The architect’s adaptive capacity: public perception of the architect adaptive capacity in coping with disaster

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Abstract. Architects play an important role in building the concept and design of housing so that they can meet aesthetic, functional and safety standards for residents, especially for Jabodetabek people who are in disaster prone areas. This study wants to see how people's perceptions of the architect's adaptation capacity to disasters contained in the design and concept of housing built. The research method uses mixed methods Neuroresearch that is explanatory research. The population is the inhabitants of all housing complexes throughout Jabodetabek. Sampling technique used is random cluster sampling. The number of residents in 94 housing complexes taken randomly is 753 households. The results showed that the architect was considered by the community to be quite adaptive to the disaster risk mitigation seen in their housing design. There are two important aspects to be able to improve this perception, namely architects need to understand various current threats and understand how rescue mitigation can be done when a disaster occurs.

Keywords: architect’s adaptive capacity, public perception, disaster

1. Introduction
The concept of housing emerged as an effort to produce balance and harmony in creating a quality life for the community as [1], [2]. One factor that can support the creation of quality of life is when the occupants of the housing are fulfilled its safety. Therefore, the concept of architecture must be able to combine the layout, function, aesthetics and especially security and comfort that are the needs of modern society today. Some architects have even tried to present new designs that accommodate technological developments with smart home designs that prioritize security and privacy for its inhabitants [3].

For the people of Indonesia, the definition of security in choosing housing now extends to how housing is able to provide a sense of security from disasters. This is due to the geographical condition...
of Indonesia, which is located in disaster prone areas, especially earthquake disasters. The concept of architecture that is able to provide security in the face of disasters becomes one of the considerations, especially for the majority of Jabodetabek residents who have recently felt earthquake shocks several times and have caused concern for their homes. Disasters themselves can be caused by natural factors and human factors with various impacts from human victims, environmental damage, loss of property and psychological [4].

Various studies have been carried out to examine various potential disasters in Indonesia, the impacts and various efforts made to overcome and carry out the recovery process after a disaster [5] - [7]. With these various potentials and impacts, housing concept and design are important. Therefore, this study wants to see how the evaluation of housing residents in the Greater Jakarta area about the capacity of housing architects in realizing designs that are adaptive to disasters? in anticipation of disaster?

2. Literature Review
Housing is built on a basic concept where housing must be connected with livelihoods, the environment, security and governance. This concept was developed after seeing the condition of Aceh after the Tsunami where housing development and design must be able to take a role in increasing the effectiveness of reconstruction in the face of disasters as well as during disaster recovery so as to build urban resilience [8]. Housing must be able to be a means for residents to improve their quality of life. In one study, failure of public housing in large cities is usually due to residents feeling dissatisfied with both physical and non-physical qualities [9].

The current concept of housing prioritizes the safety factor. Therefore, for people who live in disaster-prone areas, community perceptions in assessing the capacity of architects in pouring housing designs so that residents feel that housing designs are quite adaptive and have the concept of risk mitigation to disaster becomes important for residents. Adaptive capacity can be interpreted as a condition or ability to be able to adapt to changes that occur in the surrounding environment [10]. Adaptive capacity is often described as related to resilience, a resilience capacity that is able to be responded to by the community through the emphasis and design of infrastructure that shows resilience in critical situations and disasters [11]. Therefore, an architect who has an adaptive capacity and is able to put it in housing architecture design has 3 main characteristics, namely that the architect must have insight and understanding of the threat of disaster as a new condition that must be faced; sensitive to vulnerability and understanding efforts to overcome disaster risks.

3. Research Method
The research method with Neuroresearch is one of the mixed methods models that combines exploratory, explanatory, and confirmatory research [12]. This research is limited to explanatory research. The population is the inhabitants of all housing complexes throughout Jabodetabek. Sampling technique with cluster random sampling. And the number of samples as many as the number of residents in 94 housing complexes taken randomly, as many as 753 households. Data collection techniques using a Likert scale of 1 to 5. Calibration of the instrument with content validity is done through focus group discussions as expert judgment by academics, some housing developers, and some occupants. The research paradigms are as follows:
4. Result

The results of the first study, to answer the condition of the assessment of housing residents regarding the capacity of the housing architect in realizing an adaptive design to the disaster (Arch_Adaptive), the study analysed with confidence intervals (µ) with a significance level of $\alpha <0.05$ whose results are as shown in Table 1 below.

