Consumer Willingness to Pay for Multiple Attributes of Organic Rice : A Case Study in the Philippines

Shihomi Ara*

Department of Agricultural, Environmental and Development Economics
The Ohio State University

Contributed paper selected for presentation at the 25th International Conference of Agricultural Economists, August 16-22, 2003, Durban, South Africa

**Mailing Address:*
Shihomi Ara
Department of Agricultural,
Environmental and Development Economics
The Ohio State University
342 Ag Admin., 2120 Fyffe Road
Columbus, OH 43210-1067
USA

E-mail: ara.1@osu.edu

Consumer Willingness to Pay for Multiple Attributes of Organic Rice : A Case Study in the Philippines

Abstract
Organic rice production in the Philippines has been growing rapidly since 1986. We conducted a conjoint analysis to determine consumers' preferences of multiple attributes of organic rice in Manila and Naga city. Attributes included were price, reduced health risk level, environmental quality, eating quality, type of organic certification and a fair trade factor. In both cities, health risk was the primary concern. Consumers in Manila revealed organic certification to be the second most important factor while improvement of the farm environment was the second highest factor in Naga city. We found that consumers who live further from the production site have a higher demand for certification. On the other hand, consumers who live close to the farms care more about the farm environment and have a lower demand for certification.

Keywords: organic agriculture; food safety; risk perception; conjoint analysis; willingness to pay

1. Introduction

A large number of consumer surveys on organic agricultural produce as well as food safety have been conducted in developed countries, yet the number of studies in developing countries is very limited. Although organic agriculture is still in its initial stage in most developing nations, several countries have experienced rapid growth in recent years. In the case of the Philippines, organic agricultural production was launched in 1986 and since then the area of production has been increasing dramatically. In order for producers and government to follow an appropriate strategy regarding the marketing, certification and export of these products, consumer surveys are necessary. Our study tries to elicit characteristics of consumers' preferences toward multiple attributes of organic rice by conducting a conjoint analysis.

The Green Revolution started in 1961 in the Philippines and brought with it serious economic, environmental and producers' health issues onto rice farms as a result of the heavy use of chemical inputs. The shift from such "conventional" farming to organic farming has therefore been encouraged by Non Governmental Organizations (NGO),

farmers' cooperatives and several academic collaborators since 1986 based on two motivations - poverty alleviation for small farms and improvement of the farm environment and producers' health.

2. Organic Production in the Philippines

Organic agriculture in the Philippines is promoted by NGOs and academic supporters. In recent years, one of the Department of Trade and Industry branches, Center for International Trade Expositions and Missions (CITEM) has been planning the Philippines Organic Certification Program which is planned to start in 2004 in order to enhance exports and promote organic products. Nation-wide official statistics on organic farming situation are not available as of 2001. However, one of the best available datasets which captures the current situation is the one collected by MASIPAG (Magsasaka at Sayantipiko Para sa Ikauunlad ng Agham Pang-agrikultura) Foundation, which is an NGO leading the organic adoption movement. According to their study, in 1999, there were 1,897 producers who had fully adopted organic farming under the guidance of the MASIPAG Foundation, and 11,052 producers who partially adopted. The corresponding areas covered by full and partial adoption were 1,754 and 15,411 hectares, respectively (MASIPAG, 2001). The adopters' farms were distributed all over the country. CITEM, MASIPAG Foundation and several other NGOs working on the promotion of organic agriculture are collaborating very closely to develop the Organic Certification Program.

3. Model Specification of Consumers' Stated Preferences for Organic Rice

A choice experiment is employed in our study in order to elicit consumers' preferences for various attributes of organic rice. This experiment is based on a Lancaster

characteristics demand model and Random Utility Theory. We employ a modified version of the model by Baker (1999). We define a Random Utility Model as follows:

$$U_i = V_i(\mathbf{a}_i, p_i) + \varepsilon_i \tag{1}$$

where V_i is the observable part of the utility, ε_i is the unobservable part of utility obtained from product i, and $\mathbf{a}_i$ is a vector of attributes of the product i. We assume a linear indirect utility function and define it as

$$V = \sum_j \beta_j a_j + \beta_p p \tag{2}$$

where $\beta_j (j = 1, \cdots, n)$ are the coefficients for attributes and β_p is the coefficient for price of the good.

