SPATIAL PLANNING OF AROSUKA CITY, SOLOK DISTRICT IN THE PERSPECTIVE OF A GREEN CITY IN THE INDRAGIRI ROKAN WATERSHED AREA

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ABSTRACT

Purpose: Several locations in Arosuka City have used land and water that are not in accordance with their functions. Many water catchment areas have turned into residential areas in Arosuka City as well as other forms of closure that can reduce the infiltration of rainwater into the ground.

Theoretical reference: In addition, there is also the construction of buildings on the Indragiri Rokan watershed which will result in narrower water catchment areas. The population of this study is the entire community in the Arosuka area, totaling 53,376 people.

Method: The sampling technique in this study used a proportional sampling technique with a sample of 400 respondents. Data collection techniques in this study used a questionnaire with a Likert scale. Then the data were analyzed using Structural Equation Modeling (SEM) analysis through IBM SPSS AMOS ver. 26.

Results and Conclusion: The results of the study found that there was an influence supervision of land use and land use control, community environmental awareness.

Implications of research: community perceptions of the environment and city parks and appreciation for the greening program on the implementation of green city spatial planning.

Originality/value: community participation in the management of green open spaces as a mediating variable.

Keywords: supervision, environmental awareness, perception, appreciation, participation, implementation.

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RESUMO

Propósito: Vários locais na cidade de Arosuka têm usado terra e água que não estão de acordo com suas funções. Muitas bacias hidrográficas transformaram-se em áreas residenciais na cidade de Arosuka, bem como outras formas de fechamento que podem reduzir a infiltração de água da chuva no solo.

Referência teórica: Além disso, há também a construção de edifícios na bacia hidrográfica de Indragiri Rokan, o que resultará em áreas de captação de água mais estreitas. A população deste estudo é toda a comunidade na área de Arosuka, totalizando 53.376 pessoas.

Método: A técnica de amostragem neste estudo utilizou uma técnica de amostragem proporcional com uma amostra de 400 entrevistados. As técnicas de coleta de dados deste estudo utilizaram um questionário com escala Likert. Em seguida, os dados foram analisados usando a análise de Modelagem de Equação Estrutural (SEM) por meio do IBM SPSS AMOS ver. 26.

Resultados e Conclusão: Os resultados do estudo constataram que houve uma supervisão da influência do uso da terra e controle do uso da terra, conscientização ambiental da comunidade.

Implicações da pesquisa: percepção comunitária do meio ambiente e dos parques urbanos e valorização do programa de ecologização na implementação do planejamento do espaço urbano verde.

Originalidade/valor: participação da comunidade na gestão de espaços abertos verdes como uma variável de mediação.

Palavras-chave: supervisão, consciência ambiental, percepção, apreciação, participação, implementação.

1 INTRODUCTION

Urban areas at this time have become a problem that is quite difficult to overcome, especially in the field of green open space utilization where the demand for land continues from year to year. Changes in land use due to settlement development can indirectly damage water catchment areas. Reduced rainwater catchment areas can cause rainwater to collect in existing drainage channels. The increased volume of surface water entering the drainage channel will cause overflow of water in the channel so that puddles arise and allow flooding (Bahunta & Waspodo, 2019). This condition often occurs at several road points in Arosuka City in the rainy season, there is a large enough surface because it experiences a deep enough puddle.
Flooding as a form of natural disaster due to the inability of the river to accommodate too large a water discharge that submerged hundreds of houses and thousands of hectares of rice fields and community plantations in Solok Regency. Solok Regency is a disaster-prone area with the fifth highest rank in West Sumatra (Central Bureau of Statistics of Solok Regency, 2013). Based on disaster (Central Bureau of Statistics of Solok Regency, 2013) there were fluctuations in natural disasters from 2018-2021 which included floods and landslides in Solok Regency. The worst flood disaster with the highest frequency occurred in 2021. Floods that occur often erode the foundations of surrounding people's houses causing casualties.

In addition, landslides in 2018 and 2019 were landslides with the highest frequency of events that caused material losses. Gunung Talang District, which is an administrative area of Arosuka City, is included in the high category as an area prone to landslides. The landslide disaster that occurred in Solok Regency was caused by the high intensity of rain in the rainy season and the topography of the hillside area with a slope of 15-25%. Floods and landslides in Solok Regency resulted in material losses and caused casualties.

The problem in Solok Regency, especially in Arosuka City, cannot be separated from the problem of garbage being thrown carelessly both in the drainage and Indragiri Rokan watershed. Clogged drainage channels caused by the accumulation of garbage so that water from the drainage canal will overflow. Then illegal felling of trees in forest areas used for firewood. Illegal loggers are mostly economically weak communities. This condition shows that the level of community awareness in Arosuka is still relatively low in maintaining and caring for the surrounding environment.

