Resilient Covid-19 Village: The Application of Healthy Housing in Densely Populated Area in Surabaya. Study Case: Kampung Pradah, Surabaya.

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Abstract. The presence of thematic villages in cities in Indonesia has increasingly sprung up and become one of the important programs to increase tourism by the local government. The existence of urban thematic villages is in densely populated areas, where the theme raised on average focuses on visual and spatial storytelling. With the COVID-19 pandemic impacting on the decline in tourist interest, the existence of resilient villages where the creation of a safe and comfortable ecosystem for activities for visitors and villagers has become a priority. This underlies the importance of the existence of a standard guide to create a healthy spatial environment in a densely populated residential area. This research was conducted to be able to find the model, so that it can be an early guide in the presence of a healthy and comfortable thematic village in the pandemic era. This research was conducted using the case study of Kampung Pradah Surabaya, with qualitative methodology using literature studies and design modelling. The goal of this are that this pilot research can be a foundation in the development of thematically resilient covid healthy areas by using sustainable community housing concept.

1. Introduction

Urban villages arise because of the imbalance of supply and demand for housing in urban areas, meeting the needs of residential areas for urban communities whose numbers continue to increase both naturally and due to urbanization and become one of the factors that increase urban power. In line with the development of the city, the presence of a slum village is certainly expected to disappear, one solution is to invite the villagers with all their limitations to participate independently to take care and beautify their own village. The birth of thematic villages such as creative villages, healthy villages, and others can be a solution to eliminate slum city villages can even lift the uniqueness that is owned into a tourist destination to improve the economy of its residents.

During the COVID-19 pandemic, amid all kinds of community conditions that are limited in movement, also gave rise to a new urban village 'branding' called Kampung Tangguh COVID-19 which has the support of many parties including local governments because this village reflects the readiness of citizens to face the long road to the threat of the COVID-19 pandemic which is uncertain when it is completed. In general, the presence of thematic villages in this urban area has a positive impact on the environment. Thematic village reflects the desire of its residents to build their own villages towards safe and comfortable residential areas, this is in line with the government's desire to create decent urban residential areas away from the impression of slums can also be the answer to the generality of living in an increasingly dense and saturated city.
Judging from its development, often these urban villages grow naturally but seem to be 'separated' from urban rules such as Building Border Regulations (GSB) or other standardized building regulations. The birth of the thematic village play a role as closing that hole into a unique tourist destination. The thematic village grew up with its attractive 'branding', but impressed only as a cosmetic factor. Is the village actually viable as a residential area in the city? If referring to the Kampung Tangguh Malang Guidelines, which should be appreciated because they can give birth to guidelines, but the guidelines still focus only on non-physical aspects. How the village should be organized in terms of urban physical aspects towards a healthy and comfortable residential area.

Existing problems can be formulated as follows:
1. How urban villages should be organized physically into a healthy environment based on their distinctive characteristics as an urban environment. This healthy environment also includes how existing buildings in it are modified to support the environment.
2. How then the rules can be easily informed to the community / villagers as a guide for residents. The ultimate goal of this research is to give birth to a kind of guide that focuses on the process of restructuring existing physical conditions, also easy to understand that can be read by residents of urban villages easily without the need for training or special education.

