SOCIAL CAPITAL-BASED EMPOWERMENT MODEL FOR COMMUNITY PARTICIPATION IN HOUSEHOLD WASTE MANAGEMENT IN BANTUL, YOGYAKARTA

Heru Subaris Kasjono [1]*, Yamtana [2],
Purbudi Wahyuni [3] and M. Noviansyah Aridito [4]

[1,2] Politeknik Kesehatan Kementerian Kesehatan Yogyakarta, Yogyakarta, Indonesia.
[3] Universitas Pembangunan Nasional Veteran, Yogyakarta, Indonesia.
[4] Universitas Proklamasi 45, Yogyakarta, Indonesia.
Email: [1]heru.subarisk@poltekkesjogja.ac.id (*Corresponding Author),
[2]yamtana@poltekkesjogja.ac.id, [3]purbudiwahyuni11@gmail.com, [4]noviansyaharidito@up45.ac.id

Abstract

Background and Aim: Indonesia is currently facing two problems: difficulty managing waste collection and rapid waste accumulation. Data in 2019 showed that Indonesia produced 67 million tons of waste of which 15% was plastic waste. Yogyakarta, as one of the major cities in Indonesia, also faces challenges in waste management. Every day, the amount of waste in Yogyakarta continues to increase. This increase in waste volume has led to a waste management crisis. One of the waste management sites in Yogyakarta, TPST Piyungan, has become a big issue in Yogyakarta because it is experiencing overcapacity, receiving an average of 700 tons of waste per day. So this study aims to determine the effect of social capital in Health empowerment on community participation in household waste management in Semail, Bantul, Yogyakarta. **Materials and Methods:** The type of research used is mixed research with a sequential exploration approach. This method begins with the use of qualitative methods, followed by quantitative methods, and ends with interpretation. A qualitative method with a phenomenological approach data collection techniques were carried out using observation, interviews with selected informants by snowball sampling and focus group discussions (FGD). Data analysis for quantitative data, namely univariate, bivariate, and multivariate. **Results:** Social capital has a positive and significant effect on attitudes and household and environmental waste management, but it does not affect community knowledge of waste management. Attitudes are positively and significantly influenced by knowledge; participation in household waste management is positively and significantly influenced by social capital; and attitudes and participation in waste management in the environment are positively and significantly influenced by participation in household waste management, attitudes, and social capital. **Conclusion:** A good waste management model in the community is designed by increasing participation in waste management in the family and the environment through strengthening attitudes by taking into account the social capital of the community. Strengthening attitudes also requires increasing public knowledge in waste management, either through counseling or health promotion.

Keywords: Social Capital, Waste Management, Behavior, Empowerment.

INTRODUCTION

Indonesia is currently facing two fundamental environmental problems: the difficulty of managing waste collection and the rapid buildup of waste. [1]. Data in 2019 showed that Indonesia produced 67 million tons of waste of which 15% was plastic waste. [2]. The waste management system in Indonesia is still 69% concentrated in landfills, 10% of waste is landfilled, 7% of waste is composted and recycled, 5% of waste is burned, and 7% of waste is not managed [3]. So that effective and efficient waste management is an important concern to maintain ecological balance, public health and aesthetics [4] [5].

Yogyakarta, as one of the major cities in Indonesia, faces challenges in waste management [2] [6]. Every day, the amount of waste in Yogyakarta continues to increase along with population growth, urbanization, and changes in consumption patterns. [7][8]. This increase in waste volume has led to a waste management crisis. One of the waste management sites in Yogyakarta is TPST Piyungan.[5]. This integrated waste disposal site has become a major issue in Yogyakarta due to overcapacity, receiving an average of 700 tons of waste per day.[9]. As a result, the Piyungan landfill had to temporarily suspend services and caused a buildup of unmanaged waste in several areas around Yogyakarta. This certainly has a negative impact on environmental health and city aesthetics.

Presidential Regulation No. 97/2017 on theNational Policy and Strategy for Household and Household Waste Management mandates that the central government to local governments must be able to manage 100% (30% waste reduction and 70% waste management) of the waste generated nationally by 2025. In addition, the MoEF has issued Minister of Environment Regulation No. 13 of 2012 concerning guidelines for the implementation of reduce, reuse, recycle (3R) through the Waste Bank. The implementation of the 3Rs, especially composting, can provide considerable opportunities, around 30-40%, and provide economic benefits to the community [10].

Semail Village in Kapanewon Sewon, Bantul Regency, is one of the areas that contributes significantly to TPST Piyungan as some of the waste generated is dumped there. Kapanewon Sewon faces similar waste management problems to other areas. Factors such as community knowledge and geography affect people's behavior in managing waste. For example, some irrigation channels pass through residential areas causing people to dispose of waste there. In addition, rural characteristics with large yards and less dense houses make people tend to burn waste.

