

A Quantitative Perspective on Kampung Kota: Elaborating Definition and Variables of Indonesian Informal Settlements: Case study: Kelurahan Tamansari, Bandung City

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A Quantitative Perspective on Kampung Kota: Elaborating Definition and Variables of Indonesian Informal Settlements

Case study: Kelurahan Tamansari, Bandung City

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Abstract: Indonesia still has challenges in meeting the Sustainable Development Goals by 2030, particularly in regard to human settlements. In Indonesian cities there is a type of residential area referred to as *kampung kota* which is occupied by a large portion of urban dwellers. Despite the efforts to plan the residential area, *kampung kota* is considered equal to slum and squatter areas. This study seeks to identify the key variables of *kampung kota*, to later define *kampung kota* as a type of Indonesian residential area. The analyses are done qualitatively and quantitatively, aiming to generate a more comprehensive definition of *kampung kota*. It is found that at the kelurahan scale (the lowest level of government administration in Indonesia), economic ability, infrastructure condition, building condition, and social interaction can help to define *kampung kota*.

1. INTRODUCTION

One of the Sustainable Development Goals to be achieved by 2030 is to build inclusive, safe, resilient, and sustainable city and human settlements. This target does not only revolve around mid-upper class residential but also includes the poor and marginalised communities in a city. The current growth of housing in cities throughout the world has presented the best practices of urban renewal and rejuvenation. For example, there has been the relocation of slum dwellers into a high-density residential area. In the Indonesian context, there was the Kampung Improvement Program (KIP) initiated by the Government of Indonesia and the Asian Development Bank ([Firman, 2004](#); [Milone, 1993](#); [Pugh, 2000](#); [Reerink & van Gelder, 2010](#); [Tunas & Peresthu, 2010](#)).

On the other hand, there are some lessons learnt from practices of slum eviction ([Kim, 2010](#); [Kool, Verboom, & Van der Linden, 1989](#); [Paul, 2006](#)) and the phenomenon of gentrification, happening in both developed and emerging nations. One of those lessons is the changing livelihoods ([Erman, 1997](#)), which is often protested by those who are going to be displaced from their previous neighbourhood. This is also drawn back to the issue of social

injustice, as newly evicted residents sometimes move into a residential area still lacking basic infrastructure.

The discussions of slum and squatter areas have expanded to various solutions and programs—where some of them have been successfully implemented—one of the most fundamental problems is that the definitions are not clear (Berner, 2000; Obermayr, 2017). A slum is a type of housing which is far from optimal living standards and health codes (Erman, 1997; Purwanto, Sugiri, & Novian, 2017). On the other hand, the squatter is a type of housing dealing with land tenure issues (Brueckner & Selod, 2009; Kim, 2010; Neuwirth, 2007; Paul, 2006; Shabane, Nkambwe, & Chanda, 2011; Taher & Ibrahim, 2014). Besides “slum” and “squatter”, there are various terms regarding similar settlements occupied by urban dwellers throughout the world. In Turkey, there is *gecekondu* (Erman, 1997; Neuwirth, 2007; Özdemirli, 2014), *bustee* in Bangladesh (Paul, 2006), *barriadas* in Peru (Milone, 1993) and *favela* in Brazil (Handzic, 2010; Jenkins et al., 2010; Neuwirth, 2007). Some characteristics may be similar from one settlement to another, leading to the use of a more general term by Obermayr (2017), “informal settlements”, an area occupied by urban dwellers informally—whether the land is not legal for them to build their house upon or they have to trade their amenity and health so they can reside where they want to. UN Habitat (2015) defines informal settlements as “...areas where groups of housing units have been constructed on land that the occupants have no legal claim to or occupy legally”, and they can also be defined “as unplanned settlements and areas where housing is not in compliance with current planning and building regulations” (UN Habitat, 2015). It can be seen that “informal settlements” are similar to both “slum” and “squatter” regarding legal occupation, but it extends further in its compliance with planning, regulations, and standards.

In Indonesia, the development of *kampung kota* goes back to the Colonization era. Besides housing for Western residents, there was also housing for natives in several parts of the city, mostly in the fringe area (Tunas & Peresthu, 2010; Widjaja, 2013). These settlements somehow still exist until today, which range from the city centres to periphery areas. There have also been settlements emerging in types of slums and squatter areas, organically built on an area near the former *kampung kota* or on land that should not be used for residential areas, such as river banks and along the railway (Tunas & Peresthu, 2010; Widjaja, 2013). However, managing these types of informal settlements faces a problem, since Indonesian regulations only recognise slums as informal settlements. This condition leads to programs created only to improve the condition of slum areas up to the minimum optimal living and health standards, neglecting whether or not the settlements may have socio-economic or even historical contexts as *kampung kota*.

This study aims to identify key variables of what *kampung kota* may manifest from. This goal will be reached by extrapolating the general characteristics of slum and squatter areas along with identifying programs and policies related to *kampung kota*. Taking a case in the Bandung City of Indonesia, this study aims to introduce the particular variables which may distinguish *kampung kota* from other informal settlements. Also, this study should construct a basic model of how *kampung kota* will manifest in urban perspectives of Indonesia. Also, this study should contribute to addressing the shortcoming of the Indonesian housing systems, hopefully, to better integrate them into an urban planning system (Minnery et al., 2013).

This article consists of seven sections, with the next section (Section 2) describing *kampung kota* as a housing type in Indonesia and discusses the theoretical framework of housing in which *kampung kota* is juxtaposed. Section 3 elaborates the research methods employed. Section 4 and 5 explain the findings at the Bandung City scale and *kelurahan* (urban village) scale—which takes a *kelurahan* as the sample. This section is followed by Section 6 which discusses the findings on the results and the methods, and finally by Section 7 which presents the conclusion of this study.

2. KAMPUNG KOTA IN INDONESIAN HOUSING SYSTEM

2.1 Theoretical context of informal settlements

Slum and squatter issues have been substantial housing issues in nations throughout the world. These issues range from inadequate housing amenities and infrastructure to the eviction and relocation of slum and squatter dwellers. While the terms of “slum” and “squatter” are too vague to distinguish ([Berner, 2000](#))—which somehow lead to the use of more comprehensive terms such as “informal settlements” ([UN Habitat, 2015](#)) and “marginalized settlements” ([Obermayr, 2017](#))—the characteristics are actually different. To better identify the characteristics of “slum” and “squatter”, elaboration of these terms will distinguish them.

A squatter settlement can be defined as a type of residence in an urban area dwelled by poor people who cannot afford land tenure of their own, and thereby “squat” on vacant land, either private or public ([Brueckner & Selod, 2009](#); [Kim, 2010](#); [Shabane, Nkambwe, & Chanda, 2011](#); [Taher & Ibrahim, 2014](#)). “Squatter” also has a low standard of housing and lacks basic infrastructure, which leads to unsanitary neighbourhoods ([Erman, 1997](#); [Neuwirth, 2007](#)). The location of a squatter may be unattractive and include places such as steep slope and river banks ([Erman, 1997](#)), in addition to vacant public lands, such as railroad lines and sidewalks ([Paul, 2006](#)). However, [Brueckner and Selod \(2009\)](#) also find that squatter abodes may be built upon private land.

