Abstract: This paper examines the processes and outcomes of a post-disaster housing assistance program delivered by an NGO, Islamic Relief Bangladesh (ISRB), in one of the villages worst affected by Cyclone Aila in Bangladesh in 2009. The findings, based on both qualitative and quantitative data collected in the field, reveal that the selection of the most suitable beneficiaries for housing aid was subject to undue influence from both elected and unelected leaders. A broad tendency on the part of ISRB to deliver houses through a top-down approach left little room for meaningful consultation with local people. The recipients thus felt excluded and became passive recipients. Although ISRB adopted a ‘build back better’ principle in the delivery of the housing assistance, the capacity of the new houses to withstand a severe cyclone remains limited. Despite some unhappiness with the process through which the housing was delivered, and dissatisfaction with certain aspects of the houses, most recipients were satisfied overall as they would have been unable to build houses of the same quality by themselves due to their poverty. These findings should be of direct value for relevant government agencies, NGOs, and donor agencies in the future delivery of more successful outcomes in post-disaster contexts in Bangladesh and elsewhere.

Keywords: Cyclone Aila; Bangladesh; post-disaster; housing; NGO; disaster risk reduction; build back better

1. Introduction

Housing recovery following a disaster is one of the basic elements of household recovery [1]. It is also a critical area for understanding the recovery process at the community level [2]. Disaster-affected households cannot restart routine household activities until they re-establish either temporary or permanent housing [2–4]. As the nature and rate of housing recovery among affected households within in a community can vary based on a range of factors, such as the economic condition of the household [1,2], some households within the community may experience greater difficulty than others in achieving housing recovery [4]. As a result, some of the affected households of a community may return to permanent housing after a disaster, while others remain in emergency shelters [4]. Moreover, those affected households that experience delays in housing recovery may also experience delays in other dimensions of recovery [2].

The financial resources of disaster-affected households are a vital factor in achieving housing recovery, and this is particularly true for permanent housing recovery [2]. Many affected households cannot repair a damaged house or rebuild a destroyed house by themselves due to their lack of resources. This is not unexpected, as many households encounter severe challenges in addressing housing issues even in normal situations [2]. Thus, affected households in Bangladesh commonly require assistance from government or non-government organisations (NGOs) in repairing a damaged house or constructing a new one [5].
The national government, NGOs, and donor agencies have provided various types of assistance to cyclone-affected households in Bangladesh to assist them in their housing recovery efforts after major disaster events such as Cyclone Sidr in 2007 and Cyclone Aila in 2009. For instance, the Bangladesh government, together with many NGOs and donor agencies, provided various types of housing assistance such as housing materials, housing grants and houses to households affected by Cyclone Aila [5,6]. While researchers have focused on a range of aspects of the post-cyclone situation in Bangladesh, research on post-cyclone housing reconstruction issues in Bangladesh has been limited [7–9]. Nadiruzzaman and Paul [7] examined how the ‘build back better’ approach was addressed in a post-Cyclone Sidr government housing reconstruction project. Likewise, Sadik et al. [8] studied post-Cyclone Aila housing recovery measures and housing recovery outcomes from the perspective of ‘build back better’. Islam [10] and Islam, Kolade and Kibreab [9] focused largely on the relationship between access to resources and post-cyclone housing reconstruction in Bangladesh. Nevertheless, details of the processes and outcomes of post-cyclone housing assistance provided by the government, NGOs, and donor agencies are still under-researched. For instance, although Nadiruzzaman and Paul [7] discussed the problems associated with beneficiary selection and community participation in the context of a public housing assistance program implemented after Cyclone Sidr, they did not explore levels of beneficiary satisfaction. Likewise, Sadik et al. [8] examined neither the issues related to beneficiary selection and community participation nor the level of satisfaction amongst beneficiaries who received houses. Our paper intends to fill this present research gap by examining the processes and outcomes of the housing assistance provided after Cyclone Aila by a single NGO in Khulna District, Bangladesh.

The paper examines the processes and outcomes of the provision by Islamic Relief Bangladesh of two types of house, the dochala (two-roofed) and chouchala (four-roofed) house types, under two separate projects related to Cyclone Aila-affected households in Dakshin Bedkashi Village, Ward 7 of the Dakshin Bedkashi Union, in Koyra Upazila of Khulna District, Bangladesh (Figure 1). An upazila or sub-district includes several union parishads, and a union consists of nine wards, each of which usually includes one or more villages. A union parishad has thirteen elected representatives: one chairman, as head, and twelve members, nine representing each of the nine wards, with the three remaining seats being reserved for women (each individual woman member representing three wards). Ward number seven contains only Dakshin Bedkashi Village.

Khulna District is located on the Bay of Bengal coastline in southwest Bangladesh [5]. This location renders the district particularly vulnerable to major cyclones, the most recent of which include Cyclone Yaas (2021), Cyclone Amphan (2020), Cyclone Bulbul (2019), Cyclone Fani (2019), Cyclone Komen (2015), Cyclone Aila (2009), Cyclone Reshmi (2008), Cyclone Sidr (2007) and Cyclone 04B (1988) [5,11–19]. Koyra Upazila, which includes the study village, is one of the most vulnerable areas in Khulna District, and was one of the two worst upazilas in the district most affected by Cyclone Aila [5]. Two of the most recent cyclones in Bangladesh, Cyclone Yaas in 2021 and Cyclone Amphan in 2020, also severely affected this upazila [11,12].

We briefly present the need for housing assistance at Dakshin Bedkashi Village following Cyclone Aila, and the background of the two Islamic Relief Bangladesh projects that provided housing assistance locally. After reviewing the methods and approaches employed in this research, we examine the process of beneficiary selection and the nature of consultation with recipients during provision of the houses. Then we examine recipients’ satisfaction with the houses and the perceived capacity of the supplied houses to withstand severe cyclones in the future. The final two sections provide further discussion and a conclusion.
Figure 1. Map of Dakshin Bedkashi Village. Source: Fieldwork (2017–2018).