The Bantul Regency Government has issued Regional Regulation Number 2 of 2019 concerning Household Waste Management and Waste Similar to Household Waste to deal with this problem. However, waste management in Kapanewon Sewon is not yet in accordance with the regulation, as evidenced by the fact that many people still burn garbage in their yards and throw garbage into rivers or irrigation. The Community-Based Total Sanitation (STBM) program has also been implemented to support the creation of a clean environment. STBM is a new approach to changing hygiene and sanitation behavior through empowerment with triggering methods.

A national strategy for community-based total sanitation (STBM) is needed because sectoral approaches and hardware subsidies have not been effective in changing behavior and improving access to sanitation.[11]. Thus, a new strategy is needed that involves cross-sectors in accordance with their respective duties and functions. The success of programs involving communities depends on natural capital, economic capital, human capital, and social capital. [12] including in community waste management in waste management.

The STBM approach in waste management through community empowerment is based on the application of social capital such as trust, norms, networks, reciprocal relationships, and values. Many interdisciplinary studies from various disciplines have examined social capital [13]. Social capital is a new variable in growth modeling, representing forms of trust and social ties associated with productivity that drive growth [14]. The results of Haryanti S, et al research show that social capital is a force that can encourage the community to maintain commitment and consistency in the

sustainability of waste management, especially through the waste bank program that has been running so far [15].

Social capital and the Community-Based Total Sanitation (STBM) Strategy are theoretical models used to develop community empowerment models in household waste management. This research is expected to identify the influence of social capital and community behavior in household waste management in Semail Hamlet, Bangunharjo, Sewon, Bantul and obtain an appropriate community empowerment modelin household waste management.

MATERIALS AND METHODS

Ethical approval

The Health Research Ethics Commission of The College of Health Sciences of Guna Bangsa Yogyakarta has conducted an assessment of ethical principles based on library studies to protect health research subjects. The research has been approved and appropriate for ethics with the ethical approval number 006/KEPK/XI/2022.

Study period and location

The research was conducted from August to November 2022. This study used samples of community from Semail village, Bangunharjo, Sewon, Bantul, Yogyakarta, Indonesia.

Research Methods

This type of research uses mixed research (Mix Method) with the Sequential Exploration approach. This method begins with the use of qualitative methods followed by quantitative methods and ends with interpretation.
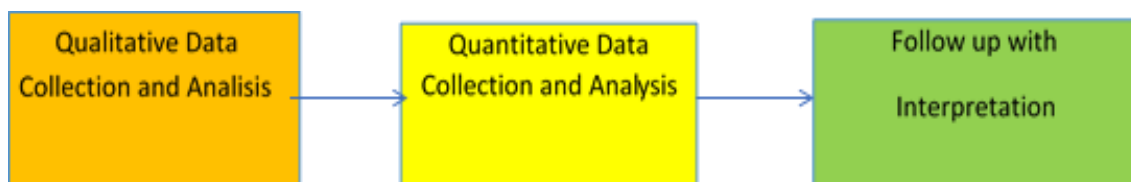

Figure 1: Types of research

A qualitative method with a phenomenological approach data collection techniques were carried out using observation, interviews with selected informants by snowball sampling, and focus group discussions (FGD). Data analysis for quantitative data, namely univariate, bivariate, and multivariate.

Determining the Neighbourhood (RT) for the study area is by determining the number of RTs in each village as the study area. The main sampling unit was selected using random sampling. In this study, at least 30 respondents per RT. Respondents in this study were heads of 46 families or mothers or daughters who were married and aged between 18 to 60 years who represented the selected houses.

RESULTS

Based on the results of the social mapping carried out by the Sewon II Public Health Center (Puskesmas) in Semail Village on the 4th pillar of Community-Based Total Sanitation (STBM) in 2022, there were 312 respondents with characteristics as in the table 1.

Table 1: Characteristics of research respondents

No	Population Factor	Frequency	
		N	%
1	**Age**		
	26-32	32	10.27
	33-39	36	11.54
	40-46	64	20.51
	47-53	48	15.38
	54-60	48	15.38
	61-67	56	17.95
	68-74	28	8.97
	Amount	312	100
2	**Gender**		
	Man	224	74.67
	Woman	88	25.3
	Amount	312	100
3	**Education**		
	No school	24	7.69
	Elementary school is not finished	60	19.23
	Elementary school finished	72	23.39
	Middle school is not finished	4	1.28
	Middle school finished	52	16.67
	High school is not finished	0	0
	High school finished	76	24.36
	College not finished / D1/D2	24	7.69
	College finished / D1/D2	0	0
	Total	312	100
4	**Non-formal education related to waste management**		
	Courses	4	33.33
	Counseling	8	66.67
	Total	12	100
5	**Employment**		
	Unemployment	32	10.56
	Farmer	68	21.79
	Trader	24	7.69
	Self-employed	16	5.13
	Private sector employee	44	14.10
	Civil servants / Polri/TNI	8	2.56
	Fisherman	0	0
	Service	20	6.41
	Others (laborers, village officials, etc.)	100	32.05
	Total	312	100
6	**Marrital Status**		
	Single	18	5.77
	Married	256	82.95
	Widower widow	38	12.18
	Total	312	100
7	**Home ownership**		
	Own property	194	62.18
	Rent/contract	38	12.18
	Parents' property	80	25.64
	Total	312	100

