Vulnerability of the Magersari Heritage Settlement Keraton Kasepuhan in Indonesia for Pandemics: The case of Covid-19

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Abstract

Keraton Kasepuhan is located in the Cirebon City, in the West Java Province of Indonesia. The keraton has a particular settlement area for abdi dalem (people who work at the palace) named Magersari. The Magersari area lies together with the Keraton building. Today, the Magersari settlement is of high density, and therefore is very susceptible to COVID-19. Social distancing practices are problematic. The aim of this study is to examine the vulnerability of the Magersari heritage settlement, against pandemics such as COVID 19.

The study used qualitative methods through a rationalistic approach to examine the concept of social distancing as practiced in this settlement. The empirical data taken looks at the total house area, total residents, age of residents and house positions in the Magersari settlement. A descriptive analysis is accomplished to ascertain the distance parameters that can be practiced as recommended by the WHO. Then, it is calculated from total house area, total residents, and residents' ages. The outcomes show the areas highly vulnerable to the pandemics of this nature. The recommendations will help the government of Cirebon City and Keraton Kasepuhan to follow up the efforts to safeguard the areas of Magersari heritage settlement of Keraton Kasepuhan.

Keywords: Heritage Settlement- Magersari Keraton Kasepuhan, Vulnerability COVID-19

1. Introduction

Keraton Kasepuhan is one of the historical heritage of the Kingdom in West Java (Agustina, *et al*, 2016). It is part of the Kasultanan Cirebon and still carries the lineage of the Pajajaran empire (one of the biggest empires in West Java in the pre-Islamic times) (Agustina, *et al*, 2016). Kasultanan Cirebon is the center from where Islam spread in Western Java. Sunan Gunung Jati acted as *wali* the spreader of Islam and as one of the famous kings from the Kasultanan Cirebon (Agustina, 2017). Ever since the 16th century, Kasultanan Cirebon has been divided into three: namely Keraton Kasepuhan, Keraton Kanoman, and Keraton Kacirebonan (Agustina & Hindersah, 2019). These keratons remain in existence until today. The past history of Kasultanan Cirebon's glory and the processes of spreading Islam is still maintained in those three keratons.

Those Keratons in the Cirebon City are still attractive for their pilgrimage tours until today (Agustina, 2017). The destinations are the tomb of Sunan Gunung Jati and the Keraton. Visitors are not only the locals but also come from various areas and even foreign countries. The number of visitors to the Keraton Kasepuhan is around 4000 persons/month (The King of Keraton Kasepuhan: Arif Natadiningrat). Visitor nymbers usually increase sharply when the traditional ceremonies are held: one of which is the *esoterik panjang jimat* tradition. This

ceremony is based on the Java year calendar which is in the month of *Mulud* (Agustina, 2017). The Keraton Kasepuhan is the Keraton with a professional management compared to the other two (Agustina & Hindersah, 2019). Only Keraton Kasepuhan of the Magersari area is now managed by the Keraton party; the other two Keratons had given the authority of management of Magersari area to the residents.

Magersari is a heritage area of the Keraton. This settlement lies together with the Keraton's building. The Keraton was built with fort *kuta kosod*, and was made from red brick as high as 2 meters. The builder was Sunan Kalijaga, one of the members of the Wali Sanga. The Magersari settlement is also located in the Fort. Inside this area, there are artifacts like animal symbols, and the house of *patih* and *lawangsanga (*nine doors) dock. The historical value and the building has made Magersari a very important heritage area.

Indeed, this heritage area has received the world's attention (Stoica, 2009 cited in Mubaideen, 2017). It says that in the 20th century, this heritage area has received the world's attention because the sites have historical and cultural values. Even more, UNESCO convention in 1972 concluded that the heritage sites have "exceptional universal value from the point of view of history of art or science". The Magersari settlement area and Keraton Kasepuhan is the history of the formation of urban civilization in West Java (Suryanto, Djunaedi, & Sudaryono, 2015). Historical values glued to this area must become an important concern for the society, the local government and the central government. The international world and even UNESCO have emphasized the urgency of taking care of the historical sites as sources of knowledge. Undeniably, the heritage area of Magersari settlement must be well taken care of.

