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# Designing Low-Income Housing Using Local Architectural Concepts

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**Abstract.** The provision of houses for low-income people who do not have a home worthy of being one of the major problems in the city of Gorontalo, because the community in establishing the house only pay attention to their wants and needs in creating a healthy environment, the beauty of the city and the planning of the home environment in accordance with the culture of the people of Gorontalo. In relation to the condition, the focus of this research is the design of housing based on local architecture as residential house so that it can be reached by a group of low income people with house and environment form determined based on family development, social and economic development of society and environment which take into account the local culture. Stages of this research includes five (5) stages, including the identification phase characteristics Gorontalo people of low income, the characteristics of the identification phase house inhabited by low-income people, the stage of identification preference low-income households, the phase formation house prototype and the environment, as well as the stage of formation model home for low-income people. Analysis of the model homes for low-income people using descriptive analysis, Hierarchical Cluster Analysis, and discrimination analysis to produce a prototype of the house and its surroundings. The prototype is then reanalyzed to obtain the model home for low-income people in the city of Gorontalo. The shape of a model home can be used as a reference for developers of housing intended for low-income people so that housing is provided to achieve the goals and the desired target group.

## 1. Introduction

The community is part of the development of the city of Gorontalo as a whole, with a population growth rate of about 2-3% per year. The people of Gorontalo City are based on the socio-economic condition of the community, grouped into three levels of community groups, i.e. high-income communities, middle income and low-income communities. These low-income groups still do not have permanent houses and some still live in undue environments that can disrupt the beauty and spatial layout of Gorontalo City.

Government policies on the development of "Very Simple Homes" and "Simple Homes" (RSS / RS) intended for low-income communities have not fully met the needs of low-income people. This is because part of the community cannot provide the down payment and monthly instalment as a requirement to get the House ownership credit. In addition, various government efforts in cooperation with developers have been implemented in order to meet housing needs for low-income people at affordable prices, but in the construction of housing is not noticed the arrangement and model of the form of houses and infrastructure facilities such as sewerage, septic tank, a garden that formed an irregular and unhealthy housing area and seemed to be slums.



The need for a home for low-income peoples is the target to create a decent and healthy home design based on local architecture so as to create a well-organized and organized residence.

## **2. Research Methodology**

To be able to see the dynamics that occur in the housing needs of low-income communities in the city of Gorontalo with the object of the target is the community group who do not have a house and want to have a decent house, this research is done qualitatively to get the design house with local architecture concept based on the desire of low-income peoples. Data collection methods used in this study with random sampling technique, that is taking sampled data taken randomly from a population of 160 peoples in low-income groups in 9 (nine) regions in the city of Gorontalo.

The stages of this study include five (5) stages, including identification of the characteristic stages of low-income Gorontalo peoples, the identification phase characteristics of houses occupied by low-income households, the identification phase of low-income household preference, the prototype, and environmental phases for low-income peoples. Design analysis of home models for low-income peoples using descriptive analysis, Hierarchical Cluster Analysis, and analytical discrimination to generate a prototype from the house and environment. The prototype was then re-analyzed to get a house model design for low-income peoples in the city of Gorontalo.

## **3. Theoretical Review**

Low-income peoples are groups of peoples who experience long-standing economic, social, cultural and political pressures resulting in a culture called poor culture [1]. The low-income peoples are caught in its poor culture so that the community can no longer see its potential to be developed. Determining the low-income people's group is not easy because of the uncertainty of income [2].

The behavior of low-income people is strongly influenced by external stimuli that are the physical environment and social environment. The physical environment in the form of an environment that is less and minimal while the social environment occurs a very tight competition to fight and even maintain something, so there is a strong internal stimulus in order to fight something and maintain something. This external stimulus takes place within the framework of strong economic pressures. This economic pressure limits the accessibility of low-income communities to environmental facilities and infrastructure [1].

Home as a place of residence is a place used to live and will develop in line with the psychological development, social development of the inhabitants, and economic development so that the house will develop in accordance with the developments in the community where the fulfillment of community needs as the core of human relationships against the desire of a home [3]. The desire for homes is influenced by the level of society that is divided into low-income, middle-income and high-income communities [4]. The condition of low-income people is more concerned with the priority scale of the location of housing close to the workplace than the status of land ownership and the quality of housing [4].