Source: Primary Data Analysis 2022

Table 1 shows that the majority of respondents are aged 40-46 years (20.51%) and are male (74.67%). Most have a high school equivalent education (24.36%). Only 12 respondents (3.84%) have participated in non-formal education on waste management, with counseling being the most common type of non-formal education (66.67%). In terms of occupation, the majority work as laborers, construction workers, village officials, and so on (32.05%). Most respondents are married (82.95%) and own their homes (62.18%). Population characteristics are very important in supporting or hindering health programs. The majority of respondents have never received non-formal education related to waste management, so this needs to be considered regarding the extent of attitudes and knowledge in waste management, especially household waste.

A. Research Results according to Research Variablel

1. Social capital

a. Cognitive social capital

Cognitive social capital consists of four indicators, namely compliance with existing regulations, the role of community leaders and social/community organizations, mutual trust between residents and mutual relations. The results of the study of 312 respondents can be seen in table 2 below.

Table 2: Cognitive social capital

No	Indicator	Category	Frequency	
			N	%
1	Compliance with existing rules	Very obedient	66	21.15
		Comply	246	78.85
		Disobedient	0	0
		Very disobedient	0	0
		Total	312	100
2	The role of community leaders and social / community organization	Very often	0	0
		Often	66	21.15
		Sometimes	138	44.23
		Never	108	34.61
		Total	312	100
3	Mutual trust among residents	Strongly believes	62	19.87
		Believe	250	80.13
		Don't believe	0	0
		Very unbelievable	0	0
		Total	312	100
4	Mutual relations	Very good	98	31.41
		Good	214	68.59
		Not good	0	0
		Very good	0	0
		Total	312	100

Source: Primary Data Analysis 2022

Social capital in the aspect of hamlet residents' compliance with environmental hygiene rules showed that 78.85% of respondents were compliant, while the level of non-compliance was 0%. This compliance follows the direction of religious leaders, cultural values of mutual cooperation, mertidesa, rules for not littering, and participation in clean Friday activities. Meanwhile, social capital in the aspect of the role of community leaders and social organizations in visiting or discussing waste

management is 34.61% never and 44.23% sometimes occurs, while 21.15% of respondents reported often or very often. Social capital in the level of trust of residents to various entities such as family, neighbors, village officials, community leaders, and health workers reached 80.13%. Reciprocal relationships within the family were also good with a frequency of 68.59%. Overall, the research shows that the level of trust in the study area is high, which allows waste management to run well. High social capital with mutual trust between residents helps in dealing with waste problems collectively.

b. Structural social capital

The second cognitive Social Capital relates to the local associations followed by the community of Semail Hamlet. The level of community participation can be identified as high, based on the number of associations followed as well as participation and benefits obtained from local associations. The results showed that 72.43% of respondents actively participated in community activities, while 9.62% of respondents were less active or inactive. A recap of the interview results can be seen in table 3 below.

Table 3: Participation rate

Indicator	Category	N	%
Participation rate	Very active	26	8.33
	Active	226	72.43
	Less active	30	9.62
	Not active	30	9.62
	Total	312	100

Source: Primary Data Analysis 2022

2. Waste management education

The majority of respondents, namely 300 respondents, had never received waste management counseling in Semail Village. While as many as 12 respondents had received counseling related to waste management, of the 12 people who had received counseling about waste management, the results were as shown in table 4.

Table 4: Extension of waste management

No	Indicator	Category	Frequency N	Frequency %
1	Counseling material	Strongly agree	0	0
		Agree	12	100
		Don't agree	0	0
		Strongly disagree	0	0
		Total	12	100
2	Extension method	Strongly agree	2	16.67
		Agree	10	83.33
		Don't agree	0	0
		Strongly disagree	0	0
		Total	12	100
3	Extension media	Strongly agree	1	8.33
		Agree	11	91.67
		Don't agree	0	0
		Strongly disagree	0	0
		Total	12	100
4	Extension capabilities	Very good	1	8.33
		Good	11	91.67
		Not good	0	0
		Very less	0	0
		Total	12	100

Source: Primary Data Analysis, 2022

The waste management extension activities in Semail Village received positive feedback. All 12 respondents (100%) agreed with the extension materials, 10 respondents (83.33%) were satisfied with the methods used, and 11 respondents (91.67%) approved of the media used. In addition, 11 respondents (91.67%) rated the extension workers' ability to provide guidance on waste management as good. The existence of cooperation (bonding), collaboration between various parties (bridging), and social relations (linking) in waste management efforts shows that this system can be communicated and implemented effectively.