2. Literature Review
Based on the previous chapter on the background and problems that have been formulated, this literature review chapter contains several understandings and research results that have a relationship with this research, namely:
First, a study conducted by Akbar T and Alfian F (1), by using qualitative descriptive, showing results that the presence of thematic villages was able to turn slums into the answer to development problems in urban areas. Thematic villages can have a positive impact on the economic sector by growing the micro-economy of local communities as well as social sectors that change clearly through increased levels of community education. The environmental sector also experienced quality improvements, especially in the condition of public spaces, sanitation, waste management and so on. Public awareness of the environment creates community participation and initiatives towards the environment is also increasing. The infrastructure sector is growing better with the availability and maintenance of roads, sewers and some much better buildings. All sectors show a positive impact with the change of slums into thematic villages and increase the participation of citizens in managing their places of life.
Another research by Oktaviani (2) was conducted using descriptive qualitative methods. The results of this study show that aspects of communication are important for the implementation of village structuring programs but there are also prominent obstacles related to human resources and awareness of the importance of healthy living. In this study also mentioned that basically the government initiated by establishing a clean, safe, and smart village program but because of low awareness, many citizens participated but only at the beginning or during the race / assessment event only. Public awareness, a sense of discipline, responsibility, and care for a healthy environment is still low, this is characterized by infrastructure facilities (children's playgrounds, kamling posts, fishponds as community creative land) in the end unkempt and not utilized properly. Furthermore, the researcher also emphasized that other solutions are still needed and not just focus on implementation so that the Kampung Bentar program is implemented.
Third, a research by Mulasari, SA in 2018 (3). This research becomes a series with Community Service Activities with lecture and discussion methods. The results obtained from this study are based on discussions conducted show the activeness of the community to participate in healthy city programs but the discussion also shows that there is still a need for information and education about the program and what is a healthy city to the citizens.
Referring to the three studies above, it can be seen that the thematic village programs were originally one solution to alleviate poverty and focus on improving the local economy, but over time, thematic villages have many environmental-related issues. The presence of thematic village is recognized to have many positive impacts but less based on the knowledge of the citizens of a healthy environment. One of
the obstacles is the human resources factor that lacks awareness of healthy living, especially in living spaces.

The condition of the city village has basically been alluded to by Bianpoen (4) who mentioned that “...A ‘kampung’ (urban village) is a human settlement, that generally:

1. Has no or almost no facilities like tap water, electricity, sewage systems, proper drainage systems, open space, etc.
2. Grow uncontrolled with a high population density,
3. Is the habitat of the low income group,
4. has mostly temporary or semi-permanent buildings, which do not comply with requirements of health, security and hygiene,
5. Has no clear status of land, while the population (the majority) occupying the land, have no clear little either.”

Furthermore, Bianpoen also emphasized the priorities for village structuring, namely: [1] more job opportunities,[2] Training and improvement of skills and education,[3] Improvement of health,[4] provision of public services, such as water, sewage and drainage systems, [5] Security of land tenure, [6] Improvement of the quality of shelters. The list emphasizes that in addition to providing infrastructure, village development also needs to improve the quality of houses / buildings in it in addition to increasing human resources.

The presence of thematic villages today, which still uses the term village, has a more understanding that leads to a residential area in the city. According to Wijono RS [5], kampung in Malay comes from the word compound and experienced the development of meaning in some time. It is mentioned that in Malaysia, kampung is heard as a village environment or a place to live in the countryside, but in Indonesia this word is more often used to refer to settlements in cities. It is also explained that the name of the village has existed since the beginning of the 20th century to indicate a village located in the city area.

According to Eko Budihardjo as mentioned in the book Modernity in Kampung (5), kampung is defined as a marginal settlement that grows and develops without applicable standards. In the book is also interpreted by Herlianto that the village is the name for a village to refer to the city area that has a density of high buildings and densely populated. Furthermore, Wirjomartono (5) also defines the village as a settlement that grows in urban areas that are formed without infrastructure planning and urban networks.

As mentioned earlier, where the presence of these thematic villages was originally intended to alleviate urban slums as well as improve the local economy such as farmers' villages, batik villages, to creative villages. But then this thematic village developed to raise increasingly widening issues, especially environmental issues including disasters. The emergence of so-called "Kampung Tangguh” is one of the answers to the preparedness of the village facing potential disasters both general and special where the village is located. The theme of "Kampung Tangguh" is increasingly getting a 'place' in the current pandemic period, where many governments to brand many urban villages into Kampung Tangguh COVID-19 as a sign of citizens' preparedness to face the COVID-19 pandemic which is uncertain when it ends.

There are several guideline book for villagers to create standardized health environment. One of the guidelines is: “Buku Pedoman Panduan Kampung Tangguh, Langkah Sistemik Melawan Pandemi COVID-19” compiled by task force COVID-19 Universitas Brawijaya [7] which is a refinement of the previous book entitled "Manual PSBB Kampung Tangguh”. This book is intended as a guideline equipped with theories that underlie to enrich and clarify the position of the concept of resilient villages by involving several related parties.

