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Willingness to Pay to Reduce Plastic Waste in Order to Realize Green Campus

Amin Pujiati*, Bestari Dwi Handayani, Dyah Maya Nihayah, M. Aulia Rachman, Amelia Choya Tia Rosalia

Faculty of Economics and Business, Universitas Negeri Semarang, Semarang 50229, Indonesia

Corresponding Author Email: amin.pujiati@mail.unnes.ac.id

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ABSTRACT

Green campus is a concrete implementation in realizing a campus characterized by conservation. One of the supporting components in the successful implementation of conservation is the availability of a canteen that supports university policies. The purpose of this study is to describe and analyze the willingness to pay (WTP) value of repairing damage or environmental pollution, factors that affect the WTP value of repairing damage or environmental pollution and the perception of canteen managers on green campus indicators. The type of research used is descriptive quantitative with contingent valuation method (CVM), logistic regression, and descriptive. Data collection techniques using observation, interviews, documentation and questionnaires. The population of this study is the manager of the canteen in the UNNES environment totaling 33 people. The results showed that the amount of WTP for repairing environmental damage was 24,000 IDR/person/month with a total economic value of 792,000 IDR/person/month with factors affecting WTP, income and distance from home to the canteen. Based on the perceptions of canteen managers, socialization is still lacking in the context of green campus indicators. To realize a green campus needs continuous socialization to all parties involved both internal and external to the campus.

1. INTRODUCTION

Sustainable development is development that takes into account economic, social and environmental elements. The realization of sustainable development can be through educational institutions, which is manifested in the green campus program through the application of sustainability principles that have been applied to academic institutions through campus greening and promoting education for sustainable development [1]. Educational institutions play an important role in the success of sustainable development. Green campus is a concrete implementation in realizing a campus characterized by conservation [2-5].

The concept of green campus has gone through a process of continuous improvement, nowadays green campus is generally believed to have several characteristics: (1) Developing based on the concept of sustainability. (2) It pays attention to sustainable education and integrates campus infrastructure construction, campus operation and management, campus cultural activities, etc. (3) The goal is to continuously infiltrate the concept of sustainable development and ecological environment protection into all aspects of the campus, as a social symbol of harmonious development between man and nature, to promote the sustainable development of the whole society [5]. Important aspects of implementing the concept of sustainability in higher education institutions are implemented through the use of sustainable energy, reducing waste and environmental education [6]. However, the implementation of green campus programs needs to be supported by every stakeholder and institution, universities are expected to have moral and ethical responsibilities and/or lead campaigns for environmental protection and preservation. In addition, universities train and educate people who are considered experts in this field in the community. Through their expertise in environmental management with the management of solid waste that is inclusive, higher institutions have the necessary capacity to promote and spread the necessary awareness through campaigns and knowledge transfer, creation of technologies and tools needed to encourage and promote sustainable practices both on campus and off campus [7, 8].

The application of the green campus concept in higher education institutions has come a long way. The Stockholm Declaration of 1972 was the first declaration to refer to sustainability in higher education and has recognized the interdependence between mankind and the environment and suggested several ways to achieve environmental sustainability [9]. In the 1990s, the University Rectors' Secretariat for a Sustainable Future was established in 1992 as a direct result of the Talloires Declaration. This historic document was drafted in 1990 at an international conference on "The Role of Universities in Environmental Management and Sustainable Development," held in Talloires, France at the Tufts University European Center.1 The Kyoto Declaration of 1993 increased campus interest and activity towards sustainability by requiring higher education institutions to

promote sustainability by reviewing their operations to reflect sustainable development best practices [10].

