Income inequality and willingness to pay for ecosystem services

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Extended abstract
We study how the distribution of income among members of society, and income inequality in particular, affects the average willingness to pay (WTP) for public ecosystem services. This is highly relevant for the practice of benefit transfer, and for policy recommendations aimed at both allocative efficiency and distributive justice.
To address this issue, we use a specification of the model of Ebert (2003) where a continuum of individual households have identical preferences over a market-traded private consumption good and a non-market-traded pure-public-good ecosystem service, which are represented by a constant-elasticity-of-substitution utility function. We extend Ebert's model by assuming that exogenous income is log-normally distributed over households. We consider two alternative measures of income inequality: the coefficient of variation and the standard deviation of income. These correspond to relative and absolute notions of inequality, respectively.
We show that (i) average WTP for ecosystem services increases with mean household income; (ii) average WTP for ecosystem services decreases (increases) with income inequality, if ecosystem services and manufactured goods are substitutes (complements); (iii) average WTP for ecosystem services normally changes more elastically with mean household income than with income inequality, except for extreme cases.
We quantitatively estimate and illustrate our theoretical results of how the income distribution influences WTP with empirical data concerning how WTP for (1) a cultural ecosystem service in Sweden (from Broberg 2010), (2) a provisioning ecosystem service in rural China (from Wang et al. 2011), and (3) a proxy for global ecosystem services (from the meta-study of Jacobsen and Hanley 2009) depend on their respective distributions of income. Among other results we find that, on global average, ecosystem services are systematically undervalued by up to 16 per cent, if one assumes the current grossly unequal global income distribution rather than the hypothetical case of an equal distribution.
Our results are relevant in several respects. First, when doing benefit or value transfer, one should correct WTP-estimates for differences in both mean household income and income inequality. Our study yields a handsome adjustment factor for this purpose. Second, when giving policy recommendations aimed at both allocative efficiency and distributive justice, one may correct WTP-estimates for grossly unjust income inequality, and use inequality-adjusted WTP-estimates for efficiency (e.g. cost-benefit)-analysis.

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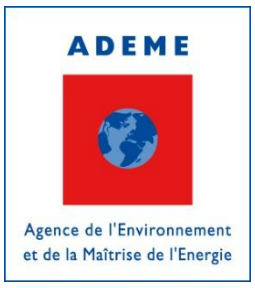

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