The Willingness to Pay for Changes in Water, Wastewater and Electricity Services in Trinidad and Tobago

Preliminary Survey Results

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Structure of Presentation

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Introduction

- Trinidad and Tobago
  - Population : 1.3 million
  - GDP per capita (PPP) : US$9500*
  - Water supply/sewerage service: Water and Sewerage Authority (WASA)
  - Electricity : Trinidad and Tobago Electricity Commission (T&TEC)

* Source: CIA World Fact Book, 2003

Survey Purpose

- RIC is at the preparatory stage prior to the rate review process under Price Cap Regulation
- WTP Survey is an effective tool
  - Designing new tariff structures
    - Level and targeting of subsidy
  - Informing other policy decision

Survey Purpose

- Ascertain the current level of water, wastewater and electricity services in Trinidad and Tobago
- Estimate the maximum willingness to pay (WTP) for changes to the status quo service levels

Methodology

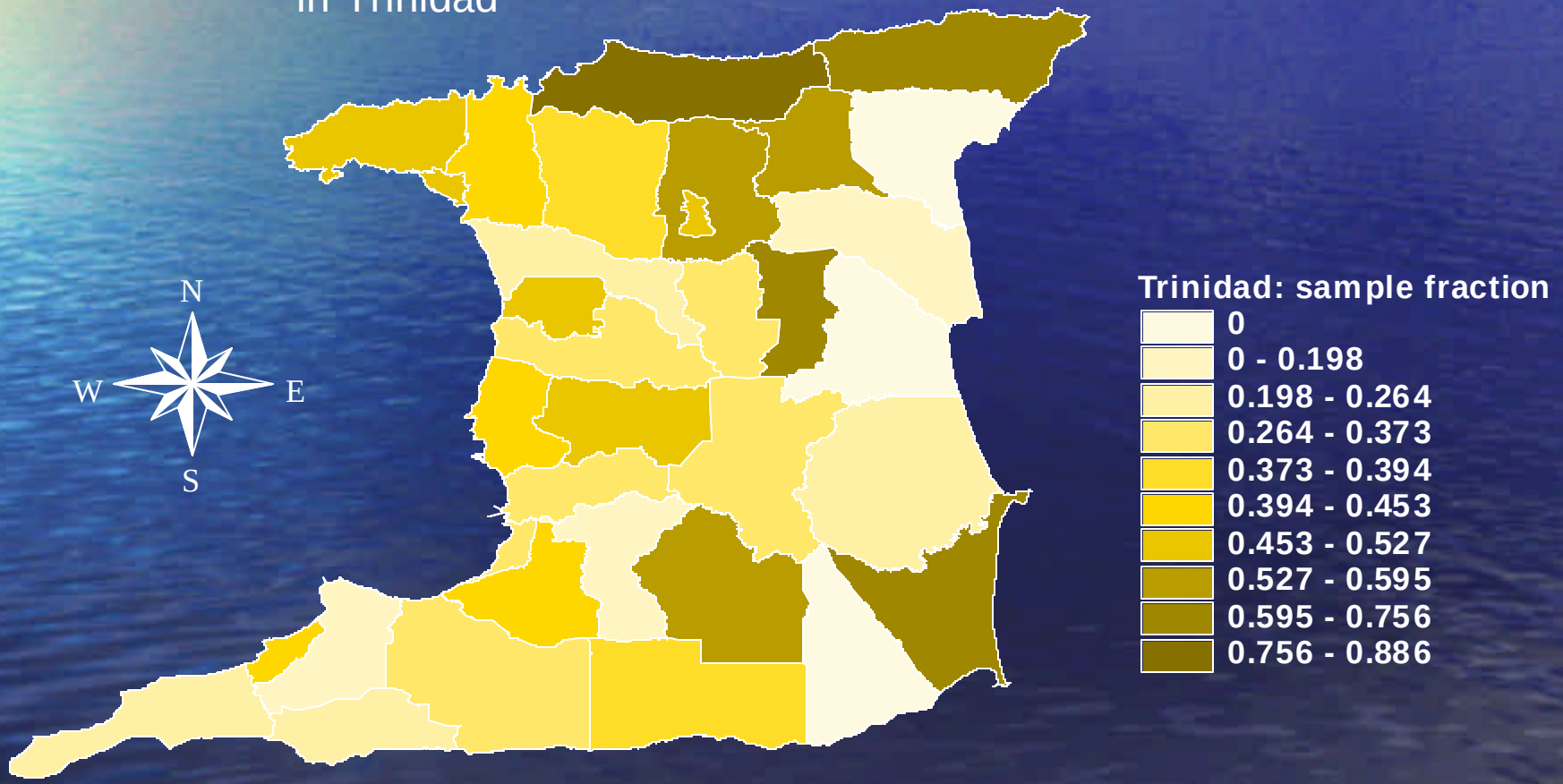
- Hypothetical stated preference techniques
  - Contingent Valuation
    - One policy option presented
    - Iterative bidding game used to develop an interval estimate of maximum WTP
  - Discrete Choice experiments (attribute based stated preference techniques)
    - Many policy bundles presented
    - Respondent chooses preferred option in a series of choice sets