Previous studies have not focused on research on the heritage of the Magersari settlements in terms of potential health implications of viruses. The 2014-2018 research on the Magersari settlements of the Cirebon palaces have focused on the meanings of spaces and explorations of the Magersari heritage settlements, from the physical and socio-cultural aspects. This research focuses on the vulnerability of Magersari heritage settlement area for pandemics such as COVID-19. Previously, research on vulnerability has been carried out on areas such as vulnerability due to climate change (Aguilar, Bannack, & Fuentes, 2013; Haque *et al*., 2013; Downing *et al*., 2001; and Ford & Pearce, 2010), changing environment (Pearce, *et al*, 2012), river floods (Musa *et al*., 2015), and diseases (Bardosh, *et al*, 2017). However, heritage settlement research with a focus on vulnerability of COVID-19 disaster is different from previous research.

COVID-19 has had an impact on the policies, such as temporarily closing the Keraton Kasepuhan tour. The Keraton itself has applied the government policy to stay at home during the pandemic. Magersari settlement is a high-density settlement area, and therefore the implementation of the social distancing regulations is constrained by the high density of the population of this area. Moreover, the area is integrated with the Keraton Kasepuhan which attracts a relatively large number of tourists. Besides, this area has cultural heritage values which can be considered as being important as knowledge and for the improvement of Indonesia. If this area is exposed to COVID 19, it will surely reduce its attractiveness and decrease the possibility to retain knowledge about its historical values. Therefore, this study aims to examine the vulnerability of Magersari settlement to COVID 19. The findings will provide recommendations to deal with pandemics of viruses such as COVID 19 in this region.

2. A Review of Literature

Construction and design of spaces of ancient sites have not sufficiently considered the sensitivity of health issues. For the first time, the European Union in 2020 considered cultural heritage protection arising from the issues of sustainability due to excessive economic growth (Agapiou, *et al.*, 2016). Habitat III published by UNESCO demanded a new model of urban development and Habitat III acknowledges that culture, historically had become the strength of urban development (Duxbury, Hosaghrahar & Pascual, 2016). The Cirebon City has potential, and the Keraton as the central area of cultural heritage plays a role in promoting sustainability of the Cirebon City. Keraton has pilgrimage tour attractions. The city of pilgrimage has a philosophy and its control values must be regulated not only sectionally but cross regionally

(Chandan & Kumar, 2019). The Keraton has influence not only in the Cirebon City but also in other regions.

The Magersari heritage settlement is an area integrated with the Keraton: both the physical location and the cultural community. The social cohesion in Magersari is influenced by the existence of the Keraton. The residents are *abdi dalem* and Keraton people. Consequently, the community in Magersari is an integral part of the Keraton. Magersari settlement is a physical cultural heritage, while social cohesion that arises is an intangible heritage that also has to be protected (Vecco, 2010). Magersari is an old artefact merged with the Keraton. The old artefacts that must be preserved are the products of mind, because that is the product of religious human beings who believed that there is a unity between the human beings, the universe and the realm of divinity (Sumardjo, 2014). The mind products are included in intangible heritage.

Covid 19 is a disease that has plagued the entire regions, including Keraton Kasepuhan and the Magersari settlements. According to WHO, social distancing between people should be one meter (2020). Furthermore, all countries in the world including Indonesia have ordered people to stay at home as much as possible. Hence, house is a space that has a crucial role in the prevention of COVID 19. The house is a social construction built within the parameters of social norms, an appropriated micro-territory that territorializes socio-spatial practices in everyday life (Andrea & Hormazabal, 2016). A house is a private activity place of its occupants. Research of simple housing in Indonesia shows a minimum total area of 32,5-36 m^2 (Suryo, 2017). House is set as the shelter from Covid 19 and as the safest place to avoid being exposed to Covid 19.

Previous studies in the Magersari region did not focus on the vulnerability of Covid or other pandemics. The table 1 below shows previous research on various vulnerability issues.

