

E-Paper

Economic Valuation and Payment for Environmental Services

Recognizing Nature's Value or Pricing Nature's Destruction?

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Introduction and purpose of this paper

Economic valuation of nature is not new. In fact, it has been a companion of capital accumulation for centuries. Yet, despite the long history of valuing select portions of nature economically, there seems to be a new quality to current approaches. This paper will explore where the recent initiatives aimed at "ending the economic invisibility of nature" differ from previous approaches to economic valuation of nature.

One such difference is the current context of a crisis with manifold economic, ecological and social dimensions and an apparent recognition by leading corporations and politicians that "business-as-usual" no longer is an option. This paper will show how in that context, "green accounting" first and foremost serves to delay the necessary transition away from a development model that relies on producing economic growth through destroying nature. Green accounting does this by supporting the notion that with the right kind of accounting and market-based instruments for environmental protection, economic exploitation will automatically better price in the value of nature. Such economic visibility would hence lead corporations to recognize the value of nature's capital stock. As a result, nature would be protected and growth would become "green".

Implicit in this narrative of the potential of economic valuation of nature to conserve biological diversity is also that less old-style "command-and-control" environmental regulation will be necessary. Another implicit message is that the latest valuation initiatives are merely a variation of tried and tested "payment for environmental services" programs and an improvement of the "polluter pays" principle which are already part of the environmental regulatory toolbox. In addition, proponents of economic valuation argue that combining economic valuation of nature with market-based instruments for policy implementation could relieve the state of much of the burden of environmental protection. One of the outcomes of this latest round of making nature visible economically may thus well be a paradigmatic change to the framework of environmental legislation.

The paper will explore where signs of such potentially paradigmatic change are already detectable and what we can learn from these early experiences. What are the connections between proponents who appear to pursue very different ends through the means of economic valuation of nature? It also takes a look at some gaps between the rhetoric and practice of economic valuation of nature on the ground. Why is economic valuation of "ecosystem services" needed, for example, if penalties or levels of remuneration e.g. in payment for environmental services programs are not based on the numbers calculated for ecosystem services, even where such numbers exist?

Finally, by challenging some of the most commonly presented arguments in the debate, the paper builds a solid foundation for the argument that economic valuation will first and foremost help put a price on nature's destruction rather than contribute to nature's value being respected.

The appeal of a "green economy"

Signs of ecological crisis abound: climate change, loss of biodiversity and depletion of fertile soils, water shortages and devastating floods, deforestation, and acidification of oceans – to name just a few. And the consequences are not just ecological damage – the manifold dimensions of the ecological crisis also impact the social, cultural, spiritual and economic fabric of societies. This is particularly so where several dimensions of the crisis are felt at the same time. Often, this combination hits places where those affected have contributed least to causing the crisis and where local livelihoods and ways of life are closely tied to – even an integral part of – the nature that is being destroyed.

In this context of manifold ecological crisis, nation states are facing a dilemma: They are expected to enact environmental legislation to maintain living conditions on the planet without unduly hampering industrial production processes and economic growth. Conventional approaches to environmental protection that focus on those parts of nature considered particularly rich in biodiversity or that set limits for particularly polluting or hazardous substances have run up against this dilemma, too: On the one hand, calls have been increasing that "old-style environmental protection is not working" because biodiversity is still being lost at a rate now approaching that of mass extinction. On the other hand, corporations and planners have been lobbying for more "flexibility" to the environmental regulatory framework that has been in place since Rachel Carson's book "Silent Spring" in the 1960s.¹ Their business model is built on unrestricted access to minerals and land increasingly left only in those places that have been put off-limits under existing environmental legislation.

