

# Spatial Assessment of Slum Area in Jepara City from Physical and Non-Physical Aspects Perspective

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# Spatial Assessment of Slum Area in Jepara City from Physical and Non-Physical Aspects Perspective

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## 1. Introduction

Slums are residential areas with substandard housing that are not well-served and/or overcrowded, in unhealthy, unsafe, and socially undesirable environments [1]. This is in line with the statement of the Khotifa [2] which says slums as informal areas exposed to accessibility problems, narrow streets, lack of vacant land and open space, very high housing densities, and inadequate infrastructure and services. Both statements indicate that slums are identical to the availability and quality of substandard physical aspects. Or if simplified, slums can be defined as areas where people have unsafe housing status [3].

Some of these aspects are a top priority for the majority of organizations or government agencies to follow up on the physical aspects of dealing with slum settlement issues. Such as the Regulation of the Minister of Public Works and Housing Number 2 in 2016 about Quality Improvement of Slum Housing and Slum Settlements, this mentions that there are 7 + 1 aspects in determining the priority scale of slums. The seven aspects are physical, while one aspect is an aspect related to land legality and other considerations (covering the conditions of strategic value, population, socio-economic and cultural conditions). The composition of these aspects shows that indeed the aspect which becomes the dominance of the slum level is a physical aspect, and other aspects can be said as supporting aspects.

Generally, what most slums share in common is a lack of basic urban services including clean water, improved sanitation, electricity, paved roads and drainage alongside with the absence of social



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**4** services such as schools, health centres and market places [2]. On the other hand, slum upgrading actions need to consist of physical, social, economic, organizational, and environmental improvements which are undertaken as a collaboration between citizens, community groups, businesses and authorities [4]. Thus, social and environmental aspects actually have an equally important role such as the physical aspect of dealing with slum settlement issues. But so far, the slum problems in Indonesia have not been addressed comprehensively, or can be said still handled partially. Government programs are limited in physical aspects only.

It is also experienced by Jepara City which has slum settlement problems in the coastal area. Based on the Decree of Jepara Regent Number 055/333 in 2014, Jepara city has slum locations spread in six urban villages. Determination of the slum location is also still focused on the physical aspects, but social and environmental aspects have not been a priority to be addressed. Whereas if traced more deeply, the root of slum problems arises from the social aspect of society. In fact, the data related social aspects are still minimal and difficult to obtain because it requires synchronization and strong commitment from the local government. But it should still be a concern in dealing with slum problems. Moreover, slum settlements quickly spread to the surrounding area, so that requiring serious discussion of the authorities [5]. The urban slum upgrading of Jepara has not been comprehensively assessed because of the incomplete nonphysical indicators that are the main assessment criteria, the lack of involvement of agencies at the community level, and the formulation of slum upgrading strategies focused on improving physical conditions.

This paper investigates spatial assessment of slum area in in Jepara City by focusing the analysis on two important aspects as infrastructure (physical aspect) and non-physical aspects such as social; aspect of society behaviour, urban policy set by the local government and stakeholder commitment. Therefore, the organization of the paper is divided in 4 section, as follows. Section 1 gives introduction on the importance of the spatial assessment in Jepara urban slum area. Section 2 describes briefly the research methods and main literature. Section 3 explains the characteristics of slum settlements in Jepara, the importance of using non-physical aspects in assessing slums upgrading, the necessity of individual commitment, and comprehensive slums upgrading strategies. Then section 4 explains the conclusion, namely the need to prioritize non-physical aspects in slums upgrading.

