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Analysis of Influential Factors in the Implementation of Land Value Capture in Indonesian Metropolitan Areas

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ABSTRACT

The Indonesian government requires relatively large costs to build area and regional infrastructure. One alternative to overcome the development financing gap is by utilizing the increase in land values as a development financing instrument. This article aims to analyze the influencing factors, including the change in spatial use from rural areas to urban areas, building density intensity, norms, zoning regulations on increasing land values and their application to land value capture in the new city area of Moncongloe-Pattallassang in Mamminasata metropolitan area. Obtaining primary and secondary data through surveys and field observations. Meanwhile, data processing and analysis of influential factors uses the Path Analysis method. The results of the research show that changes in the use of space from rural areas to urban areas, the intensity of building density, norms, zoning regulations have a significant effect on increasing land value with a correlation coefficient (R12) of 0.617 and a significant effect in its application to land value capture with an R22 coefficient of 0.381. This study contributes to developing a new aspect in financing the development of urban areas, namely by utilizing increases in land values as a new source of financing to overcome the limited funding for the development of new urban areas.

1. INTRODUCTION

Governments face severe fiscal constraints in upgrading infrastructure [1] as well as weak regulations for private investment in infrastructure in developing countries [2]. Financing gap of Rp. 1,435 trillion (70%) for infrastructure development [3]. The implementation of the Mamminasata urban development concept implies changes and increases in land value [4, 5] alternative sources are needed to fund development [6]. Land Value Capture allows the government to capture land value for development financing [7] in the form of both taxes and non-taxes [8].

Creating a safe, comfortable and inclusive city to improve the welfare of its citizens is not only related to environmental impacts but requires sustainable development [9]. Development of new urban planning policies [10] and proper understanding regarding the pattern of expansion of urban development space [11]. Where its realization requires quite large finances [12] as well as innovative financing mechanisms for urban development [13]. It is a major challenge for urban planning [14] and policy makers [15]. In this case, the government plays an important role in realizing a sustainable city [16].

The construction of the new city of Moncongloe-Pattallassang caused a change in land use patterns to become cultivation areas. Furthermore, the change from rural areas to urban areas, building density, norms and zoning regulations also have an impact on land values in the new city area of Moncongloe-Pattallassang. With a financing gap of 63% for infrastructure financing [17], the application of land-based tools has become an innovative solution [18]. One of which is land value capture, as a source of development financing [19].

The rapid growth of Makassar City and Mamminasata Metropolitan is causing problems, namely the problem of urbanization. The large flow of urbanization causes the expansion of urban areas [20]. Land conversion is an important thing to understand urbanization [21]. In line with this, creativity is needed to overcome these challenges [22]. Where land value capture has long been the answer to this problem [23].

The development planning scheme for the new city area of Moncongloe-Patallassang is to pursue economic growth and investment. Infrastructure is important [24] for economic activities [25] where infrastructure and economic growth are very closely related [26]. Thus contributing to the development of the region [27]. The land value capture

mechanism is expected to support infrastructure financing [28], and synchronized with government-private cooperation for regional economic development [29]. The land value capture scheme is used to convert land value due to development [29].

New breakthroughs are needed in urban regeneration [30] where increasing land value is very important [31]. Important factors that influence land value are planning [32] as well as location characteristics and regulations [33] land value increases drastically when there is planning permission [34]. Land value capture mechanisms help a lot to cover planning costs [35] but need to pay attention to financing strategies and local wisdom [36]. So that there is a need for balance in the planning system [37] where equality and independence are consequences of planning [38] which results in new planning laws [39].

Innovative financing and a sense of justice so that new sources of financing are needed [40]. Land is the source of all value [41]. The concept of increasing land value is taken partly from the land owner [42]. This increase in value is used as a significant source of funding [43] and has a positive influence on the development of new cities [44] has become a special concern of the government to overcome fiscal problems [45]. With the support of various institutions as a strategy for obtaining land value, it creates stronger awareness in its implementation [46].

The obstacle in infrastructure development is financing [47]. Increase in land value as a result of conversion of agricultural land into built-up areas [48]. The process of transferring land ownership from farmers to the government, then from the government to operators for urban development, causes an increase in land values [49]. City development, especially in suburban areas, in the provision of infrastructure is financed from land value capture [50] one of which is through tax instruments [51] which are implemented independently [52]. This model is for the government [53] to cover fiscal constraints [54] in building public infrastructure [55]. Apart from infrastructure, the increase in land value is also due to regulations [56] as well as public investment [57].

Changes in land values affect urban regeneration [58] as well as increasing environmental issues, so that it is necessary to control urban expansion [59]. Completion of projects with land-based capital plays an important role [60] including urban development and public services [61].

The novelty of this research is: Concept and Strategy for implementing the land value capture (LVC) policy for the development of the new city of Moncongloe-Pattalassang. The change in rural areas to urban areas, the intensity of building density, norms and zoning regulations are factors that influence the increase in land values. This study contributes to developing a new aspect in financing the development of urban areas, namely by utilizing increases in land values as a new source of financing to overcome the limited funding for the development of new urban areas.

