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Stakeholder Satısfactıon Wıth Physıcal Infrastructure Development In Rural Areas: Sustaınable Constructıon Approach

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Abstract

By fulfilling fundamental development objectives like creating jobs, providing for the needs of the community, and achieving sustainable and coordinated urban and rural development, physical infrastructure development in rural areas makes a substantial contribution to the overall economic development of the village. In rural areas, physical infrastructure development approaches have evolved to support sustainable development—that is, economic independence, community involvement, and environmental sustainability—as well as social and economic advancement. The overall goal of this study is to assess how well stakeholders are satisfied with the physical infrastructure built in rural areas in terms of sustainable construction practices. The study was conducted by interviewing stakeholders in rural development in Cirebon Regency. Stakeholders include local (village) and district planners, supervisors, and communities. Sustainable construction is viewed from the perspectives of economic sustainability, social sustainability, and environmental sustainability variables. The data in this study were analyzed using satisfaction index analysis and gap analysis between expectations (weighting), stakeholder assessment, and a t-test. According to the findings, the physical infrastructure development in Cirebon's rural areas has generally been met with satisfaction by stakeholders. There was no significant gap between the expectations and assessments of stakeholders in environmental, economic, and social aspects ($p > 0.5$). However, of the 16 indicators, there were six indicators (37.5%) that exhibited gaps.

Keywords: Sustainable Development, Rural Physical Infrastructure, Stakeholder Satisfaction

1. INTRODUCTION

The development of physical infrastructure in rural areas is fundamental to ensuring the comprehensive development of the rural economy (Ao et al., 2017). Such development in rural areas has a strong relationship with sustainable development in the triple bottom line: economic growth, environmental impact, and social progress. A safe, healthy, and comfortable building environment as well as sustainable and coordinated urban and rural development are achieved through the development of physical infrastructure in rural areas (Ao et al., 2017), which will ultimately increase satisfaction and productivity. This balance of human needs is achieved through these activities. Therefore, physical infrastructure development in rural areas cannot be perceived only by considering its impact on socio-economic development; it must also be reviewed for its impact on the physical and social environment.

In compliance with Law No. 6 of 2014 on Villages, the government will distribute village funds to districts and cities via a transfer mechanism. The goal of village funding is to ensure that infrastructure development in each village is equitable and free from district/city-level control. In terms of use, based on the report of the Ministry of National Development Planning and the Australian Government (Kompak, 2017), 84 percent of village funds were used for the construction of rural physical facilities and infrastructure (such as rural roads, agricultural roads, irrigation, environmental sanitation, village-scale clean water, production facilities and infrastructure, education, health, and cultural facilities), as much as 6.5 percent for community economic empowerment, and the remaining for government and social activities.

There are possible advantages to Law No. 6 of 2014's implementation, including bottom-up and local wisdom. However, a number of recent studies have discovered that village fund development for physical infrastructure is ineffective in terms of social, environmental, and economic sustainability. The construction of infrastructure using village funds has the potential to improve social sustainability by fostering greater community involvement and cooperation (Rohmah, 2016). However, as rural facilities develop quickly, issues like inadequate oversight procedures, constrained funding sources, and poor maintenance have become more apparent. Regarding the influence of economic sustainability, while the construction of infrastructure, such as village gates, offices, or fences, has the potential to reduce poverty through the selection of infrastructure types that have an economic impact, many villages are building infrastructure in the field that will have little to no effect on the economy, let alone the reduction of poverty (Kompak, 2017). In terms of environmental impact, minimizing resource consumption, optimizing the benefits of facilities and resources, the use of renewable resources, environmentally friendly and

recycled, natural and healthy environmental protection, and the quality of management of the built environment (Chik, 2019) should become the core of infrastructure development in rural areas.

Policies that promote awareness, capacity building, and the availability of guidelines are necessary because rural communities and village officials typically have limited knowledge about sustainable development. Some driving potential and barriers need to be identified to support the efficacy of the program. One of the assessments of effectiveness and development sustainability is viewed from the perspective of stakeholders, as development in rural areas involves the participation of diverse stakeholders. Therefore, this serves as the background of this study. Additionally, the purpose of this research was to assess how well stakeholders were satisfied with the physical infrastructure development in rural areas in relation to sustainable construction practices.

2. LITERATURE REVIEW

The theory used in this research is Sustainable Construction, developed by the Theory of Sustainability Development (Pearce, 2006), which is known as the concept of triple-bottom-line (Sev, 2009). Evaluation of sustainable construction development uses public service quality management theory developed from quality management of the users (stakeholders) (Parasuraman et al., 1985).

