Infrastructure Provision by Residential Developers in The Peri-Urban Neighbourhoods of Metropolitan Bandung Raya

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Abstract. Peri-urban areas are often regarded as a potential land for urban housing needs. Private sectors' involvement in peri-urban residential development is often viewed by the government as a solution for housing supply provision. However, their complicity is suspected to generate an unstructured and fragmented infrastructure network. This study aims to find out how housing infrastructure provision in micro-spatial areas could form an unstructured network of macro-spatial ones. The selection of case studies is based on three typologies of residential developer. Examination aspects include the availability and accessibility of residential infrastructure. The research was conducted in two villages, each located in the southern and northern part of peri-urban areas of Metropolitan Bandung Raya. The data were collected through observation and interviews with old and new inhabitants. The analytical method uses a qualitative approach. Infrastructure availability is examined by the national standard, and the accessibility is examined by the absence of obstacles. The results showed that only a few aspects of housing infrastructure components fulfilled the standard, and the accessibility of most housing infrastructures for outer residents was restricted through the gated concept. From this research, we found that even though the developer has provided the residential infrastructure properly, without an integrated planning network it would not bring any spatial improvement.

1. Introduction
Peri-urban residential development might be driven by several factors, such as population growth [1] and migration [2], better services[3,4], environmental factors[5,6], economic price [7,8], geographical factors and spatial planning [9], as well as housing policies[10,11]. Yet, many developing countries experience difficulty in handling the problems that emerge from the uncontrolled mushrooming of residential development [12] in peri-urban areas, especially in the formation of large areas such as the metropolitan region. The transformation of peri-urban land into residential areas has brought some critical issues that are commonly discussed, including high congestion[13,14,15,16], lack of infrastructure[17,18], diminished production land [19], environmental degradation[20,21], fragmentation, and segregation [22], as well as social changes[1,8,23, 24]. In metropolitan regions, the peri-urban problems are combined with the charge of several local governments due to the large coverage of development area.
With the concept of decentralization, local governments have the authority to regulate their own territory. However, as Webster’s research on some countries in East Asia [13] noted, local governments often do not have sufficient capacity to deal with large-scale developments. Not to mention that local governments also sometimes pay less attention to peri-urban areas because their location is not as salient as the city center. Peri-urban areas, which originally are virgin land, oftentimes are not equipped with a strict regional concept yet, nor mature infrastructure planning. As a result, developers can develop infrastructure without restraint, sometimes unconnected to the surrounding environment, or even make connections at will. Developers also may not consider the adequacy of existing infrastructure since they are financially able to create new infrastructure subsequently. As a result, the new peri-urban infrastructure independently built by private developers is often not integrated into the existing infrastructure network, which is either already provided by the government or has been built by the former developer. As we can see, the spatial manifestation of these practices in the macro scale has created structural fragmentation and infrastructure deficiency [25].

The impact of private sector domination in the residential development of peri-urban areas is mostly not clearly realized by local governments. They are often more focused on the benefits derived from the investment of the private sector in peri-urban housing development, because their involvement can bring in local revenue sources and also provide solutions for housing supply and infrastructure development in the peri-urban area [26]. The weakness of peri-urban planning and the low capacity of local government have indirectly supported the private sector to produce peri-urban housing in a more flexible arrangement.

The failing of infrastructure planning in peri-urban housing can be seen from the inequality of residential infrastructure provision. In Indonesia, this problem may be caused by the lack of technical guidance or the inconsistent application at the local level. Within the national level, there are at least 6 central government rules related to the provision of housing infrastructure, including Law 1/2011 on Housing and Settlement, Government Regulation 14/2016 on the Implementation of Housing and Settlement, Minister of Home Affairs Regulation 9/2009 concerning Guidelines on The Procedures of Infrastructure Handover in Local Regions, Minister of Public Housing Regulation 22/2008 on Minimum Service Standard of Housing Sector in the Region, Minister of Public Housing Regulation 34/2006 on General Guidelines for Implementation of Integration of Infrastructure for Housing Neighborhood, and Indonesian National Standard (SNI) 03-1733-2004 on Procedures for Urban Housing Neighborhood Planning. The entire regulation explains the comprehensiveness of infrastructure provision in the neighborhoods which include public facilities, basic infrastructure, and utilities. Referring to these regulations, SNI 03-1733-2004 shows a more detailed technical guidance on standard housing infrastructure provision [27]. However, this housing standard guidance is rarely applied as the main reference for housing infrastructure development at the local level.