Table 1: Previous Research on vulnerability issues
Source: Author

Vulnerability Research
Building vulnerability (Peduto et al., 2016)
Food vulnerability (Musa, Nda, Usman, Abdul, & Sanni, 2015)
Land vulnerability (Rusdi, Roosli, & Ahamad, 2015)
Heat vulnerability (Coates, Haynes, O'Brien, McAneney, & De Oliveira, 2014)
People vulnerability (Haque et al., 2013)
Karst vulnerability (Lenhare & Sallun Filho, 2019)
Vulnerability pattern (Ni & Ni, 2010)
Flood vulnerability (Musa et al., 2015)
Spatial vulnerability (Mejía-Navarro, W. & Oaks, 1994);(Perry, et al., 2012)
Water vulnerability (Domínguez Aguilar et al.,2013; Pandey, et.al., 2009;Goldhar, et.al, 2014)
Urban vulnerability (Ernawati, 2013;Surjan & Shaw, 2008)
Seismic vulnerability (Khamespanah, Delavar, Alinia, & Zare, 2013;Geiß, Jilge, Lakes, & Taubenböck, 2016)(Gomes, Gaspar, & Queiroz, 2006)
Kampung vulnerability (Ernawati, 2013)
Vulnerability to human activities (Bowden et al., 2013)
Coastal vulnerability (Palmer et al., 2011)
Human settlement vulnerability (Surjan & Shaw, 2008;Mitchell, 1998)
Cultural heritage vulnerability (Palmer et al., 2011)
Social vulnerability (Cutter, 2006)
Human habitat (Kabisch, 2012)
Socio-ecological vulnerability (Flint, 2008;Salvati, 2014)
Landscape vulnerability (Liendo, Solleiro-Rebolledo, Solis-Castillo, Sedov, & Ortiz-Pérez, 2014);(Day, Moerschbaecher, Pimentel, Hall, & Yáñez-Arancibia, 2014;Fan, Xie, Qi, Chen, & Huang, 2014;McWethy et al., 2010)
Coastal heritage vulnerability (Reeder-Myers, 2015;Palmer et al., 2011)

Although above research have been carried out, no one has focused on the vulnerability due to pandemics in the Magersari of Keraton Kasepuhan. The study of the vulnerability to Covid 19 in Magersari is therefore new. Covid 19 has now become a serious aspect due to its impact on sustainability of attraction of the area and the cultural transformation of the past for the next generation.

2.1 Theoretical Orientation

The study is based on the theories related to vulnerability. Vulnerability is often associated with disasters, especially natural disasters. The term vulnerability has become a popular topic of scientific research in this decade. The concept has been used in different studies, although there is no consensus on its meaning (Adger, 2006; Smit & Shaw, 2006; and Gallopin, 2006). The concept of vulnerability is the basis of human-environmental research (Wu et al. 2002). The word "vulnerability" comes from the Latin word vulnerability, which means "to injure". At the most basic level, vulnerability can be defined as "potential loss" (Cutter, 1996). However, a general definition of vulnerability does not specify the type of loss or the individuals, groups, or communities that suffer losses (Cutter, 1996). There are two perspectives of vulnerability, first treating vulnerability as a pre-existing condition and focusing on potential hazard exposure (Cutter, 1996). Studies conducted according to this perspective tend to assess the distribution of some hazardous conditions, human occupancy in danger zones, and rates of loss of life and property resulting from certain events. A second perspective on vulnerability suggests that not all exposed individuals and groups are equally vulnerable; conversely, affected people display different patterns of loss (Wu et al. 2002).

