



THE EFFECT OF COMMUNITY PARTICIPATION ON THE DEVELOPMENT OF A GREEN CITY SPATIAL IN AROSUKA, SOLOK REGENCY, IN THE INDRAGIRI ROKAN RIVER FLOW

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ABSTRACT

Urban development is reflected by the physical construction of facilities and infrastructure in a city. The development and population growth of Arosuka-Solok, which has continued until now, has reduced the open space due to the increased use of built-up land for facilities and other urban functions. Data were collected from the eight components of a green city in the research area, through observation and by distributing questionnaires. The respondents were 100 people randomly picked from various household units. The data collected were tabulated.

Keywords

Green City, Community Participation

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INTRODUCTION

Urban areas as gathering places for residents are rapidly developing due to the inflow of rural residents for jobs and quality education to better their lives. Cities tend to develop faster when supported by a good hinterland's natural potential and are on the trade and service route. The speed of development requires the provision of several facilities, which cannot be fulfilled quickly, thereby leading to the evolution of several problems, overtime due to an imbalance between the

needs of the population and the environment's carrying capacity. Therefore, the major problem in urban areas is poor development management (Hegazy, I., Siddik, W., & Ibrahim, H., 2017).

Urban development is reflected by the physical construction of facilities and infrastructure in a city. During the development process, fertile agricultural lands and several green open spaces are converted into shops, settlements, recreation areas, industries, etc, thereby disturbing the environment. Therefore,



disturbing the stability of the urban ecosystem negatively affects nature through a rise in air temperature and water, flooding/inundation, decrease in groundwater level, pollution, availability of heavy metals in drinking water, etc. Therefore, it is imperative to apply the concept of a green city during urban development and these several principles of cities that have received its associated award (Albino, V. &

The environment can be arranged to function ecologically and socially by providing space for comfortable and beautiful outdoor family activities (Aliero, MS et al., 2021). The green open space also increases the city's carrying capacity and conserves water and air. Its reciprocal form is not only limited to the quality of comfort in the environment but will further increase productivity, thereby birthing a better life and livelihood due to ecological balance. In addition, this concept must manage wastewater to avoid polluting the environment and disturbing community activities (Hossain, K. et al., 2018; Fetene, Addis, Beyene, & Kloos, 2018).

Green City is an area expected to grow, develop and create a floriculture systemic domestic market. According to preliminary research, this category of the city has the ultimate goal of achieving a clean, zero carbon footprint in energy, transportation, architecture, and business activity cost chains (Bednarska-Olejniczak, Olejniczak & Svobodová, 2019; Tehrani, M., Fulton, L., & Schmutz, 2020). It comprises eight components, namely green planning and design, green open space, green waste (Wang, Zhang, & Sun, 2021), green transportation (Lu, Xie, Chen, Zou, & Tang, 2019), green water, green energy (Arun, Gopinath, Sivaramakrishnan, Sundar, Rajan, Malolan & Pugazhendhi, 2021), green building and green community. This process will increase the city's comfort and freshness, which will positively impact the environment (Hosam, K. El Ghorab & Heidi A. Shalaby, 2016). In addition, its establishment will minimize

the risk of flooding, thereby reducing public concerns (Antrobus, D., 2011). This process is indirectly a wise step toward maintaining the beauty of the environment (Scott Campbell, 2007). One of the threats from its formation is the increase in the number of vehicles, leading to a high level of air pollution through the emission of toxic gases (Zhou Z. et al., 2018). Therefore, urban planning must be able to study the interdependence between evolutionary cities and the environment (Bork, R. & Pflueger, M., 2015; Brilhante & Klaas, 2018). The formation of this green city will provide added value or a positive environmental assessment because it helps reduce pollution and maintain the stability of oxygen needed by all living things (Kreans, P., 2012). Mishra S. et al. (2012) nicknamed the green city a healthy region. Currently, many big cities are carrying out this development process in Korea and Asian countries (Mullins, PD & Shwayri, s. T., 2016). This is because its formation will provide added value to the environment and help in reducing pollution and maintaining the stability of oxygen needed by all living things (Kreans, P., 2012).

