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Analysis of Willingness and Ability to Pay (WTP and ATP) On Waste Management in the City Ternate

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Abstract: *This study aims to estimate the value of the willingness and ability of society (Willingness to Pay / WTP and Ability to Pay / ATP) which is the 4 categories of human settlements in the city of Ternate. Category of human settlements include : residential area of CBD, residential area of the city, residential area of the new town and residential area of the coastal town. The results of this study explains that human settlements in the CBD magnitude WTP value of IDR 18,000 and WTP total of IDR 21,500. In the residential area of the town category WTP value of IDR 15,600 and WTP total of IDR 19,100 while the residential new town category WTP value of IDR 12,200 and WTP total of IDR 15,700. The latter category is the residential area of the coastal town with WTP value of IDR 9,550 and WTP total of IDR 13,050. The performance and technical innovation and non-technical waste management of PD Ternate City Health will assist the community in providing a high appreciation and participation with the willingness and ability to pay a levy municipal waste. The willingness of the community can be measured aspects of the value of WTP and total WTP while the ability can be measured from ATP/Ability to Pay. The distribution of the estimated value of ATP in the CBD area of IDR 25.650; residential community located in the town of ATP value of IDR 21160.00; residential community located in the new town has a value of ATP IDR 19.600; and in the coastal town ATP value of IDR 14.375.*
Estimates of the value of WTP and total WTP and ATP for each community a city located in the cluster group of settlements in the city of Ternate different. It is caused by factors outside the model which affect, among others: the density of houses/population, utilization and availability function of the area of open land for sewage treatment.
Keywords*: Willingness and ability to pay (WTP and ATP) and Waste Management*.

I. Introduction

One of the problems faced by people living in urban areas as a result of the development of the city is a matter of management and waste treatment and the aesthetic impact of environmental pollution. Therefore, to reduce the interference arising from the municipal waste management needs to be done. Empirical fact explains that population growth would lacks the increasing amount of waste and if not followed by an increase in the management can lead to health problems, the beauty and aesthetics. One source of municipal waste originating from residential areas, the region's Central Business Develoment/CBD and trading activities in the market. The dominant characteristics of municipal solid waste in the form of organic waste, wet and rot easily, and has a large volume because it is primarily a waste that comes from vegetables and fruits as well as leftovers. Therefore, it is necessary to manage in accordance with these characteristics so that no negative impact on the surrounding environment. The amount of waste cities be an indicator that the municipal waste management system is not good (Admin, 2007).

Waste management system launched, either managed by the government and non-governmental organizations as well as technical implementation is not separated from the availability of funds as the motor of the waste management system. Matters relating to waste management shall be composed of factors, among others: (1). Operating Costs. In general, the cost of waste management issued by the government, and also by non-governmental managing waste in a specific location. The operational costs are the direct operating costs were calculated based on the daily operations. (2). Waste levy charges. There are two sources of income of waste management services, from taxes and charges set by the government in collaboration with the PLN and other government agencies. Withdrawals also levy is usually done through the agency/community-based non instantly appealing levy of society in accordance with the agreement, and (3). Management systems affect the willingness and ability of society.

Factors waste management system depends on the volume of funding, types of waste and conditions of an area. In certain areas without access to laystall (TPS), waste management is usually managed by the local community. So as to detect an integrated management required an interaction with the community. Such interactions may be the willingness and ability of the community, so that people can participate and implement responsible for waste management, environmental conditions in the region. Another factor of the co-

management of garbage is retribution. Waste retribution by the government based on the provision of facilities and the implementation of the waste management system. Among them is the provision of waste disposal, transport, and disposal to the final disposal. Efforts to optimize and carry out these activities require funding from both government subsidies and the results of public retribution. Due to the availability of funds, waste management process can be well applied. Basic levy charged by the government in the city of Ternate based on Ternate City Regional Regulation No. 16 of 2001 on the Management of Health in Ternate, and the Mayor's Decision No. 644 of 2002 Ternate on Cleaning Services Fees in Ternate.

Government of Ternate implement garbage levy as one source of revenue (the original income) and sources of funding in the implementation of waste management services. The phenomenon is associated with this funding that is the two times the garbage fee to be paid by the public. First, levies in the form of a monthly garbage fee that is managed by RW for waste management in the form of garbage collection activities of the houses to the laystall. While the latter form of retribution garbage collection (at the time of payment of electricity) collected by PD Health in the form of waste management activities of TPS transporting waste to landfill. It accordance with the opinion of The Allen Consulting Group (2003), which describes one of the sources of financing for waste management can be derived from the levy which is called by the user charger (tariff customers). The amount of user chargers are influenced by the Ability to Pay (ATP) and Willingness to Pay (WTP) or collectively, the ability and willingness of society to pay the levy garbage. The larger the value of ATP and WTP, the greater the rate of customers who can pay, and vice versa. This will affect the increase in the number of income inclusion in waste management that can be used to cover the expenses and increase hygiene services. The fee paid by the urban community to the manager/PD Health Ternate who handle waste management. The cost of this levy varies from one society to another.