Previous studies about residential infrastructure development in peri-urban areas are generally discussed in terms of macro-spatial contexts[3,9,15,17,28,29,30,31,32,33]. Research that specifically studied the condition of the existing housing infrastructure in the micro-spatial context such as neighborhood is rarely found [34,35]. Handayani and Widayastuti identify the availability of residential facilities in the urban fringe area of Pudakpayung in Semarang city, but the research did not focus on housing infrastructure built by the developer. Meanwhile, Putri tried to identify the characteristics of basic infrastructure provision by developers in the residential neighborhood of Parongpong District in West Bandung Regency, while she only focused on the aspect of physical availability and did not discuss any aspects of its utilization for the surrounding community. Therefore, this research specifically aimed to examine the characteristics of infrastructure in the more detailed aspects of availability (by quantity indicators) and usability (by accessibility indicators) for the surrounding community in the neighborhood. This research is important as a source of information on how the development pattern of housing infrastructure in the micro-spatial generated the structural fragmentation on the macro level. The unstructured infrastructure network which is formed in the macro spatial level would be the manifestation of a bunch of irregular residential infrastructure development at the micro-spatial level.
To discover the characteristics of housing infrastructure practice in peri-urban neighborhoods, this study specifically focused on micro-empirical study. This study was obtained through the identification of housing infrastructure characteristics provided by the private sector in two case study locations in the inner peri-urban area [36] of Metropolitan Bandung Raya (MBR), with each representing a different administrative area in peri-urban MBR, including Bandung Regency and West Bandung Regency. We determined the three housing estates in each location to represent the three typologies of housing developers.

2. Infrastructure Provision in the Residential Peri-Urban Area Neighborhood in MBR: Characteristic Identification and Accessibility

This research takes place on the neighborhoods located in the fringe areas of Bandung Municipality. Bandung city is the urban center of MBR, which experienced population growth and urban expansion pass through the surrounding areas. In recent years, some regencies adjacent to Bandung city have undergone rapid growth in residential neighborhoods. MBR is known as the third largest metropolitan area in Indonesia [20]. Based on Local Regulation 12/2014, MBR covers the areas of Bandung city and Cimahi city, almost half of the areas of Bandung Regency and West Bandung Regency, and some area of Sumedang Regency. According to the Technical Report on the Preparation of Masterplan for MBR’s Public Housing Provision, Bandung Municipality’s developed area has reached 90.27%, while Cimahi City, Bandung Regency, West Bandung Regency, and Sumedang Regency respectively covered 86.37%, 16.39%, 15.21%, and 3.04% in 2014 [37]. These numbers indicate that the regencies located on the fringe area of Bandung city are potentially developed into a peri-urban residential area of MBR. The development of MBR indicates a growing population that drives the increase in residential needs.

This paper uses the housing typology categorization according to the study by Winarso when he tried categorize the typology of developers in Jabotabek Area (2000) [38]. Based on his study, the two categories of residential housing developers are network-extenders and foot-holders. Network extenders are those who involve themselves in the land development industry and have matured into investors and viewed the land as a long-term managed financial asset. While the foot-holder developer category referred to the type of developers that get involved after seeing the success of other developers. In his research, Winarso explained the developer typology with the aspect of investment characteristics, development characteristics, and company characteristics. In accordance to the housing development phenomenon that occurred in most of the peri-urban areas of Greater Bandung, the study refers to the terminology of foot-holder developers. Thus, the developers' typology in this research only focused on the aspect of development characteristics, specified in the area developed. Therefore, the typology of developers in this research was according to developed aspects of the wide area that consist of 1) small developers with a development area scale of less than 5 Ha, 2) medium developers with a development area of between 5 to 15 Ha and 3) large developers with a land development area of more than 15 Ha. Identification of residential infrastructure characteristics was acquired in accordance with the national standard requirement.

