Rapid assessment for housing in Indramayu, West Java-Indonesia

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Abstract. The Self-Help Housing Stimulant (SHHS) is an assistance program from the Ministry of Public Work and Public Housing together with the World Bank to help family with low income to improve their house. Indramayu District is one of the districts in Indonesia receiving the help. A rapid assessment was conducted to 212 randomly sampled houses that have received the 2019 SHHS assistance program. Based on the result of the rapid assessment it can be concluded that structural component and sanitation component of a house are still a concern which needs to be paid attention.

Keyword: assistance program, house, Indramayu, low income, rapid assessment

1. Introduction

The Ministry of Public Work and Public Housing together with the World Bank has an assistance program called the Self-Help Housing Stimulant (SHHS). This program helps family with low income to improve their house to be more decent and safer to be lived in[1]. Each house project was given stimulant in the form of construction materials and workers equivalent toRp 17,500,000 (seventeen million and five hundred rupiah) for house renovation and Rp 35,000,000 (thirty-five million rupiah) for new house construction. During renovation/construction, it is carried out by the community in mutual corporation. There are certain criteria that needs to be met to receive the stimulant. The citizens need to be an Indonesian citizen, own the land legally, does not own a house or own and live at a non-decent house, have not yet receive any assistance from the SHHS program or any other government housing assistance, have low income, and willing to make a statement as a group to mutually help each other[2].

A total of 1410 citizen have received the stimulant from the SHHS program in the year 2019 in Indramayu District. A rapid assessment was conducted in January 2020 on the renovated house and newly constructed house with the total amount of 212 sample houses [1]. This rapid assessment was done to inspect and assess visually on the structural, non-structural component, lighting, ventilation, space area, clean water accessibility, the toilet and the drainage of the houses renovated and constructed [3].
2. Rapid Assessment Method

There are 5 (five) components that are assessed in the rapid assessment method: (1) structural and non-structural components, (2) health components, (3) adequacy of space, (4) safety of location, and (5) drainage system [3].

2.1. Structural Components

In the structural components, there are 5 (five) components that are inspected and assessed. Those components are:

- the foundation
- the sloof
- the column
- the beam
- the roof truss

Each component was given scores to assess the completeness and the integration of the structural component, the construction rules being followed, and the dimension, quality and qualified standard material being used. The structural component score can be seen in Table 1.

Table 1. Scoring Guidance of Structural Component

| Score | Explanation |
|-------|-------------|
| 1     | Structural components not complete, not integrated, construction rules not followed, and not appropriate material used |
| 2     | Structural components are available and installed, not integrated, construction rule not fully followed, and dimension, quality, and not qualified material used |
| 3     | Structural components are completely installed, construction rules followed however maybe not effectively (especially the rebar rules), and the dimension, quality, and not qualified/nearly qualified material used |
| 4     | Structural components are completely installed, integrated with other structural components, likelihood of construction rules being followed and more complete however cannot be seen (covered by finishing), and the dimension, quality, and material nearly qualified to standards |
| 5     | Structural components are completely installed, integrated with other structural components, construction rules being followed (prove available), and the dimension, quality and material are qualified to standards |

2.2. Non-Structural Components

In the non-structural components, there are 4 (four) components that are inspected and assessed. Those components are:

- the wall
- the roof covers
- the floor
- frame-door-window

Each component was given scores to assess the completeness of the non-structural components and the integration to the structural components, the construction rules being followed, and the dimension, quality, and the qualified standard material being used. The non-structural component score can be seen in Table 2.

Table 2. Scoring Guidance of Non-Structural Component

| Score | Explanation |
|-------|-------------|
| 1     | Non-structural component not installed |
| 2     | Not all non-structural components are available/installed to the structure, and the dimension, quality and material are not badly qualified |
| 3     | Non-structural components are completely installed, integrated with the structure however |
not properly secured, and the dimension, quality and materials are adequate but doubtful.
Non-structural components are completely installed, integrated with the structure, the
construction rules followed (prove available), and the dimension, quality and materials are
qualified.
Non-structural components are completely installed, integrated with the structure, the
construction rules followed however cannot be seen, and the dimension, quality and
materials are qualified.

2.3. Health Components
In the health components, there are 5 (five) components that are inspected and assessed. Those components are:

- Lighting & ventilation
- Clean water
- Toilet
- Electricity

The health components score can be seen in Table 3.

Table 3. Scoring Guidance of Health Component

| Lighting & ventilation | Clean water | Toilet | Electricity |
|------------------------|-------------|--------|-------------|
| Y                      | Installed inside or outside the house, and easily accessed | Functional toilet available inside the house, easily accessed for bathing, washing, urinate and defecate, and channeled to the septic tank | Electricity available |
| N                      | Not installed inside or outside the house, and easily accessed | Functional toilet not available inside the house, easily accessed for bathing, washing, urinate and defecate, and channeled to the septic tank | Electricity not available |

2.4. Space Adequacy
The standard space adequacy per resident is minimum 9 m² with the height of the ceiling of minimum 2.8 m. The space adequacy score can be seen in Table 4.