In the aspect of implementation, the Government of Ternate required to have an agreement among implementers to apply the payment policy of municipal waste by reference to the amount of user charger influenced by Ability to Pay (ATP) and Willingness to Pay (WTP). Ternate City Government puts PD Health as Regional EnteIDRrise conducting waste management in the city of Ternate. However, urban waste management conducted PD Cleanliness only focused on waste management in terms of transporting waste from laystall to landfill. Local Regulation of Waste Management in Ternate not refer to Article 5 and Article 6 of Law No. 18 of 2008 on Waste Management, which mandates to local governments to include community participation in waste management.

Waste management particularly municipal waste is a serious concern for the governance of a city that embraces the concept of green city as the city of Ternate. Therefore the problem is how the formulation is focused in the magnitude of the user charger influenced by Ability to Pay (ATP) and Willingness to Pay (WTP) for spatially urban communities that support waste management in the city of Ternate that support the realization of the green city in the run length.

II. Research Methods

1. Methods To Assess Ability to Pay (ATP) and Willingness to Pay (WTP)

The method will be used to assess the public's willingness to pay, namely: the contingent valuation method (Altaf et al., 1992; Abelson, 1996). Contingent valuation method is a survey technique that attempts to obtain information about the preferences of the individual/household for a product or service (Abelson, 1996; Whittington, 1998). These methods fall into the category of direct method, a method that directly ask how much the price that the user wants to pay for the product used. Respondents in this survey were given several questions about how much they value a good or services.

Analysis of the nominal value of the willingness to pay the contingent valuation method using the technique Methods Payment Card. This method uses a single starting point for choosing cards as expected by researchers from the respondents. Respondents were given the opportunity to provide a determination in accordance with the option price (willingness to pay existing) to the cards that have been designed questionnaire. Interviewer presents the respondents range value to be selected as well as the consequences of death/permanent (fixed) of each alternative range of values. Payment cards have a picture that this method can provide cues implied value (implied cue values), including the minimum, average, and maximum.

In an effort to maintain the validity of the data from respondents, researchers involve factors that may affect the willingness to pay the respondent, namely: (1). Understanding of the need for waste management; (2). The perceived benefits of their waste management; (3). Household strategies; an identification of the proportion of expenditure per month for the needs or specific services, this identification can be obtained from the proportion of expenditure on waste management services; (4). Method of payment, if payment is made by the lowering of the amount of money spent on the target population for specific services (extrapolation), for example, extrapolation to the payment of electricity, (5). The number of family members, (6). Total revenue, (7). Level of education, and (8). type of work.

2. Sampling Techniques

Withdrawal technique of the number of samples that will be involved in the research process is conducted by systematic random sampling technique. Namely, sampling techniques with the number of samples taken from the level/administrative hierarchy of smaller, in this study is the number of samples taken in each village population in the city of Ternate.

Methods for identifying ATP and WTP waste management is the method of payment cards. Where served range to be selected by the respondents. Determining how much range presented influenced by policy basis for determining the garbage retribution tariff, which is related to the amount of the value of alternative waste management costs. Reference tariff for each range refers to the lowest value and the highest value offered by the researcher. Value/cost of waste management subsequently measured by statistics, which divides the highest rates minus the lowest rate, then divided by the number of alternatives offered ($N_{interval}$; which is based on a group of House Live).

$$\text{Range} = \frac{\text{The Highest Score - The Lowest Score}}{N_{\text{Interval}}}$$

Description: Range (R) = Point / value deals

$N_{Interval}$ = Number of alternative conditions offered

This study was conducted from July to December 2013. The place and primary data collection is in the city of Ternate Map of research sites can be seen on the map below.