The implementation of green campus in Indonesia has become a program initiated by the government and higher education institutions, referring to the 1970s, by Prof. Emil Salim who served as Minister of Environment (which was then called the State Minister of Development Supervision and Environment) who initiated the environmental development movement, under his initiative, environmental education in Higher Education has aligned environmental conservation and economic growth from the beginning by including related socio-economic issues [11]. Universities began to adjust to the alignment of green campus, and began to launch training activities, teaching development and environmental studies. The government began to support the alignment of climate improvement conditions through Law No. 6 of 1994 concerning the climate change conference, Law No. 17 of 2004 concerning the ratification of the Kyoto conference on Climate Change, until the legal foundation that supports education for sustainable development in higher education is law number 20 of 2003 concerning the National Education System, law number 32 of 2009 concerning Environmental Protection and Management and government regulation number 19 of 2005 concerning National Standards [12]. Semarang State University (UNNES) is one of the universities characterized by conservation. This is supported by various policies that have been prepared as an implementation of conservation values. The Rector's Regulation, student and staff support are supporting factors for the success of green campus [4, 13, 14]. Several policies have been formulated related to the implementation of a green campus, namely UNNES Rector's Regulation Number 21 of 2019 concerning the prohibition of use of plastic once disposable plastic at UNNES, letter circular number B/7107/UN37/TU/2022 regarding the obligation to bring a tumbler for every offline activity and Government Regulation of the Republic of Indonesia Number 36 of 2022 concerning State Universities Legal Entity UNNES Article 92 point 2 that the use and utilization of land in the UNNES environment must pay attention to land use, aesthetics, environmental sustainability, and sustainability nature conservation.

One of the supporting components in the successful implementation of conservation is the availability of food and beverage facilities (canteen) and waste-based waste management food that supports university policies [15-17]. Waste management in the campus area can support sustainable development which is considered important because universities are agents of change that can collaborate between academics and society [18, 19]. This is supported by research by Reilly et al. [20], the suitability of the planning of products sold with applicable policy guidelines is often a mismatch. The canteen is part of campus life that supports the lecture process because it provides energy to the academic community and has a big role in shaping student behavior, especially being aware of the impact on the environment from consumption activities carried out.

Canteen management on campus should support the vision of conservation-minded UNNES, which does not only aim for profit (economic side) but must pay attention to the environment. The canteen at UNNES should be an integral part of the UNNES conservation program. The policy that UNNES has made is very contradictory, in fact, the management of the canteen which is expected to pay attention to the environment and comply with UNNES policies related to green campus has not been implemented. Canteens in UNNES have not complied with the ban on single-use plastic by selling drinks in single-use plastic bottles. The reason for the canteen managers to sell these drinks is only aimed at the economic side (profit). The sales turnover of plastic bottled drinks is calculated to be very large profits (economic side). So that the canteen manager feels objections if he has to comply with University policies and derivative regulations in the unit related to the prohibition of the use of disposable plastics. This shows that canteen managers have not paid attention to the environment. The management of the canteen in the UNNES environment that has not paid attention to the environmental side is supported by the results of research by Retnoningsih et al. [21] that the canteen at UNNES produces wet food waste, plastic, and paper. Widhiastuti et al. [22] stated that the canteen is one of the producers of plastic waste.

Based on the fact that canteen management in the UNNES environment has not paid attention to canteen management from an environmental perspective for reasons of economic factors (profit), research is needed that supports green campus policies but still pays attention to the sustainability of the canteen manager's business. Environmental damage must be compensated with economic measures so that the environment is maintained. The weak measurement of the value of willingness to pay for environmental damage is the reason that research is also needed to measure how much the ability to pay (purchasing power) of the community (canteen tenants) to improve environmental quality. WTP is calculated how much the ability of individuals or individual communities in aggregate to pay or spend money in order to improve environmental conditions to match the desired conditions [23].

Previous studies on WTP for waste management have been conducted by various researchers. Researchers [24-26] focused on municipal solid waste treatment; others [27-31] investigated households in urban areas; and Ismail [32] studied resident areas. Other empirical studies related to waste management on campuses include Tangwanichagapong et al. [19], who examined the experimental application of the 3Rs (reduce, reuse, and recycle) in a campus community; Jakimiuk et al. [33], who explored waste management pathways at a university; Setyowati et al. [16], who looked into waste treatment at a university; and Ghazvinei et al. [34], who analyzed strategies using the Analytical Hierarchy Process method on campus. However, none of these studies have explored WTP related to canteen management within the campus environment to achieve a green campus. As a conservation campus, UNNES must implement environmental quality improvements in all aspects, including canteen management. Therefore, it is crucial to conduct WTP research to reduce plastic waste and realize a green campus. The purpose of this research is to calculate the WTP value for repairing environmental damage or pollution, analyze factors that affect the WTP value, and understand the perceptions of canteen managers towards achieving a green campus.

