Volume 10, Issue 2, February – 2025 International Journal of Innovative Science and Research Technology
ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

Study of Housing Needs Backlog in Palu City

Muhammad Farid[1]; Nirmalawati[2]; Arief Setiawan[3]

[1;2;3]Department of Civil Engineering, Tadulako University, Palu, Indonesia

Publication Date: 2025/02/26

Abstract: Housing, clothing, and food constitute fundamental human needs, indicating that all individuals require a residence or living space. On September 28, 2018, a natural disaster manifested as a 7.4 magnitude earthquake on the Richter scale, subsequently accompanied by a tsunami and liquefaction. The disaster impacted housing and settlements in the city of Palu. This study seeks to identify the backlog and its characteristics in the city of Palu. This research employs a quantitative descriptive methodology. The methods for data collection encompass observation activities, literature review, interviews, questionnaires, and documentation. This study employs backlog occupancy analysis and descriptive statistical analysis as its data analysis techniques. The findings of this study indicate that the housing backlog in the City of Palu comprises 9,558 units in East Palu District, 4,911 units in West Palu District, 2,687 units in South Palu District, 659 units in Ulujadi District, and 656 units in Tawaeli District. Currently, Tatanga, Mantikulore, and North Palu Districts exhibit no backlog, indicating that the supply of available houses meets demand. The examination of backlog characteristics reveals an average indicator value of 3.25 for the price variable, 3.56 for the location variable, and 3.11 for the facility variable. This suggests that the residents of the City of Palu seek enhancements and modifications to policies concerning housing prices, locations, and available facilities within the city.

Keywords: *Housing, Backlog, Palu City.*

How to Cite: Muhammad Farid; Nirmalawati; Arief Setiawan (2025). Study of Housing Needs Backlog in Palu City. *International Journal of Innovative Science and Research Technology*, 10(2), 670-682.
https://doi.org/10.5281/zenodo.14928736

I. INTRODUCTION

According to home appropriateness requirements, everyone is deemed to have the same degree of need. Everybody believes that having a home is essential to the sustainability of their lives. The requirement for housing that is in line with societal conditions and preferences, where each individual has varying financial capabilities, is known as housing demand. Every individual is thought to have varying degrees of capacity to obtain housing when discussing housing demand (Yulinda Rossa, 2013). In the meantime, housing supply considerations also affect the availability of housing stock in addition to demand, according to Joesron et al. (2003). The cost of new housing determines how much is available. The cost of manufacturing elements and technological factors that affect building costs have an impact on the supply of new dwellings. Furthermore, new home offers that is, complete expansions to the housing stock are also gross investments.

On September 28, 2018, a natural disaster occurred, characterized by a 7.4 magnitude earthquake on the Richter Scale, subsequently resulting in a tsunami and liquefaction. The earthquake's epicenter was located 26 km north of Donggala and 80 km northwest of Palu City, at a depth of 10 km. The tragedy resulted in the loss of 1,784 dwellings in Palu City, with 2,158 houses sustaining severe damage, 1,484 houses experiencing moderate damage, and 2,175 units incurring minor damage. In Sigi Regency, 12,657 dwellings had severe damage, 9,219 buildings incurred moderate damage, and 9,712 houses experienced minor damage. In Donggala Regency, 7,989 dwellings sustained severe damage, 6,099 buildings incurred moderate damage, and 3,643 houses experienced minor damage. The construction of subsidized housing in Central Sulawesi is predominantly focused around Palu City and its vicinity, along with Sigi Regency. Simultaneously, in other regions, the construction of housing for low-income individuals (MBR) continues to encounter numerous challenges, particularly with inadequate basic infrastructure, given that Central Sulawesi is characterized by its valley and rocky terrain.

As mentioned in the Housing Sector Strategic Plan (Renstra) and the Medium Term Development Plan (RPJMN), the housing backlog is one of the metrics used by the government to measure the number of housing demands in Indonesia. The occupancy side and the ownership side are two ways to look at home backlog. The backlog can be defined as the disparity between the quantity of buildings constructed and the quantity required by the population. In this context, the number of unfulfilled residences is called a backlog.

This research will analyze the housing backlog in Palu City and ascertain the features of the backlog itself. The author selected the research title "Study of Housing Needs in Palu City" as indicated in the description above.

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

This study has two primary goals: (1) to determine the backlog or housing needs in Palu City, and (2) to determine the characteristics of the backlog or housing needs in Palu City. Both of these objectives serve as the basis for this research.

II. LITERATURE REVIEW

A. Settlement Areas and Housing

Housing, as defined by Law 1 of 2011 on Housing and Settlement Areas, is a collection of houses that are part of settlements, both urban and rural, and are equipped with public infrastructure, facilities, and utilities in order to provide habitable housing. Concurrently, a settlement is a component of a residential environment that encompasses multiple housing units, public utilities, infrastructure, and other functional activities in urban or rural spaces.

In general, policies regarding housing development are intended to:

- Providing enough and affordable housing in a healthy and safe environment with sustainable infrastructure, facilities, and public utilities that represent Indonesian lifestyles.
- Low-cost, long-term finances are available to address the demands of dwellings, housing, settlements, and urban and rural residential areas.
- Making homes that are well-balanced and aesthetically pleasing through strategic land use and efficient spatial planning;
- Offering use rights while protecting the sovereignty of states
- Promote foreign investment

The optimal form of urban settlement necessitates a thorough response, as housing and settlements pertain to human existence, encompassing diverse human needs. Sinulingga (2005) articulated the essential criteria for a settlement, stipulating that it must fulfill the following requirements:

- The site is well-situated to avoid interference from nearby industries that are known to contribute to air and other forms of environmental contamination.
- Access to service hubs, including education, healthcare, and trade.
- Provides efficient drainage to prevent puddles even during heavy rains.
- Provides clean water through a distribution network to each dwelling.
- Outfitted with facilities for handling unclean water, such as septic tanks and seepage fields for individual systems or shared septic tanks for communal use.
- Regular garbage disposal facilities are necessary for maintaining a comfortable living environment.
- The settlement is equipped with public amenities, including playgrounds for children, fields or parks, places of worship, education, and health, in accordance with its size.
- Provided with access to electrical and telephone networks.

B. Definition of Housing Backlog

Backlog refers to an accumulation of unfinished work, unprocessed materials, and unfulfilled orders for goods or services. According to Muh. Dimyati (2010), the housing backlog is defined primarily as a shortage of houses. It is not essential for these houses to have accompanying environmental infrastructure and facilities, although they should ideally be equipped with such amenities. The terms 'equipped' and 'with or part of' will yield significantly different derivative consequences in implementation, affecting not only costs but various other factors as well. Housing backlog refers to the discrepancy between the quantity of houses constructed and the demand for housing among the population. The housing backlog refers to the quantity of houses that have not been addressed or managed. The housing backlog is determined by the principle of one housing unit allocated per household or family head.

In the document The Role of the APBN in Overcoming the Housing Backlog for Low-Income Communities (MBR), the Directorate General of Budget, Ministry of Finance (2015:3) is cited. The housing backlog figure is influenced by the number of households, which is indicative of the number of houses that are required by the population, and the number of houses that can be constructed or provided. The data available allows for the projection of household growth for the next few years, as the number of households will increase annually. In the meantime, the quantity of houses that are available is significantly impacted by government policy in the development sector, which dictates the maximum number of houses that can be constructed by both the government and the private sector (developers). Every year, the housing backlog will increase if government intervention through housing policy or direct house construction is unable to maintain pace with the rate of household growth.