In addition, several locations in Arosuka City occur land and water utilization that is not in accordance with their functions. Many water catchment areas have been converted into settlements in Arosuka City as well as other forms of closure that can reduce the seepage of rainwater into the ground. In addition, there is also the construction of buildings on the border of the Indragiri Rokan watershed which will have an impact on the narrower water catchment area. Aridity can also occur in the dry season due to the absence of trees and forests around the damaged watershed. One of the most felt impacts of land use change is flooding. This is certainly an inconsistency of the government implementing spatial planning policies in Arosuka City and there is still community indifference to the spatial plan of Arosuka City. The government as a policy...
implementing organization has the most important contribution to the effective implementation of spatial policy in Arosuka City.

From some of the problems above, research on spatial planning is interesting to research. Some literature on environmental studies that discusses related to what researchers do states that factors that affect the implementation of green urban spatial planning include community participation (Handayani et al., 2021; Lisaria Putri et al., 2023; Muna et al., 2023); supervision of land and land use control tanah (Gustiawan & Syahrani, 2020); community environmental awareness (Miranti et al., 2015); community perception of the environment and urban parks (Januarisa et al., 2015); and appreciation for reforestation programs (Lisaria Putri, Chasan Amrulloh, et al., 2023; Yulida et al., 2016).

In addition, community participation in green open space management can be influenced by several factors, including supervision of land and land use control (Gustiawan & Syahrani, 2020); community environmental awareness (Rubiantoro & Haryanto, 2013); community perception of the environment and urban parks (Wantouw et al., 2014); and appreciation for the reforestation program (Mulawangsaa & Nursaifullah, 2022). Based on this study, researchers feel that the participation variable is an intermediate variable in the relationship between the independent variable of supervision of land use control and land; community environmental awareness; community perception of the environment and city parks; and appreciation of greening programs with dependent variable to the implementation of Arosuka's green city spatial planning.

So it can be stated that the research objective is to determine the conditions spatial planning of Arosuka City, Solok District in the perspective of a green city in the Indragiri Rokan Watershed Area. Specifically, focusing on determining the influence of land use and land use control supervision; community environmental awareness; community perception of the environment and city parks; and appreciation for the greening program for the implementation of the Arosuka green city spatial plan in the Indragiri Rokan watershed with community participation in managing green open spaces as a mediating variable.
2 THEORETICAL FRAME

The growth of a city is accompanied by economic, social and ecological development. There needs to be a balance between aspects of growth in order to create a modern, environmentally friendly and sustainable city development (Rathee et al., 2020). The development of urban areas often brings problems to the area, both transportation systems and environmental issues. Therefore, it is necessary to have urban planning so that the quality of the city is balanced. The balance of urban planning can be seen from the existence of green and non-green areas to achieve a livable city.

Green areas are important because they are a source of oxygen and water absorption in the area. Green cities are one of the concepts of sustainable urban planning approaches. Green Cities are also known as Ecological Cities or healthy cities. This means that there is a balance between city development and development with environmental sustainability. With a healthy city, it can create a city that is safe, comfortable, clean and healthy for its residents to live in by optimizing the socio-economic potential of the community through empowering community forums, facilitated by related sectors and in sync with city planning (Brilhante & Klaas, 2018).

To make this happen, efforts are needed from every individual member of society and all related parties (stakeholders). It can also be said that a green city is an ecologically healthy city. A green city must be understood as a city that utilizes water and energy resources effectively and efficiently, reduces waste, implements an integrated transportation system, ensures environmental health and synergizes the natural and artificial environment (Prihanto, T. et al., 2020). A green city is an urban concept, where environmental, economic and socio-cultural issues (local wisdom) must be balanced for the sake of a better future generation (Breuste, 2021). The criteria for a green city have at least eight attributes (Hasanah, 2015), namely: green planning and design, green open space, green waste, green transportation, green water, green energy, green building, green community.

The development of this area also pays attention to environmental aspects so as to create an environmentally friendly area or city (Denis et al., 2021). If this enormous potential is not accompanied by a planning and space utilization process, the potential that should have a positive impact will turn into a negative impact, as has happened in many other regions in Indonesia (Ayompe et al., 2021). Therefore, an integrated city development concept is needed. In connection with the conditions and potential of the
Arosuka area being developed as Solok (Regency Capital), the concept of a Green City in an integrated watershed is considered feasible.