In the playbook it is mentioned that the resilient village is based on important health aspects as mentioned in the UU no. 36 year 2009 on Health article 4 states that: “… health is a human right and one of the elements of welfare that must be realized in accordance with the ideals of the Indonesian nation as referred to in Pancasila and the Constitution of the Republic of Indonesia in 1945.”. It is also explained in the book that: "Kampung Tangguh is a generic concept with three main components..."
namely the theoretical base, the level of movement, and the pattern of movement.” First, "Kampung Tangguh" fully utilizes the theory of 'social movement' as the basis of the movement, 'theory of space' as a reference for territorial control, 'social practice theory' to direct people's behavior, and 'progressive leadership theory' for the command system.

Furthermore, the concept of "Kampung Tangguh" can also be used for any purpose, only need to adjust for certain toughness assistance or set up the formation / orbit of existing toughness. For example, if facing dengue fever then the health aspect is used as an orbit of one followed by information and culture. If facing COVID-19, although the threat is both viral, but has different threat characteristics, then the toughness of health aspects becomes the second orbit after food, information, and security and order. The culture placed in the back orbit moved forward because dengue fever vectors grew due to dirty living culture, so culture became a priority. Likewise, if it will be mobilized for the economy, then the concept of "Kampung Tangguh" can be modified to focus on economic toughness, technological toughness, or other toughness.

The other guidebook is “Buku Panduan Kampus Siaga COVID-19” compiled by the Directorate General of Public Health of the Ministry of Health of the Republic of Indonesia (6). This book was compiled as a handle for educational institutions and universities throughout Indonesia to prevent the transmission of COVID-19 in the campus environment. Referring to its contents, this book contains information on controlling the spread of COVID-19 ranging from [1] campus participation in the prevention and mitigation of COVID-19,[2] campus activities in the control of COVID-19,[3] the target of the COVID-19 Standby Campus program, [4] stakeholders of the Kampus Siaga COVID-19, and finally [5] how to develop the Kampus Siaga COVID-19.

Referring to “Panduan Pembangunan Perumahan dan Permukiman Perdesaan” about “Dasar-dasar Rumah Sehat” published by the Ministry of Public Works and Public Housing, it is stated that housing and settlements under Law No. 1 of 2011 are:

- A house is a building that serves as a habitable residence, a means of family construction, a reflection of the dignity and dignity of its residents, as well as assets for its owner.
- Housing is a collection of houses as part of settlements, both urban and rural, equipped with infrastructure, facilities, and public utilities as a result of efforts to fulfill a livable home.
- Infrastructure is the basic physical completeness of a residential environment that meets certain standards for the needs of a decent, healthy, safe, and comfortable residence.
- Tools are facilities in a residential environment that serve to support the implementation and development of social, cultural, and economic life.

3. Research Methods

3.1. Research Design
This study uses a case-study method in which researchers choose the right object and can represent urban areas in the population in East Java and can provide an overview of spatial problems that occur in general in the community. The data was obtained by means of surveys and observations, as well as an understanding of people's behavior as a cultural background in this study. Data is processed by qualitative methods, with descriptively analytical description that aims to find, analyze, and describe the layout of environmental and building arrangements with the approach of a dense residential environment in urban areas.