C. Backlog Calculation Concept

The rules and policies of a country significantly influence the backlog calculation model. The rules and policies that are referenced in this discussion are considered primary in nature, as it pertains to the relevant housing law. According to Law Number 1 of 2011, which pertains to housing and residential area policies, the community actively participates in the provision of housing. Consequently, each household remains accountable for housing. The government continues to provide a limited number of subsidies for housing provision. First, it is imperative to establish the fundamental concept as a reference, whether it be a single housing unit for a single household or a single head of family (Yulinda Rossa: 2013). This will then determine the backlog calculation model. As a result of the selection of this fundamental concept, the backlog calculation model will be influenced. There are two distinct categories of home backlog model formulations that will be described below:

- *Household Concept.*

The definition of a household is categorized into:

- A person or group of people who inhabit part or all of a physical structure or home, and who typically live together and eat from the same kitchen, is referred to as an ordinary

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

household. For the most part, homes are made up of a mother, a father, and their children. However, in addition to that, the following are also considered to be examples of regular families:

- ✓ Someone who rents a room or part of a census building but takes care of the meals themselves.
- ✓ Families who live separately in two census buildings but eat from the same kitchen, as long as the two census buildings are in the same census block.
- ✓ Lodgings with meals (indekost) where there are less than 10 people staying. Lodgers are considered members of their host's household.
- ✓ Several people who live together in one room in a census building even though they take care of their own food are considered to be an ordinary household.

- Special Households, which are included/considered as special households, include:

- ✓ People who live in dormitories, namely residences where the management of their daily needs is regulated by a foundation or agency, for example, nurses' dormitories, TNI and POLRI dormitories. TNI and POLRI members who live with their families and take care of their own daily needs are not special households.
- ✓ People living in correctional institutions, orphanages, detention centers.
- ✓ A group of people who board and eat (boarding house) whose number is greater than or equal to 10 people.

Based on this definition, one household can consist of several family heads. As an illustration, several heads of families who live in a dormitory using a shared kitchen and bathroom need to be excluded from the backlog calculation, because they are one household, and their need for housing has been met. Apart from that, people who live in boarding houses or shared rentals, where they use a shared bathroom and/or kitchen are not included in the backlog calculation.

➢ *Head of Family Concepts.*

The head of the family is defined as a nuclear family comprising a mother, father, and children. The typical family consists of four individuals. Consequently, in the absence of data regarding the number of family heads, an estimation is made by dividing the population by four individuals.

III. METHODOLOGY OF RESEARCH

The methodology of quantitative descriptive research combined with an approach to secondary data analysis is utilized by the author in this study. A technique known as secondary data analysis is one that makes use of secondary data as the primary source of information. It was said by Narbuko et al. (2015) that descriptive research is research that makes an effort to provide solutions to existing problems based on data by presenting, evaluating, and interpreting the data. In the meantime, Indrawan and Yaniawati (2016) state that the quantitative method is the effort that a researcher makes to obtain numerical data. Following this, the numerical data is processed by means of statistical working formulae, and the results are obtained from variables that have been operationalized, employing a particular measuring scale during the process.

A. Scope of Activities

Palu City, the provincial capital of Central Sulawesi, is the site of this study. Palu City government's administrative area spans 395.06 km², with 8 sub-districts and 46 sub-districts making up the total.

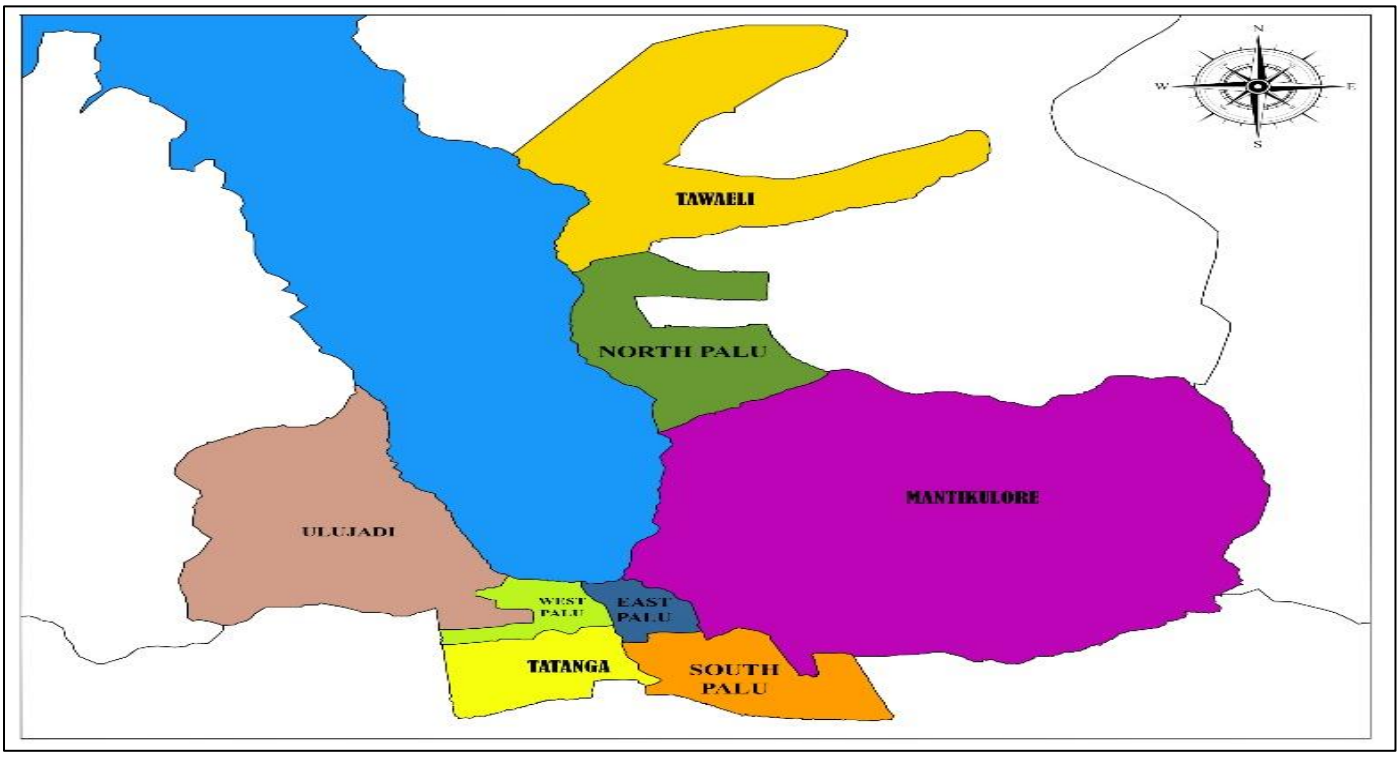

Fig 1 Map of Palu City Administrative Area

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

B. Method of Data Collecting

Data gathering approaches employed in this study include:

- Observation serves as a method for gathering data through the meticulous examination and documentation of particular objects or phenomena.
- Literature review is a research methodology that involves the collection and analysis of data from diverse written sources.
- An interview serves as a method for gathering data through a dialogue consisting of questions posed by the interviewer and responses provided by the informant.
- Questionnaire is a data gathering method that uses a set of questions/statements prepared for each respondent.
- Documentation is a data collection method that entails locating and assembling documents pertinent to the inquiry. The documents may consist of textual texts, photographs, or electronic files.

C. Analysis Techniques

The first stage of this research involved the compilation of the collected data. Subsequently, the factors that increase the demand for housing (housing demand) and those that reduce the supply of housing (housing supply) were calculated. Finally, a housing backlog analysis was conducted (housing backlog). Backlog analysis is employed in this research from a residential perspective, with the concept of Head of Family.

$$\text{Backlog} = \Sigma \text{ Head of Family} - \Sigma \text{ Total Household}$$

Following the acquisition of the backlog figure, the process of determining the characteristics of the backlog is carried into the next step. In order to carry out the identification process, questionnaires are first distributed to respondents who satisfy the backlog criteria. Following this, the findings of the questionnaire are processed by means of descriptive statistics, namely the average frequency distribution. In order to describe the frequency distribution and the average of the responses that respondents gave to the variable items that were investigated, this statistic is utilized.