Implementation is an action of a plan that has been prepared carefully and in detail. Implementation is usually carried out after the planning is considered perfect. According to Usman (2002), implementation boils down to activities, actions, actions or the existence of mechanisms in a system. Implementation is not just an activity, but an activity that is planned and to achieve activity goals. Apart from that, implementation can be interpreted as an expansion of activities that mutually adjust the process of interaction between goals and actions to achieve them and requires an effective network of bureaucratic implementers (Mulyana, 2013). According to Grindle in (Kasmad, 2016), implementation success is influenced by two large variables, namely the content of policy and the implementation environment (context of implementation).

There are several factors that influence the implementation of green city spatial planning, including: community participation in managing green open spaces (Handayani et al., 2021), supervision of land and land use control (Gustiawan & Syahrani, 2020), community environmental awareness (Miranti et al., 2015), community perception of the environment and urban parks (Gashu et al., 2020); and appreciation for the greening program (Mulawangsa & Nursaifullah, 2022).

3 METHODOLOGY

This study used quantitative methods with descriptive types. According to Yusuf (2014) and Muna et al., (2023) descriptive research is one type of research that aims to describe systematically, factually, and accurately certain facts and properties or try to describe phenomena in detail. This study will describe the effect of monitoring land and land use control; community environmental awareness; community perception of the environment and city parks; and appreciation of the greening program for the implementation of Arosuka's green city spatial planning by mediating community participation in green open space management.

The population of this study is the entire community in the Arosuka area which amounted to 53,376 people. The sampling technique in this study used proportional sampling techniques, with a sample of 400 respondents. According to Sugiyono (2016), proportional sampling is a technique that takes samples representatively and each subject is determined in balance with the number of subjects from each strata. Data collection
techniques in this study used questionnaires. The questionnaire in this study used the Likert scale with five alternative answers. Respondents can answer the questionnaire statement by putting a check mark (√) on the available answers with five available possibilities.

Then the data was analyzed using Structural Equation Modelling (SEM) analysis through IBM SPSS AMOS ver. 26. SEM is a set of statistical techniques that allow testing a relatively complex set of relationships simultaneously. For data processing, this technique is used to cover the weaknesses of regression methods (Ghozali, 2001). The data analyzed are in the form of the influence of land and land use control, community environmental awareness, community perception of the environment and urban parks and appreciation of greening programs on the implementation of green urban spatial planning with community participation in green open space management as a mediation variable.

4 RESULTS AND DISCUSSION

The questionnaires in this study amounted to 400 questionnaires distributed to respondents. Data analysis in this study used Structural Equation Modeling (SEM) through IBM AMOS ver. 26. However, to obtain a good model, several stages of analysis are first carried out. While the input data used in this study is the variance/covariance matrix.

4.1 ANALYSIS MEASUREMENT MODEL

The latent variables or constructs used in this research model consist of 6 constructs, namely latent variables of environmental supervision of green urban spaces there are 7 indicator items, latent variables of community environmental awareness there are 9 indicator items, latent variables of community perception in the environment and city parks there are 13 indicator items, latent variables of appreciation of greening programs there are 8 indicator items, The latent variable of community participation in the management of green open space is 8 indicator items and the latent variable of green city spatial implementation is 9 indicator items. The measurement model test is carried out by means of confirmatory factor analysis (CFA).

The results of the construct validity test show that all indicators both in each endogenous, mediated and exogenous variable have a critical ratio value (C.R.) greater than 2 times the standard error value (S.E.) and the probability of each indicator is less
than 0.05. It can be ensured that all indicators on each variable have met the construct validity requirements. Then, based on the value of the loading factor, each variable has a loading factor value of more than 0.05. So, it can be concluded that all indicators in each of these variables are a unity of the indicators studied.

Next, variable reliability testing is carried out. The level of reliability is measured by the value of composite reliability and the value of AVE. In composite reliability, the minimum value applied to indicate that the construct is acceptable is 0.7. If the composite reliability value is greater than 0.7, the construct passes the reliability test. The results of the construct reliability test can be seen in Table 1.

<table>
<thead>
<tr>
<th>Latent variables</th>
<th>Composite Reliability</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green City Spatial Implementation (Y)</td>
<td>0.974</td>
<td>Reliable</td>
</tr>
<tr>
<td>Community Participation in Green Open Space Management (Z)</td>
<td>0.977</td>
<td>Reliable</td>
</tr>
<tr>
<td>Land Use and Land Control Supervision (X1)</td>
<td>0.961</td>
<td>Reliable</td>
</tr>
<tr>
<td>Community Environmental Awareness (X2)</td>
<td>0.970</td>
<td>Reliable</td>
</tr>
<tr>
<td>Community Perception on the Environment and City Parks (X3)</td>
<td>0.981</td>
<td>Reliable</td>
</tr>
<tr>
<td>Appreciation for Greening Program (X4)</td>
<td>0.968</td>
<td>Reliable</td>
</tr>
</tbody>
</table>

Source: Primary Data (2022)

Composite reliability test results from Table 1. shows that the value of composite reliability on each construct has been better than 0.7. This indicates that the tested construct is reliable. Another measurement that is also used to test reliability is to use AVE values. The purpose is to measure the degree of variance of a construct component compiled from the indicator by adjusting to the error level The minimum recommended AVE value is 0.5.