3.2. Research Location
Considering the time available, the research was conducted in the city village in Surabaya. To get the data needed, the way of data collection is done through survey methods and observations. The survey method is used to obtain data, especially the physical condition of residential environments in Kampung Pradah Permai RW 4 Surabaya, as well as existing infrastructure. Survey methods are also used to obtain data on the existing conditions of the environment, socio-culture, and existing conditions of existing
buildings in the village that are used as research objects. One of the cities in Indonesia that has been a lot of people who question their villages to be more beautiful and cleaner is the city of Surabaya, under the leadership of Mayor Tri Risma Harini some time ago vociferous in improving the village. The scope of research focuses on Kampung Pradah Permai located in the elite residential area of Darmo Permai Surabaya. The position of the village in the middle of the elite settlement gives its own phenomenon and uniqueness to the changing face and spatial conditions of the city village. Therefore, this village is used as the location of settlements from this research because it is considered to represent the type of village that exists in major cities in Indonesia or in the archipelago with all the social phenomena seen from its architectural design. The scope of Kampung Pradah Permai in RW 4, can be seen in the map as follows:

![Picture 1 Location and photo of the condition of Kampung Pradah Permai RW 4 Surabaya (Source: Digitalization by Yanita Mila Ardiani)](image)

3.3. Data Collection Methods
Broadly speaking, the stages of data collection activities are as follows:

1. The initial study stage is an activity to make a draft of the association, formulate a frame of mind, and understand the issues related to the proposed title. In addition, it is also done to identify the needs of supporting data to support the desired output.

2. Problem analysis to group existing problems, used as a frame of reference for field surveys to Kampung Pradah Permai RW 4 Surabaya.

3. The survey /data acquisition stage is a data retrieval activity to be used as planning materials. For potential data related to typical characteristics / local villages used as research objects will be equipped also with secondary data such as reviews of socio-cultural aspects. Observations are made to the field / site in the village that is used as a research object to gain a clear understanding of the state of the existing residential environment. Interviews to residents are conducted to obtain primary data on the pattern of activities of the villagers concerned.

4. Design Stage to get a layout model of structuring a healthy residential environment in urban areas including the outside environment and buildings. The existing prototype will be developed in more detail with the results of advanced observations and will produce a precise technology design that will be made and installed in the settlement of Kampung Pradah Permai RW 4 Surabaya.

3.4. Initial Data as Research Foundation
Preliminary data obtained from previous research is used as a foundation in getting an overview of the development of prototypes in the form of building models for standardization of healthy environment creation in densely populated urban areas. Alternative design in this prototype is made to maximize the effectiveness of land use while still paying attention to the needs of space for its residents.
3.5. **Data Analysis Method**

The analysis method is done with descriptive analysis, based on observation results, interview results in the field, and looking at the typology of buildings and environments by looking at the variables of a residential environment. The data obtained is then processed also coupled with data on environmental conditions, regulations and ideal conditions of residential environment in urban areas, then an in-depth analysis is carried out related to how the residential environment is organized.

4. **Results and Discussion**

4.1 **Housing.**

Kampung Pradah Permai Surabaya has undergone changes not only spatially but also occurred in its buildings. This happens naturally adapting to the development of other areas around the village. As explained above, Kampung Pradah is 'besieged' by a rapidly growing area, among others, the elite Darmo Permai Surabaya area.

One of the obvious changes is in people's homes. The front of the house, which was originally a terrace and yard, then turned into other functions, such as a parking lot / garage, aviary area, and even turned into a stall / shop. There are even cases of the establishment of some small houses because of the result of the division of the original house into small houses. The case occurred for reasons of family inheritance resulting in small, crowded houses. To make typology of houses in the area of the object of research, several types of houses have been made depicted in floor plans and 3D models to make it more visible building mass. The types of houses that exist are:

![Picture 2. Common layout of private housing in Kampong Pradah](image)

4.2 **Healthy Settlements Model**

To realize a healthy city village, of course, must meet the infrastructure standards for residential environments. One of the references is the Basics of Housing Planning (Pusbindiklatren Bappenas). The main factors are environmental infrastructure consisting of environmental facilities, circulatory network systems, drainage, and environmental health (including aspects of health in each home). Furthermore, the Director General of Cipta Karya also gave reference to the basic elements in the residential environment, namely: environmental roads / footpaths, drainage systems, clean water supply, Garbage Collection and Disposal and Toilet Washing Baths areas. Here is the table of Basic Components of Settlements:
Table 1. Settlement Basic Component Table  
(Source: Housing Planning Fundamentals by Dipusbindiklatren Bappenas (2003: 2-4))