The second theoretical orientation is heritage settlement. Magersari is a housing complex given by the King for his servants (Agustina & Hindersah, 2009). The word 'magersari' is a spatial concept based on the historical tendency of social compartmentalization and extended family systems in culture (Budiarto, 2005). Heritage has the concept of something that is transmitted (Vecco, 2010). Magersari settlement is an area that contributes to the history of the formation of living space; even the origin of a city is initiated by the formation of a living space (Suryanto, et al, 2015). In addition, heritage is considered as a stimulus of economic activity and a booster of economic development (Keser, 2016). The study of the economic impact of heritage areas has two perspectives: the first involves estimating various types of inheritance that cannot be given market prices because they are not traded commodities like other goods. The second perspective has a positive impact on investment in heritage areas on local and regional economies in terms of income, employment and services (Dans et al, 2017). Magersari is a heritage settlement that has historical values and needs to be preserved because it has an impact on the local and regional economy of the Cirebon City.

3. Research Methodology

3.1 Context of the Study

This research is located in the Magersari area of the Keraton Kasepuhan, Cirebon City, West Java Province of Indonesia. The Cirebon City is geographically located at 108°33 East Longitude and 6°41 South Latitude. The Cirebon city is approximately 200 km from the capital city of Jakarta. Jakarta-Cirebon can be reached by using the Toll Road Network.

3.2 Data Collection Procedure

Data was collected by surveying the location of the Magersari region in September 2019 for one week. The survey was assisted by two surveyors. The house map data collection was obtained from Google Earth in 2018, then digitized for each house. Maps from Google Earth processing produced maps for the field observations. The object of the field observation is the collection of data of each house such as: building type, building condition, type of building function, building area, number of building floors, residential facilities. 203 houses were observed.

3.3 Methods of Analysis

The research used the 'rationalistic approach' method. Rationalistic approach method introduces reality in the form of sensual empiric, logical/theoretical empiric and ethical empiric (Muhadjir, 2002). Theoretical empiric uses the grand concept of social distancing published by WHO. WHO (2020) set the one meter distance for each person to prevent Covid 19 transmission. The grand concept is used to analyze the vulnerability of the houses in the Magersari heritage settlement Keraton Kasepuhan. According to the grand concept, it is assumed that the safe area for each person is 4 m^2. This assumption becomes the standard to observe vulnerability in the Magersari settlement area. Distribution map of the houses in this area helps analyzing the areas susceptible to Covid 19. Furthermore, the assessment of houses from the GIS-based maps was carried out. GIS was used as a tool for mapping the Magersari region. Interpretative mapping is a very important tool in the context of cultural heritage, and might work more like a logical deduction (Hossain, 2019). The result is the classification of the susceptible area in the map. It will then justify the most vulnerable to the less vulnerable areas.

Data processing is carried out by simple calculations using the house area indicator as an indicator of vulnerability. Rygel, O'Sullivan and Yarnal (2006) highlight the usefulness of indicators as proxies for vulnerability assessment, especially in indicators in the context of time and space. Data is processed by creating tables for 203 houses. It is then codified using building numbers, area codes, number of occupants, and the building area. Then it multiplies the number of residents by 4 m^2 (the safe area defined by WHO). The result compares the building area observed with the result of the multiplication. If the area of the building is below the area of the result of multiplying the number of occupants by 4m^2, then it is classified as very vulnerable, whereas if the ratio of the area of the building to the result of the multiplication of the occupants with 4 m^2 or less, the result is less than 20 M^2 , then it is categorized as quite vulnerable. The comparison results above 20 M^2 are considered as not vulnerable. The result is a simple calculation comparison between the area of houses in the field and the safe area stipulated by WHO.

Result and Discussion

4.1 Results

Magersari settlements form is dense and has irregular settlement patterns. The region is located in the unit of neighborhood named *Rukun Warga* (RW) that is RW 02, Kasepuhan village, District Lemahwungkuk, Cirebon City, West Java Province (Fig. 1 and Fig. 2). Magersari area has been historically divided into 3 areas: the blue colored is *mandalangan*, the red colored is water garden and the green is *lawangsanga* (Sembilan pintu). It is not written (information from the abdi dalem) that the three zones are for settlement arrangements. The mandalangen zone arrangement is a zone for housing (building houses), the water park zone is a water filtration area and the lawangsanga zone (meaning nine doors) is the entrance to the palace from the back side (Information from the palace servants). The location of the lawang sanga zone borders the Kriyan River, where the river is connected to the Java sea. Previously, this zone was a place for the goods to enter and exit the palace from outside the area. Magersari settlements no longer follow these rules, so they are not regular.