<table>
<thead>
<tr>
<th>Latent variables</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green City Spatial Implementation (Y)</td>
<td>0.804</td>
</tr>
<tr>
<td>Community Participation in Green Open Space Management (Z)</td>
<td>0.841</td>
</tr>
<tr>
<td>Land Use and Land Control Supervision (X1)</td>
<td>0.780</td>
</tr>
<tr>
<td>Community Environmental Awareness (X2)</td>
<td>0.785</td>
</tr>
<tr>
<td>Community Perception on the Environment and City Parks (X3)</td>
<td>0.802</td>
</tr>
<tr>
<td>Appreciation for Greening Program (X4)</td>
<td>0.793</td>
</tr>
</tbody>
</table>

Source: Primary Data (2022)

Based on the test results with AVE values, it can also be said that all constructs in the model have good reliable values. This can be seen from the AVE value on all constructs that have a value greater than 0.5.
4.2 STRUCTURAL MODEL ANALYSIS

This structural model stage serves to ensure that the model is in accordance with the data and ensure that there is no influence between the variables that have been studied. In structural testing, this model also uses the maximum likelihood model estimate. However, before being tested at the structural model stage, it is certain that it has fulfilled several assumptions, including the assumptions of normality, univariate and multivariate outliers.

a. Normality Test

The normality test aims to see the level of normality of the data used in this study. Based on the results of the normality test, it can be seen that univariately, the majority of data is normally distributed because the critical ratio skewness value is below the range of 2.58. While the multivariate data is in accordance with the normality assumption because the value of the multivariate kurtosis critical ratio is 0.824 (below 2.58). From the results of this normality test, it can be concluded that the data in the study have met the requirements of data normality, or it can be said that the data in the study has been normally distributed.

b. Outlier Test

The outlier test aims to determine whether the observation conditions of a data obtained have unique characteristics that are very different and appear in extreme forms from other observations, both for a single variable and a combination variable (Hair et. al. dalam Ghozali, 2011). Multivariate outlier analysis can be tested with Chi-Square statistics against the mahalanobis distance square value at a significant level of p<0.01 with a degree of freedom of 54 indicators. Mahalanobis distance value \( (0.001; 54) = 91.87 \). This means that all cases that have an expensive distance greater than 91.87 are multivariate outliers. From the results of AMOS output in the outlier test shows that the value of mahalanobis distance square is smaller than 91.87 with a value of p2>0.01. So, it can be concluded that the data in the study does not have multivariate problems and is worth using.

The results of data processing for structural analysis of the SEM model are shown in Figure 1.
After obtaining the results of the structural model, the next step is to evaluate the goodness of fit criteria, namely Chi-square, CMIN/DF, GFI (goodness of fit index), AGFI (adjusted goodness of fit), TLI (tucker lewis index), CFI (comparative fit index) and RMSEA (the root mean square error of approximation).

a. **Goodness of Fit Analysis**

Goodness of fit testing is used to determine whether a model is statistically accepted or rejected.

<table>
<thead>
<tr>
<th>Goodness of Fit</th>
<th>Cut-Off Value</th>
<th>Model Results</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>Smaller</td>
<td>3847.339</td>
<td>Not Fit Yet</td>
</tr>
<tr>
<td>Probability</td>
<td>≥0.05</td>
<td>0.000</td>
<td>Not Fit Yet</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>≤2.00</td>
<td>2.825</td>
<td>Not Fit Yet</td>
</tr>
<tr>
<td>GFI</td>
<td>≥0.90</td>
<td>0.722</td>
<td>Not Fit Yet</td>
</tr>
<tr>
<td>AGFI</td>
<td>≥0.91</td>
<td>0.697</td>
<td>Not Fit Yet</td>
</tr>
<tr>
<td>RMSEA</td>
<td>≤0.08</td>
<td>0.68</td>
<td>Not Fit Yet</td>
</tr>
<tr>
<td>TLI</td>
<td>≥0.90</td>
<td>0.941</td>
<td>Fit</td>
</tr>
<tr>
<td>NFI</td>
<td>≥0.90</td>
<td>0.916</td>
<td>Fit</td>
</tr>
<tr>
<td>PGFI</td>
<td>≥0.00</td>
<td>0.662</td>
<td>Fit</td>
</tr>
</tbody>
</table>
Based on the cut-off value and goodness of fit model in Table 3. It can be seen that there are five indicators of goodness of fit that have not been met from nine criteria, the above model can be stated as a poor model (Solimun, 2002; Solimun, 2004). The data shows that this model cannot be declared as a good model or has not met the goodness of fit and it is considered necessary to modify the model to be able to improve the fit of the goodness of fit model (Solimun, 2004).

