

# Dorms and Covid-19: Resilient Architecture Approach to Darul Ulum Islamic Boarding School Dormitory Design

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## ABSTRACT

Covid-19 pandemic has been going on for the past few years. One of the impacts of the pandemic is change in education sector, including in *pesantren*. Indonesian Doctors Association (IDI) issues requirements that must be met if a boarding school is opened. Life in a boarding school, especially in dormitory housing is identical with shared activities. The issue of the pandemic and the potential of the dormitory environment become a new cluster for the spread of Covid-19 is the background for designing resilient dormitory. The Resilient Architecture approach that is applied stems from the resilient theory by Istiadji, Hardiman, and Satwiko which has four principles, namely: Recovery, Responsive, Adaptive, and Absorptive. The principles of resilience architecture approach in the design are complemented by two Islamic principles those are protecting views and maintaining privacy. The design process uses linear analysis which applicate the resilient concept in the arrangement of mass and user circulation, natural lighting of the room, the structure and processing of the building's facade, as well as the open space on the site. The application of four principles of resilient architecture and two Islamic principles makes the dormitory design able to adapt to changes during the pandemic and the environment around the site.

**Keywords:** Dormitory, Covid-19, Resilient architecture approach

## 1. INTRODUCTION

### 1.1. Background

The beginning of 2019 was a period of the Covid-19 pandemic that hit Indonesia. There is a new normal in social life, one of which is in the field of education. Islamic boarding schools as one of the educational facilities based on Islamic education, including getting affected during the COVID-19 pandemic. For example, in Jombang Regency as a student city with a large number of Islamic boarding schools, there have been 60 cases of COVID-19 experienced by students in Islamic boarding schools in the Mojowarno and Peterongan (Darul 'Ulum) areas[2].

As the object of study, the Darul Ulum Islamic Boarding School which based in Jombang with 42 dormitories and 15 formal education has carried out *diniyah* activities using hybrid learning (online and offline). This is done in conjunction with efforts to prevent the spread of COVID-19. Efforts made in offline activities include requiring all student students to do an antigen swab test when they first enter the dormitory,

limiting visiting activities, changing the function of the living room to an *isoman* room, adding hand washing facilities and requiring personal eating utensils. The decision to return to activities in Islamic boarding schools is quite a dilemma because the Indonesian Doctors Association (IDI) states that there are conditions that must be met if a *pesantren* is to be opened[3].

This condition requires a solution that can allow *diniyah* activities to be carried out offline while still making efforts to prevent the spread of COVID-19. The solution to this problem focuses on the design of the student dormitory with a Resilient Architecture approach that is able to adapt to the covid-19 pandemic.

### 1.2. Resilient Architecture Approach

Resilience is not only about sustainable design, resilient also means how to get up and survive after changes such as the current pandemic. The use of a resilient architecture approach in the design aims so that the design is able to adapt to changes that may occur due to the pandemic. There are four principles of resilient

architecture approach that will be applied in the design. The four principles are:

1. Recovery, which is the function of the recovery system from severe shock to reach the desired state quickly [1].
2. Responsive, readiness to respond to disturbances [4]
3. Adaptive, adaptive reuse essentially involves changes in how building used [5]
4. Absorptive, the system should be capable of withstanding the design level disruption [6]

The need to adjust dormitories during the pandemic is the main background for choosing a resilient architecture approach to design. The resilient architecture approach creates a space design that is able to adapt to the implementation of health protocols without reducing the number of dorm users (all offline).

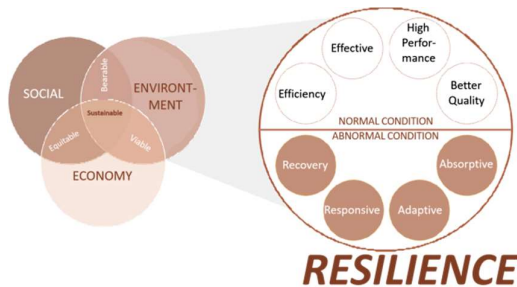


Figure 1 Resilient Architecture infograph [7]

### 1.3. New normal with 6M

The health protocol is a series of rules issued by the government through the ministry of health in regulating the safety of activities during the Covid-19 pandemic. The purpose of implementing health protocols is to help the community to be able to carry out activities safely and not endanger the health conditions of others [8].