“Slum” itself has been used to refer to the physical attributes of housing for marginalised people. The development of slums cannot be easily distinguished from the squatter, as ([Ward, 1976](#)) finds that slum is a squatter located in the city centre, but the physical condition deteriorates over time. The slum is usually characterised by a crowded and unhealthy environment, low-quality buildings, and lacking public infrastructure and facilities ([Purwanto, Sugiri, & Novian, 2017](#)), though these characteristics are similar to those of squatters. [Minnery et al. \(2013\)](#) identify that slums represent where the urban poverty is located, even though some of the inhabitants may not be poor. The definition of slums is further elaborated on to include the negation of what condition slum upgrading tries to achieve. This negation includes unsustainable livelihood ([Minnery et al., 2013](#)) which comprises mostly informal economic activities and has firm ties to the geographical location ([Purwanto, Sugiri, & Novian, 2017](#)), leading to relatively low incomes for the slum dwellers and their low economic standards ([Bijlani, 1988](#)).

From those definitions, it can be agreed upon that slum and squatter share one similar characteristic, which is tenure insecurity. However, these

characteristics are generated by various factors. The first factor is that the urban area provides mainly job opportunities that attract migrants from the rural area ([Paul, 2006](#); [Shabane, Nkambwe, & Chanda, 2011](#)). Later, urban migrants choose the best locations which have proximity to urban jobs and such amenities ([Ulack, 1978](#)). These flows of migration result in the dynamics of slum and squatter dwellers, as they tend to move in nearby slums and squatters if they are to be evicted ([Paul, 2006](#)).

The second factor is the horizontal and vertical networks of squatter inhabitants. These newly urban inhabitants play a role in extending squatter development by attracting their relatives to relocate to live near them ([Erman, 1997](#); [Kool, Verboom, & Van der Linden, 1989](#); [Paul, 2006](#); [Ward, 1976](#)). There are particular socio-economic conditions ([Erman, 1997](#)), basic infrastructure provisions ([Neuwirth, 2007](#); [Paul, 2006](#)), and even political arrangements ([Brueckner & Selod, 2009](#)) recognized in slum areas.

The third factor, which is the spatial location of slum and squatter areas, also contributes to different characteristics of slums and squatters. For example, a city centre may have informal employment opportunities nearby ([Erman, 1997](#); [Obermayr, 2017](#); [Ward, 1976](#)). Furthermore, the city centre sometimes provides low transport costs and is subject to rent control regulations ([Obermayr, 2017](#)), while on the other hand, periphery areas may be occupied by people who once lived in the city centre ([Ward, 1976](#)). More relatable to the characteristics of intermediate cities ([Ulack, 1978](#)) or even rural areas, the housing may be built upon illegal land ([Obermayr, 2017](#)).

Those factors somehow contribute to substantial issues for slum and squatter dwellers to solve. The first problem is how slums and squatters imply urban poverty. The high dependence of the dwellers in the informal economy also includes their spatial location, as the slum and squatter dwellers may need to restart their businesses once they get relocated ([Purwanto, Sugiri, & Novian, 2017](#)). Slum upgrading needs to integrate efforts to alleviate poverty by generating employment ([Bijlani, 1988](#); [Neuwirth, 2007](#)); therefore the household incomes increase ([Rakodi, 1982](#)). The second problem is the unhealthy living environments ([Erman, 1997](#); [Purwanto, Sugiri, & Novian, 2017](#)). The problem is caused by the fact that slum and squatter dwellers have no formal access to water sources ([Paul, 2006](#); [Pugh, 2000](#)). Additionally, a study done by [Pugh \(2000\)](#) suggests that the lack of access to formal water sources exposes the inhabitants of informal settlements towards a higher risk of mortality, particularly for children.

The third issue is crime rates occurring in slum and squatter areas. As squatters are prone to criminal activities ([Obermayr, 2017](#); [Pojani, 2013](#); [Ulack, 1978](#)), [Paul \(2006\)](#) elaborates on those activities which include, “[...] murder, robbery, illegal arms smuggling, drug peddling, and female trafficking and prostitution”. Furthermore, it is found that the government in Dhaka claims that criminals use bustees as a place to seek asylum, in addition to ensuring that their interests are safe by extorting payments from the inhabitants ([Paul, 2006](#)). Next, the threat of eviction has been feared by most of the slum and squatter dwellers across the world ([Paul, 2006](#); [Ulack, 1978](#); [Ward, 1976](#)). Though people living in slum and squatter areas have been showing themselves capable of improving their housing and surrounding environment ([Kool, Verboom, & Van der Linden, 1989](#); [Özdemirli, 2014](#)), eviction has been one way for government to implement housing policies ([Kim, 2010](#)), which sometimes impedes the dwellers from enhancing the quality of their housing ([Paul, 2006](#)). On the other hand, [Brueckner and Selod \(2009\)](#) argue that sometimes enforcement of the

property rights may be difficult to do by local governments because eviction is too costly from the political perspective while maintaining the degree of tenure security for the inhabitants.

The next issue being questioned is the ineffective institutional arrangement to address the housing planning. As slum and squatter dwellers may face complex problems aforementioned, the government should use multidimensional approaches in solving the intertwined issues, as suggested by [Rakodi \(1982\)](#) and [\(Bijlani, 1988\)](#). These approaches should address the poor information systems, poor land management practices, and land tenure systems ([Shabane, Nkambwe, & Chanda, 2011](#)), aside from upholding the community participation. Community participation is needed as the slum and squatter dwellers may have more appropriate yet sustainable solutions to their problems ([\(Bijlani, 1988; Purwanto, Sugiri, & Novian, 2017; Rakodi, 1982\)](#)).

2.2 The historical context of kampung kota

Historically, the word “*kampung*” comes from the Malay language, which is a terminology used to describe a village settlement system ([Setiawan, 2010](#)). The word “*kampung kota*” or “*kampung*” has been used since the early 20th century by the Dutch Colonial government through the *kampung verbrechting* program ([Milone, 1993](#)). From the beginning, the Dutch Colonial government had separated kampung dwellers (*Indlandsche Gemeente*) from another class of dwellers, especially from high-class citizens (*warga priyayi* or *stads gemeente*). The word “*kampung*” was then used by the Indonesian government in the Kampung Improvement Program which had begun in the early 1960s ([Milone, 1993](#)).

So far, *kampung kota* does not have an agreed definition of experts, and it is because each *kampung* has their unique characteristics ([Nugroho, 2009](#)). However, there are already some definitions of *kampung kota* from various perspectives according to the condition and location of various *kampung kota*, particularly the forming process of *kampung kota*, its physical quality and general condition of the dwellers ([Widjaja, 2013](#)). For example, *kampung kota* can be included in an example of self-help housing found in an urban area with its informality, irregularity, and illegality ([Tunas & Peresthu, 2010](#)). This definition extends spatially as *kampung kota* can be found near city plazas, called *alun-alun*, which act as the city centre ([Obermayr, 2017](#)) in most Indonesian cities ([Ford, 1993; McGee, 1967](#)). It is also a form of settlement in urban areas with discernible characteristics such as strong kinship ties among dwellers, poor physical condition of the buildings and the environment, high density housing, high density population, and poor infrastructure conditions such as in clean water provision, sewerage, garbage disposal and so on ([Milone, 1993; Sumintarsih & Adrianto, 2014](#)). *Kampung kota* are formed without any planning process, and have indeed existed and developed even before formal planning was implemented ([Nugroho, 2009](#)).