2. RESEARCH METHODS

2.1 Study area and data collection

This research was conducted in the UNNES Campus area located in Semarang City, Indonesia. Data and information were collected through observation, interviews, documentation, questionnaires and FGDs. Observation and

documentation were conducted at the research location, namely the canteen in the campus environment. Interviews and questionnaires were conducted to respondents directly, namely, canteen managers in the campus environment, and FGDs were conducted by presenting the head of the UNNES conservation sub-directorate.

The population in this study were canteen managers who owned or worked and met the criteria that could make strategic decisions in the management of canteens in the Semarang State University environment. The number of canteen managers was as many as *N*=33 people and involved as the entire research data used. The data used in the study include the socio-economics of canteen managers in the form of income, education, and age. The questionnaire was designed to obtain the most appropriate data for econometric analysis of household willingness to pay; determinants and amount of WTP, and assessment of plastic waste control in the UNNES canteen environment. The questionnaire was designed to obtain the most appropriate data for econometric analysis of household willingness to pay; determinants and amount of WTP, and assessment of plastic waste control in the UNNES Canteen environment.

2.2 Research materials and methods

Data were analyzed using WTP analysis and logit model. The WTP method is used to determine the fair value paid for canteen managers to control single-use plastic waste, while the logit method is used to determine the variables that affect the WTP of canteen managers for waste management.

2.2.1 Calculating the WTP value

The determination of the WTP value is achieved by employing CVM. This method involves collecting information about preferences or willingness to pay through direct questioning techniques. The WTP value is ascertained using the "open-ended" method, where respondents freely state their willingness to pay. According to Fauzi [35], the calculation of WTP using the CVM method in this research comprises the following stages: (a) establishing the hypothetical market, (b) obtaining auction values for WTP, (c) calculating the average WTP value, (d) estimating the WTP curve, and (e) aggregating the total WTP value (TWTP).

Creating a hypothetical market

This hypothetical market was created to provide an explanation and knowledge of the environmental damage caused by canteen activities that sell food and drinks using disposable plastic. By providing explanations and knowledge of the impacts caused during the sale of food and beverages using single-use plastic, the canteen will be able to reduce the impact on the environment food and drinks with disposable plastic wrap and information on solutions to reduce environmental damage, especially on soil pollution, namely in the form program of incentives, reward and punishments to increase awareness in canteen managers. So that the next hope is that the respondents become aware of the importance of protecting the environment and participate in the success of the environmental sustainability program that has been launched to make better environmental conditions in the campus environment.

Getting an unqualified bid value

The technique used to obtain the WTP value in this study is the bidding game technique. This method involves repeatedly asking respondents questions until a specific payment value is reached, which can be increased or decreased based on the respondent's answers. Additionally, this study employed the dichotomous choice method, where respondents are presented with a predefined monetary amount and asked if they are willing to pay that amount to improve environmental quality at UNNES. This approach was adopted because respondents were unable to specify the amount they were willing to pay, prompting researchers to determine the minimum payable amount. In this study, the auction values or payment offers for the incentives, rewards, and punishment program are set at 5,000 IDR; 10,000 IDR; 20,000 IDR; 25,000 IDR; 30,000 IDR; 50,000 IDR; and 100,000 IDR.

Calculating average WTP value

After obtaining the payment auction value, the next step is to calculate the average (mean) WTP value that has been obtained from the respondents' answers. In calculating the WTP value, the reference used in this research is the research results from Tuaputy et al. [36] with the following:

$$EWTP = \sum_{i=1}^{n} WiPfi \quad (1)$$

where, $EWTP$ is the average WTP value, Wi is the WTP number of i, Pfi is the relative frequency, n is the number of respondents, and i is the respondent who is WTP.

