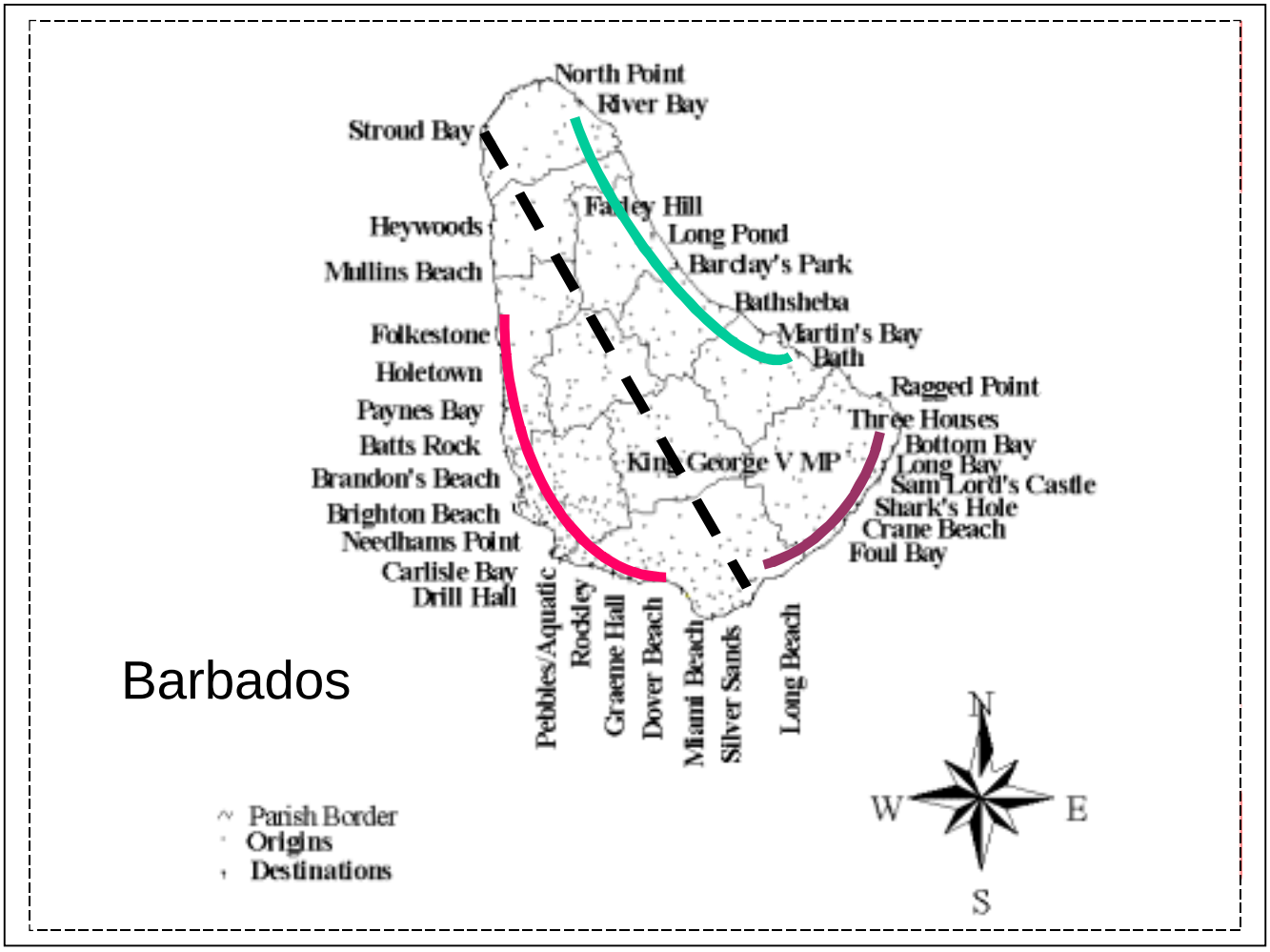
Economic Valuation

Purpose: To explain the economic logic and economic methods used to assess, in economic terms, the value of environmental and natural resources. Can't talk about countries without some background.

Context: Consider a beach in Barbados that will be lost with sea-level rise. Within this context, let's ask what is that beach "worth" or what is its value to residents of Barbados.



How would we use this information? Perhaps there are some costly measures that we could take to preserve it and want some perspective on whether to undertake it's preservation.

Some fundamentals of economic valuation:

1. A change is taking place. Two different states of the world are being compared. Consider the question " what's the value of the beach? One state- it exists, second state- it doesn't.

2. The value is anthropocentric in nature. That is, we do not value the sand's wellbeing but rather the wellbeing of a person who cares about the sand.

