

Introduction to non-market valuation

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Economics [in a Nutshell]

- Choices, choices, choices...
 - Consumption choices can be complex
 - Each product has different attributes (including price)
 - Each person has different preferences
 - We all have budgets
 - Prices are well known for some things (e.g., groceries) but are less well known for other things that we don't buy all the time (e.g., vehicles, houses)



Environmental Valuation

- ‘Nonmarket’ Goods
 - Some may say that these things are “priceless”
 - But, when it comes to policy decisions, priceless often means $\text{price} = \$0$
 - If prices do not reflect true value, some may say it is “uneconomical” to invest in preservation & protection



Under-pricing environmental goods

- A typical resource industry will decide at what level to produce based on an analysis of 'traditional' costs (e.g. operating costs) and benefits (e.g. sales)
- Producers and consumers might indirectly use a number of environmental inputs
 - Waste disposal services provided by air and water



Under-pricing environmental goods

- A negative externality is any loss of human well-being associated with a process, which is not already allowed for in its price
- Users of resources such as clean air, water in rivers, oceans and the atmosphere often consider them as 'free' goods
- Just because there is no market-price for these commodities does not mean they should be ignored
- **One of the key aims of the work by environmental economists is to ensure that environmental goods and services are given the same attention by policymakers as all other marketed goods in society**

The Free Rider Problem

The fundamental problem of all public goods is I'd rather someone else paid for the public goods I consumed.



This is called the **free-rider problem**.

- Environmental are public goods and are generally not traded in the markets and hence they do not have readily available prices that can be used in CBA
- Value of environmental goods have a broader definition: Total Economic Value (TEV)

Total Economic Value:

- **Use Values:** Related to values derived from using the environmental good
 - Direct use value: Value that come from the consumptive use of the environmental good
 - Indirect use value: Value of functions of the environmental good
 - Option value: values of conserving the option of making use of the environmental good in the future even though no current use is made of it.
- **Non-use values:** Unrelated to the value of current or planned use of the environmental good
 - Bequest value: Value of knowing that future generations will benefit from the environmental good
 - Altruistic value: Value of knowing that other individuals in this generation benefit from the environmental good
 - Existence value: Value of knowing that the environmental good exists even if no one in this generation or in the future generations will ever use it.