A key moment in the search for ways to resolve this impasse was the 2012 United Nations Conference on Sustainable Development, or Rio+20. In the lead-up to Rio+20, two initiatives – the Millennium Ecosystem Assessment (MEA) and The Economics of Ecosystems and Biodiversity (TEEB)² – helped pave the way for the "green economy" to emerge as the dominant policy approach to supposedly achieve both environmental protection and economic growth. These two initiatives helped frame the "green economy" as a flexible policy toolkit based on environmental regulation that sets national and/or international limits on resource extraction and pollution and relies for implementation of these legal limits on market-based and financial instruments rather than "old-fashioned command-and-control" measures. In the "green economy" approach to environmental regulation, legal limits can be exceeded in any one location by compensating the excess pollution or destruction with additional investments in conservation or nature restoration elsewhere.

The UN's Kyoto Protocol has pioneered such an approach to binding yet "flexible" limits to greenhouse gas emissions at an international level. The US Clean Air Act's Sulphur Dioxide Trading Program, the US Clean Water Act with its wetlands mitigation banks and the EU's Emission Trading Scheme are the most prominent – albeit not the only – examples of regional regulatory approaches to limiting environmental damage through such market-based instruments. *All of these policy instruments were introduced with the explicit intent of reducing the cost of compliance with environmental legislation for large industrial polluters, be they countries or corporations, not because they were shown to be more effective or preferable from an ecological or social justice point of view.*¹

Such a "flexible" approach to environmental regulation appeals especially to corporations directly engaged in extraction of "natural resources" and to the industrial agriculture sector. For them, the risk of ever-increasing local resistance to the destruction they cause has become a significant cost of doing business, and a reputational risk. They prefer environmental regulation that guarantees access

¹ The book was published in 1962. It documented the devastating effects of the indiscriminate use of pesticides, particularly on birds.

² The Millennium Ecosystem Assessment (MEA) was initiated in 2001 by the UN with the objective to assess the consequences of ecosystem change for human well-being. More than 1,360 experts worldwide were involved. The findings report on "the condition and trends in the world's ecosystems and the services they provide (such as clean water, food, forest products, flood control, and natural resources) and the options to restore, conserve or enhance the sustainable use of ecosystems." More information at: <http://www.millenniumassessment.org/en/About.html#1>. The Economics of Ecosystems and Biodiversity (TEEB) is a global initiative focused on "making nature's values visible". Its principal objective is to mainstream the values of biodiversity and ecosystem services into decision-making at all levels. It aims to achieve this goal by following a structured approach to valuation that helps decision-makers recognize the wide range of benefits provided by ecosystems and biodiversity, demonstrate their values in economic terms and, where appropriate, capture those values in decision-making." More information at: <http://www.teebweb.org/>

to ever-harder-to-get-at land, minerals and other resources through payment for restoration on land of less interest to them to the current framework of environmental regulation. The current framework establishes clear limits that need to be complied with in each location and include mechanisms for fining and holding those polluters to account who exceed legal limits. An added benefit of the new market-based approaches is that they allow industries to present themselves as part of the solution to environmental crises (they cause).

The "green economy" discourse also proves appealing to those looking to "green the GDP". A raft of initiatives now promote inclusion of nature's wealth into national economic accounts. Two initiatives in particular, the World Bank's WAVES and the Natural Capital Declaration^{III} link "natural wealth accounting" with the financial sector interest in creating new financial assets. For private banks and international agencies like the World Bank, the "green economy" discourse opens new possibilities for exploring how to integrate what they describe as "natural capital" into capital markets. Such integration, they hope, will create new financial assets and stimulate additional economic growth through trading of new financial products based on the novel nature assets.

Nature thus plays an important role for many that have gathered behind the promise of a "green economy". Those promoting it say that by ending "the invisibility of nature", a "green economy" will be more effective in protecting biodiversity than conventional environmental regulation.

Nature has been made visible to the economic eye before

As mentioned above, economic valuation of nature is not new. In recent times, various payment for environmental services (PES) programs have been using some form of economic valuation already. Yet there is something new about current approaches to the economic valuation of nature. This section will take a cursory look at previous stages of economic valuation and explore how these paved the way for the economic valuation of ecosystem services that characterizes present initiatives.