## **2. Method**

The method used in this study is mixed methods. Mixed method is used with the aim of combining quantitative and qualitative approaches in order to complement each other to obtain maximum research results. Furthermore, mixed methods are done assuming that collecting the best types of data can provide a thorough understanding of the research problem [6]. Data collection is conducted through primary data and secondary data. Primary data was obtained by field observation accompanied by several community leaders. While the secondary data sourced from relevant agencies, literature, and previous studies. The intended agencies are Regional Research and Development Agency (Balitbangda) of Jepara City, Public Works and Spatial Planning Agency (DPUPR) of Jepara City, Public Housing and Residential Areas Agency of Jepara City, and KOTAKU (City Without the Slums). Analytical technique used descriptive qualitative analysis by looking at and considering social problems, and also by overlaying the problem map of environmental infrastructure of slums. The main literature is the literature of Singh [7], which reveals that slum upgrading can not only look at the physical aspect, but also need to pay attention for socio-economic and environmental aspects in order to implement policies and programs effectively. In addition, also supported by the literature of Inostroza [8] which essentially states that the spatial assessment of slums needs to combine socio-economic analysis with possible planning so that develop a differentiated spatial approach towards large geographical areas.

## **3. Result and Discussion**

### *3.1 Characteristics of Slum Urban Settlements of Jepara*

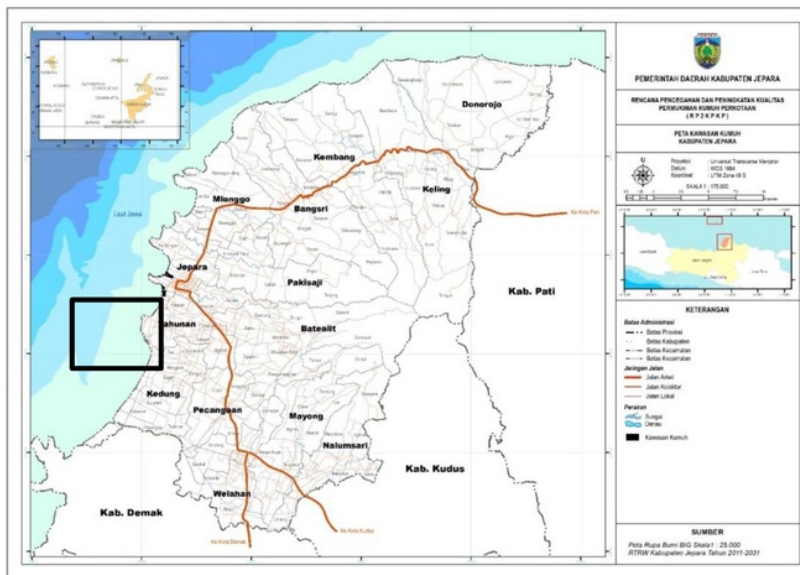
Based on the Decree of Jepara Regent Number 055/333 in 2014, Jepara City has slum locations spread over six urban villages in Jepara Subdistrict with total area 49,27 ha. The six urban villages are Bulu, Demaan, Jobokuto, Karangkebagusan, Kauman, and Ujungbatu. Each urban village has different slum areas (see Table 1).

**Table 1.** Priority of Slum Areas in Jepara City

No	Urban Village	Wide (Ha)	Percentage	Category of Slum
1	Bulu	5,57	11,30%	Medium
2	Kauman	1,35	2,73%	Medium
3	Jobokuto	8,90	18,05%	Medium
4	Ujungbatu	19,18	38,91%	Medium
5	Demaan	13,45	27,19%	Medium
6	Karangkebagusan	0,92	1,87%	Medium
<b>TOTAL</b>		<b>49,27</b>	<b>100%</b>	

Source: Decree of Jepara Regent Number 055/333 in 2014

Based on Table 1, urban village with the widest slum area is in Ujungbatu which is as wide 19,18 Ha and urban villages with the least number of slums is in Karangkebagusan which is as wide 0,92 Ha. Overall, each urban village has a different slum area, but all locations are included in the medium slum category. The distribution of slum settlement location in Jepara city can be seen in Figure 1 as spatial translation of Table 1.