In the case of Bandung City, *kampung kota* have been formed since the era of Tatar Priangan, before the Dutch Colonialization era starting from 1810 ([Widjaja, 2013](#)). These kampungs occupied riverside or the centres of economic activity. From the era of Dutch Colonialization, *kampung kota* became an inseparable part of the urban administrative area due to the expansion of Bandung City ([Voskuil, 1996](#)). Each kampung has their unique characteristics, as a result of ethnic grouping policies by the Dutch colonials. Moreover, *kampung kota* also developed in the era of Indonesian

independence, one because of the Bandung Lautan Api (Bandung Sea of Fire) (1945-1950) tragedy, and the other because of the tragedy of Darul Islam/Tentara Islam Indonesia (DI/TII) (1955). Implementation of Undang-Undang Pokok Agraria (UUPA; The Agrarian Law) in 1960 caused *kampung kota* to go through an era of territorialization.

2.3 Characteristics of *kampung kota*

There are many arguments in defence of *kampung kota*, which distinguish it from the slum, squatter, or informal settlements. *Kampung kota* is a unique form of settlement (Widjaja, 2013), in which this uniqueness is represented in various and organic physical patterns, along within the embodiment of history and culture (Setiawan, 2010). Nugroho (2009) argues that the existence of *kampung kota* can be a starting point in creating sustainable urban conditions and cityscapes. However, no regulatory framework specifically defines *kampung kota*, as “slum” is a more common term. According to the Law of Indonesia 1/2011 about Housing and Settlement Areas, slums are small settlements due to building irregularity, high density, and quality of buildings and facilities that do not meet the requirements. Furthermore, slum housing is defined as housing that has decreased in quality of function as a place of dwelling.

There have been studies which tried to elaborate on the characteristics of *kampung kota* (Milone, 1993; Obermayr, 2017; Reerink & van Gelder, 2010; Widjaja, 2013; Mulyana, 2016). These characteristics can be grouped into several aspects, which are:

1. Socio-demographic aspect

There are mostly three kinds of the status of residence of *kampung kota* dwellers: natives, migrants, and seasonal migrants. As most of the migrants come from various regions, living in *kampung kota* is preferable as it is less complicated compared to living in a formal settlement (Mulyana, 2016). As *kampung kota* tends to be dense, it encourages strong social ties between the dwellers (Rolalisasi, Santosa, & Soemarno, 2013). Milone (1993) also adds that this strong social capital in *kampung kota* creates effective local leadership—comprising of *Rukun Warga* (sub-village) and *Rukun Tetangga* (smaller than *Rukun Warga*). Local leadership is essential in connecting both horizontal and vertical networks, aiming to achieve better living (Rolalisasi, Santosa, & Soemarno, 2013).

2. Socio-economic aspect

Generally, the dwellers of *kampung kota* are mostly low-income people, though middle and high-income people also live there (Obermayr, 2017). Most of them cannot afford to live in a new, better place, because they have to pay for more and they may lose their current jobs (Tunas & Peresthu, 2010). This condition shows that, geographically, *kampung kota* are mostly located near the sources of livelihood, and thus create specific types of employment, mostly informal (Obermayr, 2017). Furthermore, many dwellers use their houses for various economic activities, such as grocery stores, salons, boarding houses, or household-scale industries.

3. Physical Aspect

Kampung kota come in various sizes, and are commonly confined to permanent buildings (Obermayr, 2017). A *kampung kota* generally has an irregular pattern (Tunas & Peresthu, 2010). This condition is worsened by

the culture of land-sharing from one generation to the next. The location of *kampung kota* also show the duration of stay because natives are living near city centres while new rural migrants choose peripheral areas. As the density of housing is high, the environment sometimes does not meet housing standards, which include basic infrastructure. For example, *kampung kota* may lack open space ([Mulyana, 2016](#)).

4. Land Ownership Aspect

There are three kinds of land ownership in *kampung kota*, namely formal tenure, semi-formal tenure, and informal tenure ([Reerink & van Gelder, 2010](#)). Formal owners have legitimate ownership, acclaimed by the 1960 Agrarian Law. Semi-formal owners are familiar among others, with permits registered by customary law. Informal owners, on the other hand, are squatters, whose lands are owned by the government or private sector.

2.4 Typology by location

Based on the characteristics of *kampung kota*, the location of *kampung kota* also plays a significant role in defining the *kampung kota*. There have been studies conducted ([Ford, 1993](#); [McGee, 1967](#); [Obermayr, 2017](#); [Tunas & Peresthu, 2010](#)); which identify common land uses in Indonesian cities, recognising *kampung kota* as a residential area. However, [Milone \(1993\)](#) argues that the studies related to *kampung kota* were done mostly in big cities, which somehow neglect the particular features of mid-size and small cities. To conclude, a study by [Obermayr \(2017\)](#) identifies two polarised types of Indonesian squatter; the first *kampung kota* is located in the inner city. This type of *kampung kota* can have improved infrastructure or not. [Mulyana \(2016\)](#) elaborates on this type of *kampung kota* as being *kampung kota* built upon communal land with an official owner and tenement *kampung*, a type of *kampung kota* which have existed since the Dutch colonialization era. The second is located in the periphery area, which may be illegally constructed and whose characteristics are more rural ([Obermayr, 2017](#)). This type of *kampung kota* emerges as there is a preference to less crowded neighbourhoods, yet the still lack adequate infrastructure. Besides those types, there are also illegal *kampung*, built upon land which is not intended for residential use, such as land along railroads, riversides and greenbelts. The building condition is semi-permanent, it does not meet health and safety requirements and sometimes lacks environmental infrastructure and facilities ([Mulyana, 2016](#)).

2.5 Potential of *kampung kota*

There is already some literature regarding the potential of *kampung kota*. [Nugroho \(2009\)](#) concludes that *kampung kota*'s existence can be a starting point in creating sustainable urban conditions. [Setiawan \(2010\)](#) shows that in some ways, *kampung kota* represent the so-called compact city concept, through mixed and efficient land use. In coping with the housing access, *kampung* dwellers show strong kinship ties, thus making *kampung* a form of urban settlement with high social capital compared to other forms of urban settlement ([Rolalisasi, Santosa, & Soemarno, 2013](#)). *Kampung kota* are also places where migrants try to adapt themselves and learn to live in the city. In the process of becoming an urban resident, the migrants in the village learn to live together and collaborate with other migrants with different ethnic, religious and cultural backgrounds ([Santoso, 2013](#)). Current issues in

Indonesian *kampung*s are “[...] expansion of business districts in former *kampung* areas; eviction of squatter settlements; new squatter *kampung*s in other areas, and the transformation of rural *kampung*s into urban *kampung*s” ([Obermayr, 2017](#)).

3. METHODOLOGY

This study uses a sequential exploratory mixed-method, which combines qualitative and quantitative techniques ([Creswell, 2017](#)). In this study, qualitative data provides a basis for the collection of quantitative data ([Cameron, 2009](#); [Terrell, 2012](#)). The qualitative phase in this study includes several interviews with relevant stakeholders, mainly municipal agencies and local officials. This phase was followed by a quantitative phase, which gathers empirical evidence for each variable to hopefully confirm the findings from regulations and literature identified earlier.

The main phase of this research involves spatial analysis. [Sirueri \(2015\)](#) divides three different levels of spatial analysis needed in analysing informal settlements, suggesting that a similar perspective can be used in analysing *kampung kota*. These levels are landscape level, settlement level and object level. The landscape level analyses general location characteristics of informal settlements concerning the surrounding areas, while the settlement level analyses overall size, form, shape and density of informal settlement blocks. Meanwhile, at the object level, finer component details such as building characteristics are analysed. In this study, object level (neighbourhood scale) are analysed, hence hot spot analysis is used.

The summary of the methods and techniques used in this study is explained below.