Different disciplines have been relied upon at different times to enable economic valuation of successive parts of nature. Such valuation always involved re-defining what is "nature". Each such re-definition made a different set of the human and non-human relationships that create nature visible while others were made invisible by excluding them from the definition. Disciplines that played a key role in achieving economic visibility of nature at earlier times include western cartography and botanical classification. Western cartography made particular tracts of land visible, clearly identifiable, measurable in standardized units and thus tradable. Botanical classification laid the foundation for some tree species becoming abstracted from their complex relationships with the nature that had created them. It made them clearly identifiable and measurable in units of merchantable timber. Certain tree species thus became an economically valuable "natural resource" while others were not given such economic visibility.

Ecological classification extended the selective visibility of nature even further. It separated biological diversity further from its cultural ties. This in turn paved the way for the UN's Convention on Biological Diversity describing one subset of biological diversity – genetic diversity – as a "genetic resource" to which access could be regulated and benefit sharing protocols negotiated. The web of relationships in nature that could be economically valued as "genetic resource" had thus been made

^{III} WAVES stands for Wealth Accounting and the Valuation of Ecosystem Services. The Natural Capital Declaration was signed by over 30 private banks during the Rio+20 conference in 2012. It is supported by several governments and international institutions and additional corporations and business groups have signed the declaration since. The United Nations Environment Programme's Finance Initiative (UNEP FI) co-hosts the Declaration's secretariat.

visible, identifiable, measurable and tradable. In parallel, ecologists and ecological economists began to describe nature as ecosystems that were home to an identifiable set of species. Crucially, these ecosystems were shown to provide a series of ecological functions that were essential to human well-being – and which were not yet valued economically. The UK-based organization Global Canopy Programme, which jointly manages the Natural Capital Declaration with the UNEP Finance Initiative, claims for example that forests *"are like giant utilities providing ecosystem services to the world that we all benefit from but we don't pay for."*¹²

It is at this juncture that current approaches to economic valuation of nature set in: They attempt to define clearly identifiable "services" that are provided by those ecological functions. The MEA played a key role in this classification of ecosystems and their ecological functions. The current identification of "ecosystem services" is to a large extent based on the classifications used in the MEA. The following section will look at what is involved in making these newly identified "ecosystem services" visible to the economic eye.

From Payment for Environmental Services to Tradable Rights to Pollute or Destroy

The term "Payment for Environmental Services", or PES, is used to describe many different arrangements to pay for a certain practice that will protect or restore some function or process of nature. Such arrangements, however, have entirely different historical and social origins because the struggles, motivations and pressures that gave rise to them differ greatly.

The original PES programs used public funds to implement a policy that was for the public good. Some of the best-known PES examples include a) New York City or Vancouver city paying watershed owners who are located outside the city boundaries and are therefore not bound by the cities' regulation to preserve the land that is vital for the cities' water supply; (b) the government of Costa Rica using public money raised from collecting a tax on petrol consumption to pay land owners to restore or not cut down forests; or (c) the EU's Common Agricultural Policy payments to farmers to preserve biodiversity. The amounts to be paid are negotiated or set by the state or directly among the parties involved. The payment may compensate for the lack of enforcement capacity in relation to a ban on clear cut logging. The "service" is described in very general terms, or not at all. No direct or detailed measurement of the quantity or quality of the specific "service" for which payment is received, is necessary and the payment is not linked to permission to destroy or pollute above legal limits elsewhere. Payments do not require a financial market and no environmental commodity or asset is bought or sold. Modification of existing law to create new assets or define environmental commodities is not required.