The following are important disciplines when applying the 6M rule [9].

#### 1. Washing Hands With Soap

Diligent hand washing reduces the potential for transmission of the COVID-19 virus. Alcohol-based hand sanitizer is also allowed. However, if there is access to hand washing, it is better to wash your hands with soap and running water.

#### 2. Using a Mask Correctly

Masks play a big role in catching the droplets that come out of a person's mouth. Currently the government recommends using 2 masks so that the potential for transmission is reduced.

#### 3. Keep Your Distance

Keep a safe distance of at least 2 meters from other people to prevent the transfer of droplets in close proximity.

#### 4. Avoid Crowds

Viruses can be present in a person's body without any prior notification through any symptoms. So be aware of your surroundings.

#### 5. Avoid Eating Together

Eating together, let alone talking, is very prone to droplet transfer. So, just eat alone. For the health of yourself and others.

#### 6. Reduced Mobility

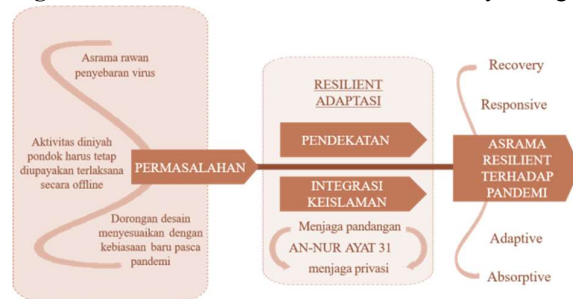
If work can be done from home, it is better to do it from home. Leave the house only for emergencies.

## 2. METHODS

The main data was obtained by collecting problems during the pandemic in the residential area of the dormitory. The data collection process was carried out through observations and interviews with dorm users in the Darul Ulum Islamic Boarding School, Jombang. From the problem data that has been collected, the solution appears through the application of the principles of a resilient architecture approach to residential dormitories.

The process of finding the basic idea of a dormitory design with a resilient architecture approach is described through the following infographic. The next stage is an analysis to come up with a solution to the issue in the form of applying the principles of resilient architecture in the design.

Figure 2 Architecture Resilient In Dormitory Design



During The Covid-19 Pandemic [7]

## 3. RESULT

The results of the analysis of the application of resilient architecture principles in the design are summarized in the tagline "No Worry with Resilient Dormitory." The Resilient Dormitory is a building for shared housing in the boarding school area that has resistance to pandemic outbreaks. The resilient dormitory

design will save users from worrying about the virus spreading during the pandemic.

**Figure 3** No Worry With Resilient Dormitory Concept<sup>7</sup>



The principle of recovery has the aim of recovering from a situation that requires staying in a dormitory. With the principle of recovery, residents can carry out activities that are usually carried out outside the dormitory such as cafes, Islamic boarding centers, and others comfortably. These activities include talking, doing tasks together, buying daily necessities and snacks.

The principle of responsiveness is the background for the emergence of the concept of food security and the separation of circulation in the same way. Food security and segregation of circulation are important to consider because they can regulate and reduce physical contact between dorm residents and outsiders.

The adaptive principle in the design affects some existing facilities in general, dormitories, but there are changes that are adapted from several new customary rules during the pandemic. These changes refer to the habit of washing hands, maintaining distance, and limiting the number of users in a room.

The absorptive principle refers to healthy building. With the absorptive principle, users can maintain their health condition with the embodiment of buildings that are designed to survive/remain able to be used properly even during a pandemic.

