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The Effect of Social Capital on the Sustainability of the Waste Bank Program in Bondowoso Regency

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ABSTRACT
Bondowoso is one of the cities in Indonesia that has contributed significantly to the total volume of national waste with total waste generated reaching 470 tons per day. In order to overcome these problems, the government through the Department of Environment and Transportation of Bondowoso seeks to establish a waste bank in the hope of inviting the public to participate in sorting waste from its source so that no more garbage enters the landfill or at least can reduce the volume of waste entering the landfill. The method of collecting data using questionnaires and interviews collected from 5 groups of waste banks with a total of 69 research respondents. Data were analyzed using descriptive quantitative methods and multiple linear regression tests. The results showed that there was a significant influence between social capital on the sustainability of the waste bank program with a regression coefficient of .000.
Keywords: Social Capital, Waste Bank,

INTRODUCTION

Garbage is a global issue that, if not handled properly, will have an impact on health and environmental damage. According to a survey conducted by the World Economic Forum's Global Sharpers Survey (2017), for more than 3 years, environmental damage due to waste still ranks first as the most critical problem in the world that needs to be taken seriously. The proliferation of waste has destroyed the balance of the ecosystem today and even later if the waste problem is not resolved.

Based on the results of research by Jambeck (2015), Indonesia produces 187.2 million tons of waste into the sea and ranks as the second-largest contributor of plastic waste in the world after China. The Ministry of Environment and Forestry stated that Indonesia is currently in a plastic waste emergency. Statistical data shows that in 2016 with a population of 261,115,456 people, the waste generated reached 65,200,000 tons per year (Indonesian Environmental Statistics, 2018). This number will continue to increase in line with population growth and consumption patterns.

Bondowoso is one of the districts in Indonesia that cannot be separated from the problem of environmental damage due to waste. There are 23 sub-districts in Bondowoso district with a total waste production of 470 tons per day (SIPSN, 2018). Based on data obtained from the National Waste Management Information System (SIPSN) of the Ministry of Environment, the average source of waste comes from household activities and traditional markets.

The waste problem in Bondowoso can be said to be quite serious. Heaps of garbage can be easily found on roads, riverbanks, and in rice fields. Waste management in Bondowoso Regency still uses the old paradigm, which is the open dumping system. Waste management using this system raises new problems, including the conversion of agricultural land into a final disposal site due to the existing landfill that is no longer able to accommodate waste disposal. The government realizes that sooner or later this system must be changed, considering that the open dumping system is not the right solution to deal with the waste that continues to accumulate. Therefore, in 2014, the Department of

Environment and Transportation of Bondowoso Regency attempted to establish a waste bank in the hope of inviting the community to participate in sorting waste from its source so that no more waste goes to the landfill or at least can reduce the volume of waste that goes to the landfill.

According to the Secretary of the Department of Environment and Transportation of Bondowoso Regency, there should have been more than 15 waste banks that had been successfully established in several areas of Bondowoso Regency, but there were only about 5 waste banks left. This fact shows that the existence of waste banks in the Bondowoso Regency is still low, so it is necessary to research what factors cause the remaining 5 waste banks to still exist. So that the formation of new waste banks will be able to pay more attention to these factors.

The waste bank is a community participation-based waste sorting program with management like a bank. Like other programs, the waste bank program should be established with the principle of sustainability to have a long-term impact, not just a temporary stand. The concept of sustainability itself arises from the term sustainable development, which is a development process with the principle of meeting the needs of the present without compromising future generations (WCED, 1987). Meanwhile, according to Nasdian (2014) program sustainability is the ability of a program to maintain the implementation of services, or its usefulness even though it has been separated from the assistance of other parties.

Waste bank management to achieve sustainability turns out to have a close relationship with the mechanism of relations and social networks, this study based on the sociological aspect is the implementation of social capital. In waste bank management, there are interrelated and interacting actors who are bound by the social capital component (Widodo, 2014). Social capital is the relationships within the group to increase access to information and the participation of parties involved in the waste bank. The close relationship between the parties who are bound by social capital will encourage sustainability. Based on the findings from Buswijaya (2019), it is known that 3 elements of social capital support waste bank management, namely norms, trust, and networks.