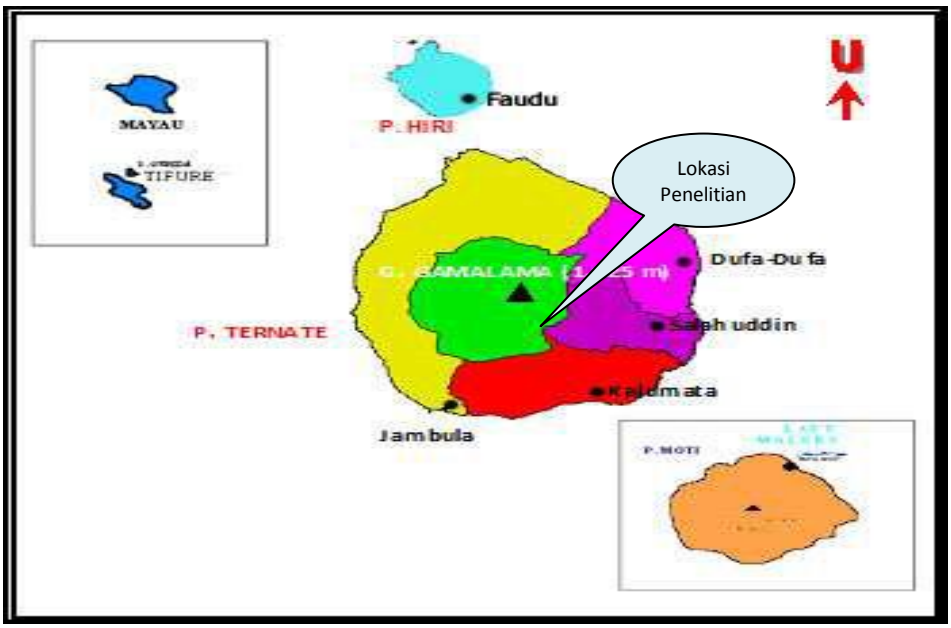


Figure 1. Research Location Map

III. Empirical Result

1. Analysis of Ability to Pay (ATP) and Willingness to Pay (WTP)

The concept of utility measurement using the PAP has done a lot, especially for goods/public services are not traded (non-marketed) (Delaeny & O'Toole, 2004a; Delaeny & O'Toole, 2004b ; Fernandez et al, 2004; Zhao & Kling, 2004; Crooker & Herriges, 2004; MuIDRhy, et al, 2005; Morancho, et al, 2005). The reason the use of PAPs in public goods or services is due to the price or market value fails to be reflected to the public or consumers or because of absence market transactions (Crooker & Herriges, 2004; Cuena, et al, 2004). Another reason put forward by Pattanayak, et al (2006), because data not available from consumer demand, it can be used to overcome WTP survey.

Sampling methods in primary data collection is important before describing the results of the estimation value (WTP-ATP) and variables that influence it. Description of the data according to the main variables studied are shown in Table 1 which shows that for the puIDRoses of analysis (WTP-ATP) are 500 Household. Household of the sample turns out there are 20 RT or about 4% of data WTP and 28, or about 4.6% of the ATP data can not be analyzed. The data associated with the estimated value (WTP-ATP) are categorized as Data inclution because the respondents did not answer the questions asked by the researcher or not write the

answers on the questionnaire. Such data is treated as a missing value or data that is incorrect or missing then given a value of zero. Description of related data value estimate WTP and ATP on waste management in the city of Ternate can be seen in Table 1.

Table 1: Descriptive characteristics Primary Variable Data According to research

Variable	Community Residential Clusters in Ternate		Valid Observation		Missing		Total	
			N	%	N	%	N	%
Willingness to Pay/WTP	a.	CBD Residential (PK1)	35	100	0	7,1	28	100
	b.	Town Residential (PK2)	380	94,9	21	11,0	408	100
	c.	New Town Residential (PK3)	20	90,0	2	15,0	20	100
	d.	Coastal Residential (PK4)	40	95,9	2	18,2	44	100
Ability to Pay/ ATP	a.	CBD Residential (PK1)	36	92,9	2	7,1	28	100
	b.	Town Residential (PK2)	370	93,1	28	6,9	408	100
	c.	New Town Residential (PK3)	18	90,0	2	10,0	20	100
	d.	Coastal Residential (PK4)	38	86,4	6	13,6	44	100

Answers that respondents are categorized as missing value (in the questionnaire No. 18) previously expected as additional levy dollars of waste management at this time (an average of IDR 3,500, -) as an economic assessment of the benefits of urban waste management services that will performed by PD. Cleanliness of Ternate. If society does not give an answer or fill with a value of 0 (zero) means that they do not provide an economic assessment of the benefits to be received when the PD Health Ternate implementing innovations in technical and non-technical management of municipal waste. This can occur due to several factors, among others; (I) the respondent did not understand a variety of innovations in the management of municipal waste by PD Health, (ii). respondents can understand the various innovations in the management of municipal waste by PD Health but they are not sure will be implemented, (iii). respondents can understand innovations in municipal waste management by PD Health and sure to be carried out but not sure that the additional benefits of an impact on hygiene environment, (iv). respondents perceived that their answers would only be inteIDRreted as a kind of mapping information from the public for garbage levy hike policy in Ternate. ATP Data Description (questionnaire No. 21) is the data that is missing value caused respondents did not answer the question asked by the researcher questionnaire. The respondents did not give an answer regarding the ability to pay per month because of the perception that this research will be related to the increase in municipal waste levy.

Respondents from the community in the city of Ternate grouped based on settlements in spatial Ternate City is divided into four categories of settlement, namely (1). Residential clusters of CBD (PK1), Town Residential (PK2), New Town Residential (PK3) and Coastal Residential (PK 4). The results of the analysis of the estimated value of the average WTP for Cluster category CBD (PK1-IDR 18,000,-), Town Residential (PK2-IDR IDR15.600,-), New Town Residential (PK3-IDR12.200,-) and Coastal Residential (PK4-IDR 9,550,-) The value of WTP for each group of human settlements in the region Ternate is the economic assessment of the additional benefits of technical innovation and non-technical management of municipal waste which aims to improve environmental hygiene services both in terms of quantity and quality. If the estimate of the average WTP values are then added to the garbage levy (USD 3,500,-) current in each group of community residential area of the city of Ternate, it will get the average value estimated WTP total of the urban population. Estimates of the average value of the total urban WTP is a broad-based economic assessment of the cleaning service if there are additional benefits of technical innovation and non-technical management of municipal waste. Estimates of the average value of total WTP is hereinafter referred to as the total WTP. WTP Good value and WTP total indicates that a relatively small town communities as consumers of PD Health services. Cleanliness of Ternate can not appreciate the value of the benefits of adequate environmental hygiene. Description of WTP and total WTP is shown in Table 2.