2.1 Sustainable Construction Development

The construction sector creates a wide range of physical facilities that affect the social, economic, and physical environments, such as factories, roads, bridges, residential and commercial buildings, dams, and recreational areas. Currently, research regarding rural infrastructure focuses primarily on sustainable development, policy issues and recommendations, and performance evaluation (Ao et al., 2017). Therefore, the size of the success of the construction industry should be considered based on the size of the triple bottom line and not conventional indicators that embrace punctuality, cost, and quality aspects (Durdyev et al., 2018; Sev, 2009).

Sustainability is "ensuring a better quality of life for everyone, in the present and future generations (Pearce, 2006). Sustainable development encompasses three themes; environmental accountability, social accountability, and economic accountability, also known as the triple bottom line (Durdyev et al., 2018; Sev, 2009). The concept of sustainability encompasses more than just protecting the environment; it also includes economic and social dimensions that are equally important (Durdyev et al., 2018; Sev, 2009). Efforts to maintain a balance between the three elements of the concept of sustainability

should be carried out in a holistic and integrative approach (Durdyev et al., 2018). Sustainable development is increasingly important in the construction industry.

Sustainable Construction addresses (Elmualim & Alp, 2016) the application of sustainable development in the construction industry. According to Kibert, (Nokotoet al., 2014: 135), sustainable construction is the creation and response of management in the development of natural and healthy infrastructure following the principles of resource-efficient use and ecology. (Sev, 2009) defines sustainable construction as building physical infrastructure that promotes social and economic independence as well as environmental balance. Further, Djokovic et al. (2014: 135) categorize six principles in the construction of sustainable construction, which consist of:

a. Minimize resource consumption
b. Optimize energy use
c. Use of renewable resources and recycling
d. Protect Natural Environmental
e. Develop healthy environment
f. Optimize the site management quality

The aforementioned explanation of sustainable construction highlights methods and end results while introducing a number of social, economic, and environmental sustainability concepts. Building physical infrastructure with the goal of ensuring a higher standard of living for all people—both current and future generations—while utilizing social progress (meeting individual needs), promoting rapid and steady economic growth and job creation, preserving and enhancing environmental quality, and managing natural resources effectively is known as sustainable construction.

2.2 *Stakeholder* Satisfaction Index

Evaluation is the process of providing information about the degree to which a specific activity has been completed, the degree to which the completion differs from a given standard to determine whether the two are different, and how the benefits have been realized in relation to the anticipated outcomes (Durdyev et al., 2018;3). Evaluation entails three objectives (Ao et al., 2017) as follows.

a. To identify the changes that should be made to a single product or team.
b. to determine whether or not a product's specific component requires an upgrade.
c. To improve engineering quality work by making it more consistent and predictable, as well as making technical performance more manageable.

A stakeholder perception-based evaluation is one method for assessing the performance of rural development (Ao et al., 2017) define stakeholders as "groups or individuals who can influence or be influenced by the achievement of organizational goals." The community, village consultative bodies, local, district, and city governments, supervisors and planners at the local and district levels, donor organizations, non-governmental organizations (NGOs), and the private sector are all parties involved in the use of village funds (Ministry of Finance, 2015:10). The development of rural areas, which include many stakeholders who coordinate and communicate, is beneficial in finding better ways to mobilize support and reduce the risk of failure.

(Parasuraman et al., 1985) establish the foundation for quantitative measurement of customer satisfaction (in this case stakeholder) with the service by utilizing the gap between customer expectations of performance and perceived experience of performance. Two different measures (perception and performance expectation) become a single measurement of performance in line with expectations. This model is based on a comparison of the level of stakeholder expectations and perceived performance. Satisfaction with performance occurs when the product delivers performance as expected. Dissatisfaction occurs when a product performs below expectations. Satisfaction is deemed to be the result of a gap in expectations and use. In regards to operation, satisfaction is similar to an attitude that can be measured as the sum of satisfaction with specific product features.

According to (Ao et al., 2017) research on sustainable infrastructure development falls into evaluation index research and evaluation model determination. The government continues to invest in rural infrastructure development in Indonesia to promote the growth of the rural economy, agricultural sector, and environment. Continuous improvements are still required in assessing the effectiveness of rural infrastructure investments and carrying out new rural infrastructure projects.

3. RESEARCH METHOD

The study was conducted in rural areas in Cirebon Regency. The site was chosen by considering the researcher's access to the location and the researcher's understanding of the object of research. The research is expected to contribute to universities, namely Universitas Swadaya Gunung Jati (UNSWAGATI) Cirebon in providing input for Regional Development Policies. The research employed two distinct categories of data: primary and secondary.

