



## Implementation of Smart City Development Policy in Gedebage, Bandung, Indonesia

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### Abstract

The smart city concept aims to help the people by enhancing information to the community or institution to carry out activities or anticipate unexpected events to manage resources more efficiently ultimately. Within the smart city field, the Technopolis sub-concept aims for developing a safe and comfortable city life technology supported by accessible, fast, smooth, and productive city management. This project is expected to provide main activities of trade and services, creative and high technology industries, tourism, and transportation. The case study of Gedebage district was chosen because of its power as a fast-growing economic potential by optimizing existing potential, both in the form of physical possibility, resources, and cooperation between the government and the private sector. This type of research is field research, which uses the object of research regarding a symptom or event in community groups. Therefore, this research can also be a case study with a descriptive-quantitative approach. Quantitative analysis shows an actual sign, that can be studied epistemologically, and the research that will be carried out aims to find explanations between indicators. Based on the findings of the analysis and research, it has been determined that the implementation of Bandung city government policies has a significant effect on community participation in planning the Gedebage Sub-region as the new city center of Bandung through the concept of Technopolis.

Keywords: implementation; policy; smart city development, technopolis

### 1. Introduction

The concept of spatial planning is formally regulated nationally through the Spatial Planning Law of the Republic Indonesia No. 26 of 2007. This regulation states that spatial planning is regarded as a set of spatial planning procedures, space usage, and space utilization control. The regulation is a legal umbrella for maintaining the balance of spatial use both on a regional scale and in the concept of sustainable planning to create a synergy between planning and technology that saves natural resources, energy, and costs. The discourse on spatial planning develops along with the tendency of big cities to place information technology as a crucial factor in urbanization planning. The development of information technology is considered to have a role in shaping urban space, especially in shaping the social and economic interactions that run within it. This can be seen in the information technology infrastructure and digital-based economic activities that have been utilized and become a priority agenda for city development.

The city government's efforts have made the city government itself the main subject in implementing spatial development. The city then becomes a new competitive space, both politically and in a wider social context, in the

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entrepreneurial city approach. The current development of the city cannot be separated from the cooperation carried out by several important actors, such as politicians and private actors through partnerships and local governments. Technopolis is a critical innovation in the development of intersection technology and urban spatial planning. Technopolis is a concept that developed with the advancement of technology and is currently developing due to the rapid growth of innovation. Technopolis should be relevant and valuable to the society in order to stimulate the economy (Sutriadi, 2016). Therefore, the infrastructure that must be built is a high-tech industrial complex incubator, Technopark, and general support center (Lee & Oh, 2016). The presence of the “Technopolis” concept is actually inseparable from the trend of global urban development discourse. In the context of that consequence, technology is then aimed at increasing the interaction between high technology-based companies, research centers, and the role of universities to create synergies in the development of knowledge, innovation, products, companies, which are considered in such a way. One way to have a positive impact on regional development.

The Technopolis concept was created as a technology centre and a bridge between research institutions to develop science and technology, with industrial activities acting as capital. The government in governance and regulation aims to give birth to innovations (Ajikusumah, 2017). Based on the Detailed Spatial Planning and Zoning Regulations for the City of Bandung in 2015-2035, it is explained that the purpose of spatial planning in the City of Bandung is to make technology a concept that will support the synergy between universities and creative industries, a commercial and government center, with a Technopolis concept. The technology development policy in the Gedebage Sub-region is consistent with the Smart City concept through general. However, there are some issues that are vital enough to be resolved by the Bandung City Government in the technology development policy process, especially regarding environmental factors which currently have the status of Gedebage as a buffer zone for the city's green open space.

Based on the Detailed Spatial Planning and Zoning Regulations of Bandung in 2015-2035, it is explained that the purpose of spatial planning in the city is to make technology a concept that will support the synergy between higher education, creative industries, commercial, and government centers with a Technopolis concept.