3. Participation in the implementation of waste management in the household

Participation in the implementation of waste management can be seen from 2 aspects, namely waste management within the household and within the community. In this study, the results obtained were based on the opinions of 312 respondents, 205 of whom (65.71%) stated that they often did household waste management, and there were no respondents who said they had never done household waste management. Can be seen in table 5 below.

Table 5: Participation in household waste management

Indicator	Category	Frequency	
		N	%
Household waste management	Very often	22	7.05
	Often	205	65.71
	Sometimes	86	27.56
	Never	0	0
	Total	312	100

Source: Primary Data Analysis, 2022

4. Participation in the implementation of waste management in the community

In this study, the results were obtained based on the opinions of 312 respondents, 159 (50.96%) of whom stated that they often carry out waste management in the community. Details in table 6 below.

Table 6: Participation in community waste management

Indicator	Category	Frequency	
		N	%
Community waste management	Very often	16	5.13
	Often	159	50.96
	Sometimes	137	43.91
	Never	0	0
	Total	312	100

Source: Primary Data Analysis 2022

5. Knowledge

The results of this study based on the knowledge of the Semail Village community were obtained from 312 respondents, 173 (55.45%) of whom answered "Correct" in knowledge related to waste processing. Details are listed in Table 7 below.

Table 7: Knowledge

Category	Frequency	Percentage
	N	**%**
Correct	173	55.45
Wrong	139	44.55
Total	312	100

Source: Primary Data Analysis 2022

6. Attitude in waste management

The research results on community attitudes toward waste management in Semail Village, based on responses from 312 individuals, indicate that 182 respondents (57.33%) "strongly agree" with the community's approach to waste management. There were no respondents who "disagreed" or "strongly disagreed" with attitudes toward household waste management. Further details are provided in Table 8 below.

Table 8: Attitudes in waste management.

Category	Frequency	
	N	**%**
Strongly agree	**182**	58.33
Agree	**130**	**41.67**
Don't agree	0	0
Strongly disagree	0	0
Amount	**312**	100

Source: Primary Data Analysis 2022

B. Results of Bivariate Analysis/Hypothesis Testing

1. The results of the influence of social capital on knowledge

Table 9: Social capital on knowledge

Dependent Variable	Independent Variable	Regression coefficient (β)	P
Knowledge	Social Capital	0,001	0,7
			7
R square		0	
Adjusted R		-0,003	

Source: Primary Data Analysis 2022

Based on Table 9, it can be seen that the first hypothesis is not proven with a significance value of 0.707 > 0.05, meaning that there is no significant effect between social capital on knowledge.

The magnitude of the coefficient of determination (R2), of -0.003, which means that there is an influence of social capital on knowledge of -0.003 or -0.3%.

This means that there are other factors that influence knowledge besides social capital.

2. The results of the analysis of the influence of social capital on attitudes

Table 10: The results of the analysis of the influence of social capital on attitudes

Dependent Variable	Independent Variable	Regression coefficient (β)	P
Attitude	Social Capital	0.117	0
			0
R Square	0,107		
Adjusted R Square	0,104		

Source: Primary data analysis. 2022

Based on Table 10 above, it can be seen that the second hypothesis is proven with a significance value of 0.000 <0.05, meaning that there is a significant influence between social capital on attitudes. The magnitude of the coefficient of determination (R2), of 0.107, which means that there is an influence of social capital on attitudes of 0.107 or 10.7%. This means that there are other factors that influence attitudes other than social capital of 89.3%. The regression model is Y = 18.859 + 0.177X.

3. The results of the analysis of the effect of knowledge on attitudes

Table 11: The results of the analysis of the influence of knowledge on attitudes

Dependent Variable	Independent Variable	Regression coefficient (β)	P
Attitude	Knowledge	1,24	0,005
R Square	0,025		
Adjusted R Square	0,022		

Source: Primary data analysis, 2022

Based on Table 11 above, it can be seen that the third hypothesis is proven with a significance value of 0.005 < 0.05, meaning that there is a significant influence between knowledge and attitudes. The magnitude of the coefficient of determination (R2), of 0.025, which means that there is an influence of knowledge on attitude of 0.025 or 2.5%. This means that there are other factors that influence attitudes other than knowledge of 97.5%. The Regression model is Y = 0.35 + 1.24X.