4. Survey Design and Data

As a result of discussions with producers and experts as well as the pre-test we conducted three months prior to the survey, six attributes were considered in our study. These are price, reduced health risk, farm environmental quality, eating quality, certification, and fair trade. We set the status quo product to be non-organic rice which respondents purchase regularly. The descriptions of the attributes and their levels are summarized in Table 1. In our estimation, we regress the following equation and estimate willingness to pay (WTP) for each attribute:

$$\begin{aligned} V = {} & \beta_1 PRICE + \beta_2 RISK + \beta_3 ENV(Fair) + \beta_4 ENV(Good) + \beta_5 ENV(VeryGood) \\ & + \beta_6 EAT(Bad) + \beta_7 EAT(Fair) + \beta_8 EAT(Excel) \\ & + \beta_9 CER(Coop) + \beta_{10} CER(NGO) + \beta_{11} CER(DA) + \beta_{12} TRADE \end{aligned} \tag{3}$$

Table 1: Attributes and Levels

Attributes	Description	Levels
Price (PRICE)	Price differences between the rice the respondent regularly buys and the other type of rice.	2, 4, 6, 10, 15, 20 (Philippines Peso per kilogram)
Reduced Health Risk(RISK)	Percentage of the health risk which can be reduced by choosing the non-status quo rice compared to the status-quo rice. We assume 50, 80% reduction as "reduced pesticide" rice and 99% as "organic rice". Explained with risk ladder.	0*, 50, 80, 99%
Environmental Quality(ENV)	Lake water pollution level on farm site due to pesticide use. Explained with a ladder index.	Bad*, Fair, Good, Very Good
Eating Quality(EAT)	If the rice has "1.softness, 2.white grain, 3.good smell and 4.high purity" features, it is an excellent rice. Bad quality does not have any of these features.	Bad, Fair(with feature1,2), Good*(1,2,3), Excellent(1,2,3,4)
Certification(CER)	Whether the rice is certified (reduced pesticide or organic) or not. If so, the type of organization that is the certification body.	None*, Farmer's Cooperative, NGO, Dept. of Agriculture
Fair Trade(TRADE)	If a trader who buys rice from an organic/reduced pesticide farmer pays the appropriate price for the product. Without fair trade, the conventional rice price is earned even for organic/reduced pesticide rice. With fair trade, this rice commands a 10-15% higher price.	No Fair Trade*, With Fair Trade

*indicates levels for status quo profile

We conducted our survey in two locations, the Manila region (10 different areas including Quezon city and Manila) and Naga city in the Philippines between 27th of June to 7th of July, 2001. We used the same survey instrument for each city. Naga city is located in about 377 kilometers south of Manila and is one of the regional cities. It has a total land area of 8,448 hectares and about 75 percentage of the land is used for agriculture. In 2000, the total population was 137,810 (City Planning, 2000). We conducted a survey in Naga city in part because there was a research need due to the recent expansion of organic rice production in the region and because we wanted to

compare consumers' preferences in a city close to production sites compared to those in a typical urban city such as Manila.

Four and nine well-trained interviewers were employed, and 200 and 348 questionnaires were collected in Manila and Naga city, respectively. Interviewers visited each household chosen randomly, explained the questionnaire and panels, asked questions and wrote answers by themselves. The time they spent per questionnaire was approximately 20 minutes. (We conducted Contingent Valuation Methods (CVM) as well as Conjoint Analysis. See Ara (2002) for the results of CVM.) Six choice experiments were asked to each respondent. The general characteristics of our sample are listed in Table 2. In addition to socio-demographic information, respondents were asked the price of the conventional rice they regularly purchase, their attitudes toward risk from pesticide residues (1-to-5 scale with descriptions), knowledge level regarding "organic rice", "pesticide residues", "sustainable agriculture", and "water pollution", and willingness to purchase organic rice when they find it in the market.

More than 70 percent of respondents were female. This is because we intentionally targeted the household member who makes the purchasing decisions. Household monthly income is nine times higher in Manila. As for education, although the Manila sample shows a higher education level compared to the Naga sample, more than 50 percentage of the Naga sample has at least a college level education. The literacy rate in Naga City is 98 % (City Planning, 2000). Average price of conventional rice purchased by the household is 24.29 peso per kg for Manila and 18.22 peso for Naga city as a total ($1=53.22 peso in July 2001). We elicited respondents' subjective attitudes toward the risk from pesticide residues by using a 1 to 5 scale - with 1 indicating "no risk" and 5 indicating "very serious risk". We employed a 1 to 5 scale instead of a 1 to 10 scale

which is frequently used in other studies (Eom, 1994; Smith and Desvousges, 1989) to make it easier for respondents to understand the level.

