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Urban Slum Residential Areas: Policy Model for Domestic Wastewater Management (Case Study: Maleer Sub-district, Bandung City)

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Abstract
One of Bandung's residential slum areas, the Maleer sub-district, has been identified as a priority sanitation area, particularly in terms of wastewater management. In order to improve wastewater management in the slum area, technical and non-technical aspects are considered. This study aims to know the wastewater management policy factors that affect the sustainability of the wastewater management system and to propose a policy model in the slum area. A convenience sampling method was used to collect data from 99 respondents and 7 institutional respondents using a self-administered questionnaire. Partial least square structural equation modelling (PLS-SEM) was used to test the proposed model. The sanitation risk index value in a slum area of Maleer district was 283. Some factors affecting the sustainability of sanitation system arranged by value correlation were (0.325) for technical aspects, (0.283) for community participation, (0.272) for management institution and (0.174) for financial aspect, respectively. The existing policy model only included technical and financial factors, while community participation and management institution were not included in the existing policy. In developing a new model of slum sanitation to achieve sustainability, factors in the form of active community participation and presence of management institution need to be added.
Keywords: *domestic wastewater management, risk sanitation index, slum area, policy, sustainability*

Abstrak
Kelurahan Maleer adalah salah satu kawasan permukiman kumuh yang hingga saat ini masih menjadi daerah prioritas sanitasi, terutama terkait permasalahan air limbah. Dalam hal meningkatkan performa dari teknologi pengelolaan air limbah tersebut, dilakukan evaluasi dari aspek teknis maupun aspek non teknis. Penelitian ini bertujuan untuk menentukan factor yang berpengaruh terhadap keberlanjutan pengelolaan air limbah dan yang digunakan sebagai model kebijakan pengelolaan air limbah. Penelitian ini menggunakan metode *convenience sampling* untuk mengumpulkan data dari 99 responden dan 7 responden institusi dengan menggunakan kuesioner. Untuk menguji model yang diusulkan, digunakan model persamaan struktural *partial least square* (PLS-SEM). Indeks risiko sanitasi di Kelurahan Maleer adalah 283. Faktor yang mempengaruhi keberlanjutan pengelolaan air limbah berdasarkan nilai korelasinya yaitu (0,325) untuk aspek teknis, (0,283) untuk partisipasi masyarakat, (0,272) untuk lembaga institusi, dan (0,174) untuk aspek finansial. Model kebijakan eksisting hanya mengakomodir faktor teknis dan finansial, sementara partisipasi Masyarakat dan kelembagaan pengelola belum masuk ke dalam model kebijakan eksisting. Dalam pengembangan model kebijakan pengelolaan air limbah yang baru untuk mencapai keberlanjutan pengelolaan, maka harus ditambahkan beberapa factor yaitu partisipasi Masyarakat yang aktif dan membuat sebuah lembaga pengelolaan air limbah.
Kata Kunci: *indeks risiko sanitasi, keberlanjutan, kebijakan, pengelolaan air limbah domestik, permukiman kumuh*

1. Introduction

According to Indonesia's 2019 SDGs Roadmap data, 64.53% of the communities have access to appropriate drinking water for consumption, and 77.83% have access to basic sanitation. At the provincial level, 73.17% of communities in West Java Province, home to 49.94 million people in 2019, had access to consumable drinking water, while 66.25% had access to basic sanitation. Based on that, explains Indonesia's is far from national target of 100% consumable drinking water and sanitation by 2019. Indonesia is a developing nation, with 270 million people living there as of 2020 and a 56% urbanization

rate. It is not always possible to balance the rapid growth and development of urban areas with the high rate of urbanization inside them. This can undoubtedly serve as a gauge for the rise of slum areas found in Indonesia's major cities. People's quality of life is undoubtedly significantly impacted by this, both in terms of their health and the health of the environment

One of the major cities is Bandung, the number of slum areas in the City of Bandung is 1,164.72 Ha, according to Bandung Mayor Decree No. 648/Kep. 286-distarcip/2015 about Determining the Location of Housing and Slum Settlements in the City of Bandung [1], which was issued on December 31, 2017. The infrastructure, facilities, and accessibility to sanitation services in these impoverished areas are classified as either insufficient or outside of the sanitation service coverage area.