This research is a development of research conducted by Buswijaya (2019) with a different approach. This study aims to deepen the analysis and provide quantitative evidence regarding the factors that influence the sustainability of the waste bank program from the aspect of social capital owned by the waste bank driving group.

METHOD

This research is a type of explanatory research that explains the influence between research variables through hypothesis testing that has been formulated. This type of research aims to test a theory or hypothesis in order to strengthen or even reject the theory or hypothesis from the results of the research that has been done. The approach used descriptive quantitative. The method used for data collection was a survey method and structured interviews. Quantitative data were collected using questionnaires, while qualitative data were obtained by in-depth interviews with research respondents. The study was conducted for 5 months, starting from March to June 2020. Data collection was carried out in 5 groups of waste banks located in the Bondowoso Regency area. The research population is 226 members of 5 waste banks. The following is the population in this study.

Table 1. Research Population

No	Name of the Waste Bank	Number of Members
1	Tanjung	60
2	Ceria Mandiri	60
3	Al-Barokah	30

4	Sekarputih	40
5	Sahabat Rakyat	36
TOTAL		226

Source: Primary Data, 2020

Sampling was done by a proportionate random sampling technique. Samples were taken proportionally according to the number of members in each waste bank. Then individual samples are taken randomly, where the sampling is done randomly so that it can represent the actual situation in the field. Sampling using the Slovin formula, to obtain a research sample of 69 people. Based on the sampling results, the distribution of respondents per group of waste banks is as follows.

Table 2. Research Sample

No	**Name of the Waste Bank**	Population	Sample
1	Tanjung	60	18
2	Ceria Mandiri	60	18
3	Al-Barokah	30	10
4	Sekarputih	40	12
5	Sahabat Rakyat	36	11

Source: Primary Data, 2020

There are two variables which are the independent variable (X) and the dependent variable (Y). The independent variable in this study is social capital which can be seen from norms, beliefs, and networks. While the dependent variable is the sustainability of the waste bank program can be seen from environmental aspects, technical aspects, social aspects, economic aspects, as well as institutional and policy aspects. Simple linear regression analysis was used to test the effect of variable X on variable Y with the help of the Statistical Package For The Sciences (SPSS 20) software. The simple linear regression model used in this study is as follows:

Y = a + bX

a = constant number of unstandardized coefficients

b = variable regression coefficient number X

While the hypotheses in this study are:

H0 = Social capital has no significant effect on the sustainability of the waste bank program

H1 = Social capital has a significant effect on the sustainability of the waste bank program

Before testing to determine the effect of the independent variable (social capital) on the dependent variable (sustainability of the waste bank program) using simple linear regression, it is necessary to test the classical assumptions on the data that has been obtained. This is to find out whether in the linear regression model there are problems with classical assumptions. Several classical assumption tests used in this study are the Kolmogorov Smirnov normality test, linearity test, and heteroscedasticity test (Glejser test).

RESULT

The Use of Social Capital

The analysis of social capital in waste banks can seen from the level of compliance with norms, the level of trust, and the willingness to form social networks. The following are the results of data collection from research respondents.

Table 3. The Use of Social Capital

No	Indikator	Kategori	F	%
1.	Norm	High	67	97%
		Medium	2	3%
		Low	-	-
		Total	69	100%
2.	Trust	High	67	97%
		Medium	2	3%
		Low	-	-
		Total	69	100%
3.	Network	High	32	46%
		Medium	29	42%
		Low	8	12%
		Total	69	100%