Through this research, it would be known whether the private sector has been able to provide appropriate housing infrastructure in accordance with the standard provision. According to SNI 03-1733-2004, we classify 13 aspects of housing infrastructure, consisting of 7 aspects of basic infrastructure and 6 aspects of housing facilities. The examination of infrastructure provision will be seen from the aspect of physical availability, while the examination of infrastructure accessibility was addressed to the external inhabitants' perception for the ease to gain the infrastructure provided by the housing developers. The research on housing infrastructure characteristics in the peri-urban neighborhood of MBR would be identified through the aspects of provision and accessibility. The use of urban housing procedures in this study can be explained as the peri-urban residential neighborhood are generally designed for urban housing needs. The availability of housing infrastructure should fulfill the equality and evenness, because the principle of the provision of basic services and public facilities, should be usable for all the community. The notion of accessibility that positively contributed to this
study refers to the lack of physical barriers (access) as well as strategic spatial placement (distribution). In this case, the housing infrastructure built by developers eventually would be handed over to the local government. The list of observations and interviews of infrastructure aspects can be seen in Table 1.

| No | Aspects                              | Availability Components (Observation and Measurement Methods)                                                                 | Accessibility Components (Interview)                                                                 |
|----|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1  | Road network                         | The provision and dimension of 1) Pavement, 2) Roadside, 3) Pedestrian way, 4) The area of road benefit, 5) The area belonging to the road, 6) The area of road control, 7) The building borderline | There were 1) main road improvements, 2) no roads cut off, 3) no alleyway adjacent, 4) no one-way road network |
| 2  | Drainage network                     | 1) The dimension of drainage channel, 2) The provision of body of water                                                                 | There were 1) main road drainage construction and widening, 2) continuous drainage                   |
| 3  | Sewerage Network                     | The provision of 1) Septic Tank and 2) WWTP                                                                                   | There were 1) WWTP that can be used by surrounding communities, 2) No direct waste water disposal to drainage |
| 4  | Solid Waste Disposal and Management  | The provision of 1) Trashcan 2) Garbage transport 3 times/week                                                                | There were 1) Temporary disposal sites that can be shared with the neighborhood, 2) collective transport system |
| 5  | Clean Water Network                  | The provision of 1) Water pipe network, 2) Public tap water (250 inhabitants), 3) Hydrant                                        | There was clean water network that can be shared with the neighborhood                                |
| 6  | Power Grid                            | The provision of 1) Power supply, 2) Electricity network                                                                      | There was 1) Street lights, substations and power poles that can be shared with the neighborhood     |
| 7  | Phone Network                         | The provision of 1) Cable phone network, 2) Cell phone network                                                               | There was a shared telephone network                                                                  |
| 8  | Religious Means                      | The provision and dimension of 1) Islamic Prayer Room or Musholla (250 inhabitants) or 2) Mosque (2500 inhabitants)        | There were 1) Easy / no physical barrier to access the facility 2) Strategic on-site placement          |
| 9  | Public Open Space                    | The provision and dimension of 1) Private green yard, 2) Public green space (RT/Neighborhood Association = 250 Inhabitants and RW/Citizen Association = 2500) |                                                                                                       |
| 10 | Public Facilities                    | The provision and dimension of 1) Meeting hall (250 inhabitants), Security post (2500 inhabitants), Power House (2500 inhabitants), Public phone and mailboxes (2500 inhabitants), Public parking (RT = 250 inhabitants and RW = 2500 inhabitants) |                                                                                                       |
| 11 | Educational Facilities               | The provision of 1) Kindergarten (1250 inhabitants), Elementary School (1600 inhabitants), Reading Playground (2500 inhabitants) |                                                                                                       |
| 12 | Health Facilities                    | The provision of Clinic (2500 inhabitants)                                                                                   |                                                                                                       |
| 13 | Trade Facilities                     | The provision of Store (250 inhabitants)                                                                                      |                                                                                                       |

3. Methods

This research uses three approaches: 1) the method to determine the case study locations 2) the method of data collection and 3) the method of analysis.

3.1 Location Determination Method on Case Study Research

This paper uses a case study approach to extract lessons learned. Referring to Creswell [39], case study research is an exploration of a bonded system or case / multiple cases through in-depth data collection and involving rich sources of information in a context. The research follows a multi-level case selection...
process. The stages of determining the location of the case study are the following. First, we looked for a housing list and all the supporting data from the technical departments of the Local Governments of Bandung Regency and West Bandung Regency. Second, we categorized and classified the secondary data of housing based on the typology of developers and unit settlement area (by sub-district and by village). Third, we filtered the location of case studies using the existing parameters for the three developer typologies in each village. At this step, we obtained three villages in West Bandung Regency and six villages in West Bandung which contain all three housing developer typologies.