Fig. 1: Position of Cirebon City in West Java Province Scope
Source: Agustina, 2020

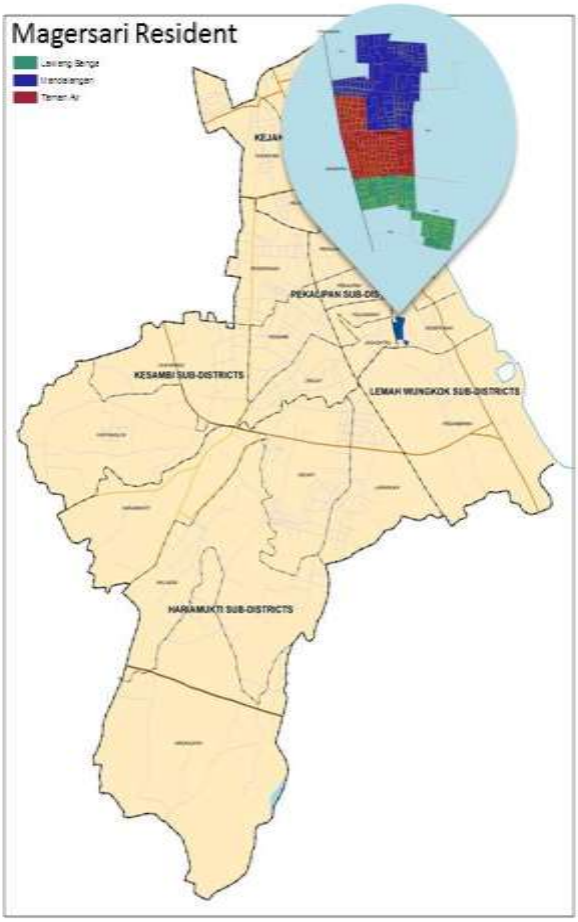

Fig. 2: Position of the Magersari Area withine the scope of Cirebon City
Source: Agustina, 2020

House buildings no longer follow the rules set by the palace. Buildings in the Magersari settlement area are dense and have permanent buildings. The density of the buildings can be seen through the road network that can only be passed by two-wheeled motorcycle vehicles. Sanitation around the area is poorly maintained; therefore when the rainy season comes, flooding occurs. Moreover, it had experienced a number of floods (see the houses building). The total area of the buildings vary from 13 m^2-400 m^2. The unwritten rules for housing construction in the Magersari settlements are that the building heights must not exceed the height of the palace. The height is set as a symbol of respect for the palace (abdi dalem keraton). However, this rule has been violated by several houses that exceed the height of the palace buildings.

The number of residents in one house does not follow ideal rules and regulations. A house is inhabited by 3-13 people; those numbers are relatively high for residents of a house. According to WHO provisions for the prevention of the pandemic COVID 19, social distancing or physical distancing is needed; therefore, the building density in this area should be observed referring to the limitation of the area size. The limited area size for each person is 4 m^2. This boundary is in accordance with the housing rules and housing studies in Indonesia for urban areas (Rosa, 2013). There are houses where the ratio of people and size does not match the reference to these rules, so they have vulnerability to Covid-19 exposure.

The results of calculating the area of the house compared to the number of residents produce a level of vulnerability to the Covid-19. In accordance with the purpose of this study to describe the vulnerability of Covid-19 in the Magersari settlement area, 160 houses were examined using the GIS map. Each house has its building code and area code, which is the limitation of the neighborhood unit *Rukun Tetangga* (RT). Then, the total residents of each house is multiplied by a minimum area of 4 m^2. If the result is smaller from the multiplication result of residents with 4 m^2, then the house is very susceptible to Covid 19. The calculation results show there houses that are very vulnerable to Covid 19 (see Fig. 3).

The classification of the level of vulnerability is carried out within the scope of the area by dividing into 3 classifications, namely: Highly vulnerable (black), moderately vulnerable (gray) and least vulnerable (light gray). Zone boundaries use the administrative boundaries of the RT (Rukun Tetangga/ neighborhood Association).