Source: Primary Data, 2020

a. Norm

Based on Table 3 above, it can be seen that there are 67 people (97%) with a high level of obedience to the norm, 2 people (3%) with a moderate level of obedience to the norm. Norms are understandings, values, expectations, and goals that are believed and carried out together by a group of people. The norms contained in the groups are not so different from one another. The norms are understood by all members even though they are not written, for example, the obligation to participate in group activities, members are obliged to deposit their waste in a sorted state, and prohibition of littering. If these norms are violated, there will be sanctions, for example when members deposit their waste, not in a segregated state, there will be a reduction in the purchase price of waste. If there is someone who violates the applicable norms, that person will get sanctions or laws as a consequence of his actions.

b. Trust

Viewed from the level of trust, it was found that 67 people (97%) had a high level of trust in the group and 2 people (3%) had a low level of trust in the group. Trust is a hope that grows in society which is indicated by honest, orderly, and cooperative behavior based on shared norms. Group members have high trust in the board and chairperson. This mutual trust has been built by the group for a long time, even since there was no waste bank. One of these beliefs is implemented in the form of an honesty waste bank, where members can save and weigh their waste in the provided place even though there is no administrator. According to Cox (1995), high trust in society can encourage good cooperative relationships.

c. Network

Furthermore, from the network aspect, it can be seen that 32 people (46%) have a high desire to actively form a social network, 29 people (42%) have a moderate desire, and 8 people (12%) have a low desire to form a network. A network is a series of social relationships that form a system that is used to maintain and develop interpersonal relationships. In the management of the five waste banks,

it was found that there were social relationships that formed a network. This social relationship is formed because of joint activities that are often held, such as recreation and the social gathering. This makes their social ties even stronger, plus they live in the same community unit area, thus making the members of this waste bank have to greet and meet almost every day. In addition, other social networks are also formed through interactions between groups that are bridged by the chairman and administrators. The chairman and management of each waste bank always share information through the Bondowoso waste bank what's app group, sometimes the head of the waste bank that has been established earlier also provides guidance and assistance for new waste banks.

Waste Bank Program Sustainability

The sustainability of the waste bank program is seen from environmental aspects, technical aspects, social aspects, economic aspects, as well as institutional and policy aspects. The following are the results of data collection for the sustainability of the waste bank program from research respondents.

Table 4. Sustainability of the Waste Bank Program

No	Indicators	Categories	F	%
1.	Environmental Aspects	High	65	94%
		Medium	4	6%
		Low	-	-
		Total	69	100%
2.	Technical Aspects	High	43	62%
		Medium	21	30%
		Low	5	8%
		Total	69	100%
3.	Social Aspects	High	34	49%
		Medium	33	48%
		Low	2	3%
		Total	69	100%
4.	Economic Aspects	High	63	91%
		Medium	6	9%
		Low	-	-
		Total	69	100%
5.	Institutional And Policy Aspects	High	65	94%
		Medium	3	4%
		Low	1	2%
		Total	69	100%

Source: Primary Data, 2020

a. Environmental Aspect Sustainability

Based on Table 3 above, it can be seen that there are 65 people (94%) stating that the sustainability of the waste bank from the environmental aspect is in the high category and 4 people (6%) stated that the sustainability of the waste bank from the environmental aspect is in the medium category. The sustainability of the waste bank program is based on environmental aspects in terms of the impact given by the waste bank program on the quality of the environment around the coverage area. This can be seen from members' perceptions of changes or improvements in cleanliness, air quality, beauty, and the presence of disease vectors. All respondents have realized the positive impact

of having a waste bank in their environment, namely increasing cleanliness and awareness of the importance of health. This increase in cleanliness in the end also encourages respondents to plant plants around their home environment, as a form of optimizing the utilization of organic waste that has been processed. This activity ultimately creates beauty and reduces the breeding ground for disease vectors.