Variable Name	Community Residential Clusters	WTP Average	Average WTP Total
Willingness to Pay Value (WTP)	a.CBD Residential (PK1)	18.000,-	21.500,-
	b.Town Residential (PK2)	15.600,-	19.100,-
	c.New Town Residential (PK3)	12.200,-	15.700,-
	d.Coastal Residential (PK4)	9.550,-	13.050,-

Processed data, July 2013

The variables that significantly affect the estimates of WTP values for urban waste management in response to additional benefits to be gained from technical innovation and non-technical waste management by PD. Cleanliness of of Ternate, the econometric analysis in the form of regression analysis using WTP dependent variable (not the total WTP). Regression results are shown in Table 3. The model used in this study consists of three (3) pieces idependent variables that represent categories of clusters of residential housing area in Kota Ternate, namely:

the availability of facilities and infrastructure trash (X1), The type of municipal waste (X2) and the amount/volume of waste (X3) and three dummy variables, which consists of formal education (X4); the total number of family members (X5) and total family income (X6).

The results of the regression analysis explained that the two (2) independent variables are statistically significant impact on estimates of WTP values of society in the city of Ternate. Two independent variables are formal education (X4) and total family income variable (X6) that each have a p-value of 0.98% and 9% (significant at test level 10%). With coefficient β = 38.30836 means when other independent variables constant, the variables formal education community in the city of Ternate influence on the estimation of WTP values which formally educated people graduate high school and above will provide an economic assessment of the changes in municipal waste management IDR 38, 30 or USD 38 higher than the communities of Ternate that formal education below high school. Responsibility formal education community Ternate against WTP values they express have a logical argument that if the people of Ternate that formal education is higher then it would be more rational in the decision approving the municipal waste management effectively and efficiently. The more rational society Ternate increasingly better the economic assessment for a public services.

Total family income variable is the second variable that affects the estimated WTP values Ternate real society. β coefficient of 0.00000643 indicates that if the total income of families increased by about IDR 1,000,000.00 then WTP Ternate City community will increase by about IDR 6.43. By considering that WTP here is an economic assessment on waste management services efective and efficient. This is in addition associated with the 4 factors that lead people in Ternate not provide an answer to the question WTP responses. Another factor is public appreciation in Ternate on waste management that can support the realization of environmental hygiene as a public service. Results of regression analisys to the model used in the study are shown in Table 3.

Table 3: Results of Regression With Dependent Variable WTP (WTP Nominal Value)

Independent Variable	Coefficient	Standart Error	t-statistics	Prob
C 3,6923356	20,25360	0,182305 0,8554		
Availability Infrastructures (X1)	-18.48710	15,70476	-1,177166	0,2398
Types of municipal waste (X2)	-35,18380	21,77667	-1,615665	0,1069
Amount / volume of waste(X3)	13,77113	29,25429	0,470739	0,6381
Family Formal Education(X4)	38,30836	7,060932	2,592910	0,0098
Number of family members(X5)	3,646933	2,633625	1,384758	0,1668
Family Income(X6)	6,43E-06	4,97E-06	1,698239	0,0902
R-square	0,058183	Mean depend var		27,18610
Adjusted R-square	0,045311	S.D dependend var		78,69645
S.E of Regression	76,89288	Akaike info criterion		11,53827
Sum squared resid	2595594	Schwarz criterion		11,60263

Processed data, July 2013

Various empirical studies explain that the small effect of family income on WTP values, among others, due to the value of municipal solid waste levy has not been a top priority in family expenses (Irawan, 2000: 50). The results of this study reinforce the existing empirical fact that the effect of the total family income on WTP values are in accordance with the theoretical relevance. The total number of family members in a household (X5) proved to have the exact level of significance of 16.68% which means that the independent variable is not significantly affect the value of WTP community in the city of Ternate. Theoretically said that the WTP value is highly dependent on individual perception and not on market behavior. Therefore no significant effect on the total number of family members WTP values in this study may lead to the conclusion that the people in the city of Ternate in answering questions about how much money will be paid to municipal waste management effective and efficient which is the responsibility of PD Health does not consider the number of people in his family.

In Table 3 explains that that variable infrastructure availability garbage (X1), type of household waste (X2) and the amount / volume of household waste (X3) which is a representation of the character of human settlements in the city of Ternate not have a significant influence on the magnitude WTP values of each p-value of 23.98%; 10.7%; 63.8%). This means that the value of WTP of cluster Settlement City (PK2), Residential New Town (PK3) and Settlements Coastal City (PK4) did not differ significantly with residential clusters CBD (PK1) as (base category). Statistical analysis explains that the four clusters of human settlements in the city of Ternate shows the value of WTP are diverse. It is an indicator that the people of the city who are in the 4 clusters of human settlements have not shown their sense of satisfaction on the performance of municipal waste management is the responsibility of the PD Health Ternate.

People's understanding of municipal waste management effective and efficient by PD. Cleanliness is very important to remember Ternate realization of environmental hygiene is very dependent on their performance to solve the garbage problem area of residence. The performance and technical innovation and non-technical waste management of PD Ternate City Health will assist the community in providing a high appreciation and participation of the management of municipal waste. Another factor is that people assume Ternate city garbage problem is not a

problem that gets top priority for every household, causing a low appreciation of the management of municipal waste. The estimation results of ATP or the Ability to Pay society Ternate shown in Table 4. The value of ATP contained in the table is the value expressed by the public ATP Ternate when they were asked "How many dollars is actually the ability of Father / Mother to pay a levy of waste in PD Sanitation Ternate per month?"

