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Appreciating the growth of informal utilization of city space for sustainable urban development in Yogyakarta city

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Abstract. At present many people live within the cities and more than 30% of all city dwellers live in slums or marginal areas. It is internationally recognized by the Sustainable Development Goals (SDG), which set as the first target of SDG 11 to ensure, by 2030, access to all to adequate, safe and affordable housing, to ensure access to basic services and to improve slums. Cities need large spaces and are the main source of wealth and the center of innovation, culture and politics. Obviously, they have become the most important arena of humanity. Today, in most cities in the world, forms of urbanism develop side by side in the same urban space. This situation happens also in other cities in developing countries including Indonesia. This paper will discuss about the patterns of informal urban space utilization carried out by low-income communities. The method used is conducting field surveys and observing objects that have been determined directly in some cities. By discovering the pattern of informal use of urban space, it can be formulated as how low-income communities use the urban space to settle and business informally. Based on the formulation that has been made, a planning and design method is developed which can later be proposed as a sustainable development strategy for improving urban areas occupied by low income people.

Keywords: Informal settlement, Space utilization, Sustainable Development, Low-income

1. Introduction

Today, in most cities around the world, several forms of urbanism coexist in the same space. The form of urbanism could be either formal urban form or informal urban form which is mostly carried out by the low-income people [1]. In general, more people live in urban areas than in rural areas. 54 percent of the world's population is in urban areas in 2014. The continued population growth and urbanization are projected to add 2.5 billion people to the world's urban population by 2050. Nearly 90 percent of the world's population is concentrated in Asia and Africa. As the world continues to move into urban areas, the challenges of sustainable development will increasingly be concentrated in cities, especially in low to middle income countries where the rate of urbanization is seen to be the fastest [1].

UN Secretary General Ban Ki-moon in 2015 said that "Our generation is the first generation that can end poverty, and the last generation can take steps to avoid the worst impacts of climate change." The Sustainable Development Goals replace the United Nations Millennium Development Goals (MDGs), which ended in 2015. MDG 1 about halving poverty has been achieved [2]. Poverty is a multidimensional situation that cannot be understood simply by knowing whether a person lives with...
US $ 1.8 or 2 a day. While extreme poverty can be interpreted as a lack of fulfillment of basic human needs such as housing, clothing, food, access to basic education and primary health care; lack of choice; and, at least, significant vulnerability to climate change, environmental degradation, natural disasters, and others. Besides that, poverty is one of the most complex and diverse problems facing the world community. The causes of poverty can be global, international, national, even historical, and structural - and there is no single, simpler problem solving. Therefore it is important for the government to communicate the understanding of the SDGs as a comprehensive and interdependent "package" to eliminate permanent extreme poverty when they start implementing the SDG. It is very important to take a holistic approach if we want to succeed and to ensure that nothing is left behind[2].

Transfer of population to cities or urbanization is one of the main challenges often faced by big cities in developing countries such as Indonesia. Because the rapid growth of these large cities is not commensurate with the industrial development, most of the population lives in informal settlements or slums where they experience high levels of poverty and vulnerability to disasters. In terms of social, cultural and political participation, these slum communities are marginalized: lack of full integration with various urban systems, they are very dependent on the human, social and cultural capital they have[3].

The problem of rural-urban migration is closely related to urban poverty because the urban poor in the cities of developing countries are mostly rural migrants. According to many available migration literature, people moved to cities for economic reasons. When people are asked why they move to the city, they usually answer 'to get a better prospect' in the urban economy as their main reason. Seeing increasingly severe and widespread poverty in cities in developing countries easily leads to the assumption that migrants do not really know what is expected, and are not aware of the risk of being trapped in urban poverty[3].

![Figure 1](SampleImage.png)

**Figure 1.** Illustration of Migration of the Poor People Occupying the City Shape Spontaneously.

The development of informal areas in large cities in developing countries generally can be seen in the spontaneous residential areas of low-income communities and informal trade areas that develop spontaneously along the roads in the city center. Spontaneous residential areas of low-income communities develop a lot in empty areas in the middle of the city that are not utilized either by the government or by the community individually or privately. Spontaneous settlements have developed along the riverbanks, along railroads, under bridges, at burial sites, behind shops or vacant lots in the middle of the city. In general, spontaneous settlements of low-income communities develop around
the city center or Central Business District, because many low-income people work in the informal sector as pedicab drivers, sell at informal kiosks, peddling on the side of the road, etc. [See Figure 1]

As explained in the previous paragraph that in addition to spontaneous settlement of low-income communities, informal traders also occupy public spaces around the city center to sell their merchandise. In general, the development of informal traders is on the sidewalks that are strategically crossing the city center. The phenomenon of informal sector development is quite interesting to discuss, because the development of informal traders is always followed by many consumers who are interested in buying their products. The more the informal trader areas developed, the more open space around the city center is lost because it is occupied by street vendors.