4. The results of the analysis of the influence of social capital, knowledge and attitudes towards participation in household waste management

Table 12: The results of the analysis of the influence of social capital, knowledge and attitudes towards waste management in households

Dependent Variable	Independent Variable	Regression coefficient (β)	P
Waste management in the household	Social Capital	0,066	0
	Knowledge	0,311	0,088
	Attitude	0,061	0,013
Say.F Change	0		
R Square	0,140		
Adjusted R Square	0,131		

Source: Primary data analysis 2022

Based on Table 12 above, it can be seen that the fourth hypothesis is proven with a significance value of 0.000 <0.05, meaning that there is a significant simultaneous influence between social capital, knowledge and attitudes towards participation in household waste management. The magnitude of the coefficient of determination

(R2), equal to 0.140, which means that there is an influence of social capital, knowledge and attitudes simultaneously on participation in household waste management of 0.140 or 14%. This means that there are other factors that influence participation in household waste management by 86%. The regression model is Y = -7.855 + 0.66 X1 + 0.311 X2 + 0.061 X3.

5. The results of the analysis of the influence of social capital, knowledge and attitudes towards waste management in the environment

Table 13: The results of the analysis of the influence of social capital, knowledge and attitudes on waste management in the environment

Dependent Variable	Independent Variable	Regression coefficient (β)
Waste management in the environment	Social Capital	0,018
	Knowledge	0,244
	Attitude	0,033
Say.F Change	0	
R Square	0,148	
Adjusted R Square	0,14	

Source: Primary data analysis, 2022

Based on Table 13 above, it can be seen that the fifth hypothesis is proven with a significance value of 0.000 <0.05, meaning that there is a significant simultaneous influence between social capital, knowledge and attitudes towards participation in waste management in the environment. The magnitude of the coefficient of determination (R2), of 0.148, which means that there is influence of social capital, knowledge and attitudes simultaneously on participation in waste management in the environment of 0.148 or 14.8%. This means that there are other factors that influence participation in household waste management by 85.2%. The regression model is Y = -5.195 + 0.105 X1 + 0.174 X2 + 0.061 X3

6. The results of the analysis of the effect of household waste management on environmental waste management

Table 14: Results of the analysis of the influence of household waste management participation on management participation trash in the environment

Dependent Variable	Independent Variable	Regression coefficient (β)	P
Waste Management in the environment	Waste Management in Households	0,347	0
R square	0,066		
Adjusted R Square	0,063		

Source: Primary data analysis 2022

Based on Table 14 it can be seen that the sixth hypothesis is proven and the magnitude of the coefficient of determination (R2), amounting to 0.066, which means that there is a significant effect of participation in household waste management of 0.066 or 6.6%. This means that there are other factors that influence participation in waste management in the environment by 95.4%. The regression model is Y = 6.853 + 0.347 X.

7. The results of the analysis of the influence of social capital, knowledge, attitudes and household waste management on waste management in the environment

Table 15: The results of the analysis of the influence of social capital, knowledge, attitudes and household waste management on waste management in the environment.

Dependent Variable	Independent Variable	Regression coefficient (β)	P
Waste management in the environment	Social Capital	0,093	0
	Knowledge	0,117	0,63
	Attitude	0,049	0,135
	Waste management in the household	0,183	0,016
Say. F Change	0,000		
R Square	0,164		
Adjusted R Square	0,153		

Source: Primary data analysis 2022

Based on Table 15 above, it can be seen that the seventh hypothesis is proven with a significance value of 0.000 <0.05, meaning that there is a significant simultaneous influence between social capital, knowledge, attitudes and participation in household waste management on participation in waste management in the environment. The magnitude of the coefficient of determination (R2), of 0.164, which means that there is influence of social capital, knowledge, attitudes and participation in household waste management simultaneously on participation in waste management in the environment of 0.164 or 16.4%. This means that there are other factors that influence participation in household waste management by 84.6%. Y = -3.755 + 0.093 X1+ 0.117 X2 + 0.049 X3 + 0.183 X4.