Source: Local Government of Jepara City, 2017

**Figure 1.** Map of Slum Areas Jepara City

The location and extent of the slums are obtained by considering 9 aspects, namely (a) building, (b) road network, (c) condition of clean water, (d) drainage, (e) waste water system, (f) garbage, (g) fire protection, (h) legality of land, and (i) social economy. These aspects are descriptions of 7 + 1 aspects which has been set on the Regulation of the Minister of Public Works and Housing Number 2 in 2016 about Quality Improvement of Slum Housing and Slum Settlements, which another aspect is directly mentioned as aspects of land legality and socio-economic aspects. Based on the result of field observation and the result of secondary data from institution, then there are some indicators of handling for slum conditions in Jepara City (see Table 2). The slum settlement indicators are based on the priority slum settlement locations that previously mentioned in Table 1.

**Table 2.** Condition of Slums in Jepara City

No	Aspect	Bulu	Demaan	Jobokuto	Karangkebagusan	Kauman	Ujungbatu	Total
<b>1 Building</b>								
a	Number of houses not eligible	286 units (20,8%)	228 units (16,58%)	253 units (18,4%)	77 units (5,6%)	235 units (17,08%)	296 units (21,53%)	1,375 units
b	Building density	55 units/ha	69 units/ha	89 units/ha	35 units/ha	43 units/ha	58 units/ha	-
c	Irregular building	499 units (24,13%)	568 units (27,46%)	378 units (18,28%)	91 units (4,4%)	258 units (12,48%)	274 units (13,25%)	2.068 units
<b>2 Road network</b>								
a	The length of the road is damaged and not yet hardened	4.841,75 m (22%)	4.405 m (20,02%)	3.780 m (17,18%)	1.850 m (8,41%)	3.721 m (16,91%)	3.404 m (15,47%)	22.001,75 m
b	The length of the road has not been hardened	3.279 m (22,72%)	2.906 m (20,14%)	3.560 m (24,57%)	1.350 m (9,35%)	1.898 m (13,51%)	1.438 m (9,96%)	14.431 m
<b>3 Condition of Clean Water</b>								
a	Number of people who are not served by drinking water, bathing, washing	181 families (45,25%)	116 families (29%)	1 family (0,25%)	89 families (22,25%)	2 families (0,5%)	11 families (2,75%)	400 families
b	Number of people who unfulfilled drinking water, bathing, washing	115 families (15,33%)	58 families (7,73%)	252 families (33,6%)	0 family (0%)	325 families (43,33%)	0 family (0%)	750 families
<b>4 Drainage</b>								
a	Length of damaged drainage	1.872 m (20,11%)	2.215 m (23,79%)	630 m (6,77%)	1.110 m (11,92%)	2.390 m (25,67%)	1.093 m (11,74%)	9.310 m
b	Extensive settlements that occur puddles or floods	1,71 ha (9,34%)	0,13 ha (0,71%)	3,72 ha (20,33%)	1,44 ha (7,86%)	3,86 ha (21,09%)	7,44 ha (40,65%)	18,3 ha
<b>5 Waste Water System</b>								
a	Number of people who do not have access to public latrines	230 families (21,61%)	242 families (22,74%)	236 families (22,18%)	10 families (0,94%)	111 families (10,43%)	235 families (22,08%)	1.064 families
b	Number of family latrines / shared latrines that do not fit the standards	200 families (22,78%)	212 families (24,15%)	43 families (4,9%)	86 families (9,79%)	123 families (14,01%)	214 families (24,37%)	878 families
<b>6 Garbage</b>								
	The waste management system does not fit technical requirements	416 families (21,20%)	743 families (37,87%)	137 families (6,98%)	269 families (13,71%)	231 families (11,77%)	166 families (8,46%)	1.962 families
<b>7 Fire Protection</b>								
	Has infrastructure/facilities fire protection	0	0	0	0	0	0	0
<b>8 Social Economy</b>								
a	Total population	3.560 people (16,49%)	5.586 people (25,87%)	4.212 people (19,51%)	1.128 people (5,22%)	2.793 people (12,93%)	4.314 people (19,98%)	21.593 people
b	Population density	36 people/ha	64 people/ha	76 people/ha	25 people/ha	59 people/ha	14 people/ha	-
c	Number of low-income families	474 (16,53%)	814 (28,39%)	585 (20,4%)	132 (4,6%)	284 (9,9%)	578 (20,16%)	2.867
<b>9 Legality of Land</b>								
	The building does not have a license	725 units (18,32%)	1.085 units (27,41%)	576 units (14,55%)	196 units (4,95%)	306 units (7,73%)	1.070 units (27,03%)	3.958 units

