Land value analysis in the suburban of Bandung and agricultural land availability impact

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Abstract. Suburban of Bandung City is an expansion area of the city development activities. The magnitude of the development of the city of Bandung is inseparable from the problem of limited area and land prices, so that development to meet these needs extends to suburban areas. This causes a change in the area of agricultural land in the suburban of Bandung. Analysis the value of land on the edge of the city of Bandung is useful to determine the condition of the land and its impact on the availability of agricultural land. The place of research was conducted in the suburban of Bandung which included Lembang, Cimeyan, Cilengkran, Margaaish, Margahayu, Bojongsoang, Dayeuhkolot, North Cimahi, South Cimahi Districts, Parongpong and Cileunyi. The research aims: 1) analyzing the value of land in the suburban of Bandung, 2) analyzing the impact of land values on the availability of agricultural land in the suburban of Bandung. Based on the method of this type of research is descriptive research that describes the results of interviews about the value of land and its impact on the availability of farmland. The resulting analysis in the form of the availability of agricultural land in the suburban of Bandung is decreasing due to the low value of agricultural land.

1. Introduction
Land is part of a landscape that has spatial characteristics and is the location of human activity. Land has many functions, one of which is as a space of life, land provides physical facilities for human habitation, industry, and social activities such as sports and recreation in other words, land has a very important role for human life [1].

Land area is increasingly not in accordance with the existing population because the population continues to increase each year. The condition of the population with the growth of the city that is not matched by the construction of settlements and the number of houses that are livable so that the need for land in the community increases. The increase in population has consequences for economic development that demands land requirements for settlements, industry, infrastructure and services [2].

The phenomenon of land needs is likely to continue to increase in line with the development and population growth. Every aspect of life and development, both directly and indirectly, is related to land issues. Meanwhile, land is reviewed from its availability in terms of the extent of the limited administrative boundaries of land. The insistence on land requirements for development is so strong, while the land area has not increased or is limited so that the demand for land will continue to increase towards the suburban [3].

The suburban based on the fiscal approach can be seen from the form of land use which has 100% of rural land and 100% of urban land [4]. The development of this suburban area arises because of the limited availability of land in the city center. Suburban are expansion areas of urban development...
activities. In the process of development, the suburban are not free from problems. Problems in suburban areas include physical changes in urban areas, changes in land use, population growth, changes in socioeconomic conditions, and problems in ecological balance [5]. Many problems in the suburban are caused by increasing urban activity pressure, namely the problem of converting agricultural land to non-agricultural land [5].

Suburban landuse is dominated by agricultural land because the people in the suburban depend on land. Agricultural land is a supporting factor for the necessities of life of people, especially rural and suburban communities. Most people in rural and peripheral areas earn income or rely on businesses engaged in agriculture [6].

Agricultural land has a value so that it can be traded by the community. Land value can be measured directly or indirectly, measurement is directly related to the physical condition of the land, such as fertility (example: agricultural land) and also on the surrounding environmental factors, measurements are carried out by measuring the level of soil productivity directly, while indirectly related to economic capacity and land productivity, and this is assessed according to the function or activity to be given to the available land.

The value of agricultural land tends to be lower compared to land with other functions being one of the factors of the community targeting agricultural land in suburban areas. So far, agricultural land has a low land value compared to other land uses (non-agricultural), as a result agricultural land is continuously experiencing land conversion to non-agriculture. Whereas agricultural land (rice fields) in addition to having economic value as a buffer for food needs, also functions ecologically as regulating water management, carbon sequestration in the air.

The decrease in agricultural land will certainly have an impact on the availability of agricultural land and regional food security. The benefits of agricultural land should be maintained and not to be ignored because besides disrupting the social economic life of farmers, land conversion also affects the amount of regional food production and the lack of agricultural land as happened in the suburban of Bandung [3].

The suburban of Bandung continue to experience a decrease in the area of agricultural land each year. Based on the results of his research concluded that: the transfer of function of agricultural land in the city of Bandung in 2011 to 2015 based on data from the technical consideration of land permits that is equal to 4,235,432 m² or 423.5432 hectares. Transfer of function of agricultural land is dominated by the suburban of the city of Bandung followed by the occurrence of the conversion of agricultural land into non-agricultural questions so it needs to be examined the relationship between the value of land and the availability of agricultural land in the suburban of Bandung.