We found interesting differences between the two cities in terms of the subjective risk perception. The most prominent feature of Manila sample is that 45.9 percent of the respondents think the risk is acceptable while 33 percent perceive it is either serious or very serious risk. Those who think there is no risk are only 1.6 percent. The average level is 3.18. As for the Naga sample, 51 percent of respondents think the risk is either serious or very serious while 12.1 percent of them conceive that there is no risk. The average level is 3.3, which is higher than the one in Manila. This compares favorably to the result of Eom (1994) who obtained a mean of 6.6 using a 1 to 10 Likert scale questioning pesticide residues risk perceptions in North Carolina, USA in 1990 as well as the study by Misra *et al.* which revealed that 56 percent of the respondents in Georgia, USA considered "very important" for fresh produce to be tested and certified as free of pesticide residues while 33 and 4 percent answered "somewhat important" or "not important", respectively. The structure of the subjective risk in Naga is similar to the ones in the cases of U.S. except for the relatively high "no risk" responses. Manila sample shows less perceived risk.

We also elicited knowledge level of four concepts, organic rice, pesticide residues, sustainable agriculture and water pollution. About half of the respondents in Manila at least had heard the word organic rice while it was 33 percent in Naga. Since organic producers and traders seek higher premium price in the market in Manila, organic product is available more frequently in Manila. These numbers are higher than we expected considering the fact that one study in Cagayan de Oro City in the Philippines in 1995 revealed that none of their 378 respondents were aware of organic rice (Xavier

Table2: Summary of the Sample

		Manila		Naga	
		Sample	Target Population	Sample	Target Population
Sex (%)	Male	25.7	48.8	25.9	49.1
	Female	74.3	51.2	74.1	50.9
Age	Average	38.5	N.A.	39.3	N.A.
Household Size	Average	5.56	4.6	6.3	5.24
No. children under18	Average	0.86	N.A.	2.1	N.A.
Household income/mo.	Average (peso)	60,204	N.A.	6,679	6,495
	-15,000/-5,000 (%)	7.10		31.1	57.9
	15,001-30,000/5,001-10,000	11.48		37.8	29.0
	30,001-45,000/10,001-20,000	9.84		23.6	9.5
	45,001-60,000/20,001-40,000	22.95		5.5	2.8
	60,001-100,000/40,001-	24.04		2.0	0.9
	100,001-/	24.59			
Education (%)	Elementary	0.55		10.7	
	High Scl.	17.49		36.3	
	College/Univ	74.32	N.A.	50.1	N.A.
	Post Grad.	7.65		1.7	
	Others	0		1.2	
Ave. Price of Conventional Rice Bought by Income Bracket (peso*/kg) (Manila/Naga)	Total	24.29		18.22	
	15,000/5,000	24.62		17.77	
	22,500/7,500	23.48		18.29	
	37,500/15,000	22.61	N.A.	18.60	N.A.
	52,500/35,000	25.32		18.47	
	80,000/40,000	26.88		19.30	
	100,000/N.A.	30.97		N.A.	
Subjective Attitude to Pesticide Residue Risk (%)	1.No Risk	1.64		12.1	
	2.Little Risk	19.13		8.4	
	3.Acceptable	45.90	N.A.	28.5	N.A.
	4.Serious	26.23		38.6	
	5.VerySerious	7.10		12.4	
Knowledge "Organic Rice" (%)	Never Heard	50.82		66.6	
	Know Word	37.70	N.A.	27.1	N.A.
	Know Well	11.48		6.1	
Knowledge "Pesticide Residues" (%)	Never Heard	54.64		57.9	
	Know Word	30.60	N.A.	34.0	N.A.
	Know Well	14.75		8.1	
Knowledge "Sustainable Agriculture"(%)	Never Heard	61.75		62.3	
	Know Word	32.24	N.A.	30.0	N.A.
	Know Well	6.01		7.8	
Knowledge "Water Pollution" (%)	Never Heard	4.37		11.0	
	Know Word	24.59	N.A.	26.5	N.A.
	Know Well	71.04		62.5	
Will buy if Organic Rice is available (%)	Will not buy	27.87	N.A.	17.7	N.A.
	Will buy	71.58		82.3	