IV. RESULTS AND DISCUSSION

A. Social Conditions of the Population in Palu City

Table 1 Number and Rate of Population Growth in Palu City, 2021

No	Subdistrict	Population (People)	Population Growth Rate Per Year (%)
			2010-2020
1.	East Palu	43.441	0,48
2.	Mantikulore	77.949	1,77
3.	North Palu	24.716	1,25
4.	South Palu	72.674	1,05
5.	Tatanga	53.270	1,51
6.	Tawaeli	22.900	1,67
7.	Ulujadi	35.536	1,57
8.	West Palu	46.544	0,43
	Palu City	**377.030**	**1,22**

According to Table 1, the district with the highest population is Mantikulore District, which has 77,949 people, while the district with the lowest population is Tawaeli District, which has 22,900 people. To determine the rate of population growth in Palu City throughout the period of 2010-2020. Among the districts, Mantikulore District had the highest population growth rate, which was 1.77%, while West Palu District had the lowest population growth rate, which was 0.43%.

Table 2 Population Density in Palu City 2021

No	Subdistrict	An area	Population	Population density
		km²	people	people/km²
		(a)	(b)	(c = b/a)
1.	East Palu	7,71	43.441	5.634
2.	Mantikulore	206,80	77.949	377
3.	North Palu	29,94	24.716	826
4.	South Palu	27,38	72.674	2.654
5.	Tatanga	14,95	53.270	3.563
6.	Tawaeli	59.75	22.900	383
7.	Ulujadi	40,25	35.536	883
8.	West Palu	8,28	46.544	5.621
	Palu City	**395,06**	**377.030**	**954**

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

According to Table 2, the district with the highest population density is East Palu District, which has 5,634 people per square kilometer, while the district with the lowest population density is Mantikulore District, which has 377 people per square kilometer.

B. Backlog Analysis of Housing Needs in Palu City

This research employs backlog analysis from a residential perspective, utilizing the concept of Head of Family. The backlog analysis in Palu City is presented in table form as follows for a more comprehensive description:

Table 3 Occupancy Backlog Analysis in Palu City 2021

No	Subdistrict	An area (km^2) (a)	Population (People) (b)	Number of family heads (c)	Population Ratio (d = b/c)	Population density (people/km^2) (e = b/a)	Number of Houses (Units) (f)	Backlog (Units) (g = c-f)
1	West Palu	8,28	46.544	14.600	3	5.621	9.689	4.911
2	Tatanga	14,95	53.270	10.705	5	3.563	11.663	-958
3	Ulujadi	40,25	35.536	7.011	5	883	6.352	659
4	South Palu	27,38	72.674	18.655	4	2.654	15.968	2.687
5	East Palu	7,71	43.441	15.888	3	5.634	6.330	9.558
6	Mantikulore	206,8	77.949	14.822	5	377	15.036	-214
7	North Palu	29,94	24.716	4.856	5	826	5.149	-293
8	Tawaeli	59,75	22.900	4.624	5	383	3.968	656
Palu City		**395,06**	**377.030**	**91.161**	**4**	**954**	**74.155**	**18.471**

If you look at Table 3 the total housing need or backlog in the city of Palu is 18,471 units, where the highest housing need or backlog is in East Palu District, namely 9,558 units, where the number of heads of families who need a house is 15,888 families, while the available houses are 6,330 units. Meanwhile, the need for housing or the lowest backlog is in Tawaeli District, namely 656 units, where the number of heads of families who need a house is 4,624 families while the available houses are 3,968 units. In the Tatanga, Mantikulore and North Palu sub-districts, there is no need for houses or backlog because the number of heads of families who need houses is less than the number of houses available. Figure 4.1 depicts the spatial distribution of the housing backlog in Palu City.

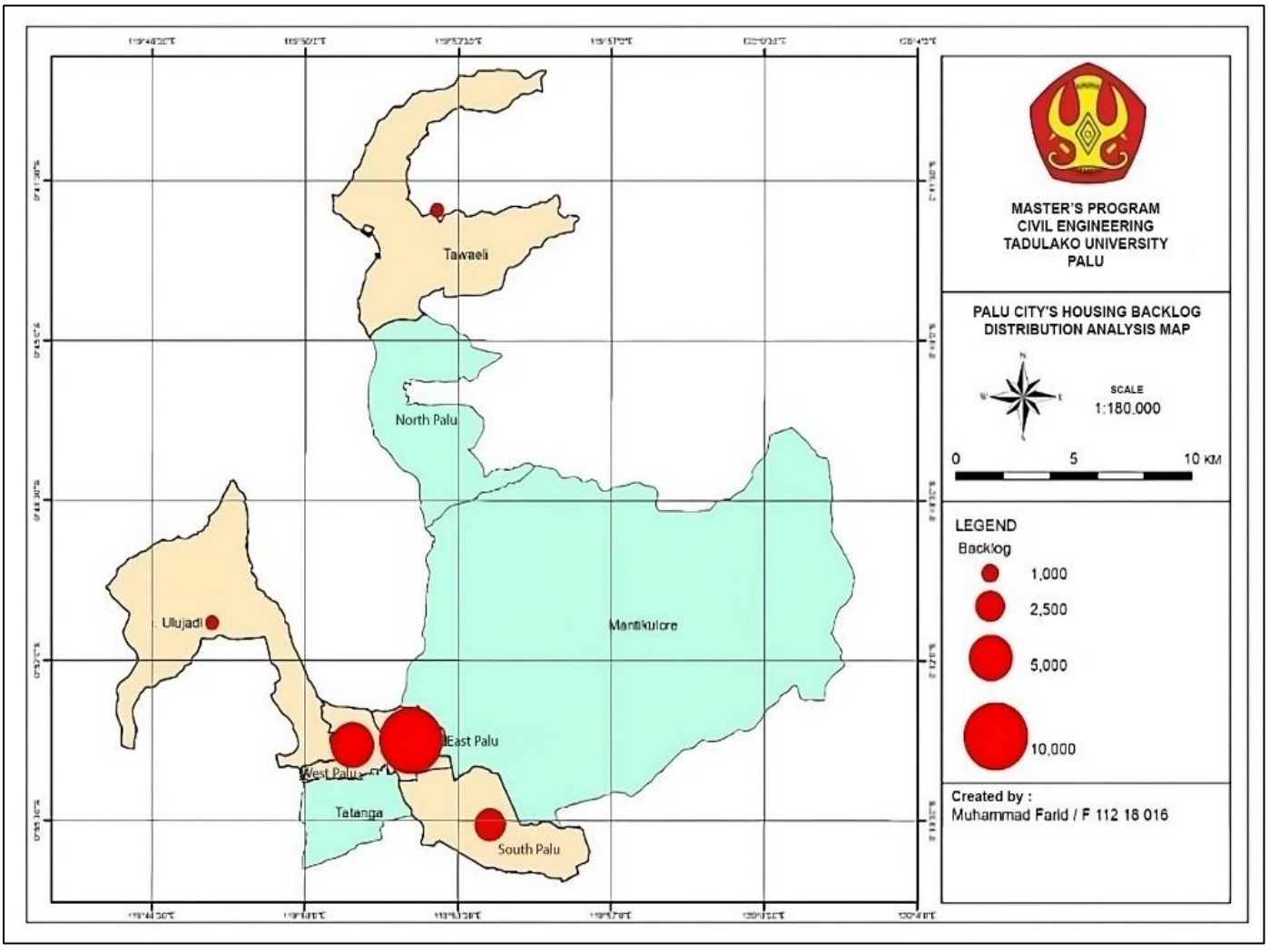

Fig 2 Distribution Map of Backlog Analysis in Palu City

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

The East Palu District exhibits the highest backlog, totaling 9,558 units. It encompasses the smallest area within the city of Palu, measuring 7.71 km², which constitutes 1.95% of Palu's total area, and has the highest population density at 5,634 individuals per km². The districts of Tatanga, Mantikulore, and Tawaeli exhibit no backlog or significant housing needs. The Mantikulore District in Palu exhibits significant potential for residential development, encompassing a land area of 206.8 km², representing 52.35% of Palu City's total area. The district contains a residential area of 63.45 km² and has the lowest population density in the city, recorded at 377 people/km².