The government bears the obligation of resolving the issue of providing drinking water and sanitation in impoverished communities, and it needs to be done right away. Building a domestic-communal wastewater treatment plants in Maleer district (*IPAL)* is one way the government is putting its proposed policy into practice. This initiative, which is a partnership between the Islamic Development Bank and the Bandung City Government, aims to provide wastewater management services to the community and discourage people from disposing of their waste in nearby canals or water bodies, which can contaminate clean water sources and the environment.

Based on the implementation of policies that have been carried out by the Government by presenting various programs that can minimize sanitation problems in slum areas, they are not always successful and in accordance with targets, there are times when these programs fail because they feel they have not been able to meet the community's needs for drinking water and sanitation. There are many factors that can influence the failure to achieve a program, one of which is the lack of community involvement, in this case the lack of study of important factors from the community's perspective on the success of these programs. This results in the program's inability to realize sustainability aspects in meeting drinking water and sanitation needs [2].

The researcher in purposed to conduct research related to wastewater management study in Maleer Village. It is known that the high population density of Maleer Village will result in a lack of land that can be used as a place for wastewater management; while the amount of waste produced is increasing along with the increase in population in the area, the existing domestic-communal wastewater treatment plants in Maleer district built in the slum area is considered less efficient due to the condition of the wastewater management installation not managing domestic-communal waste optimally at certain times such as when it rains, this causes the output from waste management not to be in accordance with quality standards, causing the quality of the water environment around the domestic-communal wastewater treatment plants to have high contamination of Coliform bacteria [3]. Likewise, some communities who manage their wastewater do not use domestic-communal wastewater treatment plants in Maleer district, such as using biofilters whose maintenance continuity has not been explained to each user, then for managing private wastewater using septic tanks, where the average population has not drained the septic tank since the septic tank was drained.

2. Research Methods

Research Approach

The study utilized quantitative approach to elaborate the variable used within the research [13] and analysis descriptive is further implement to explains the correlations within the variables. The data analysis technique used descriptive and causal analysis with SEM-PLS. PLS-SEM is primarily used to develop theories in exploratory research [14]. It does this by focusing on explaining the variance in the dependent variables when examining the model Simultaneous hypothesis testing in SEM was carried out using the F-Test. For partial testing, t-tests were used, where H0 is rejected if t-value > 1.96 at a level of 5%.

Research Variables and Data Collection

There are two variables in this study, that are the independent and dependent variable. In order to obtain the research data, questioners with closed questions are constructed. There are two consecutive questioners used in this research for two different target audiences: (1) The KAP (Knowledge, Attitude and Practices) Survey used to evaluate the implementation of the of domestic-communal wastewater treatment plants in Maleer district; (2) Questionnaire to analysis the determining factors for the sustainability of domestic wastewater treatment plants in Maleer district and evaluation of communal scale wastewater management policies. The second questionnaire is constructed based on Confirmatory Factor Analysis.

Research Population and Sampling

The term population refers to the whole set of people, events, or subjects that a researcher is interested in studying and hopes to draw conclusions from. This research contains 2 targeted audiences to be studied, that is the resident of Maleer District and Management Institutions incorporate with the wastewater management. The populations are the total of resident of Maleer District that consist of 17.539 individuals made up from a total of 5.582 families. Purposive sampling is used with Yamane equation. This concludes 99 individual respondents that among them are from different family. Meanwhile for the management institution, the population consisted of Maleer sub-district and district's government authority, National and Political Unity Agency of Bandung City (*KESBANGPOL*), Municipal Waterworks of Tirtawening, Environmental Authorities of Bandung, Watershed Management Center and Department of Housing and Bandung City Residential Areas. These management institutions are taken into account in the research due to its relevancy to the waste water management system in Maleer District.

Research Indicators

The present study's latent variables that are measured from the indicators, include management sustainability, technical aspects, community participation aspects, institutional aspects of management, financing and financing aspects, environmental impact aspects, and government support aspects. Below are the determining Factors for the Sustainability of Wastewater Management in Maleer Village.

Evaluation of Domestic-communal Wastewater Management Policies on a Communal Scale

The evaluation criteria formulated by William Dunn (2003) are made up of effectivity, efficiency, berikut. adequacy, alignment, responsiveness and accuracy aspects.