Figure 2. Distribution of Slum and Squatter Settlements in Indonesia and Yogyakarta City.
Source: RPLP Report from the City of Yogyakarta.
In developing countries including Indonesia the growth of informal areas in the form of spontaneous settlements and informal traders has always developed in urban areas in developing countries including Indonesia. In 2016 Slums in Indonesia in 2016 were seen to spread to almost all cities which were concentrated in cities on Java. Figure 2. shows the distribution of slum areas in Indonesia in 2015. On the map it can be seen that the province with the largest slum area of more than 3,000 ha is the Province of Central Java and West Java. While in Yogyakarta City the total slum area is 234, 40 Ha and spread to 35 Sub-Districts.

The use of city space informally in the city of Yogyakarta is a challenge that is currently being regulated. The development of the informal region was greatly influenced by the growth of migration in the city of Yogyakarta. Spontaneous settlements of low-income communities are also influenced by the growth of poor society settlements which are increasingly growing. The area around the city center which is a magnet for the arrival of migration flows demands the fulfillment of the need for shelter. Because the price of land and formal housing in the downtown area is quite high, the pedestrians will try to find or rent the cheapest housing. The most strategic location is the area of spontaneous settlements located around the city center which is not far from where they work in the informal sector. Thus, the use of urban space that is used informally by low-income people is increasing day by day and the density is also getting higher.

2. Methods

This research uses quantitative and qualitative methods. The quantitative methods were carried out by questionnaire and doing a measurement for physical infrastructure. Whereas the qualitative method started from literature study to collect secondary data about informal utilzation of city space, followed by observation and interview to the local community who live in low-income settlements and work within the city in informal sector as a street vendors, and afterwards examine the quality of city space[4] As the basis of the qualitative research method, Robert Yin gave several aspects focused on the research. Those aspects include[5]:

- Studying the meaning of people’s lives, under real-world conditions;
- Representing the views and perspectives of the people in a study;
- Covering the contextual conditions within which people live;
- Contributing insights into existing or emerging concepts that may help to explain human social behavior; and
- Striving to use multiple sources of evidence rather than relying on a single source alone.

Qualitative research first attempts to study the meaning of people's lives in real-world conditions. People will appear in their daily life roles or have expressed themselves through diaries, journals, writings and even photography - entirely independent of any research investigations. Social interaction will occur with minimal intrusion by artificial research procedures, and people will say what they want to say, not, for example, limited to responding to questionnaires that were previously determined by the researcher.

The research method used is very useful to understand how low-income communities use urban space informally. Some architectural aspects will be used to support the understanding process of the use of urban space. In addition, the process of using urban space carried out by low-income communities is also discussed to get the typology of the election of space which is often chosen to develop their activities in living and trading in the informal sector[6].

The methods section describes the rationale for the application of specific procedures or techniques used to identify, select, and analyze information applied to understanding the research problem, thereby, allowing the reader to critically evaluate a study’s overall validity and reliability. The initial process is to prepare research by forming a research team, selecting the research location, preparing all research instruments, collecting literature books that support research, surveying agencies to obtain secondary data needed. Then all the literature obtained is well studied, especially those related to the
process of developing spontaneous settlements inhabited by low-income people and the location where these communities make a living in the middle of the city in the informal sector. After all the preparations have been done well, the field observations are carried out in detail by the full team. Field studies are carried out several times to observe the process of settling the community and the process of carrying out daily living[7]. After the field study was carried out, the next step was to carry out an analysis comparing the results of the field study with secondary data and the results of the literature study that had been done previously. The process of living and looking for livelihoods is also well analyzed to give appreciation to low-income people in settling and making a living in urban space.

