



## Thoughts of a travelling ecologist 9.

# What money cannot buy – monetarising ecosystem services

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A few years before the millennium, due to a desire to make the occasion significant, there was a flurry of activities. Various summaries and initiatives were born, mostly of transient importance, and more than one of these are simply marks of hubris. Ecologists were not exempt from this spirit of the times – but they were successful in making an impact. A group of American ecologists initiated the Millennium Ecosystem Assessment (MEA, 2005), a global exercise, to synthesise our knowledge about the state of the Earth's ecosystems, with the intent of influencing policy, and of triggering a higher awareness of the importance of ecosystems for human well-being. An important aspect of the MEA was to document the usefulness of ecosystem services (ESs). This concept exploded into the public consciousness with a famous and much-discussed article in *Nature*, by Roberto Costanza and co-workers (Costanza *et al.*, 1997). Costanza's team sought to calculate the financial value of ESs globally, and came to the amount of 33 trillion US dollars/year, which is about double of the then-total global GDP. The juggernaut of monetarising ESs has started.

The MEA solidified the terminology of the ESs, grouping them into four classes: productive, regulating, cultural and supporting services. Four scenarios

were also developed, looking at developed and developing countries separately. The "global orchestration", and "order from strength" scenarios promised declining living standards by harming important ESs. The techno-garden scenario would result in a world where unknown human psychological problems lurked, due to a steep decline in cultural services. The only meaningful scenario was the "adaptive mosaic", in which natural, and not political boundaries would determine the management of natural resources.

After the MEA, more evaluations started to appear, with more and more detailed and refined estimates of the monetary value of ecosystems (see, e.g. TEEB Foundation, 2010). Work on valuing ESs became a veritable bandwagon: search any database with the words "ecosystem service", and you will get tens of thousands of hits. In 2010, the General Assembly of the United Nations decided that an Inter-governmental Panel on Biodiversity and Ecosystem Services (IPBES, see [www.ipbes.net](http://www.ipbes.net)) should be established that is now working very actively to estimate the value of biodiversity, as well as of ecosystem services. A success story, therefore? Not yet obvious. There are various important, unclear aspects.

One group of objections against this approach is technical. There has been a lot of criticism of the original figures published by Costanza *et al.* in their 1997 paper. Nevertheless, the exercise has been repeated for various sub-groups (Losey & Vaughan, 2006), regions (Kubiszewski *et al.*, 2013), habitats (Fausto *et al.*, 2012), and even the global estimate has been updated (Costanza *et al.*, 2014). Still, if these figures are used to direct decisions to manage, restore, or ignore various ecosystems or habitats, losses are inevitable because of the time-and-place fixation of values. We cannot know how future generations will value the same things – but very likely, they will do so differently from us. What today we do not value and thus do not protect from harm, may become very valuable for future generations.

A second uncertainty concerns biodiversity. What level of biodiversity is necessary for a continued functioning of the ecological processes that underpin these services? While this has been intensively studied and hotly debated since the early 1990ies, the answer, even today, is far from obvious. One of the first papers documenting the importance of biodiversity for plant production, on the basis of mesocosm studies at Silwood Park in the United Kingdom (Naeem *et al.*, 1995), found that a mesocosm had higher plant production when it was more species-rich. This and other experiments were criticised as statistical artefacts (Huston, 1997) and today the consensus is that it is not diversity per se what is important. Ecosystems are redundant – they have more species than necessary for their "proper" functioning. However, a recent review, summarising field experiments world-wide (Isbell *et al.*, 2011) proves that redundancy is a permanent but shifting condition; the necessary set of species, while always a sub-set of those present, is different in every year, location or habitat. The more locations, ecosystem functions, large environmental shifts, or longer timespan are considered, the more of the species present will play an important role – even if not everywhere, every time.

But perhaps we are completely on the wrong track if we seek to monetarize the value of nature to us? In a

recent update, Costanza *et al.* (2014) feel compelled to exonerate themselves from the excesses of the monetarizing approach, acknowledging that certain important values cannot be monetarized. However, what if the whole approach is faulty? A strong warning signal is provided by the eminent scholar of economics, a professor of philosophy, Michael Sandel. In his book (Sandel, 2013), he describes how economists have been gradually emboldened by their successes, aggressively seeking to extend the validity of their approach to more and more areas of life. Originally, economics was an attempt to describe the workings of the market. Emboldened by their success, economists started to extend their approach to whole nations, then other areas of human behaviour. In the 1980ies, they were making claims that human behaviour, and even all areas of human enterprise can not only be described, but understood by the economic approach, and money is the common currency by which this can also be measured. And this is plainly not so, as Sandel convincingly argues (ch. 22 in Sandel, 2013).

An even more profound question can also be formulated: is the world to be understood, and its various parts handled, guided by only their utility to humans? In the slender book "The value of species", Edward McCord (McCord, 2012) presents profound arguments that if only those things that have value for humans remain, we cannot keep or create a liveable world for our descendants. To a large extent, humans are now able to shape the world as they wish. What should be the guiding principles?

It seems that in this quest, utilitarianism is a trap, because if we equate value with human benefit, little will remain of our world. Proponents of the ES valuation still hope that more ecology can be brought into decision making by using this approach, and the outcome will be a better management of the living world. In spite of all the current hype surrounding the ES valuation efforts, this is just that: a hope. The protection of life on earth is too important a thing to leave it exposed to utility as the only criterion, however sophisticated.

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