2. MATERIALS AND METHODS

2.1 Case study

The basic considerations for choosing a research location in the Moncongloe-Pattalassang new city area (Figure 1), are: (a) The application of the concept of integrated city development in the Mamminasata metropolitan urban area (Makassar, Maros, Sungguminasa, and Takalar) has had implications for changes and increases in *land value*; (b) Mamminasata urban development requires significant investment costs, whereas on the other hand, the government's limited economic capacity requires fresh and profitable financing schemes to attract investor interest; and (c) The Moncongloe-Patallassang new city area is a development area that was formed as a result of the rapid development of Makassar City and caused agglomeration between three other main cities, namely Makassar, Sungguminasa Gowa and Maros.

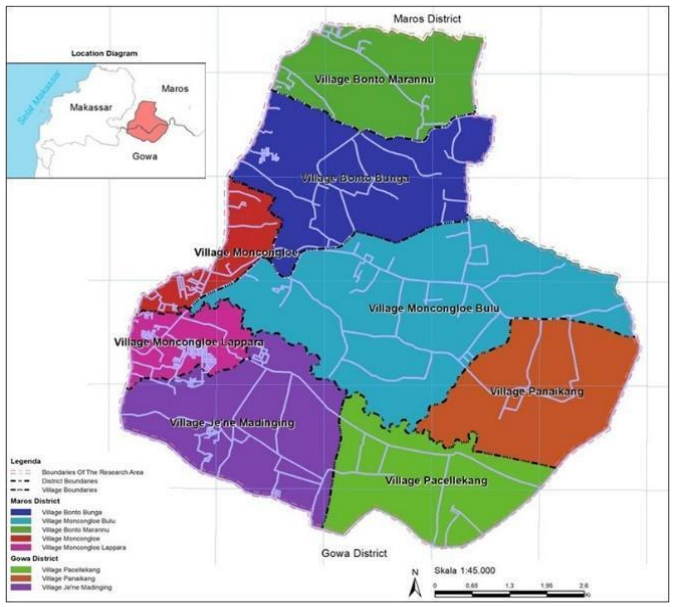


Figure 1. Map of research locations

2.2 Data collection

The research area is partly located in the new city area of Moncongloe - Pattallassang with an area of 3,531Ha, of which 2,493Ha or 71% of the Moncongloe District area and 1,038 or 29% of the Pattallasang District area, this is due to geographical factors being close to Makassar City so that Moncongloe District is wider than Pattallassang District (Figure 2).

Most of the land use is dominated by rice fields, fields and some of them are still covered by natural vegetation, located at an altitude of 30-50m above sea level, so this area is included in the lowland area where the built-up area is 330.90Ha while the non-built land is 3,234 .44Ha. So that development in the planned site area can be carried out easily (Figure 3).

