

ARE PEOPLE WILLING TO PAY FOR IMPROVED WATER SUPPLY?

**Evidence from Metro Manila and
Camarines Sur**

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INTRODUCTION

- **Philippine Strategy for Sustainable Development (1989)**
 - **Proper pricing of natural resources**
 - **Price reform plan for environmental resources, like water**

INTRODUCTION

- **Philippine Strategy for Improved Watershed Management (1998) under the Water Resources Development Project**
 - **Stresses the need to price raw water and other watershed resources**
 - **Pricing based on true economic values**
 - **Valuation should include full cost of protecting and harnessing individual resources**

INTRODUCTION

- Little effort to price and collect fees for raw water
- UPLB studies on people's attitudes towards and evaluate the WTP for watershed conservation
- Positive step toward raw water pricing
- Budgetary constraints

The Study Areas

■ **Metro Manila**

- Domestic water supply: Angat, Ipo, Umiray and La Mesa watersheds
- Manila Water Company, Inc.: east zone
- Maynilad Water Services, Inc: west zone
- Water concessionaires do not pay for raw water

The Study Areas

■ **Camarines Sur**

- MINP supplies water to 15 municipalities and 1 city
- Metro Naga Water District
- Pili Water District
- Municipal waterworks
- DENR, LGUs and NGOs as fund providers, but limited budget

The Study Areas

- Need to ensure continuous financing of management interventions in these watersheds
- Need for revenue generation
- Put prices on the goods and services that these watersheds produce
- Collect these prices

Objectives of the Paper

- Compare results of two CVM studies done in Metro Manila and Camarines Sur to estimate households' WTP to pay for the improved management of four watersheds in Metro Manila and Mt. Isarog

Objectives of the Paper

The studies aimed to:

- Evaluate the respondents' level of awareness about the importance of watersheds in ensuring a sustainable water supply
- Determine the water users' WTP and the amount they are willing to pay for the protection and conservation of the watersheds
- Identify factors that affect the water users' WTP

METHODOLOGY

- FGDs (government agencies and water distributors; household water users)
- Training of enumerators
- Pre-tests
- Sample size
 - Metro Manila – 2,232 HHs
 - MWSI (west zone) – 1,224 HHs
 - MWCI (east zone) – 1,008 HHs
 - Camarines Sur – 1,521 HHs
 - MNWD – 1,158 HHs
 - PIWAD – 363 HHs

METHODOLOGY

- **Interview Schedule: 4 Parts**
 1. **Background information on HH's water use, and expenditures, and awareness about watersheds**
 2. **Brief description of the current water supply situation in the area, discusses the role of forests and watersheds in sustainable water supply, describes the hypothetical trust fund that will be created, and asks the CV question**
 3. **Assessment of the preferred institutional arrangements**
 4. **Socioeconomic background of the respondent**

METHODOLOGY

■ The CV Model

$$\log\left(\frac{\Pr(WTP = 1)}{1 - \Pr(WTP = 1)}\right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_m X_m + \beta_n A$$

Where: WTP = 1 is equivalent to the “yes” response

X_1, X_2, \dots, X_m are the independent variables, and A is the bid amount

From the model, the mean WTP was determined using the formula:

$$Mean = \gamma / \hat{\beta}_n$$

Where:

γ

is the constant plus the coefficients of the variables multiplied by their respective mean values;

$\hat{\beta}_n$

is the coefficient of the bid amount variable

RESULTS

- Awareness level: Metro Manila (%)

ITEM	RESPONSE	MWCI	MWSI	TOTAL
Water-sheds	Aware	19	14	16
	Not Aware	81	86	84
	Total	100	100	100
Forests	Aware	87	94	91
	Not Aware	13	6	9
	Total	100	100	100

RESULTS

- Awareness level: Mt. Isarog (%)

ITEM	RESPONSE	MNWD	PIWAD	TOTAL
Water-sheds	Aware	32	35	33
	Not Aware	68	65	67
	Total	100	100	100
Forests	Aware	99	99	99
	Not Aware	1	1	1
	Total	100	100	100

RESULTS

- Awareness level: Camarines Sur (%)

ITEM	RESPONSE	MNWD	PIWAD	TOTAL
Mt. Isarog	Familiar	94	94	94
	Not familiar	6	6	6
	Aware as WS	94	100	96
	Not aware	6	0	4

RESULTS

- WTP estimates: Metro Manila

Model	Equation		Mean WTP (P/mo)
	γ	$\hat{\beta}_n$	
A (General model)	0.341710610	-0.0117403	29.11
B (MWSI)	0.464655000	-0.0122318	37.98
C (MWCI)	0.219609228	-0.0113695	19.31

RESULTS

- WTP estimates: Mt. Isarog

Model	Equation		Mean WTP (P/mo)
	γ	$\hat{\beta}_n$	
A (General model)	1.553241279	-0.0281712	55.14
B (MNWD)	1.529540000	-0.0276070	55.40
C (PIWAD)	1.221877720	-0.0242380	50.41

Significant factors affecting WTP: Metro Manila (1)

Variable	Model A	Model B	Model C
BA	-0.0117403 (0.000)	-0.122318 (0.000)	-0.0113695 (0.000)
WDist	-0.2052112 (0.025)		
WExp	0.0002374 (0.27)		
WDCon		-0.3723940 (0.023)	
Occ1	0.1735257 (0.088)		

Significant factors affecting WTP: Metro Manila (2)

