

Ecosystem service valuation and trade-off analysis for sustainable development

Ecosystem services are becoming increasingly threatened globally (MEA, 2005). This trend is partially due to a lack of valuation because resources that are not valued in the market and are ignored in management decisions (Costanza et al., 1997). Referring to environmental assets as 'priceless' and 'invaluable' has proven insufficient in terms of reducing or halting ecosystem degradation. The challenge then is to acknowledge the multiple contributions of ecosystem services to human well being while managing them as public goods. Ecosystem Services Valuation (ESV) is the process of assessing the contributions of ecosystem services when managing for sustainable scale, fair distribution, and efficient allocation (Liu et al., 2010). The concept of ecosystem service is anthropogenic, as is the process of ESV. However, the fact that ecosystem services have an economic value does not mean that economic benefits are the only focus for ESV. On the contrary, nature is vital to human survival and well-being for several reasons and, therefore, forcing all values into a single economic indicator is not realistic. Recognizing the existence of multiple values and encouraging open and pluralistic discussion of values will lead to new solutions for conservation. In addition, ESs may interact with one another in complex and unpredictable ways, and knowledge of the interactions among ESs is necessary for making sound decisions about how society manages the services Trade-offs occur when the provision of one ES is reduced as a consequence of increased use of another ES. Trade-offs seem inevitable in many circumstances and will be critical for determining the outcome of environmental decisions. In some cases, a trade-off may be the consequence of an explicit choice; but in others, trade-offs arise without premeditation or awareness that they are taking place. More recently, monumental efforts such as the Millennium Ecosystem Assessment (MEA, 2003, 2005) and The Economics of Ecosystems and Biodiversity (Sukhdev, 2008), increasingly recognize the critical role of ecosystem service valuation and trade-off analysis for sustainable development.