Step 1: Content analysis of regulations and literature. The qualitative phase was done first by analysing relevant Indonesian regulations and literature pertained to the informal settlement in Indonesia, particularly *kampung kota*. Those regulations were hierarchically structured, aimed to find the definition and the programs related to informal settlements.

Step 2: Interview with relevant municipal agencies. Interviews were conducted face-to-face, containing semi-structured and open-ended questions. The respondents were local municipal offices (*Satuan Kerja Perangkat Daerah/SKPD*) of Bandung City, chosen by purposive sampling. These offices were selected based on functions, and job descriptions are relevant in the context of *kampung kota*. These interviews were conducted to get an understanding of the characteristics of *kampung kota* in Bandung City under each SKPD’s responsibility toward the problems of *kampung kota*.

Step 3: Qualitative analysis. From Step 2, the results were then compared to the literature reviewed, taking precedents from around the world. The combination of this process generates the indicative variables and parameters of *kampung kota*. These were later constructed to be the measurements in the quantitative phase. Based on the development of indicators of *kampung kota* characteristics in Bandung city, it is found that there are some additional indicators from the Indonesian Government, from the national to municipal level, which enrich typical indicators describing slum and squatter areas. However, from all analyses conducted, no discussion was found that used the term *kampung kota* explicitly. As with the results of the analyses and findings presented, the terminology used by each SKPD varies in a village-to-village review; in both definitions,

characteristics and indicators used. In the end, however, these indicators can be grouped, distinguished according to relevant aspects of the *kampung kota* context, and not overlapping with each other. The result is 34 indicators that are divided into five aspects of the *kampung kota* concept (see Table 1).

Table 1. Variables used in questionnaires

Variables	Sub-variables	Indicators
Economy		Head of family occupation
		Monthly total household income
		Dominant use of expenditure
		Occupation ability to fulfil daily basic needs
		Ability to buy clothes
		Head of family education
		Ability to school children
		Healthcare affordability
		Eating frequency per day
		Cooking fuel
		Ownership of easy-to-sell goods
		Home function for economic activities
Social	Status of Residence	Status of residence
		Duration of stay
	Reasons for staying	Reasons for staying
	Social Interaction	Interaction intensity with neighbors
Housing Physical quality		Participation in socio-cultural event
		Completeness of building function
		Materials and quality of house walls
		Materials and quality of house floor
		Materials and quality of house roof
		Lot area
		Building area
Land Ownership		Building height
		Total of floors
		Status of settlement
		Ownership legality

Step 4: Site selection. To elaborate on what variables constitute *kampung kota*, a *kelurahan* is selected. The criteria for the selection are the location before the city centre, the variety of land use, and the historical background of the *kelurahan* in terms of *kampung kota* (Widjaja, 2013). From these criteria, Kelurahan Tamansari was chosen due to its closeness to the city centre, its high-density settlement area surrounded by a commercial area and two universities, and its development of *kampung kota* since the Dutch colonialization era (Widjaja, 2013). These neighbourhoods have a higher ratio of high-density housing, compared to other neighbourhoods which are dominated by commercial areas. Several neighbourhoods (*Rukun Warga/RW*) are selected as samples, with consideration of the potential conflicts as there was negligence caused by the on-site upgrading in several neighbourhoods at the time study was conducted.

Step 5: Questionnaires. This step was done by using variables identified from the qualitative phase. In this study, spatial sampling was used to determine sample distribution. Using ArcGIS, spatially balanced designs are constructed to improve the efficiency of estimated values by maximising spatial independence among sample locations. This process results in more efficient sampling by providing more information per sample unit as every sample is distributed across the population (ESRI, 2012). With a margin of error of 10%, sample points were 100 from the population of 5,372 households in Kelurahan Tamansari. The sample is visually displayed in Figure 1.



Figure 1. Sample of households for questionnaire survey

Step 6: Two-step cluster analysis. After obtaining the appropriate indicators, an explorative review is needed to identify the characteristics of the *kampung kota* in Kelurahan Tamansari. An analytical tool that categorises respondents into groups or clusters is needed. Also, an analytical tool is needed to know which indicators are most influential in the formation of these groups. Two-step cluster analysis is a scalable cluster analysis algorithm used to handle large data. This analysis can also handle data that is continuous or also categorical.

Step 7: Hotspot analysis. From the questionnaire results, hotspot analysis is employed to model the spatial clusters of households having high or low values of *kampung kota* characteristics. This analysis focuses on the z -scores and p -values of each variable input. The results of this analysis emphasise the G_i^* statistic which is the z -score and measures the degree of association that results from the concentration of weighted points and all other weighted points included within a radius of a distance from the original weighted point (Getis & Ord, 1992). For statistically significant positive z -scores, the larger the z -score is, the more intense the clustering of high values or ‘hot spots’. For statistically significant negative z -scores, the smaller the z -score is, the more intense the clustering of low values— ‘cold spots’ (ESRI, 2012). In the context of this research, the hotspot analysis is used to analyse the characteristics of urban *kampung* in Kelurahan Tamansari spatially, within the observed sample points. In this study, there will be five hotspot maps produced, referring to the aspect classification of *kampung kota* characteristics. The visualisation of these hot spot and cold spot areas will be clarified by a layer of Inverse distance weighted (IDW). IDW interpolation determines cell values using a linearly weighted combination of a set of sample points. The weight itself is a function of inverse distance. The surface being interpolated should be that of the

spatially dependent variable. This method reflects the assumption that samples will have relatively similar value of variables if they are closer to each other (ESRI, 2012).

4. KAMPUNG KOTA IN BANDUNG CITY

Bandung City is one of the biggest cities in Indonesia, inhabited by approximately 2.5 million people. As this city struggles as one of the national economic centres, Bandung is also home to slum dwellers, as more than 50% of subdistricts in Bandung City still contain slums built upon land along the rail line and river (Tarigan et al., 2016). To date, the development of massive squatter areas extends back to the decade of 1970, where migration from the rural area to Bandung created squatter areas in the urban fringe (Voskuil, 1996). This sprawl also triggered the development of road and other infrastructure, though Voskuil (1996) noticed the inadequate facilities in some *kampung kota*. As in 1980, 54% of the residential area was identified as *kampung kota*. The city planning implemented in Bandung City exemplifies the transformation of city planning principles in the Dutch colonialization era, continued with efforts to deal with the population surpassing the carrying capacity; both of which recognise and aim to improve the infrastructure of *kampung kota*.

Currently, the management of *kampung kota* in Bandung City involves several municipal offices (see Table 2). It is identified that the main offices who are responsible for managing slums include the Development Planning and Research Agency (*Badan Perencanaan Pembangunan, Penelitian, dan Pengembangan*); Spatial Planning Agency (*Dinas Penataan Ruang*); Housing, Human Settlement, Agrarian, and Park Agency (*Dinas Perumahan, Kawasan Permukiman, Pertanahan, dan Pertamanan*); Social Affairs and Poverty Alleviation Agency (*Dinas Sosial dan Penanggulangan Kemiskinan*); and Environmental and Sanitary Agency (*Dinas Lingkungan Hidup dan Kebersihan*). However, it is also found that all of these offices do not have a specific definition nor program related to *kampung kota*. These offices use terms such as high-density residential area and slums. There are also no regulations issued by these offices focusing on the management of *kampung kota*, only those for the management of high-density residential area and slums.