2. Housing Assistance Needs and the Response of Islamic Relief Bangladesh

2.1. Housing Assistance Needs in Dakshin Bedkashi Village after Cyclone Aila

Cyclone Aila, which struck the southwest coastal area of Bangladesh on 25 May 2009, affected 11 coastal districts and over 3.9 million people, causing 190 deaths and about
The impact of Aila on the housing sector was severe, as it destroyed an estimated 243,191 houses and damaged a further 370,587 houses [6]. Khulna and Satkhira districts were amongst the most severely impacted of the eleven affected districts [6], with damage to between 90 and 100 percent of houses in the four worst-affected upazilas of these two districts (Dacope and Koyra upazilas in Khulna; Ashasuni and Shyamnagar upazilas in Satkhira) [21]. The cyclone destroyed about 49,000 houses and damaged 27,000 houses in Dacope and Koyra upazilas [22,23]. Losses across Dakshin Bedkashi Union of Koyra Upazila included 3520 houses destroyed and 1800 houses damaged [23]. In the study village of Dakshin Bedkashi itself, 92.2 percent of households suffered the total destruction of their housing, with the remaining 7.8 percent experiencing partial damage (household survey, 2017–2018).

Cyclone Aila caused massive displacement in Dakshin Bedkashi Village. Much of the wider area of Dakshin Bedkashi Union was subject to regular inundation for almost 33 months following the cyclone, due to breaches in the protective embankment of Polder No. 14/1 [24]. The flow of water into Dakshin Bedkashi Village and other inundated villages of the union stopped on 3 March 2012 when the Hareskhol section of the embankment was finally repaired [24]. Households in the study village were unable to initiate the recovery process and build houses until the embankment was repaired, and were compelled to live either on the embankments themselves and other places in makeshift houses, or in the ruins of their flooded houses [5]. In the immediate aftermath, they badly needed emergency shelter items such as tarpaulins, plastic sheets, bamboo, and rope. Once the village became dewatered in 2012, housing assistance was required.

Both the government and NGOs provided emergency shelter materials to the study village. The government also made small amounts of money available for house repair or construction. The main support provided by the government was 20,000 Taka for each household that received a card, with which to repair or rebuild their houses (as of 31 December 2009, 1000 Taka was equivalent to USD 14.44 [25]). Although each household usually received a single card, a few larger households received two cards, or a total of 40,000 Taka. However, many households did not receive even the 20,000 Taka assistance as the cards allocated were insufficient for the number of households requiring support [5]. The government also provided six completely new houses in the study village. In addition to the government, the UNDP and two NGOs, namely Islamic Relief Bangladesh and Shishu Sasthya Foundation, also provided houses. Islamic Relief Bangladesh, which we focus on here, provided a total of 86 houses to as many households in the village under two projects.

2.2. Housing Assistance Provided by Islamic Relief Bangladesh in Dakshin Bedkashi Village

Islamic Relief Bangladesh (hereafter ISRB) implemented a number of projects in Dakshin Bedkashi Village following Cyclone Aila. Only two of the projects implemented by ISRB provided housing assistance to the affected households in Dakshin Bedkashi Village: the first project was labelled ‘Emergency Response and Early Recovery in Aila Affected Communities in Bangladesh’ (ERER) and the other the ‘Enhancing Resilience of Climate Affected Communities in Southwestern Bangladesh’ (ERCAC). The ERER project, which ran from January to July 2012, was funded by the Directorate General for Humanitarian Aid and Civil Protection (ECHO), and the ERCAC project, from August 2012 to July 2014, was funded by Islamic Relief USA.

ISRB implemented both the ERER and ERCAC projects in each of the villages of Dakshin Bedkashi Union. Both projects also involved other interventions in addition to the housing assistance. ISRB constructed 450 dochala (two-roofed) houses and 250 chouchala (four-roofed) houses in Dakshin Bedkashi Union under ERER and ERCAC, respectively. A total of 58 of the ERER dochala houses (Figures 2–4) and 28 of the ERCAC chouchala houses (Figures 5–7) were constructed in Dakshin Bedkashi Village. ISRB defined the dochala house as a ‘flood resilient family shelter’ and the chouchala house as a ‘disaster resilient family shelter considering the flood level’ [26,27].
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Figure 2. A modified version of the dochala (two-roofed) house provided by ISRB (an extra layer of fence has been added outside the original bamboo mesh fence by the recipient to block rain). Source: Fieldwork (2017–2018).

Figure 3. A modified version of the dochala (two-roofed) house provided by ISRB (a veranda has been added and an extra layer of fence inserted outside the original bamboo mesh fence by the recipient to block rain). Source: Fieldwork (2017–2018).
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Figure 4. A modified version of the dochala (two-roofed) house provided by ISRB (a veranda and a kitchen were added by the recipient). Source: Fieldwork (2017–2018).

Figure 5. A chouchala (four-roofed) house provided by ISRB (an extra layer of fence outside the original bamboo mesh fence in some parts of the front side of the house has been added by the recipient). Source: Fieldwork (2017–2018).

Figure 6. A modified version of the chouchala (four-roofed) house provided by ISRB (with a veranda added by the recipient). Source: Fieldwork (2017–2018).
Figure 5. A chouchala (four-roofed) house provided by ISRB (an extra layer of fence outside the original bamboo mesh fence in some parts of the front side of the house has been added by the recipient). Source: Fieldwork (2017–2018).

Figure 6. A modified version of the chouchala (four-roofed) house provided by ISRB (with a veranda added by the recipient). Source: Fieldwork (2017–2018).

Figure 7. A modified version of the chouchala (four-roofed) house provided by ISRB (with an added veranda and an extra layer of fence in some parts of the rear of the house for protection from rain). Source: Fieldwork (2017–2018).

Dochala houses were constructed first, during 2012, while the chouchala houses were built between January and April 2014. The standard size of the dochala houses was 193.6 square feet and that of chouchala houses was 198 square feet (see Table 1 for the main features of both types of house). Each household that received a house also received a sanitary latrine (see Figures 8 and 9). The recipient of each chouchala house also received
a solar home system (10 watt), 12 fruit saplings, and vegetable seeds. In addition, 50 of the 250 chouchala houses provided by ISRB in Dakshin Bedkashi Union were accompanied by an improved cooking stove.