Table 4: Description Value Estimation ATP Waste Management in Ternate

Variable Name	Community Residential Clusters in Ternate	Average ATP Total
Ability to Pay Value (ATP)	a.CBD Residential (PK1)	25.650,00
	b.Town Residential (PK2)	21.160,00
	c.New Town Residential (PK3)	19.600,00
	d.Coastal Residential (PK4)	14.375,00

The data is processed, July 2013

The table above explains that the people who are in a residential area of the CBD (PK1) has a value of ATP to levy municipal waste IDR 25,650.00; residential community located in the town (PK2) ATP value of IDR 21,160.00; residential community located in the new town (PK3) has a value of ATP IDR 19,600.00; and the people residing in the coastal area (PK4) ATP value of IDR 14,375.00. ATP values for each community in the city which are clusters of different groups of settlements. One factor that affects the outside of the model, including: the density of houses / population, utilization and availability function of the area of open land for sewage treatment. Factors affecting differences in ATP values of the urban population residing in the various clusters of settlements can be seen from the model used in the study. The regression analysis of the models used in this research can be seen in Table 5.

Table 5: Results of Regression With Dependent Variable ATP (WTP Nominal Value)

Independent Variable	Coefficient	Standart Error	t-statistics	Prob
C 3482,254	2827,412	1,231605	0,2188	
Availability Infrastructures (X1)	8699,602	1778,092	4,892661	0,0000
Types of municipal waste (X2)	7827,955	3517,693	2,225309	0,0266
Amount / volume of waste(X3)	16866,74	3693,854	4,566163	0,0000
Family Formal Education(X4)	3856,892	1510,776	2,552921	0,0110
Number of family members(X5)	1667,003	415,0747	4,016153	0,0001
Family Income(X6)	0,004220	0,001046	4,034045	0,0001
R-square	0,167144	Mean depend var		28007,79
Adjusted R-square	0,155683	S.D dependend var		18634,62
S.E of Regression	17122,74	Akaike info criterion		22,34988
Sum squared resid	1,28E+11	Schwarz criterion		22,41456
Log likehood	-4943,498	F-Statistic		14,58334
Durbin Watson stat	1,653244	Prob (F-Statistik)		0,0000

Note:
Regression methods: Least Square with White Heteroskedasticity-Consistent Standard Errors and Covarians.
- Sample 1-200
- Observations included: 172
- Observations were not included because of missing value: 28

In Table 5 explains that the six (X1, X2, X3, X4, X5 and X6) independent variables were analyzed a significant influence on the dependent variable is the value of ATP. The significance of the influence of the independent variables can be known from the magnitude of the exact level of significance were all below 10% (still significant even when used $\alpha = 5\%$). Results of regression analyzes in full as follows:

a. Variable of dummy availability of facilities and infrastructure category (X1) for example, has a coefficient β 8.699,602 which means if the other independent variables constant, the ATP residential community located in the city (PK2) will be higher at around IDR 8,670, - compared to ATP society located in the residential area of the CBD (PK1).
b. Variable of dummy types of municipal solid waste (X2) with β coefficient of 7.827,955, which means when the other independent variables constant, the ATP community located in neighborhood new town (PK3) will be higher around IDR 7828.00 compared with ATP values of society located in the residential area of the CBD (PK1).
c. Variable of dummy number / vol garbage (X3) with β coefficient of 16.866,74, which means when the other independent variables constant, the ATP residential community located in the coastal city (PK4) will be higher around IDR16.867, compared with the value of the ATP residential community located in the CBD (PK1).

Real effect shown by all dummy variables cluster category of human settlements in the city of Ternate indicates that categorization or grouping of urban communities who lived by a settlement has significant effect on the value of ATP waste retribution. This means that the value of ATP or ability to pay of the urban population living based cluster of settlements in Ternate that PK2, PK3 and PK 4 is different from the PK1 in this study treated as the base category. The tendency of the pattern on the value of ATP utilization of urban society in harmony with the area function between functions only for residential areas alone will have a lower economic value to the function of the area of economic activity (CBD) and offices.

d. Variable of categorical formal education family (X4) significantly affects the ATP with a p-value of 1.1%. With coefficient β 3.856,892 means that people residing in residential areas (PK1, PK2, PK3 and PK4) with a formal high school education and above will have the ATP IDR 3,857.00 higher than the people residing in residential areas (PK1, PK2, PK3 and PK4) whose formal education below high school, assuming other variables constant.