The growth and development of Arosuka-Solok, which has continued until now, has implications for the reduction of open (non-built) space due to the increase in built-up land to fulfill land for facilities and other urban functions. The development process in this region is a series of sustainable construction techniques covering all aspects of life. The Arosuka-Solok area is a very attractive place for the community to develop their socio-economic life, affecting population growth naturally and by migration. This causes uncontrolled development of settlements and the housing environment.

A very important factor in environmental problems is the size of the human population, which tends to have a negative impact when not properly controlled (Richter, B. & Behnisch, M., 2019). Population growth is the main factor influencing the development of



settlements and the need for infrastructure and facilities. Arosuka-Solok experienced continuous population growth from 207,896 to 249,985 people between 1988 to 2008, at an average rate of 0.93% per year.

The unequal distribution of the population in an area will negatively influence the carrying capacity of the environment. Therefore, green open space is increasingly being pushed into existence with the development of buildings to meet the needs of urban residents. The spatial plan, which applies regulations regarding green open spaces, has not been implemented properly to accommodate aspects that require green open spaces.

Arosuka was declared a green city through the Government Program in 2011. This is supported by the 2012 regional budget allocation, which allocated funds of 2.8 billion rupiahs equally shared to each sub-district at a budget of 350 million rupiahs, with tree planting protective and productive activities. The head of the kelurahan, as the technical implementing officer, embraces the community through the distribution of tree seeds planted in people's homes and along the road. In connection with the program to make Arosuka-Solok a green city, it is necessary to study the extent to which the perceptions and attitudes of the community, specifically the central business district, support the program, given the limited land built in the area.

METHOD

The purposive method was used to select the research location in the heart of the city, which comprises mostly traders, and houses comprising more than two floors. Data were collected through the survey method using observation and questionnaire techniques. Meanwhile, the random process was used to determine the respondents, who are community members from all research locations, expected to represent all elements of the layer. The number of respondents was set

at 100 people, with the research unit being households, drawn through the simple random sampling process.

Data collection techniques were conducted by conducting direct interviews with respondents and distributing questionnaires containing closed questions. The data collected from the field were tabulated with a score weight given according to the quality level of the answer. Furthermore, the respondents were classified based on the answer scores with the frequency distribution table.

RESULTS AND DISCUSSION

1. Respondents Characteristics

Characteristics of respondents obtained include age, education, occupation, type of roof, number of floors and family members, as well as residential address. These characteristics presentation aim to determine the perceptions and attitudes of the community through their socio-economic profile. It also reflects the family head's character in the city's central business district.

The tabulated data showed that 30%, 49%, and 21% of the respondents are between the age of 30-39, 40-49, and over 50 years, respectively. The education level of the respondents is quite good, with all having completed secondary education, whereby 5%, 78%, 8%, and 12% graduated from Junior High School, Senior High School, Diploma, and Bachelor's Degree.

The result found that the respondents' occupation was dominated by the self-employed sector at 62%, while the remaining 38% were allocated to other fields. In terms of the type of residence, respondents are dominated by permanent buildings, with the number of floors of the house spread out on the 1st, 2nd, 3rd, 4th, and 5th floors by 4%, 13%, 50%, 27%, and 6%. Regarding the type of roof, approximately 62% of the respondents use concrete floors, while the remaining 38% utilize zinc and other types.

The characteristics description of the respondents above shows that the

people who live in the central business district area are classified as homogeneous. This is because they possess adequate levels of education and dominate the economic sector.

2. Willingness to Support Green City Program

Arosuka-Solok, the second largest city in North Sumatra Province, has a pluralistic religious and ethnic society. In 2011, it launched a green city program with its success seen in the city's ability to win the 2013 Adipura Cup for medium-sized cities. The results indicated that the attitude of respondents to the willingness to support the green city program is positive, as presented in Table 1.

The table indicates that 9 out of 10 question items give a value from 50% to 91%. This shows a positive attitude from the community towards the willingness to

support the green city program. Similarly, 58% of respondents do not think that the city government should establish an area for pedestrians.

This can be presumably due to people's daily activities in the economy, ethnicity, culture, and the community in general. Respondents valued the community's willingness to support the green city program, as shown in Table 2.

Table 2 shows that the sum of each respondent's scores gives positive, neutral, and negative values of 48%, 38%, and 14%. Although the variation in the respondent's answers above regarding their willingness is quite good, it is necessary to build motivation by those competent in planning the Arosuka-Solok Kota Hijau program. This effort will be realized with encouragement and various promotional and outreach activities.