From the results of model modification by correlating several indicator errors that have a modification index (M.I.) >4,000, a comparison of goodness of fit can be made between the main model and the modified model. The comparison includes the magnitude of the coefficient (goodness of fit).
When viewed from the goodness of fit, it can be seen that the modified model shows improvements in eight indicators from nine existing indicators. The main model has five indicators that have not met the goodness of fit, becoming five indicators that meet the requirements of RMSEA, TLI, NFI, PCFI, PNFI. From the analysis above, it can be stated that doing a modified model has been able to improve the suitability of the model (goodness of fit). Since there have been five dictators who qualify for goodness of fit, the model has been viewed as goodness of fit. This is in accordance with (Solimun, 2002; Solimun, 2004). Based on these results, there is no need to make further modifications.

b. Analysis of the Direct Influence Hypothesis

After all model conformity tests can be met, hypothesis testing will be carried out as proposed in the previous chapter. The results of testing the hypothesis of direct influence can be seen as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>X1</td>
<td>0.174</td>
<td>0.021</td>
<td>8.418</td>
<td>*** H1 accepted</td>
</tr>
<tr>
<td>Z</td>
<td>X2</td>
<td>0.217</td>
<td>0.025</td>
<td>8.574</td>
<td>*** H2 accepted</td>
</tr>
<tr>
<td>Z</td>
<td>X3</td>
<td>0.507</td>
<td>0.034</td>
<td>15.092</td>
<td>*** H3 accepted</td>
</tr>
<tr>
<td>Z</td>
<td>X4</td>
<td>0.128</td>
<td>0.024</td>
<td>5.397</td>
<td>*** H4 accepted</td>
</tr>
<tr>
<td>Y</td>
<td>Z</td>
<td>0.091</td>
<td>0.018</td>
<td>5.011</td>
<td>*** H5 accepted</td>
</tr>
<tr>
<td>Y</td>
<td>X1</td>
<td>0.122</td>
<td>0.017</td>
<td>7.204</td>
<td>*** H6 accepted</td>
</tr>
<tr>
<td>Y</td>
<td>X2</td>
<td>0.124</td>
<td>0.021</td>
<td>5.869</td>
<td>*** H7 accepted</td>
</tr>
<tr>
<td>Y</td>
<td>X3</td>
<td>0.412</td>
<td>0.033</td>
<td>12.438</td>
<td>*** H8 accepted</td>
</tr>
<tr>
<td>Y</td>
<td>X4</td>
<td>0.282</td>
<td>0.021</td>
<td>13.220</td>
<td>*** H9 accepted</td>
</tr>
</tbody>
</table>

Source: Primary Data (2022)

Based on Table 5. The following equation can be obtained:
Z = 0.174X₁ + 0.217X₂ + 0.507X₃ + 0.128X₄ + e
Y = 0.122X₁ + 0.124X₂ + 0.412X₃ + 0.282X₄ + 0.091Z + e

Based on the results of hypothesis testing in Table 5. It can be argued that:

1) Testing the first hypothesis (H1)

The results of the first hypothesis test showed that the exogenous variable of supervision of land use control and land use with endogenous variables of community participation in green open space management obtained a critical ratio value of 8.418, a significance value of 0.000 and a path coefficient of 0.174. The value of c.r. is greater than the value of t table=1.96, with p<0.001. These results mean that monitoring land and land use control has a significant direct influence on community participation in green open space management. Based on these results, it can be concluded that the first hypothesis in the study was accepted (H1) and Ho was rejected. This finding is supported by the opinion of Gustiawan & Syahrani (2020) and Degnet et al. (2022) that there is an influence of land use and land use supervision on community participation. The better the level of supervision of land and land use control, it will have a significant impact on the high participation of the community in the management of Arosuka green open space in the Indragiri Rokan watershed.