Based on path analysis, a model that fits the research is obtained in figure 2.
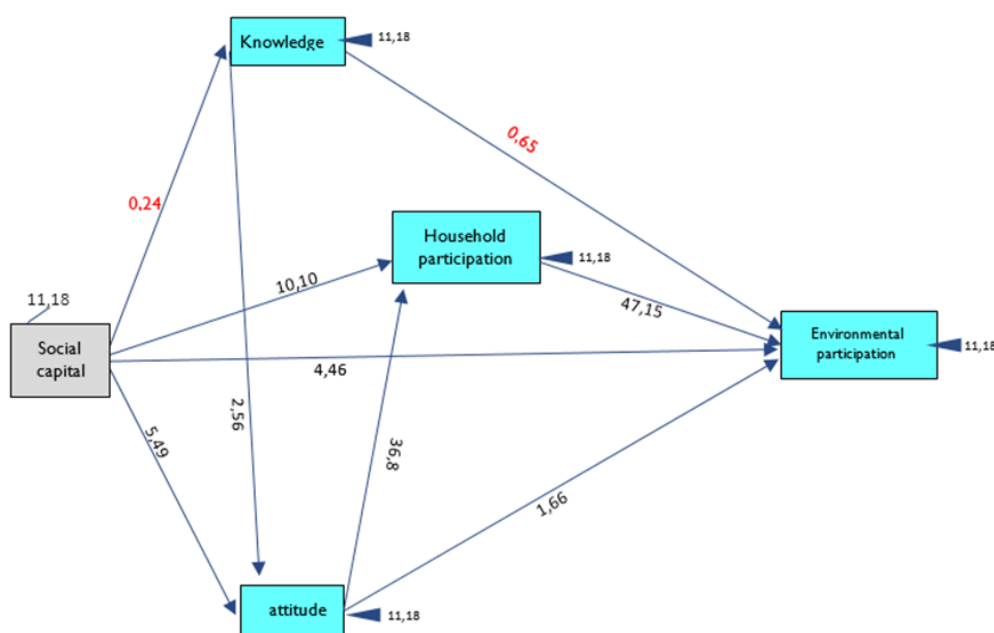
Figure 2: Fit Model

The fit model value, obtained chi square value = 0.15, df = 1 p-value = 0.70172, and RMSEA value = 0.000. This value meets the fit model criteria where the p-value <0.05, and the RMSEA value <0.08. Because the model is FIT, path interpretation can be carried out. The results of the interpretation of the path influence can be seen in Table 16.

Table 16: Interpretation Results of Path Analysis

| Variabel	p-value	Conclusion
Social Capital*Knowledge	0.24	No Significant
Social Capital *Attitude	5,49	Significant
Social Capital *Household Partisipation	10.10	Significant
Social Capital *Environment Partisipation	4,46	Significant
Knowledge* Attitude	2.56	Significant
Knowledge * Environment Partisipation	0,65	No Significant
Attitude * Household Partisipation	36.8	Significant
Attitude * Environment Partisipation	1,66	Significant
Household Partisipation * Environment Partisipation	47,15	Significant

The analysis results revealed that social capital does not affect knowledge. However, social capital significantly influences attitudes, household participation, and environmental participation. Additionally, knowledge significantly influences attitudes but does not affect environmental participation. Attitudes significantly influence household participation but do not affect environmental participation. Lastly, household participation significantly influences environmental participation. A summary of the direct and indirect effects of the independent variables in the research on environmental waste management is presented in Table 17.

Table 17: Summary of direct and indirect influences on waste management in the environment

Dependent Variable	Independent Variable	Influence (%)		Total
		Direct (%)	Undirect (%)	
Environment	Social Capital	29,5	3,8	33,3
Participation	Knowledge	2,6	1,3	3,9
	attitude	8,5	1,9	10,4
	Household Participation	13,6	0	13,6

Path analysis of the direct and indirect influence of variables on environmental participation shows that social capital, knowledge, attitude, and household waste management participation directly impact environmental participation by 29.5%, 2.6%, 8.5%, and 13.6%, respectively, as shown in Table 17. In terms of total influence, these factors contribute to environmental participation by 33.3%, 3.9%, 10.4%, and 13.6%, respectively

Based on the path analysis above, a new concept was identified, which was then integrated with the results of interviews and FGDs conducted in Dusun Semail, Bantul. The final outcome of this research is a social capital-based empowerment model in household waste management, as depicted in Figure 3.
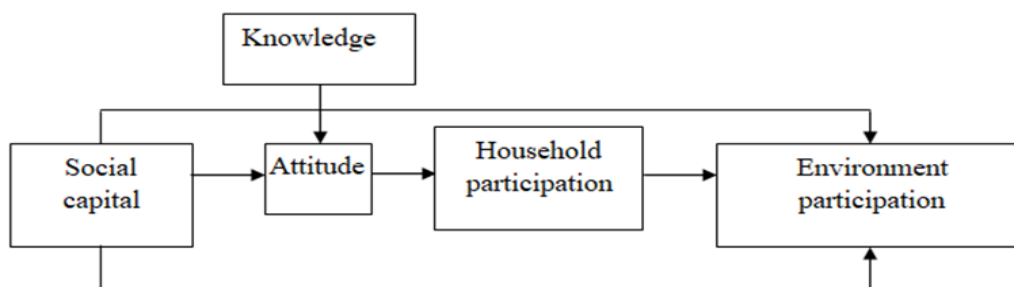
Figure 3: Concept of Health Empowerment Model in Waste Management in Semail Village

DISCUSSION

Based on the analysis of the research results, it shows that social capital has a positive effect on community attitudes and household waste management. This is in line with research (Yexin Zhou et, all, 2022) that social capital has a significant positive impact on individual behavior in waste selection.[16] and social capital can increase the dissemination of waste sorting information, thereby increasing the frequency of waste sorting behavior among urban residents [17]. In addition, social capital also has a significant positive effect on participation in waste management. Based on the results of the model as a whole, aspects of household participation and neighborhood participation have an important role in waste management efforts. This situation is caused by the model of intervention efforts based on households and the environment is a source of success in achieving the goal of complete waste management. In this community situation, strengthening social capital, especially in the cognitive aspect, is much more efficient in an effort to increase resources in the community.