Some literature that has reviewed the Technopolis so far is dominated by the modern development paradigm, which sees more Technopolis development as an innovation policy for urban planning to improve the regional economy and the community's quality of life (Deitrick et al., 2010). This view then confirms that the economic structure formed in the Technopolis concept becomes an essential factor in development. Technopolis is more oriented as a development policy that pursues economic growth. However, in its dynamics, often development that only leads to economic growth creates problems of exclusion and social deprivation in urban areas (Chen, 2014).

This research will focus on some issues that are vital enough to be resolved by the Bandung Municipality in the technology development policy process, especially regarding environmental factors with the current status of Gedebage as a buffer zone for the city's green open space. The Technopolis development policy in Gedebage is in line with the Smart City concept in general. The development of Bandung Technopolis can have a positive impact if the change provides benefits to the community and can also have a negative impact. The existence of a new discourse regarding the Gedebage sub-area as the new city center in the city of Bandung through the concept of Technopolis, this study seeks to understand how the policy that will be carried out by the Bandung city government towards Technopolis and its impact on community participation in the surrounding area.

Some policies regarding the mechanism of public participation in government administration are needed to anticipate the implications of increasing public interest and desire to participate in administering the government (Conyers, 1994). These policies regulate the means or media and the game's rules that can facilitate public interest and wish to participate in the governance process from participation in development planning and preparing regional development budgets to monitor the implementation of development programs and utilization of the development budget (Kaho, 2005).

Finally, the setting where participation and policy implementation occur must enable and facilitate better outcomes. To achieve optimal advantage from implementing stakeholder participation policy, the government should maintain high-quality stakeholder engagement by ensuring wide publicity and the participatory sessions' correct constitution, establishing a standard practice in public employment or stakeholder engagement.

## **2. Research Methods**

This research uses a mix method, which combines quantitative and qualitative approaches. Creswell (2013) suggests that the sequential mixed methods strategy are procedures in which the researcher tries to combine or expand his findings obtained from one method with the conclusions from another process. An explanatory sequential strategy is applied by collecting quantitative data analysis data in the first stage using a later linear regression analysis, followed by qualitative data collection and analysis in the second stage which builds on the initial quantitative results. In this research, quantitative data is prioritized, then quantitative results are deepened with qualitative data.

This type of research is field research, which uses the object of research regarding a symptom or event in community groups. Therefore, this research can also be a case study with a descriptive-quantitative approach. Quantitative analysis shows an actual sign, can be studied epistemologically, and the research that will be carried out aims to find explanations between indicators. In this case, the research conducted by the researcher shows real signs in the community in Gedebage and Rancasari districts regarding the impact of the implementation of the policy in Gedebage, Bandung. Researchers use scientific methods in data collection to achieve objectivity and neutrality during

the investigation process. Post-positivists, however, modify the belief that researchers and research subjects are independent by recognizing that the researcher's theories, hypotheses, and background knowledge can significantly influence what is observed, how it is observed, and the outcome of what is observed.

The population in this study are stakeholders who are directly related to policymakers or formulators, namely employees of the Spatial Planning Department (DISTARU) and BAPPEDA (Development Planning Agency) of Bandung, and the output is feedback on the policy input process or object that receives the direct policy made are people in Gedebage and Rancasari Districts, Bandung. Meanwhile, external factors like private sector, are not included because they are policy-supporting factors. The sampling technique used is probability sampling technique, with proportional random sampling. While the calculation of the sampling formula using the Slovin formula, in order to obtain as many as 179 people as research respondents consisting of 79 employees of the Spatial Planning Department (DISTARU) and BAPPEDA (Development Planning Agency) of Bandung City and 100 people in the Gedebage and Rancasari Districts.