Table 1. Main features of the dochala and chouchala house types.

| Main Features       | Dochala (Two-Roofed) House | Chouchala (Four-Roofed) House |
|---------------------|----------------------------|-----------------------------|
| Size                | 193.6 square feet          | 198 square feet             |
| Room                | One                        | Two                         |
| Roof                | Corrugated galvanised iron (CGI) sheets (18 pieces) | Corrugated galvanised iron (CGI) sheets (18 pieces) |
| RCC Pillar          | 8 reinforced cement concrete (RCC) pillars (5’’ × 5’’ × 11’-6’’)) | 10 reinforced cement concrete (RCC) pillars (5’’ × 5’’ × 11’-6’’)) |
| Wooden Pole         | Two wooden poles           | No wooden pole              |
| Fence               | Bamboo mesh fence (tarza), locally known as chacher bera | Bamboo mesh fence in the upper part of all four sides and CGI sheet fence in the lower part of all four sides (up to 2 feet 6 inches) |
| Door                | One (double shutter wooden door and wooden frame) | One (double shutter wooden door and wooden frame) |
| Windows             | Three (double shutter wooden window and wooden frame) | Two (double shutter wooden window and wooden frame) |
| Plinth              | Boundary brick wall up to the plinth level and earthen floor inside the boundary brick wall | Boundary brick wall up to the plinth level and earthen floor inside the boundary brick wall |
| Staircase           | Earthen stair (community contribution) | Brick stair |
| Budget              | 78,000 Taka (for the house only) | 90,000 Taka (for the house only) |

Source: Observation, household-level in-depth interviews, key informant interviews (KIIs), and project documents provided by ISRB staff.

Figure 8. A latrine provided with the dochala (two-roofed) house delivered by ISRB. Source: Fieldwork (2017–2018).
ISRB used the term ‘shelter’ or ‘family shelter’ for both the dochala and chouchala houses. A shelter usually denotes ‘a family dwelling unit or a house’ [28] (p. 56). Here, we use the term ‘house’ instead of ‘shelter’ or ‘family shelter’ for both types of house, as disaster sheltering is fundamentally different from disaster housing. Quarantelli [4,29,30] distinguishes between sheltering and housing after a disaster, and proposes four terms: emergency sheltering, temporary sheltering, temporary housing, and permanent housing. The difference between sheltering and housing is that sheltering (both emergency and temporary) does not involve the re-establishment of regular household routines associated with both temporary and permanent housing [4,29,30]. Thus, the key criterion for distinguishing between sheltering and housing is ‘the resumption of household responsibilities and activities’ in the dwelling occupied by the affected household after a disaster [4] (p. 3). While both temporary and permanent housing involve the re-establishment of household routines, the affected household re-establishes routine household activities in either the original home or a new dwelling where the household plans to live on a permanent basis in the case of permanent housing. However, although households may re-establish routine household activities in temporary housing, they tend to wait for permanent housing solutions [2–4,7,29–32].

Following Quarantelli [4,29,30], both the dochala and chouchala house types considered here can be identified as the re-establishment of housing instead of sheltering. Both types were built on permanent sites (that is, on land belonging to the recipients) and will not require households to relocate further [33]. Moreover, the recipient households are living in these houses on a permanent basis, even if they plan to build better houses in the future, should their economic conditions improve. Moreover, as rural houses in Bangladesh are usually categorised as jhupri shacks, temporary kutcha houses, semi-permanent semi-pucca houses, and permanent pucca houses [34], this paper considers both types of ISRB-provided housing to be semi-pucca or semi-permanent houses. In general, the standards used for structures and materials in the case of both types of house are close to the standards suitable for a transitional shelter following the shelter standards and guidelines of the Bangladesh Shelter Cluster [35]. For instance, Sadik et al. [8] considered these two types of house as transitional shelters. A transitional shelter is a semi-durable construction that provides shelter during the period between the emergency phase and the attainment of a longer-term
durable shelter solution. It can be disassembled and relocated if needed. On the other hand, a permanent house is a permanent structure that is constructed following the national standard for exposure to hazards. It is a durable solution. Both types are considered as recovery shelters rather than emergency shelter responses [35]. It is worth noting that the great majority of rural houses in Bangladesh are either *kutcha* or *semi-pucca* [36]. Most rural households in Bangladesh, including those in the study village, lack the capacity to build *pucca* or permanent houses [28]. Despite having many limitations, the ISRB houses are usually of good quality relative to both the pre-Aila and current housing arrangements in the study village.

3. Methodology

This paper is based on both qualitative and quantitative data collected through nine months of fieldwork by the first author in two villages, over two phases (May 2017 to January 2018, and March 2019 to April 2019). Data collection methods included in-depth interviews, focus group discussions (FGD), key informant interviews (KII) and observations, and household surveys. Using an exploratory sequential mixed methods design, the qualitative data were collected in the first phase and the quantitative data were collected in the second phase [37,38]. The survey questionnaire for quantitative data was developed based on the preliminary understanding of the qualitative data collected in the first phase. The surveyed households were selected using a simple random sampling procedure, so that the findings could be generalised [39]. Although the study was conducted in the villages of Channirchak and Dakshin Bedkashi, as part of the doctoral research of the first author, this paper is based solely on the data collected from Dakshin Bedkashi, as this was the only study village in which ISRB constructed houses.

The first author conducted 51 in-depth semi-structured interviews with household heads (including female-headed households and wives of the male household heads in the absence of household heads) in Dakshin Bedkashi Village. In addition, four FGDs (two with males and two with females) and 26 KIIs (including ISRB staff involved in the implementation of the two projects under investigation) were conducted in Dakshin Bedkashi Village. Of the 51 household-level in-depth semi-structured interviews in Dakshin Bedkashi Village, just 12 interviewees received either type of housing from ISRB, including 8 *dochala* and 4 *chouchala* houses. This paper draws on these 12 household-level interviewees to understand the nature of ISRB housing assistance. This paper also employs qualitative data from each of the FGDs and KIIs as FGD participants and KIIIs were asked to comment on the processes and outcomes of the housing assistance provided by the government and NGOs including ISRB (some of the FGD participants were also recipients of housing assistance from ISRB). It is worth noting that the other household-level interviewees, who did not receive houses from ISRB, were also asked to share their thoughts on the processes and outcomes of the housing assistance provided by the government and NGOs in the village, and most of them shared their thoughts on the issue. However, the responses regarding housing assistance from the other household-level interviewees have not been used here.