![Diagram of Research Process](image)

**Figure 3.** Diagram of Research Process in Spontaneous Settlements and Informal Sectors.

### 3. Basic Theories

Although the government considers their settlements illegal, the poor are able to demonstrate extraordinary ingenuity in developing the neighborhood where they live. With all their limitations, they regulate open space and housing construction with simple materials[8]. The above statement is understandable, because if someone is forced by a bad situation in his life, his power will automatically emerge and he will face problems with all the creativity he has. People in informal settlements have limited capabilities and poor life situations compel them to be creative in developing and dealing with settlement problems.

According to written regulations, the Indonesian government will help poor people in order to struggle to live properly in their settlements. The government's attention for the poor can be seen in the 1945 Constitution of the Republic of Indonesia [9]. It is clearly written in Article 34 of the 1945 Constitution that the poor or needy people and neglected children will be protected by the government. In addition, in the amendments to the 1945 Constitution, articles 28A to 28J, it was made in 2000 clearly written that human rights are protected and appointed as the basis for making other government regulations[9]. Thus the Indonesian government also gives attention to poor people, who live in rural
and urban areas. Because poor people in urban areas live in informal settlements, the government always tries to help them by developing many houses for the poor.

Based on the previous researches in several informal housing areas in big cities like Jakarta, Surabaya, Semarang, etc. the problems of informal settlement begin to appear when the local government considers the settlement as a bad image of the city that must be removed. In 2009 the people living in Stren Kali Wonokromo, Surabaya were evicted by the government of Surabaya Municipality[10]. From this research it was found that the financial lost caused by house demolation was Rp. 22 billion for building materials; Rp. 4.56 – 6.84 billion for labor income; and Rp. 212.5 million/year for social cost. Another observation was about eviction program in Kampung Tambakrejo, Kelurahan Tanjung Mas, Semarang City[11]. This program was carried out by Municipality Government for the development of East Semarang flood canal. In this eviction program there were 97 families whose houses were demolished. Every eviction program in a certain area has always so many victims and lost of material and social cost.

In fact the informal settlement has been developed up to the second generation or more than 20 years. They have roots in that area of the settlement socio-culturally, economically, even psychologically. By removing the settlement, in one side the local government tries to beautify the area based on the concept of beauty idealized by the city planner and architects who work with the local government. On the other side, the local government stimulates indirectly the appearance of the informal settlement in other areas, because the grass root people who are not able to buy a formal house will look for another empty area in the city centre as their place to build their new informal huts. Low-income communities in spontaneous settlements do not have the opportunity to live in the settlements built formally, because they are too poor to reach housing prices in formal housing. In other words, it is quite difficult for poor people who are often called grassroots communities to save money so they can have a better future[12]

The only alternative to living around the city center is on a plot of land where they do not need to buy land or pay rent. That is why so many poor people occupy empty areas in the city, where the government or private institutions have not used it. In such vacant land there are no adequate infrastructure facilities, however, the poor with their high intelligence can struggle to survive in the middle of the city. Because they live in informal settlements with minimal infrastructure facilities, they must be creative and use facilities within the settlement effectively. Therefore their methods, plans, designs and building materials are often far more suited to local needs, income, climatic conditions, and resources than official standards and laws required by the government[13].

The form of public spaces in spontaneous settlements can be seen as spatial forms and road lanes where many people carry out their daily activities. After finding the active spatial form used for population activities, the space will be identified and then used as a pattern of development plans for spontaneous settlement revitalization programs. Active open space is chosen because it is a place that is used as a center for human activities within the settlements. Circulation that connects available open space must be considered as a secondary pattern of settlements, because the main pattern of settlements is mostly a linear pattern following a river or main road. After that, the houses built along the circulation or lane must be improved their quality step by step with the strategy of self-help development[14].

To understand the poor's activities in the architectural space on spontaneous settlements is very useful for regulating the development strategy based on the character of the population. Taking into account the economic situation of low-income people living in informal settlements, it is understandable that they are hard-working persons, who are persistent in seeking the basic needs of life for their families[15]. Not only husbands work in informal sectors, but also wives work to help their husbands to increase family income. Their dependence on the hustle and bustle of the city center is very strong, because in the region they can earn income for their daily lives.
4. Discussion

In this section, we will discuss the results of the research team in the city of Yogyakarta. The discussion done in this section will be divided into three parts, which will discuss Low Income Settlements, Street Vendors, and Apreciating the Informal Utilization of City Space. Each discussion will be given data directly obtained from the field, some statistical data obtained from secondary data and literature studies will be discussed to support analysis of the results of field studies. The density of these settlements is higher. In addition, many people use the land on the riverside in order to build their houses illegally, often known as squatter settlements.

