majority, With JabbarHowladar and Lal Mia advocating for wooden house. For storm surge resilience, macha was agreed to be vital advantage. Economy of construction and scope of expansion were also considered as important features of a good house. Some preferable features pointed out were color, wooden decoration, light and ventilation, comfort, enough area for plantation, etc.



## **5.4 Analysis and discussion**

This section will compare concepts described in chapter 3, the process and product of post-Sidr reconstruction in the context of Southern Bangladesh as elaborated in chapter 4, with the details of research finding from the case studies presented in different section of this chapter. For more focused analysis, the following section is divided into the following four focus areas:

- Post-Sidr housing and culture
- Aspirations of the local community
- Level of satisfaction
- Settlement pattern and visual eclecticism

### **5.4.1 Post-Sidr housing and culture**

Literature review shows that the reconstruction process followed by both Gob and various agencies acknowledged culture and cultural appropriateness in their assessment and evaluation reports as a minor consideration. This is understandable, since the daunting task of emergency response and rehabilitation rarely gives opportunity to think deep about culture or heritage when bare necessities and human life is at stake. However, some variables within the umbrella of culture (see fig. 3.1) have been used as key consideration that could lead to culture-specific housing. The Shelter Cluster formulated an indirect way to address this by focusing on neutral core shelter with ample scope for user adaptation. Moreover, they stressed on user participation in all stages through the framework of Owner Driven Housing Reconstruction (ODHR). Following these two steps, even without understanding local culture would have resulted in an acceptable degree of cultural responsiveness. One of the successful attempt was shown in section 4.6 showing core houses built by IFRC and adapted by the beneficiaries with their own fund generating products very close to traditional house form. Due to use of R.C.C core, these houses certainly became more resilient as well. Similar attempt by Gob, as seen in Uttar Southkhali village (cluster3) generated similar result with even lower cost, although the original core aroused dissatisfaction. On the contrary to this, more expensive assisted houses, especially the permanent or more complete ones (by Muslim Aid and BRAC) gained more satisfaction at the cost of lesser adaptability. These houses remained out of context in the cultural landscape.

### **5.4.2 Aspirations of the local community**

It is difficult to ascertain local aspiration regarding built environment in an area that underwent such massive external intervention. The distressed population has been motivated

in building resilient houses using modern technology and advanced materials. Since elaborated research on traditional house form and technology is nonexistent in post-Sidr documents and reports, and since framed policy guidelines provided vague direction on dealing with cultural issues, it can be easily assumed that the local community has been made to believe in the new designs accepting the vulnerability of their traditional houses. The case was somewhat different, as revealed in household survey and Focus Group Discussion. The wooden house is still aspired by a large portion of households and community 11 out of 24 household aspired for a wooden two storied house while 3 aspired a single story house. Three other households recognized local elite-styled pacca two storied house as their dream habitat (see figure 5.31). Focus group agreed upon wooden house form as well. Moreover, Observation in Southkhali shows low budget user adaptations still could evolve a core shelter into a house form very close the local typology.

#### **5.4.3 Level of satisfaction**

Both household survey and Focus Group Discussion shows mixed opinion about the level of satisfaction of the beneficiaries. This is understandable because a number of households got elevated from a shack to a pacca house. It is beyond their pre-Sidr capacity and local house form could not be an issue here. For some others, agency advocacy acted as towards reshaping the mindset. However, a significant number of households and a few participants of FDG still expressed dissatisfaction due to a wide variety of reasons (see figure 5.30). On the other hand, those who were satisfied mentioned strength and permanency of the house as the key reason.

#### **5.4.4 Settlement pattern and visual eclecticism**

In-situ reconstruction works are found to be in harmony with existing settlement pattern. This gave way to much easier habitation and adaptation by the users and the eventual level of satisfaction. Relocated projects are seen to be imposed on the context can be argued as a threat to local identity and cultural landscape. Although all built houses that aimed for a finished product failed to merge with the surrounding and also failed to generated appropriate user adaptation that could lead to a less eclectic visual scenario.