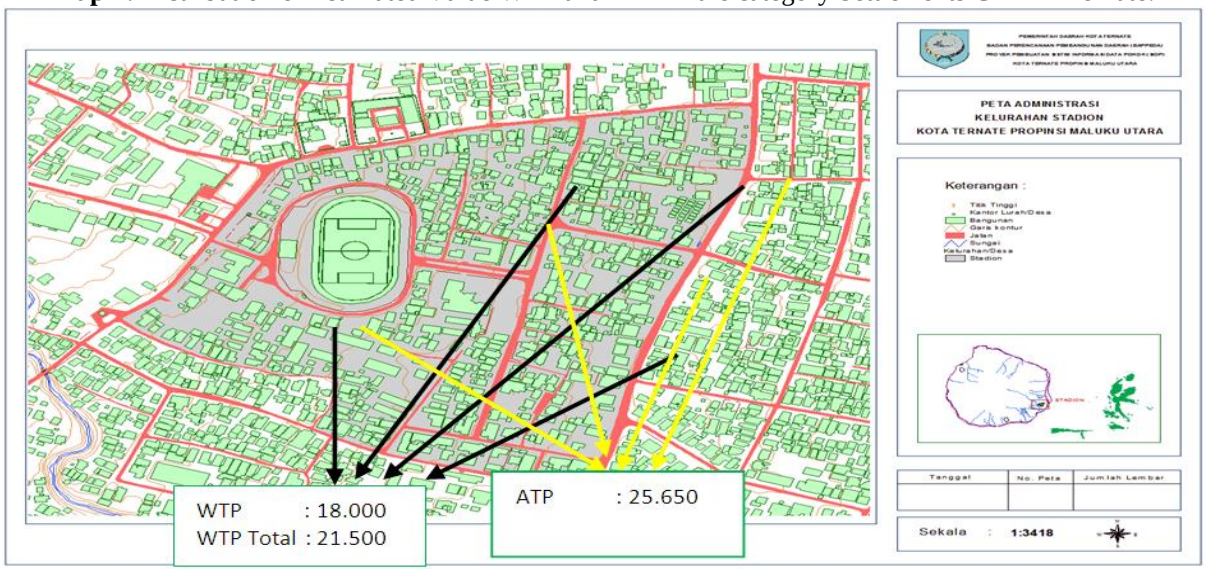
Above phenomenon is supported by several studies related to the environmental assessment of the economy, especially with respect to the WTP and ATP. Formal education community is a variable that conclusively affect responsibility for services that are public (See Whittington, 1990: 306; Witzke & Urfei, 1999: 5; Irawan, 2001: 168; Jung Um, 2002: 291). People who live in the city of Ternate (PK1, PK2, PK3 and PK4) which has a higher formal education will be more rational in making decisions to determine the amount of municipal solid waste levy which is a fundamental issue for the city of Ternate. High rationality of the urban population will encourage a more symmetric information about the performance of PD. Cleanliness of Ternate in managing waste from upstream to downstream so that the bias in the response of urban society can be reduced. Information that is symmetrical about the behavior of people in the city of Ternate became urgent when PD Health Ternate perform breakthroughs and innovations do both technical and non-technical in the management of municipal waste that can realized Ternate clean, green and sustainable.

e. Variable of category total number of families (X5) significantly affect the value of ATP. Variable total number of family members has a coefficient β = 1,667.003, which means when the family members of the community who are in residential areas (PK1, PK2, PK3 and PK4) incremented by 1 (one) person, then ATP urban communities will increase by IDR1.667,00 assuming other independent variables constant. The influence of the number of family members of the ATP of the people residing in residential areas (PK1, PK2, PK3 and PK4) seems unavoidable because of the greater number of people in a family, the greater the waste generated by the family. It means having the greater the value of ATP to be paid. People residing in residential areas (PK1, PK2, PK3 and PK4) consequences will provide answers to the question of ability to pay ATP per month then it will make a lot of family members at least for consideration.

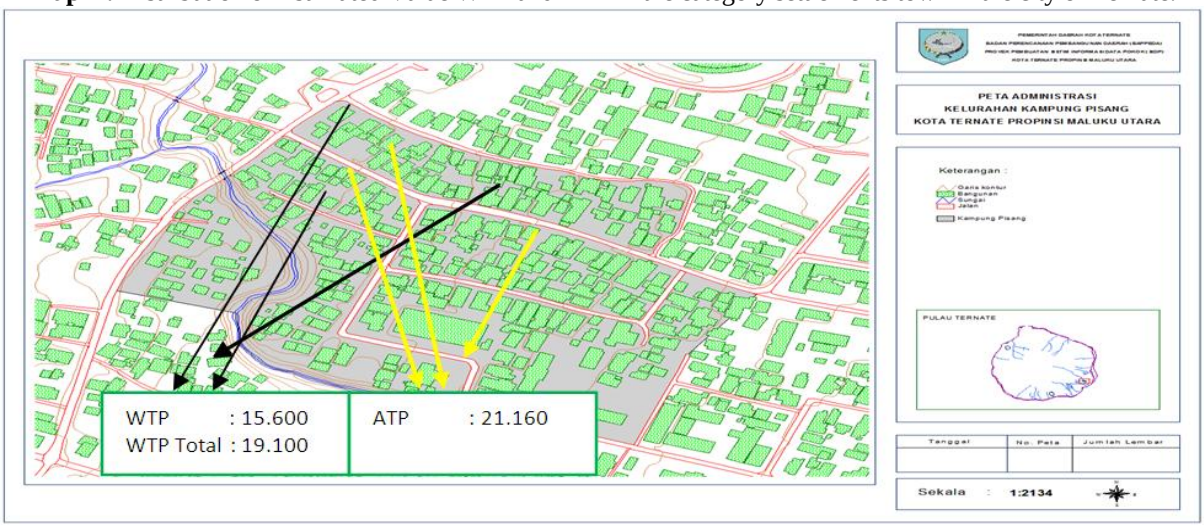
f. Family total income per month is the independent variable significant effect on the ATP people residing in residential areas (PK1, PK2, PK3 and PK4). With a value of 0.004220, the β coefficient can be inteIDRreted that if the total income of the family per month rose IDR 100,000.00 then the ATP people residing in residential areas (PK1, PK2, PK3 and PK4) will increase by USD 422. These results are consistent with the theory that an individual's ability to consume goods and services is affected by income. Although ATP is not the actual behavior of the municipal solid waste levy to pay the people residing in residential areas (PK1, PK2, PK3 and PK4) are real, but ATP is an indicator of the urban population about how much money they allocate their income for the puIDRoses of effective management of municipal solid waste and efficient. Therefore, ATP is always strongly associated with the income of the people in the city of Ternate.