b. Technical Aspect Sustainability

As many as 43 people (62%) stated that the sustainability of the waste bank from the technical aspect was in the high category, 21 people (30%) stated that the sustainability of the waste bank from the technical aspect was in the medium category and 5 people (8%) stated that the sustainability of the waste bank from the technical aspect is included in the low category. The sustainability of the waste bank program is based on technical aspects in terms of the suitability of integrated waste management by respondents or members of the waste bank. Some things that need to be known are how to manage organic waste, the amount of waste that is managed, and the residue that is dumped into the environment. Most of the waste banks have done good management of inorganic waste. However, these waste banks have not managed organic waste and are still focused on accepting savings in the form of plastic waste that can be sold and have economic value. So that the management of organic waste which has more volume than inorganic waste has been neglected because they consider it has no economic value. Only a small proportion of respondents have a high awareness of managing organic waste independently at home.

c. Economic Aspect Sustainability

Meanwhile, 34 people (49%) stated that the sustainability of the waste bank from the economic aspect was in the high category, 33 people (48%) stated that the sustainability of the waste bank from the economic aspect was in the medium category and 2 people (3%) stated that the sustainability of the bank waste from the economic aspect is included in the low category. The sustainability of the waste bank program based on the economic aspect is seen from the ability of the waste bank to manage finances and the economic impact given to the driving figures of members and administrators. Most of the respondents who are members of the waste bank realize that the waste bank has an economic impact in the form of additional income and is very beneficial for them. In addition, the existence of a waste bank also provides few job opportunities for the people around them by becoming part of the administration or joining the craft team. However, according to several respondents, several times there have been delays in paying the incentives that are set to be taken every year. Based on the results of interviews with group leaders, this delay occurred due to poor financial management.

d. Social Aspect Sustainability

In addition, 63 people (91%) stated that the sustainability of the waste bank from the social aspect was in the high category, 6 people (9%) stated that the sustainability of the waste bank from the social aspect was in the medium category. The sustainability of the waste bank program from the social aspect is seen from the role of the driving figures of members, administrators, and support from community leaders. Therefore, the questions in the questionnaire include participation in the implementation of the waste bank program by the community as reflected in the willingness to apply the 3R principles, members' perceptions of the activeness of the management, and support from community leaders such as the head of villagers.

Almost all of the respondents stated that they have been doing waste sorting consistently in their homes. Waste is divided into 3 types, which are organic waste, inorganic waste (plastic, glass bottles, and cans), and paper waste. In addition, respondents also tried to apply the 3R principles in their waste management, although it was still very difficult and some thought that it was very

inconvenient, especially in reducing the use of plastic. The interesting thing is that almost all members are involved in recycling the waste that they have collected, especially when the price of the waste is low. For example, plastic waste is recycled into crafts, eco-bricks, and biopore. In addition, the existence of this waste bank program also received positive support from community leaders.

e. Policy and Institutional Aspect Sustainability

Meanwhile, from the policy and institutional aspect, 65 people (94%) stated that they were in the high category, 3 people (4%) stated that they were in the medium category and 1 person (2%) stated that the sustainability of the waste bank from the policy and institutional aspects was in the middle category. in the low category. The sustainability of the waste bank program based on institutional and policy aspects is seen from the suitability of the roles and functions of regulators and operators in waste management. In addition, the policies referred to here include statutory provisions regarding environmental management, regulations related to public order, city or environmental cleanliness, as well as regulations related to the establishment of environmental management organizations or institutions. The waste bank which is the object of research has carried out operational records well, its members also have individual passbooks and there is a ledger that serves as a guide for the management. In addition, the waste bank management has qualified competence because they have received direct guidance from the environmental service. As for the policy on solid waste, most of the respondents knew about it, but they did not understand the contents of the law.

Normality test

Normality test is one of the requirements of simple linear regression analysis. The normality test is used to determine whether the data obtained from the research results are normally distributed or not. The data is said to be normally distributed if the value of Sig. > .05. The following are the results of the Kolmogorov Smirnov normality test in this study.

Table 5. Normality Test Results

		Unstandardized Residual
N		69
Normal Parameters[a,b]	Mean	0E-7
	Std. Deviation	4,99902155
Most Extreme Differences	Absolute	,097
	Positive	,052
	Negative	-,097
Kolmogorov-Smirnov Z		,810
Asymp. Sig. (2-tailed)		,528

Source: SPSS, 2020

Based on Table 5 above, it is known that the Asymp Sig. .528 > .05. This result implies that the research data are normally distributed.