The value of land in the suburban of Bandung is very important for the development and supervision of land functions. In addition, the high and low value of land in the suburban of Bandung need to be known because it impacts on various aspects of human life, especially the availability of agricultural land. This becomes a problem that needs to be investigated so that it can then become a reference policy for the control of the conversion of agricultural land and the determination of land values in the suburban of Bandung. Therefore the researchers conducted a study with the title "Land Value Analysis in the Suburban of Bandung and Agricultural Land Availability Impact".

2. Methods

The research site was conducted in a suburb of Bandung which covers 4 regional borders, namely the North bordering Lembang, Cimeyan, and Cilengkrang Districts. The south is bordered by Margasih, Margahayu, Bojongsoang, and Dayeuhkolot Districts. West side is bordered by North Cimahi, South Cimahi, and Parongpong Districts. East side is bordered by Cileunyi District.

The subjects in this study can be known from the population and sample. Population is a generalization area consisting of objects or subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions [7]. Samples are part of the population [8]. Based on this understanding, the population and sample in the study are all regions in the suburban of Bandung.
The instrument used for data collection in the form of observation sheets and interview guidelines. Observation sheets are used to obtain secondary data on land values and the impact of land values on the availability of agricultural land. Interview technique used is unstructured interview technique. The interview guide used is only in the form of an outline of the problem to be asked, as a check and re-check of observational data in the laboratory and the field. The material used for data collection in this study, namely Quickbird Imagery in the suburban of Bandung in 2000-2014, Bandung Earth Sheet Visual Map, Padalarang, Cimahi, Lembang, Ujung Berung, Cicalengka and Cililin with a scale of 1: 25.000, Map of Planning Regional Spaces (RTRW) of suburban scale 1: 25.000 and data on the number of residents of the suburban of Bandung from 2000-2014.

The tools used in this study consisted of hardware and software. Hardware includes one Intel® Core 2 GB laptop and 500 GB hard drive, one printer for printing maps, one GPS for locating the outskirts of Bandung. The software used for the analysis in this study is GIS Software namely ArcGis Version 9.3, SPSS, Microsoft Word 2010 and Microsoft Excel 2010.

2.1 Rancangan Penelitian

a. Pre data processing stage

Data inventorying, identification of data on the suburban of Bandung, and the data in this pre-study were obtained from the agencies of the City of Bandung. Landsat and Quickbird image analysis was performed by remote sensing analysis. This was done to get an accurate analysis of the administrative boundaries of the suburban of Bandung.

b. Data Processing Stage

Data from field interviews were processed using a statistical application to find out related data, namely the value of agricultural land in the suburban of Bandung and the impact of land values on the availability of agricultural land in the suburban of Bandung. Administrative maps of the suburban of Bandung are used to digitize the results of the data obtained and produce maps of land values in the suburban of Bandung as well as maps of the distribution of agricultural land in the suburban of Bandung in order to determine changes in the area and availability of agricultural land in the suburban of Bandung.

c. Analysis Stage

The results of this study are recapitulation of interviews about the value of land and the availability of agricultural land in the suburban of Bandung. If the value of land affects the availability of agricultural land in the suburban of Bandung, a review of government policies related to state food security is needed so that pro-people policies can be formed. If the land value does not affect the availability of agricultural land in the suburban of Bandung, there needs to be more support and supervision from the government.

3. Result and Discussion

Land is seen as a strategic property in the development of an area, and is widely known as land resources. Land resources themselves constitute the entire physical potential of natural land plus the various development activities on it [9]. Land in its use has special characteristics that are unique when we compare it with other resources, i.e. [10]:

- Physically land prices never go down and are not affected by time
- Land cannot be moved
- The quantity of land is limited and the supply cannot be increased.
- Land is used not only for production purposes but also for investment or savings.

Therefore land can be categorized as a commodity in development, the use of which is considered to provide benefits for the owner. Then it can be said that land is the main natural resource in human life. That is why its use requires careful planning so that the value of the land does not decrease but rather increases and can provide benefits to human life.

Land as the main natural capital that underlies the activities of life has two basic functions, namely [11]:

- Function of production: Land as a resource that can be used for the production of goods and services for human needs. The production of goods and services from land can be in various forms, such as agricultural land, livestock, forest, and so on.
- Function of preservation: Land as a natural capital that can be preserved to ensure the sustainability of life on the Earth. Preservation of land can be done through various means, such as conservation, restoration, and sustainable management.
a. The function of cultivation activities, which has the meaning of an area that can be used for various uses, such as settlements, both as urban and rural areas, plantations, production forests and others.

b. Protection function, means that the area is determined by its main function to protect the preservation of the existing environment, which includes natural resources, artificial resources and historical values and national culture that can support the use of aquaculture.