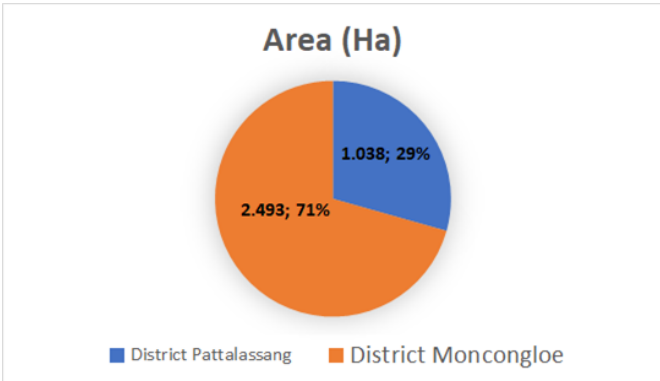


Figure 2. Area diagram Moncongloe-Pattallassang New Town

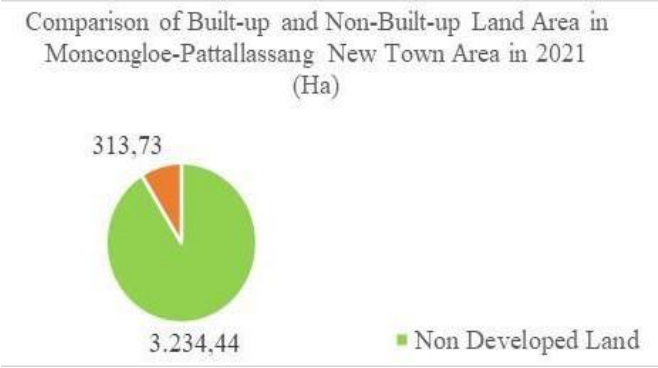
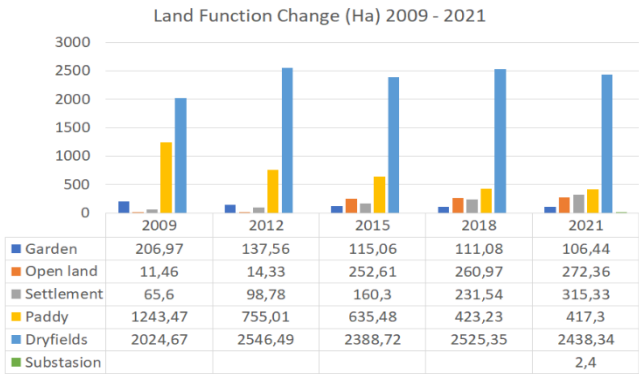
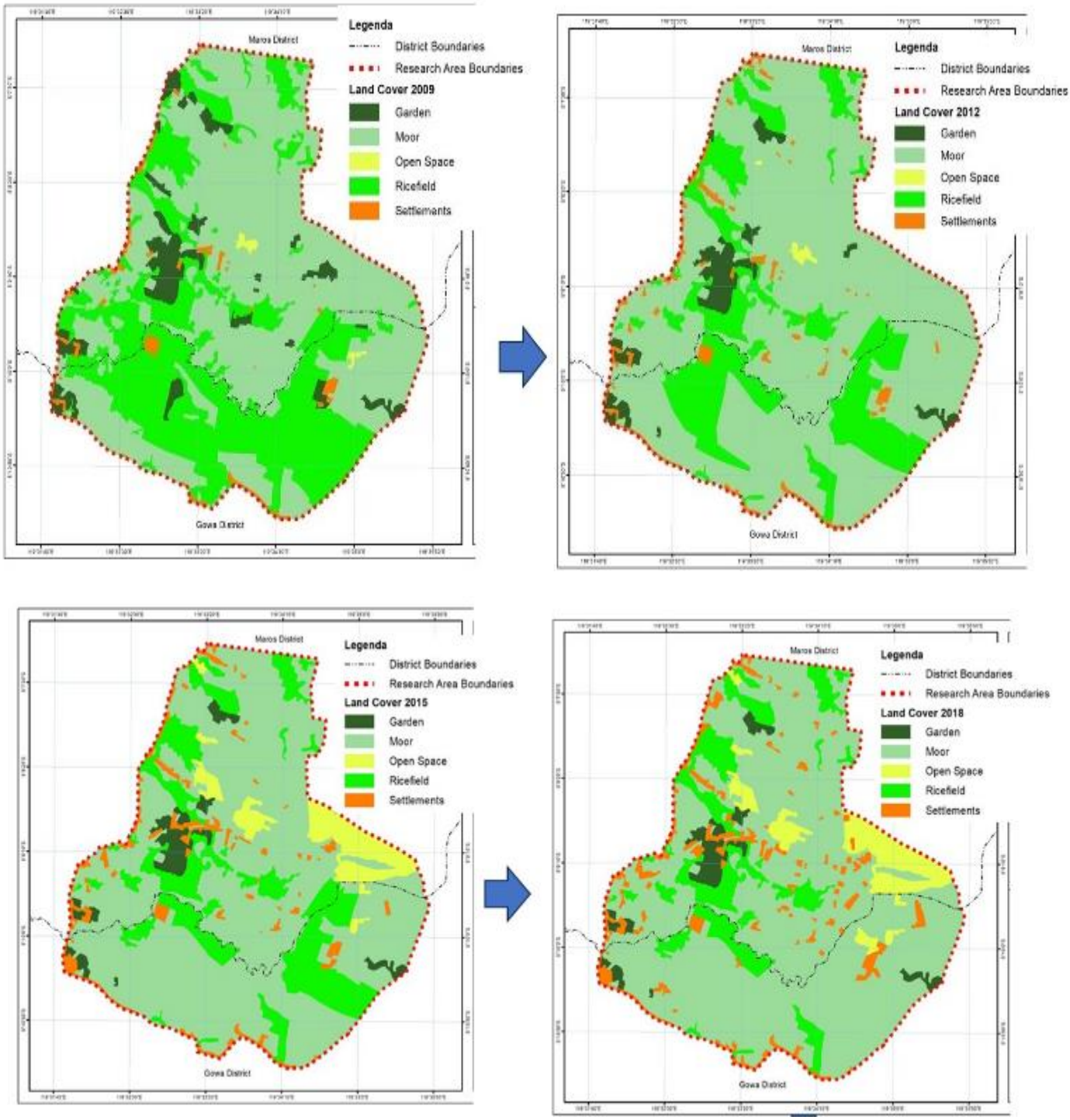


Figure 3. Comparison diagram of built-up and non-built-up areas in 2021, in Moncongloe-Pattallassang New Town



	2009	2012	2015	2018	2021
Garden	206,97	137,56	115,06	111,08	106,44
Open land	11,46	14,33	252,61	260,97	272,36
Settlement	65,6	98,78	160,3	231,54	315,33
Paddy	1243,47	755,01	635,48	423,23	417,3
Dryfields	2024,67	2546,49	2388,72	2525,35	2438,34
Substasion					2,4

