VALUING ESSENTIAL AND NON-SUBSTITUTABLE RESOURCES ON AN UNEQUAL AND FULL PLANET

PURVI SEVAK[1]; JOSHUA FARLEY[2]
1.HUNTER COLLEGE; 2.UNIVERSITY OF VERMONT.

Abstract:

Markets theoretically allocate scarce resources towards producing the highest valued products, then allocate those products towards the consumers who value them the most. This maximizes monetary value on both the production and consumption sides of the equation, subject to the constraint that no one is left worse off than they were at the start. The goal of this paper is to assess the ethical implications of maximizing monetary value as an economic goal, in particular as it applies to essential and non-substitutable resources, including ecosystem services. We then propose a dynamic alternative to the valuation of ecosystem services based on biophysical demand.

Monetary value is based on willingness to pay, a measure of preferences weighted by purchasing power—the principle of one dollar, one vote. This is particularly problematic for essential, non-substitutable resources, such as food, water, energy and ecosystem services, which exhibit inelastic demand. For such resources, a small change in quantity leads to a large change in marginal value, as happened recently with tripling oil and grain prices. The conventional story behind demand curves is that as prices rise, we forgo those uses of a resource that generate the lowest marginal benefit. For example, as the price of food rises, we throw less in the garbage. However, the higher the share of income dedicated to a particular good, the more elastic the demand, all else equal. In addition, the higher one's income, the lower the marginal benefit from additional consumption. So when the price of grains triple, people who were previously spending half their income on raw foods purchase much less, and suffer malnutrition or worse. In contrast, the price of raw grain is a negligible component of income for wealthy individuals, so tripling grain prices scarcely affects their demand for grain. As this example illustrates, when resource prices rise, markets do not weed out resource uses with the lowest marginal value, but rather stop allocating resources towards the essential needs of the poorest individuals.

Monetary valuation of non-marketed ecosystem services based on willingness to pay is similarly problematic. Poor people are likely to depend most directly on ecosystem services and have the fewest possibilities for substitution. For example, if ecological degradation reduces water quality or food provision, rich people can purchase water filters or import food, while poor people cannot. When damaged barrier islands, mangrove forests and wetlands fail to reduce deadly storm surges, the rich flee, the poor cannot. Those who value ecosystem services most in biophysical terms may value them least in willingness to pay measures. Furthermore, the marginal values of essential and non-substitutable resources fluctuate dramatically with small changes in quantity, so the direction and rate of change is more important than a point estimate of value.

We propose a dynamic measure of ecosystem service values that gives equal weight to the preferences of the poor. The first step is to assess whether or not a particular service is essential and non-substitutable for a particular population. Water provisioning for example is obviously essential, and poor people may be unable to purchase substitutes for a local water source. Monetary valuation based on willingness to pay is only appropriate for non-essential resources. The second step is to determine whether or not

the resource is abundant, meaning there is no competition for use and hence zero marginal value; scarce, meaning that there is competition between uses and/or users; or critical, meaning that supply is inadequate to meet essential needs. The third step is to determine direction and rate of change: is supply decreasing, constant, or increasing?

For a constant or increasing supply of scarce, essential resources, willingness to accept is a reasonable approach to valuation as long as money provides access to substitutes. When supply is decreasing, marginal values climb quickly, and point estimates provide little useful information. Instead, the policy goal should be to halt resource degradation, and let prices respond to the now fixed supply. When a resource is critical, marginal values on the demand side are immeasurable. The appropriate valuation tool is replacement cost, measured by the marginal cost of restoring the resource, and the appropriate policy response is restoration. Taking together the characteristics of highly unequal wealth and increasing scarcity of essential resources in many modern economies, market valuation and allocation have profound moral implications that cannot be ignored.