Source: Analysis of Authors, 2017

### 3.2 Urgency Completeness Indicator Assessment of Non-Physical Aspects

Based on Table 2, it can be seen that the criteria for slum settlements are dominated by physical aspects. Data related to the physical aspects are already collected and arranged in accordance with the indicators of slum settlements, but unfortunately aspects of socio-economic data is still very limited. Pacione [9] revealed that the quality of the settlement is not only attached to the physical and environmental aspects, but also related to the interaction of environmental characteristics and individual characteristics. Such individual characteristics need to be identified to see how human behaviour is to the environment, because basically the behaviour would form the development of the environment. Thus, social problems should have the same portion as the physical aspect to consider in slums upgrading.

In fact, the socio-economic aspect has already been considered and discussed but the details are not quite deep, only limited to population, population density, and low-income families (see Table 2). On the other hand, indeed the collection of data related to slums is quite difficult to obtain. This is because the shape, size and conditions of slum settlements are changing rapidly, which encourages the establishment and maintenance of accurate databases to be extremely difficult [10]. Whereas the collection, formation, and maintenance of data must be an important part as the basis for the establishment of accurate and quality data. High quality urban data for use as a fact base is an essential component of decision-making at large and small scales, and across a variety of sectors [11]. The things that need to be underlined is the collection of data related to the social aspects of society requires synchronization and strong commitment from the government and related parties because social data tend to be difficult to obtain because it is dynamic. This is reasonable because public and social information requires institutional commitment to adaptive management [12]. In addition, governments or institutions, especially leadership at the municipal level, have a fundamental role in shaping an inclusive city development [13]. In essence, accurate data collection is necessary to form a description of existing conditions by involving the roles of various parties to be analyzed in order to improve and organize the slums in the future.

So far, slum data are still limited and dominated by physical aspects as shown in Table 2. Indeed, socio-economic aspects are included, but the portion and depth of the information is not comparable with the physical aspect. Whereas Harris [1] states that physical planning can indeed be adjusted and may improve, but can not eliminate slums unless they are accompanied by social and economic programs. In line with the statement of Maretha and Sunarti [14], that the low economic community causes the inability of the community to improve their physical environment independently, so the condition of the settlement becomes impressed slum. Thus, the social and economic aspects have a strong enough influence in shaping the slums. In addition, the decline in status of some inner city areas has been revealed by analyses which showed high concentrations of the unemployed, the low skilled, dominance of elderly, accompanied by high levels of overcrowding, amenity deficient housing, and out-migration [9].

The above statements illustrate that slums encompass many things beyond the physical aspect, namely related to social aspects (individual or community behaviour), economic, environmental, and institutional. Furthermore, the above statements corroborate that spatial assessment of slum settlements needs to combine socio-economic analysis with existing planning policies in order to accurately describe slum locations [8]. This is because the application of socio-economic spatial is needed to make an explicit relationship between slums to urban planning and governance [15]. Thus, the elaboration in Table 2 which is the indicator standard of the slum from government is not sufficiently comprehensive as the basis for slums upgrading. Slum settlement indicators should pay close attention to other aspects in addition to physical aspects, so that slum management is comprehensive and can be handled more effectively.