Figure 4. Land function change 2009-2021, in Moncongloe-Pattallassang New Town



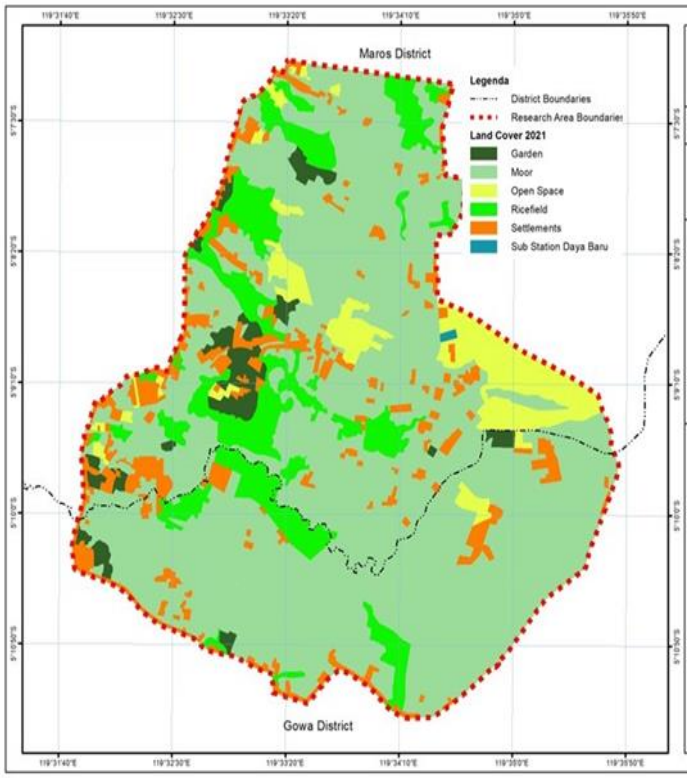


Figure 5. Land use change 2009-2021 in The New Moncongloe-Pattallassang
Source: field survey results

The development of the new city of Moncongloe-Pattallassang greatly contributed to the physical spatial development and changes in space use, especially productive agricultural land which then changed its function to residential areas and other commercial economic functions built by developers so that it had an impact on the area of agricultural land which is the dominant space use of previous conditions experienced a reduction in area (Figure 4 and Figure 5).

In 2009 the land value was still around IDR 5,000,- IDR 7,000, in 2011 the land value was around IDR 13,000,- IDR 1,000,000 and by the end of 2022 it would be IDR 3,700,000,- IDR 10,000. 000,-. Ascension data in land values provide potential as a source of development financing (Figure 6).

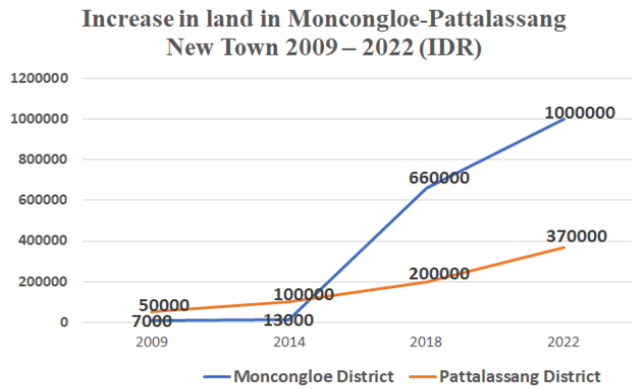


Figure 6. Graph of land value increase in the New Town of Moncongloe-Pattallassang 2009-2022

The development of roads in the Moncongloe-Pattallassang new city area is quite significant, where in 2009 the road length was only 50,385Km to 118,650Km in 2021. Apart from the ease of getting in and out of the Moncongloe-Pattallassang new city area, the role of road development in this area is expected to be a driving force. economic sector which is in line with the KSN Mamminasata development planning scheme to pursue economic growth and investment (Figure 7). The new city area of Moncongloe-Patallassang is a development area that was formed as a result of the rapid development of Makassar City and caused agglomeration between three other main cities, namely Makassar, Sungguminasa Gowa and Maros.

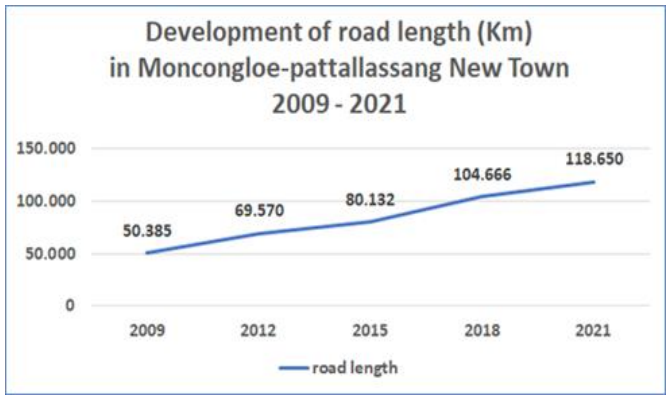


Figure 7. Road length progression graph (Km), in Moncongloe-Pattallassang New Town

Rapid population growth will have an impact on increasing population density and utilization of existing space. This is because residents need more space to support their activities. This phenomenon is proven by the very rapid land conversion process due to urban activities that spread to the outskirts of the city (Figure 8 and Figure 9). The change in land use characteristics from agricultural to non-agricultural occurred

over a certain period of time, triggering the development of rural areas with rural activities as the main activity into villages with urban activities. These changes have reduced agricultural land, leading to a reduction in people's basic needs and reduced open space (Figure 10).