The design of this study is a non-experimental research using the survey method, which is the systematic collection of information from respondents as stakeholders in village development. Stakeholders include local (village) and district planners, supervisors, and communities. Primary data were obtained through questionnaires and interviews with

stakeholders in rural development in Cirebon. Primary data sampling was carried out through a random sampling approach with a cluster sampling method, namely sampling with two stages. Phase I is regional sampling. Regional sampling with stratified sampling techniques was conducted in 30 villages, representing developed villages with the lowest poverty rate (15 villages) and the highest (15 villages). Phase II is participant sampling. Participant sampling was done with accidental sampling. Secondary Data were used to support primary data, which consists of institutional data, policy data, and relevant programs.

Variables and indicators in this study developed from the research of (Ao et al., 2017; Sourani & Sohail, 2005) which are summarized in Table 1 as follows.

Table 1. Objectives, variables, and Indicators of the Study

Variable	Indicator
Environment	1. Minimize resource consumption 2. Optimize energy use 3. Use of renewable resources and recycling 4. Protect Natural Environmental 5. Develop healthy environment 6. Optimize the site management quality
Economy	1. Local Resources 2. Economic intermediary among regions 3. economic independence 4. Enhanced Productivity 5. Local Economic Carrying Capacity
Social	1. Participation 2. Job Creation 3. Local Wisdom 4. Social Acceptance 5. Income Distribution

Triangulation techniques (data collection, source, and time triangulation), group discussions, and negative case analysis were used to test data credibility. Following data collection, the next systematic step in data processing is to tabulate the questionnaire results by coding them in a data recapitulation table. To fit the purpose of this study, the

data were quantitatively analyzed. The results of this study were compared with the results of a randomized controlled trial (*gap analysis*) supported by *t-test*.

4 RESULT

4.1 Weighting and Rating Analysis

The results of the questionnaire with stakeholders were further codified and tabulated. Respondents' answers consist of weighting and rating answers. Weight indicates the importance of the attribute which consists of 5 scales (5=Very Important, 4=important, 3 = fairly important, 2 = unimportant, 1= very unimportant). The results of the means of weighting the importance of the Sustainable Construction indicator attribute can be found in Table 2.

Table 2. Weight of Importance of Sustainable Construction Indicators

Sustainable Construction Indicator	Weight		
	Village n=90	**Regency** n=10	**Means**
A. Environment	**4.74**	**4.70**	**4.72**
1. Minimize resource consumption	4.68	4.63	4.66
2. Optimize energy use	4.83	4.78	4.81
3. Use of renewable resources and recycling	4.75	4.66	4.71
4. Protect Natural Environmental	4.81	4.78	4.80
5. Develop healthy environment	4.87	4.82	4.85
6. Optimize the site management quality	4.51	4.54	4.53
B. Economy	**4.81**	**4.77**	**4.79**
1. Local Resources	4.81	4.82	4.82
2. Economic intermediary among regions	4.82	4.81	4.82
3. economic independence	4.81	4.78	4.80
4. Enhanced Productivity	4.83	4.72	4.78
5. Local Economic Carrying Capacity	4.79	4.72	4.76
C. Social	**4.62**	**4.63**	**4.63**
1. Participation	4.92	4.88	4.90
2. Job Creation	4.45	4.51	4.48
3. Local Wisdom	4.43	4.48	4.46
4. Social Acceptance	4.73	4.69	4.71
5. Income Distribution	4.58	4.6	4.59

Means	**4.73**	**4.70**	**4.71**

Source: processed primary data

Rating suggests attribute assessment consists of 5 scales (5= very good, 4 = good, 3 = fair, 2 = bad, and 1 = very bad). The results of the questionnaire tabulated average values. Table 3 presents the findings of the average stakeholder preferences calculation regarding the evaluation rating of sustainable construction indicators.