**Table 1.** Results of Inclination Tests of Public Housing Residents’ Assessment of the Capacity of the Housing Architect in Realizing an Adaptive Design for Disasters (Arch_Adaptive)

| Descriptives                           | Statistic | Std. Error |
|----------------------------------------|-----------|------------|
| Arch_Adaptive                          | 43.6401   | 28844      |
| 95% Confidence Interval for Mean       | 43.1131   | 44.1671    |
| Median                                 | 43.0000   |            |
| Variance                               | 54.263    |            |
| Std. Deviation                         | 7.3631    |            |
| Minimum                                | 13.00     |            |
| Maximum                                | 60.00     |            |
| Range                                  | 47.00     |            |
| Interquartile Range                    | 9.00      |            |
| Skewness                               | -1.17     | .089       |
| Kurtosis                               | .630      | .173       |
Before drawing conclusions, researchers set 5 categories of the adaptive capacity of architects with a design that anticipates disasters (Arch_Adaptive), namely: (1) not at all adaptive, (2) not adaptive, (3) sometimes adaptive, (4) adaptive, and (5) very adaptive to anticipate disasters. Based on Table 1 produced Lower Bound of 43.1131 and Upper Bound of 44.1671, it can be concluded that the designs of architects throughout Jabodetabek tend to have been adaptive in anticipating disasters significantly at $\alpha < 0.05$.

The second research result is finding aspects that must be addressed by architects so that the design is felt by residents that architects as designers have been able to adapt in anticipating disasters (Arch_Adaptive). The proof is analyzed with Binary Segmentation which is also called Classification and Regression Trees. In this analysis, researchers set a Prunning Depth of 2, a Prunning Parent of 2, and a Prunning Child of 1 and a significance level of $\alpha < 0.05$. The analysis found as in Figure 2 below.

**Figure 2.** Binary Segmentation to the Capacity of Architects as Housing Designers who are Able to Adapt in Anticipating Disasters (Arch_Adaptive)

Based on Figure 2 above, the Capacity of Understanding Threats (Dim_Thret), and Understanding Rescue when Disaster Strikes (Diss_Strik) are the aspects that most determine the architect so that the design can be felt by residents that he as a designer has been able to adapt in anticipating disasters (Arch_Adaptive). If both aspects are considered and addressed, the valuation of housing residents will increase 63,582 times from the current condition which has an impact on the trust of the housing complex to become an investment choice.

5. Discussion and Conclusion

The increasing disaster risk in Indonesia has an impact on various aspects one of which is the concept and design of housing that not only has a high value in terms of aesthetics and function but also needs to improve resilience and security, especially in the Greater Jakarta area which has recently been exposed to information to increase awareness of disaster.

The results showed that architects were judged by the community to be quite adaptive with disaster risk mitigation as stated in their housing design. However, there are two important aspects to be able to improve this perception, namely that architects need to understand the various threats that exist when and understand how mitigation of rescue can be carried out in the event of a disaster.

In Vietnam, a similar study has been conducted which examines architectural design that considers the impact of disasters, where an architect in his design must be able to highlight local construction
practices and sharpen skills to reduce the risk of disaster. In addition, architects must also be widely involved in raising public and government awareness so that they have the same perception in building resilient and resilient housing [13].

Therefore, the results of the study have the implication that architects need to be given additional provisions both knowledge and capacity to respond to changes in the situation and environment, especially for disasters that can occur at any time without predictability [14]. The community's need for comfort and safety is an important factor in housing design so that the concept of housing that is built does not only meet aesthetic standards but also meets the security aspects as required by the housing residents.

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