### 3.3 Engagement and Commitment of Implementing Agencies

Slums are increasingly confronted with negative consequences such as environmental degradation [7]. Slum residents usually produce large amounts of solid waste but are not collected regularly, then make it difficult to maintain a healthy life [16]. The paradigm of slums is closely related to environmental problems or inappropriate living conditions. Unhealthy living conditions of slum dwellers are the result of a lack of basic services, with visible open drains, lack of road access,

uncontrolled waste disposal, polluted environments, irregular building construction, and so on [7]. The statement shows that the limitations of facilities and infrastructure form the basis of the emergence of unhealthy neighborhoods. Communities in the coastal areas of Jepara City also experienced such things, namely sebagian most people are usually dump garbage to the seaside (Figure 2) because the majority of people do not yet have a solid waste management system that fits the technical standards (see Table 2). Worse, the pile of garbage is made as a foundation of the building so that the building is also very close to the sea. It is conducted because the community is limited in accessing basic needs for a family residence, which ultimately affects the damage to the marine ecosystem.



Source: Result of Field Observation, 2017

**Figure 2.** Garbage Dumps on the Seaside

Limitations of basic facilities and services make it difficult for communities to create living conditions that conform to standards. In addition, unhealthy environmental conditions will affect the health of local communities. Slum areas in Jepara City also have environmental problems, related to several public latrine buildings adjacent to people's houses. It certainly needs to be addressed because public latrines adjacent to the house of the residents will affect the water conditions around the houses. Study of Sunil Kumar, Shigeo, and Hideki [17] shows that contaminated drinking water, unhealthy living conditions, poor personal hygiene and food hygiene contribute to diseases that related with water among slum dwellers.

Moreover, the abundance of non-functioning drainage systems (see Table 2) to drain water contributes to the settlement becoming flooded in slums area Jepara City. Non-functional drainage systems are also caused by natural conditions in coastal areas that have flat topography. If left unchecked, the damage of the drainage system will cause environmental pollution. Therefore, the construction or repair of drainage systems is very important, especially in coastal areas with flat topography. The condition also makes the handling of slum settlements in coastal areas can not be conducted partially, but must see the region as a regional environment that is interconnected with other areas. The problems of public latrines and drainage systems in the field have shown that environmental problems will become widespread and complex if the physical aspects of the slums are not addressed comprehensively.

Therefore, the approach taken to determine the main problem of Jepara urban slum settlement is by doing agreement among Regional Research and Development Agency and other Organizations of the Regional Level, both at the community level (neighborhood association, citizens association, or urban village) and at the official level at the city or city level. The stage is conducted by doing FGD (*Focus Group Discussion*) two times, there is first FGD to deal with the main issues, which include the

unity of physical and nonphysical problems, including discussing the priority locations for slums upgrading. Priority problem determination is prepared by creating problem tree which then assessed its priority scale. By prioritizing the problem, then get an alternative solution to problem solving. Furthermore, stage of FGD were also conducted to prepare local community institutions (BKM/KSM) as a driving force for activities while ensuring the sustainability of slum settlement programs at the community level.

While the second FGD conducted to formulate the concept and strategy for slums upgrading, and programs indication of upgrading urban slum areas. The concepts and strategies are formulated based on the results of the needs assessment review, includes a list of potential issues, problems and mapping of handling needs. In more detail, the concept and strategy for slum upgrading encompasses several aspects including physical, environmental, social, institutional, economic and funding aspects based on the objectives that have been formulated. Basically, the FGD technique is conducted to formulate a program of slum upgrading based on the discussion and participation of each agency or related institutions, both government and society. It is important to do because slum upgrading actions need to be done by improving the physical, social, economic, organizational and environmental aspects of collaboration between citizens, community groups, businesses and authorities[4]. Collaboration of each party is taken into consideration because the alignment of the views from the relevant parties will affect the program implementation and the program successness. Therefore, the cooperation and coordination of each agency or related institutions should be built as good as possible, both in the process of formulation and in the program implementation.

#### 3.4 Strategy Formulation in Improving the Quality of Slum Areas Comprehensively

The standard level of social life of slum dwellers is generally bad for the environment [7]. In addition, the socio-economic status of slum dwellers may be characterized as low-income groups especially with inadequate education [7]. Basically, low education makes people's behaviour less good for the environment. The bad social behaviour occurred in the slums of Jepara City, one of them is sanitary disposal to the drainage system (Figure 3). It shows that individual behaviour as part of social aspect very influential toward environmental condition in the future. Unauthorized sanitation disposal will clog the drainage and also disease-prone because the sanitary sewer should be closed. Moreover, many drainage systems are not flowing so that waste water will be prone to cause flooding. These conditions indicate that individual or community behaviour will affect environmental pollution.