TEV of a Wetland

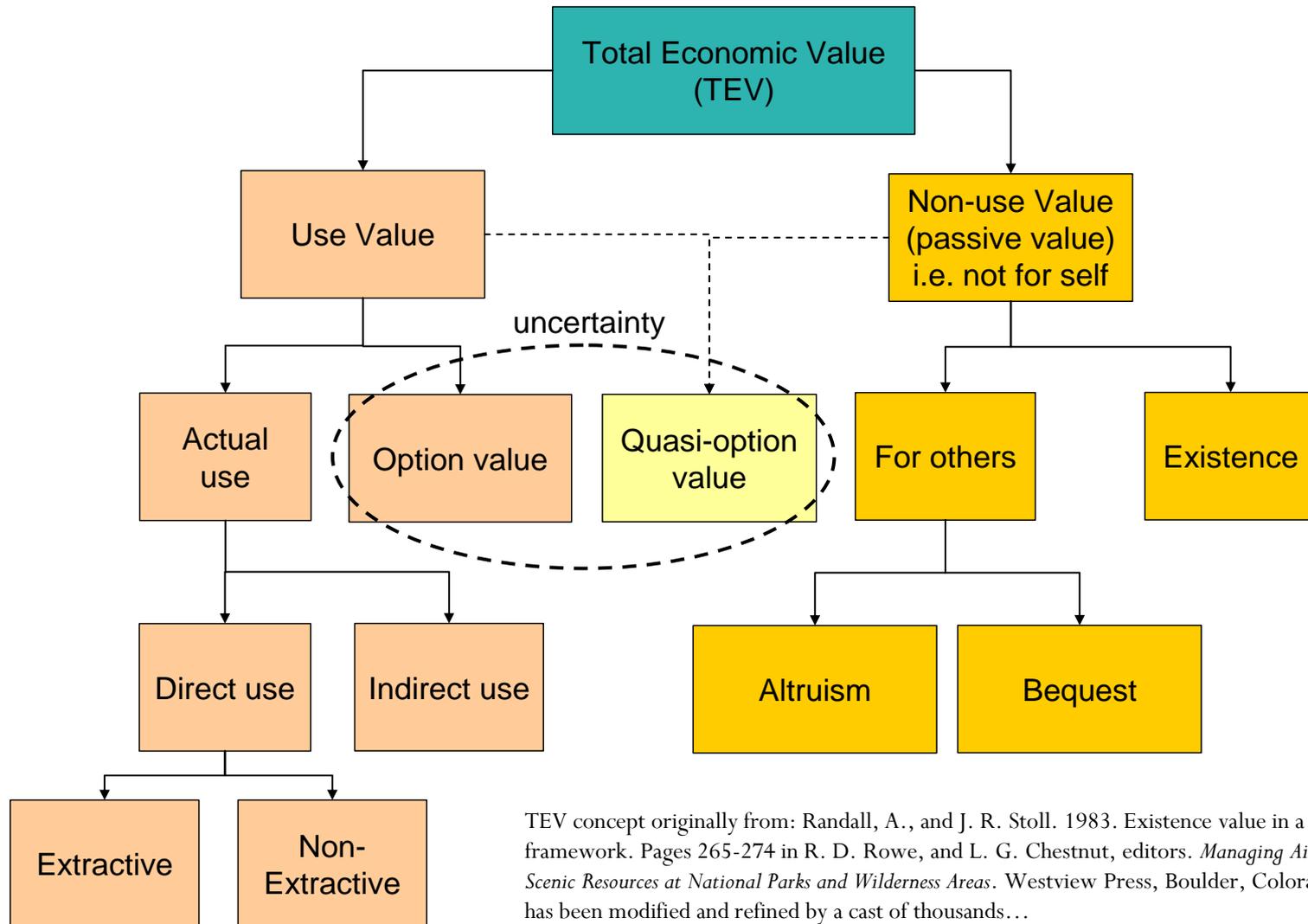
USE VALUES			NON-USE VALUES
Direct Use Value	Indirect Use Value	Option Value	
fish agriculture fuelwood recreation transport wildlife harvesting energy	nutrient retention flood control storm protection groundwater recharge external ecosystem support micro-climatic stabilisation shoreline stabilisation, etc.	potential future uses (as per direct and indirect uses) future value of information	bequest value altruistic value existence value related to biodiversity and cultural heritage

Barbier et al. 1997

Valuation

- $\text{Total Value} = \text{Use Value} + \text{Nonuse Value}$
- Since non-use values are derived from motivations other than personal use, they are obviously less tangible than use values
- Furthermore estimated non-use (sometimes called passive use value) values can be quite large and can tip the scales in favour of preserving natural resources in cost-benefit analysis
- One criticism made in relation to non-use values is that they are irrelevant to the decision making process, (do not represent an economic value) and therefore should not be taken into account.
 - Consider this thought experiment: Imagine a policy choice between making an area into a wildlife sanctuary for endangered species that would not be open to visitation by the public and leasing the area for coal strip mining

TEV Framework



Valuing the Environment

- Environmental valuation: our task is to **directly or indirectly determine shapes of demand curves** for ecosystem services
- If a market good (commercially landed fish for example), this may be straightforward
- If not, **environmental economics is detective work!**
- Individuals often can't change consumption levels, so **no price and quantity data** available...
- Values depend on individual preferences, production technology, resource endowments, scarcity and use, substitute products, and institutions (rules / norms)

Valuing Ecosystem services

- We will lose an estimated 20% of species richness by the middle of this century – should we be worried by this
- Have been essential to human success
- Are provided for free by natural ecosystems
- Are becoming less available as human population size and consumption increase