   Results estimation WTP and ATP values of the community in the city of Ternate grouped into 4 categories of human settlements, including: (1). CBD residential area, a residential area in addition to the community is also an office area and a center of economic activity in addition it is the center of growth in the city of Ternate (2). Residential areas of the town is a buffer zone of one of the central region of the economic growth that is in the CBD area. This town is a residential area that is intended only for residential and education. This area is in the category of infrastructure facilities, town caused a more complete than any other region, causing access to CBD faster., (3). Residential areas of the new town is residential spatial development of Ternate so where is directed away from the center point of economic growth are included in the CBD. This new town residential area into a buffer zone to 2 for the CBD., (4). The coastal area residential areas to the buffer zone 3 of spatial Ternate closer to the coastal areas in accordance with the character of the island of Ternate who entered in the coastal zone. Residential area of the coastal town became strategically located at the entrance to the path of Ternate by air and sea. Value estimates of WTP and ATP based on the category of human settlements in the city of Ternate when spatially mapped by category of human settlements can be seen in the map below.

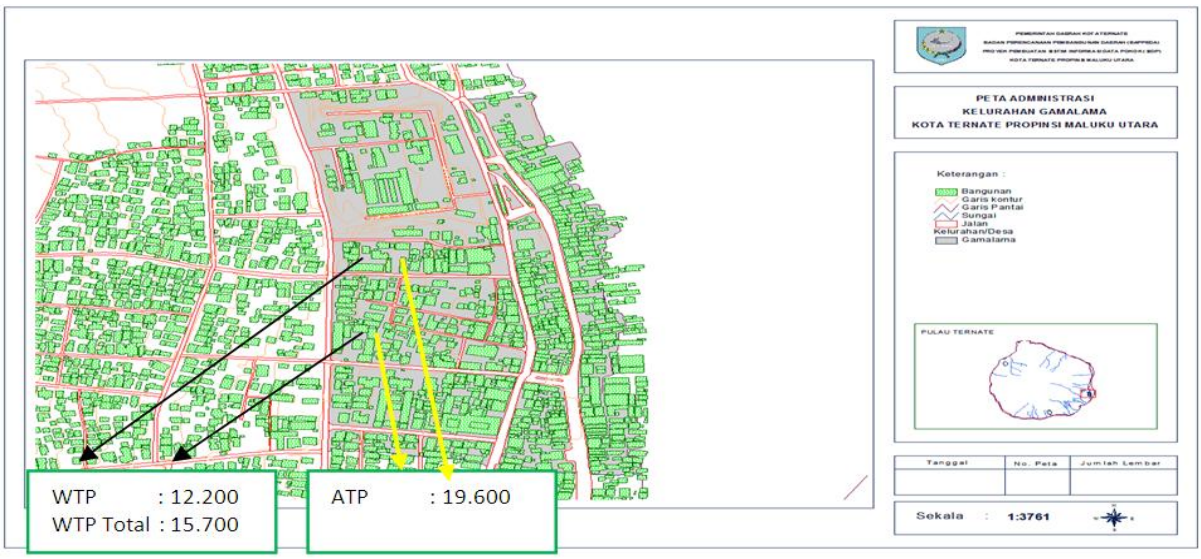
Map 1: Distribution of Estimated Value WTP and ATP in the category Settlements CBD in Ternate.



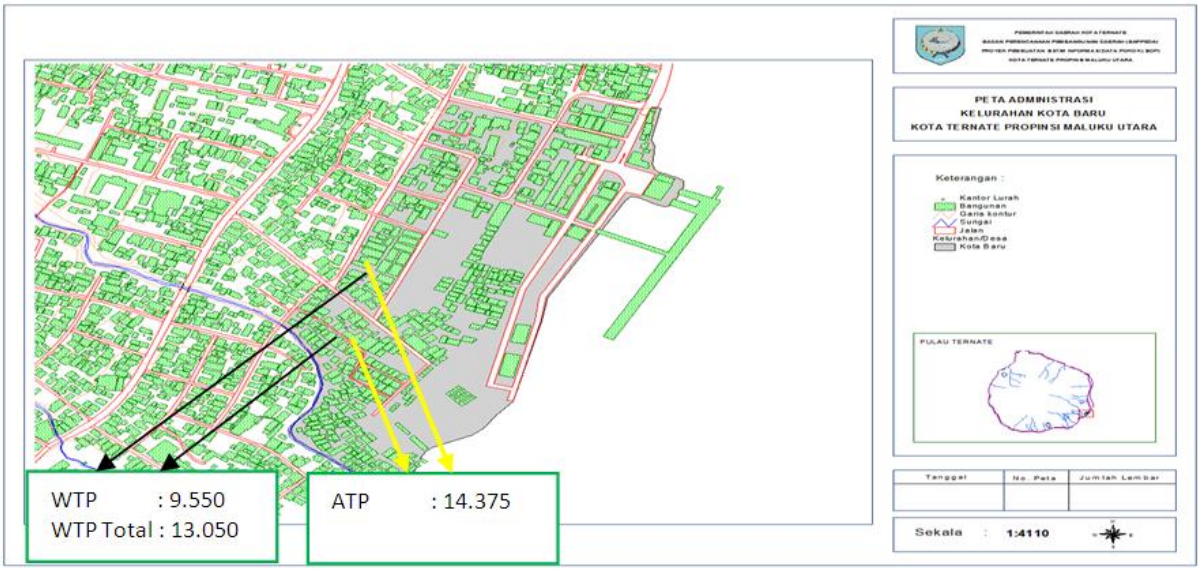
Map 2 : Distribution of Estimated Value WTP and ATP in the category settlements town in the city of Ternate.