2) Testing the second hypothesis (H2)

The results of testing the second hypothesis showed that the exogenous variable of community environmental awareness with endogenous variables of community participation in green open space management obtained a critical ratio value of 8.574, a significance value of 0.000 and a path coefficient of 0.217. The value of c.r. is greater than the value of t table=1.96, with p<0.001. These results mean that people's environmental awareness has a significant direct influence on community participation in green open space management. Based on these results, it can be concluded that the second hypothesis in the study was accepted (H2) and Ho was rejected. This finding is also reinforced by research conducted by Rubiantoro & Haryanto (2013) found that community awareness affects community participation in the development of urban green spaces, such as in garden nurseries, choosing garden types, how to plant and so on.

3) Testing the third hypothesis (H3)

The results of testing the third hypothesis showed that exogenous variables of community perception in the environment and urban parks with endogenous variables of
4) Testing the fourth hypothesis (H4)

The results of testing the fourth hypothesis showed that the exogenous variable of appreciation for the greening program with endogenous variables of community participation in green open space management obtained a critical ratio value of 5.397, a significance value of 0.000 and a path coefficient of 0.128. The value of c.r. is greater than the value of t table=1.96, with p<0.001. These results mean that appreciation of greening programs has a significant direct influence on community participation in green open space management. Based on these results, it can be concluded that the fourth hypothesis in the study was accepted (H4) and Ho was rejected. This finding is also reinforced by research conducted by Wantouw et al. (2014) and Degnet et al. (2022) found that community perceptions affect community participation in green areas. The better the level of community perception of the environment and city parks, it will have a significant impact on the high participation of the community in the management of Arosuka green open space in the Indragiri Rokan watershed.

5) Testing the fifth hypothesis (H5)

The results of testing the fifth hypothesis showed that the exogenous variable of community participation in green open space management with endogenous variables of green city spatial implementation obtained a critical ratio value of 5.011, a significance value of 0.000 and a path coefficient of 0.091. The value of c.r. is greater than the value of t table=1.96, with p<0.001. These results mean that community participation in green open space management has a significant direct influence on the implementation of
Arosuka's green urban spatial planning in the Indragiri Rokan watershed. Based on these results, it can be concluded that the fifth hypothesis in the study was accepted (H5) and Ho was rejected. This finding is also reinforced by research conducted by Yuslimu & Setiawan (2021); Victoria & Setiawan (2020); Allokendek et al. (2019); and Setiawan & Widiyastuti (2015) found that community participation affects the implementation of green open space. The better the level of community participation in green open space management, it will have a significant impact on the high implementation of Arosuka green city spatial planning in the Indragiri Rokan watershed.

6) Testing the sixth hypothesis (H6)

The results of the sixth hypothesis test show that the exogenous variable of land use and land use control monitoring with the endogenous variable of green city spatial planning implementation obtains a critical ratio value of 7.204, a significance value of 0.000 and a path coefficient of 0.122. The value of c.r. is greater than the value of t table=1.96, with p<0.001. This result means that the supervision of land use and land use control has a significant direct influence on the implementation of the Arosuka green city spatial plan in the Indragiri Rokan watershed. Based on these results, it can be concluded that the sixth hypothesis in the study is accepted (H6) and Ho is rejected. This finding is reinforced by research conducted by Imansyah (2012) that supervision influences the implementation of green open space policies. The better the level of supervision of land use and land use control, the higher the implementation of the Arosuka Green City Spatial Planning in the Indragiri Rokan Watershed.

7) Testing the seventh hypothesis (H7)

The results of testing the seventh hypothesis show that the exogenous variable of community environmental awareness and the endogenous variable of green city spatial planning implementation obtain a critical ratio value of 5.869, a significance value of 0.000 and a path coefficient of 0.124. The value of c.r. is greater than the value of t table=1.96, with p<0.001. This result means that community environmental awareness has a significant direct influence on the implementation of Arosuka green city spatial planning in the Indragiri Rokan watershed. Based on these results, it can be concluded that the seventh hypothesis in the study is accepted (H7) and Ho is rejected. This finding is reinforced by research conducted by Miranti et al. (2015) and Gustiawan & Syahrani (2020) that community awareness influences the implementation of green city spatial planning. The better the level of community environmental awareness, the better the
implementation of green city spatial planning in the Indragiri Rokan watershed will have a significant impact.

8) Testing the eighth hypothesis (H8)

The results of testing the eighth hypothesis show that the exogenous variable of community perception of the environment and city parks with the endogenous variable of green city spatial planning implementation obtains a critical ratio value of 12.438, a significance value of 0.000 and a path coefficient of 0.412. The value of c.r. is greater than the value of t table=1.96, with p<0.001. This result means that people's perceptions of the environment and city parks have a significant direct influence on the implementation of Arosuka green city planning in the Indragiri Rokan watershed. Based on these results, it can be concluded that the eighth hypothesis in the study is accepted (H8) and Ho is rejected. This finding is reinforced by research conducted by Victoria & Setiawan (2020); Gashu et al. (2020); Januarisa et al. (2015); and Degnet et al. (2022) revealed that community perceptions influence the implementation of green open spaces. The better the level of community perception of the environment and city parks, it will have a significant impact on the high implementation of Arosuka green city planning in the Indragiri Rokan watershed.