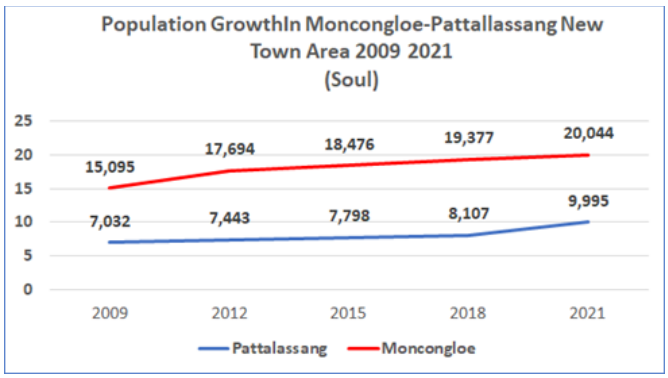


Figure 8. Graph of population growth 2009-2021 in Moncongloe-Pattallassang New Town

Rapid population growth will have an impact on increasing population density, building density and utilization of existing space. This is because residents need more space to support their activities. This phenomenon is proven by the very rapid land conversion process due to urban activities that spread to the outskirts of the city. The change in land use characteristics from agricultural to non-agricultural occurred over a certain period of time, triggering the development of rural areas with rural activities as the main activity into villages with urban activities (Figure 9 and Figure 10).

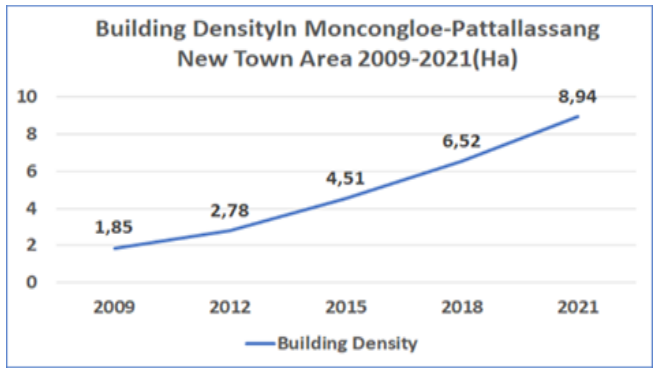


Figure 9. Building density graph 2009-2021 in Moncongloe-Pattallassang New Town

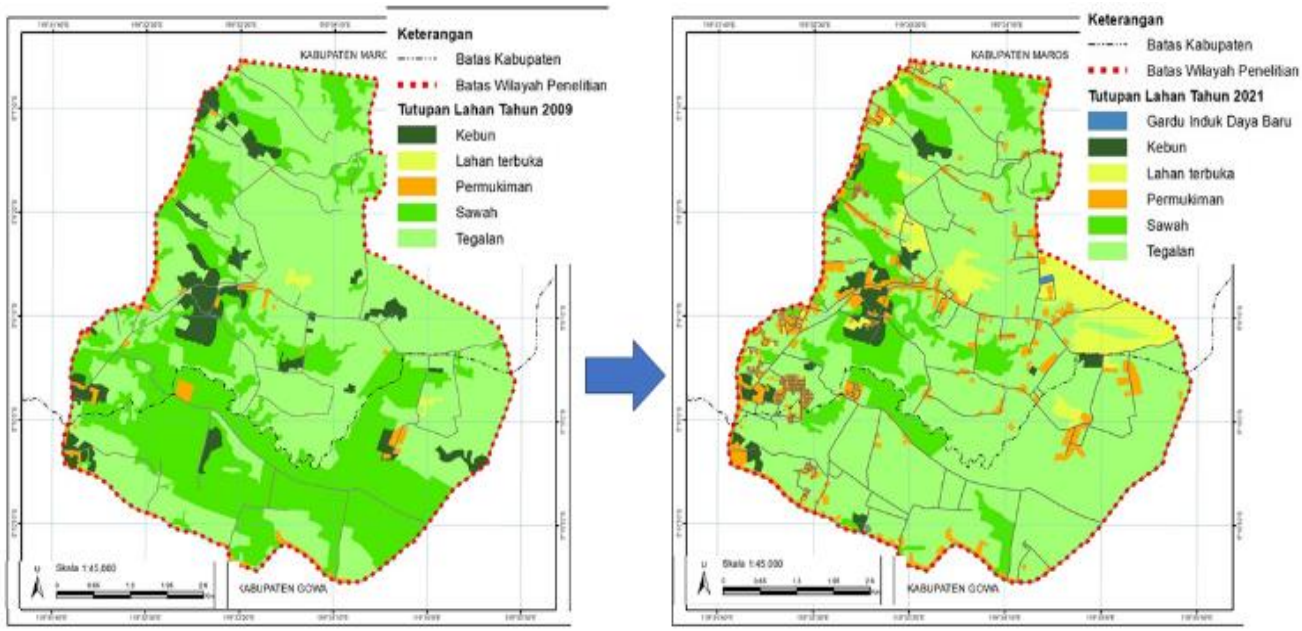


Figure 10. Building density 2009-2021, in Moncongloe-Pattallassang New Town
Source: field survey results

2.3 Population and sample

This sampling technique uses a type of proportionate stratified random sampling, namely a sampling technique that is carried out if the population has members/elements that are not homogeneous and proportionally stratified. In Proportionate Stratified Random Sampling the previous data was grouped into certain levels, in the Moncongloe-Pattallassang new city area it was divided into three strata (levels), namely Government, Private and Community. The population of the Moncongloe-Pattalassang new city area which will be used as the research sample target uses levels 5% error. To calculate the determination of the number of samples from a particular population being developed, samples were taken using the Slovin formula (Table 1).

$$n = \frac{N}{N.(d^2) + 1}$$

where,
n = Size sample
N = Population
d = Level real or margin of error

Respondent characteristics show that most participants work in the tertiary sector, namely civil servants/TNI/Polri (45%), and self-employed/Developers/contractors (35%). The rest work in the primary sector, namely farmers and laborers (20%). Where the respondents are dominated by men as much as 62.92% and the rest are women 37.08%.