3. A trade-off between objects is essential to assessing value. A unit of exchange is essential to the process. Normally think of money measures but it could be time. Particularly problematic when dealing when adding up across people.

4. The value is conditional on the distribution of income across the population. There are ways to assess the effect of income distribution on the aggregate "value" but in practice, they are difficult to perform.

5. The most critical element on which a value is based is the ease with which you can substitute with something.

Fundamental Definitions for Economic Value

The willingness to pay
or
the willingness to sell

- The willingness expresses both the desire to buy (or sell) but the intensiveness of the desire to buy (or sell).

- There are important caveats and restrictive conditions that are used to more rigorously define these definitions.

- The most important of the caveats is that the "value" of a transaction is maximum amount that the individual is willingness to buy or the minimum amount for which they would sell.

- We could formally define one measure as:

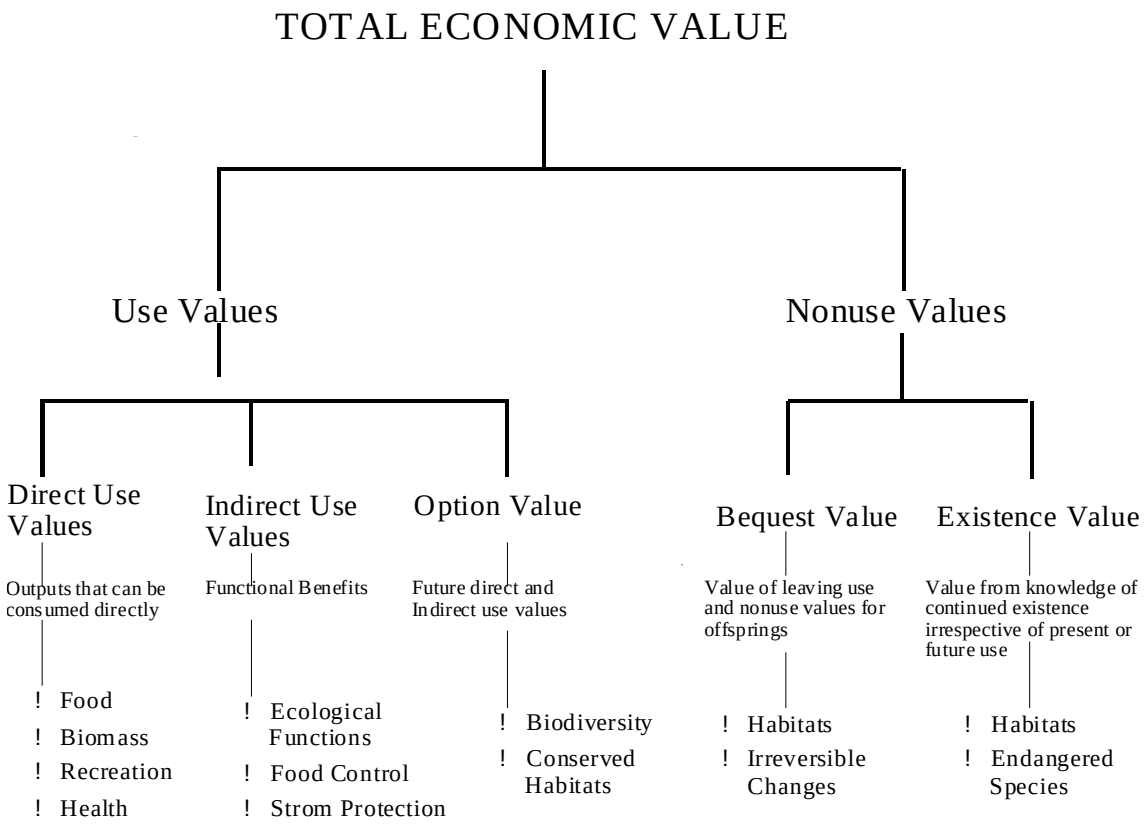
Utility (Y, Bad situation)= Utility (Y-b, Good situation)

- Whether we use willingness to pay or willingness to sell depends on whether or not the person has "rights" to the good situation.

- Willingness to buy and willingness to sell can differ.

- The willingness depends on different motivations.

Motivations for Valuing Objects



Source: Munasinghe, M (1993). " Environmental Economics and Natural Resoruce Management in Developing Countries.

Important Methodological Distinction Regarding Value

Does the value derive from the use of the beach or from some other motivation?

If it is from use, then there may be some behavioral (economic) footprints that may allow us to determine value.

If it is a "non-use" value like existence value, then there will not be behavioral evidence from which to derive value.