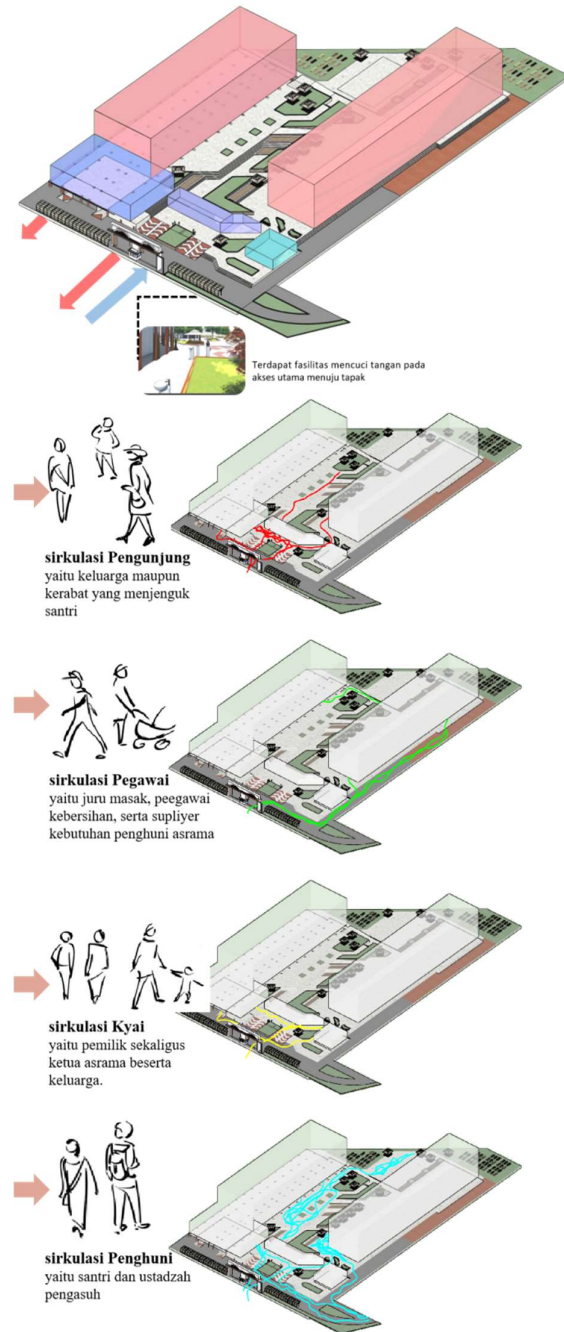
The application of the principles of resilient architecture in the design resulted in several concepts that made the design resilient to the pandemic. This is a fourth level heading. You can replicate it where suitable.

### 3.1. Separation of Circulation in Site

The concept of resilient application in building mass arrangement directs users to be in their zone according to the type of user classification. The mass of the main building is more private, located in an inner area that is

intended for dormitory residents, both *santri* and administrators.

**Figure 4** Separate Access and Mass Zoning<sup>vi</sup>



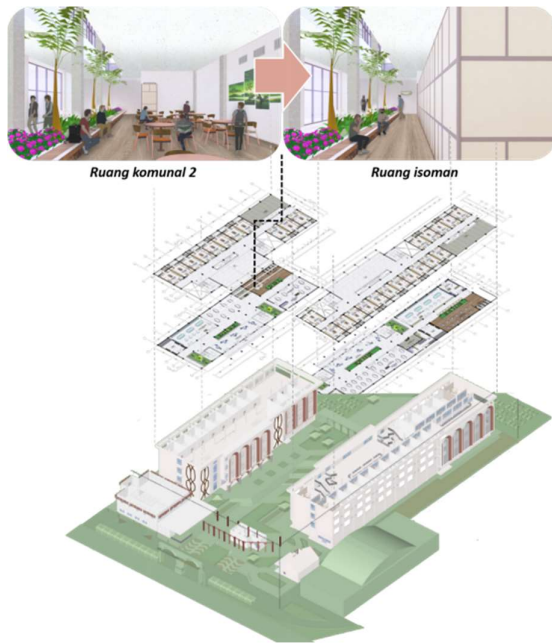
**Figure 5** Separate Circulation in Site<sup>7</sup>