University, 1995), and another study conducted in Metro Manila in 1997 showed that only four percent of 77 respondents understood the concept of organically grown products (Upland Marketing, 1998). This result indicates that consumers have a greater chance of hearing about organic rice as the result of the expansion of organic movement in recent years. Knowledge about pesticide residues and sustainable agriculture shows similar structure in both cities. Water pollution is the most recognized concept most probably due to serious river water pollution problems both in Manila and Naga city. The answer to the question "will you buy organic rice if it is available in the market?" revealed that majority of respondents are willing to try at least once. The ratio is higher for Naga than for Manila. This result can be related to the differences in the result of subjective risk perception in each city.

5. Empirical Results

The estimated model results are listed in Table 3. Each of the estimated parameters are statistically significant at least at 10 % significant level for the whole sample in Manila as well as Naga sample except for EAT(Fair) attribute. These parameters indicate how much individual's utility increases when each attribute goes up by one unit, which is one peso for price, one percent for risk, a unit improved from status-quo level to the level of comparison for environmental and eating quality, and comparisons between no certification and certification by certain agency and situation without fair trade versus with fair trade. Signs are all consistent with the ones we expected except for the insignificant attribute of Naga sample. Respondents' utility decreases if price increases as the result of choosing non-conventional rice, increases when the percentage of reduced risk increases, increases when farm environment improved from bad to fair, from bad to

good, and from bad to very good level, decreases if eating quality is degraded from good to bad, from good to fair, increases if the quality is improved from good to excellent, increases if certification is available on the produce, and increases if fair trade is enforced.

Further estimations depending on income levels have been conducted. The kinds of attitudes which are statistically significant differ in each income group. Price is significant for all income levels except for the low income group in Naga and is less significant for the low income group in Manila. Risk is significant at the 1 percent level for all incomes in both cities. Environmental quality is also one of the factors which influence consumers' utility including the low income group. Lower rice quality significantly decreases people's utility in Manila while improving the quality does not have an effect except for the high income group. Certification by any kind of institution does not significantly increase the utility of the low income sample in Manila. However, middle and high income groups in Manila gain positive utility from the certification by an NGO and the Department of Agriculture while the Naga sample has a significant result for all institutions except NGOs for the low income group. The fair trade factor is significant for all income levels except for low income group in Naga.

Based on the estimated results in Table 3, we computed willingness to pay (WTP) measures for each attribute for each sample group. The results are listed in Table 4 for Manila and in Table 5 for Naga. WTP for reducing 80 percent of the health risk is 13.6 peso and it has the highest value compared to the other factors. We found that people in Manila place a high priority on certification by an NGO or Department of Agriculture. Degrading rice quality from Good to Bad due to the shift to organic or reduced pesticide rice has a significant impact while improving the quality of rice has a lower value for consumers in Manila. The farm environment and fair trade factors received relatively low

priority. If we evaluate WTP for certain types of rice, such as 80 percent reduced risk, good farm environment, good eating quality, certification by NGO and no fair trade, the price of the rice is 28.92 peso. Since the average price of conventional rice bought by the Manila sample is 24.29, WTP estimated is in a reasonable range. We evaluated results for each income group and these are shown in Table 4. The outcomes with insignificant estimates in Table 3 are not listed in the table. The tendency of consumer preference is basically similar to the result as a whole. The high income group obviously has higher WTP for each factor.

WTP for Naga case is listed in Table 5. The first thing we have to mention is that the value of WTP is very high considering the average price of rice paid by this sample, that is 18.22 peso. There are two possible reasons which may cause this result. One is that respondents in Naga were not familiar with organic rice since it has a limited availability in this market. The sample summary shows that 67 percent of the respondents in Naga city had never heard about organic rice. Therefore, it is possible that respondents overreacted to health risk or other newly stated factors. The other possible reason is that interviewers could not make respondents consider their budget constraints sufficiently. Although we cannot obtain implications given the absolute value of WTP, we can still evaluate the estimated results by considering their relative magnitudes to learn something about consumer preferences in Naga city.