Methodology

- Sampling method
  - Only domestic users in sample frame
  - Central Statistical Office (CSO) CSSP design used
  - Sample size → 1420 households nationally
  - Non-response → 12.5%

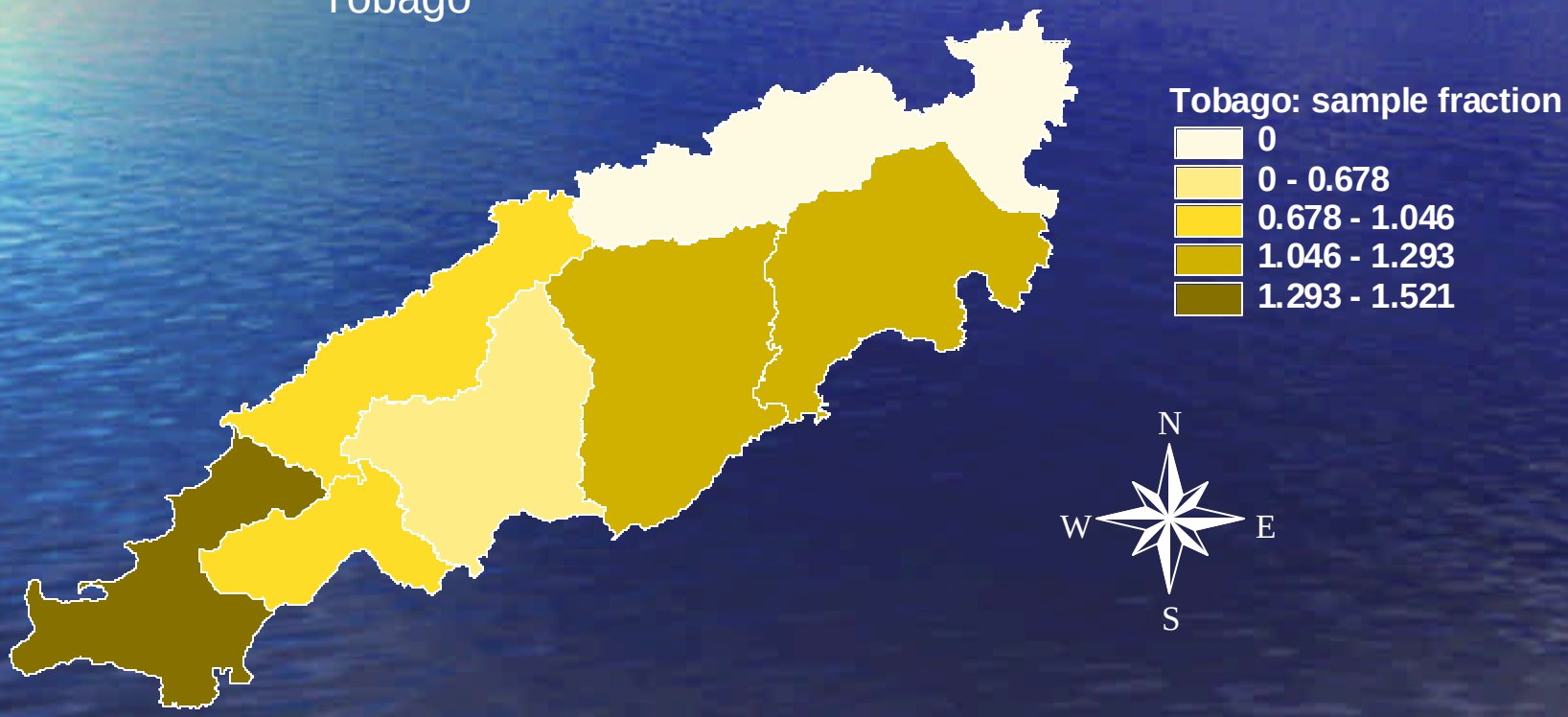
Methodology

Percentage of households per ward surveyed in Trinidad



Methodology

Percentage of households per parish surveyed in Tobago



Sample Characteristics

- 59 % of respondents were females and 41% males
- 84% were over 30 years
- 82 % of respondents were either the head of the household or spouse /partner

Survey Results

- Water supply
  - 83% had either in house or standpipe levels of service (WASA reports 92% coverage)
  - 27% of the population relies upon two or more sources