Based on the above understanding, it can be concluded that land is a land that is not limited to the term land only but includes it such as the lithosphere, hydrosphere, atmosphere, biosphere and anthroposphere which is the holder of the control of changes both in the better direction and vice versa. The changes made by humans were done in the past, now even in the future when humans use the land for the sake of their lives.

Land properties, namely: attributes or conditions of land elements that can be measured or estimated, such as soil texture, soil structure, amount of rainfall, rainfall distribution, temperature, soil dainase, types of vegetation and so on. The nature of land is a characteristic of everything that is in that land which is a differentiator from another land [1].

The nature of the land shows how likely the land will look if used for a land use. The nature of land determines or influences conditions such as how water is available, air circulation, the development of erosion sensitivity, availability of unsurhara, and so on. Land behavior that determines growth is called land quality. Land properties consist of several parts, namely land characteristics, land quality, land boundary, land use requirements, land improvement [12].

The natural resources in an area are basically the basic capital of development that needs to be extracted and utilized appropriately with due regard to its characteristics. Land as one of natural resources, can actually be viewed from a variety of different points of view, thus giving different meanings. Land is a "spatial natural resource that refers to spatial elements such as area, position and distribution" [13]. Whereas according to Dunggio land is "a container for human activities to carry out various activities in order to maintain survival and have a quality physical environment" [6]. The division and use of land in an urban space is very important to maintain the sustainability of development.

The conclusion of the opinion is that land is a natural resource and a place for human activities to carry out activities in order to maintain survival which refers to spatial elements such as area, position and distribution. Land is an important aspect in supporting regional development.

The development of an area is often faced with land use. Land is an input and physical container in a production system. Each type of land use can characterize the quality of its land use and when the land provides signs of damage then other types of land use are ready to replace it. On the other hand, if land use provides benefits, then land use should be maintained.

Judging from the social and economic aspects, land use in rural and urban areas are very different. In general, rural land use contains interests that focus on agricultural production. Whereas urban land use has a more complex dimension and not only focuses on economic aspects (industry and services) but also accommodates social interests, governance and environmental control. In city development, the integration of these aspects is very important because it can give the color of a city development.

Land use arrangements are very necessary to determine the best choice in the allocation of certain functions on the land so that land use can be optimized. "Urban land use is always associated with economic assessments of land parcels used for residential or business activities" [6].

The demand for land for development has been growing rapidly. This affects the price and land use in city development. The process of transforming the structure of the economy from agricultural land to non-agricultural land has led to an increase in the role of the non-agricultural sector, especially settlements and housing compared to the agricultural sector. The impact of this has led to increasingly threatened agricultural land.

Agricultural land is a supporting factor for the necessities of life of people, especially rural and suburban communities. Most people in rural and peripheral areas earn income or rely on businesses engaged in agriculture. But agricultural land or rice fields have been converted into industrial land, housing and settlements that cause national rice production will continue to decline.
Agriculture is a typical production process based on the process of growing plants and animals of regulating farmers and promoting the growth of those plants and animals. Agriculture according to Tohir is a business that includes fields such as farming (agriculture in the narrow sense), fisheries, livestock, plantations, forestry, crop management and marketing of agricultural products (agriculture in the broad sense). Where substances or inorganic materials with the help of plants and animals that are reproductive and preservation efforts.

The Central Statistics Agency of the city of Bandung states that agricultural land is land consisting of land that is cultivated and temporarily not being cultivated (land that is usually cultivated but for a while (for one to two years) is not managed / cultivated) for agriculture. While non-agricultural land is land that includes houses, buildings and surrounding yards, state forests, swamps (which are not planted), other non-agricultural land (roads, rivers, lakes, barren land, etc.), including non-rice fields not planted anything for more than two years [14].

Empirically agricultural land that is most vulnerable to function change is paddy fields. This is caused by: Population density in rural areas that have a dominant paddy agroecosystem is generally much higher than dryland agroecosystems, paddy areas are located close to urban areas, paddy area infrastructure is generally better than dryland areas, and infrastructure development and settlement facilities and industrial estates tend to take place quickly in flat topographic areas with agricultural ecosystems dominated by paddy fields [15].

3.1. Land Value Analysis in Bandung Suburban

There are two things that need to be examined in examining the benefits of land, namely the value and price of land. Land value is a land valuation based on productivity capability or economic strategic characteristics. So, the value of land is largely determined by the ability of land in its use.