The selected three villages in the West Bandung Regency were Cilame Village in Ngamprah Sub-district, Ciwaruga Village in Parongpong Sub-district, and Jayamekar Village in Padalarang District, while the six villages in Kab. Bandung consist of Cipagalo and Lengkong Village in Bojongsoang Subdistrict, Cinunuk Village in Cileunyi Sub-district, Sangkanthurip Village in Katapang Sub-district, Sukamenak Village in Margahayu Sub-district and Bojongloa Village in Rancaekek Sub-district.

Forth, the determination of the case study location. In this step, we determine one village per regency by considering the location that best represents the peri-urban areas of MBR. We selected Ciwaruga Village in West Bandung Regency, and Cipagalo Village in Bandung Regency as the case study locations for the following reasons: 1) the two areas contain the three typologies of housing developers, 2) both are also directly adjacent to Bandung City as the urban center of MBR, 3) those two villages have the combination of urban-rural land use as the physical characteristic of peri-urban region, and 4) their geographically locations contrast each other (northern boundary and southern boundary of Bandung city). Fifth, we assigned three formal housing neighborhoods that best represented the three typologies of developers from the two selected villages. The site selection was acquired based on the recommendations of village officials by considering the information and data retrieval.

Figure 1. The village location points with the three typologies of housing developers in West Bandung Regency and Bandung Regency [40]
Representation of the three typologies of developers in Ciwaruga Village included (a) Griya Amanda housing estates (small-scale housing developer typology), (b) Geger Kalong Permai housing estates (medium-scale housing developer typology), and (c) Parahyangan Rumah Villa Estates (large-scale housing developer typology). Meanwhile, in Cipagalo Village the representative housing estates included (d) Surya Asri Residence housing estates (small-scale), (e) Pesona Ciganitri housing estates (medium-scale), and (f) Cherry Field Housing (large-scale). The location of housing estates in each village can be seen in Figure 2 and Figure 3.

3.2 Data Collection Method

The research uses primary and secondary sources. In the preparation phase, we collected secondary data from the Housing Department Affairs of Bandung Regency and West Bandung Regency. The data consists of housing data list, spatial plan, and regional map. In the implementation phase, we collected primary and secondary data. We collected primary data through observation and measurement of all infrastructure aspects as mentioned in SNI 03-1733-2004. Meanwhile, we interviewed old inhabitants, the management of housing estates, and the community around the housing estates. We obtained the secondary data, including housing maps and information, from the village office as well as the housing management.
3.3 Analytical Methods
This paper relies on qualitative analysis. The data were examined using mixed qualitative methods. The analytical methods include standard qualitative techniques (coding-grouping-conclusion) and qualitative content analysis. We used standard qualitative techniques to process the physical availability data, while content analysis was used to process the interviews results.

4. Results and Discussion
Based on the data collection, we performed data processing, classification, and grouping to deliver analytical models for the housing infrastructure availability and accessibility. In the infrastructure availability model, the grouping indicators are divided into 1) available and meeting standards, 2) available but not fully meeting standards, 3) unavailable and not meeting standards, and 4) unavailable and not yet necessary. Figure 4 shows the analytical model of the housing infrastructure availability at the two case study villages of peri-urban MBR and Figure 5 shows the assessment model for infrastructure accessibility with the parameters of positive or negative contribution.

From Figure 4 and Figure 5, we can see two aspects of road components that are significantly in accordance with the standard, i.e., the dimensions of pavement and roadside vegetation. Meanwhile, the dimensions of the roadside (emergency parking) and pedestrian way was unavailable for most of the housing. Other aspects of the road network, such as drainage, road benefit area (damaja), road-owned area (damija), road-supervised area (dawasja), and GSB, indicate unfulfilled availability standards. A significant matter related to the results of road identification is related to the dimensions of the road. When we investigated the road network on a wider scale, we found that there were dimensional gaps between the housing estates’ roads with the main road. While the housing estates’ roads have adequate dimensions, even wider than the standard, the main road has smaller dimensions, creating congestion.

Figure 3. The location of housing estates case Study in Cipagalo Village, Bandung Regency
Source: Result from Map Processing and Google Earth
There were also lots of sidetracks along the main road, which appended the traffic jam along the roads. We can predict that the number of congestion-prone points at the peri-urban transportation network will still increase in the future if such practices still happened without any solutions. It can be argued that the road improvements that have been provided by developers for the housing estates’ roads has no significant effect if not supported by comprehensive infrastructure network planning.