**Chapter 6**  
**Conclusion**

## **Chapter 6: Conclusion**

### **6.1 Key observations**

The geographical location of Bangladesh with respect to the shoreline of Myanmar and India, in combination with the emerging reality of climate change and corresponding sea level rise, has made it inevitable that we will continue to experience cyclones and storm surges of greater intensity and scale in the coming years. Therefore, our vulnerable coastal region will continue to be devastated and our valuable surviving vernacular heritage and the associated local knowledge will continue to lose its foothold unless we dramatically change the way we manage risk reduction efforts, post disaster response, rehabilitation, and reconstruction. The realm of post disaster reconstruction is being flooded with well-intended publications from agencies focusing on risk reduction, poverty alleviation and development. However, focus on safeguarding heritage, tradition, culture and local technologies are still not significant. However, Sendai framework for Disaster Risk Reduction (UNISDR, 2015) has ushered a hint of hope and can be considered an important global step towards recognizing heritage and tradition as a part and parcel of reconstruction discourse.

This research has looked back into a reconstruction endeavor of unprecedented scale in the history of Bangladesh and as such, it revealed how vulnerable our rural heritage can become in an emergency or post disaster situation, when saving lives and reviving livelihood overshadows every far cry of tradition loving romantics. A country engulfed by the curse of disparity, corruption, and lack of justice will always have greater challenges in safeguarding its ultra-poor population with basic needs; taking in to consideration their pride, lifestyle or aspirations has remained optional in most cases. When speedy recovery becomes the prime goal for all stakeholders, priceless local knowledge and technologies can be easily sacrificed without opposition. When unplanned invasion of urban economy and industrialization is already destroying rural regions closer to large cities, the last resort of untapped and unhindered vernacular landscapes are the remote fringe areas such as Sharankhola. This makes the impact of Sidr on rural heritage even more significant.

Bangladesh, as per recent predictions by leading financial organization such as World Bank may become one of top thirty economies of the world with in year 2030. Population dividend will continue to boost our healthy GDP growth throughout the next decade. So it can be argued that our poverty will reduce, our industries will thrive, our food production will continue to reach new milestones, but amidst such rapid transformations, the vulnerable traditions may be lost forever just as we have lost Muslim centuries ago. No wealth, technology or efficient management can bring them back.

The household interviews and focus group discussions, discussed in chapter five, showed the state of traditional house form in the psyche of the people of Sharankhola. Observation and analysis indicate that the local wooden houses are potentially more resilient to cyclone and storm surge than most of the new house forms proposed and constructed by various agencies. However, some survey findings also show that repeated advocacy from reconstruction agencies has influenced and modified the aspiration of some households towards masonry built houses over traditional wooden ones. This tells us how external intervention, when done without enough consideration to context, can diminish the value of heritage in the mindset of the affected population. At times, they are unfortunate to not even know what they are losing.

As some findings has indicated, there is another side of this story. It can be argued that when a community is left alone without external influence and with a revived livelihood, a substantial portion of the community may still aspire to build like their ancestors, bypassing the misleading alien house forms propagated by external bodies. Ample examples of post-Sidr wooden houses, found in the villages of Sharankhola (see Chapter four and five), testify in favor of this argument.

## **6.2 The way forward**

Post disaster reconstruction regime of Bangladesh should open up to include ideas from rural landscape experts, pro-vernacular designers, and community craftsmen following the guidelines of Sendai Framework for Disaster Risk Reduction 2015-2030.

Organizations working primarily in the field of heritage conservation should include in their agenda rural landscape and heritage with due importance.

Architect community should consider documenting building heritage and house forms of our coastal region and experiment on ways of improving their resilience (if and where needed).

The research argued that rural house form such as the wooden houses of Sharankhola has its own evolutionary path from shack through paschati hut to two storied paka residence (see chapter 5). This progressive development is supported by the economic growth of a household. This is still uncharted territory for the architectural research of the country and we should act fast before more valuable local knowledge is lost.

The terms like sustainable, people-centric and owner-driven should no longer remain popular risk reduction jargons, these should be applied in accordance with what these concepts are destined to achieve.