In terms of quantitative data, the paper uses household survey data only from those households that received ISRB housing assistance. Of the 180 households surveyed in Dakshin Bedkashi Village, 46 received housing assistance from ISRB (31 *dochala* and 15 *chouchala* houses). In addition to the primary qualitative and survey data, this paper also draws on data from project-related documentation received from ISRB staff. Qualitative and quantitative data were analysed separately at the initial level and the two datasets were combined during data analysis and interpretation [38]. The audio-recorded qualitative interviews and FGDS were transcribed, and data were sorted and arranged based on sources. Themes were then identified through a bottom-up (i.e., data-driven) approach [40]. The survey data were processed and analysed using Statistical Package for the Social Sciences (SPSS).
4. Beneficiary Selection and Consultation

4.1. Beneficiary Selection

At the outset of the project, ISRB staff contacted the elected officials of the Union and informed them briefly about project objectives and interventions. A project inception meeting was then held, open to all members of the union, including elected leaders, unelected village leaders, and other inhabitants of the union’s villages. The goals, objectives, and expected interventions of the project were introduced, along with broad figures for the likely number of beneficiaries and the process for their selection. Following this meeting, a baseline survey of all the households in the project area by local level staff of ISRB collected socio-economic data on various indicators such as the number of household members, household income, the number of income-earning members of the household, the amount of homestead and agricultural land owned by the household, and the condition of existing housing.

Drawing on survey results, the households were variously categorised by ISRB as extremely poor, poor, lower middle class, middle class or rich. These categories then became the basis for selecting project beneficiaries, initially prioritising the poorest and most vulnerable households. In addition to housing, which could be given only to a small proportion of the village, the ISRB projects provided a number of other interventions for the wider community, such as cash for work and training programs. Thus, while only 450 households across Dakshin Bedkashi Union received housing assistance through the ERER project, 4056 households received cash for work interventions and 4270 households received cash for training interventions [27].

The limited availability of housing assistance placed enormous pressure on the beneficiary selection process. After preparing their initial list, the ISRB staff consulted with the elected leaders, largely the chairman of the Union Parishad and ward members. This discussion was particularly vigorous, with Union-level elected leaders seeking to alter the composition of the list and ISRB staff defending their decisions. Although ISRB staff had final authority in the selection of beneficiaries, the elected leaders of Union Parishad insisted on recommending households that were either close to them through blood, marriage or friendship, or their political supporters, or that had plied them directly with bribes. Like elected leaders of a Union Parishad, elected leaders of an Upazila Parishad and powerful unelected leaders such as village or union-level unelected leaders of the ruling party at the national level sometimes exercised undue influence in the beneficiary selection process. Recognising that they depended on the assistance of local leaders to implement the project, and being subjected to insults and threats by these same leaders, the ISRB staff were forced into compromise. As one ISRB staff member observed:

‘Beneficiary selection for housing was the most difficult task. The chairman and ward members pressured us to select their own people as beneficiaries. They pressured [us] to select their relatives by blood and marriage, friends, political supporters, and people from whom they took bribes to give them houses. Like elected leaders, local leaders, especially the leaders of the ruling political party, also pressured us to select their own people as beneficiaries.’ (11 September 2017)

4.2. Consultation with the Recipients

Although ISRB staff engaged in numerous meetings with village residents, the consultative process followed a strongly top-down approach. Technical staff of the ISRB designed both the dochala and chouchala house types without any input from local people. Although ISRB had some knowledge of local needs, having previously implemented other projects in the same village, there was no serious assessment of community needs. In interview, ISRB staff admitted that community needs were not taken into account properly as both projects were emergency assistance. Although the ERER project that provided dochala houses might be considered an emergency response, it was not implemented until 32 months after Cyclone Aila; the second project, which provided the chouchala houses, was not an emergency project.
There was also minimal consultation with local people during the project implementation phase. Once the form of the house plans became known to village residents, they informed ISRB staff of likely problems in their design and in the selection of construction materials. However, in both projects, ISRB elected not to address this advice, but provided houses following externally prescribed design and materials, and through the contractor. The ‘one-size-fits-all’ approach saw identical forms of house delivered to all recipient households irrespective of their actual housing needs [41,42]. As with design, in both projects, construction itself was a fundamentally top-down process.

The failure of ISRB to adequately consult and involve the recipients in the design and implementation processes resulted in housing programs that were poorly suited to local needs, cultures, and vulnerabilities. The following statements by a FGD participant and an ERCAC project employee suggest that these limitations were clearly understood on both sides:

‘They will build the house, but we have to live in it. It would have been better if they had consulted us.’ (FGD participant, 10 August 2017)

‘The recipients did not agree with our design, but what could they do? They needed shelter.’ (ERCAC project employee, 11 September 2017)

Of the 46 recipient households surveyed, 32, or almost 70 percent, claimed that they had not been consulted at all in the process of housing provision, while just 2 households felt that their views had been adequately taken into account. While the remaining 12 households declared that they had been consulted to some extent, it appears from further interview that this consultation consisted largely of ISRB team members sharing information about the housing plans, rather than actively seeking local input. This sort of information-sharing does not constitute participation in any real sense, as true participation requires the ceding of influence and a degree of control to recipients over the decisions and resources of the project [43,44].

In most cases, villagers wanted ISRB to provide chouchala houses instead of dochala houses. Although many had lived in dochala houses prior to Aila due to their poverty, villagers usually prefer chouchala houses as they feel that dochala houses are less wind- or cyclone-resistant [45]. The first ISRB project had limited funding and thus focused on the delivery of dochala houses, but an improved budget situation during the second project allowed them to construct more chouchala houses.