- Water supply – reliability
  - 27% had a 24 hour supply
  - 29% received no water at all

Survey Results

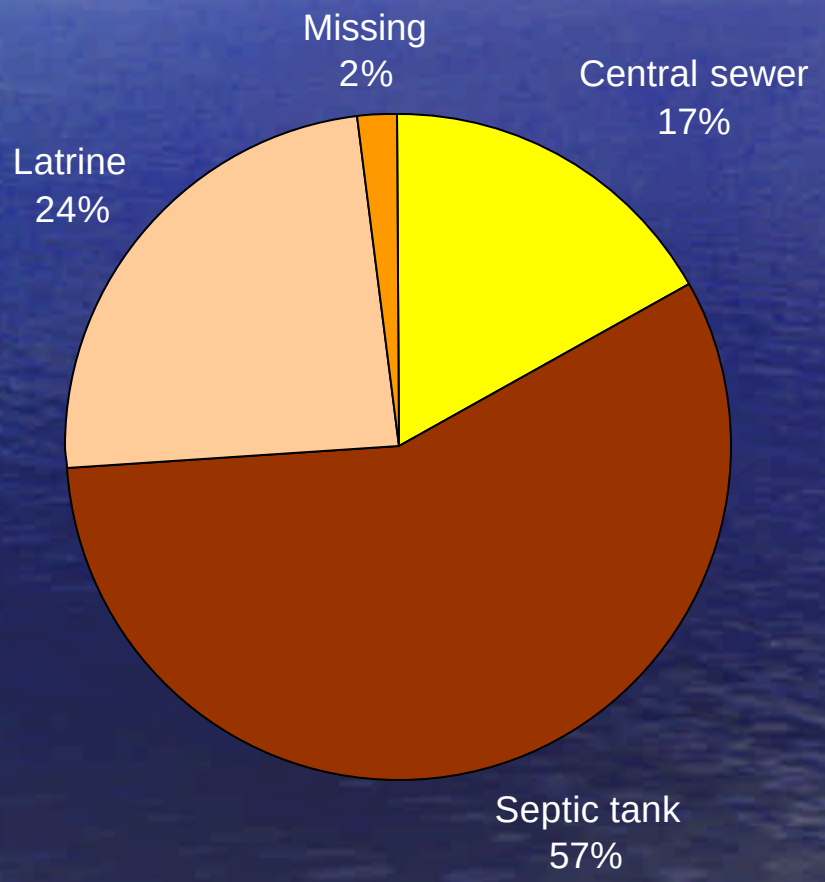
- Storage facilities
  - 68% of houses had local storage facilities
  - Average storage amount → 610 gallons / household
  - Total domestic local storage → 200 million gallons nationally

Survey Results

- Water supply – pressure
  - Approx 50% said pressure was good-excellent
- Water supply – quality
  - 91% found overall quality to be satisfactory
  - 20% found colour to be unacceptable
- Reasons for not having a water connection
  - 40 % of respondents said that connection is not available/no mains nearby.
  - 18% indicated that land tenure not secured.