Table 1. Variable Composition and Indicators

Criteria	**Output**	**Indicator**	
		Statements	**Data Type**
Effectivity	How much has the goal been achieved by implementing the domestic-communal wastewater treatment plants and biofilter infrastructure?	A.2. The function of KSM in wastewater management	Rating scale for distribution of respondents' answers (Strongly disagree, disagree, quite agree, agree, strongly agree)
		C.1. Willingness to participate in operational and maintenance activities of domestic-communal wastewater treatment plants, Biofilter, or Septic Tank	
		C.2. Willingness to become a member of the wastewater management group in Maleer Village	
		C.4. Willingness to contribute to repair efforts if problems occur with wastewater management channels or facilities	
Efficiency	How much effort is required to achieve the desired results	F.1. After the existence of wastewater management facilities, the environmental conditions around the community have improved	Rating scale for distribution of respondents' answers (Strongly disagree, disagree, quite agree, agree, strongly agree)
		F.2. After the Wastewater Management Facility was established, the health condition of family members improved	
		F.3. After the introduction of wastewater management facilities, water-borne diseases (diarrhea, dysentery, typhus, dengue fever) are very rare.	
		D.1. The existence of a management institution in the field of managing domestic-communal wastewater originating from the community	

Criteria	Output	Indicator	
		Statements	Data Type
		D.4. There are routine maintenance activities for wastewater management facilities initiated by community management institutions	
Adequacy	How far the desired results have been achieved from the implementation of the domestic-communal wastewater treatment plants in Maleer district infrastructure in solving problems	D.1. There is a domestic-communal wastewater management institution that comes from the community	Rating scale for distribution of respondents' answers (Strongly disagree, disagree, quite agree, agree, strongly agree)
		D.2. There are regulations governing the disposal and handling of domestic-communal wastewater to the wastewater management advice provided by the community	
		D.6. There is special involvement of women in the continuity of wastewater management in Maleer Village	
		C.1. Willingness of users to carry out operational activities and carry out maintenance of domestic-communal wastewater treatment plants, Biofilter, or Septic Tank	
		C.2. Willingness to become a management group administrator in managing domestic wastewater	
		C.4. Willingness to contribute to repair efforts if problems occur with wastewater management channels or facilities	
Alignment	How far are the costs and benefits of implementing domestic-communal wastewater treatment plants infrastructure distributed evenly among community members?	E.1. Operational and maintenance costs are obtained from residents' contributions	Rating scale for distribution of respondents' answers (Strongly disagree, disagree, quite agree, agree, strongly agree)
		E.2. Funds are collected from the community only if the wastewater management facility is having problems	
		E.3. Contribution funds from the community should be managed by a management institution that comes from the community	
		E.4. The amount of the maintenance fee for wastewater management facilities is the same for each household	
		C.3. Willingness to pay operational and maintenance fees in wastewater management	
		G.2. The government periodically provides guidance in wastewater management	
Responsivity	How much existing policies can satisfy the needs, preferences and values of community members	C.2. Willingness to become a management group administrator in managing domestic-communal wastewater	Rating scale for distribution of respondents' answers (Strongly disagree, disagree, quite agree, agree, strongly agree)
		C.3. Willingness to pay operational and maintenance fees in wastewater management	
		C.4. Willingness to contribute to repair efforts if problems occur with	

Criteria	Output	Indicator	
		Statements	Data Type
		wastewater management channels or facilities	
		E.1. Operational and maintenance costs are obtained from residents' contributions	
		E.2. Funds are collected from the community only if the wastewater management facility is having problems	
Accuracy	How big is the desired result in achieving the desired goal	F.1. After the existence of wastewater management facilities, the environmental conditions around the community have improved	Rating scale for distribution of respondents' answers (Strongly disagree, disagree, quite agree, agree, strongly agree)
		F.2. After the Wastewater Management Facility was established, the health condition of family members improved	
		F.3. After the introduction of Wastewater Management Facilities, water-borne diseases (diarrhea, dysentery, typhus, dengue fever) are very rare.	
		B.2. Waste disposal channels from domestic-communal wastewater treatment plants, biofilters or septic tanks rarely have problems	
		B.3. If the waste disposal facility from the domestic-communal wastewater treatment plants, Biofilter or Septic Tank has a problem, it can be easily repaired	
		B.4. If there is a problem with the domestic-communal wastewater treatment plant, Biofilter or Septic Tank, large funds are not required for repairs	