Table 2. The pertinent municipal offices in managing *kampung kota* in Bandung City

Municipal office (SKPD)	Role
Development Planning and Research Agency (<i>Badan Perencanaan Pembangunan, Penelitian, dan Pengembangan</i>)	Coordinating planning function of Bandung Municipality, which includes development planning, spatial planning, and budget planning. This office perceives <i>kampung kota</i> as a high-density residential area.
Spatial Planning Agency (<i>Dinas Penataan Ruang</i>)	Leading the spatial planning whose outcomes are city spatial plan and detailed spatial plan. This office perceives <i>kampung kota</i> as a high-density residential area.
Housing, Human Settlement, Agrarian, and Park Agency (<i>Dinas Perumahan, Kawasan Permukiman, Pertanahan, dan Pertamanan</i>)	Managing residential area and its supporting infrastructure. This office perceives <i>kampung kota</i> as slum.

Municipal office (SKPD)	Role
Social Affairs and Poverty Alleviation Agency (<i>Dinas Sosial dan Penanggulangan Kemiskinan</i>)	Alleviating poverty and improving the living of marginalized people. This office perceives <i>kampung kota</i> as slum. Unlike other offices, this office only focuses on the social aspect of slum dwellers.
Environmental and Sanitary Agency (<i>Dinas Lingkungan Hidup dan Kebersihan</i>)	Managing natural environment and sanitation. This office perceives <i>kampung kota</i> as a high-density residential area.
Public Works Agency (<i>Dinas Pekerjaan Umum</i>)	Managing roads, pedestrian walkways, bridges, rivers, and streetlighting. Regarding slums on riverbanks, this office does not have any pertinent function.

This condition also represents the fact that there is no clear data basis for *kampung kota*, as also suggested by [Obermayr \(2017\)](#) in his study of Surakarta. Some measurements were taken by comparing indicators of slum and squatter areas, indicators of *kampung kota*, and the availability of the data owned by the Bandung Municipality. In Bandung City, no supporting data impedes the efforts to describe *kampung kota* correctly. There is only the ratio of slum area for each *kelurahan* as stated by Mayor Decree 648/2015 about The Location of Slum Areas in Bandung City ([Anindito, Maula, & Akbar, 2018](#)). Additionally, there are some variables in the national database, namely *Potensi Desa*, which can be used to infer the characteristics of *kampung kota*. This database has the village (both *kelurahan* in a city or *desa* in a district) as the unit. However, these variables only measure the *kampung kota* as the slum area, as it only recognises the number of unstandardized houses and the number of poor people.

5. KAMPUNG KOTA IN KELURAHAN TAMANSARI

Kelurahan Tamansari is located in Kecamatan Bandung Wetan, with a total area of 102 hectares. The high-density housing occupies 40% of the area. Regarding population, *Kelurahan* Tamansari has the most significant number of residents in Kecamatan Bandung Wetan with 23,262 people and 5,372 families, as well as the densest *kelurahan* with a density of 228.05 people/hectare ([Bandung City Statistics Bureau, 2016](#)). Kelurahan Tamansari was chosen as the site for hot spot analysis because it is located in a reasonably strategic area, located in the city centre, adjacent to the trade and service centres and university facilities, and also shows a dominance of high-density housing. The existence of *kampung kota* in Kelurahan Tamansari can be traced from 1910, where the village of Tamansari is a result of administrative expansion from the government of Gemeente Bandung to the north ([Widjaja, 2013](#)). Currently, densely populated residential areas in Tamansari have many problems, such as a lack of open space, poor road circulation, and low quality of basic facilities and infrastructure, all of which also contribute to the pollution of Cikapundung River ([Ministry of Public Works, 2007](#)).

5.1 Two-step cluster analysis result

Attributes or variables that will be used for this analysis are determined from the previous two-step cluster analysis process. Using 100 households as the sample, responses retrieved from questionnaires are used in this analysis. This analysis is explained first according to each variable (see Table 3).

For economic variables, it is found that there are three clusters generated. These clusters are of poor quality, but they are not below zero, so the model can still be used. The most influential or the most crucial variable in this cluster is an indicator of the ability of the job to meet basic needs, followed by income, the frequency of eating a day and so on. The variable that has the smallest importance is the type of cooking fuel. Next, social variables consist of sub-variables of settlement purpose, the status of residence, and social interaction. For the first sub-variable, which is the purpose of settling, it is known that based on the results of two-step cluster analysis, there are four clusters produced with good quality. The most influential variable in this cluster analysis is "close to the place of work", then "occupying the heritage land" or "has been hereditarily lived in".

Regarding the sub-variable of the population, it is known that the existing clusters are divided into three clusters, with good enough quality. It is known that variables with higher importance are population status, and length of stay has a high level of importance, but is slightly lower than the population status.

On the other hand, the sub-variable of the level of social interaction has three clusters. The quality of the cluster is very good. Both indicators in this sub-variable have a high degree of importance, i.e. interaction with neighbours and participation in socio-cultural activities.

The third variable is the infrastructure. There are two clusters generated with good quality. The most influential variable, having the highest level of importance, is the place or sewer of liquid waste. While the rest—i.e. landfills, clean water sources, electricity sources and defecation—have low importance. The next variable is the building condition. This variable is divided into three clusters with good enough quality. The indicator that has the highest importance is the material and condition of the floor, while the variable that has the lowest importance is the Building Floor Coefficient.

Every cluster from variables and sub-variables will get scores according to their level of cluster before the results are used next in hot spot analysis. However, it is important to note that the attributes are just variables having the highest level of importance, assuming that reviewing those variables may represent all clusters. Some of those variables and sub-variables that were formerly used in questionnaires—such as reason to stay, status of residence, and land ownership legality—will not be used as the answers did not reflect any level among them. The variables attained from the two-step cluster analysis result is displayed in Table 3.

Table 3. The result of two-step cluster analysis in defining variables of *kampung kota*

Variables	Cluster 1	Size (%)	Score	Cluster 2	Size (%)	Score	Cluster 3	Size (%)	Score
	Unable to fulfil daily needs			Able to fulfil daily needs			Able to fulfil daily needs		
Economic Ability	Income between Rp.600,000 - Rp.2,500,000	28.8	1	Income between Rp.600,000 - Rp.2,500,000	42.5	2	Income between Rp.2,500,000 - Rp.5,000,000	28.8	3

Variables	Cluster 1	Size (%)	Score	Cluster 2	Size (%)	Score	Cluster 3	Size (%)	Score
Social interaction	Sometimes participate in socio-cultural activity	64.2	1	Sometimes participating in socio-cultural activity	18.9	2	Always participating in socio-cultural activity	17.0	3
	Interacting every other day			Interacting everyday			Interacting everyday		
Infrastructure Condition	Disposing liquid waste into the river	34.6	1	Disposing liquid waste into drainage	34.6	2	Disposing liquid waste into drainage	30.9	3
	Water source from PDAM or well water			Water source from well			Water source from PDAM		
Building Condition	Floor made from ceramics with bad quality	50.0	1	Floors made from ceramics with bad quality	22.5	2	Floors made from ceramics with good quality	27.5	3
	Roof made from tile with bad quality			Roof made from tile with good quality			Roof made from tile with good quality		

5.2 Hotspot analysis result

Based on the variables and indicators in Table 3, each point representing a household is scored. All the households with scores are analysed using hotspot analysis, based on each variable attributed to it. The results are later visualised using Inverse Distance Weight (IDW) to extrapolate the extent of households having significant similarities.