WTP for health risk is 0.35 peso per one percent of risk reduction. This implies 28 peso for 80 percent reduction and comparing to other factors, this has a big influence on purchasing behavior. The second factor which consumers voice concern over is environmental quality. Eating quality comes next, and certification and fair trade factors are the least important factors.

We can point out two interesting findings as the result of this comparison between Naga city and Manila. Consumers in Naga city have heightened concerns about the farm environment while consumers in Manila have higher concerns for organic certification. This result indicates that consumers living relatively close to the production site logically place a higher weight on improving the farm environment while they have a relatively low demand for certification. On the other hand, for consumers living far from farms, certification is one of the most important factors when they choose organic or reduced pesticide rice. This fact should be considered carefully when the government introduces the national certification program since the demand for organic certification varies from place to place. The second point we should mention is that the type of certification preferred the most in Naga is that by the Department of Agriculture while it is by an NGO in Manila. Interestingly, certification by an NGO is the least preferred in Naga city. The high income group has a higher WTP than the middle income group in general, which is as expected. However, WTP for risk for the high income group is lower than the one for the middle income group and they prefer certification by an NGO to the one by the Department of Agriculture while the middle income group prefers certification by farmers cooperative the most. Further investigation is required to determine what makes people prefer one certification to another in each city and for each income category.

6. Concluding Remarks

In our analysis, we found that consumers near the production sites have higher interest in improving the farm environment. This is compatible with the desire of farmers who wish to achieve sustainable agriculture with reduced health risk from handling pesticides and for consumers within the Philippines and elsewhere who seek safer foods. Since

consumers living far from the production site wish to have some form of certification on their organic or reduced pesticide foods, establishing a credible certification system which meets consumers' demand is necessary for the success of both sustainable agriculture and food safety. It is important to determine the impact of this certification system on the demand for the certification and subsequently on organic products in the country. A uniform certification plan may not be desired by consumers living close to production sites although it may benefit urban consumers. Certification program which will be adopted fully by 2004 in the Philippines should avoid distorting the current demand situation in the places like Naga city as much as possible. This study highlights important issues to be considered in the development of this organic program.

References

Ara, S., 2002. Environmental Evaluation of Organic Rice: A Case Study in the Philippines. Master's Thesis. Dept. of Econ. Kobe University. Japan.

Baker, G,. 1999. Consumer Preferences for Food Safety Attributes in Fresh Apples: Market Segments, Consumer Characteristics, and Marketing Opportunities. J. Agric. Res. Econ. 24(1), 80-97.

City Planning and Naga City Hall Development Office, 2000. Naga City Statistical Profile Year 2000. Technical report.

Eom, Y.S., 1994. Pesticide Residue Risk and Food Safety Valuation: A Random Utility Approach. Am. J. Agric. Econ. 76, 760 – 771.

Krinsky, I., Robb, A.L., 1986. On Approximating the Statistical Properties of Elasticities. Rev. Econ. Statist. 68i, 715-719.

MASIPAG Foundation, 2001. Results and Impact. Technical report.

Misra, K.S., Huang, L.C., Ott, L.S., 1991. Consumer Willingness to Pay for Pesticide-Free Fresh Produce. West. J. Agric. Econ. 16(2), 218 -227.

Smith, K.V., Desvousges, H.W., 1989. Subjective versus Technical Risk Estimates: Do Risk Communication Policies Increase Consistency? Econ. Letters 31, 287 – 291.

Upland Marketing Program Philippines Business for Social Progress, 1998. The Rice Trading Dynamics and an Appraisal of the Market Potential for Organically Grown Rice. Technical report.

Xavier University College of Agriculture, 1995. Survey on Target Markets for Organically Grown Rice. Technical report.

Table 3: Logit Estimates for Respondents' Preferences on Organic Rice, All and Each Income Group, Manila/Naga Case