Estimating the WTP curve

The WTP curve is used to show and estimate changes in WTP values caused by changes in influencing factors. In determining the auction curve using the dependent variable in the form of WTP value and independent variables in the form of factors that affect the value of WTP.

Aggregate or TWTP

To obtain the TWTP value, calculations need to be made based on the distribution of respondents' WTP. Aggregate/total WTP value is used to determine the economic value of natural resources and the environment. In aggregating the WTP value, the research used the formula from the research of Tuaputy et al. [36]. The formula is as follows.

$$TWTP = \sum_{i=1}^{n} WTP\left(\frac{ni}{N}\right)P \quad (2)$$

where, $TWTP$ is the total WTP respondent; WTP is the respondent's WTP amount, ni is the number of the sample of the WTP value, N is the number of samples, P is the number of populations, and i is the respondent in WTP.

2.2.2 Logistic regression for WTP response

A logistic regression model was used to assess willingness to join. The willingness to pay question was framed as a dichotomous choice between willing to pay and unwilling to pay. The dependent variable was coded 1 = yes (willing to join the specific insurance package) and 0 = otherwise. The selected variables adopted from Tassie and Endalew [24], Abas et al. [27], Rahji and Oloruntoba [31], and Mulat et al. [37] are education level, length of business, family dependents, income and distance.

The logistic model in this study is used to predict dichotomous (binary) outcomes. When dealing with the dependent variable, the regression equation can be expressed as follows:

$$y_i = \mathbb{x}_i'\beta + \varepsilon_i \quad (3)$$

where $\mathbb{x}_i'$ are $1, x_{i1}, x_{i2}, \ldots, x_{ik}$ and β are $\beta_1, \beta_2, \ldots, \beta_k$, y_i is the response variable in this model is dichotomous, it can only have a value of 0 or 1, where the probability value of 1 is assessed by $\Pr(y_i = 1) = f(\beta \mathbb{x}_i')$ and 0 by $\Pr(y_i = 0) = 1 - f(\beta \mathbb{x}_i')$ and assume the response variable follows a Bernoulli distribution, a probability distribution commonly used to model events with two possible outcomes, and a simple model of binary logistic regression is:

$$Ln\left(\frac{Pr}{Pr-1}\right) = a + \beta_i \sum_{i=1}^{n} \mathbb{x}_i + \varepsilon_i \quad (4)$$

From the above equation, the logit model used here to assess the effect of independent variables on the probability of respondents' willingness to pay is:

$$WTP = \alpha + \beta_1 Periode + \beta_2 Educ + \beta_3 Responbility + \beta_4 Income + \beta_5 Distance + \varepsilon \quad (5)$$

where, WTP is the willingness to pay with a rating of 1 is willing and 0 otherwise; $Periode$ is the total period of doing business, measured based on the classification of years of running the business; $Educ$ is the level of education, and is measured based on the level of education primary school, secondary school certificate, high school certificate and diploma/university; $Responbility$ is number of household member; $Income$ is monthly income from managing the canteen with units in IDR; $Distance$ is distance from home to canteen with classification per mileage in km. Details of variables and data distribution can be seen in Table 1.

Table 1. Descriptive statistics of the population

	Characteristics	Unit	Frequency (%)
WTP	1 = Willing to pay	20	60.6%
	0 = ortherwise	13	39.4%
Education	Elementary School	8	24.2%
	Junior High	8	24.2%
	High School	9	27.3%
	Collage	8	24.2%
Number of household member	< 0	1	3.0%
	1	1	3.0%
	2	5	15.2%
	3	8	24.2%
	> 3	18	54.5%
Mothly Income (in 000 IDR)	≤ 2,000	8	24.2%
	2,001 - 3,000	11	33.3%
	3,001 - 4,000	9	27.3%
	> 4,000	5	15.2%
Work Period (in year)	≤ 1	1	3.0%
	1 - 5	11	33.3%
	6 - 10	12	36.4%
	> 10	9	27.3%
Distance between residence and canteen	< 5 Km	15	45.5%
	6 Km - 10 Km	13	39.4%
	10 Km - 15 Km	2	6.1%
	> 15 Km	3	9.1%