In Figure 2, hot spots are formed in regard to clustering of respondents with high economic capabilities, along with cold spots, which denote clusters of respondents with low economic capabilities. A cold point is a point with a value of G_i^* below zero, while a hot point is a point with a value of G_i^* above zero. The cold spots are spread in the RW 15 area by two points, RW 16 for four points, and RW 5 by one point. On the other hand, hot spots are spread over RW 14 and RW 20. The IDW map shows an extrapolation of the values of G_i^* in the area around the points, indicated by the brighter colour of the area. Cold points indicate areas with low levels of economic capability. In this case, economic ability cannot be identified because the analysis of hot spots only shows clusters with high or low value only.

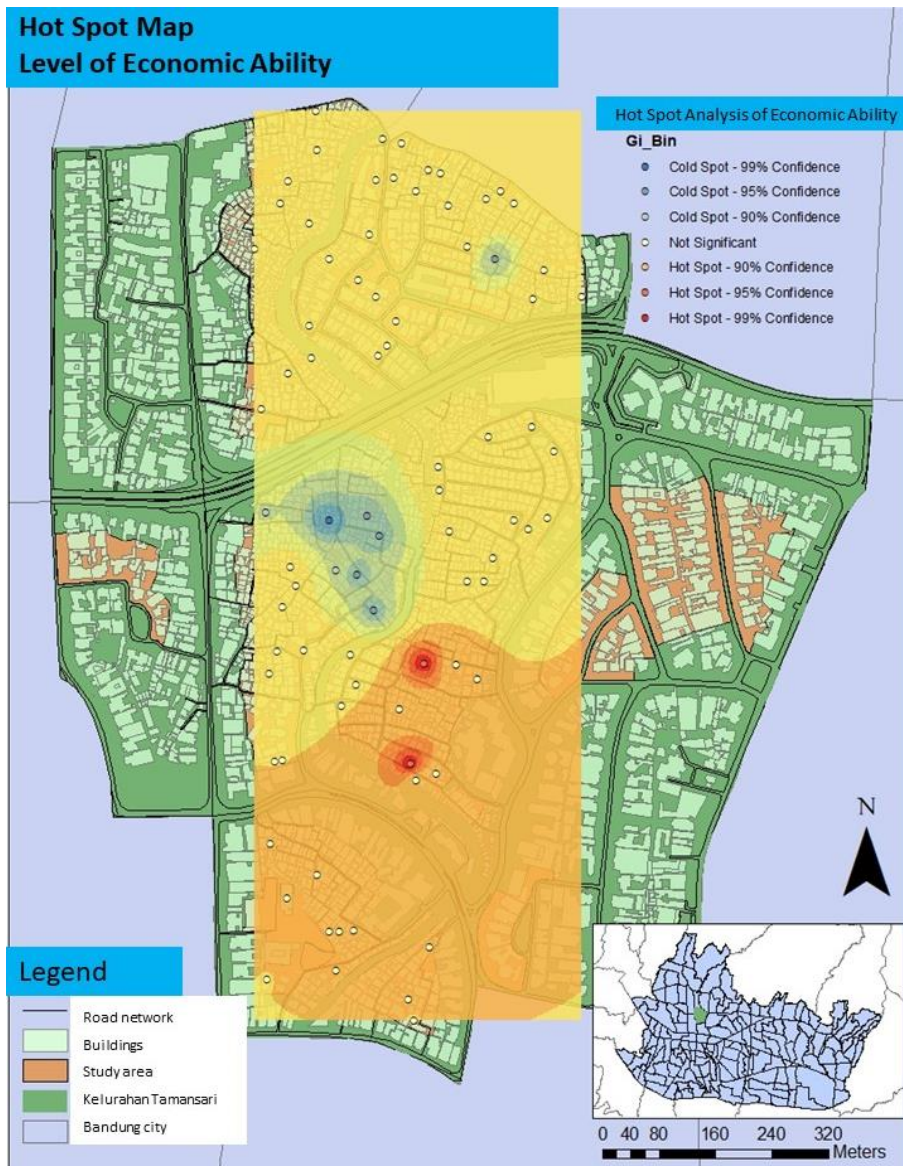


Figure 2. The result of hot spot analysis on economic ability of the dwellers of *kampung kota*.

In Figure 3, hot spots indicate a collection or cluster of respondents with a high level of social interaction and vice versa. Based on its location to the neighbourhood association or RW, the cluster area with respondents who have a low social interaction level is RW 10 with four points, RW 5 with four points, RW 11 with one point, and RW 6 with three points, so it can be known that RW 10 and RW 5 are locations with the most dominant social interactions. While the area that is a cluster with respondents who have a high level of social interaction is only in RW 14 and RW 16, with RW 14 having the most points, that is three points, and RW 16 has only one point. This result shows that RW 14 is one of the RWs with a high level of social interaction. In addition, the IDW map also shows the predicted region having the same values for each point, which is the value of G_i^* respectively. From these interpretations, it can be predicted which areas have high or low levels of social interaction. In this analysis, average interaction rates cannot be identified, as hot spot analysis only reviews high value and low value clusters.

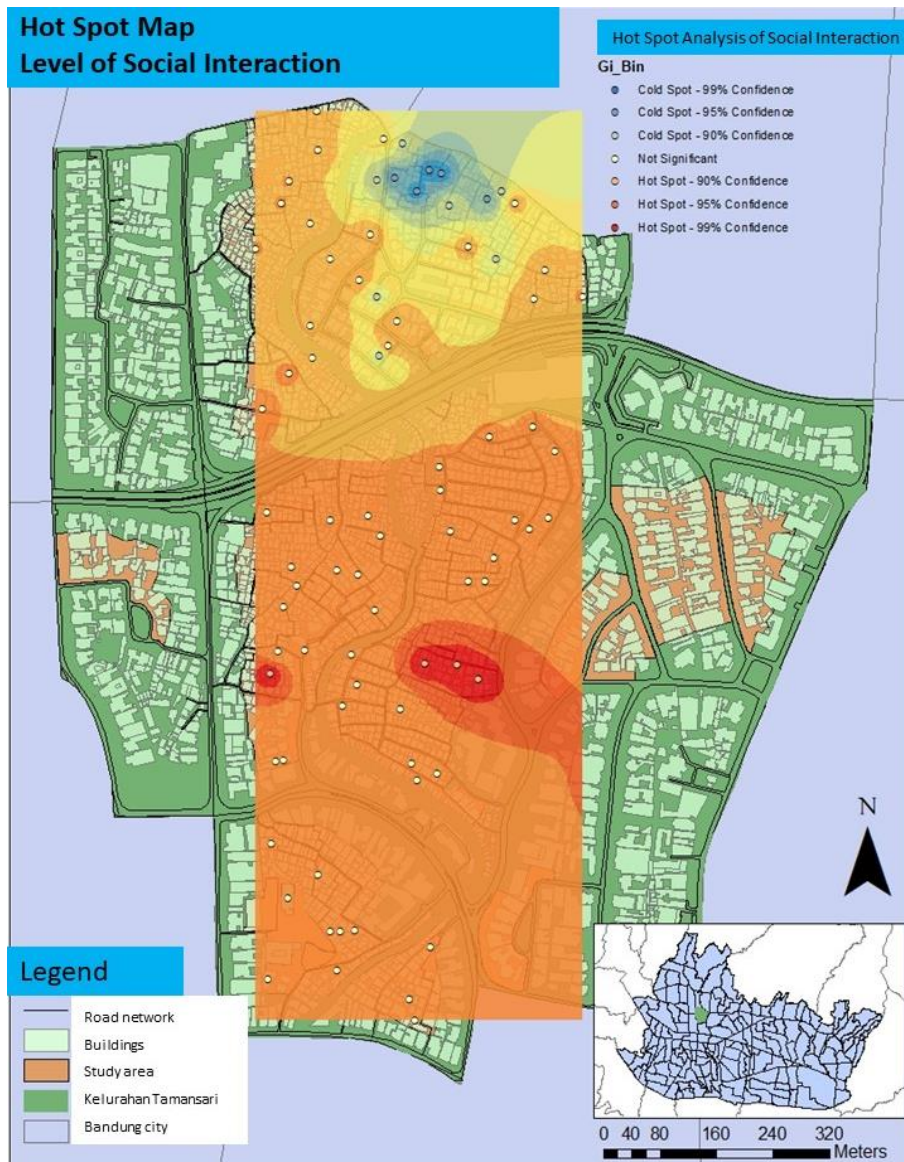


Figure 3. The result of hot spot analysis on social interaction of the dwellers of *kampung kota*