Table 3. Rating Indicators of Sustainable Construction

Sustainable Construction Indicator	**Rating**		
	Village n=90	**Regency** n=10	**Means**
A. Environment	**4.02**	**3.78**	**3.90**
1. Minimize resource consumption	3.70	3.61	3.66
2. Optimize energy use	4.13	4.08	4.10
3. Use of renewable resources and recycling	3.49	2.52	3.00
4. Protect Natural Environmental	4.11	3.96	4.03
5. Develop healthy environment	4.38	4.34	4.36
6. Optimize the site management quality	4.29	4.17	4.23
B. Economy	**4.28**	**4.03**	**4.16**
1. Local Resources	4.69	4.52	4.60
2. Economic intermediary among regions	4.74	4.70	4.72
3. economic independence	3.72	3.62	3.67
4. Enhanced Productivity	4.11	3.92	4.01
5. Local Economic Carrying Capacity	4.15	3.41	3.78
C. Social	**4.15**	**4.08**	**4.12**
1. Participation	4.77	4.54	4.66
2. Job Creation	3.05	3.66	3.36
3. Local Wisdom	4.21	3.97	4.09
4. Social Acceptance	4.84	4.51	4.672
5. Income Distribution	3.91	3.70	3.804
Means	**9.44**	**8.76**	**4.06**

Source: processed primary data

Furthermore, the average results of respondents ' answers to each question item in coding by Category. The interval was determined according to the following formula:

$$\text{Interval} = \frac{\text{highest score - lowest score}}{\text{number of categories}}$$

Categories total 5, so the interval can be calculated as follows:

$$\text{Interval} = \frac{5 - 1}{5} = 1{,}8$$

With a range of 1.8, the next category is organized as follows

Means	Weight	Rating
Between 1 and 1.8	= very unimportant	very bad
Between 1.81 to 2.6	= not important	bad
Between 2.61 to 3.4	= fairly important	fair
Between 3.4 to 4.2	= important	good
Between 4.21 to 5	= very important	very good

Based on the categories listed above, the weighting score (Table 2) ranges from 4.21 to 5, indicating that all attributes are very important. Upon reviewing the rating value (Table 3), it can be seen that of the 16 indicators, there are as many as 6 (six) Indicators (37.5%) are found in the very good category, which comprises (Table 4): developing a healthy environment, site quality management, local resources, economic intermediaries among regions, participation, and social acceptance. A total of 8 (eight) indicators (50.0%) are in a good category, consisting of minimizing resource consumption, optimizing resource use, natural environment protection, economic independence, enhanced productivity, and local economy carrying capacity. A total of two (12.5%) indicators are in the fair category, which encompasses the use of renewable resources, recycling, and job creation.

Table 4. Rating Indicators Category of Sustainable Construction

Sustainable Construction Indicator	Rating		
	Village n=90	**Regency** n=10	**Means**
A. Environment	good	good	good
1. Minimize resource consumption	good	good	good

2. Optimize energy use	good	good	good
3. Use of renewable resources and recycling	good	bad	fair
4. Natural Environmental Protection	good	good	good
5. Development of a healthy environment	very good	very good	very good
6. Site Quality Management	very good	good	very good
B. Economy	very good	good	good
1. Local Resources	very good	very good	very good
2. Penghubung Ekonomi antar wilayah	very good	very good	very good
3. economic independence	good	good	good
4. Enhanced Productivity	good	good	good
5. Local Economic Carrying Capacity	good	good	good
C. Social	good	good	good
1. Participation	very good	very good	very good
2. Job Creation	fair	good	fair
3. Local Wisdom	very good	good	good
4. Social Acceptance	very good	very good	very good
5. Income Distribution	good	good	good
Means	very good	very good	good

Source: processed primary data

a. Gap Analysis

A gap, or difference between weights and ratings, can be calculated using the results of the weights (Table 2) and ratings (Table 3) calculations. The gap calculation's outcomes are shown as follows in Table 5:

Table 5. *Stakeholder* Satisfaction with the Physical Infrastructure Development in Rural Areas in Cirebon

Sustainable Construction Indicator	Gap Means				Satisfaction
	Weight	Rating	Gap	*p*	
A. Environment	**4.72**	**3.90**	**0.82**	**0.02**	satisfied
1. Minimize resource consumption	4.66	3.66	1.00	*** 0.00	dissatisfied
2. Optimize energy use	4.81	4.10	0.70	*** 0.00	dissatisfied
3. Use of renewable resources and recycling	4.71	3.00	1.70	*** 0.00	dissatisfied
4. Natural Environmental Protection	4.80	4.03	0.76	0.36	satisfied
5. Development of a healthy environment	4.85	4.36	0.49	0.20	satisfied
6. Site Quality Management	4.53	4.23	0.29	0.36	satisfied
B. Economy	**4.79**	**4.16**	**0.63**	**0.20**	satisfied
1. Local Resources	4.82	4.60	0.21	0.15	satisfied
2. Economic intermediary among regions	4.82	4.72	0.09	0.12	satisfied
3. economic independence	4.80	3.67	1.13	** 0.04	dissatisfied
4. Enhanced Productivity	4.78	4.01	0.76	0.86	satisfied
5. Local Economic Carrying Capacity	4.76	3.78	0.97	** 0.03	dissatisfied
C. Social	**4.63**	**4.12**	**0.51**	**0.24**	satisfied
1. Participation	4.90	4.66	0.24	0.86	satisfied
2. Job Creation	4.48	3.36	1.13	** 0.04	dissatisfied
3. Local Wisdom	4.46	4.09	0.37	0.18	satisfied
4. Social Acceptance	4.71	4.67	0.04	0.36	satisfied
5. Income Distribution	4.59	3.80	0.79	0.20	satisfied
Total Gap	**4.71**	**4.06**	**0.66**	**0.22**	satisfied