The quantitative research approach includes survey and causal designs, while data collection techniques include questionnaires, observations, and interviews. In this context, the purpose of this research is to find the relationship between the implementation of Bandung Municipality policies towards the community in planning Gedebage as the new city center of Bandung through the concept of Technopolis. Data analysis in quantitative research collects data from all respondents. Activities in data analysis are grouping data based on variables and types of respondents, tabulating data based on variables from all respondents, presenting data for each variable studied, performing calculations to answer the problem formulation, and performing calculations to test hypotheses. Data analysis in this study used descriptive analysis and simple linear regression analysis. The quantitative data analysis technique used is linear regression analysis, which aims to determine the effect of policy implementation on community participation in regional planning for the Gedebage Sub-region as the new city center of Bandung through the concept of Technopolis which will then be deepened by the results of the perception of qualitative data.

### 3. Results and Discussions

#### 3.1. Respondent Demographics

Respondents in this study were employees of the Department of Spatial Planning (DISTARU) and BAPPEDA (Development Planning Agency) of Bandung City and people in Gedebage and Rancasari Districts, totaling 179 people. Furthermore, from the results of data collection and processing through the distribution of questionnaires to the respondents, it can be seen that some of the characteristics of the respondents studied consisted of gender, age, and occupation and in full see Table 1.

Table 1: Respondent Demographic

Demographic	Frequency	Percentage (%)
<b>Gender</b>		
Male	106	59.22
Female	73	40.78
<b>Age</b>		
< 30	13	7.26
31 - 40	46	25.70
41-50	76	42.46
> 50	44	24.58
<b>Profession</b>		
Government Officer	79	44.13
State-owned Company Officer	32	17.88
Private Employee	24	13.41
Entrepreneur	44	24.58

From the demographic results of respondents totaling 179 people, it can be seen that based on the gender of the respondents, most of them were male as many as 106 people (59.22%), while the smallest number was 73 people (40.78%). Based on the age of the respondents, it can be seen that most of the respondents aged between 41-50 years were 76 people (42.46%), then aged 31-40 years were 46 people (25.70%), aged >50 years were 44 people (24.58%) and aged <30 years as many as 13 people (7.26%). Based on the respondents' occupations, it can be seen that most of the respondents have jobs as civil servants as many as 79 people (44.13%), then 44 people are self-employed (24.58%), SOE employees are 32 people (17.88%), and private employees are 24 people (13.41%).

#### 3.2. Descriptive Statistical Analysis

Descriptive statistical analysis techniques are statistics used to analyze data by describing or describing the data that has been collected as it is without the intention of making generally accepted conclusions or generalizations. Descriptive statistics in this study use the description of the minimum, maximum, mean, and standard deviation values.

The descriptive results show the distribution of respondents' responses regarding the implementation of the policies contained in this study (see Table 2). If it is seen that the highest respondent's responses are on the item

regarding the availability of a clear Standard Operating Procedure (SOP) in supporting the implementation of the Technopolis program in the Gedebage Sub-region which gets an average score of 4.09 with a standard deviation of 1.11. This shows that from several indicators on the implementation of policies in the planning of the Gedebage Sub-region as the new city center of Bandung, the respondents who are official officials have supported this, that there is a clear standard operating procedure with the issuance of government regulations regarding development planning for the implementation of the Technopolis program in Gedebage, so that there is clear authority according to their respective fields.