Due to data limitations, the backlog calculation in this study only takes into account the comparison of the number of households (KK) and the availability of built houses with the occupancy concept. The author offers a relevant and specific backlog calculation model for the city of Palu, citing the Housing Need Backlog: Overview, South Hampshire Housing Market Assessment. 2005 model in Yulinda Rossa (2013). The following image illustrates the calculation algorithm:

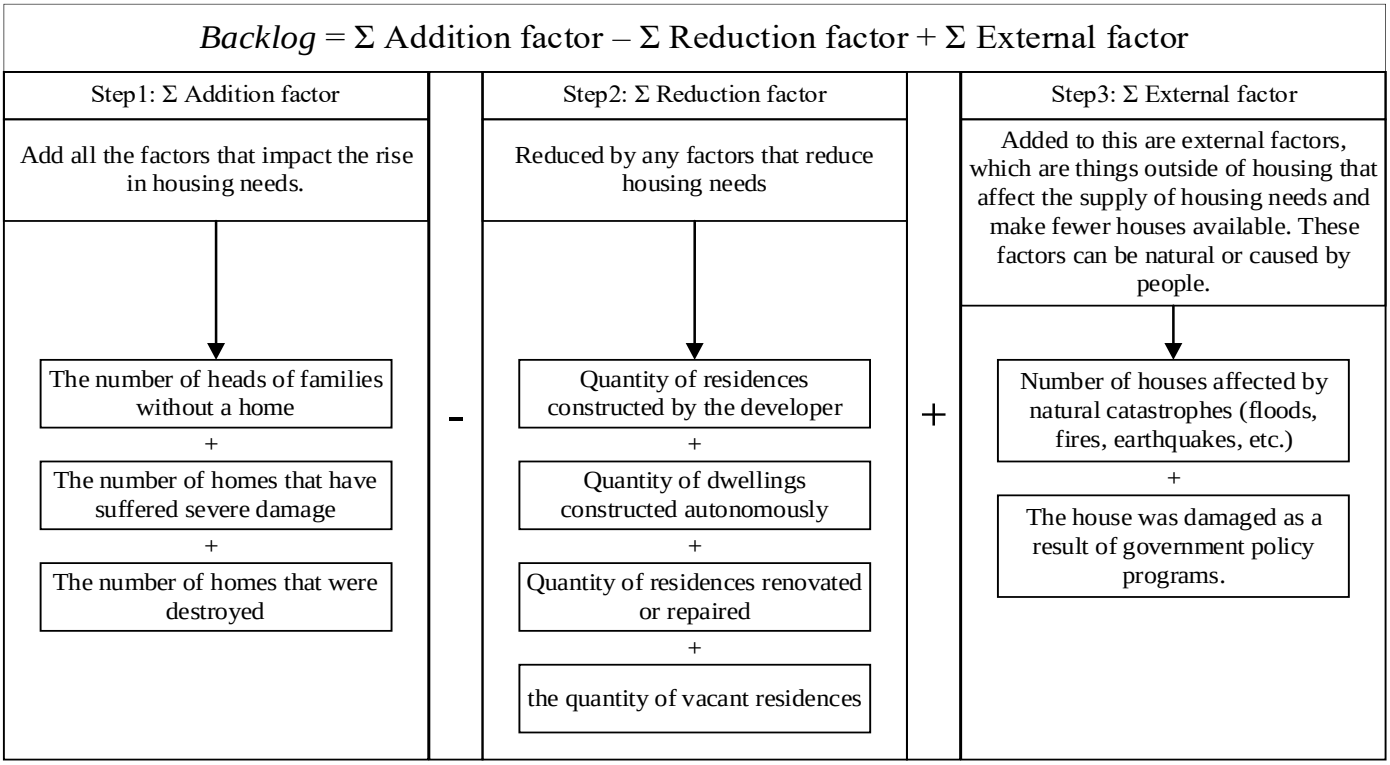

Fig 3 Recommended Backlog Calculation Model

C. Backlog Characteristics

➢ *Population to Determine the Characteristics of the Backlog*

The following table shows the population used to establish the characteristics of the backlog, namely the number of backlogs in each sub-district of the city of Palu.

Table 4 Backlog in the City of Palu by District

No	Subdistrict	Backlog
1.	East Palu	9558
2.	Mantikulore	0
3.	North Palu	0
4.	South Palu	2687
5.	Tatanga	0
6.	Tawaeli	656
7.	Ulujadi	659
8.	West Palu	4911
	Palu City	18.471

➢ *Sample to Determine the Characteristics of the Backlog*

The Slovin formula is used to estimate the sample size in order to identify the characteristics of the backlog. This is done because the number that is sampled needs to be representative in order for the findings of the research to be able to be generalized. The following is the Slovin formula for determining the appropriate size of the sample:

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

$$n = \frac{N}{1 + Ne^2}$$

With the value of *n* representing the sample size, *N* representing the population size from which the sample is drawn, and the value of *e* being the allowed margin of error (set at 10%, with a confidence level of 90%).

Based on this formula, the following sample is obtained:

$$n = \frac{18.471}{1+18.471(0.1)^2} = 99{,}46 \sim 100 \text{ respondents}$$

The known sample size will be used to estimate the percentage of the sample size for each sub-district. Eight sub-districts comprise the population used for the backlog: Mantikulore, North Palu, Tawaeli Districts, West Palu, Tatanga, Ulujadi, South Palu, East Palu, and East Palu. Each sub-district's research sample size is determined using the following formula:

$$ni = \frac{Ni}{N}\ x\ n$$

In this context, *ni* denotes the sample size within the i-th stratum/unit, *Ni* indicates the population size of the i-th stratum/unit, *N* represents the total population size, and *n* signifies the overall sample size.

The subsequent sample proportions are presented in the table below.

Table 5 Proportion of Backlog Samples in Palu City According to District

No	Subdistrict	Total Population	Total Sample
1.	East Palu	9558	52
2.	Mantikulore	0	0
3.	North Palu	0	0
4.	South Palu	2687	15
5.	Tatanga	0	0
6.	Tawaeli	656	4
7.	Ulujadi	659	4
8.	West Palu	4911	27
	Palu City	18.471	100

➢ *Respondent Profile*

In general, the respondent profile to determine the characteristics of the backlog in Palu City includes age, education, occupation, income, number of family members and place of residence which can be explained as follows:

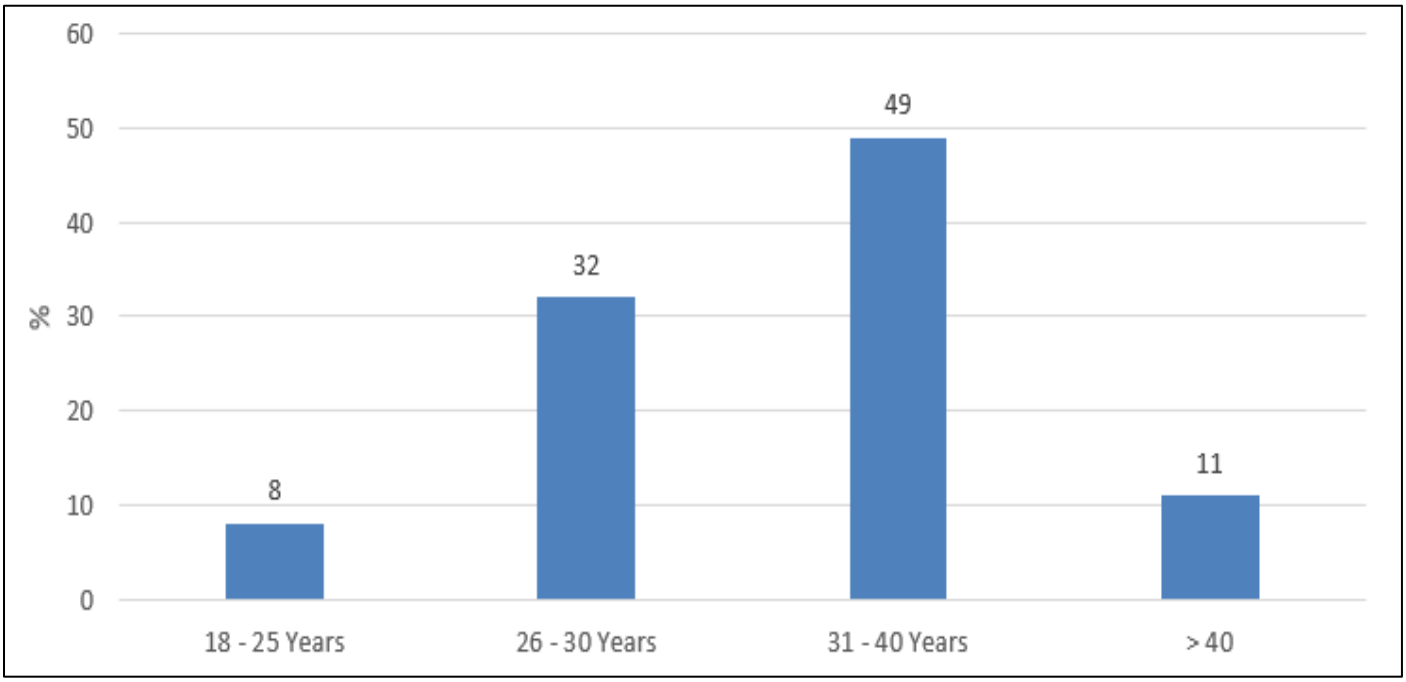

Fig 4 Respondent Profile Based on Age Group

Figure 3 illustrates that the majority of respondents meeting the backlog criteria are aged 31-40 years, comprising 49%. This is followed by the 26-30 age group at 32%, those over 40 years at 11%, and finally, the 18-25 age group at 8%.

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

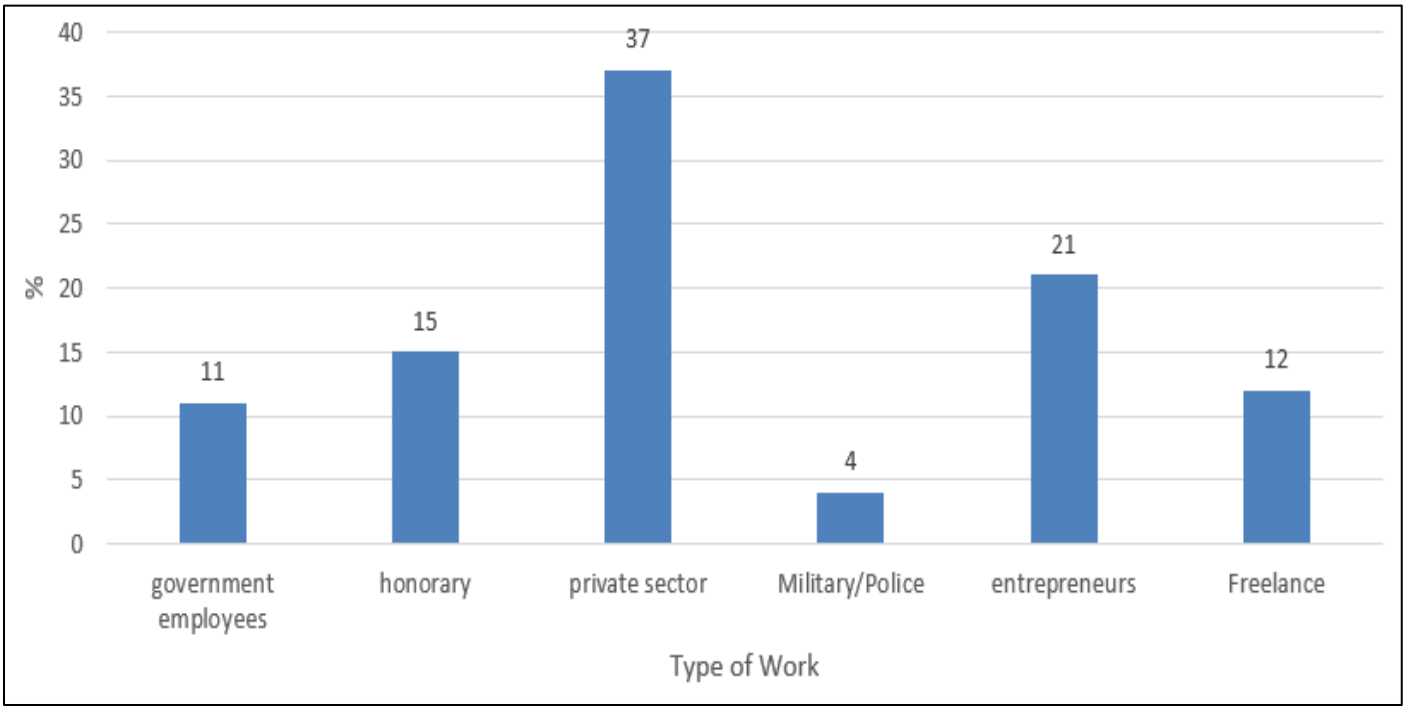

Fig 5 Profile of Respondents Based on Type of Work

It can be seen from Figure 5 that the respondents who meet the backlog criteria based on the type of work they do have jobs in the private sector the majority of the time, with a percentage of 37%. Following that, the respondents are entrepreneurs with a percentage of 21%, honorary with a percentage of 15%, freelancers with a percentage of 12%, government employees with a percentage of 11%, and finally, military and police personnel with a percentage of 4%.

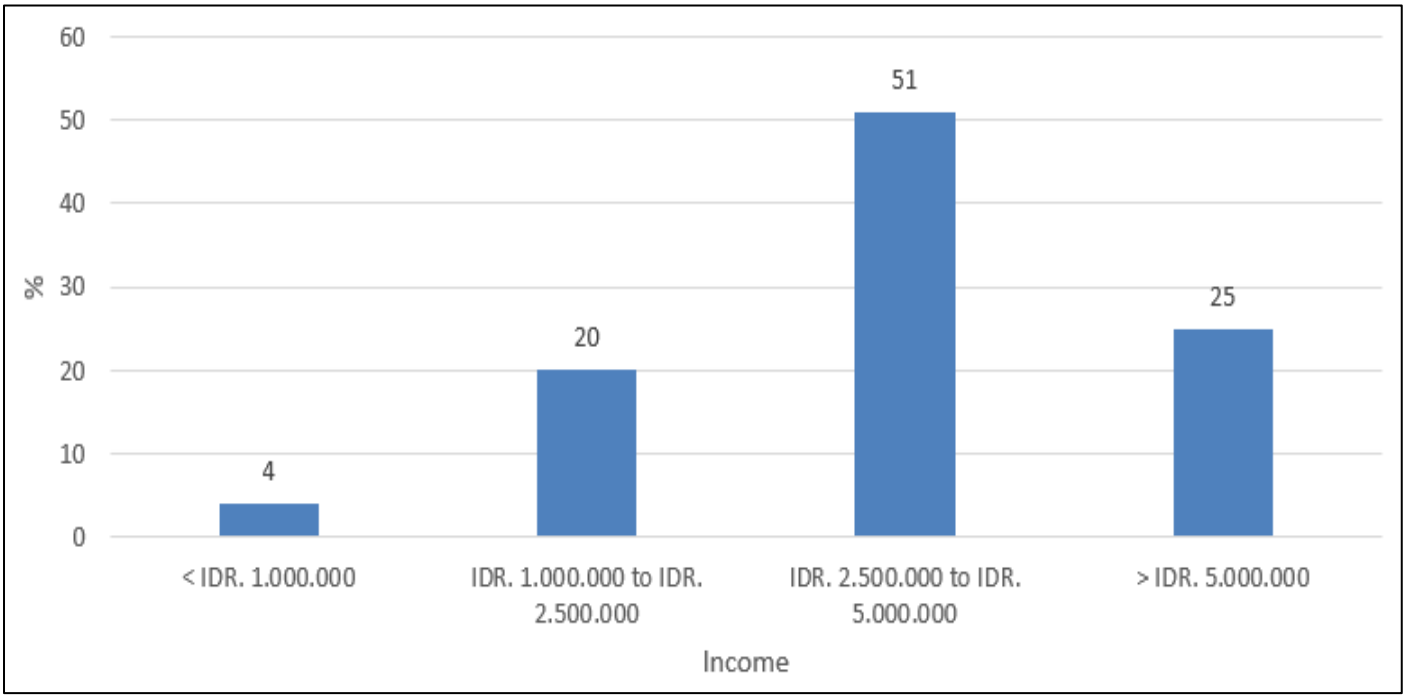

Fig 6 Respondent Profile Based on Income

Figure 5 reveals that among the respondents who meet the backlog criteria based on income, the majority have an income that falls between IDR. 2.500.000 and IDR. 5.000.000, with a percentage of 51%. This is followed by an income that is greater than IDR. 5.000.000, with a percentage of 25%. Following that, respondents with an income between IDR. 1.000.000 and IDR. 2.500.000 have a percentage of 20%, and those with an income less than IDR. 1.000.000 have a percentage of 4%.