| No | Component                  | Technical Criteria                                                                 | Information                                                                                                                                 |
|----|----------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Road Network               | • Minimum distance of each house is 100 m from one-way road and 300 m from 2-way road.<br>• Minimum width of pavement 2-way road is 4 m.<br>• Minimum road density is 50-100 m/ha for 2-way road.<br>• Pedestrian pavements are at least 20 m away with pavements of 1-3 m.<br>• In principle, the road network should be able to serve the interests of fire cars..<br>• In addition, a maximum of 15 minutes of walking must be served by public transport.<br>• The minimum dimensions of pedestrians are proportional to the width of a wheelbarrow/rickshaw. |                                                                                                                                               |
| 2  | Clean Water (common faucet)| • Minimum service capacity of 201 person/day.<br>• Minimum network capacity 60 litre/person/day.<br>• Service coverage 20-50 KK/unit.<br>• Fire Hydrant minimum radius 60 m - 120 m.<br>• The calculation of the need is more detailed about the general faucet based on the number of PAM customers and local water quality. |                                                                                                                                               |
| 3  | Sanitary                   | • Individual septic tank, individual catchment.<br>• Septic tank together, catchment with Mini IPAL.<br>• In principle, the environment should be clean from household waste pollution. |                                                                                                                                               |
| 4  | Waste Management           | • Each gerobag serves 30 to 50 housing units.<br>• Environmental waste management is handled by local communities.<br>• In principle, environmentally managed waste services can be managed by the concerned environment. |                                                                                                                                               |
| 5  | Drainage                   | • Drainage networks are built utilizing existing road networks and bodies of water.<br>• Channel dimensions are considered based on the service (coverage area) of the concerned block/environment.<br>• The placement of the channel considers the availability of land (can be beside or under the road).<br>• If it is not connected to the city system, a local catchment or retention pool must be prepared.<br>• This form of handling can be part of a city network system or a local system. |                                                                                                                                               |
Furthermore, Surtiani (7) mentioned that there are several points in creating a Healthy Environment, namely:

a. The arrangement of building area and land area with a composition of 40% of the building area compared to at least 60% of land area. One of the benefits is for areas of beneficial plant planting, such as vegetables, plants for medicines (living pharmacies), shady trees as shaders, and others.

b. Sanitary arrangements:
   1) Clean water. There must be a source of clean water that becomes a source of drinking water for the community in the residential environment. If the water source around the residential environment is not eligible for drinking, water purification must be done first.
   2) Dirty water discharged through channels that are distinguished into:
      • Rainwater network.
      • Open, located under the roof channel and should be able to drain rainwater into the environmental rainwater channel with a slope of at least 2%.
      • Bathing and washing drains are streamed to the environmental channels.
      • Dirty drains from closed outhouses, channelled to cubluks or septic tanks to then flow fluid to the well presentment or filtration which can then be discharged into existing bodies of water (rivers and others).
   3) Garbage management. Must be thrown in place so as not to damage the environment and clog waterways that can cause flooding.

Based on the above references, there are 2 main components in realizing a healthy residential environment, namely houses / buildings and environmental infrastructure facilities. In this study, the two main components were further elaborated and became the basis of structuring in realizing a healthy residential environment:

a. House
   • Air circulation in the house can flow well.
   • House lighting.
   • Layout of the space according to function and needs.
   • Suitable furniture.

b. Environmental Infrastructure and Facilities
   • Road
   • Sanitary (liquid and solid waste channels)
   • Green Open Space

which is then made a model of arrangement in accordance with the environmental context of Kampung Pradah Permai.

4.3 *Healthy House Model.*
The criteria of a healthy house can be summed up in the following points:
1. A house with good air circulation so that the air inside the house is not damp and stuffy.
2. Sufficient natural lighting.
3. Layout Space. The prototype was made assuming a 36 m² type house in Kampung Pradah Permai Surabaya. Minimalist room needs with two bedrooms, kitchen, toilet, and family room that also serves as a living room. Space layouts like this are suitable for families who want to separate the privacy space between couples and their children.