Assumption testing in model feasibility is used to fulfill the Goodness of Fit if there is a match between the data included in the model and the observed data. In Logistic Regression, the method for testing model fit is usually the Hosmer-Lemeshow Method. In addition, the chi-square test is used to compare sociodemographic factors. This statistical test examines the relationship or significant variation between categorical variables such as gender and knowledge level, education level and number of responsibilities, income, length of employment, and distance. The chi-square test results give an idea of the relationship between these variables, helping to find statistically significant associations.

3. SECTION HEADINGS

3.1 WTP value analysis

The results of the WTP analysis will explain the steps taken in the CVM model used. The various answers to the open-ended bid questions were grouped into classes and frequencies. The class value of each class boundary was calculated following statistical procedures. The survey results show that 20 people are willing to pay the amount of cost for plastic waste management or 60.6%, with seven levels of availability to pay; the lowest bid is 5,000 IDR with a response of 1 person, and the highest is 100,000 IDR with a response of 2 people, but the most responses are in the budget of 10,000 IDR with 11 responses. The mean (±SD) amount that research participants were willing to pay monthly was 24,000 IDR (refer to Table 2).

Table 2. Number and mean of WTP

No	Class Mark (in IDR)	Unit	Frequency (Pfi) (%)	Mean WTP (in IDR)
1	5,000	1	5	250
2	10,000	11	55	5,500
3	20,000	3	15	3,000
4	25,000	1	5	1,250
5	30,000	1	5	1,500
6	50,000	1	5	2,500
7	100,000	2	10	10,000
	Total	20	100	24,000

From the results of the WTP value, the bid is most responsive to the cost at level 2 (or 10,000 IDR), but the more expensive the cost of waste management services, the less of canteen managers who are willing to pay for it. If you graph the demand for this service, the line slopes downward. This means that, just like other goods, the demand for waste management services will decrease if the price is increased, even if other factors are kept the same. This response confirms the research Tassie and Endalew [24].

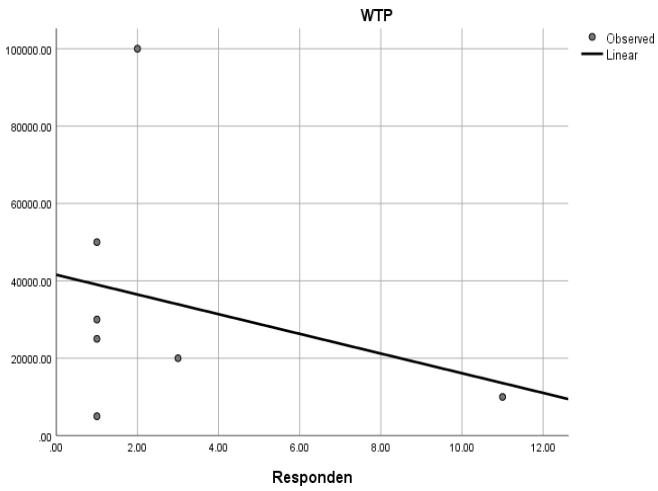

Figure 1. WTP value auction curve

Figure 1 shows the auction curve of the WTP value obtained for repairing environmental damage, where the curve shows that the more significant cost burden set for repairing environmental damage causes a decrease in a person's ability to pay or a decrease in the number of people willing to pay.

The final stage is to calculate TWTP, which is the average willingness to pay multiplied by the total population, where the average WTP value is 24,000 IDR with a population of 33 people, so the TWTP value is 24,000 IDR × 33 = 792,000 IDR per month or 9,504,000 IDR per year.