Table 2: Descriptive Statistics of Policy Implementation

Variable	Item	Indicator	Min	Max	Mean	SD
Policy Implementation	P1	The Bandung city government always carries out public consultations or socialization regarding the technopolis implementation program in the Gedebage sub-region.	1	5	4.17	1.07
	P2	Dissemination of information about the technopolis program in the Gedebage sub-region, Bandung city	2	5	4.03	1.08
	P3	The level of clarity of content/substance regarding the guidelines for implementing the technopolis program in the Gedebage sub-region of Bandung city	1	5	3.97	1.18
	P4	Availability of supporting facilities in the implementation of the technopolis program in the Gedebage sub-region of Bandung City	1	5	3.90	1.17
	P5	There has been an increase in the quality of public services in the Gedebage sub-region from the impact of the technopolis implementation plan.	2	5	4.12	1.01
	P6	Job Description held in the implementation of the technopolis program in the Gedebage sub-region	1	5	3.97	1.03
	P7	Availability of clear Standard Operating Procedures (SOP) to support the implementation of the technopolis program in the Gedebage sub-region	1	5	4.09	1.11
	P8	There has been an improvement in development transparency (budget, policy-making process, implementer) in the Gedebage sub-region from the impact of the technopolis implementation plan.	1	5	4.00	1.12
	P9	There has been an increase in quality in one of the social aspects of the impact of the planned implementation of technopolis in the Gedebage sub-region area	1	5	4.01	1.15
	P10	Feel the benefits of infrastructure development from the impact of the planned implementation of technopolis in the Gedebage sub-region area	1	5	4.00	1.10
<b>Mean Score</b>					<b>4.03</b>	<b>0.05</b>

While the lowest respondents' responses were on the item regarding the availability of supporting facilities in the implementation of the Technopolis concept in Gedebage which obtained an average score of 3.90 with a standard deviation of 1.17. It shows that there is a lack of trust from the apparatus regarding the location and supporting factors to implement the Gedebage area as the new city center of Bandung. There are still some shortcomings, such as various facilities, so that the designation of the Gedebage Sub-region is still being studied and improved, so that the implementation of the Technopolis program can be realized.

Table 3: Descriptive Statistics of Community Participation

Variable	Item	Indicator	Min	Max	Mean	SD
Community Participation	P1	Knowing about the Bandung Technopolis program	1	5	4.15	1.05
	P2	Public awareness to participate in the Bandung Technopolis program	1	5	3.89	1.10
	P3	Motivation to participate in the Bandung Technopolis program	1	5	3.85	1.20
	P4	Want to be involved in the Bandung Technopolis program	1	5	3.87	1.18
	P5	Initiative to propose the Bandung Technopolis program and is willing to convey his aspirations to the Bandung city government	1	5	4.12	1.07
	P6	Communities are organized and have adequate capacity to engage productively in decision-making processes	1	5	3.95	1.09
<b>Mean Score</b>					<b>3.97</b>	<b>0.06</b>

The descriptive results show the distribution of respondents' responses regarding community participation in the Gedebage and Rancasari sub-districts contained in this study (see Table 3). If it is seen that the highest respondents' responses are on the item regarding knowing the existence of the Bandung Technopolis program which obtains an

average score of 4.15 with a standard deviation of 1.05. This shows that there is information dissemination carried out by the implementer using various media, so that the public is aware of the Bandung Technopolis planning program.

While the lowest respondents' responses were on the item regarding motivation to participate in the Bandung Technopolis program, which obtained an average score of 3.85 with a standard deviation of 1.20. This shows that there is a lack of motivation from the surrounding community, which is due to the program not yet running, and it can be seen that in the area there are still many shortcomings, especially from the frequent occurrence of disasters that are experienced because the area is often flooded.

### 3.3. Data Analysis

The data used in this study are primary data and distributed questionnaires. With this, an instrument test consisting of validity and reliability tests will be carried out. A validity test is used to measure the validity or validity. An instrument or questionnaire is said to be valid if the questions on the instrument or questionnaire can reveal something that will be measured by the questionnaire (Ghozali, 2018). The significance test was carried out by comparing the calculated *r-value* with the *r-table value*. In determining whether or not an item will be used, a correlation coefficient significance test is usually carried out at a significance level of 0.05, which means an item is considered valid if it has a significant correlation with the total score. The following are the results of the validity test obtained on the two variables in this study which are (a) test assumption and (b) simple linear regression analysis.