The results illustrate that strengthening social capital may be more *sustainable* with counseling and mentoring programs related to waste management. This is supported by previous research that social capital has a positive impact on society through economic development [18]-[20], improved governance [21][22], environmental safety [23][24], community organizing [25] and public health counseling and promotion [3][26]. This is also in line with research (Kasjono et, al, 2023) that the main strategy in problem solving is institutional strengthening based on social capital, especially network aspects and the value of trust, comfort and relationships.[27].

Waste management programs that will be implemented by the government or social institutions or anyone else still pay attention to the needs, conditions, local potential and situation of the community or in short, the social capital of the community. For this

reason, identifying the social capital of the community that will be mobilized in waste management, especially in terms of trust and the role of community leaders. Because paying attention to the social capital of the community will have a greater influence on the community both in the household and the environment, so that the waste management program can run sustainably. Knowledge possessed by the community will affect community attitudes, but the strongest influence on community attitudes in waste management is social capital.

Community social capital is an important factor to support the success of health promotion in waste management. Aspects that need to be considered by government officials or anyone who will mobilize the community in waste management are; community compliance with existing rules, especially related to waste management, the role of community leaders, the level of mutual trust between residents and those in their environment, mutual relations between residents, organizations or local groups that residents participate in and the level of participation in these groups. The more officers understand the community's social capital, the more they will be able to improve community attitudes, the level of participation in their households and neighborhoods, which in turn will lead to responsible waste management.

CONCLUSION

Based on the results of the research and discussion, several research conclusions can be drawn, including:

1. Social capital has a positive and significant effect on attitudes, household and environmental waste management, but does not affect people's knowledge of waste management.

2. Attitudes are positively and significantly influenced by knowledge.

3. Household participation in waste management is positively and significantly influenced by social capital and attitudes.

4. Participation in waste management in the environment is positively and significantly influenced by participation in household waste management, attitudes and social capital.

5. A good waste management model in the community is designed by increasing participation in waste management in the family and the environment through strengthening attitudes by taking into account the social capital of the community. Strengthening attitudes also requires increasing public knowledge in waste management, either through counseling or health promotion.

References

1) A. Brotosusilo, S. H. Nabila, H. A. Negoro, and D. Utari, "The level of individual participation of community in implementing effective solid waste management policies," *Glob. J. Environ. Sci. Manag.*, vol. 6, no. 3, pp. 341–354, 2020, doi: 10.22034/gjesm.2020.03.05.

2) M. H. Aryantie and M. Y. Hidayat, "Regulatory evaluation of waste management institutions in Yogyakarta, Sleman, and Bantul Metropolitan Areas," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 407, no. 1, 2019, doi: 10.1088/1755-1315/407/1/012015.

3) M. Ahmad, U. S. Tri, W. Tri, and R. Novia, "Community Empowerment in Waste Management Area for Sustainable Development," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 281, no. 1, 2019, doi: 10.1088/1755-1315/281/1/012019.

4) M. Ramaiah, R. Avtar, and M. M. Rahman, "Land cover influences on LST in two proposed smart cities of india: Comparative analysis using spectral indices," *Land*, vol. 9, no. 9, 2020, doi: 10.3390/LAND9090292.

5) S. Suhardono *et al.*, "Multidimensional factors of community behavioral responses and implications to landfill closures: A case study in Yogyakarta, Indonesia," *Environ. Adv.*, vol. 16, no. April, p. 100533, 2024, doi: 10.1016/j.envadv.2024.100533.

6) E. Putra, H.P., Damanhuri, E. & Sembiring, "The role of MRF in Indonesia's solid waste management system (case study of the Special Region of Yogyakarta, Indonesia).," *J Mater Cycles Waste Manag*, vol. 22, pp. 396–404, 2020, doi: https://doi.org/10.1007/s10163-020-00979-7.

7) H. B. Sharma *et al.*, "Challenges, opportunities, and innovations for effective solid waste management during and post COVID-19 pandemic," *Resour. Conserv. Recycl.*, vol. 162, no. May, p. 105052, 2020, doi: 10.1016/j.resconrec.2020.105052.