Source: processed primary data

Table 5 indicates that, out of the 16 indicators, six have a large discrepancy between expectations (weight of interest) and ratings based on stakeholder preferences. Three of the six indicators pertain to environmental aspects, specifically, the use of recycled and renewable resources, maximizing resource utilization, and minimizing resource

consumption. Two indicators of economic aspects are economic independence and local economic carrying capacity. One indicator of social aspects is job creation. The gap suggests the lack of satisfaction from stakeholders towards sustainable construction practices.

5 DISCUSSION

From 2015 to 2020, village funds were used to improve physical infrastructure in rural Cirebon Regency. Physical infrastructure promotes economic empowerment, while social and environmental infrastructure improves rural communities' quality of life. Based on the findings, stakeholders were generally satisfied with the development of physical infrastructure in Cirebon's rural areas. However, there are 3 (three) indicators in environmental aspects, 2 (two) indicators in economic aspects, and 1 (one) indicator in social aspects that still have gaps or are unsatisfactory. This demonstrates that some of the benefits of village self-reliance in economic, social, and environmental infrastructure development are not final goals but must be directed toward village SDGs such as poverty reduction, welfare improvement, food security and nutrition, sustainable agriculture promotion, access to inclusive and equitable quality education and health, and environmental sustainability. We need to encourage high-quality village fund management in order to create new sources of income for the village outside of the village fund itself because the village fund is only a stimulus for the village that will provide a long-term economic source.

The ultimate goal of development performance is not the development of physical infrastructure such as village roads, agricultural roads, bridges, village reservoirs, sports facilities, and rural tourism, but rather the development of sustainable environmental, economic, and social quality. The development of sports facilities provides infrastructure for the village community's social and health needs. The development of village tourism is not only the ultimate goal but also the long-term viability of management for the benefit of the community. This calls for management abilities in the areas of marketing, competitive strategy for the tourism industry, service and maintenance management, cooperation, and investment management. Not only is the development of the village internet network the ultimate goal, but even more significant is the utilization of internet resources for things like the creation of market information systems, cropping patterns information systems in the agricultural sector, food quality and safety improvement, public service quality enhancement, education accessibility, and natural disaster mitigation.

As per the Permendes (Ministerial Regulation) No. 5 of 2015, Permendes (Ministerial Regulation) No. 22 of 2016, Permendes (Ministerial Regulation) No. 19 of 2017, Permendes (Ministerial Regulation) No. 16 of 2018, Permendes No. 11 of 2019, and Permendes

(Ministerial Regulation) No. 13 of 2020, the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration has annually provided priority guidance in the management of village funds for economic, social, and environmental empowerment. The development of village information systems, social forestry, renewable energy, mitigation and adaptation of climate change, food security, job training, parents, sick people, village/rural area superior product development, productive-scale agricultural enterprises, village-owned enterprise capital engagement, and partnerships with producer organizations for economic scale efficiency and competitiveness are a few of the priorities. Additionally, village funds may be utilized for the acquisition, development, and upkeep of infrastructure related to agricultural production, including distribution networks, information systems, agricultural mechanization, processing of agricultural products, and other relevant technologies. Opportunities for entrepreneurship that are beneficial to the economy, society, and environment are among these priorities.

6 CONCLUSİON

The findings demonstrated that stakeholders' satisfaction levels with the physical infrastructure development in Cirebon's rural areas have been generally positive. Nonetheless, a number of environmental, economic, and social indicators continue to exhibit gaps or fall into the unsatisfied category.

This indicates that some of the advantages of village self-reliance in the development of economic, social, and environmental infrastructure are not end goals but rather need to be focused on achieving village SDGs like poverty alleviation, welfare enhancement, food security and nutrition, sustainable agriculture promotion, access to high-quality, inclusive, and equitable health and education, and environmental sustainability.

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