#### a. Test Assumption

The analysis used in this study is linear regression analysis, so it is necessary to carry out a test assumption. It is because regression analysis is a parametric statistical analysis, so a normality test will be carried out with the Kolmogorov Smirnov test with the provisions of the test if the significance value (*p-value*) > 0.05 can be stated that it is normally distributed. Based on the results of data processing, the results of the normality test are obtained (see Table 4).

Table 4: Normality Test

One-Sample Kolmogorov-Smirnov Test		
N		Unstandardized Residual
Normal Parameters <sup>a,b</sup>	Mean	179
	Std. Deviation	.0000000
Most Extreme Differences	Absolute	2.73495635
	Positive	.060
	Negative	.060
Test Statistic		-.044
Asymp. Sig. (2-tailed)		.060
		.200 <sup>c,d</sup>

The results of the normality test with Kolmogorov Smirnov obtained a significance (*p-value*) of 0.200 (0.200>0.05), so it can be stated that the data in this study are normally distributed. In addition, the heteroscedasticity test is used to determine whether or not there is a deviation from the classical assumption of heteroscedasticity, namely the existence of variance inequality from the residuals for all observations in the regression model. The requirement that must be met in the regression model is the absence of symptoms of heteroscedasticity. In this study, researchers test whether heteroscedasticity occurs or not is to using the Glejser test. In the heteroscedasticity test with the Glejser test, if the value of Sig. (significance) of all explanatory variables is not statistically significant ( $p > 0.05$ ), it can be said that the regression equation model does not experience heteroscedasticity. Based on the results of data processing, the results of the heteroscedasticity test were obtained (see Table 5).

Table 5: Heteroscedasticity Test

		Coefficients <sup>a</sup>				
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.701	.738		2.303	.022
	Policy Implementation	.012	.023	.041	.539	.590

a. Dependent Variable: RES2

The results of the heteroscedasticity test with the Glesjer test, obtained a significance result (*p-value*) of 0.590 (0.590>0.05). Thus, from these results, it can be stated that the data in this study did not occur heteroscedasticity due to the variance inequality of the residuals for all observations in the regression model.

#### b. Simple Linear Regression Analysis

The results of data processing, using linear regression analysis on the effect of policy implementation on community participation in regional planning for the Gedebage sub-district as the new city center of Bandung through the concept of Technopolis, were obtained as can be seen in Table 6.

Table 6: Simple Linear Regression Analysis and t-test

Model		Coefficients <sup>a</sup>			t	Sig.
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	(Constant)	3.159	1.152		2.741	.007
	Policy Implementation	.537	.035	.752	15.159	.000

a. Dependent Variable: Community Participation

From the results of data analysis with simple linear regression, the regression equation is obtained on the effect of policy implementation on public participation (Equation 1).

$$Y = 3.159 + 0.537X + e \tag{1}$$

The value of the Policy Implementation regression coefficient obtained is 0.537, the coefficient results are positive indicating that if the implementation of the policy increases by 1% then public participation will increase by 0.537 units.

Table 7: Correlation Coefficient Analysis

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	.752 <sup>a</sup>	.565	.562	2.74267	

a. Predictors: (Constant), Policy Implementation

The results of data analysis with correlation analysis obtained a value of 0.752, which indicates that the relationship between the two variables of policy implementation with public participation is in the strong and unidirectional category (see Table 7). The coefficient of determination analysis results is shown at the Rsquare value of 0.565 (0.752x 100%), which is 56.5%. It shows that 56.5% contributes to the influence of policy implementation on community participation in planning the Gedebage sub-region as the new city center of Bandung through the concept of Technopolis, while the remaining 43.5% is the contribution of other variables to community participation. The results of hypothesis testing on the effect of policy implementation on community participation in planning the Gedebage sub-region as the new city center of Bandung through the concept of Technopolis obtained a t-count of 15,159 (t-count 15.159 > t-table 1.973) and significance (p-value) 0.000 < 0.05. It can be stated that the implementation of the policy Bandung city government has a significant effect on community participation in planning the Gedebage sub-region as the new city center of Bandung through the concept of Technopolis.