3. Results and Discussion

One of the Villages mentioned in Bandung Mayor Decree No. 648/KEP.286-DISTARCIP/2015 About Determining The Location Of Housing And Slum Settlements In The City[15] of Bandung dated December 31, 2017, is Maleer Village, where the research was carried out. With a moderate degree of vulnerability to slum risk, Maleer Village is served by the local communal wastewater treatment plant (*IPAL*) system via the City Without Slums (KOTAKU) program, the administration of which is left to the public. Maleer Village was selected as the subject region for this study because, at 43,647 people/km2, it has the highest population density among the communities along the Cikapundung River Watershed's banks.

General Descriptions of Respondents

To support the initial hypothesis and conduct additional data analysis, a general description of the respondent profile from the research location is required. A broad summary of each respondent's profile in this study includes their gender, age, occupation, degree of education, monthly income, length of time they have lived in the research region, and status as a home owner.

Respondents of the research categorized by gender. 60% of the 106 participants in the research sample were women and 40% were men. Based on the sample size of 106 individuals, the majority of respondents are between the ages of 31 and 40, with a percentage of 44,37%. Based on their background, the respondents' educational level was described 40% distribution of the 106 participants in the research sample overall had a high school or vocational school educational background as their primary education

background. Among the respondents, 28% of the respondents in the sample were private workers, and 27% were housewives. Furthermore, majority of respondents earn between IDR 3-5 million each month, according to the poll results. Forty-five percent of the respondents earn between three and five million IDR. According to the findings of a three to four families typically occupy each home with almost 60% of the respondents have more than 5 individuals in a family and had been living in Maleer District for mostly up to more than 10 years. Through the research it was found that 64% of the villagers rent house in Maleer district.

Hypothesis Testing

Completion of the model with latent variables in this study used SmartPLS 3.0 software. The structural model of this research is as follows.