4.4 *Healthy Physical Environment Model.*
Here are some of the main considerations in creating a healthy residential environment:
1. Road
2. Dirty Waterways  
3. Rainwater Channel  
4. Trash  
5. Green Open Space

Healthy Physical Environment Model adds Green Open Space planning presented in the following table:

| No | GOS Model | Information |
|----|-----------|-------------|
| 1  | Gardens on the side of the road | Green Open Space (GOS) in the form of a roadside garden.  
(+) Easy care and shared responsibility.  
(₋₋) Needs space |
| 2  | Gardens above the road | The garden is placed in the street space but 'lifted' above the road. It must be ensured that the vehicle can still pass under it.  
(+) Save space.  
(₋₋) Access to plant care is more difficult |
| 3  | Roof gardens | Green space is placed on the roof of the house.  
(+) Save space.  
(₋₋) Prone to neglect because it becomes the business of each house. |
| 4  | Vertical gardens | The garden is created vertically if there is no horizontal space available.  
(+) Save space  
(₋₋) Periodic care is needed. |

4.5 Conclusion

This research come to a conclusion that creating a healthy and resilient village in already densely populated area is possible by giving continuing education and give some example of simple sustainability systems, in this study case area to feel the benefits directly for their community. The simple yet sustainable model to improve their health conditions is by creating the Green Open Space Planning that presented in the above table. Special Green Open Space (GOS) in this study has been made a 1:1 model in the form of a garden model on a road built at the research site. This model is made
to know the constraints and potential that exist from alternative garden models like this. Here is a photo of the park on the road that has been made in Kampung Pradah Permai.

![Photo of Kampung Pradah Permai park on the road](image)

**Picture 3.** Garden above road prototype in Kampung Pradah Permai Surabaya

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**References**

1. Akbar T. KAMPUNG TEMATIK SEBAGAI BENTUK PARTISIPASI MASYARAKAT DALAM PERMASALAHAN PERMUKIMAN KUMUH DI KOTA MALANG. Wahana Tridharma Perguru Tinggi. 2018;70(2).
2. Oktaviani O, Muchtar H. Implementasi Program Kampung BANTAR (Bersih, Aman dan Pintar) di Kelurahan Eka Jaya Kecamatan Paal Merah Kota Jambi. J Civ Educ [Internet]. 2019 Sep 2 [cited 2021 Oct 10];2(3):260–9. Available from: http://jce.ppj.unp.ac.id/index.php/jce/article/view/160
3. Asti Mulasari S, Ahmad Dahlan Yogyakarta U. MEMBANGUN KOTA SEHAT (HEALTHY CITY) MENUJU INDONESIA SEHAT BERKEMAJUAN. 2018;2(2):187–94.
4. Bianpoen. Untuk apa? Untuk siapa? Rangkaian pemikiran lingkungan berkelanjutan. 2011;
5. Abdurrachman S, Wijono RS. Modernitas dalam kampung : pengaruh kompleks perumahan Sompok terhadap pemukiman rakyat di Semarang abad ke-20 | OPAC Integrasi | Online Public Access Catalog | Universitas Gadjah Mada [Internet]. 2013 [cited 2021 Oct 10]. Available from: http://opac.lib.ugm.ac.id/index.php?mod=book_detail&sub=BookDetail&act=view&typ=html&xt=buku_id=461297&unit_id=1
6. Direktorat Jenderal Kesehatan Masyarakat Kementrian Kesehatan Republik Indonesia. Buku Panduan Kampus Siaga Covid 19 [Internet]. 2020 [cited 2021 Oct 10]. Available from: https://hpu.ugm.ac.id/wp-content/uploads/sites/1261/2020/08/Buku-Panduan-Kampus-Siaga-Covid-19.pdf
7. Surtiani EE. FAKTOR-FAKTOR YANG MEMPENGARUHIT CERPTANYA KAWASAN PERMUKIMAN KUMUHDI KAWASAN PUSAT KOTA(STUDI KASUS: KAWASAN PANCURAN, SALATIGA). 2006;