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## Appendix 1

### Sample questionnaire for household survey

#### Respondent's information

Household code		Interview date	
Name		Village: Chalrainda Kadamtala Southkhali	
Relationship of respondent to household		<ol style="list-style-type: none"> <li>1. Household head</li> <li>2. Spouse</li> <li>3. Father or Mother</li> <li>4. Child</li> <li>5. Others (specify)</li> </ol>	
Sex: Male   Female		Age 10 to below 18 18 to below 30 30 to below 50 50+	
Marital status:	Single Married Divorced/ separated Widow/ widower		
Household composition	Husband		
	Wife		
	Son		
	Daughter		
	Father		
	Mother		
	Others (specify)		
Total			
Household heads occupation		<ol style="list-style-type: none"> <li>1. Agriculture</li> <li>2. Fisheries</li> <li>3. Business</li> <li>4. Others ( plz. specify)</li> </ol>	
Respondent's education		<ol style="list-style-type: none"> <li>1. Illiterate</li> <li>2. Primary</li> <li>3. Class eight</li> <li>4. SSC</li> <li>5. HSC</li> <li>6. Others</li> <li>7. Higer</li> </ol>	
Type of house		<ol style="list-style-type: none"> <li>1. Scattered settlement in-situ</li> <li>2. Dense cluster in-situ</li> <li>3. Scattered settlement relocated</li> <li>4. Dense cluster relocated</li> <li>5. Scattered, owner-built</li> <li>6. Dense, owner-built</li> </ol>	

### Sidr and post-Sidr housing related questions

1	How did you survive cyclone Sidr?	<ol style="list-style-type: none"> <li>1. In cyclone shelter</li> <li>2. In neighboring strong house</li> <li>3. On a tree</li> <li>4. Floating</li> <li>5. In your own house</li> </ol>
2	How was your pre-Sidr house?	<ol style="list-style-type: none"> <li>1. Mud wall and thatched roof</li> <li>2. CI sheet with bamboo frame</li> <li>3. Bamboo frame, bamboo mat wall, CI Sheet roof</li> <li>4. Brick wall and CI sheet roof</li> <li>5. Temporary shack</li> <li>6. Others (pls specify)</li> </ol>
3	How did you repair/ rebuilt your house after Sidr?	<ol style="list-style-type: none"> <li>1. Received Cash-grant and/ or relief Material for repair</li> <li>2. Received Cash-grant/ material for owner driven reconstruction</li> <li>3. Received agency built house in-situ</li> <li>4. No assistance received, Repaired by own fund</li> <li>5. No assistance received, rebuilt by on fund</li> <li>6. Received agency built house in relocated land</li> <li>7. Bought land with own fund and received agency built house</li> <li>8. House undamaged</li> </ol>
4	If you have received any assistance form any agency or GoB, did you receive it directly or some local elite helped?	<p>Received assistance through local elite</p> <p>Received assistance directly</p>
5	How much of your opinion was considered while deciding on the following?	<ol style="list-style-type: none"> <li>1. House size</li> <li>2. Rooms and spaces</li> <li>3. Doors and windows</li> <li>4. Building height and matcha</li> <li>5. Building location</li> <li>6. Building material</li> </ol>

6	Do you think everyone one who deserved a house received one?	Yes  no
7	If you have answered 3, 6 or 7 in question 3 how happy are you with your new house compared you your previous one?	<ol style="list-style-type: none"> <li>1. very satisfied</li> <li>2. satisfied</li> <li>3. mixed opinion</li> <li>4. unsatisfied</li> <li>5. very much unsatisfied</li> </ol>
8	If you have answered 3, 4 or 5 in question 7, specify reasons for lack of satisfaction.	<ol style="list-style-type: none"> <li>1. less comfortable</li> <li>2. not strong enough</li> <li>3. poor construction</li> <li>4. delay in delivery</li> <li>5. inadequate room size</li> <li>6. lack adaptability</li> <li>7. expensive to repair</li> <li>8. no matcha</li> <li>9. no paschati</li> <li>10. reduced social network</li> </ol>
9	If you have answered 1 or 2, give reasons?	
10	If you have enough money to build a new house what kind of house would you build?	<ol style="list-style-type: none"> <li>1. Wooden single story</li> <li>2. Wooden two storied</li> <li>3. Any type of agency provided design</li> <li>4. Paka urban style house</li> <li>5. Paka elite style house</li> </ol>