Villagers’ dissatisfaction with the ISRB housing focused on the placement of pillars inside the boundary brick wall built up to the plinth level, which experience had taught them would lead to increased flooding of the house. Despite voiced opposition to this design, ISRB persisted with construction according to its original plans, on the grounds that the placement of pillars inside the boundary brick wall would protect the boundary brick wall from cracking when the house was shaken by strong wind, and minor additional improvements on the part of householders would eliminate the problem of flooding. As a result of the placement of RCC pillars inside the boundary brick wall, the mud floor inside the house becomes wet during heavy rain, which falls on the upper surface of the boundary brick wall and fence and easily enters the house (see Figure 10). Thus, although the recipients welcomed the use of RCC pillars, given their benefits in minimising disaster risk and their suitability for long-term use, they were less accepting of the placement of pillars inside the boundary brick wall. One dochala recipient expressed his opposition in the following terms:
‘There is no house like this anywhere in Bangladesh. I have worked in many districts. I have not seen this type of house anywhere. This is a failure on the part of the engineers. This house is not suitable for living.’ (9 July 2017)

During the second project, when chouchala houses were being constructed, a cement concrete sill was provided on top of the boundary brick wall to prevent the entry of rainwater. While this was an improvement on the dochala house, which had no sill, the concrete was of poor quality and quickly degraded. The most widespread complaint related to the woven bamboo fencing, known locally as chacher bera, which was used in some parts of the house as walling but which failed to keep water out; a local preference for corrugated galvanised iron (or CGI) sheet fencing was ignored.

As with the complaints about the placement of the pillars and the use of woven bamboo fencing, requests for additional windows or repositioning of the planned windows failed to influence the construction process, with ISRB employees insisting that they were required to implement the initial designs and plans. In practice, a few recipients of chouchala houses were able to convince the carpenters working on their houses to reposition the window frames. Most households sought slight modifications, such as repositioned windows or brick stairs up to the house platform, directly from the masons, carpenters, and the contractor involved in the construction process. Of the 46 surveyed households, 6 (13 percent) stated that their requests for modification had been met, while the requests from 28 (60.9 percent) were not met; the remaining 12 households made no such requests.

5. Housing Recipient Satisfaction
5.1. Number of Rooms

When Cyclone Aila struck in 2009, 72.2 percent (n = 130) of the 180 households surveyed in Dakshin Bedkashi Village had a single-room house. Of the 700 houses constructed in Dakshin Bedkashi Union under ISRB’s ERER and ERCAC programs, 450 were single-room dochala (Figures 2–4), and 250 were double-room chouchala houses (Figures 5–7). In the survey village, Dakshin Bedkashi, 58 houses were single-room dochala, and 28 houses were double-room chouchala. Of the recipient households surveyed (n = 46), 67.4 percent

Figure 10. Boundary brick wall (built up to the plinth level) of a dochala (two-roofed) house provided by ISRB. RCC pillars have been placed inside this boundary brick wall. Source: Fieldwork (2019).
(n = 31) were satisfied with the number of rooms (see Table 2). Not surprisingly, satisfaction rates among recipient households varied according to the type of house they had received, with 80 percent of chouchala recipients expressing satisfaction compared to only 61.3 percent of dochala recipients.

Table 2. Recipient satisfaction with aspects of the house provided by ISRB (n = 46, 31 dochala houses and 15 chouchala houses).

| Aspects of the House                           | Satisfied Percent (n) | Dissatisfied Percent (n) | Neither Satisfied nor Dissatisfied Percent (n) |
|-----------------------------------------------|-----------------------|--------------------------|-----------------------------------------------|
| Number of rooms                               | 67.4 (31)             | 26.1 (12)                | 6.5 (3)                                       |
| Fencing                                       | 8.7 (4)               | 82.6 (38)                | 8.7 (4)                                       |
| Number of doors                               | 78.3 (36)             | 17.4 (8)                 | 4.3 (2)                                       |
| Number of windows                             | 76.1 (35)             | 19.6 (9)                 | 4.3 (2)                                       |
| Placement of windows                          | 71.7 (33)             | 21.7 (10)                | 6.5 (3)                                       |
| Movement of air through the house             | 93.5 (43)             | 2.2 (1)                  | 4.3 (2)                                       |
| Quality of construction materials             | 34.8 (16)             | 41.3 (19)                | 23.9 (11)                                     |
| Quality of construction                       | 41.3 (19)             | 39.1 (18)                | 19.6 (9)                                      |
| Flexibility in house design to allow for the addition of further structures | 84.8 (39) | 8.7 (4) | 6.5 (3) |
| Disaster risk reduction measures included     | 73.9 (34)             | 10.9 (5)                 | 15.2 (7)                                      |

Source: Household survey (2017–2018).

5.2. Fencing

The fencing of the house was the most common focus for dissatisfaction in both types of house. Dochala houses had only woven bamboo fence walls, while chouchala houses had a mix of CGI sheet fencing for the lower part of the wall and woven bamboo for the upper part (see Figures 5–7). Local households that cannot afford a brick wall or CGI sheet fencing usually use either earthen walling, Goran tree fencing plastered with mud and dung (chhitter bera), or golpata fencing. Following the sudden and very dangerous collapse of many of the earth walls during Cyclone Aila, there was widespread reluctance to rebuild with earth, but woven bamboo was also regarded as inadequate protection from rain and unsuitable for long-term use. Prior to Cyclone Aila, just 3 of the 180 surveyed households of Dakshin Bedkashi Village had only woven bamboo walls. Instead, almost all villagers expressed a preference for CGI sheet walls. However, if improperly installed, CGI sheets can become deadly during violent winds [7,45].

As stated above, the ISRB housing consisted only of woven bamboo for the dochala houses, and a mix of woven bamboo and CGI sheeting for the chouchala houses, with the improvement to the latter type reflecting the increased budget for the second program as well as a response to dissatisfaction with the woven bamboo walling erected in the first project. At the time of the field survey in 2017–2018 and 2019, the bamboo walling in many houses, and especially in dochala houses, was already damaged and broken (Figures 11–13). Many of the recipient households had either added an extra layer of fencing such as golpata outside the original woven bamboo fence to protect the house from rain (Figures 2, 3, 5 and 7), or changed the original fence on either one or two sides of the house. The problems of woven bamboo fencing can be understood from the following statements:
a mix of CGI sheet fencing for the lower part of the wall and woven bamboo for the upper part (see Figures 5–7). Local households that cannot afford a brick wall or CGI sheet fencing usually use either earthen walling, Goran tree fencing plastered with mud and dung (chhitter bera), or golpata fencing. Following the sudden and very dangerous collapse of many of the earth walls during Cyclone Aila, there was widespread reluctance to rebuild with earth, but woven bamboo was also regarded as inadequate protection from rain and unsuitable for long-term use. Prior to Cyclone Aila, just 3 of the 180 surveyed households of Dakshin Bedkashi Village had only woven bamboo walls. Instead, almost all villagers expressed a preference for CGI sheet walls. However, if improperly installed, CGI sheets can become deadly during violent winds [7,45].