Source: Result of Field Observation, 2017

**Figure 3.** Disposal of Wastewater into Drainage System

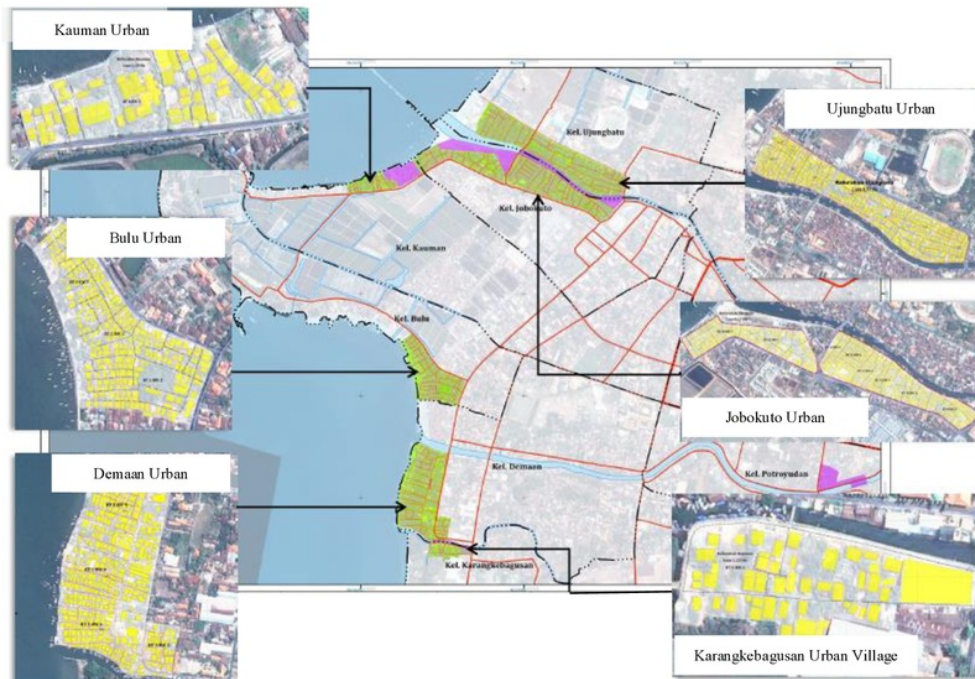
Other social problems that occur in the slums of Jepara City is related to the management of public latrines that are not maintained and supervised continuously by the relevant institutions. This condition can be seen from the number of public latrines that do not fit the technical requirements, there are 878 (see Table 2). Commitment and responsibility of the institutions or communities are still low that make the maintenance and supervision of public latrines are not continuous, then in the end many latrines are abandoned. Whereas public and social issues require institutional commitments for adaptive management [12]. These conditions show that the physical construction undertaken will not be meaningful and continuous if not supported by a qualified institutional management. Or can be said, the improvement of infrastructure is important because it is proven to significantly reduce the prevalence of slum areas, but the municipality or related institution needs to be strengthened by the authority, resources, and capacity required to carry out the various functions of the existing policy [18].

The ability of institution is related to the understanding, awareness, and behaviour of members or individuals within it. Thus, the main thing that needs to be considered in dealing with slum area is related to social problems of society. The understanding, awareness, and behaviour of individuals or institutions must first be identified as the first handling measures in slum upgrading. This is because the actions taken by individuals or institutions that will ultimately affect the physical and environmental aspects. United Nation (1994) also reveals that social indicators need to be considered for identifying social issues that require action, to develop priorities and goals for declarative action, and to assess program and policy effectiveness [15]. Moreover, Sunarti, Syahbana, and Manaf [19] said that the development of economic and social activities of communities in slums need to be conducted to stimulate people to invest in the rehabilitation of their homes and the neighborhoods. Thus, social and economic aspects are important to be identified and acted upon in the early stages as a lighter in slums upgrading because they are sourced from each individual which will affect the implementation of the program.