9) Testing the ninth hypothesis (H9)

The results of testing the ninth hypothesis show that the exogenous variable appreciation of the greening program with the endogenous variable implementing green city spatial planning obtains a critical ratio value of 13.220, a significance value of 0.000 and a path coefficient of 0.282. The value of c.r. is greater than the value of t table=1.96, with p<0.001. This result means that the appreciation of the greening program has a significant direct influence on the implementation of the Arosuka green city spatial plan in the Indragiri Rokan watershed. Based on these results, it can be concluded that the ninth hypothesis in the study is accepted (H9) and Ho is rejected. This finding is supported by research conducted by Yulida et al. (2016) that awards or prizes affect the success of the implementation of greening and green spatial planning programs. The better the level of appreciation for the greening program, the higher the implementation of green city planning in the Indragiri Rokan watershed will have a significant impact.

c. Analysis of Indirect or Mediation Effects (Mediation Effect)

The results of the mediation test based on the results of the indirect effect can be seen in Table 6.
Table 6. Hypothesis Test Results for the Indirect Effect of Mediation

<table>
<thead>
<tr>
<th>Model</th>
<th>Standardized Indirect Effect</th>
<th>P (Bias-corrected two tailed significance)</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1→Z→Y</td>
<td>0.015</td>
<td>0.004</td>
<td>H10 accepted</td>
</tr>
<tr>
<td>X2→Z→Y</td>
<td>0.019</td>
<td>0.002</td>
<td>H11 accepted</td>
</tr>
<tr>
<td>X3→Z→Y</td>
<td>0.045</td>
<td>0.004</td>
<td>H12 accepted</td>
</tr>
<tr>
<td>X4→Z→Y</td>
<td>0.011</td>
<td>0.002</td>
<td>H13 accepted</td>
</tr>
</tbody>
</table>

Source: Primary Data (2022)

Based on the results of the mediation test in Table 6, it can be stated that:

1) Testing the tenth hypothesis (H10)

The results of testing the tenth hypothesis show that the exogenous variable of land use and land use control has an indirect effect on the endogenous variable of implementing green city spatial planning with community participation in the management of green open spaces as a mediating variable with a mediation coefficient value of 0.015 with a corrected two-tailed bias value significance of 0.004 (p <0.05). This shows that the supervision of land use and land use control has a significant indirect effect on the implementation of green city spatial planning with community participation in the management of green open spaces as a mediating variable.

Supervision of land use and land use control is very important along with the rapid progress and development of urban development. Weak oversight is basically due to the lack of legal provisions confirming permits for controlling buildings that use green open space (Peramesti, 2016). Monitoring activities for land use and land use control require community participation in the management of green open spaces as a form of improving the quality of the environment which then has an impact on the successful implementation of green city spatial planning.

2) Testing the eleventh hypothesis (H11)

The results of testing the eleventh hypothesis show that the exogenous variable of community environmental awareness has an indirect effect on the endogenous variable of the implementation of green city spatial planning with community participation in the management of green open spaces as a mediating variable with a mediation coefficient value of 0.019 with a corrected two-tailed significance bias value of 0.002 (p<0.05). This shows that community environmental awareness has a significant indirect effect on the implementation of green city spatial planning with community participation in the management of green open spaces as a mediating variable.

Community environmental awareness influences the implementation of green city spatial planning through community participation in the management of green open...
spaces. In line with the findings of Miranti et al. (2015) that the low awareness of the community's environment in environmental maintenance and management is due to limited knowledge about maintaining green open spaces. This low awareness causes a lack of participation in protecting the environment so that it becomes an inhibiting factor in the implementation of green open space policies. Meanwhile, the emergence of community environmental awareness in preserving nature is due to the many benefits that people feel are obtained from nature.

3) Testing the twelfth hypothesis (H12)

The results of testing the twelfth hypothesis show that the exogenous variable of community perception of the environment and city parks has an indirect effect on the endogenous variable of the implementation of green city spatial planning with community participation in the management of green open spaces as a mediating variable with a mediation coefficient value of 0.045 with a two-tailed corrected bias value. significance of 0.004 (p <0.05). This shows that people's perceptions of the environment and city parks have a significant indirect influence on the implementation of green city spatial planning with community participation in the management of green open spaces as a mediating variable.