Survey Results

- Wastewater



  - 40% preferred an improved system esp. latrine users

Survey Results

- Electricity
  - 92% of the respondents had electricity
  - 83% found service to be satisfactory
  - 75% of the sample claimed infrequent outages

WTP – all water users

- Bidding game results

Primary water source	Mean willingness to pay (TT$/month)
WASA in house piped connection	48
Standpipe	62
Truck borne	57
Supply from neighbour	46
Rainwater	43
Natural sources	78

WTP – all water users

- Linear WTP model (OLS estimates)

Parameter	estimate	t-statistic
Intercept	57.77	5.16
Income (1000 TT$)	1.70	2.71
Current bill amount (TT$/quarter)	0.08	5.36
Squatter (1= squatting; 0 = not squatting)	25.21	2.35
Piped (1 = currently have piped connection; 0 = currently do not have piped connection	-16.66	-2.25
Tanks not connected to WASA mains (1 = have non connected tanks; 0 = do not have tanks not connected to WASA mains	-5.15	-1.65

WTP – Choice models

- WTP water - Conditional logit model

Parameter	Units	Estimate
Reliability (days per week)	1 = 4 days per week	3.28
Reliability (days per week)	1 = 7 days per week	3.81
Reliability (hours per day)	1 = 12 hours per day	2.06
Reliability (hours per day)	1 = 24 hours per day	1.66
Pressure	1 = medium	1.51
Pressure	1 = high	0.91
Quality	1 = medium	2.15
Quality	1 = high	2.16
Price	Scaled price (continuous)	-0.87

Survey Results

- Willingness to Pay – Wastewater (OLS estimates)
  - Average TT$27 per month

Parameter		Estimate	t-statistic
Intercept		38.15	4.52
Income (1000 TT$)		1.68	3.69
Current water bill amount (TT$/quarter)		0.02	1.86
Squatter (1= squatting; 0 = not squatting)		19.95	2.47
Tanks not connected to WASA mains (1 = have non connected tanks; 0 = do not have tanks not connected to WASA mains		-4.65	-1.99
Class of service (1 to 5 depending upon hours of service per week)	Class = 1 (168 hrs/week)	7.91	2.87
	Class = 2 (120-168 hrs/week)	6.11	1.39
	Class = 3 (84-120 hrs/week)	4.53	1.35
	Class = 4 (48-84 hrs/week)	2.02	0.53
	Class = 5 (<48 hrs/week)	0[a]	

Survey Results

- Willingness to Pay – Electricity (OLS estimates)
  - Average WTP : TT$92 monthly

Parameter		Estimate	t-statistic
Intercept		58.00	9.41
Income (1000 TT$)		3.82	7.91
Frequency of outages	Weekly	-8.89	-1.25
	Monthly	-8.89	-1.49
	Infrequently	-13.74	-2.54
	Never	0[a]	
Household owns:	Water heater	10.17	3.72
	Washer	5.46	4.92
	Television	10.88	2.19

Conclusions

- Coverage in water sector is lower than utility estimates (83% vs. 92%)
- Changes to reliability is the most important water service improvement
- WTP for water is lower with local storage
- WTP for water highest amongst standpipe users
- No net WTP amongst those with in house connections

Conclusions

- Increased water reliability → increased WTP for wastewater
- WTP for water and wastewater is higher amongst squatters
- Electricity coverage is good but there is still a net WTP for increases in the current level of service

Lessons Learned

- WTP survey is an effective tool for
  - Measuring utility service
  - Quantifying consumer priorities
- Quality control in survey administration is critical
- Comprehensive understanding of ‘question’ is mandatory

Future Work

- Policy
  - Estimation of social costs/benefits accruing from various pricing policies
  - Design of targeted subsides
- Theory
  - Discrete choice modeling of choice set data with socioeconomic parameter/ at the individual level
  - Quantitative comparison of models generated from CV and CM data