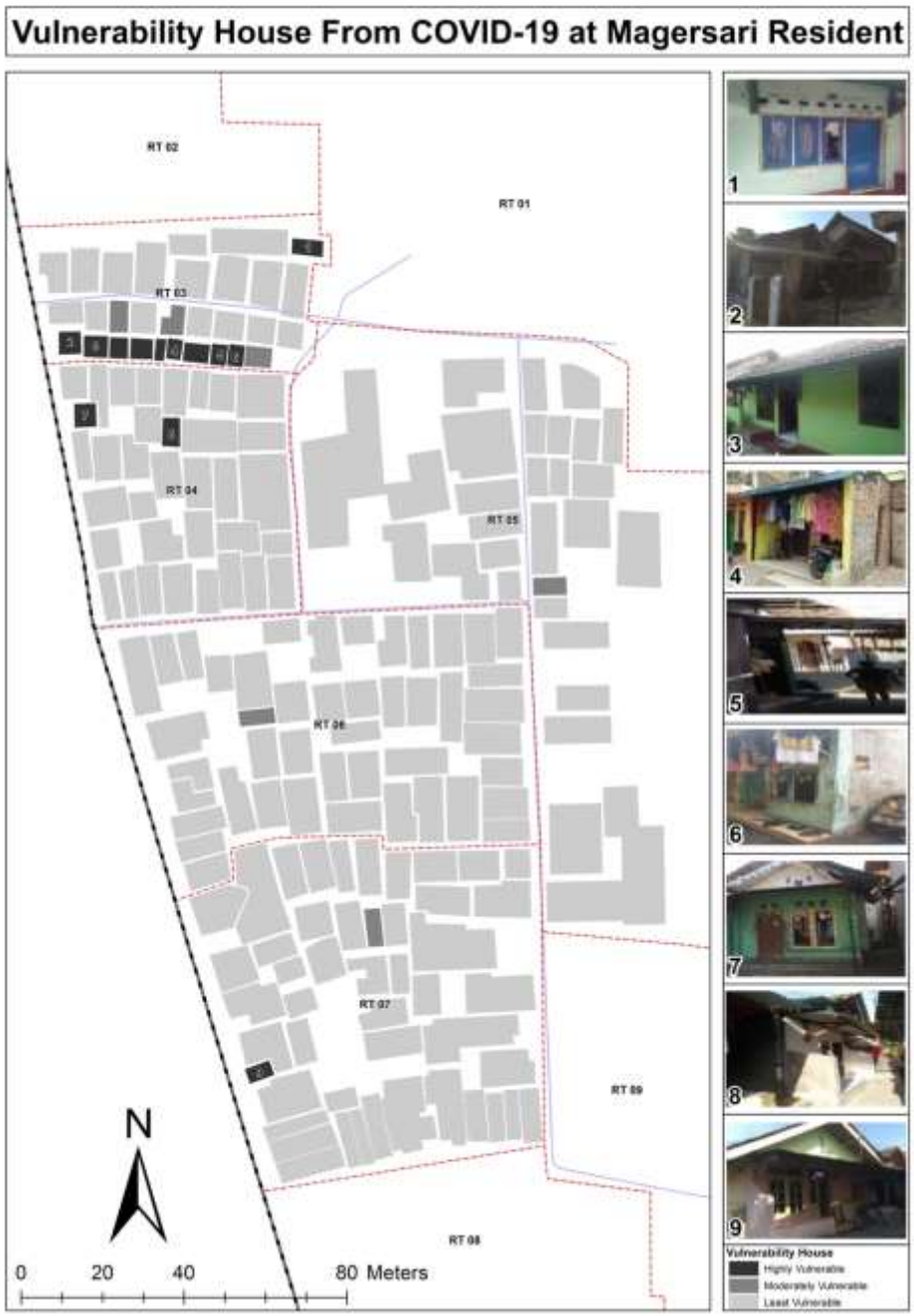

Fig. 3: Distribution of houses vulnerable to COVID 19
Source: Agustina, 2020

The classification of the level of vulnerability of the housing environment is interpreted from the total number of houses that has a level of vulnerability (seen from the area of the house), the density of the building, and the land area between houses. The distribution can be seen in Fig. 4. Classification of vulnerability within the scope of the area is to estimate the conditions of vulnerability in the Magersari area, because with the presence of houses that are vulnerable to COVID 19, the surroundings areas of the house will also have a level of vulnerability to COVID 19.