In Figure 4, Hot spots marked with red dots are points indicating the level of condition of facilities and infrastructure that are good and form clusters significantly. While a cold spot is marked with a blue dot, this indicates whether the level of condition of facilities and infrastructure is still bad or low, and clustered significantly. The remainder are the points that do not form clusters and are not significant. Based on the location of points in the RW, it can be seen that clusters with a poor condition of facilities and infrastructure are located in RW 19, RW 6 and RW 15 areas, with the most points being in RW 6. As for clusters with a good condition of the existing facilities and infrastructure, these are found in RW 15, RW 16, RW 18, RW 17, and RW 6 areas, with the highest number in RW 15 and RW 16. Also, RW 6 shows the characteristics of a different cluster. The IDW map shows the predicted regions having the same G_i^* value as the points studied. From the map, it can be seen that the areas that are likely to have a good level of condition and condition of infrastructure are still poor or low. In this analysis, the level of medium-sized facilities and infrastructure is not further investigated, since the hot spot analysis tends to show a significant clustering of good and bad facilities' condition level values.

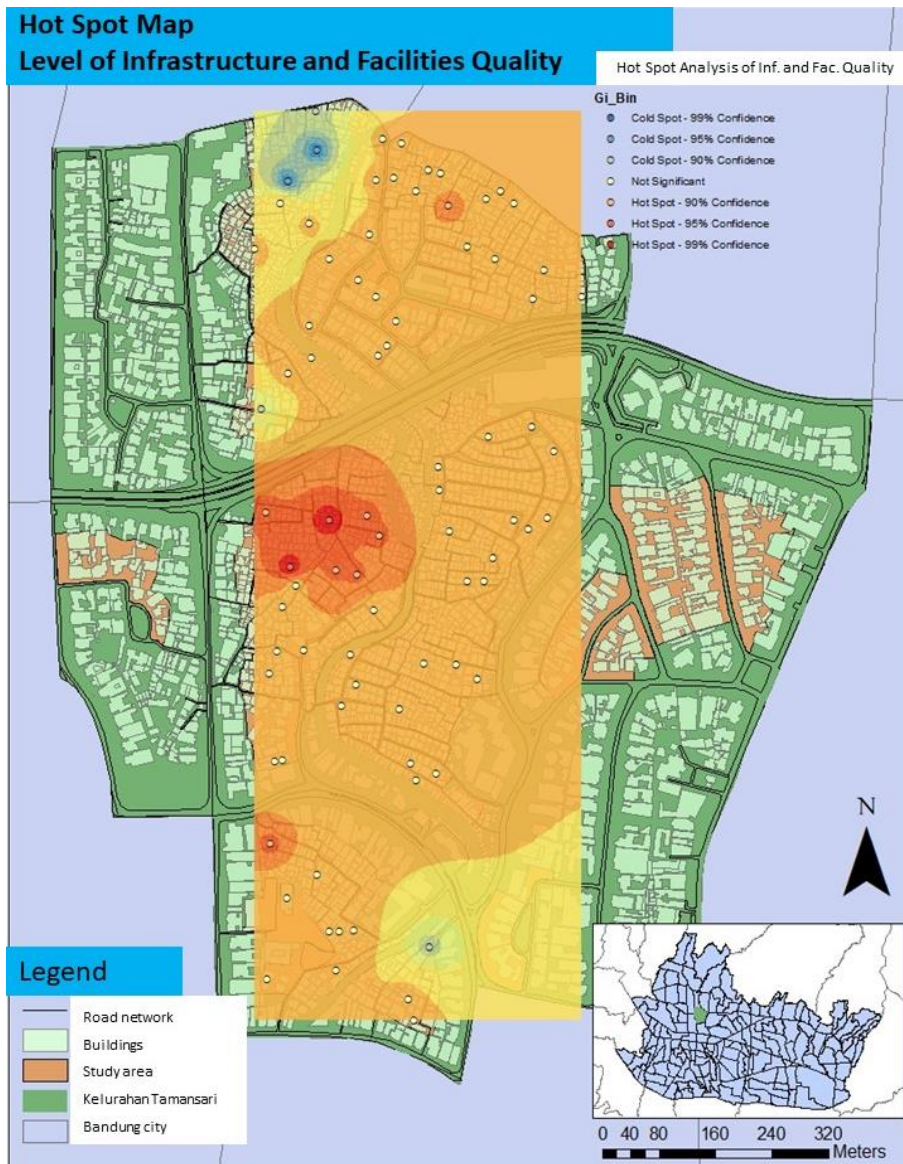


Figure 4. The result of hot spot analysis on infrastructure condition of the dwellers of *kampung kota*

In Figure 5, hot spots marked with red dots indicate good home building conditions and form a significant spatial cluster. Cold spots marked with blue dots indicate poor or poor-quality housing conditions and form a significant spatial cluster. The darker the colour of the dots, the more significant the cluster level of the building condition. Based on its location to RW, clusters showing poor building condition are found in RW 16, RW 11, RW 4, RW 17, and RW 5, with the most points in RW 17. On the other hand, RW 20 and RW 12 clusters indicate a good level of building condition with the number of points in each one. The IDW map shows the predicted region having the same G_i^* value from each point. This result means the area can predict which are likely to be areas that have houses with good or bad building conditions. In this analysis, the level of condition of the buildings in the middle (not good or not bad), are not shown because hot spot analysis tends to review the high and low only.