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

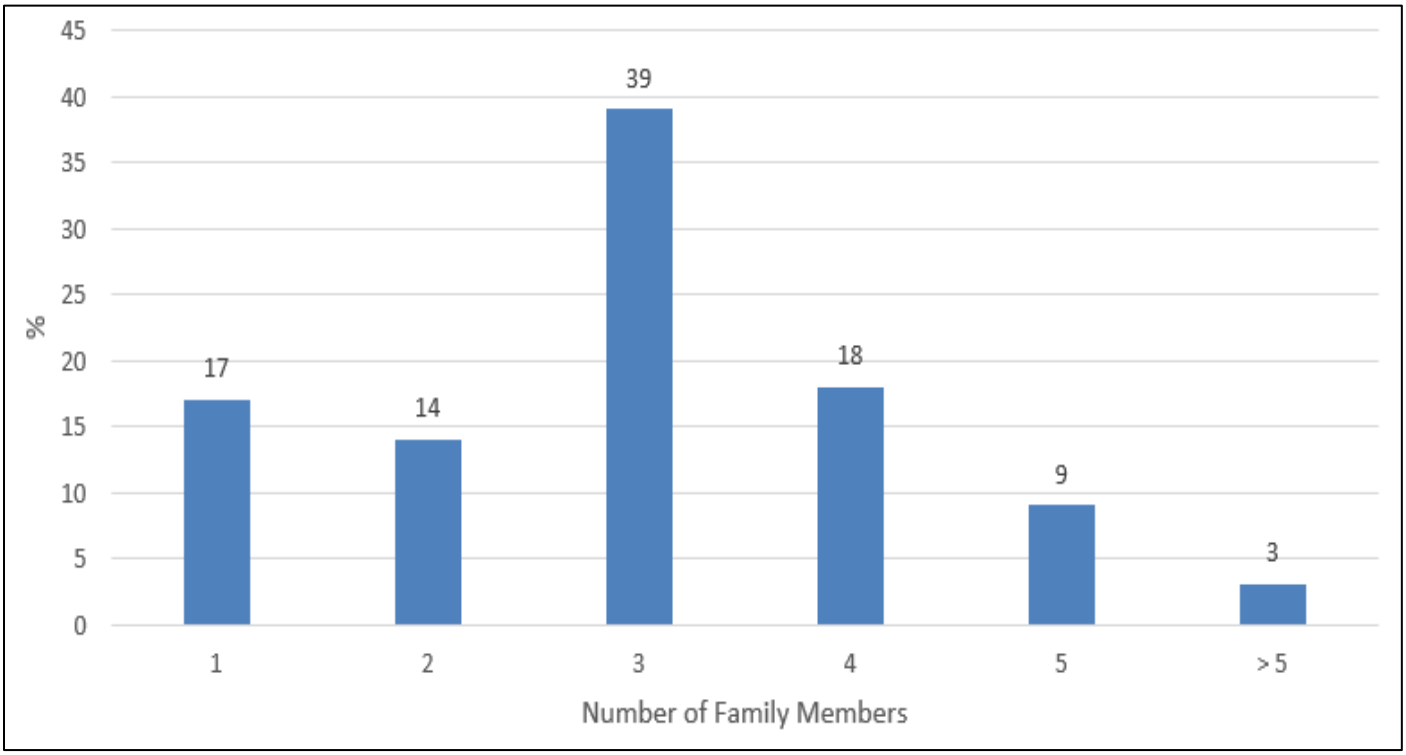

Fig 7 Respondent Profile Based on Number of Family Members

Figure 6 illustrates that respondents categorized under the backlog criteria exhibit a diverse range of family member counts. A significant portion of the respondents, specifically 39%, consist of families with 3 members. This is followed by families with 4 members, which account for 18%. Families with 1 member represent 17%, while those with 2 members make up 14%. Families with 5 members are at 9%, and those with more than 5 members constitute 3% of the total.

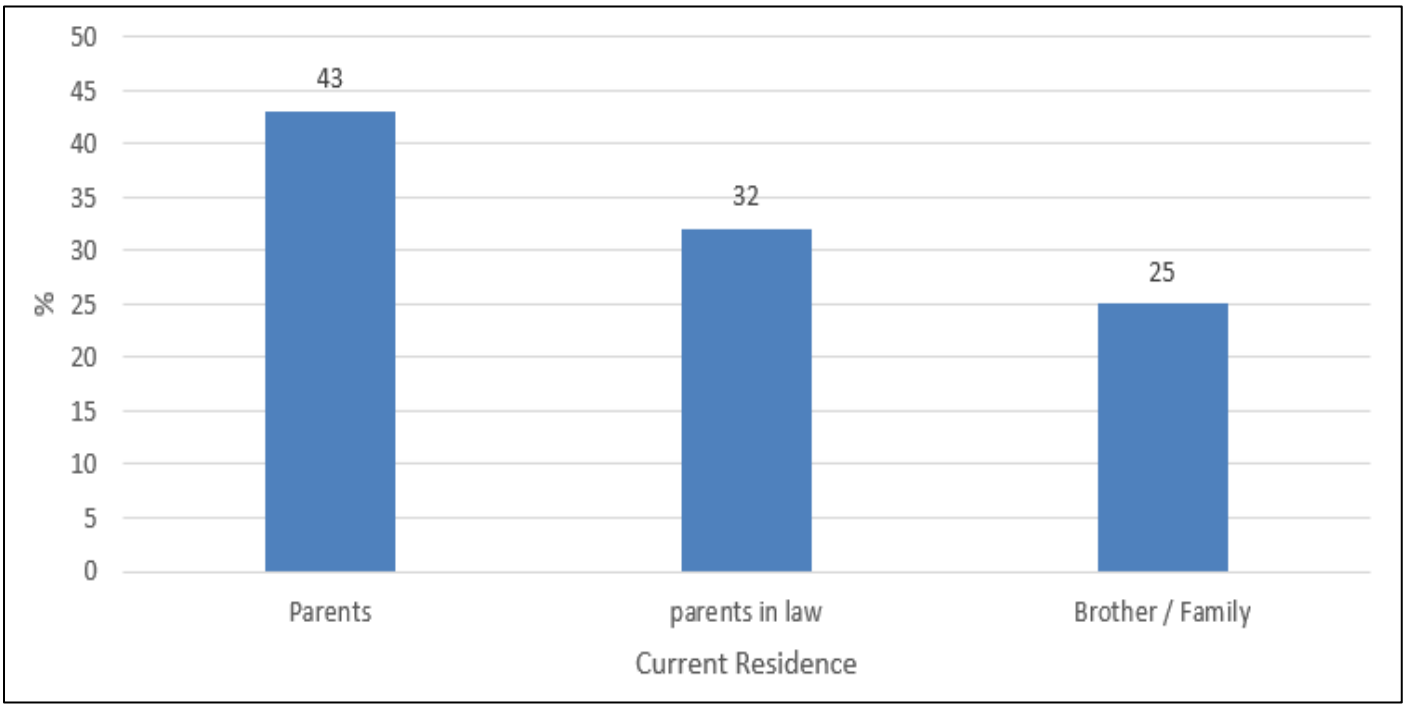

Fig 8 Respondent Profile Based on Place of Residence

From Figure 7 it can be seen that respondents who fall into the backlog criteria based on the place they currently live in, live with their parents with a percentage of 43%, live with their in-laws with a percentage of 32%, and live with relatives/family with a percentage of 25%.