Fig. 4: The classification of the level of vulnerability at Magersari
Source: Agustina, 2020

The results show that there are two areas or two neighborhood units which can be classified as being highly vulnerable to Covid 19 (see the red colored part) in the Magersari settlement. The yellow shows the moderately vulnerable area, while the green one shows the least vulnerable area. There are two areas which are considered as highly vulnerable to Covid 19, and therefore, they must be dealt with some follow-up efforts to prevent the spread of Covid in the Magerari Settlement area Keraton Kasepuhan.

4.2 Discussion

The findings of the study show that the Magersari heritage settlement is an area vulnerable to the impact of the Covid-19 disaster. Highly classified vulnerability levels dominate this area. This finding, when viewed from the perspective of the vulnerability concept

of "loss position" (Wu et al, 2002), will cause harm to the local community and the Keraton Kasepuhan. Losses happen because it will have an impact on the closure of the area as a tourist destination and of course it will have an impact on the income of the palace from tourists and also the income of the Magersari community. This area will become a dangerous zone for the spread of Covid-19.

The reduced attractiveness of tourists has hampered economic growth. The development of heritage tourism should increase economic growth (Keser, 2016), but vulnerability to the Covid 19 disaster will reduce tourist attraction and the image of the region. Economic growth in this region is also hampered. The study findings show that the Magersari is a zone that is susceptible to Covid-19. This condition shows conformity with the concept of vulnerability caused by humans and the environment (Wu et al, 2002). Vulnerability that occurs in the Magersari area must be dealt with by involving the community to play a role in maintaining the cleanliness of their environment. This is because the facts show that not only are the buildings densely populated but the environment is also unhealthy, so they have the opportunity to cause various diseases.

This research generates three classifications of vulnerability levels, namely high, medium and low. This classification is related to zone coverage and risk measures caused by the Covid 19 disaster. Classification is carried out as an effort to manage the Magersari area to be more healthy because it has implications for tourist attraction to the Keraton Kasepuhan area and has an impact on socio-culture, local knowledge and heritage values of this area. For this reason, the management of the Magersari residential area must consider the socio-cultural cohesion, the number of people and the density of the buildings. In the high classification zone, the increase in the area of the building and the number of occupants must begin to be limited without reducing the value of the socio-cultural kinship that formed in it.

Handling of Covid-19 Vulnerability in the Magersari area must be assisted by various stakeholders, because this area has historical artefacts in the formation of space. The need for a systems approach has become one of the foundational pillars of contemporary management theory, in relation not only to business organizations but with auto-poetic social systems (Petric´, *et al*, 2020). Although the Magersari area is under the authority of the Keraton Kasepuhan, efforts to approach the system must be considered. This system approach can be assisted by the Cirebon City government.

Conclusions

Covid 19 has caused several policy actions and even social distancing policies for all regions including Keraton Kasepuhan in Cirebon City. Keraton Kasepuhan has the Magersari area which is a densely populated area integrated with the Keraton. The results of the Covid 19 vulnerability study indicates that this area is vulnerable to Covid 19 due to its settlement density. The implication can reduce the appeal of the palace; even the loss of the transformation of heritage values in this area. Socio-cultural implications will result in economic degradation of the community and the destruction of social cohesion and the religious mindset of the residents.

In preparation for Covid -19 and other pandemics, the policy to restrict occupants and buildings in this area must be revised immediately. The control of this area must be carried out using a systems approach and the Cirebon City government together with the palace parties must begin to take concrete action against these potential vulnerability threats.

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