4.1. Low-income Settlements

As explained in Introduction, that the development of spontaneous settlements around the city center is consequence of the natural birth process and the process of migration of residents who are looking for a place to live with cheap housing prices. The growth of spontaneous settlements occupied by the low-income people is increasing and the density of the settlements is also becoming very high. Consequently, environmental degradation occurs in spontaneous settlements of the low-income communities. The case studies discussed in this section are taken from the results of the KOTAKU study program in Kelurahan Kricak, Yogyakarta city. Density in these settlements also occurs due to land densification by the community because of the distribution of land inheritance to their children and grandchildren. Generally densification due to the division of land for inheritance develops into a legal dense settlement area or often called a slum area. Some land that has been divided into smaller ones is sold and leased to newcomers at low prices. Thus the density of these settlements is higher. In addition, many people use riverbank land to build their homes illegally, which is often known as squatter settlement.

![Diagram of densification process of spontaneous settlements caused by heritage of the land from the great grand father.](image)

**Figure 4.** Diagram of densification process of spontaneous settlements caused by heritage of the land from the great grand father.

The study in Kelurahan Kricak, Yogyakarta City was used for the preparation of the Arrangement Settlement Environment Plans (Rencana Penataan Lingkungan Permukiman = RPLP) for Kelurahan Kricak 2017 - 2021. Based on the conditions and problems of the settlement observed in the field, the slum areas in Kelurahan Kricak can be divided into 2 (two) typologies. Each typology has a distinctive character that gives a life style to the neighborhood.

4.1.1. Slum areas developed not on the riverbank. This settlement areas that are near the city center (urban fringe) are generally grow and develop between the riverbank and the main street. This development is a consequence of the growth of the city, the rapid development of the population and the rate of migration from rural areas to the city which is very high. Slum settlements in Kricak Subdistrict arose due to the rapid growth of the central city of Yogyakarta which attracted residents to enter the city of Yogyakarta. In addition, population growth is inevitable in this region. In general,
Slum areas of this type are found in the middle of settlements which have very high densities. The characteristics of slums developed not on the riverbank in Kelurahan Kricak are to have very narrow pathways (difficult to be accessed) and very high house densities.

Figure 5. The Atmosphere of spontaneous Housing developed on the pheriphery of Kelurahan Kricak - Yogyakarta city.

4.1.2. Riverbank slum areas. Slum areas on the riverbanks are the settlements that have bad environment located outside the River Side Line (Garis Sempadan Bangunan = GSS). The opinion of people in slum areas within the cities that historically define the river as a very vital component of infrastructure, still continues up to present situation. In general, the location of slums in cities like this is in the riverbank corridor. The characteristics of the houses including their environment can be divided into 3 (three) types, namely the type of raft, stage and resting directly on the ground. Stage-type building units are generally transitions between raft-type buildings that rely directly on the ground. For types of slum settlements on the Winongo riverbanks in Kelurahan Kricak have a permanent type of building building. There are buildings that are on the riverbanks around 2 or 3 meters, but there are also those that are above the river.

Figure 6. Atmosphere of spontaneous housing developed along the Winongo Riverbank in Kelurahan Kricak - Yogyakarta city.

Source: Documentation RPLP Kelurahan Kricak Tahun 2017 - 2021

4.2. Street Vendors
Informal sectors developing on roadside areas have never been carried out simultaneously at the same time. These traders occupy gradual city spaces one by one. Because the local government has no response to the use of city space by the informal sectors, then slowly the use of city space is spread out and massive. Another thing that drives the growth of informal sectors is consumer behavior in buying the needs of those, who often choose the easiest location to reach. The most preferred location for consumers to buy something is along the road where they pass.
4.2.1. **Space Utilization by the Informal Sectors.** City spaces that are often used by informal sectors are vacant areas that have not been utilized by the government or the private sector, especially spaces on the roadside or sidewalks where people pass by. The location of vacant areas becomes more attractive to informal sectors, if areas are close to the crowds such as in the centers of business and education which are generally developed into student boarding houses or shop clerks.