Based on the above description, slums upgrading requires consideration from various aspects, namely physical, social, environmental, economic and institutional aspects. In addition, socio-economic aspects are crucial in spatial assessment of slum settlements because spatial behaviour usually depends on territorial and local socio-economic specific [15]. Moreover, slums settlement are a process depending on a complex set of socio-economic conditions [8]. On the other hand, although slums are spatially and socially relevant, but it needs to be reassured that the existing data is processed systematically and in depth [1]. These statements indicate that the spatial assessment of slums needs to consider socio-economic aspects by systematically, profoundly, and easily understood.

The government as the most authoritative party needs to re-examine the important indicators that need to be considered in slum upgrading to be effectively addressed. The government needs to ensure the root of the obvious problem of slums to be addressed in a prioritized way. As for based on the existing problems in the slums of Jepara city, then the strategy that can be done is as follows.

1. Makes slum locations scattered unevenly in the form of dots, held together by the connecting area (see Figure 4). It aims to provide the legality of the authorities responsible for the reduction of the slums for the intended location. In addition, the connecting areas are also considered because slum settlements are linked or influenced by the surrounding area. For example, to build a drainage system it is necessary to pay attention to the whole channel so that there is no blockage, then the water can flow continuously. In other words, slums are seen as an interconnected environments so that the given measures of handling can be done properly and thoroughly.



Source: Analysis of Authors, 2017

Figure 4. Spreading Slum Locations with Conneting Area

2. Directly determines the commitment to follow-up improvement of urban slum in Jepra City. Implementation of programs both physical and non-physical, should be accompanied and supervised by the parties concerned. Thus, it is necessary to clearly divide the task and function of the implementing agency responsible for each program. For example, by physical planning of road improvement with development coastal road and construction of talud by Ministry of Public Works and Housing (work unit), construction of communal WWTP by Ministry of Public Works and Housing (work unit), education of waste management 3R by Ministry for The Environment and Public Works & Spatial Planning Agency of Jepra City, skills training according to potential labor by Regional Research and Development Agency of Jepra City and FEDEP, and also socialization of livable home and healthy environment by Regional Research and Development Agency, Public Works & Spatial Planning Agency, and Health Agency of Jepra City.

3. Affirm contribution of KOTAKU area in Jepra for updating databases and nonphysical aspects assessment as the basis or indicator of the slum level that can begin to be applied per September 2018. Its implementation requires two-way communication between community-based nonprofits with Regional Research and Development Agency and Public Works & Spatial Planning Agency of Jepra City as the technical agency which responsible for the slums.

#### 4. Conclusion

The urban slum upgrading of Jepra has not been comprehensively assessed because of the incomplete nonphysical indicators that are the main assessment criteria, the lack of involvement of agencies at the community level, and the formulation of slum upgrading strategies focused on improving physical conditions. So far, public awareness in improving the quality of settlements has not grown, can be seen from the behaviour of people who are less concerned about the environment settlements. Furthermore, the determination of slum settlement indicators has not been deeply considering other aspects beyond the physical aspect, including social, economic, environmental, and institutional aspects. In addition, spatial assessment of slum settlements indeed needs to combine socio-economic analysis

with existing planning policies in order to accurately describe slum locations. Thus, the slums upgrading can be conducted properly and effectively. As for the nine indicators was set (Table 2), the actual slum settlement indicators need to be prioritized is on the environmental and socio-economic conditions of the community. Environmental and social conditions are closely related to the behaviour, habits, and interactions between individuals to the surrounding environment, so that the root causes of slum settlements should be identified from the environmental and social conditions of the community. Therefore, the government needs to review the priority indicators in slum upgrading so that the handling measures undertaken can appropriately improve the quality of slums comprehensively.

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