Linearity Test

Linearity test is used to determine the linear relationship between the independent variable and the dependent variable. This test is also one of the requirements of regression analysis. The relationship between the independent variable and the dependent variable is said to be linear if the deviation from linearity Sig. > .05 and the calculated F value < F table. The following are the results of the linearity test of research data analyzed using SPSS 20 software.

Table 6. Linearity Test Results

		F	Sig.
Between Groups	(Combined)	4,909	,000
	Linearity	32,849	,000
	Deviation from Linearity	,918	,499

Source: SPSS, 2020

Based on Table 6, it can be seen that the deviation from linearity Sig. of .499 > .005 and the calculated F value of .918 < F table (2.17). These results can be interpreted that there is a linear relationship between the independent variable, which are social capital and the dependent variable, that the sustainability of the waste bank program.

Heteroscedasticity Test

Heteroscedasticity test is one of the tests that must be carried out on the data to be analyzed using regression. The heteroscedasticity test is used to test the variance in the residual value from one observation to another. A good regression model should not have heteroscedasticity symptoms. The heteroscedasticity test in this study used the Glejser test with the condition that if the value of Sig. > .05 then there is no heteroscedasticity symptom in the regression model.

Table 7. Glejser Test Results

Coefficients[a]			
Model	Standardized Coefficients	t	Sig.
	Beta		
(Constant)		3,051	,003
Modal_Sosial	-,197	-1,641	,106
a. Dependent Variable: Res_Abs			

Source: SPSS, 2020

Table 7 clearly shows that the social capital variable has a Sig value. of .106 > .05. So it can be concluded that there is no symptom of heteroscedasticity between the social capital variable and the Abs_res variable.

Simple Linear Regression Analysis

Simple regression analysis was used to determine whether there was an effect between social capital variables on the sustainability variable of the waste bank program. The following is the result of simple linear regression analysis in this study.

a. Estimating Simple Linear Regression Equation

Simple linear regression analysis begins by estimating the regression model. The following is an estimate of the simple linear regression model in this study.

Tabel 8. Coefficients

Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	21,750	5,673
	Modal_sosial	1,350	,235

Source: SPSS, 2020

Based on Table 8, it is known that the value of Constant (a) is 21.750, while the value of social capital (b/ regression coefficient) is 1.350, so the regression equation can be written as follows:

Y = a + bX

Y = 21,750 + 1.350X

The equation can be interpreted, as follows:

1. The constant of 21.750, implies that the consistent value of the sustainability variable of the waste bank program is 21.750.
2. The regression coefficient of X is 1.350, which means that for every 1% addition to the value of social capital, the value of the sustainability of the waste bank program increases by 1.350. The regression coefficient is positive, so it can be said that the direction of the influence of the social capital variable (X) on the sustainability variable of the waste bank program (Y) is positive.

b. Hypothesis testing

Hypothesis testing was conducted to determine whether there was an effect of social capital on the sustainability variable of the waste bank program by comparing t count and t table or significance value. The following are the coefficients of SPSS data processing results.

Table 9. Hypothesis Test Results

Coefficients[a]			
Model		t	Sig.
1	(Constant)	3,834	,000
	Modal_Sosial	5,756	,000

a. Dependent Variable: Keberlanjutan

Source: SPSS, 2020

Based on Table 9 above, it can be seen that the significance value is .000 < .05 and the t-count value is 5.756 > 1.671. So it can be concluded that there is a significant influence between the social capital variable and the sustainability variable of the waste bank program. This means that the alternative hypothesis (H1) is accepted and the null hypothesis (H0) is rejected.

c. Coefficient of Determination

The coefficient of determination is used to determine the contribution of the influence given by the independent variable or independent variable (X) to the dependent variable or dependent variable (Y). The coefficient of determination can be seen in the table model summary column R square. The value of the coefficient of determination in this study can be seen in table 10.