Independent Variables	Manila					Naga				
	(1) All	(2) Low	(3) Middle	(4) High	(5)Mid.+ High	(1)All	(2)Low	(3)Middle	(4)High	(5)Mid.+ High
PRICE	-0.069 (-8.58***)	-0.029 (-1.74*)	-0.099 (-5.87***)	-0.075 (-6.44***)	-0.083 (-8.79***)	-0.023 (-4.38***)	-0.008 (-0.86)	-0.035 (-3.94***)	-0.027 (-2.78***)	-0.031 (-4.76***)
RISK	0.012 (10.14***)	0.011 (3.82***)	0.011 (5.42***)	0.013 (7.64***)	0.012 (9.44***)	0.008 (9.47***)	0.004 (2.92***)	0.011 (7.53***)	0.009 (5.64***)	0.010 (9.40***)
ENV(Fair)	0.317 (2.38**)	0.393 (1.32)	0.495 (1.96**)	0.246 (1.27)	0.337 (2.22**)	0.567 (5.97***)	0.556 (3.06***)	0.520 (3.44***)	0.607 (3.56***)	0.570 (5.07***)
ENV(Good)	0.375 (2.18**)	0.748 (1.92*)	0.511 (1.66*)	0.205 (0.80)	0.322 (1.66*)	0.677 (5.46***)	1.041 (4.53***)	0.698 (3.67***)	0.227 (0.94)	0.511 (3.44***)
ENV(VeryGood)	0.453 (3.13***)	0.838 (2.37**)	0.132 (0.50)	0.569 (2.71***)	0.391 (2.42**)	0.756 (6.81***)	0.803 (4.06***)	0.802 (4.43***)	0.660 (3.15***)	0.743 (5.45***)
EAT(Bad)	-1.090 (-7.45***)	-0.783 (-2.68***)	-1.118 (-4.03***)	-1.236 (-5.47***)	-1.181 (-6.82***)	-0.500 (-5.24***)	-0.448 (-2.59***)	-0.662 (-4.15***)	-0.321 (-1.87*)	-0.513 (-4.41***)
EAT(Fair)	-0.591 (-4.32***)	-0.631 (-2.00**)	-0.476 (-1.99**)	-0.649 (-3.17***)	-0.571 (-3.71***)	0.029 (0.30)	0.292 (1.65*)	-0.233 (-1.52)	0.105 (0.59)	-0.087 (-0.75)
EAT(Excel)	0.406 (3.36***)	0.261 (1.03)	0.317 (1.43)	0.586 (3.19***)	0.480 (3.42***)	0.406 (4.86***)	0.414 (2.70***)	0.183 (1.35)	0.723 (4.69***)	0.417 (4.13***)
CER(Coop)	0.221 (1.91*)	0.158 (0.64)	0.291 (1.36)	0.199 (1.16)	0.227 (1.72*)	0.361 (4.48***)	0.378 (2.56***)	0.383 (2.94***)	0.328 (2.18**)	0.350 (3.58***)
CER(NGO)	0.685 (4.49***)	0.237 (0.69)	0.741 (2.79***)	0.849 (3.61***)	0.797 (4.60***)	0.341 (3.13***)	0.107 (0.54)	0.296 (1.72*)	0.604 (2.83***)	0.421 (3.17***)
CER(DA)	0.502 (4.07***)	0.310 (1.09)	0.520 (2.41**)	0.524 (2.83***)	0.521 (3.76***)	0.417 (4.89***)	0.380 (2.46**)	0.333 (2.40**)	0.619 (3.92***)	0.448 (4.33***)
TRADE	0.381 (3.75***)	0.520 (2.10**)	0.434 (2.37**)	0.350 (2.34**)	0.367 (3.24***)	0.264 (3.60***)	0.046 (0.35)	0.378 (3.14***)	0.381 (2.70***)	0.381 (4.21***)
N	1098	204	360	534	894	2074	643	786	642	1428
LogL	-1040.65	-192.26	-338.92	-492.11	-838.1	-1967.41	-608.341	-748.651	-574.321	-1333.94
Schwarz B.I.C.	1082.66	224.17	374.24	529.8	878.87	2013.23	647.129	788.652	613.109	1377.52

*Inside parentheses is t-value. *** 1%, ** 5%, * 10% significance level.

