Objective of the chapter 4

- Present the main methods of valuation of environmental goods and services.
- Distinguish between revealed preference methods and stated preference methods.

Chapter 4. Valuation methods

How to assess willingness to pay for non-market goods and services (see Figure 1) ?
We have to study :

- behaviors,
- answers given in the surveys,
- deduce the price that people are willing to pay based on the market for the goods/services in question.

Methods of valuation

Methods	Revealed preferences	Stated preferences
Direct	Market price	Contingent valuation
	Market simulation	
Indirect	Cost of transport	Models based on certain attributes
	Hedonic value of real estate	Conjoint analysis
	Hedonic value of wages	Discret choix experiment
	Avoidance cost	Contingent Classification

(Tietenberg et al. 2013)

Revealed preference methods

Revealed preference methods

Revealed preference methods rely on the observation of choices in order to immediately infer the value placed on resources.

For example : if one wants to calculate the economic cost of an oil spill for fishermen, the revealed preference method allows one to calculate how much the quantity of fish caught has decreased and the amount of loss caused by this decrease.
In this case, prices can be observed without delay and the value of the loss can be calculated directly.

Stated preference methods

Stated preference methods

Stated preference methods are used when value is not perceived directly.

For example : the use value of an endangered species is not directly observable.
In this case, a survey can be used to deduce the value once the amount that respondents would be willing to pay for the preservation of the species is obtained.

Contingent valuation

- In a simpler version, respondents are asked how much they would value environmental change (loss of a wetland or significant exposure to pollution) or preservation of the current state of resources.
- In another version, they are asked whether they would be willing to pay X amount of money to prevent a change or to protect a species.
- Responses reveal the weakness of the link with the environment (in case of a negative response) or its strength (in case of a positive response).
- It should be noted that a question is about the price associated with a good or a service.

Contingent valuation

A particular problem with contingent valuation is that respondents' answers may be biased.
There are 5 types of bias :

- strategic bias,
- information or informational bias,
- starting point bias,
- hypothetical bias,
- observed mismatch between willingness to pay and willingness to receive.

Benefits transfer

- To reduce the cost of new studies (surveys), benefits transfer allows estimates from previsous studies.
- These methods become more common when budget, time, or data constraints exclude the possibility of initiating a new study.
- Policymakers often review previously published surveys for information that can better inform their decisions.

Meta-analysis

- Sometimes called « analysis of analyses ».
- Meta-analysis is the retrieval of empirical data from previous surveys and their statistical association with characteristics of other studies.
- For example, meta-analysis uses the cross-sectional portion of contingent evaluations to isolate evidence for the value of non-use.

Cost of transport

Cost of transport

This method is used to assess the value of recreational sites (e.g., recreational fishing areas, parks, nature reserves), they can be inferred by plotting the demand curve showing how much people would be willing to pay to attend a natural site.

Freeman (2003) identifies two variations to this approach :

- we ca study the number of times visitors come to the site, or
- we can study how visitors make their choices on the site.

Cost of transport

Transportation cost models were used :

- to evaluate the cost of a beach closure caused by an oil spill,
- make recommendations regarding fish consumption,
- calculate the cost of a development that involves the loss of a recreational area,
- assessing the value of an activity such as rock climbing.

Hedonic price method

There are two types :

- the hedonic value of real estate,
- the hedonic value of wages.

In both cases, a multiple regression analysis is performed to isolate and identify the environmental component of value in the market concerned. For example, it is thus possible to realize that, all other things being equal, the value of real estate will be lower in polluted areas than in those where the environment is cleaner. (Freeman, 2003).

Models based on the hedonic value of real estate

- Market data (house prices) is decomposed by segmenting the sale prices of properties into different components.
- Components : property-specific characteristics (number of bedrooms, surface, property, etc) ; neighborhood-specific characteristics (crime rate, quality of schools) ; environmental characteristics (air quality, percentage of natural area, proximity to municipal landfills).
- The hedonic price model measures the marginal willingness to pay for small changes in an attribute.

Models based on the hedonic value of wages

- This method attempts to isolate the component of wages that justifies the payment of compensation to people in hazardous occupations.
- These people can ask for a higher wage in return for the additional risk to which they are exposed.
- When these workers are aware of the environmental risk involved (exposure to a toxic substance), the results of the multiple regression analysis can be used to determine the willingness to pay to mitigate this type of risk.

Reference

Tietenberg, Tom et al. (2013). *Économie de l'environnement et du développement durable*. 6e éd. Pearson.