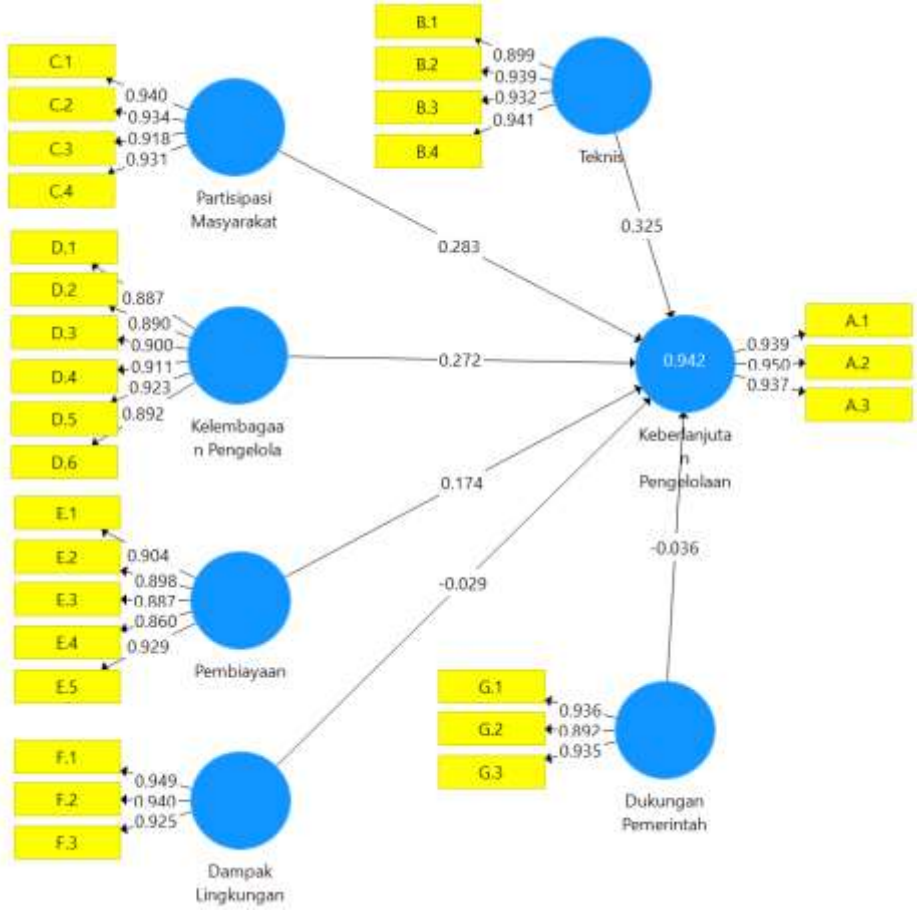

Figure 2: SmartPLS Result

The following are the results for Loading Factors on each variable derived from the data processing data as displayed.

Table 2 : Loading Factors value of each variables are significant

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
A.1 <- Management Sustainability	0.939	0.939	0.010	92.141	0.000
A.2 <- Management Sustainability	0.950	0.950	0.009	100.251	0.000
A.3 <- Management Sustainability	0.937	0.936	0.012	79.546	0.000
B.1 <- Technicality	0.899	0.899	0.015	58.045	0.000
B.2 <- Technicality	0.939	0.939	0.008	118.905	0.000
B.3 <- Technicality	0.932	0.931	0.012	78.168	0.000

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
B.4 <- Technicality	0.941	0.941	0.008	112.815	0.000
C.1 <- Community Participation	0.940	0.939	0.011	82.911	0.000
C.2 <- Community Participation	0.934	0.933	0.018	52.560	0.000
C.3 <- Community Participation	0.918	0.917	0.021	44.631	0.000
C.4 <- Community Participation	0.931	0.931	0.010	90.029	0.000
D.1 <- Management Institutions	0.887	0.887	0.016	54.696	0.000
D.2 <- Management Institutions	0.890	0.890	0.018	48.235	0.000
D.3 <- Management Institutions	0.900	0.899	0.024	37.144	0.000
D.4 <- Management Institutions	0.911	0.910	0.018	51.464	0.000
D.5 <- Management Institutions	0.923	0.923	0.012	77.425	0.000
D.6 <- Management Institutions	0.892	0.891	0.025	36.072	0.000
E.1 <- Funding	0.904	0.903	0.017	51.725	0.000
E.2 <- Funding	0.898	0.898	0.019	48.521	0.000
E.3 <- Funding	0.887	0.886	0.021	42.767	0.000
E.4 <- Funding	0.860	0.860	0.026	32.871	0.000
E.5 <- Funding	0.929	0.929	0.011	87.300	0.000
F.1 <- Environmental Impact	0.949	0.949	0.007	139.96	0.000
F.2 <- Environmental Impact	0.940	0.940	0.011	88.879	0.000
F.3 <- Environmental Impact	0.925	0.924	0.016	57.082	0.000
G.1 <- Government Support	0.936	0.936	0.009	99.959	0.000
G.2 <- Government Support	0.892	0.890	0.024	36.644	0.000
G.3 <- Government Support	0.935	0.935	0.008	111.741	0.000

Based on the **Table 3**, each of the indications that make up the variables is important. As shown, the forming indicators can be ordered from largest to lowest value based on the original sample values (loading factors).

Table 3 : Validity based on loading factors' values

Variable	Indicators		Loading Factors	Validity
Management Sustainability	A.2	The function of KSM in maintaining wastewater management facilities	0.950	Valid
	A.1	Willingness to pay operational funds and maintenance of wastewater management facilities	0.939	Valid
	A.3	The benefit of wastewater management facilities for the community	0.937	Valid
Technicality	B.4	If the domestic-communal wastewater treatment plants, Biofilter or Septic Tank has problems, there is no need for large funds to repair it.	0.941	Valid
	B.2	Waste disposal channels from communal wastewater treatment plants, biofilters or septic tanks rarely have problems	0.939	Valid

