

# THE ECONOMIC APPROACH TO VALUATION CONSUMER VALUE OF ENVIRONMENTAL QUALITY

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Environmental valuation techniques are primarily driven by the principle that individuals are self-interested and demonstrate preferences that form the basis of market interactions. These market interactions demonstrate how individuals value environmental goods and services. The market-based nature of economic theory emphasizes the maximization of human welfare. The environment, thus, is used as an instrument to achieve human satisfaction. In turn, the environmental quality can be treated like any other commodity. In this manner, environmental valuation can be viewed as a mechanistic approach in which the total value of an environmental system is assessed in terms of the value of its individual parts.

Environmental valuation is largely based on the assumption that individuals are willing to pay for environmental gains and, conversely, are willing to accept compensation for some environmental losses. The individual demonstrates preferences, which, in turn, place values on environmental resources.

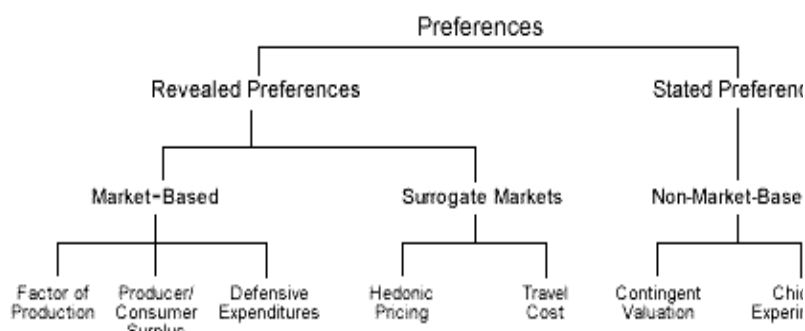


Figure 1 – Environmental Valuation Methods

The value of a natural resource can be monetized based on its value as a **Factor of Production**. This technique is methodologically straightforward; however, it is limited to those resources that are used in the production process of goods and services sold in markets. Because many goods and services produced by the environment are not sold in markets, the factor of production method generally fails to capture the total value of the resource to society. The standard method used to measure the net economic benefit of a good or service in a market involves an examination of consumer and producer surplus.

**Consumer Surplus** is the difference between what each customer is willing to pay and the price of the good or service and is represented by the area falling above the price line and below the demand curve. **Producer Surplus** is the difference between what a producer is paid for a good or service and what it costs to supply. Measuring the consumer surplus, however, generally involves the use of econometric techniques and requires time series information on the market price of the good or service and the quantity consumed at each price level, along with other factors affecting the demand for the product.

A final market-based valuation method is that of **Defensive Expenditures**, which are made on the part of industry and the public either to prevent or counteract the adverse effects of pollution or other environmental stressors. The defensive expenditures method, also known as the averting behavior approach, monetizes an environmental externality by measuring the resources expended to avoid its negative impacts on a surrounding community.

The **Hedonic Price** method of environmental valuation uses surrogate markets for placing a value on environmental quality. The real estate market is the most commonly used surrogate in hedonic pricing of environmental values. Air, water, and noise pollution have a direct impact on property values. By comparing properties with otherwise similar characteristics or by examining the price of a property over time as environmental conditions change and correcting for all nonenvironmental factors, information in the housing market can be used to estimate people's willingness to pay for environmental quality.

The **Travel cost** method is employed to measure the value of a recreational site by surveying travelers on the economic costs they incur when visiting the site from some distance away. These expenditures are considered an indicator of society's willingness to pay for access to the recreational benefits provided by the site. The travel cost method can be used to measure not only the elimination of a site but also the impact of access restrictions and changes in environmental quality.

The **Contingent Valuation** method (CVM) is a non-market-based technique that elicits information concerning environmental preferences from individuals through the use of surveys, questionnaires, and interviews. When deploying the contingent valuation method, the examiner constructs a scenario or hypothetical market involving an improvement or decline in environmental quality. Based on survey responses, examiners estimate the mean and median willingness to pay for an environmental improvement or willingness to accept compensation for a decline in environmental quality.

In **Choice Experiments** respondents are presented with a menu of alternatives relative to environmental policy options, such that preferences for various components or attributes can be examined at a more refined level. Whereas

CVM produces a single value for a change in environmental quality, choice experiments provide independent values for the individual attributes of an environmental program.

These methods form a battery of useful economic approaches for estimation of consumer values of environmental quality. All of the methods deserve continuing scientific scrutiny, have room for improvement, and should be employed cautiously and with a critical eye.