In terms of accessibility, the involvement of housing developer, especially a large one, is generally appreciated by local inhabitants since they helped to improve the main road with paving and widening the access. However, there was a different response to the usage of inner roads of housing estates. For outsiders, the existence of inner roads in housing estate neighborhoods cannot be entirely utilized by the surrounding inhabitants, especially in gated community housings which only has one-access system and equipped with a security post. In such limited access systems, ultimately, it would lead to inefficient road network infrastructure. The presence of narrow alleys around the housing estates’ barrier walls shows the presence of separate usage of road access. It indicates the inefficient supply and inequal practice of road network provision in the peri-urban neighborhood.
Most housing estates developers meritoriously arranged and constructed the main roadside drainage channel along with the main road improvement. But the development did not always follow sufficient dimensions or appropriate body water disembogue (such as tributary, river, or canal). The housing estates drainage channels are generally not directly connected to the existing network because developers preferred to build new channels since the land was formerly a plantation or paddy field with no drainage but irrigation channels. Switching irrigation channels into drainage channels often occurred in new housing development, even though these practices should not happen. Irrigation channels have a different water flowing system compared to drainage since irrigation divides water while drainage collects water. The practice of unplanned water channel transformation and the unstructured development of drainage channels generated from housing estates development has contributed to creating new puddles or even some flooding in the area of the neighborhood.

The infrastructure’s checking tools for sewerage system consists of the availability of septic tanks and household WWTP as well as its accessibility. Every house in the residential neighborhood already had a good septic-tank provision, either personal or communal septic system. However, it was quite different with the household wastewater system. Most existing housing estates did not provide WWTP management system, either personal or communal. The housing majority drained sewage directly into drainage channels. This was certainly a bad practice since it would lead to water and air pollution and also disrupted the hygiene of the surrounding environment.

One of the main problems with the solid waste management was related to the difficulties of acquiring a temporary disposal site in residential areas. Even though disposal sites were not required yet for small and medium housing scale typologies (because the requirement for the provision of temporary disposal sites in SNI 03-1733-2004 is for 2500 inhabitants), its existence is very important as a means of collecting communal garbage. As a result, every housing estate occupant seeks for their own solution to solve disposal problems. However, not all housing estates can resolve these problems. In fact, one housing estate experienced piling up garbage that was not transported out until two to three weeks.

![Figure 5. Analytical model of housing infrastructure accessibility in the MBR peri-urban neighborhoods](image-url)
this case, most developers found it was difficult to locate temporary disposal sites since there was rejection from most inhabitants to stay nearby the disposal sites, since there was no guarantee for cleanliness and standard procedure for waste transport management. In terms of disposal management accessibility, it can be said that the presence of housing estates still cannot provide a positive contribution of solid waste management for the surrounding community in the neighborhood.

Most housing estates in the study case area indicated the ownership of shallow wells due to the inadequate availability of water supply networks / regional water pipelines. The water quality of shallow wells also differs between the northern and southern part of peri-urban MBR. Most of the shallow wells in the southern part of Bandung produced water to improper for consumption. It indicated there was an inadequate supply of clean water for the community. The large housing typology served with a clean water pipeline network generally stated that the water also did not regularly flow. With those problems on clean water provision, the government should pay attention more to the water problems because clean water adequacy a public good that must be fairly accessible for all the community. In terms of infrastructure accessibility, the existence of housing estates still does not have positive contribution to the provision of clean water for the surrounding neighborhood. In fact, the presence of housing estates which are mostly equipped with shallow wells raised groundwater scarcity for the surrounding neighborhood.

Most housing estates have been equipped with electrical substations. After the year 2000, most of the electrical installations for the residential neighborhood has already used Posts Transformer Substation as an alternative substitute for a powerhouse. Meanwhile, the usage of cable phone indicates the decline in recent years since the rise of cell phone usage. It is visible from the number of Base Transceiver Station (BTS) pole pops built around the neighborhoods. Most informants reveal that the cable phone network existence is no longer important since they already get used to cell phones. Even though they have a detached power grid system, the community find the advantage of such indirect benefits from the housing estates inclusion to the village to be due to the widespread use of electric network. With the presence of housing estates, local inhabitants find that getting electricity connection to their house is no longer hard.