### 3.4. Research Gap

(Parry, 2014) describes the relationship between the public or the community and industrial activities to achieve conditions and technological development. The government plays a role in formulating policies related to developing innovation on a national and regional scale. This policy is divided into three main programs: education, building a physical structure, and conducting research and development activities based on science. The procedure is expected to support the creation of cooperation between the public/community and the private sector. With this solid foundation, it is hoped that all areas will grow and develop into Technopolis that is also conducive to growth and development in the surrounding area, such as corporate development, small and medium micro-enterprises, and large-scale companies.

Robinson et al. 2010 examined the vision of public participation concerning Kenya's water legislation among herders, focusing on the institutional management of other deliberation processes. It does not highlight or investigate the effect of the involvement on other government policies that do not touch the public interest. Hence it is necessary to determine the impact of participation on implementing other general public policies and among non-pastoralists. The study should evaluate other factors that will influence policy implementation rather than involvement in general. Studies on stakeholder participation on performance (Oloo & Orwar, 2016) on project implementation, such as the road project by KenHA, should be replicated on policy implementation to measure the effect of participation in the performance. Projects that are the product of a policy can only succeed if the procedure is successful.

This study put its focus on vital issues in Bandung Municipality in the technology development policy process, especially regarding environmental factors with the current status of Gedebage as a buffer zone for the city's green open space. The existence of a new discourse regarding the Gedebage sub-area as the new city center in the city of Bandung through the concept of Technopolis, this study seeks to understand how the policy that will be carried out by the Bandung city government towards Technopolis and its impact on community participation in the surrounding area.

#### 4. Conclusion

The implementation of regional development in the process generally consists of four parts, namely planning, budgeting, implementation, monitoring, and evaluation. The current development of smart cities tends to lead to a more focused approach to software in general and the importance of community participation in particular. What needs to be a concern is the existence of residents who will be the parties most affected by the construction of the Gedebage Technopolis. Technopolis is not a total solution for the development of an area. The environmental and local aspects of the residents must be prioritized so that the existence and sustainability of the residents are maintained. The development of Gedebage Technopolis in increasing economic growth has brought changes to the lives of the surrounding community. These changes include the change from an agricultural area to an industrial area and the impact of industrial development on the socio-economic community and the environment around the industrial area. The impact of the development process of Gedebage Technopolis is basically an environmental change caused by government policies. Therefore, in order for Gedebage Technopolis to have a positive impact, the resulting changes must benefit the community.

This study revealed that the policy's implementation had a significant effect on community participation in the planning of Gedebage District as the new city center of Bandung through the concept of technology. This is concluded on the basis of t-test hypothesis testing. The development of Technopolis launched by the Bandung City Government is an agglomeration of information, communication, technology, research activities, and motivation for innovation in the City of Bandung. Technopolis is a regional planning center that focuses on high technology-based industries. The development of Technopolis in Bandung has indeed benefited many parties such as developers, digital industry players, and the government. The Technopolis idea is a Smart City or smart city as a concept of city planning and implementation that uses Information and Communication Technology (ICT) to link, monitor, and regulate diverse resources in the city more effectively and efficiently to optimize services to the community. its residents, as well as to promote long-term growth.

Bandung Smart City policies and strategies are aligned through synchronization, harmonization, and synergy of Bandung policies. The Bandung Smart City Road Map is integrated into the Regional Medium-Term Development Plan (Rencana Pembangunan Jangka Menengah Daerah/RPJMD). Thus, if policies, procedures, goals, targets, and programs are included, Bandung Smart City initiatives can be accommodated in the Bandung Regional Government Work Plan (RKPD) and the related department's Strategic Plans. Thus, the implementation of Bandung Smart City through programs and activities carried out by the associated departments and agencies can be realized better.

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