![Figure 7](image1.png)

**Figure 7.** Street Vendor uses city space for pedestrian which causes accident vulnerability to the walkers and also traffic jam.

Those informal sectors try to attract the consumers in various ways through billboards displayed on the shop stalls where they sell and from the way they present their merchandise. Utilization of city space by the informal sectors that should be used as a pedestrian area causes the people to have to walk on the street. The situation will be exacerbated, if consumers park their motorbikes on the roadside next to the shop, so that the road becomes narrower. This situation makes pedestrians vulnerable to traffic accidents. Another problem is the occurrence of congestion when vehicles passing through the road are increasing, especially during peak hours in the morning and evening.

![Figure 8](image2.png)

**Figure 8.** The different between the space utilization in the city center without activities of street vendors and with activities of street vendors along Solo Street, Yogyakarta City. *Source: Documentation RPLP Kelurahan Kricak Tahun 2017 - 2021.*
4.2.2 Utilization of city space by costumers of Street Vendor. In principle, customers from the informal sector in urban spaces will not use space, if there is no informal sector that sells their merchandise. The sidewalk area must be used by the community to walk around the city center. Because in the city of Yogyakarta there is no such community habit to walk around within the city, so that during the day when the informal sectors do not sell their merchandize on the sidewalk, there is no one using the city space which is usually used by informal sectors. (see Figure 8 - A) If there is an informal sector selling on the sidewalk in the afternoon, then the location of city space on the sidewalk will be narrow for pedestrians, because the informal traders use almost half of the sidewalks to sell their merchandises.

In addition, if there are more visitors to the city center, the motorcycle parking areas will also takes a part of the street. Thus the main road will become narrower. (See Figure 8 – B) In the morning when the students leave for school or business man go to work and late afternoon when they are coming home, the traffic congestion in the city center will definitely become jammed. The process of using city space in pedestrian areas or sidewalks by consumers or visitors to the city center is very influenced by the informal traders who sell their wares along the streets in the city center.

4.3. Appreciating the Informal Utilization of City Space Done by the Low-income People. As mentioned in the basic theory discussion that the poor people will try to survive with all the creativity they have. In spontaneous settlements, low-income communities try to use open space for social interaction. They use city spaces by time sharing; during the morning time the city space is used by mothers to take care of their children, during the day time the children use it for playing, in the afternoon the youth takes an advantage of the space for their activities to carry out sport activities with minimal standard, and at night time the fathers use the space to meet, socialize while maintain the security of the area where they live. In addition there are several creative communities of low-income to claim open spaces to be private property by extending the roof of the house, making floors with the same motives as those in the home and various creativities to maintain their lives in spontaneous settlements.

Whereas street vendors develop their creativity more to attract the attention of buyers who pass the kiosks where they sell. The design of the wheelbarrow decorated with certain colors is also done to attract more visitors. In addition, the facilities provided with music given loudspeakers are also one of the street vendor strategies that attract consumers. If the street vendor sell some foods, then cooking demonstration will attract the attention of consumers and fragrant shoulders will also make consumers come to the food stalls.

Appreciating low-income communities in utilizing urban space needs a sincere heart and enormous attention. Not only providing assistance in the form of a development program that improve physical settlements and informal business areas, but also empower the people in the economic field and a detailed understanding of living in a healthy and sustainable environment. Thus all programs implemented for developing informal areas that grow in the city center must be carried out holistically and integrated both the physical facilities of the building and the infrastructure facilities, as well as the empowerment of the communities that manages the residential environment and the informal sector.

5. Conclusion
In the final part of this paper several conclusions are given related to the results of the research that has been carried out in the informal areas within the city of Yogyakarta. Those conclusions can be explained as follows:
• The migration of population from rural areas to the city absolutely must be kept as low as possible, in order to reduce the rate of growth of informal areas that develop around the city center.

• Informal areas around the city center must be arranged holistically, integrated and involve the local community in the planning process, because they know more about what they need and their capabilities in building

• The program for evicting informal areas should not be carried out any more, because it violates the 1945 Constitution of the Republic of Indonesia and opposes the UN regulation on Human Rights.

• The creativity of residents in spontaneous settlements and street vendors can be used to develop strategies for improving the quality of informal areas around the city center

• The research that has been done will be even better if it is developed in more detail to measure environmental quality, so the results can be used to create standards for the development of spontaneous settlement areas and the areas of informal sector.

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