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‘After the dochala house was provided, many people complained that it was better not to provide a house at all than a house such as this. Whatever the direction of the storm, water enters the house from all sides of the house. As the house is unable to protect us from storms, why give us the house?’ (A FGD participant; 10 August 2017)

‘Water comes into the house through the woven bamboo fence when there is a storm or even when it just rains. The woven bamboo fence is not appropriate; tin fencing would have been more appropriate… Water comes in to the room from whichever direction the wind or rain is coming.’ (Recipient of a chouchala house, 9 July 2017)

By the second ERCAC project, ISRB staff were certainly aware that woven bamboo was inadequate as walling because the bamboo walls in the dochala houses they had built during the first project were already damaged (ISRB employee, 11 September 2017). Not surprisingly, 82.6 percent of the surveyed recipient households expressed their dissatisfaction with the quality of the bamboo fence walls in the ISRB houses.
By the second ERCAC project, ISRB staff were certainly aware that woven bamboo was inadequate as walling because the bamboo walls in the dochala houses they had built during the first project were already damaged (ISRB employee, 11 September 2017). Not surprisingly, 82.6 percent of the surveyed recipient households expressed their dissatisfaction with the quality of the bamboo fence walls in the ISRB houses.

5.3. Number of Doors

Both the dochala and chouchala houses were supplied with just one external door. For a minority of households (17.4 percent), dissatisfaction was expressed at the failure to offer a second door in the house.

5.4. Number of Windows

Dochala houses were built with three windows (one at the front and two at the rear of the house), whereas the larger chouchala houses had just two windows (one at the front and one at the rear of the house), with a single window for each room. The qualitative findings suggest that the recipients of chouchala houses considered just one window for each room to be unsuitable for comfortable living. As expected, although 76.1 percent of the surveyed recipient households were satisfied with the number of windows, satisfaction among chouchala recipients was significantly lower (at 53.3 percent) than that reported by the dochala recipients (87.1 percent).
5.5. Placement of Windows

Some households were not satisfied with the placement of windows in the designed house and requested changes to the position of windows in the house during the construction period. Not surprisingly, although 71.7 percent of respondents of the surveyed recipient households were satisfied with the placement of windows, satisfaction among the chouchala recipients was significantly lower (53.3 percent) compared to that of the dochala recipients (80.6 percent).

5.6. Movement of Air through the House

The recipients generally considered that both types of house design allowed for adequate movement of air through the house. Among the surveyed recipient households, 93.5 percent were satisfied with the provision of the movement of air, with no significant variation in responses from dochala and chouchala house recipients.

5.7. Quality of Construction Materials

ISRB provided both types of house through building contractors, while ISRB’s local staff monitored the construction process. The quality of materials used in house construction, including the woven bamboo walling, the wood framing, and the RCC pillars, was another aspect that attracted significant criticism from recipient households. The building contractors worked with limited budgets but also sought to increase their profit margins by sourcing poor-quality materials. A substantial proportion (41.3 percent) of the surveyed recipient households was dissatisfied with the quality of materials used; the dissatisfaction amongst those receiving dochala houses was significantly higher (at 51.6 percent) than amongst those who received chouchala houses (only 20 percent). This reflects the results of ISRB monitoring of the first project, which delivered the dochala houses, and the NGO’s subsequent insistence that the building contractors supply materials as per specification; hence the significant improvement in the quality of the chouchala houses delivered through the second project.

5.8. Quality of Construction

Qualitative in-depth interviews with the recipient households revealed that the masons, carpenters, and their assistants hired by the contractor to build the ISRB-sponsored houses often failed to complete their assigned tasks properly, and failed to commit the required time to complete the houses properly. Thus, a significant proportion (39.1 percent) of the surveyed recipient households was dissatisfied with the quality of construction. As with the complaints about construction materials, the percentage of the respondents satisfied with the quality of construction was significantly higher for chouchala houses (60 percent) than for dochala houses (32.3 percent). Interviewees mentioned that many parts of the house such as the fittings of doors and windows, and the cement-to-sand ratios in the boundary walls, were not to standard. The general understanding among the interviewees who were unhappy with the quality of construction was that the poor-quality work of the contractors reflected their desire to maximise profits. Other studies have also found that contractors save time and funds by reducing the cost and quality of construction [42,46].

5.9. Flexibility in House Design

Both the dochala and chouchala houses were sufficiently flexible in design to allow for the addition of further structures by the recipients themselves. Although 84.8 percent of the surveyed recipient households were satisfied with this flexibility in design, satisfaction among the chouchala recipients was higher (100 percent) than among dochala recipients (77.4 percent).

5.10. Disaster Risk Reduction Measures

The recovery phase offers an opportunity to ‘build back better’ through the integration of disaster risk reduction measures into development planning [47,48]. The realisation
of the ‘build back better’ principle in the context of post-disaster housing projects implemented by governments and NGOs requires the inclusion of disaster risk reduction steps in house construction to make the houses resilient to future disasters [48]. The Bangladesh government, various NGOs, and other agencies such as UNDP have been implementing housing projects in Bangladesh since Cyclone Sidr in 2007, with the disaster risk reduction principle at the core of their housing interventions [46]. The Bangladesh Shelter Cluster has also emphasised the inclusion of improved practices in the construction of house in the post-disaster recovery phase to ‘build back better’ [35]. After Cyclone Aila, ISRB took steps in its construction planning to address the two natural hazards that were most significant locally: floods and cyclones. These steps included raising the level of the plinth, building a boundary brick wall up to the plinth level, using RCC pillars inside the house, placing the base of the RCC pillars 2 feet below ground level, and ensuring that roof structures were more resistant to cyclonic wind. The raising of plinth levels was a direct response to the experience of inundation for three years after Cyclone Aila. Most households (73.9 percent on average, 71 percent for dochala houses and 80 percent for chouchala houses) were happy with the disaster risk reduction measures implemented in housing construction.

However, the disaster risk reduction steps adopted fail to address the effects of even a category one cyclone such as Aila [5]. The raised plinth levels of the new houses will not be sufficient to prevent inundation on the scale witnessed during the first few days after Aila, but it must be acknowledged that the recovery process will be greatly improved and accelerated as the new plinth levels will permit reconstruction and repair from a much earlier stage than was the case with the prolonged inundation after Aila.