3.2 Analysis of factors affecting WTP

The effect of demographic and socio-economic factors on WTP using the logistic regression method, the initial stage is to conduct a model feasibility test. Table 3 shows the model feasibility test using the Andrews and Hosmer-Lemeshow Goodness of Fit Test method. The results show that if the t-stat of the *Hosmer and Lemeshow Goodness-of-Fit* Test> 0.05, then H0 cannot be rejected and declared fit and feasible to use. The results of the fit model assessment are summarized in the *likelihood ratio* value. It shows a value of 12.26 with a significance> 0.05 and is below the *-2logL* value. Indicates that adding independent variables to the regression model makes the model fit better. If the Probability Chi-Squared H-L (Hosmer- Lemeshow) Statistic value> α (0.1), then the model is feasible to use and vice versa. There are also results from calculating the *Hosmer-Lemeshow Goodness of Fit Test*, as shown in Table 3.

Table 3. *Hosmer-Lemeshow* test

Test	Stat	df	Prob Chi-Squared
Hosmer and Lemeshow Test	5.876	5	0.661

Table 4. Output of logistic regression

Variable	*Coefficient*	*Std. Error*	*Wald Stat*	*z-Stat*
Education	-0.123	0.588	-0.209	-0.209
Responbility	-0.054	0.379	-0.144	-0.143
Income	-1.339**	0.625	-2.142	-2.142
Distance	0.536*	0.277	1.935	1.935
Periode	0.020	0.119	0.168	0.168
C	1.545	1.915	0.807	0.807
LR statistic		12.26191		
Prob(LR statistic)		0.03137		
Log likelihood		-13.5838		
McFadden R-squared		0.310983		
S.D. dependent var		0.490133		

Note: *, **, *** are significance levels at 0.01, 0.05 and 0.10.

The logistic regression output in Table 4 contains information about the model coefficient of each variable, the error of the estimation, the z-score, the p-value, and the odds *ratio*. The LR Statistics value shows a probability of < 0.05, meaning that the research model can explain the availability of paying incentives for plastic use. The McFadden R-squared coefficient of determination test has a value between 0 and 1, and if the value is close to 1, it can be concluded that the variation in the independent variable more perfectly explains the variation in the dependent variable. However, the McFadden R-squared coefficient of determination test is lower than similar tests in other applications.

The coefficient of determination in the logistic regression test shows that the *McFadden R-squared* is 0.310983. This means that the variation in the variables of education level, number of dependents, income, distance of residence, and length of business can explain the variable willingness to pay by 31.09%. In the previous logit regression, it was said that the value of R^2 must be greater than 15%; from the resulting output, this research is considered quite good because the value of R^2 obtained is greater than 15%. The *Probability Likelihood Ratio Statistic* (LR statistic) value of the logistic regression test results. If *LR statistic* value < α (0.10), then all dependent variables together significantly affect the dependent variable and vice versa. Based on the logistic regression test results in the figure above, it shows that *LR statistic* is 0.03137 (< α 0.10). Then the H1 hypothesis is accepted and it can be concluded that together the variables of education level, number of dependents, income, distance of residence and length of business on the variable availability to WTP are below 10%.

The partial effect test aims to determine how the influence of each independent variable (income, education level, land ownership, age, and number of dependents) on the dependent variable (labor movement from the agricultural sector to the service sector) partially. This test can be known through the *Probability z-statistic* value in the logistic regression test results. If the *Probability z-statistic* value < α (0.05), then all independent variables partially significantly affect the dependent variable.

The logistic analysis indicates that only the income and distance variables significantly affect the WTP for plastic waste processing. Income exhibits a negative effect, meaning that higher income levels correlate with a reduced willingness to pay. Conversely, the distance from the house to the business location positively affects WTP. Specifically, business owners located further from their canteens are more willing to pay for waste management. This increased willingness to pay among those farther away may be due to the efficiencies gained in managing waste with incentives, which reduces the time and effort required for waste processing. This finding on income aligns with observations made by Malasius et al. [38] and Challcharoenwattana and Pharino [39] but contradicts the results from studies by Abas et al. [27].