Low-income peoples are more concerned about opportunities than identity and security, increasing the level of life for the community then the community's preference for homes will undergo changes that can lead to changes to the fulfillment of space needs. The fulfillment of home preferences is influenced by housing characteristics consisting of environmental and occupancy characteristics [5] and accessibility factors, achievements (transportation), and distance to urban facilities [6]. Changes that occur in the home are closely related to the stages of family development, especially those associated with changes in the number of family members that will affect the environmental changes, the way family members live in conducting activities in a residential environment [3]. In fact, the culture of low-income communities in meeting the needs of homes will shape their own architecture so that people living with national culture will be able to produce an architecture that has an identity that is the local architecture [7].

Based on the literature review related to housing development for low-income people, it can be concluded that the need for continuous study in the form of housing model for low-income people based

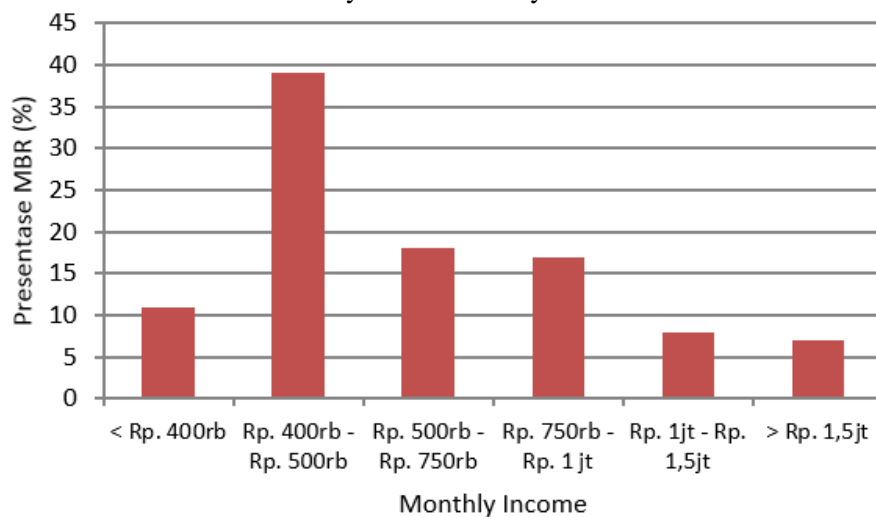
on the analysis of community characteristics and the characteristics of the people's desire for the shape, composition of space and building materials as appropriate with community culture.

**4. Results and Discussion**

A study to obtain an overview of the housing needs of low-income people based on the wishes and family development in Gorontalo City by firstly analyzing the characteristics of the community and identifying the condition of houses inhabited by low-income communities located in the city of Gorontalo.

The Government of Gorontalo City through the Office of Housing and Settlement Housing has classified the community in accordance with income in several levels, ie income below Rp. 2.400.000 belonging to the poor, income between Rp. 2,400,000 up to Rp. 4,200,000 belong to a low-income community (MBR), and income above Rp. 4,200,000 belong to non-MBR. However, based on the Central Bureau of Statistics of Gorontalo City 2014, the category of poor people on the poverty line with monthly income is between Rp. 400,000 up to Rp. 500.000 so from the data obtained then the priority of providing homes for low-income people who have monthly income less than Rp. 1,000,000.

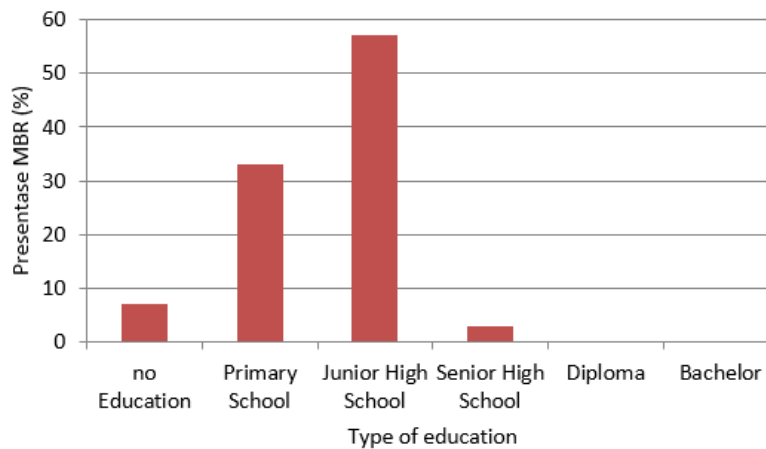
The survey results show the percentage of average monthly income of low-income peoples (Figure.1) affected by the job (figure.2) and the level of education (figure.3) due to the increasing skill gained from education can affect the income received by the community low-income.