Table 10. Coefficient of Determination

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,575[a]	,331	,321	5,036

Source: SPSS, 2020

Based on Table 10, it is known that the coefficient of determination or R Square is .331. This means that the independent variable, namely social capital, has a significant influence on the sustainability variable of the waste bank program by 33.1%. While the remaining 66.9% is influenced by other variables outside the social capital variable.

DISCUSSION

Social capital is a resource inherent in social relations that can be utilized for personal and group interests (Putnam, 1993). Social capital variables were measured using a psychosocial approach with 3 indicators, namely trust, norms, and networks. The results of simple linear regression analysis show that the value of Sig. (.000) < .05. This means that social capital has a significant effect on the sustainability of the waste bank program with a 95% confidence level. This means that the higher the

utilization of social capital, the higher the level of sustainability of the waste bank program in the Bondowoso Regency. The results of this study are in line with research conducted by Buswijaya (2019) which states that social capital with elements of trust, networks, and norms has a very important role in the sustainability of the waste management process in the Waste Bank. After being traced, it turns out that social capital also has a real and significant effect on the sustainability of farmer institutions, namely the Sumber Mulyo Farmers Association (Fanbellisa, 2019). Based on research conducted by Thobias, et al (2013) stated that social capital has a major influence on entrepreneurial behavior in this case the most influential element is trust.

This significant influence between social capital and the sustainability of the waste bank is thought to occur because of the high trust between members and trust between members and the management. Strong trust is a big capital to realize group excellence and competitiveness (Ubaididillah, 2017). Trust in the waste bank group grew because of the transparency of the management to members regarding bookkeeping and finances. In addition, the management is also active in providing information and disseminating information obtained from the Environment Agency and other resource persons openly. Firmansyah (2019) states that reciprocity is a factor that causes trust to grow. Fanbellisa (2017) also states that trust is a lubricant that keeps a group going for a long time.

This high trust in the waste bank group is also supported by members who obey the group norms that have been set together. Continuity in saving waste according to the time agreed by the group is one form of implementation of compliance with norms in the waste bank group. According to Abdullah (2013), the essence of social capital lies in the high level of trust held and adherence to norms by members in the group. Norms are also a means of control over the established system (Chintia and Nasdian, 2017).

The network formed within the group and outside the group also affects the sustainability of the waste bank itself. Within the group, social networks are formed as a result of interactions between members, while networks outside the groups that are formed include cooperative relationships between management and collectors as distributors of waste sales and good cooperation between the group and the Environment Agency and the Ministry of Environment. According to Harini (2012), networks are conceptualized as nodes, ties, or ties that form interpersonal relationships. Chintia and Nasdian (2017) state that an extensive network will further increase the sustainability of a program.

Social capital can affect individual awareness of the opportunities that can be utilized for the welfare of society. The existence of social capital encourages the ability of individuals to solve problems collectively, increase cooperation, encourage positive change and raise awareness to improve the quality of life (Haridison, 2013). According to Mangkuprawira (2010), social capital can affect the economic aspect because the social cohesion that is formed in society will strengthen social networks to facilitate economic and business ventures. Trisnanto, et al (2017) also added that group solidarity as the result of social capital can be built by strengthening trust and the unification of common norms and values of cooperation formed in a synergistic network.

CONCLUSION

The results of this study indicate that social capital has a significant effect on the sustainability of the waste bank program as indicated by a significance value of 0.000 which is smaller than = .05 (.000 < .05). It is also known that social capital can contribute or influence the sustainability of the waste bank program in Bondowoso Regency by 33.1%.

SUGGESTION

More in-depth research is needed to find out which elements of social capital most influence the sustainability of the waste bank program in the Bondowoso Regency so that more focused interventions can be carried out to create a more sustainable waste bank program. In addition, it is necessary to research other factors that may affect the sustainability of the waste bank program.

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