Community perceptions can increase community participation in the management of green open spaces in the utilization of green open spaces. The increasing community perception will affect the high level of community participation in the management of green open spaces in greening activities (Wantouw et al., 2014). With the contribution of community participation in the management of green open spaces, the implementation of green city spatial planning will be carried out well.

4) Testing the thirteenth hypothesis (H13)

The results of the thirteenth hypothesis test show that the exogenous variable appreciation of the greening program has an indirect effect on the endogenous variable of the implementation of green city spatial planning with community participation in the management of green open spaces as a mediating variable with a mediation coefficient value of 0.011 with a corrected two-tailed significance bias value of 0.002 (p<0.05). This shows that appreciation for the greening program has a significant indirect effect on the implementation of green city spatial planning with community participation in the management of green open spaces as a mediating variable.
One of the strategies for implementing green city spatial planning is by giving awards to the greening program in the form of the Adiwiyata award. This award can be given as a form of appreciation for community participation in managing green open spaces in protecting the environment around where they live (Yulida et al., 2016). The Adiwiyata award will not be obtained if it is only carried out by government agencies but also by contributions from the surrounding community. This is what supports the success of the implementation of green city spatial planning.

5 CONCLUSION

Based on the quantitative analysis and discussion in the previous section, the following conclusions can be drawn:

a. There is a direct and significant positive influence between land and land use control oversight and community participation in the management of green open spaces. The better the level of oversight of land use and land use control, the greater the community participation in the management of green open spaces in the Indragiri Rokan watershed.

b. There is a direct and significant positive effect between community environmental awareness and community participation in the management of green open spaces. The higher the level of community environmental awareness, the greater the community's participation in the management of green open spaces in the Indragiri Rokan watershed.

c. There is a direct and significant positive effect between people's perceptions of the environment and urban parks with community participation in managing green open spaces. The higher the level of community perception of the environment and urban parks, the higher the level of community participation in the management of green open spaces.

d. There is a direct and significant positive effect between appreciation of the greening program and community participation in open space management. The higher the appreciation of the greening program has a significant impact on community participation in the management of green open spaces.

e. There is a direct and significant positive effect between community participation in the management of green open spaces and the implementation of the Arosuka green city spatial plan in the Indragiri Rokan watershed.
the community's participation in the management of green open spaces, the higher the implementation of the Arosuka green city spatial planning in the Indragiri Rokan watershed.

f. There is a direct and significant positive effect between the supervision of land use and land use control and the implementation of the Arosuka green city spatial plan in the Indragiri Rokan watershed. The higher the supervision of land use and land use control, the higher the implementation of the Arosuka green city spatial planning in the Indragiri Rokan watershed.

g. There is a direct and significant positive effect between community environmental awareness which has a significant influence on the implementation of the Arosuka green city spatial plan in the Indragiri Rokan watershed. The higher the level of community environmental awareness, the higher the implementation of the Arosuka green city spatial plan in the Indragiri Rokan watershed.

h. There is a direct and significant positive influence between people's perceptions of the environment and city parks and the implementation of the Arosuka green city spatial plan in the Indragiri Rokan watershed. The higher the community's perception of the environment and city parks, the higher the implementation of Arosuka green city spatial planning in the Indragiri Rokan watershed.

i. There is a direct and significant positive effect between the appreciation of the greening program and the implementation of the Arosuka green city spatial plan in the Indragiri Rokan watershed. The higher the level of appreciation for the greening program, the higher the implementation of the Arosuka green city spatial plan in the Indragiri Rokan watershed.

j. Supervision of land use and land use control has an indirect and significant influence on the implementation of green city spatial planning with community participation in the management of green open spaces as a mediating variable. The better the supervision of land use and land use control will increase community participation in the management of green open spaces so that the implementation of green city spatial planning as determined by the local government also increases.

k. Community environmental awareness has an indirect and significant influence on the implementation of green city spatial planning with community
participation in the management of green open spaces as a mediating variable. The better the community's environmental awareness will increase the community's participation in the management of green open spaces so that the implementation of green city spatial planning as determined by the local government also increases.

1. Community perceptions of the environment and city parks have an indirect and significant influence on the implementation of green city spatial planning with community participation in the management of green open spaces as a mediating variable. The better the community perception of the environment and city parks, the more participation of the community in the management of green open spaces will also increase. Community participation in the management of high green open spaces can improve the implementation of green city spatial planning determined by the local government.

m. Appreciation for the greening program has an indirect and significant influence on the implementation of green city spatial planning with community participation in the management of green open spaces as a mediating variable. The better the appreciation of the greening program, the more participation of the community in the management of green open spaces will also increase. Community participation in the management of high green open spaces can significantly increase the implementation of green city spatial planning determined by the local government.
REFERENCES