Variable	Model A	Model B	Model C
Occ3	0.03637454 (0.004)	0.3877312 (0.023)	
Inc			0.0000007 (0.098)
Age		-0.0108988 (0.027)	
O1		-17.5141000 (0.27)	
O2		-17.6247600 (0.000)	
O3		-17.5257200 (0.000)	

Significant factors affecting WTP: Mt Isarog (1)

Variable	Model A	Model B	Model C
Naga	-0.3268227 (0.016)	-0.4058900 (0.016)	n.a.
E1	ns	ns	1.7546250 (0.003)
E2	0.9010936 (0.008)	ns	12927870 (0.022)
E3	-0.7978899 (0.004)	ns	ns
E4	2.2791010 (0.000)	2.5008680 (0.000)	ns
E5	-1.3305810 (0.000)	ns	ns

Significant factors affecting WTP: Mt Isarog (2)

Variable	Model A	Model B	Model C
E6	ns	ns	1.1230360 (0.036)
E7	ns	ns	1.3073920 (0.041)
E8	-1.2528480 (0.000)	ns	ns
E9	ns	ns	1.4292180 (0.019)
E10	-1.2999700 (0.000)	ns	ns
E11	1.69747930 (0.000)	2.1462940 (0.000)	1.9963010 (0.007)

Significant factors affecting WTP: Mt Isarog (3)

Variable	Model A	Model B	Model C
E12	ns	ns	1.4373540 (0.006)
E13	-0.9447335 (0.000)	ns	ns
E15	-1.2241450 (0.000)	-1.32566000 (0.000)	1.1456930 (0.024)
E16	-1.1852900 (0.000)	ns	ns
E17	-0.7829708 (0.004)	ns	ns
E18	-0.8466305	ns	

Significant factors affecting WTP: Mt Isarog (4)

Variable	Model A	Model B	Model C
Know WS	0.1355369 (0.026)	0.4360620 (0.000)	ns
BA	-0.0281712 (0.000)	-0.0276100 (0.000)	-0.0242400 (0.000)
Age	-0.0163812 (0.001)	-0.0150600 (0.006)	-0.0302600 (0.005)
Occ1	2.2754130 (0.009)	2.1655360 (0.016)	ns
Occ2	2.3290080 (0.008)	2.2999500 (0.010)	ns
Occ3	2.3971100 (0.007)	2.2414030 (0.014)	ns

Significant factors affecting WTP: Mt Isarog (5)

Variable	Model A	Model B	Model C
Occ4	2.3997160 (0.007)	2.2414030 (0.014)	ns
Occ5	2.4653000 (0.008)	2.2842760 (0.018)	ns
Occ6	2.2233920 (0.012)	2.0205360 (0.033)	ns
MIncome	0.0000308 (0.000)	0.0000276 (0.001)	0.0000509 (0.005)
WCons	ns	-0.0020400 (0.032)	ns
WExp	ns	0.0020610 (0.031)	ns

Significant factors affecting WTP: Mt Isarog (6)

Variable	Model A	Model B	Model C
Single	ns	ns	15.1193400 (0.000)
Married	ns	ns	15.2818400 (0.000)
Widow/er	ns	ns	16.1285400 (0.000)

Reasons for WTP (%)

Reasons	Metro Manila		
	MWSI	MWCI	All
Willing to Pay	57	59	58
Reliable water supply	41	44	43
Reliable water supply for FG	13	13	13
Continued ES	17	15	6
Believes in the Council	3	3	3
Others	3	3	3

Reasons for WTP (%)

Reasons	Mt. Isarog		
	MNWD	PIWAD	All
Willing to Pay	55	52	54
Reliable water supply	96	92	95
Reliable water supply for FG	88	95	90
Continued ES	82	92	84
Responsibility	79	80	79
Believes in the Council	66	75	68

Reasons for not WTP (%)

Reasons	Metro Manila		
	MNWD	PIWAD	All
Not Willing to Pay	43	41	42
Cannot afford	8	9	9
Govt's responsibility	9	9	9
High water tariff	4	3	4
Will not improve	1	1	1
Don't care	0.1	0	0.05
Others	3	3	3

Reasons for not WTP (%)

Reasons	Mt Isarog		
	MNWD	PIWAD	All
Not Willing to Pay	45	48	46
Government's responsibility	85	90	86
Cannot afford	71	62	69
High water tariff	60	71	62
Lack of trust	51	81	56
Doesn't believe	16	86	53
Not connected	46	86	53

Preferred Collection Mechanism

- About 50% of the Rs wanted the water user fee added to the monthly water bill
- Water user fee highlighted in the bill
- Based on volume of water consumed
- Others opted for flat rate

Conclusions (1)

- Low level of awareness about watersheds but have high level of awareness about the role of forests in securing water supply
- Residents are willing to pay for improved watershed management
 - Metro Manila: P55/hh/mo
 - Mt Isarog: P29/hh/mo

Conclusions (2)

- Important Factors affecting WTP
 - Metro Manila: bid amount, connection to water distributor, additional water expenses, and occupation
 - Mt. Isarog: bid amount, monthly income, and age
- Knowledge about other user groups being made to pay for watershed services is not significant

Conclusions (3)

- Reasons for WTP: people want reliable water supply for both present and future generations
- Reasons for not WTP: cannot afford, water tariff is too high already; government's responsibility

Recommendations

- IEC about importance of watersheds
- Implementation of a water user fee
- Public hearings and consultation
- Creation of a multi-sectoral council to manage the fund
- Strong internal and external auditing
- WTP of other sectors should be investigated also