USE VALUE

Typical Methods of Analysis:

1. Traditional Market Methods (the good is traded in a market- supply and demand)

2. Non-market Goods (goods not directly sold in a market- nonmarket valuation)

   Indirect Methods
   - i. Travel cost models- revealed preferences
   - ii. Hedonic prices- revealed preferences
   - iii. Defensive expenditures
   - iv. Contingent valuation or stated preferences

Methods for Non-use Values

Contingent Valuation (behavior) or stated preferences.

A variety of techniques but essentially setting up a hypothetical situation and asking something about willing to buy (or sell).

> "Suppose an East Coast Society was established and entrusted with the preservation of the East Coast the way it is right now. That is, development would be to maintain the Coast's rural character and any development that happened would be done so as to guarantee the current status of the beaches and general landscape characteristics. If it were funded only through private contributions, would you contribute $x per year (one value of x is used for each respondent, with the value varying randomly among $5,10,20,50,200) to guarantee that the goals would be meet?"

Answers to Membership Question in Percentages, by Respondents' Answers and Amount of Membership Fee

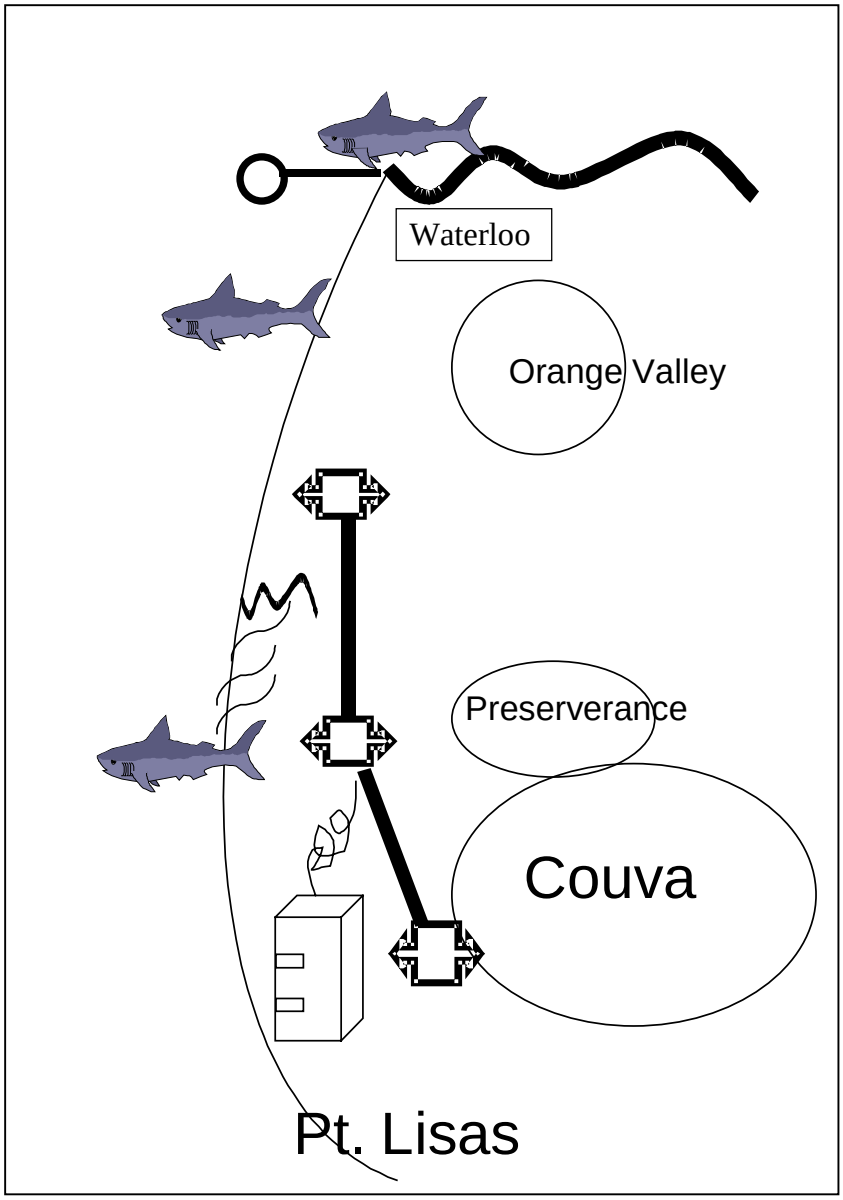
Cost of Membership (Bds$)	**Percentage Yes to Membership**			
	April-June	July-September	October-December	January- March
5	89.3	90.4	93.6	98.3
10	73.2	83.6	81.5	94.8
20	56.0	80.0	68.0	52.1
50	38.8	60.8	21.4	41.0
200	26.9	35.9	11.1	8.1