Regarding other variables, the level of education, number of dependents, and length of business operation do not significantly influence the willingness to pay among canteen business owners. Notably, among respondents whose businesses are located closer to the canteen (within 5 km), 50% expressed unwillingness to pay. This suggests that proximity may lead to perceptions of lower benefits from paid waste management services. Ruban et al. [40] and Kusumastuti and Suryantini [41] also investigated how the distance between a residence and a business location influences willingness to pay.

The lack of impact from the variables of education and length of business suggests that a certain level of education does not necessarily increase the motivation to manage environmental waste more effectively. Consequently, appropriate interventions include conducting socialization programs about the importance of waste management. Additionally, providing incentives can be seen as a rational policy choice because, logically, paying for waste management increases business costs and may lead to diseconomies of scale. By offering incentives and clearly explaining the benefits of plastic waste processing, along with implementing stricter disincentives, it is possible to enhance their awareness and engagement in environmentally responsible behaviors.

3.3 Policy implications

One indicator of a green campus is the support of residents for programs to realize a green campus. The measure of citizen support, in this case, the canteen manager, is the willingness of the canteen manager to pay for environmental damage. The environment is the unity of space with all objects, forces, conditions, and creatures of life, including resources and behavior, which affects the continuity of life and the welfare of humans and other living things. In order to preserve natural resources and ecosystems, especially on the UNNES campus and surrounding areas, a development program that includes a green campus, waste management, paperless policy, clean energy, and cultural preservation is needed. UNNES has carried out various regulations, policies, circulars, and socialization in realizing a conservation campus, but until now, it has yet to be effective; therefore, there needs to be clarity and firmness about how much damage the environment must pay.

One of the Rector's Regulations socialized to canteen managers is related to the prohibition of the use of disposable plastic. Plastic waste is hazardous both for health and the environment. The survey results show that as many as 20 people, or 61% of canteen sellers, stated that they were willing to pay a certain amount of acceptable fees to realize the behavior of reducing plastic waste. On the contrary, 13 people, or 39% of canteen sellers, stated they were unwilling to pay a certain amount of fines. Willingness to pay by canteen sellers is based on the perception that they are obedient to applicable regulations, aware of the impact of using plastic waste, and have managed plastic waste even though it could be more optimal. Then, the seller is unwilling to pay because almost all the produce sold uses plastic and has yet to find environmentally friendly materials to replace plastic. Besides that, the sellers cannot control buyers' use of plastic. So, it takes cooperation and continuous socialization from the Semarang State University and sellers and students to reduce plastic waste together. The results of the percentage who are more willing to pay show that the support of the parties involved in UNNES activities toward green campus is tremendous. For success, continuous socialization must be done with all parties, and activities must be monitored to improve conservation programs and achieve the vision of UNNES.

4. CONCLUSIONS

The average amount of WTP that can be paid by canteen managers in the UNNES environment in order to improve the environment is 24,000 IDR per month. The economic value that can be obtained from all WTP payments totals Rp. 792,000/month. Factors influencing WTP in the UNNES canteen environment are income and distance from home to the canteen. The greater the income, the greater the WTP payment. The farther the distance between the house and the canteen, the more costs incurred for transportation costs, so the smaller the ability to pay WTP. Based on the perception of canteen managers related to green campus indicators, namely the existence of a vision of UNNES conservation, Rector's Regulations, socialization, waste sorting and processing, is still lacking is good socialization of the vision of UNNES, Rector's Regulations, and circulars. According to the perception of canteen managers, indicators of waste sorting and processing and willingness to pay (WTP) are excellent.

Policy implications Socialization of plastic waste reduction in order to realize a green campus must be carried out continuously and delivered to all academicians and related parts of the UNNES environment. Canteen managers are high contributors to waste in the campus environment, therefore it is necessary to continuously upgrade knowledge about integrated waste management. Changes in mindset and work culture in accordance with the pillars of conservation must be made to realize a green campus. Strategic policy on explaining the importance of waste management, providing incentives, or even providing witnesses and disincentives can be done to increase awareness for canteen managers.

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