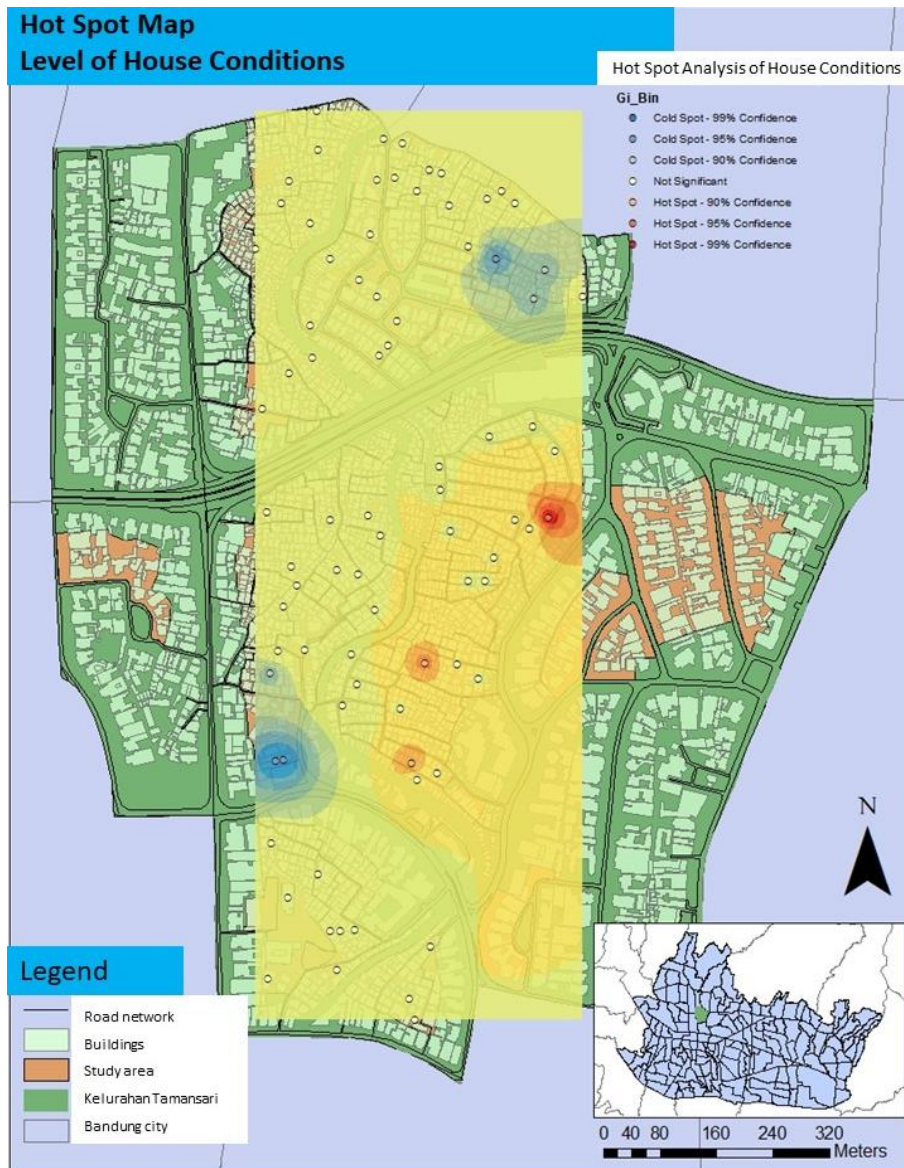


Figure 5. The result of hot spot analysis on a building's physical condition of the dwellers of *kampung kota*

6. DISCUSSION

In the *kelurahan* context, constituting variables in *kampung kota* demands extensive understanding. The assumption in this study is that a household may have a similar state which meets the characteristics of *kampung kota*. On a broader context, other households may also have the same characteristics, clustering with each other. This pattern should also be replicating in an even higher context, particularly on a city level. The results show that there are hot and cold spots manifesting regarding four variables used. However, it is interesting that hot and cold spots may be different from one variable to another. For example, the assumption is that the majority of *kampung kota* dwellers may struggle financially. However, in Kelurahan Tamansari, it is found that there are two large hot spots and two centralised cold spots which show that indeed the dwellers of *kampung kota* have a different financial capacity. The next result of social interaction variables

shows that a big part of samples is in having social ties with their community. This result is indicated by two major hot spots and two smaller cold spots. Other results of infrastructure and housing condition also have different outcomes. There are significant hot spots of households having access to infrastructure and small cold spots having less access to infrastructure. On the other hand, there are three hot spots and two cold spots conveying the housing condition. Some of the spots from a variable are different compared to that of different variables, though there are spots similarly present across the different variables.

This result suggests that the definition of *kampung kota* is multi-scale and multi-faceted. At the city level, the definition of *kampung kota* is vague as there is no use of such term in public policy making. How they see *kampung kota*, whether it is a type of residential areas or merely a poverty-concentrated area, affects the programs implemented there. There is no synchronised database, which in this study happens to be backed up with city-scale data and *kelurahan*-based national data. This condition may result in indirectly interrelated variables. Secondly, there is a difference in sampling in this study. This study only conducts an analysis on the *kelurahan* level—where there are only 100 samples taken—with no study on *kecamatan* as a bridging unit between them. This difference of sampling is likely to result in an inadequate portrayal of *kampung kota* in Kelurahan Tamansari. Next, the construction of variables from the qualitative and quantitative phase requires a pertinent database providing comprehensive information.

Along with the misconception of *kampung kota*, this study shows that current quantitative data is not adequately built to elaborate on *kampung kota* since it is only focused on the slum areas. While the results of this study place *kampung kota* as slums, historical studies are proven complementary to distinguish *kampung kota* from slums. Including historical attributes of *kampung kota* in a future study will extend the understanding of the dynamics of *kampung kota*.

7. CONCLUSION

The qualitative phase in this study indicates that no discussion regarding *kampung kota* was found among the governmental offices whose tasks are related to *kampung kota*. The terminology of *kampung kota* used by each SKPD, however, varies in a village-to-village review, including definitions, characteristics, and indicators used. The use of more general terms such as “slum” and “squatter” help in the development of indicators for *kampung kota* in Bandung city. It can be concluded that additional indicators from municipal offices enrich the characteristics of *kampung kota* from the literature review perspective only.

To corroborate the qualitative findings, quantitative measures were done using different data on a different scale. on the city scale, exploratory variables such as land use composition, population density, amount of slum housing, and the number of people identified as poor, are used for the dependent variable of the ratio of the slum area. Meanwhile, on the *kelurahan* scale, exploratory variables used are economic ability, social interaction, infrastructure condition and building condition. The objects analysed are also different; *kelurahan* is used in the city-scale analysis, and household is used in the *kelurahan*-scale analysis. The results show that there are different variables constructing *kampung kota* in city centres and

those in the peripheral area. While *kampung kota* in city centres may have more complex variables such as the composition of land uses, *kampung kota* tend to have similar characteristics in a different peripheral area. However, the data in this study cannot be used to decide whether the *kampung kota* in the periphery area is more likely to be slum or squatter. Secondly, on the *kelurahan* scale, *kampung kota* indeed are occupied by dwellers in various conditions. It can be interpreted that people from various economic backgrounds may have high access to infrastructure while some do not. Also, the physical condition of *kampung kota* is somewhere good, and the dwellers tend to have strong social ties with their neighbours. This result does not accurately distinguish *kampung kota* from slum and squatter areas, as their characteristics are quite similar.

On the other hand, the quantitative phase in this study is highly corroborated with the historical context as it helps defining which areas are *kampung kota*. Some *kampung kota* in Bandung were indeed built upon vacant land, starting even before the Dutch colonialization era. However, this study does not look at whether *kampung kota* are also built upon unattractive places such as river banks or not.

This study only proposes a brief definition of *kampung kota*, as quantitative modelling of *kampung kota* requires the most thorough yet most comprehensive data possible. While *kampung kota* in city centres will have different characteristics with those in periphery areas at the city scale ([Anindito, Maula, & Akbar, 2018](#)), on the *kelurahan* scale, *kampung kota* may also be inhabited by dwellers with different conditions; some may be financially adequate and have access to utilities while the others do not. Secondly, scale issues in analysing housing generally plays significant roles in the output of the analyses. Settlement level analysis is needed in bridging the result of landscape level and object level, as [Sirueri \(2015\)](#) suggested. In the Indonesian context, this means that housing on the *kecamatan* level are needed to be investigated to complement this study on the *kelurahan* level and that on the city level has been investigated by [Anindito, Maula, and Akbar \(2018\)](#). While both studies suggest the construction of a better *kampung kota* information system—aiming to integrate this area into city planning in the long term ([Minnery et al., 2013](#))—is needed, it is vital for pertinent stakeholders to define the *kampung kota* and incorporate it into policy making.

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