As one of the resources, land has economic potential and strength, so it has a certain value and price. Land value is an assessment of land based on the ability of the land economically in relation to productivity and economic strategies [10]. Land value theory explains the relationship between land values and their uses.

One of the determinants of the total land value is the physical condition and environmental conditions of the land. In addition, land can be valued based on location factors. Especially in urban areas, land is valued based on location not based on physical factors meaning land value is highly determined by the strategic economic ability of the location [9].

A certain location will have a higher value than another location. One of the determinants of land value is the degree of accessibility. The degree of accessibility is one of the factors influencing the high and low land values. The higher the accessibility of a location the higher the value of the land and vice versa, it is usually associated with the distance between consumers and goods and services. The degree of affordability is related to potential shoppers and the ease of coming / going to / from locations [10].

The process of obtaining land with a good level of accessibility has tight competition conditions. Therefore the price of land can easily surge along with high competition, this value in the market is known as land prices.

Land value can be measured directly or indirectly, measurement is directly related to the physical condition of the land, such as fertility (example: agricultural land) and also on the surrounding environmental factors, measurements are carried out by measuring the level of soil productivity directly, while indirectly related to economic capability and land productivity, and this is assessed according to the function or activity to be given to the available land.

Land values and land prices have different meanings, but their interrelated existence. Land price is a picture of a land value which is then measured based on the nominal value in units of money for a unit of area on the land market [10]. In addition, land prices can also be determined by physical, social and political factors that exist in these locations. This land price is used as an aspect of valuation in determining the cost of a development involving the area.
As with other economic commodities, land prices are determined by the availability and demand of the land itself. The availability and demand factors are seen in the pattern and intensity of land use, and vice versa the pattern and intensity will have an influence on the availability and demand. The pattern and intensity in question are [16]:

a. Urban activity system: is human behavior in order to meet their needs for living, working, interacting and entertaining. All of these activities are demand side in land use.

b. Land development system: a process of land conversion or conversion and its adjustment process for various land uses in a time and space scale in accordance with the city's activity system itself. This system is related to available land or availability, and in it is influenced by the socioeconomic conditions of the city.

c. Environmental systems: biotic and abiotic natural environments as human, plant and animal habitats related to water and air. This system serves as the availability and support of the two systems above.

The amount of land available for development will always be constant and not increase, while the level of need and demand for development is higher due to the choice of an open economic system to deal with a competitive world trade system, this condition makes land prices difficult to control and makes land for gain profits for land speculators.

3.2. Impact Analysis of Land Value on the Availability of Agricultural Land in Bandung Suburban

Land demand is the implication of the increasingly diverse functions of urban areas (government, trade, services, industry, etc.) caused by its excess in the availability of facilities and ease of accessibility so as to attract a variety of activities to agglomerate. With limited land availability, the dynamics of the development of this activity will lead to competition between land uses which leads to shifting land use with increasingly high intensity [17].

As a result of the development of the city is the tendency of shifting urban functions to the urban fringe (urban fringe) which is called the process of spreading the appearance of urban physical outward (urban sprawl). Furthermore, suburban areas will undergo a process of spatial transformation in the form of a process of settlement densification and socio-economic transformation as a further impact of the process of social transformation. The process of settlement densification that occurs in suburban areas is a realization of the increasing need for space in urban areas.

Suburban are areas that are formed due to unbalanced economic growth between one region and another. This economic progress is causing pressure and encouragement to the development of the surrounding area. Economic growth comes from the growth point or growing center. Usually the point of growth in a country is clustered in a place, for example industrial location. Between the central and peripheral regions there is a dependency in the supply of goods and labor. This depends on the level of complementarity between the two places [18].

The suburban as a suburbbing area of an urban development activity have been the concern of many experts in various fields of science such as geography, social and urban areas since the 1930s when the first time the term urban fringe was put forward in the literature. The amount of attention is mainly focused on various problems caused by the process of city expansion into the periphery that result in physical changes, such as changes in land use, demographics, ecological balance and socioeconomic conditions.

Urban fringe is defined as an area that is in the process of transition from rural to urban areas. As a transition area, this area is under increasing pressure from urban activities. The impact of this pressure occurs on physical changes, including conversion of agricultural and non-agricultural land [5].

The suburban based on the fiscal approach can be seen from the form of land use which has 100% of rural land and 100% of urban land [4]. If strong complementarity will occur the process of spreading development to the back regions (trickling down) and vice versa if weak complementarity will occur the effect of polarization. also has underdeveloped rural areas.