The characteristics of respondents were taken into 3 components with consideration, namely: first, the government;

(a) the government as regulator, the government is also the implementer and manager of the Moncongloe-Pattalassang new city area, and (b) the government as an economic strategist and maintains the stability of the Moncongloe-Pattalassang new city area because no matter how poor the infrastructure is, it also determines the rate of economic growth in the Moncongloe -Pattalassang new city area. Second, the private sector: (a) fills or closes the financial gap for development in the Maros-Gowa new city area, (b) encourages higher quality of development services in the resulting new Maros-Gowa city area, and applies the principle of efficiency according to value for money, and more effective governance of infrastructure development in the Maros-Gowa new city area regarding performance accountability. Third, on the part of the community, (a) community participation is a strategy to obtain community support (public support), (b) the community is a subject that has the potential to be sacrificed or victimized by development. Therefore, the community has a bargaining position to consult on their rights (right to be consulted) which is the basis of government policy.

Table 1. Number of research samples

No.	Population	Calculation of Population Strata	Sample/Population	Percentage (%)
1.	Government	112 × 250/154	69	45
2.	Private	88 × 250/154	54	35
3.	Community	50 × 250/154	31	20
	Total		154	100

Source: Author Collaborations

2.4 Analysis method

Path analysis method is a tool for graphically depicting the structure of causal relationships between independent, intervening and dependent variables. The path diagram model was created based on the variables studied, in this study the variables studied were changes in rural to urban areas (χ1), building density (χ2), norms (χ3), zoning regulations (χ4), increase in land value (γ) and land value capture (Z). To predict the relationship between results and its components and eliminate less important variations, sequential path analysis (stepwise sequence) SPSS software was used [62]. Initially, all aspects were measured as independent variables and land value capture as the dependent variable, and the traits that had the highest correlation with land value capture were considered as first class variables. In the second step, the independent variable results and the increase in land value as the dependent variable as the second path correlation relationship. In the next step, the independent variable results from increasing land value as an intervening variable to land value capture as the dependent variable. After determining the correlation coefficient and its direct and indirect effects, a sequential path analysis diagram was drawn with Edrawmax software. This research proposes a relationship model for the variables. As for the submission of the first structural equation:

$$\gamma = \rho yx_1 + \rho yx_2 + \rho yx_3 + \rho yx_4 + e1 \quad (1)$$

$$Z = \rho zy_1 + \rho zyy_2 + \rho zy_3 + \rho zy_4 + e2 \quad (2)$$

$$Z = \rho zy + e2 \quad (3)$$

Path analysis is used to formulate the dominant factors that influence the implementation of *land value capture*. The analysis process is carried out using the path analysis equation with the SPSS approach as in Figure 11.

