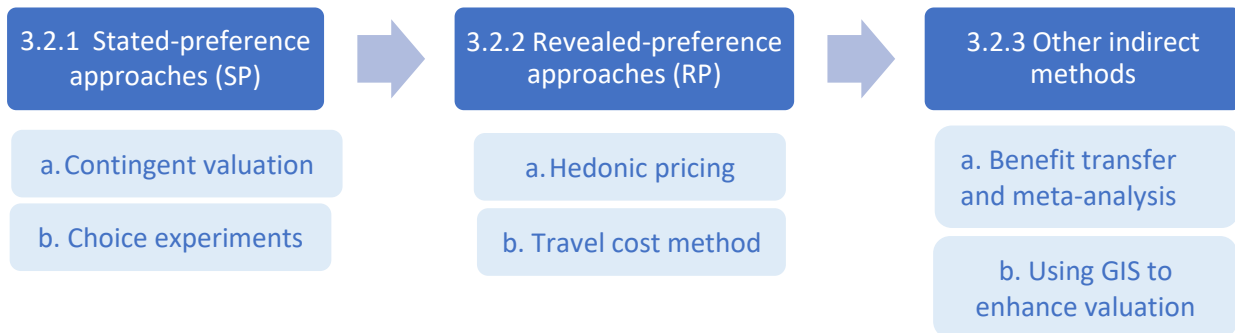


## Topic 3.2: Valuing the Environment: Methods

How to estimate economic values for non-market environmental goods and services?  
(e.g., services provided by environment & damages caused by pollutions)



### 3.2.1 Stated-preference approaches (SP)

**SP is Survey-based** approach to an estimate of an individual's willingness to pay (WTP) or willingness to accept (WTA)

#### a. Contingent valuation method (CVM)

create a hypothetical market and ask respondents directly a willingness-to-pay question contingent on the existence of this market (e.g., a clearly specified hypothetical increase or decrease in environmental quality) or what value they would place on an environmental change.

Q: "What is the maximum you are willing to pay for the change?"

Q: "Would you pay \$X to preserve the species?"

**Several main design features of a CVM questionnaire include:**

- Provide the purpose of a CVM survey and how it will be used to help inform decision (e.g., to estimate the benefits of an improvement in river quality → extra local tax revenues needed to finance wastewater treatment)
- Use a credible and uncontroversial bid vehicle (e.g., to measure local taxes, entrance fee)
- Consider different formats to ask WTP/WTA question (e.g., open-ended format, bid price format, etc.)
- Identify protest bids (e.g., to prevent 'genuine zeros' responses → not value/not afford)

**Advantages of CVM**

- A generalized method that can be applied in any situations, from benefits of preserving biodiversity to the benefits of improving a city's air quality, or protecting forest areas
- Capable of measuring both use (e.g., timber harvested from the forest) and non-use (e.g., existence value to ensure that a resource continues to exist in the absence of any interest in future use) values → Gain insights into why people value a given environmental good, and how this valuation would change given uncertainties such as when the supply of goods changes.

**Potential biased answers**

1. Strategic bias (e.g., to influence a particular outcome)
2. Information bias (e.g., to value attributes with which they have little or no experience)
3. Starting-point bias (e.g., sensitivity to a starting point under a predefined range of possibilities)
4. Hypothetical bias (e.g., ill-considered answers when they do not actually have to pay)
5. Observed gaps between WTP and WTA (e.g., report higher value for WTA than WTP for the same good or service due to different context such as the psychological value of something you own, the absence of good substitutes, consumer’s rate of time preference and willingness to take risks)

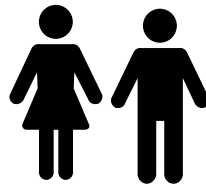


Figure 1 [The Philippines Eagle](#)

**b. Choice experiment method (CE)**

create hypothetical choices between alternatives with characteristics or attributes and ask an individual to choose among different bundles of attributes.

Example of choice experiment for valuing Australian wetlands

Attributes	Option A	Option B	Option C (Status quo)
Wetland area conserved (ha)	1,000	800	700
Bird species conserved (number)	40	30	25
Farm jobs protected	15	16	20
Cost per household (increase in local taxes)	30	15	0

Q: Which option would you prefer the government to choose – A, B or C?

**Advantages of CE**

- Represent the choices that people make (probability to choose each option)
- Estimate the marginal utility (a change in value) from a change in each attribute.

**Issues with choice experiment design**

- What attributes to include
- How to describe them to respondents
- What levels are to be used for each attribute
- What price or cost term will be used
- How the attributes are combined in the choice sets
- How many choice sets respondents can deal with
- How many choice options are included in each choice set.

Hypothetical market bias: i) how well hypothetical choices predict real choices ii) how close predicted WTP from hypothetical choices is to real WTP in an actual market. Next topic on revealed preference approach will explore market-based methods

**Reference:**

**[HSW]** – Hanley, N., Shogren, J. and White, B., Introduction to Environmental Economics 2013 (2<sup>nd</sup> edition), Oxford University Press, Chapter 4.

**[TL]** – Tietenberg, T. and Lewis, L. Environmental Natural Resource Economics, 2015 (10<sup>th</sup> edition), Pearson, Chapter 4.