**Figure 1.** Percentage of Monthly Income for Low-Income Communities in Gorontalo City  
Source: Field survey results



**Figure 2.** Percentage of Type of Work for Low-Income Communities in Gorontalo City  
Source: Field survey results



**Figure 3.** Percentage of Type of Education for Low-Income Communities in Gorontalo City  
Source: Field survey results

The house needs for low-income communities in Gorontalo City are influenced by socio-economic level and differences in community characteristics to the needs of the community at the level of needs of space functions, the extent of space and building materials. The level of requirement for the function of the space is adjusted to the activities performed routinely from day to day by low-income communities, so that will form a difference with the desire of spatial function in every family that exist in low-income communities. The results of the survey show that families in low income communities are required to meet the needs of space functions in the bedroom and family room due to the location of sleeping space according to Gorontalo culture can determine the smoothness of sustenance for residents while the family room is used as a place of family deliberation before an event. For the function of the dining room and living room should not have its own space because the existing activities in the dining room and living room can be done in another room that is in the family room. It can create a configuration of space functions in maximizing space utilization for some activities.

The character of society towards the extent of space occurs because to accommodate all sorts of activities undertaken by low-income communities. Space needs are influenced by the activity and the number of space users, so that with the number of activities and the number of users ie family members then the needs of the extent of space in the house more spacious. In addition, the space requirement is influenced by grouping of space functions so that the number of spatial functions present in one space causes the overall area of space to increase. The formation of the extent of space is adjusted by the socio-economic conditions of low income communities in Gorontalo City.

The need for building materials is the character of low-income communities in meeting the overall quality of the house. Interior and exterior quality at home can be formed well due to the quality of building materials and the availability of building materials in the area so that the needs of building materials is closely related to the use of building materials on walls, floors, ceilings, roofs and frames. The availability of building materials in the area provides similarities in the use of building materials such as coconut wood for roof trusses, batako and wooden boards / triplex for walls, zinc for roof coverings. The similarity of use of building materials to low-income houses in the city of Gorontalo shows the same level of importance to the home as a residence to protect against all kinds of disturbance. The use of building materials especially local building materials not only as a complementary material but will make as an aesthetic element that can reflect as Gorontalo architecture.

Based on the economic level on the community and the character of society on the function of space, the extent of space and building materials then created a home configuration that will be used as a benchmark in determining the design of the house. Configuration of the house as a result of the desired analysis by low-income communities in accordance with economic level, space function, the extent of space and building materials (table 1).