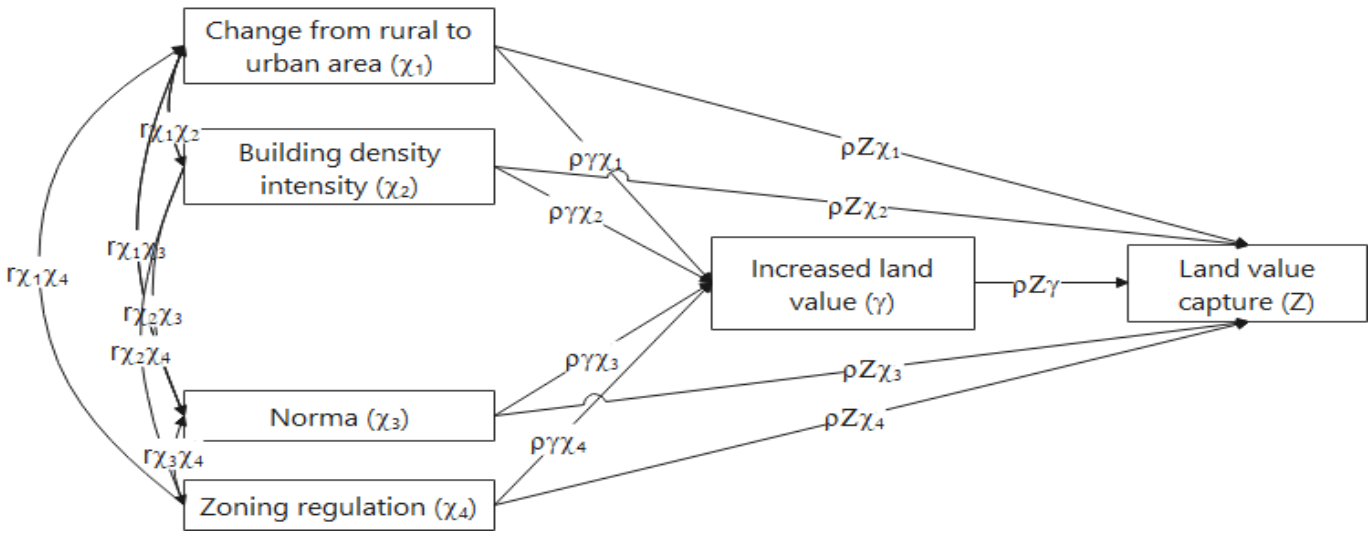


Figure 11. Conceptual model of the sequential path of factors that illustrates the interrelationship of land value increase and land value capture

X_1: Change from rural to urban area [50]
X_2: Building density intensity [61]
X_3: Norma [63]
X_4: Zoning Regulation [63]

3. RESULT AND DISCUSSION

3.1 Increase in land value to land value capture

Analysis of the effect of changing areas from rural to urban on increasing land values, from the results of the analytical model calculations carried out, a significance value of 0.011<0.05 was obtained. So it can be concluded that there is a direct, significant influence from changing rural areas to urban areas on increasing land values. Regarding the effect of changing areas from rural to urban on increasing land values, from the results of the analytical model calculations carried out, a significance value of 0.011<0.05 was obtained. So it can be concluded that there is a direct, significant influence from changing rural areas to urban areas on increasing land values. From the results of the analytical model calculations carried out, a significance value of 0.005<0.05 was obtained from the influence of building density intensity on increasing land value. So it can be concluded that there is a direct, significant influence on the intensity of building density on increasing land value. The influence of norms on increasing land values, from the results of the analytical model calculations carried out, obtained a significance value of 0.000<0.05. So it can be concluded that there is a direct significant influence of norms on Y increasing land value.

Interpretation of Table 2 shows that the R12 value, which is a symbol of the correlation coefficient value, is 0.617. This value can be interpreted to mean that the relationship between the four research variables is in the strong category. The R Square value or coefficient of determination (KD) shows how good the regression model is formed by the interaction of the independent variable and the dependent variable. The KD value obtained was 38.1%, which can be interpreted to mean that the independent variable has a contributing influence of 38.1% to the dependent variable and the other 61.9% is influenced by other factors outside the independent variable. The other variables in question are variables that are likely to have an influence on land value. The variable in question is public intervention in the form of providing infrastructure, especially transportation infrastructure, increasing the accessibility of a plot of land. Meanwhile, public intervention in the form of regulations related to spatial planning affects land value from the supply side. Spatial planning regulations, especially those related to land use regulation, allocate land supply for certain uses so that they can influence land value.

The R22 value is a symbol of the correlation coefficient value of 0.812. This value can be interpreted to mean that the relationship between the two research variables is in the very strong category. The R Square value or coefficient of determination (KD) shows how good the regression model is formed by the interaction of the independent variable and the dependent variable. The KD value obtained is 66%, which can be interpreted as meaning that the independent variable has a contributing influence of 66% to the dependent variable and the other 34% is influenced by other variables outside the independent variable. The other variables in question are variables that are likely to have an influence on land value. The variables in question include accessibility, land area, population density, building density, infrastructure and community income (Figure 12).

Table 2. Structural model analysis of the determination coefficient of land value increase and land value capture

Summary of the Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					Change in R Square	F Change	df1	df2	Sig. F Change
1 (g)	.617*	.381	.364	.27503	.381	22.907	4	149	.000

a. Predictors: Change from rural to urban areas (c_1), Building density intensity (c_2), Norms (c_3), and Zoning regulations (c_4).

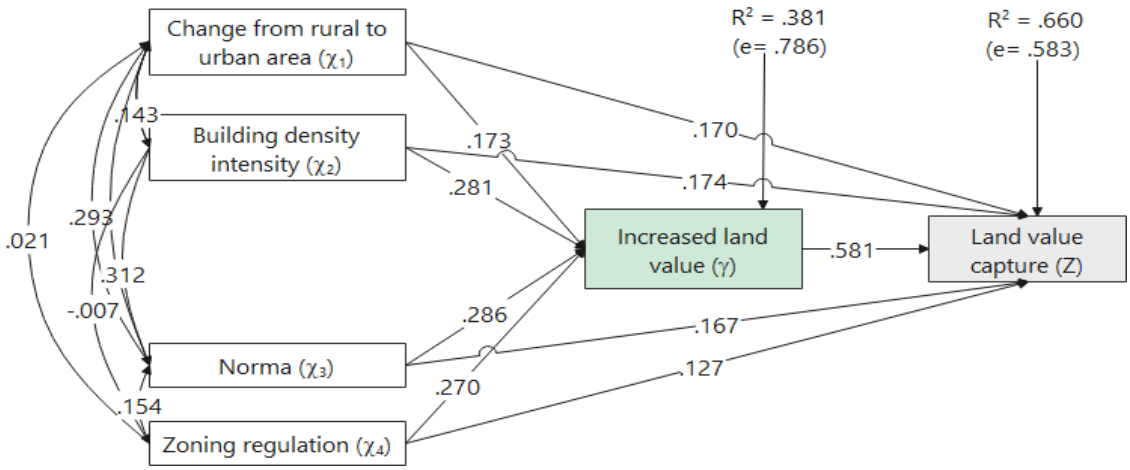


Figure 12. Results of path analysis between variables
Notes: **t-value is below 1.96 and *p<0.05