Table 4: Willingness to Pay for Each Attribute in Peso, All and Each Income Group, Manila Case

	Manila									
	(1) All		(2) Low		(3) Middle		(4) High		(5) Mid.+High	
Attributes	WTP	95% C.I. *	WTP	95% C.I.	WTP	95% C.I.	WTP	95% C.I.	WTP	95% C.I.
RISK	0.17	[0.13 - 0.22]	-0.01	[-0.27 - 1.39]	0.12	[0.08 - 0.17]	0.18	[0.13 - 0.24]	0.15	[0.12- 0.19]
ENV(Fair)	4.54	[1.54 - 7.64]	-	-	4.85	[0.87 - 8.72]	-	-	4.09	[1.31 - 6.87]
ENV(Good)	5.35	[1.30 - 9.07]	22.09	[-4.05 - 96.57]	5.28	[0.10 - 10.19]	-	-	3.85	[-0.14 - 7.69]
ENV(VeryGood)	6.47	[3.39 - 9.66]	62.05	[0.42 - 92.61]	-	-	7.57	[3.24 - 12.05]	4.65	[1.63 - 7.69]
EAT(Bad)	-15.9	[-20.62 - -11.84]	-47.87	[-113.54 - -5.95]	-11.62	[-16.99 - -7.07]	-17.01	[-24.82 - -11.08]	-14.33	[-18.78 - -10.41]
EAT(Fair)	-8.67	[-12.74 - -4.92]	-3.42	[-106.25 - 8.88]	-4.89	[-9.32 - -0.80]	-8.85	[-14.63 - -4.01]	-6.94	[-10.38 - -3.88]
EAT(Excel)	5.93	[2.97 - 9.31]	-	-	-	-	8.2	[3.82 - 13.21]	5.85	[2.98 - 9.08]
CER(Coop)	3.23	[0.43 - 6.11]	-	-	-	-	-	-	2.76	[0.12 - 5.53]
CER(NGO)	9.97	[6.14 - 14.30]	-	-	7.93	[3.31 - 13.27]	11.6	[5.82 - 18.10]	9.77	[6.09 - 13.87]
CER(DA)	7.36	[4.45 - 10.41]	-	-	5.37	[1.46 - 9.97]	7.1	[2.94 - 11.81]	6.29	[3.46 - 9.30]
TRADE	5.48	[3.13 - 7.97]	31.96	[-4.09 - 79.36]	4.45	[1.61 - 7.64]	4.83	[1.61 - 8.44]	4.47	[2.30 - 6.86]

* 95% confidence intervals for each WTP calculated by a monte carlo simulation of Krinsky and Robb's method done 1000 times

Table5: Willingness to Pay for Each Attribute in Peso, All and Each Income Group, Naga Case

	Naga									
	(1) All		(2) Low		(3) Middle		(4) High		(5) Mid+High	
Attributes	WTP	95% C.I.	WTP	95% C.I.	WTP	95% C.I.	WTP	95% C.I.	WTP	95% C.I.
RISK	0.35	[0.24 - 0.52]	-	-	0.33	[0.21 - 0.51]	0.29	[0.19 - 0.79]	0.33	[0.23 - 0.46]
ENV(Fair)	25.33	[16.34 - 37.53]	-	-	15.8	[7.63 - 25.93]	28.16	[11.31 - 53.76]	19.37	[12.62 - 28.71]
ENV(Good)	30.74	[19.65 - 46.39]	-	-	21.27	[10.99 - 34.99]	-	-	16.68	[8.03 - 27.03]
ENV(VeryGood)	33.81	[23.12 - 50.72]	-	-	24.53	[14.10 - 38.69]	34.14	[11.88 - 54.70]	25.01	[16.70 -35.97]
EAT(Bad)	-23.15	[-37.42 - -14.01]	-	-	-19.96	[-34.69 - -10.74]	-13.53	[-31.55 - -2.22]	-17.07	[-27.08 - -9.75]
EAT(Fair)	-	-	-	-	-	-	-	-	-	-
EAT(Excel)	18.51	[10.74 - 29.54]	-	-	-	-	33.13	[14.03 -70.53]	13.91	[7.49 - 22.35]
CER(Coop)	16.06	[9.00 - 25.71]	-	-	11.76	[4.72 - 21.18]	15.66	[2.48 - 32.87]	11.79	[5.75 - 19.71]
CER(NGO)	15.62	[6.25 - 28.75]	-	-	9.41	[0.55 - 19.66]	32.52	[7.55 - 63.42]	14.29	[5.74 - 24.32]
CER(DA)	18.82	[10.95 - 29.41]	-	-	10.18	[2.94 - 18.98]	24.16	[10.50 - 55.54]	14.97	[8.43 - 23.23]
TRADE	12.21	[5.96 - 20.80]	-	-	11.92	[4.67 - 21.30]	18.74	[4.98 - 38.21]	13.06	[7.17 - 21.21]