Map 3: Distribution of Estimated Value WTP and ATP in the category Settlements New Town in the city of Ternate



Map 4: Distribution of Estimated Value WTP and ATP in the category Settlements Coastal area in City of Ternate



The implications of the estimation of the value of the ATP and WTP community in the city of Ternate associated with waste management effective and efficient environment that supports kebesihan. Among them are:

1. ATP regression equation can be applied to estimate the value of ATP (ability to pay) to simulate the magnitude of the independent variables that affect it. The reason behind choosing this ATP regression equation is because all the independent variables that affect ATP dependent variable was statistically significant (Table 5). WTP regression equation indicates that only 2 (two) of the six (6) independent variables that have a significant effect on WTP so to conduct policy simulations related to the WTP estimates can not be done. Results of research conducted two simulations to generate ATP values.

a.The first simulation assuming; (I). Formal education community located in residential areas (PK1, PK2, PK3 and PK4) is senior high school to the top; (ii) the number of family members including the head of the average family is five (5) persons; (iii) the total family income per month on average for communities living in residential areas (PK1, PK2, PK3 and PK4) each is IDR 957,692.00; IDR 1,119,863.00; IDR 1,400,000.00 and IDR 1,448,968.00.

b.The second simulation assuming; (I) formal education community located in residential areas (PK1, PK2, PK3 and PK4) is below the senior high school; (ii) the number of family members including the head of the average family is five (5) persons; (iii) the total family income per month on average for a group of communities living in residential areas (PK1, PK2, PK3 and PK4) respectively IDR 957,692.00; IDR 1,119,863.00; IDR 1,400,000.00; and IDR 1,448,968.00. The results of the estimated value of ATP from communities living in residential areas (PK1, PK2, PK3 and PK4) using ATP regression equation shown in Table 6 below.

Table 6: Estimated Value Simulation Results Against Public ATP in Ternate

Community Residential Clusters in Ternate	Value Estimation Results ATP (in IDR)	
	Simulation I	Simulation II
a.CBD Residential (PK1)	19.716,00	15.859,00
b.Town Residential (PK2)	29.100,00	25.243,00
c.New Town Residential (PK3)	29.410,00	25.553,00
d.Coastal Residential (PK4)	38.656,00	34.799,00

The data is processed, July 2013

Table 6 shows that the value of the ATP community in Ternate who has a high school formal education up to all categories of people residing in residential areas (PK1, PK2, PK3 and PK4) is greater than the IDR 3,857.00 formally educated urban communities under the senior. The results of this kind can occur partly due to there are other variables outside the model which can affect the amount of ATP society Ternate but not covered in this study.

2. Results estimate WTP and ATP communities located area of the city as a base for policy making to raise the levy of municipal solid waste that must be done carefully. Prudence is based on findings of fact on the ground is not the creation of symmetric information between PD. Cleanliness of Ternate with the people residing in the city residential areas, especially on programs and technical and non-technical innovation in waste management effective and efficient. As a consequence the value of WTP urban communities (whose value is relatively low) and ATP urban communities can not be directly used as a justification for the determination of municipal waste levy but can be used as a reference.

3. Results estimated value of WTP and ATP is used as a justification for the determination of the basic rate levy garbage in Ternate based on a regional basis. In addition, the results of the estimated value of WTP and ATP in this study can be used as an indicator of the city public response to various innovations both technical and non-technical as well as on the performance of PD Health Ternate for this. Therefore, from the demand side the results of the estimated value of WTP and ATP society living in the city region is used as reference material in considering the complementary fit between the base of municipal waste levy rate calculation based on government regulations with the results of the economic valuation done by the community.

IV. Conclusion

Results of research conducted to provide solutions empirically as follows:

1. PD Health Ternate should give greater attention to the various technical innovations and non-technical in municipal waste management so that people of the city will provide an objective and positive appreciation that will no doubt give rise to waste retribution.
2. PD Health Ternate should give attention to efforts to improve public relations in the framework of an increase in two-way communication with the public in the City Ternate. The formation of symmetric information between PD.Kebersihan with people in the city of Ternate will raise awareness of the rights and obligations as people want a City Ternate WHO clean and healthy. Symmetric information will also provide the right signals for PD. The cleanliness in formulating policies related to waste management strategies. For the people of Ternate symmetric information will provide an opportunity for can Participate Actively in helping resolve the problem of garbage in their residence.
3. PD Health Ternate should complete the data on the distribution of garbage (type and volume) at any points residential area community. The results of the mapping of a more complete and integrated dots midden associated with city and community participation will help resolve the problem of garbage in the city of Ternate.

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