The placement of the mass of supporting buildings in the front area has the aim that users who are classified as visitors gather and their activities are centered on the front area. The arrangement of the building mass thus facilitates the application of circulation engineering that separates according to the type of user. Separating the circulation of types of users can minimize contact between residents, visitors, and employees so that

clusters of virus spread do not arise during the pandemic mass. The separation path of user circulation by type can be seen in the following illustration. (figure 5)

### 3.2. Flexibility Space

The concept of spatial planning in the mass of the main building concentrates the communal space on the ground floor. The rooms on the second to fourth floors are classified as very private spaces and cannot be accessed by visitors.



**Figure 6** Flexibility Space (Communal Space Become an *Isoman* Space)<sup>7</sup>

The application of resilience in space is indicated by the flexibility of function and circulation of space. There is one communal space (parquet pavement) which can be converted into an *isoman* space when needed. The room has a partition wall that can be dismantled. The position of the *isoman* space is adjacent to the shared bathroom, so that when the *isoman* space is used the shared bathroom automatically becomes an *isoman* user. In addition, the convenience of *isoman* users can be supported by the presence of green space in it.

### 3.3. Food Security

The availability of land for growing vegetables can be the first point of sustainability. The results of the gardening will initially be used for the personal consumption of dorm users. The temporary storage space for vegetables is in the dorm kitchen. If the harvest from the garden is abundant and exceeds the amount consumed by the dormitory users, then the results can be distributed to the surrounding community by selling it.



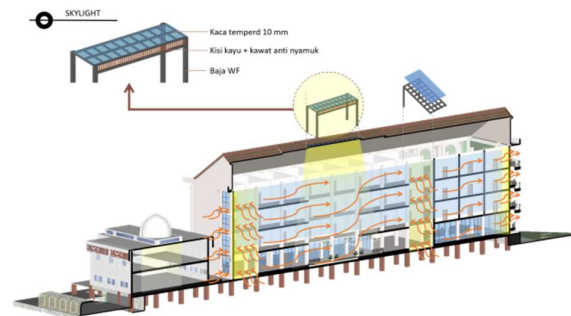
**Figure 7** Food Security with vegetable garden<sup>7</sup>

The existence of a dormitory which also indirectly expands the area of the Islamic boarding school will create a community environment that supports the existence of a dormitory. Communities around the dormitory area have job opportunities either by selling services (haircut services, print & photocopying, etc.) or certain products (food). The most common is that several places to eat / snack will appear in the area along the way to the hostel area. With the new place to eat, the results of the dormitory garden have the potential to be distributed to those who need a supply of vegetables.

The existence of a relationship that exists between the dormitory and the surrounding area will create a resilient environment in meeting consumption needs.

### 3.4. Healthy Building with Natural Lighting

The concept of space in resilient architecture is by prioritizing natural lighting. Natural lighting in the main building mass is realized with skylights in several parts to avoid room corridors that lack natural lighting and humidity. In addition to natural lighting, the rooms are designed to have wide openings to create good air circulation.



**Figure 8** Using Natural Light in Dormitory<sup>7</sup>

#### 4. CONCLUSION

The occurrence of the Covid-19 pandemic which brought various changes in life in the dormitory environment did not become an obstacle in the context of studying and self-study. The impact of the pandemic can be used as a challenge in efforts to study in the *pesantren* environment. Resisting change during a pandemic will not solve the problem. Adaptive nature is a solution to start a new life that is responsive to changes during the pandemic. The design of resilient dormitories is expected to be one of the steps to adapt to changes during the pandemic.

#### ACKNOWLEDGMENTS

The title "ACKNOWLEDGMENTS" should be in all caps and should be placed above the references. The references should be consistent within the article and follow the same style. List all the references with full details.

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