8) J. M. Chisholm *et al.*, "Sustainable waste management of medical waste in African developing countries: A narrative review," *Waste Manag. Res.*, vol. 39, no. 9, pp. 1149–1163, 2021, doi: 10.1177/0734242X211029175.

9) E. Y. Setyawati, M. T. S. Budiastuti, M. Wijaya, and P. Setyono, "The Contribution of Community Social Capital in Resolving the Environment: Case Study in Regional Landfill Area of Piyungan, Yogyakarta, Indonesia," *Indones. J. Geogr.*, vol. 55, no. 2, pp. 302–310, 2023, doi: 10.22146/ijg.79779.

10) [1H. Mundiri, A., & Baharun, "Empowerment of Women Farmers Groups in Improving Family Economic Standards through Production and Marketing of Products Based on Local Excellence in Prasi Gading Probolinggo. ICON:," *Indones. J. Community Enggegment*, vol. 1, no. 2, pp. 73–82, 2021.

11) N. F. Fitriyah, R. Markus, and Z. Lawang, "Peran Modal Sosial dalam Meningkatkan Sanitasi Lokal : Sebuah Kasus Study of Bahbul Village , Kertaraharja , Sobang , Pandeglang , Banten Province," vol. 04, pp. 539–551, 2024.

12) Eriksson M., *Social Capital, Health and Community Action.* Health (San Francisco), 2010.

13) Liu et al., "The Role of Sosial Capital in encouraging Residents' pro-environmental Behaviours in Community Based Ecotourism.," *Tour. Manag.*, vol. 41, pp. 190–201, 2014.

14) et al. Lopez, A.F., "When Sociable Workers Pay-Off: Can Firms Internalize sosial Capital Eksternalities. Structural Change and Economic Dynamics.," pp. 127–126, 2012.

15) S. Haryanti, S. P. Ganefati, and S. Muryani, "The Social Capital and Impact in Waste Management of the Waste Bank System in Yogyakarta Indonesia," *J. Enginer. Environ.*, vol. 24, no. 2, pp. 190–199, 2023.

16) Y. Zhou, H. Song, X. Huang, H. Chen, and W. Wei, "How Does Social Capital Affect Residents' Waste-Separation Behavior? Evidence from China," *Int. J. Environ. Res. Public Health*, vol. 19, no. 6, 2022, doi: 10.3390/ijerph19063469.

17) L. Chen and M. Gao, "Novel information interaction rule for municipal household waste classification behavior based on an evolving scale-free network," *Resour. Conserv. Recycl.*, vol. 168, 2021, doi: https://doi.org/10.1016/j.resconrec.2021.105445.

18) T. Engbers, B. Rubin, and C. Aubuchon, "The currency of connections: An analysis of the urban economic impact of social capital.," *Econ. Dev. Q.*, vol. 31, pp. 37–38, 2016, doi: https://doi.org/cd5c.

19) N. P. Makarem, "Social networks and regional economic development: The Los Angeles and Bay Area metropolitan regions, 1980–2010.," *Environ. Plan. C Polit. Sp.*, vol. 34, pp. 91–112, 2016, doi: https://doi.org/cd5f.

20) M. Woolcock, "Social capital in theory and practice: Where do we stand? In J. Isham, T. Kelly, & S. Ramaswamy (Eds.)," *Soc. Cap. Econ. Dev.*, pp. 18–39, 2002.

21) D. P. Aldrich and M. A. Meyer, "Social capital and community resilience.," *Am. Behav. Sci.*, vol. 59, pp. 254–269, 2014, doi: https://doi.org/f6tr2d.

22) R. Birk, "Infrastructuring the social: Local community work, urban policy and marginalized residential areas in Denmark.," *Environ. Plan. A,* vol. 49, pp. 767–783, 2017, doi: https://doi.org/f95vcw.

23) G. Price, "Broken windows and crime in development challenged urban areas: Evidence from Jackson, Mississippi USA.," *J. Dev. Areas*, vol. 50, pp. 209–220, 2016, doi: https://doi.org/cd5g.

24) F. Sampson, R. J., Raudenbush, S. W., & Earls, "Neighbourhoods and violent crime: A multilevel study of collective efficacy.," *Science (80-.).*, vol. 277, pp. 918–924, 1997, doi: https://doi.org/bg5rs9.

25) & N. K. Johansson S., Leonard R., "Caring and the generation of social capital: Two models for a positive relationship.," *Int. J. Soc. Welf.*, vol. 21, pp. 44–52, 2012, doi: https:// doi.org/c7wjst.

26) & G. M. Berkman L. F., Kawachi I., "Social epidemiology," Oxford, UK: Oxford University Press., 2014.

27) Kasjono HS, Suwerda B, Haryanti S, Ariff TM, "The social capital strengthening and its development alternatives of waste banks in Java.," *J. Aisyah J. Health Scince.*, vol. 8, no. 2, pp. 665–74., 2023.