The periphery is a relatively static area of development compared to central regions such as metropolitan or megapolis cities that are categorized as core areas. The central region is a subsystem
of development progress determined by institutions in the core area, in the sense that the periphery is in a substantial dependency relationship. The core and periphery areas together form a complete spatial system.

Skog and Steinnes divided the city area into three geographical zones. The first zone is the area of the city defined by administrative boundaries which constitute the boundaries of urban settlements. In this zone, agricultural land conversion can be analyzed in the area that has been built. The second zone is a buffer zone which is defined as a suburb. This zone is a zone of transition from urban areas to rural areas. The area included in this zone is three kilometers from the city administrative boundary, this zone is very close to an established urban settlement boundary. The third zone is a rural development area that is outside of urban agglomeration. This area is more than three kilometers from the urban settlement boundary [19].

The Central Statistics Agency periodically publishes land area statistics according to their use in Indonesia in the book "Land Area According to Their Use in Indonesia". Broadly speaking the use of land resources is divided into agricultural land and non-agricultural land. Agricultural land is further broken down into paddy land and non paddy land or dry land. Paddy fields are also distinguished from irrigated paddy fields and non-irrigated paddy fields, while dry land is further classified into tegalan/orchards, field/huma, grazing/pasture, swamps, ponds, ponds, plantation land, state forests, land planted with timber, and temporary dry land not cultivated. From the entire classification of dry land, only three types of dry land are generally managed by farmers for the business of agricultural crops, namely tegalan/garden, fields/huma, and temporary dry land which is not cultivated.

The increasing need for land has resulted in people looking for land that can be bought at cheap prices such as agricultural land. Agricultural land is relatively cheaper because the location of agricultural land is mostly located in suburban areas that connect the city with the district. Little economic activity and location far from the city center are factors driving the low value of agricultural land when compared to other land. High and low value of agricultural land will cause various impacts in terms of physical, social and cultural, economic to the availability of land both positive and negative.

Agricultural land is a supporting factor for the necessities of life of people, especially rural and suburban communities. Most people in rural and peripheral areas earn income or rely on businesses engaged in agriculture. One important element in producing food is the availability of land because land is the main production factor for producing food. Land is an economic resource whose availability is relatively fixed, but needs continue to increase due to development needs. In addition, land also has specific characteristics (topography, slope, soil texture, chemical content, etc.) so that the appropriateness of its use will greatly depend on the needs of developed economic activities. Therefore, land use needs to be directed to activities that are most appropriate to their physical characteristics and are managed in order to be able to accommodate community activities that continue to grow [20].

Provision of agricultural land for food is currently facing pressure due to competition with other sectors as a result of economic growth and population growth. Such conditions cause agricultural land for food faced with the problem of decreasing the area of land due to conversion to non-agricultural use. The land conversion is also common in paddy fields which are the main land resource to produce staple food. The results of the 2003 Agricultural Census showed that the area of paddy fields converted to non-agricultural use was around 110 ha during 2000–2002 and most of the land conversion was intended for the construction of residential housing (around 49% of the land) in addition to building public infrastructure, offices and shops, as well as industry [21].

In order to support food security the agricultural land supply policy has so far focused more on two efforts, namely controlling the conversion of paddy fields, and expanding paddy fields to offset the reduction in paddy fields due to land conversion. Given the important role of paddy fields in rice production, various regulations have been issued by the government to prevent the conversion of paddy land to non-agricultural uses, especially technical irrigated paddy fields. However, the various
regulations seemed ineffective so the government finally issued RI Law No. 41 of 2009 concerning the Protection of Sustainable Food Agriculture Land.

The implementation of this Law requires each regency/ city to determine the area of sustainable food-producing agricultural land, which is agricultural land that is protected and developed to produce staple food. In addition, each regency/ city must also reserve and protect agricultural land that has the potential to be developed into sustainable food-producing agricultural land. However, in its implementation the determination of sustainable food-producing agricultural land areas has not been done much by districts/ cities due to various problems.

4. Conclusion

The conclusion is the availability status of agricultural land in the suburban of Bandung is decreasing due to the low value of agricultural land. To protect the availability of agricultural land, the government issued Indonesian Law No.41 of 2009 concerning the Protection of Sustainable Agricultural Land. The implementation of this Law requires each regency/ city to determine the area of sustainable food-producing agricultural land, which is agricultural land that is protected and developed to produce staple food. In addition, each regency/ city must also reserve and protect agricultural land that has the potential to be developed into sustainable food-producing agricultural land.

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