➢ *Reliability Test*

The purpose of this test is to identify the features of Palu's backlog by measuring the reliability of a variable. If a variable produces a Cronbach Alpha value greater than 0.70, it is deemed dependable according to Ghozali (2013).

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

Table 6 Reliability Test Results

No	Research Variables	Cornbach Alpha Value	Standard reliability coefficient	Status
1	Price	0,744	0,70	Reliable
2	Location	0,729	0,70	Reliable
3	Facility	0,848	0,70	Reliable

➢ *Descriptive Analysis of Backlog Characteristics*

This analysis seeks to furnish an empirical representation of the data acquired in the investigation. This research employs descriptive statistics, namely frequency distributions and means. These statistics serve to delineate the frequency distribution and means of respondents' responses to the researched variable items. The frequency distribution illustrates respondents' views on backlog features in this study, emphasizing price, location, and facilities variables, derived from a sample of 100 respondents.

➢ *Descriptive Analysis of Price Variables*

The subsequent table displays the responses of respondents to the pricing variable, which consisted of four question items.

Table 7 Price Variable Frequency Distribution Statistics

No	Question	SS		S		N		TS		STS		Mean
		∑	Score	∑	Score	∑	Score	∑	Score	∑	Score	
1	The houses currently available are at affordable prices	4	20	36	144	36	108	21	42	3	3	3.17
2	According to the type of house currently available according to the price offered	4	20	37	148	35	105	21	42	3	3	3.18
3	The houses currently available are in accordance with the value of the benefits that will be received	5	25	58	232	27	81	10	20	0	0	3.58
4	The current house price is in line with my income	8	40	23	92	41	123	25	50	3	3	3.08
Indicator Average												**3.25**

Based on respondents' responses to the price variable, it can be seen in Table 4.7 that the average statement indicator has a value of 3.25 where respondents answered neutral or undecided and tended to disagree with the current housing prices in Palu City. This has implications for meeting the housing needs of the people in Palu City who want affordable prices in accordance with their income.

➢ *Descriptive Analysis of Location Variables*

You can see the results of the responses that respondents gave to the location variable, which consisted of a total of four question items, in the table that is presented below:

Table 8 Frequency Distribution of Location Variables Statistical Analysis

No	Question	SS		S		N		TS		STS		Mean
		∑	Score	∑	Score	∑	Score	∑	Score	∑	Score	
1	The currently available housing locations are easy to access by four-wheeled vehicles	13	65	49	196	28	84	9	18	1	1	3.64
2	The currently available housing locations are easy to access by two-wheeled vehicles	31	155	57	228	12	36	0	0	0	0	4.19
3	The currently available housing locations are easy to access public facilities, health facilities and economic facilities	14	70	40	160	38	114	8	16	0	0	3.60

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

No	Question	SS		S		N		TS		STS		Mean
		∑	Score	∑	Score	∑	Score	∑	Score	∑	Score	
4	The currently available housing locations are safe from criminal activity	3	15	10	40	53	159	31	62	3	3	2.79
Indicator Average												**3.56**

Table 8 illustrates that, according to the respondents' feedback on the location variable, the question indicator concerning access for two-wheeled vehicles to existing housing locations has the highest mean value of 4.19. In contrast, access for four-wheeled vehicles to these locations has a mean value of 3.64. This suggests that respondents perceive access for both two-wheeled and four-wheeled vehicles to existing housing complexes in Palu City as satisfactory. The indicator question about access to public, health, and economic amenities yielded a mean value of 3.60 from the respondents' answers. This score indicates that respondents are impartial and generally concur with the assertion that public, health, and economic facilities are easily accessible. Regarding indicators connected to security at current housing locations, respondents provided the lowest mean value of 2.79, signifying that the existing dwelling locations in Palu City are presently susceptible to criminal activity.

➢ *Descriptive Analysis of Facility Variables*

The subsequent table displays the responses or responses of the respondents to the facility variable, which consisted of a total of three question items.

Table 9 Facility Variable Frequency Distribution Statistics

No	Question	SS		S		N		TS		STS		Mean
		∑	Score	∑	Score	∑	Score	∑	Score	∑	Score	
1	The currently available housing has complete facilities provided by the developer	4	20	19	76	45	135	28	56	4	4	2.91
2	The facilities available in housing currently are in accordance with the existing house price	6	30	42	168	38	114	13	26	1	1	3.39
3	Currently available clean water facilities in housing are adequate for residents' needs	6	30	19	76	51	153	21	42	3	3	3.04
Indicator Average												**3.11**

Based on respondents' responses to the facility variable, it can be seen in Table 4.9 that the average question indicator with a value of 3.11 shows that respondents are still unsure and tend to disagree regarding the existing housing facilities in Palu City. If described in the question indicator for completeness of housing facilities with a mean value of 2.91 with the suitability of housing prices to existing facilities a mean value of 3.39 while for clean water facilities the mean value is 3.04. This value can be interpreted as indicating that the current housing facilities in Palu City still do not meet respondents' expectations.

D. Discussion

In Palu, the housing deficit in 2021 amounted to 18,471 units. According to the sub-district rankings, the East Palu sub-district exhibited the biggest backlog with 9,558 units, followed by the West Palu sub-district with 4,911 units, the South Palu sub-district with 2,687 units, the Ulujadi sub-district with 659 units, and the Tawaeli sub-district with 656 units. Simultaneously, in the Tatanga, Mantikulore, and North Palu sub-districts, there was no backlog; hence, the housing requirements were satisfied. The analysis results indicate that the elevated and diminished backlog statistics in each sub-district of Palu are influenced by population growth and the number of households, attributed to the establishment of new families and housing availability.

When it comes to regions, the East Palu sub-district has the most backlogs. This is because it covers only 7.71 km², which is just 1.95% of the total area of Palu, and has the highest population density at 5,634 people per km². The Mantikulore sub-district could be a good place to build homes and communities. It has the most land in the city of Palu 206.8 km², or 52.35 percent of all the land in Palu and the population density 377 people per km².

The backlog calculation method employed in this study is limited to a comparison between the number of households and the availability of built houses, with the concept of occupancy, as a result of the scarcity of data. The data utilized to calculate the housing inventory value is the minimum amount of information necessary to substantiate the operational system of housing provision, as per Yulinda Rossa (2013). Based on the Housing Need Backlog: Overview, South Hampshire Housing Market Assessment (2005) model, which is cited in Yulinda Rossa (2013), the author suggests a pertinent and specific backlog calculation model for the city of Palu. Figure 2 illustrates the calculation algorithm.

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

In addition, the characteristics of the backlog were investigated in this study by sampling 100 respondents from the population, which is the number of backlogs in each sub-district of the city of Palu. The sample size must be representative in order to be generalizable. The respondents' profiles indicate that 43% of them are currently residing with their parents, 32% with their in-laws, and 25% with family/relatives. Subsequently, respondents who met the backlog criteria had an income ranging from IDR. 2.500.000 to IDR. 5.000.000, 25% had an income exceeding IDR. 5.000.000, 20% had an income between IDR. 1.000.000 and IDR. 2.500.000, and 4% had an income below IDR. 1.000.000. The data indicates that 75% of the respondents are classified as low-income communities (MBR) in accordance with the provisions enumerated in Minister of PUPR Decree No. 411/KPTS/M/2021, which delineates the income of MBR. It is evident that 39% of the respondents in the city of Palu who fall into the backlog category have three family members, 18% have four family members, 17% have one family member, 14% have two family members, 5% have five family members, and 3% have more than five family members when the number of family members is ranked. In accordance with the standard floor area per person outlined in SNI 03-1733-2004, the utmost floor area for a single person is 9 m². Consequently, type 36 subsidized housing is typically designed to accommodate four individuals.

The descriptive analysis of backlog characteristics indicates that the community in Palu City seeks affordable housing prices aligned with their income, with the current subsidized housing price for type 36 being IDR 156.500.000. Moreover, concerning the location variable indicator, housing developers must consider environmental security concerns, such as implementing a housing concept with a single-entry system that incorporates security personnel. Finally, concerning the facility variable indication, home developers must ensure the provision of sufficient clean water supplies. The above mentioned elements from the analysis of backlog characteristics reflect the viewpoints of respondents who satisfy the backlog criteria in the city of Palu. This may provide as a reference for housing organizers in addressing the housing requirements in the city of Palu.