Table 1: Respondents' Attitudes towards Willingness to Support the Green City Program

No	Description	Number of Respondents			Amount
		1*	2*	3*	
1	As a society, the city is willing to support and realize the Green City program	83	0	17	100
2	Ready to participate in maintaining and caring for green open space areas in Arosuka-Solok	91	0	9	100
3	Willing to add green open spaces in residential areas, such as houses, roofs, yards, and sidewalks	72	4	24	100
4	Willing to start the green city program with the family and the facilities around the residence	70	6	24	100
5	The need for community regulations on Green City	66	1	33	100
6	Provision of sanctions to communities that violate the Green City Regulation	60	11	29	100
7	The provision of rewards, awards, and intensive support by the government to the Green City	72	3	25	100
8	The support and implementation of four attributes of a Green City by the community	64	5	31	100
9	The city's ability to support the programs such as "Car Free Day" in downtown areas in Arosuka-Solok	62	4	34	100
10	Making or determining the areas for pedestrians	39	3	58	100

Description *): 1 = Agree 2 = Disagree 3 = Disagree



Source: Primary data processed, 2013

Table 2: Distribution of Respondents' Attitudes to Support the Green City Program

Score	Category	Number of Respondents	Percentage
26 - 33	Positive	48	48.0
18 - 25	Neutral	38	38.0
10 - 17	Negative	14	14.0
Amount		100	100

3. Willingness to Implement the Green City Program

The activity center area (DPK) or central business district (CBD) is the center of social, economic, cultural, and political activities. Transportation routes from all directions are concentrated in this area,

making it the highest accessible region within the urban area.

The results showed that the respondents have a positive and neutral attitude towards their willingness to implement the green city program, as shown in Table 3.

Table 3: Respondents' Attitudes on the Willingness to Implement the Green City Program

No	Description	Number of Respondents			Amount
		1*	2*	3*	
1	Willing to use the area surrounding the residence as a green region. An example is using the house roof as a garden.	63	17	20	100
2	Willing to build infiltration wells, such as Biopori holes around the place of residence	36	10	54	100
3	Willing to separate organic and inorganic waste before being transported by officers	65	15	20	100
4	Willing not to avoid the use of the sidewalk as a place for trade and other activities	72	6	22	100
5	Willing to participate in supporting the green city program with non-binding financial support	36	20	44	100

Description *): 1 = Agree, 2 = Disagree, 3 = Disagree .

Source: Primary data processed, 2013

Table 3 shows that the highest description of questions is that 72% of the respondents are not willing to use sidewalks as a place for trade and other activities. Furthermore, approximately 65% are willing to separate organic and inorganic waste before being transported by officers. The area inside and around the residence is made into a green area by 63% of the respondents using the house roof as a garden.

By analyzing the data, this condition becomes an opportunity for the city government to enable people to willingly use sidewalks as a place to trade, thereby creating an opportunity for cars to park by road. In addition, the community's willingness to segregate waste has shown an attribute of a green city. This has solved the problems faced by land in creating city parks, with the respondents willing to use



the area around their houses, including roofs and terraces, as a garden.

Table 4 shows the overall attitude of respondents toward implementing the green city program.

Table 4: Distribution of Respondents' Attitudes about Willingness to Implement the Green City Program

Score	Category	Number of Respondents	Percentage
26 - 33	Positive	35	35.0
18 - 25	Neutral	52	52.0
10 - 17	Negative	13	13.0
Amount		100	100

The summation of score resultsshowed that 35%, 52%, and 13%of the respondents gave positive, neutral, and negative attitudes. This means, although the opportunity to implement the green city program is quite high, awareness efforts still need to be considered because 52% of respondents are "grey". Intensive counseling and approach efforts can also be performed, hence,the attitude can turn into a positive one.

CONCLUSION

In conclusion,respondents' attitude to the willingness to support the green city program is positive.

RECOGNITION/ AWARDS

In the context of implementing the green city program in Arosuka-Solok, the results indicated that more intensive socialization and counseling are needed. Government officials are the drivers and protectors in implementing the green city program, hence, it is necessary to approach several community leaders to participate in its implementation actively.

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