Variable	Indicators		Loading Factors	Validity
	B.3	If there is a problem with waste disposal facilities from the domestic-communal wastewater treatment plants, Biofilter or Septic Tank, it can be easily repaired	0.932	Valid
	B.1	The operations of domestic-communal wastewater treatment plants, Biofilters or Septic Tanks are easy to understand	0.899	Valid
Community Participation	C.1	Willingness of users to carry out operational activities and carry out maintenance of domestic-communal wastewater treatment plants, Biofilter, or Septic Tank	0.940	Valid
	C.2	If the domestic-communal wastewater treatment plants, Biofilter or Septic Tank has problems, there is no need for large funds to repair it	0.934	Valid
	C.4	Willingness to contribute to repair efforts if problems occur with wastewater management channels or facilities	0.931	Valid
	C.3	Willingness to pay operational and maintenance fees for wastewater management	0.918	Valid
Management Institutions	D.5	There needs to be operational funds for wastewater management that come from the user community	0.923	Valid
	D.4	There needs to be routine maintenance activities for wastewater management facilities initiated by management institutions from the community	0.911	Valid
	D.3	There needs to be socialization regarding rules or regulations regarding the use of domestic-communal wastewater treatment plants, Biofilters and Septic tanks	0.900	Valid
	D.6	There needs to be special involvement of women in the continuity of wastewater management in Maleer Village	0.892	Valid
	D.2	There is a need for regulations governing the disposal and handling of domestic wastewater to the wastewater management advice provided by the community	0.890	Valid
	D.1	There is a need for a management institution in the field of domestic-communal wastewater management whose members come from the community	0.887	Valid
Funding	E.5	Wastewater management costs come from trader fees and profits from sanitation management businesses in Maleer Village	0.929	Valid
	E.1	Operational and maintenance costs are obtained from user fees	0.904	Valid
	E.2	Funds are collected from the community only if the wastewater management facility is having problems	0.898	Valid
	E.3	Contribution funds from the community should be managed by a management institution that comes from the community	0.887	Valid
	E.4	The amount of the maintenance fee for wastewater management facilities is the same for each household	0.860	Valid
Environmental Impact	F.1	After the existence of Wastewater Management Facilities, the environmental conditions around the community have improved	0.949	Valid

Variable	Indicators		Loading Factors	Validity
	F.2	After the Wastewater Management Facility was established, the health condition of family members improved	0.940	Valid
	F.3	After the introduction of Wastewater Management Facilities, water-borne diseases (diarrhea, dysentery, typhus, dengue fever) are very rare.	0.925	Valid
Government Support	G.1	The government routinely monitors the condition of Wastewater Management Facilities in Maleer Village	0.936	Valid
	G.3	The government provides alternative solutions to problems that occur in wastewater management facilities	0.935	Valid
	G.2	The government periodically provides guidance in wastewater management	0.892	Valid

The first step in evaluating the PLS structural model is to look at each dependent latent variable's R-square. The outcome of R-square estimate using PLS is shown in **Table 4**.

Table 4 : R-square value

Variable	R-Square	R-Square Adjusted
Management Sustainability	0.942	0.939

Based on the results of the analysis, the answer to the research hypothesis can be obtained as follows. aspects of independent funding by the Community, active Community participation in managing the Wastewater Treatment Plant *(IPAL)*, having a management institution (*KSM*) to monitor Community waste management activities, and Government support in routine monitoring of wastewater management.

1. The aspect of independent funding by the community supports the sustainability of wastewater management.
2. Active community participation in wastewater management can influence the sustainability of wastewater management.
3. Having a management institution (KSM) whose function is to monitor wastewater management activities has an influence on the sustainability of wastewater management.
4. Understanding the technical aspects of wastewater management influences the sustainability of wastewater management.
5. The existence of wastewater management which has a significant impact on the environment can influence the sustainability of wastewater management.
6. Wastewater management does not have a significant impact on the environment and does not affect the sustainability of wastewater management.
7. Government support in routine monitoring of wastewater management has an influence on the sustainability of wastewater management.

Each proposed relationship in PLS is statistically tested through simulation. The bootstrapping procedure for the sample is used in this instance. The PLS bootstrapping analysis yielded the following results:

1. Influence of independent funding on the management sustainability.

The analysis's findings indicate that there is a positive coefficient value of 0.174 between financing and management sustainability. The t-statistic test result is 2.001 and the p-value is significant at 0.045, suggesting that financing and management sustainability have a highly significant impact on each other. Therefore, it is possible to accept the theory that says financing has a favourable impact on managerial sustainability.