**Table 1.** The configuration of the house for Low-Income Communities in Gorontalo City.

No	Socio-Economic Condition	Space Needs	Building Material Needs	Home Configuration
1	<ul style="list-style-type: none"> <li>▪ Income Rp. 400rb-Rp. 750ribu</li> <li>▪ Type Education No education and Primary School</li> <li>▪ Type Job Labor, Farmers, Breeders, <i>Tukang Bentor</i></li> </ul>	<ul style="list-style-type: none"> <li>▪ Living Room + Business Room Uk. 6 – 9 m<sup>2</sup></li> <li>▪ Family Room + The dining Room Uk. 6 – 12 m<sup>2</sup></li> <li>▪ Bedroom Uk. 6 – 9 m<sup>2</sup></li> <li>▪ Kitchen Uk. 4 – 6 m<sup>2</sup></li> <li>▪ Bathroom Uk. 3 – 4 m<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>▪ Floor Ceramics 30x30</li> <li>▪ Wall Batako</li> <li>▪ <i>Kusen Kayu kelas 3</i></li> <li>▪ Plafond Triplex</li> <li>▪ Roof Seng</li> </ul>	
2	<ul style="list-style-type: none"> <li>▪ Income Rp. 750rb-Rp. 1jt</li> <li>▪ Type Education Junior High School and Senior High School</li> <li>▪ Type Job Shopkeeper, Entrepreneur</li> </ul>	<ul style="list-style-type: none"> <li>▪ Business Room Uk. 6 – 9 m<sup>2</sup></li> <li>▪ Living Room Uk. 6 – 9 m<sup>2</sup></li> <li>▪ Family Room Uk. 9 – 12 m<sup>2</sup></li> <li>▪ The dining Room + Kitchen 6 – 9 m<sup>2</sup></li> <li>▪ Bedroom Uk. 9 – 12 m<sup>2</sup></li> <li>▪ Bathroom Uk. 3 – 6 m<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>▪ Floor Ceramics 30x30</li> <li>▪ Wall Batako</li> <li>▪ <i>Kusen Kayu kelas 2</i></li> <li>▪ Plafond Triplex</li> <li>▪ Roof Seng</li> </ul>	
3	<ul style="list-style-type: none"> <li>▪ Income Rp. 1jt – Rp. 1,5jt</li> <li>▪ Type Education Junior High School and Senior High School</li> <li>▪ Type Job Shopkeeper, Merchants, Entrepreneur</li> </ul>	<ul style="list-style-type: none"> <li>▪ Business Room Uk. 6 – 9 m<sup>2</sup></li> <li>▪ Living Room Uk. 6 – 9 m<sup>2</sup></li> <li>▪ Family Room Uk. 9 – 12 m<sup>2</sup></li> <li>▪ The dining Room 6 – 9 m<sup>2</sup></li> <li>▪ Bedroom Uk. 9 – 12 m<sup>2</sup></li> <li>▪ Kitchen Uk. 6 – 9 m<sup>2</sup></li> <li>▪ Bathroom Uk. 3 – 6 m<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>▪ Floor Ceramics 40x40</li> <li>▪ Wall Batako</li> <li>▪ <i>Kusen Kayu kelas 2</i></li> <li>▪ Plafond Triplex</li> <li>▪ Roof Seng</li> </ul>	
4	<ul style="list-style-type: none"> <li>▪ Income &gt; Rp. 1,5jt</li> <li>▪ Type Education Senior High School</li> <li>▪ Type Job Merchants, Entrepreneur</li> </ul>	<ul style="list-style-type: none"> <li>▪ Business Room Uk. 6 – 9 m<sup>2</sup></li> <li>▪ Living Room Uk. 6 – 9 m<sup>2</sup></li> <li>▪ Family Room Uk. 9 – 12 m<sup>2</sup></li> <li>▪ The dining Room 6 – 9 m<sup>2</sup></li> <li>▪ Bedroom Uk. 9 – 12 m<sup>2</sup></li> <li>▪ Kitchen Uk. 6 – 9 m<sup>2</sup></li> <li>▪ Bathroom Uk. 3 – 6 m<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>▪ Floor Ceramics 40x40</li> <li>▪ Wall Batako</li> <li>▪ <i>Kusen Kayu kelas 2</i></li> <li>▪ Plafond Triplex</li> <li>▪ Roof Seng</li> </ul>	

Fulfilling the needs of homes for low-income people is a target to do a decent home design and healthy design based on local architecture so as to create a residential area arranged neat and organized and cultured. Configuration of the house is the result of the desire of low-income people so that the composition of the space provided a reflection of the thinking needs of the community. Thus the process of creation in architecture, especially homes for low-income people must see the needs and conformity with the environment of the community so that the needs of society into consideration in realizing the physical form of culture.

## 5. Conclusion

The desire of low-income communities in Gorontalo City to the needs of decent and healthy homes greatly affect the development of life perspective both in terms of socio-economic and cultural life. The development of housing needs for low-income people is adjusted to varying socio-economic conditions based on the level of income earned from employment and the educational background of the community. Low-income communities in Gorontalo City are more dominated by working as laborers, traders, *Tukang Bentor*, and entrepreneurs with education level only to elementary and junior high school so that the income earned per month is very minimal that is between Rp. 400,000 up to Rp. 750,000.

Socioeconomic conditions and character of the society towards the function of space, the extent of space and building materials that exist in low-income communities will affect the needs of space in designing a home model that will create a variety of home form configuration needed by low-income communities. The character of the society on the function of space has a clear relationship with the space extent, so less the provision of space function in the house to accommodate family activities then the need for the extent of space in each space will increase. The desire for space for a low-income house can be grouped by main activities and additional activities. The main activity is based on the routine that the low-income peoples always do, such as family rooms, bedroom, kitchens and bathroom so that the rooms can reflect the daily culture of the society in Gorontalo in general. Additional activities as a sparse activity so that existing space will be able to accommodate some activities, such as receiving guests and eating activities can be done in the family room or can be used as a place of business in increasing revenue.

The form of house model that is allocated for the low-income peoples in Gorontalo city is classified based on socio-economic condition, namely (1) house form using the same space function by combining living room function with business room, kitchen function with dining room and combine dining room function with family room, (2) house form which has been done separation of spatial function based on activity type done by low income peoples. The forms of house models provided for the low-income communities must be adapted to the local physical form so that they reflect local architecture as a pride for the people of Gorontalo.

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