V. CONCLUSIONS & RECOMMENDATIONS

A. Conclusions

- It can be seen that the housing backlog in Palu City is 18,471 units. If we look at the sub-district, the backlog or housing needs can be ranked as follows: East Palu District 9,558 units, West Palu District 4,911 units, South Palu District 2,687 units, Ulujadi District 659 units and Tawaeli District 656 units. There is no backlog in Tatanga, Mantikulore District and North Palu District, in other words the number of houses available is sufficient or more than the number of heads of families who need houses.
- The descriptive statistical analysis of backlog characteristics indicates that the residents of Palu City fall within the backlog category. The price variable, with an average indicator value of 3.25, suggests a preference for affordable housing prices aligned with community income. The location variable, averaging 3.56, reflects a desire for housing locations that ensure environmental security from crime. Lastly, the facility variable, with an average of 3.11, indicates a need for adequate clean water facilities. The analysis of price, location, and facilities indicates that the residents of Palu City seek improvements and adjustments to existing policies concerning these variables.

B. Recommendations

- The author in this study recommends a more specific and relevant backlog calculation model that can be used in Palu City.
- Due to limited data, the backlog calculation model that is analyzed is only the occupancy backlog, further studies need to be carried out on the ownership backlog so that it can be used as a comparison and can be analyzed further.
- There is a need for a housing database in the city of Palu to support the operation of the housing supply system.
- There is a need for a housing information service system that is easy to access and obtain.

REFERENCES

[1]. Amirin, T., (2011). Population and Research Sample 4: Sample Size Slovin Formula, Erlangga, Jakarta.
[2]. Arif Rahman. (2010). Housing Growth in Jambi City. Postgraduate Master's Thesis Program in Regional and City Development Engineering, Diponegoro University, Semarang.
[3]. Awang Firdaos. (1997). Housing Demand and Supply. Valuestate, Vol. 007, Jakarta.
[4]. Department of Public Works. (1987). "City Residential Area Planning Procedures". Jakarta.
[5]. Dimyati Muh. (2010). Overcoming the Housing Backlog for Urban Communities (Spatial Planning and Urban Issues Interest, Ministry of Housing staff).
[6]. Director General of Budget, Ministry of Finance. (2015) "The Role of the APBN in Overcoming the Housing Backlog for Low-Income Communities (MBR)". Director General of Budget, Ministry of Finance, Jakarta.
[7]. Eckert. JK and R Glodemans. (1990). Property Appraisal and Assessment Administration. Chicago; The International Association of Assessing Officers.
[8]. Fanning, SF, TU, Grisson and TD, Pearson. (1994). Market Analysis for Valuation Appraisals. Chicago; Appraisal Institute.
[9]. Hendy E. A & Dian R. (2021). Effectiveness of Housing Provision by Perumnas in Handling the Housing Backlog Problem in Gresik Regency. ITS Engineering Journal, 17(1), C1-C6.
[10]. Hijrah A. (2020). Recommended Solutions to Overcome the Housing Backlog Problem in Indonesia. Conference: International Youth Conference on Sustainable Development At: Yogyakarta, Indonesia. January 2020.
[11]. Hutapea, Julintri (2012). Analysis of Factors Causing Slum Settlements in Medan City (Case Study: Medan Belawan District). Thesis for Undergraduate Study

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14928736

Program - Development Economics, Faculty of Economics, University of North Sumatra, Medan.
[12]. Indrawan R. & Yaniawati P. (2017). Quantitative, Qualitative, and Mixed Research Methodologies for Management, and Education. Bandung: Refika Aditama.
[13]. Joesron, Tati S. & Fathorrozi M. (2003). Microeconomic Theory, Equipped with Several Forms of Production Functions, Salemba Empat Publishers, Jakarta.
[14]. Joint Decree between the Minister of Home Affairs, the Minister of Public Works and the State Minister for Public Housing, Number 648-381 of 1992, 739/KPTS/1992 and 09/KPTS/1992. Regarding Guidelines for Housing and Settlement Development with a Balanced Residential Environment.
[15]. Decree of the Minister of Public Works and Public Housing, Number 411/KPTS/M/2021. Concerning the Amount of Income for Low-Income People (MBR) and Floor Area Limits for Public Houses and Self-Help Houses.
[16]. Kurniasih S. (2007). Efforts to Improve Slum Settlements in North Pertukangan, South Jakarta. Journal. Faculty of Engineering, Budi Luhur University.
[17]. Liu, Wu, et. al. (1996). Study of Housing Demand Model. Hong Kong. Research and Library Services Division Legislative Council Secretariat;
[18]. Miller, R. L. and Roger E. M. (2000). Intermediate Microeconomic Theory. Jakarta : PT Raja Grafindo Pesada.
[19]. Narbuko, Cholid & Achmadi, Abu. (2015). Research methodology. Jakarta: PT Bumi Aksara.
[20]. Regulation of the State Minister for Public Housing Number: 05//PERMEN/M/2007 concerning Procurement of Housing and Settlements with the Support of Housing Subsidy Facilities through Subsidized KPRS/Micro KPRS;
[21]. Regulation of the Minister of Public Housing Number 07/PERMEN/M/2008 concerning Procurement of Housing and Settlements with the Support of Housing Subsidized Facilities through Subsidized KPR
[22]. Government Regulation (PP) 2016 concerning Housing Development for Low Income Communities (MBR).
[23]. Sinulingga, Budi, D. (2005). Regional and Local Overview City Development; Sinar Harapan Library, Jakarta.
[24]. Soni A. B. & Baiq H. W. (2020). Post-Earthquake Housing Backlog Analysis in North Lombok Regency. Proceedings of the 2020 IPPeMas National Seminar, 1(1), 406-410.
[25]. Indonesian National Standard (SNI) 03-1733-2004. Procedures for Planning Housing Environments in Urban Areas.
[26]. Sugiyono (2019). Quantitative, Qualitative, and R&D Research Methods. Bandung: Alphabe.
[27]. Sunarti, N Yuliastuti, W P Tyas & D P P Sari. (2019). KORPRI housing development in Salatiga City: Backlog, problems and sustainability. IOP Conference Series: Earth and Environmental Science, 447/012027.
[28]. Toni R. (2021). Backlog of Housing Provision in West Java Province. Plano Krishna Scientific Journal, 17(1), 50-81.
[29]. Triyuli, Wienty. (2013). "Identification of Housing Type Development in Palembang City. Sriwijaya Engineering Journal, No. 1 Vol. 22, March 2013.
[30]. Law Number 1 of 2011 concerning Housing and Settlement Areas;
[31]. Yossyafra, Melinda N, Rini H, & M. Reza. (2018). A Challenge in Providing Housing Land and Sustainable Agricultural Land; An Effort to Meet the Backlog of Housing and Food Security in West Sumatra. International Journal on Advanced Science, Engineering and Information Technology, 8(6), 2696-2701.
[32]. Yulinda R. (2013). Formulation of Housing Backlog Calculation Method. Journal of Human Settlements, 8(2), 58-68.
[33]. 1945 Constitution (UUD) Article 28H paragraph (1) concerning Homes is a Basic Right of the People;
[34]. South Hampshire Housing Market Assessment. (2005). Housing Need Backlog: Overview. In www.push.gov.uk/wpcontent/uploads/2018/06/SHMA-2014-1.pdf. Accessed July 27, 2022.
[35]. Center for Housing Financing Fund Management, Ministry of Public Works and Public Housing. Backlog Concept. Obtained from https://ppdpp.id/kompet-backlog/. Accessed July 27, 2022.
[36]. REI Says Property Business Still Growing. 2019. Retrieved from https://sultengraya.com/read/86138/rei-buat-bisnis-properti-tetap squirm/. Accessed November 18, 2021.
[37]. REI Sulteng Targets 2,000 Houses Sold in 2022. Retrieved from https://sultengraya.com/read/123933/rei-sulteng-target-2-000-rumah-terjual-di-2022/. Accessed July 31, 2022.