2. Influence of community active participation on the management sustainability.

The analysis's findings indicate that there is a positive coefficient value of 0.283 coefficient indicating a relationship between management sustainability and community participation. The t-statistic test value is 3.414 and the P-value is significant at 0.001, suggesting that community participation has a

highly significant impact on management sustainability. Therefore, it is possible to accept the hypothesis that suggests that community participation has a favourable impact on management sustainability.

3. Influence of management intuitions on the management sustainability.

The analysis's findings indicate that there is a positive coefficient value of 0.272 coefficient indicating a relationship between management institutions and management sustainability. The t-statistic test value is 2.935 and the p-value is significant at 0.003, suggesting that management institutions have a highly significant impact on management sustainability. Therefore, it is possible to accept the idea that management institutions have a favourable impact on management sustainability.

4. Influence of technicality on the management sustainability.

The analysis's findings indicate that there is a positive coefficient value of 0.325 between technical and managerial sustainability. There is a highly significant correlation between technical and management sustainability, as shown by the t-statistic test value is 2.642 and the p-value of 0.008 that is significant. Therefore, it is possible to accept the idea that engineering has a favourable impact on management sustainability.

5. Influence of environmental impact on the management sustainability.

The analysis's findings indicate that there is a negative coefficient value of -0.029 between management sustainability and environmental relationship. The t-statistic test value is 0.318 and the p-value is 0.750, which is higher than 0.05. Thus, there is no correlation between Sustainability of Management and Environmental Impact.

6. Influence of government support on the management sustainability.

The analysis's findings indicate that there is a negative coefficient value of a -0.036 between management sustainability and government support. The t-statistic test value is 0.411 and the p-value is 0.681, which is higher than 0.05. As a result, there is no evidence that government support has any bearing on management sustainability.

4. Conclusion

This study identify problems in residential slum areas especially in wastewater management, it has been found poor sanitary condition dan high risk sanitation. Therefore, it is necessary to apply more comprehensive approach for modelling the policies to improve sanitary condition, detailed technical and non technical aspects should accommodates in the policy for community guideline, also government and stakeholders should involved practically.

Wastewater management has been implemented in the Maleer Village slum area through the use of wastewater management technology. 25% of the community's septic tanks, 25% of its wastewater treatment plants, and 50% of its septic tanks are managed by technology. Nevertheless, 77% community never had done desludging on their own septic tank. Therefore, risk sanitation index for Maleer categorize as high risk with the score 283. The risk of sanitation in the Maleer sub-district has declined in tandem with advancements in the non-technical domain through regular reviews and modifications to the wastewater management regulations that are in effect in the Maleer sub-district, as well as in the technical domain through the expansion of the number of management technologies. Maleer Subdistrict has implemented the existing policies in the Slum Settlement Area; however, there are still a few things that need to be optimised, like the technical aspects of management, which are occasionally still off spec under certain conditions.

Maleer Village has implemented the existing financing policies as outlined in Bandung Mayor Decree Number 26 Year 2022 Regarding The Arrangement of Drinking Water and Wastewater Services at the Tirtawening Regional Company In Bandung. Non-technical issues not covered by the Regulations, such community involvement and management institutions, have been implemented in the Maleer Subdistrict, but only in certain areas. The entire Maleer Subdistrict has not seen these changes. Therefore, it is thought necessary to document this implementation in a policy to ensure that it proceeds consistently and sustainably across Maleer Subdistrict. The current implementation of the policy indicates the direction that is appropriate for use in Slum Areas. It is based on community-supported initiatives and statistical data processed through the use of the SmartPLs application.

This data describes the factors that influence wastewater policy, including independent financing, active community participation, the presence of a management institution (*KSM*) to oversee community wastewater management activities, and a thorough understanding of the technical aspects of wastewater management. Therefore, it is decided that these elements should be incorporated in a regulation to help with the implementation of improved wastewater management.

Based on the research results obtained, suggestions for further research includes looking at additional elements, such as support from the private sector and corporate social responsibility, that can help ensure

the sustainability of wastewater management in urban slum regions. Furthermore, Since each location has unique psychological and demographic traits, this research can be conducted in other urban slum regions, resulting in different policies for each region.

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