The boundary brick wall, built up to the plinth level in both types of house, is also a useful disaster risk reduction step as it should protect the plinth from being washed away by floodwater. As the village is located within the polder, it will be subject to flooding if the embankment collapses due to storm surge. Most houses in the village had an earthen plinth structure before Aila struck; by protecting the mud inside the house walls from floodwater, the boundary brick wall will greatly assist in protecting houses from being washed away. The use of RCC pillars further contributes to the reduction of disaster risk, making houses more capable of withstanding cyclonic wind, and improving the chance that houses will survive flooding events. Most households consider these houses to be suitable for long-term use, due largely to the inclusion of RCC pillars and the brick-bordered plinth. To varying degrees, 95.7 percent (n = 44) of the 46 surveyed recipient households regarded the new housing as suitable for long-term use. About 77.4 percent of the dochala recipient households (n = 31) and about 86.7 percent of the chouchala recipient households (n = 15) considered their houses to be moderately to extremely suitable; and about 6.5 percent for dochala houses and 13.3 percent for chouchala houses considered their houses extremely suitable for long-term use.

6. Cyclone Resistance

Effective realisation of the ‘build back better’ principle in the case of a housing project implemented in a cyclone-prone area requires the constructed house to be strong enough to withstand severe cyclones [7]. In the estimation of the surveyed respondents amongst the recipient households (n = 46), 34.8 percent (n = 16) considered that their new houses are capable of withstanding a severe cyclone, while 23.9 percent (n = 11) were uncertain, and 41.3 percent (n = 19) regarded the houses as unlikely to survive a severe cyclone. Variation in responses from dochala and chouchala house recipients is significant: 51.6 percent of dochala recipients and only 20 percent of chouchala recipients thought that their houses would not withstand a severe cyclone. This variation is likely to reflect two considerations: firstly, dochala houses have a mix of RCC (10) and wooden (2) pillars, while chouchala houses have 12 RCC pillars; secondly, villagers consider the dochala house with its gable-shaped roof to be more prone to wind damage than the hipped-shaped roof of the chouchala house [45].
More generally, as the respondents of about 65 percent of the recipient households hold either negative or neutral opinions about the capacity of the new housing to withstand a severe cyclone, it can be claimed that ISRB was not successful in realising its goal of ‘building back better’ in its post-Aila housing interventions. As an NGO employee who worked for one of the ISRB projects observed of the relatively robust Union Parishad building, where he was based:

‘The Union Parishad building used to tremble during storms. How could a [dochala] house with a bamboo fence and tin roof survive? I think if there is any storm at night, then they [can only] remain seated during the storm and wonder when the storm will blow away the house . . . This [dochala] house will not survive any severe event.’. (1 October 2017)

Despite some unhappiness with the process through which the housing was delivered, and dissatisfaction with various aspects of the houses, most recipients were satisfied overall. About 91.3 percent (n = 42) of respondents (n = 46) stated that they were either satisfied or very satisfied with the houses they received, while 2.2 percent (n = 1) were dissatisfied and 6.5 percent (n = 3) were neither satisfied nor dissatisfied. This satisfaction stemmed largely from the recognition that they would not be able to build houses of similar quality by themselves due to their relative poverty, the opinion of 97.8 percent (n = 45) of respondents (n = 46). The nexus between poverty and satisfaction (despite problems with the houses) can be understood from the following interview excerpts:

‘This house has many problems; it has problems with the fencing, and with the roof. Rainwater enters through the fence and through the tin [roof]. Thus, the quality of the house is very bad. Nevertheless, I am happy. I am poor and I cannot build a house like this.’. (Recipient of a dochala house; 6 August 2017)

‘We are happy as ISRB gave us the house. The house has many problems. All the fencing in the house is broken . . . We have had to install [new] fencing. Yet we are happy . . . If we had not got this, we would have had to stay in our ruined house. We are poor and we do not have money to build a house like this. That is the reason we are happy with it . . . We could not build this kind of house by ourselves.’. (Recipient of a chouchala house; 2 August 2017)

Despite various limitations, these houses are generally more disaster resilient by comparison with pre-Aila housing, and 95.7 percent (n = 44) of respondents (n = 46) considered their present house to be more disaster resilient than their pre-Aila house (household survey 2017–2018).

7. Discussion

The selection of beneficiaries was challenging, as the availability of housing assistance was very limited relative to actual community need. The undue influence of elected and unelected leaders in the beneficiary selection process benefitted people close to them, to the exclusion of poor and vulnerable households. ISRB did not take into account the views of recipients in either the design or implementation stages. ISRB could have delivered houses much more suited to local needs, cultures, and vulnerabilities had they adopted a bottom-up rather than top-down approach. ISRB also missed an opportunity to address problems associated with the top-down design of the houses by the technical staff in the implementation stage by not listening to the voices of recipients; had they done so, they might have identified some of the likely problems associated with the prescribed design and construction materials and thus been in a position to modify house designs prior to actual construction. ISRB’s decision not to include local feedback led to the delivery of houses through contractors, who followed the externally prescribed design and materials. In the absence of consultation and participation, housing beneficiaries felt excluded and became passive recipients of this aid.

Most recipients were satisfied with seven of ten aspects of the house, taking the findings of both types of house together. These seven aspects include: number of rooms,
number of doors, number of windows, placement of windows, movement of air through the house, flexibility in house design, and disaster risk reduction measures undertaken. However, most recipients were not satisfied with three aspects of the house: fencing, quality of construction materials and quality of construction. When the findings are considered separately based on the type of house, the majority of recipients were found to be dissatisfied with the fencing material used in both dochala and chouchala houses. About 83.9 percent (n = 26) of dochala recipients (n = 31) and 80 percent (n = 12) of chouchala recipients (n = 15) were dissatisfied with the fencing provided. Their reason for this dissatisfaction was the use of bamboo mesh fencing (completely for dochala and partially for chouchala) despite the request of the community and the housing recipients not to use it.