Original reasons for the Selection of the Islands

- An Island area with heavy industry- Trinidad
- An Island with large sun and fun tourism- St.Lucia
- An Island with eco-tourism- Dominica

Trinidad-

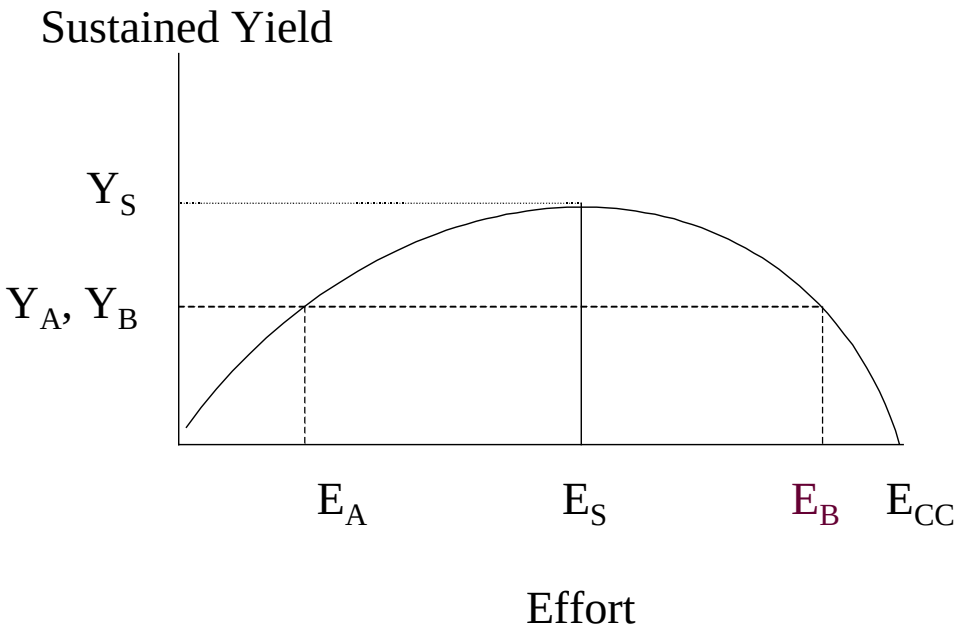
Waterloo to Pt. Lisas:
a site with heavy industry and potential sea-level rise problem.



St. Lucia's Fisheries in Castries and Gros Islet

Simple fisheries model- (Gerard tomorrow)

Figure 3: Sustained Yield-Effort Relationship



Dependent Variable: TUNAS

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	3	1810.40369	603.46790	3.081	0.1119
Error	6	1175.31571	195.8859		
U Total	9	2985.71940			

Root MSE	13.99593	R-square	0.6064
Dep Mean	15.57778	Adj R-sq	0.4095
C.V.	89.84546		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
EFF	1	5.230479	2.52740283	2.070	0.0839
EFF2	1	-0.644094	0.33016346	-1.951	0.0989
CASEFF	1	3.325369	2.78817472	1.193	0.2780

Dependent Variable: DOLPHIN

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	3	170.61668	56.87223	4.880	0.0475
Error	6	69.92512	11.65419		
U Total	9	240.54180			

Root MSE	3.41382	R-square	0.7093
Dep Mean	4.42000	Adj R-sq	0.5640
C.V.	77.23581		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
EFF	1	1.768849	0.61647264	2.869	0.0285
EFF2	1	-0.240938	0.08053197	-2.992	0.0243

Visitor data

Dichotomous Logit Estimates Regarding Cruise-ship Sample's Assessment of Definitely Returning to Barbados, 1996 and 1997

Factors	1996	1997
Constant	-4.234	-4.076
Visitor Activity		
Visited Welchman's Gully	.467*	-.006
Visited Harrison's Cave	.207[0]	-.003
Visited Flower Forest	-.044	.036
Visited Andromeda Gardens	.173	.608**
Visited Other Places of Interest	.000	.031
Went on Boat Trip	.45**	.26**
Previous Visits		
Second visit	-.358	.007
More than two visits	.527**	.392**
Rating of other trip attributes		
Rating of Taxi/bus Service	.104**	.106**
Rating of Beaches	.165**	.141**
Rating of Beaches x Went to Beach	.041**	.028**
Rating of Tours	.193**	.196**
Rating of Tours x Went on Tour	-.013	.002
Concordant % Discordant %	72.5% 26.9%	71.6% 27.8%
Chi-squared (# of observations)	280.32**	492.36**

Factors influencing whether how visitors rate whether they will come back.

* MALE- NEGATIVE EFFECT
** BEACH ASSESSMENT
* VISIT PIGEON POINT
** FEELING OF SAFETY