Previous research explains that most of the agricultural land was converted from rural land to urban construction land (residential, commercial and industrial) conclude: At the individual parcel level, this study estimates the creation of land value by individual creators and the distribution of their profits in the process of agricultural land acquisition, land rental and real estate [50]. The formation of land value is influenced by six variables, namely accessibility, land area, population density, building density, infrastructure and community income [61]. Conclusion First, it is appropriate to carry out

such an assessment. Second, they produce a compilation of socio-economic, land use and land value information that is useful for measuring the effectiveness of urban planning, infrastructure provision and land certification. Third, the results show that urban land market dynamics in less regulated cities (Curitiba and Recife) are functioning well and reflect patterns and trends found in other cities around the world. Decrease and increase in land value are determined by norms or regulations permitting development [63].

This shift in value assumes that demand for each particular type of land use in a particular area is limited. Analysis of the effect of zoning regulations on increasing land values, from the results of the analytical model calculations carried out, a significance value of 0.000<0.05 was obtained. So it can be concluded that there is a direct, significant influence of zoning regulations on increasing land values. that land value movements are generally caused by public intervention in space. This intervention can take the form of providing public infrastructure and establishing regulations related to spatial planning. The various policies adopted and repealed represented a wide range of compensation levels, the Housing, Town Planning Act of 1909 and its successors imposing a 50 percent levy on improvements arising from the approval of land use plans (called "schemes" and functioning similarly to zoning). The British also exported these instruments to their many colonies around the world. It also proved virtually unworkable due to difficulties in collecting levies from landowners at the time the scheme was approved.

3.2 Implementation of land value capture in new cities

Value capture is a way to finance capital infrastructure by increasing efficient economic performance, administration, finance and social facilities. Value capture is the basis for achieving goals, where other benefits are in the form of concentration of population density. Value capture is the process of increasing the value of land at a service center. The increase in land value should be a public right, so that part of the increase in land value should be taken back by the public (government) and returned to the public in the form of providing infrastructure and functioning as an incentive for dense development [64]. The variable in question is public intervention in the form of providing infrastructure, especially transportation infrastructure, increasing the accessibility of a plot of land. Meanwhile, public intervention in the form of regulations related to spatial planning affects land value from the supply side. Spatial planning regulations, especially those related to land use regulation, allocate land supply for certain uses so that they can influence land value.

The other variables in question are variables that are likely to have an influence on land value. The variables in question include accessibility, land area, population density, building density, infrastructure and community income.

Theory construction relationship provides space for the relationship between regional changes from rural to urban and land values to the theory put forward by Yen et al. [50]. This study contributes to a better understanding of increasing land value and distribution of benefits at different levels of analysis, for different stakeholders, and for different types of land use. Meanwhile, in this research, the variable rural land becomes urban construction land to find out how much influence it has on increasing the value of land to be used as a new source of financing in the development of the new city of Moncongloe-Pattallassang.

Theory construction relationship provides space for the relationship between building density and land value. Serra et al. [61] argue that the formation of land value is influenced by six variables, namely accessibility, land area, population density, building density, infrastructure and community income. One of the conclusions is to produce a compilation of socio-economic, land use and land value information that is useful for measuring the effectiveness of urban planning, infrastructure provision and land certification. Meanwhile, in this research, the building density variable is to find out how much influence it has on increasing land value to be used as a new source of financing in the development of the new city of Moncongloe-Pattallassang.

Theory construction relationship provides space for the relationship between land value increase norms in the research area and the theory developed by Alterman, only the norms or development permits put forward by Alterman cover a wider area whereas in this research it only covers the new city of Moncongloe-Pattalassang which is related to the Norms. or permits based on Regional Regulations, especially for the new city of Moncongloe-Pattalassang. Even though the scope of regional administration is different, the norms or permits in both regulations contribute to the increase in land value.

Theory construction relationship provides space for the relationship between zoning regulations and the increase in land values in the research area with the theory developed by Alterman. The scheme or zoning developed by Alterman is related to taxes, while the zoning regulations applied in this research are related to permits (permitted, limited permits, conditional permits and not permitted), where both schemes or regulations contribute to an increase in land value.

4. CONCLUSIONS

The application of land value capture in the development of a new city in the Moncongloe-Pattallassang Mamminasata Metropolitan area of Indonesia by taking advantage of the increase in land value is largely determined by factors changing rural areas to urban areas, intensity of building density, norms and zoning regulations. The increase in land value due to rural to urban areas, building density intensity, norms, zoning regulations will encourage the implementation of land value capture in the new City of Moncongloe-Pattallassang. This study contributes to developing a new aspect in financing the development of urban areas, namely by utilizing the increase in land values as a new source of financing to overcome the limited funding for the development of new urban areas.

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