What are Ecosystem Services

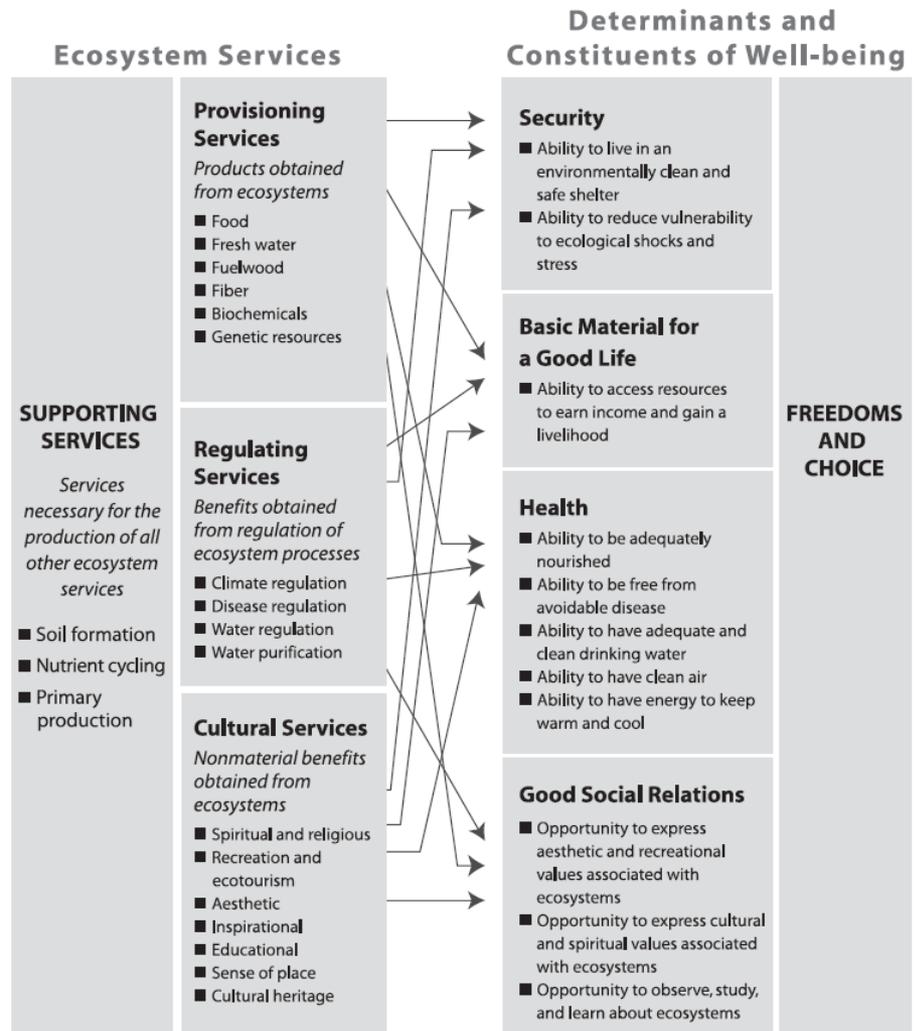
BOX 1. Key Definitions

Ecosystem. An ecosystem is a dynamic complex of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit. Humans are an integral part of ecosystems. Ecosystems vary enormously in size; a temporary pond in a tree hollow and an ocean basin can both be ecosystems.

Ecosystem services. Ecosystem services are the benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as regulation of floods, drought, land degradation, and disease; supporting services such as soil formation and nutrient cycling; and cultural services such as recreational, spiritual, religious and other nonmaterial benefits.

Well-being. Human well-being has multiple constituents, including basic material for a good life, freedom and choice, health, good social relations, and security. Well-being is at the opposite end of a continuum from poverty, which has been defined as a “pronounced deprivation in well-being.” The constituents of well-being, as experienced and perceived by people, are situation-dependent, reflecting local geography, culture, and ecological circumstances.

Note: (1) “Supporting Services” included in this framework – potential for double-counting benefits; (2) many [potentially confusing] links



From: MEA, 2003 *Ecosystems and Human Well-Being: A Framework for Assessment*. Island Press, Washington D.C.

Approaches to Valuing Ecosystem Services

- **Direct market valuation approaches:** use data from actual markets
- **Revealed preference approaches:** economic agents “reveal” their preferences through their choices
- **Stated preferences approaches:** simulated markets where values are sought for changes in provision or policy

We will be examining all these in the lectures to come

<https://www.youtube.com/watch?v=QmwOjn0LFNY>