Table 4. Scoring Guidance of Space Adequacy Component

| Explanation |
|-------------|
| Y           | Total area in the house meet the minimum area of = 9 x 2.8 m² per resident |
| N           | Total area in the house does not meet the minimum area of = 9 x 2.8 m² per resident |

2.5. Safety of Location
The safety of location inspected and assessed the location of the renovated house or newly constructed house under these circumstances; (1) does not violate the prohibited location listed in the requirement of the SHHS program, and (2) not located under a very high voltage power lines, on the riverside, beach border, area of landslide prone and flooded prone, and other restricted area. The safety of location score can be seen in Table 5.
Table 5. Scoring Guidance of Safety of Location Component

| Explanation                      |
|----------------------------------|
| Y  | Not located on the restricted area listed |
| N  | Located on the restricted area listed    |

2.6. Drainage System

In the drainage system component, it is inspected and assessed whether the drainage system for dirty water and rainwater is drained to a fully function drainage system. The drainage system score can be seen in Table 6.

Table 6. Scoring Guidance of Drainage Component

| Explanation                                                                 |
|----------------------------------------------------------------------------|
| Y  | Drainage system (dirty water and rainwater) is drained to a fully function drainage system |
| N  | Drainage system (dirty water and rainwater) is not drained to a fully function drainage system |

3. Housing in Indramayu District

A total of 212 houses in Indramayu District receiving the 2019 SHHS assistance program were randomly inspected and assessed by using the rapid assessment method. The assessment was conducted from 15th January until the 21st January 2020. The sample distribution of the 212 houses randomly inspected and assessed can be seen in Table 7.

Table 7. The Total Number of Houses Inspected and Assessed in Indramayu District based on the Village

| No | Village                  | Total House |
|----|--------------------------|-------------|
| 1  | Dermayu Village          | 30          |
| 2  | Kapringan Village        | 29          |
| 3  | Lamarantarung Village    | 25          |
| 4  | Larangan Village         | 22          |
| 5  | Lohbener Village         | 19          |
| 6  | Panyindangan Wetan Village | 20      |
| 7  | Sindangkerta Village     | 23          |
| 8  | Telukagung Village       | 21          |
| 9  | Tempel Village           | 14          |
| 10 | Tempelkulon Village      | 9           |
|    | Total                    | 212         |

Based on the rapid assessment conducted in houses receiving the SHHS program in Indramayu District, it is found that most of the houses are in good condition. However there are several houses that have not met the structural component of the house. In Figure 1 are the findings in numbers based on the scoring guidance used in the rapid assessment.
3.1. Structural Components

a. Foundation

Thirty seven (37%) percent of the foundation condition in Indramayu District is at the score of 4, however there are still 29% of the foundation condition receiving the score of 2. This is the case where the foundation of the used is a brick rollag (rollagbata) which does not provide the bearing capacity needed to support the structure of the house. The brick rollag used in the houses can be seen in Figure 2.

b. Sloof

It is found that 67% of the houses in Indramayu District are constructed without using sloof. Sloof functions as a bond holding the foundation, beam, column and wall together so that all the live load and dead from the roof below can be well distributed down to the foundation. Based on the rapid assessment the sloof used are bricks that is cast in placed which can be seen in Figure 3.
c. Column

The condition of columns in houses in Indramayu District is at a score of 3. There was a 42% percent houses that received this score, which means that the installation of column is quite well constructed since the rebar is installed following the construction standard. However, it is still found that some houses do not use concrete columns but only uses bricks at the corners of the houses, which can be seen in Figure 4.

d. Beam Ring

There is a 53% of houses in Indramayu District that did not install a beam ring which function as a bond between beam and column. This can be seen in Figure 5.

e. Roof Truss

Forty-eight (47%) percent of the houses in Indramayu District has installed roof truss in their houses. However, it is still found that there are still some missing components in roof trusses that has not be installed which can be seen in Figure 6.
3.2. Non-Structural Components

Non-structural components such as the wall, roof cover, floor and door and window frame seem to be on the average score of 4 which can be seen in Figure 1. Fifty-eight (58%) percents of houses uses roof clay material as its roof covers and are installed properly as there are no sign of leakage on the ceiling. Seventy-seven (77%) percent uses wood material as door/window frame which is anchored to the wall. Forty-five (45%) percent of wall installation on the houses is installed according to the construction standards, although some are still not coated with plaster and paint. Forty-eight (48%) percent of houses has floor which have been well plastered. The condition of houses regarding the non-structural components can be seen in Figure 7.

3.3. Supporting Components

Based on the rapid assessment that is mapped into charts that can be seen in Figure 8, most of the supporting facilities that are not available are clean water, followed by system drainage and also the toilet.
4. Conclusion

The overall conclusions of the rapid assessment done from the 212 houses assessed in Indramayu District are:

a. Several structural components of a house construction have not met the construction standards which could lead to unsafe structure. Lack of structural integrity can lead to a fall/hit which could eventually lead to death or personal injury [4]. The absence/substitution of several structural components can be due to the cost associated with the building material. The first cost of a building material is mapped as a high importance level when choosing a building material in a project [5].

b. As for the non-structural components, houses tend to be able to comply by the construction standards.

c. The supporting facilities related to sanitation which are the availability of clean water, drainage system and toilet are still a concern in Indramayu. Health components not being met can lead to health issues that can occur such as respiratory, gastrointestinal, and infectious diseases, and marital stress. These issues can then lead to someone’s poor physical or mental health [4].

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