However, although the majority of dochala recipients were dissatisfied with the quality of construction materials, the majority of chouchala recipients were satisfied. About 22.6 percent (n = 7) of the dochala recipients (n = 31) were satisfied with the quality of construction materials while 51.6 percent (n = 16) were dissatisfied and 25.8 percent (n = 8) were neither satisfied nor dissatisfied. On the other hand, 60 percent (n = 9) of the chouchala recipients (n = 15) were satisfied with the quality of construction materials while 20 percent (n = 3) were dissatisfied and 20 percent (n = 3) were neither satisfied nor dissatisfied. Likewise, although the majority of dochala recipients were not satisfied with the quality of construction, the majority of chouchala recipients were satisfied. About 32.3 percent (n = 10) of the dochala recipients (n = 31) were satisfied while 45.2 percent (n = 14) were dissatisfied and 22.6 percent (n = 7) were neither satisfied nor dissatisfied with the quality of construction. On the other hand, 60 percent (n = 9) of the chouchala recipients (n = 15) were satisfied, 26.7 percent (n = 4) were dissatisfied and 13.3 percent (n = 2) were neither satisfied nor dissatisfied with the quality of construction. The relatively better outcome in terms of the quality of construction materials and the quality of construction in the case of chouchala houses compared to dochala houses was the result of improved monitoring by ISRB staff during the second project, which delivered the chouchala houses; ISRB had observed that the building contractors had supplied substandard materials and produced poor quality work during the first project, which provided the dochala houses.

Despite dissatisfaction with three aspects of the housing, most recipients of both dochala and chouchala considered that their housing was suitable for long-term use. However, success in terms of the likely capacity of the new house to withstand a severe cyclone is limited as only 34.8 percent of the recipients (25.8 percent for dochala houses and 53.3 percent for chouchala houses) considered that their new houses would be able to withstand a severe cyclone. The outcome may be better for chouchala houses which have more RCC pillars and an improved roof design. However, most recipients were satisfied overall, as they would have been unable to build houses of the same quality by themselves, given their poverty. They were happy to receive a roof over their heads. Nevertheless, the positive opinions of only about one-third of the recipients in relation to the cyclone survivability of both types of house call into question ISRB’s success in translating the ideal of ‘build back better’ into reality. To ‘build back better’ in the context of post-disaster housing reconstruction in an area vulnerable to cyclones should involve delivering improved structures capable of withstanding most future events.

8. Conclusions

ISRB identified the poorest and most vulnerable households as priority beneficiaries and selected these beneficiaries in consultation with the elected leaders. Although consultation with the elected leaders for beneficiary selection is a desirable process, ISRB found itself unable to select the most suitable beneficiaries in many cases due to the undue influence of the elected leaders, along with powerful unelected leaders, in the selection process. Leaders often recommended households that were close to them through ties of blood, marriage, friendship, and political alignment, or from whom they received bribes. In order to ensure that the project was implemented on time, ISRB often had to include
the households recommended by the leaders, with the result that relatively poor and vulnerable households became excluded from the assistance.

ISRB’s technical staff designed and implemented both the dochala and chouchala houses through a top-down approach, without any consultation with local people. Although local people had their own choices for the design and materials and wanted ISRB to include their feedback in the design and proposed materials, ISRB followed a ‘one-size-fits-all’ approach with externally designed houses built through contractors. The contractors also implemented the construction process through a top-down approach. The recipients thus experienced a clear lack of consultation and participation in the design and implementation stage, with the result that they felt excluded and became passive recipients [7,49].

If the findings for both types of house are considered together, it is evident that most recipients were satisfied with at least seven aspects of the new houses, but dissatisfied with the fence walling provided. A substantial proportion of recipients overall were dissatisfied with the quality of construction materials and the quality of construction; but while a majority of chouchala recipients were satisfied with the quality of construction materials and the quality of construction, this was not true for a majority of dochala recipients.

Despite differences in design and quality between the two types of house, most recipients of both types of house considered their houses to be moderately to extremely suitable for long-term use. However, the capacity of these houses to survive extreme events is not satisfactory, as only about a quarter of dochala recipients (26 percent) and slightly more than half of chouchala recipients (53 percent) felt their house would be able to withstand a severe cyclone. Although ISRB adopted a ‘build back better’ principle in their delivery of this housing assistance, the limited capacity of the new houses to withstand cyclones is alarming, particularly in the context of the study village which is highly vulnerable to cyclone hazards and is already experiencing the adverse effects of climate change, which are expected to produce more intense cyclonic storms in the future [50,51].

Overall, most recipients were satisfied as they were unable to build houses of the same quality by themselves, due to their poverty. However, the failure to really address the question of cyclone survivability means that the post-Aila reconstruction must be considered something of a missed opportunity to enhance the resilience of the households and the community to future disasters and climate change. ‘Build back better’ should refer not to an improvement in previous conditions of vulnerability, but to improvements that are sustainable in the face of future disasters.

Finally, a more participatory approach that allows for the combination of local knowledge with technical knowledge should be adopted to deliver housing that is more suited to local needs and contributes to a more successful recovery outcome [7,52–54]. Rigorous consultation with the local people should be carried out to understand and take account of their preferences before developing initial designs for housing. An initial design should then be modified further, if necessary, based on feedback from the local people. Ensuring participation in the planning and implementation stages, and more accountability and transparency in the intervention process, is an essential measure to limit undue influence and corruption by local leaders in the beneficiary selection process. Recipients should be given relevant training and pictorial guidelines or printed documents to enable them to monitor the quality of materials and construction. Moreover, the contractors should also be made liable to the recipients, through the introduction of a clearance certificate from the recipients confirming that the contractors have completed the house with the materials and produced work as per the requirements of their contracts. Otherwise, the construction should be deemed incomplete. Whenever possible, the use of locally available materials should be promoted. As local people have the experience and skills to assess the quality of local materials, contractors will be required to use quality materials in construction. Moreover, as the cost of transportation of local materials to construction sites will be relatively low, the pressure on contractors to produce poor quality work to make an expected profit may be reduced. Stringent monitoring by aid delivery staff should ensure the quality of materials and construction. Moreover, strict provisions penalising contractors
for supplying substandard materials and producing poor quality construction work should be incorporated in the contract. Finally, the implementing agencies or the contractors should be made responsible for repairing any defects for a period of several months after the project is implemented, to ensure better outcomes for post-disaster housing.

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