The general characteristics of all housing estates in the case study neighborhoods have shown the unavailability of formal school facilities (kindergartens and primary schools) as well as health facilities (i.e., clinics). Some residents claimed that housing estates’ managements do not allow the presence of clinics for the privacy reasons. The existence of public open spaces (parks and garden) were commonly provided by all the developers of housing estates, even though some of them are supposed not to meet the standards. For some developers, the green open space provision is only to meet the term of availability. Some of them make the ‘remaining land’ as a green open space which only functioned as a public garden, but not as a park. For other facilities, most of the medium-large scale housing developers have provided religious facilities (mosque). At the category of government and public facilities and services, the provision of appropriate standard–meeting facilities has been served by large-scale housing. Medium-sized housing is equipped with meeting halls, even though the existing building seems to not meet the standards. Other public service facilities that should be provided in the neighborhood are public parking. All the large housing typology shows the readiness of this kind of public facility. According to the number of occupants, this facility is still not required in the small-medium housing typology. However, if there is no public parking in the housing area, cars would be parked the roadside, hampering the flow of the road. To serve commercial and trade facilities, there is a tendency that developers generally provide them in the form of shophouses. Commercial facilities are usually placed in the public area of housing estates. Referring to the study findings, the trend of shophouses provision appears in the southern area of peri-urban MBR which is generally built after the year 2010. A public service that most housing estates had is security post. Some of them even had more than one security posts. Housing estates with clustering models have some other security posts in every sub-cluster section. However, only few security posts are already equipped with toilet facilities as those required by the SNI standard.
The accessibility concept of the housing facilities is highly correlated with the placement or the position of the facilities in the sites. If the facilities are located on the outer side or at the public open space of the housing site, it would provide a better access for outside communities. In the one-gated community concept with most facilities placed on the inner side of the housing area, the outer community hesitates to use the facility. The mosque is a means of worship with a high social function, yet most of the outer community is reluctant to use the facility if it was located on the inner side of housing estates. It can be said that the presence of security posts at the entrance of the housing estates has become ‘a restriction mark’ for other communities to access the housing facilities.

5. Conclusion
The research on housing infrastructure availability and accessibility of the three typologies of neighborhoods in the two representative areas of the peri-urban MBR shows that there are still many shortcomings in the implementation of standard regulations in the provision side by housing developers. It means that although developers seem to have already provided all of the housing facilities, in reality there are only a few aspects that are in accordance with SNI 03-1733-2004 as the national standard of housing infrastructure in urban neighborhoods. This might happen because not all local government uses this kind of standard as reference for housing infrastructure provision. With so many regulatory terminologies related to the housing infrastructure provision, it would eventually cause bias on the compulsory reference that should be followed by all stakeholders. This study also revealed that although some of the housing infrastructure aspects have already met the standards, without integrated planning network it would not bring any spatial improvement. In terms of accessibility, the surrounding communities generally indicate that they were not very affected by the presence of housing estates due to the detached neighborhood. For local inhabitants, the style of a gated community housing estate become a symbolic barrier that outsiders cannot simply come and enjoy the housing estate facilities. Most of the outer community has no other choice than just receiving the housing estates and adapting to their presence. Consequently, the model of gated communities housing is often called exclusive housing estates, which generated the fragmented residential infrastructure development.

6. Recommendation
This research affirms the accelerated development of peri-urban settlements should be managed with a clear infrastructure development plan. Without prejudice to environmental issues, the prospect of peri-urban development to meet the housing needs is very high. The local community also showed some appreciation for the infrastructure improvements that have been generated by housing estates development in peri-urban areas. The role of private sectors’ involvement in peri-urban development as the government partner can be seen as an alternative solution for the provision of housing and infrastructure networks. However, the concept is totally different with the dominance of the private sector which then undermines the role of the government. Since there are so many obscure implementations, it seems that the government should evaluate the housing infrastructure provision system mechanism, whether due to the imperfect planning regulation or weak technical implementation. In this case, the government as an institution authorized to implement housing and settlements (Law No. 1 of 2011) has more roles than just a regulator. The government has to describe every regulation in more detail for housing infrastructure planning and applicable technical standards.

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Acknowledgments
The authors gratefully acknowledge that the present research is supported by the Regional Agency for Research and Development, West Java Province of Indonesia