In PES initiatives financed by private donations or voluntary programs for public relations purposes, companies or public entities offer PES projects to avoid reputational damage, to green-wash activities that are damaging to communities, or to reduce local opposition to future expansion of corporate activities like extraction of water, minerals, oil, coal, construction of a mega-dam or roads. Examples include corporations like Coca-Cola paying for water protection to compensate for damage to community water, either at the point where they extract the water or the PES project could also be located elsewhere. PES initiatives of this type are voluntary, without a law demanding the payment. In general, no claims are made that the payment is "equivalent" in economic or ecological terms to the damage caused. The amount of payment is decided by the company or public entity offering the payment. Some basic indicators to verify what could be claimed to be the result of the payment might be used but no quantification and monitoring of specific "ecosystem services" is necessary. Financial markets are not involved and no "environmental services" commodity is created

or traded. Contracts that describe how the payment will be spent might be involved but the obligations only last for the duration for which payment is received. Risks to community cohesion and conflict exist, especially when the payments are by the company or public entity linked to a development or industrial activity that is opposed by (part of) the community.

More recently, "offset" PES schemes where a payment gives permission to destroy or pollute above a legal limit have become more controversial. These are the PES schemes discussed in the section "Economic valuation as a way to transform environmental legislation into tradable instruments" of this paper, page 13. The fundamental difference in such "offset" PES schemes is that the payment buys the permission to pollute or destroy nature above a legal limit. Laws are changed so that destruction above the limit can be considered in compliance with the law as long as a payment is made for the extra pollution or destruction to be "offset" elsewhere. Causing such pollution or destruction of nature above the legal limit was previously an offense, a violation of the law – and it could result in a fine or other penalty. Such schemes always increase the ecological and social damage for the community living in or near the location where the company uses the offset credit to pollute more or destroy more nature. PES schemes that involve trade in "environmental services" always require territorial control. The "owner" of the "service" units and his/her intermediaries acquire the right to monitor the quality and existence of the commodity they paid for, to ensure that the "environmental service" is at all times delivered in full accordance with the terms of the contract. Offset PES schemes therefore require contracts that are very different from the contracts used in PES schemes that do not involve offsets. Only in the case of offset PES schemes do the contracts have to include legal obligations that last beyond the period over which payments are received.

For more information see World Rainforest Movement (2014): When "payment for environmental services" delivers a permit to destroy.

Re-defining "green", not "growth"

The logic underlying valuation of nature is that economic growth and environmental preservation are compatible only when nature and its functions are priced and integrated into capital circulation. For such pricing and market integration to be possible, nature needs to be prepared: The existing relationships that define nature as we understand it today need to be re-defined. New boundaries need to be established around those relationships that are to be made visible as providers of an "ecosystem service". Those services in turn must be defined so they are recognized as the same service by different people. And they must be made measurable in units that can be compared and to which (property) rights can be attached.

Once nature has become describable as a provider of measurable ecosystem service units, units from different places and of different quality can be compared and equivalences between them can be negotiated: x units of service A with high quality is the same as y units of the same service at a different quality, or z units of a slightly different service. The Kyoto Protocol, for example, established such equivalences by adopting a decision that one tonne of methane has the same global warming potential as 25 tonnes of carbon dioxide, so 1 unit of methane emission is equal to 25 units of carbon dioxide equivalent, CO₂e. Once this equivalence had been accepted, methane emissions could be compensated for by reductions in carbon dioxide emissions, or vice-versa. With equivalences between units from different places and with different qualities having been established, the units are ready for trading. Furthermore, as in the secondary market for emission allowances, financial products based on these units can be developed and traded as derivatives. The

European Commission estimates that derivatives^{IV} trading represents over 90% of the carbon market transactions in the EU Emissions Trading Scheme.³

Some advocates of economic valuation insist that economic valuation does not automatically lead to pricing and trading (see below). However, for many proponents, price discovery through market transactions is an important objective of economic valuation. They argue that such price discovery mechanisms help efficient allocation of scarce resources. They claim that environmental legislation that limits the use of a particular "ecosystem service" and that allows market-based instruments for implementing the limit is the way to create such scarcity and at the same time establish a market in tradable units of the restricted substance or ecosystem service. The Kyoto Protocol and the EU Emissions Trading Scheme provided such limits for greenhouse gas emissions; the US Clean Air Act limited sulfur dioxide emissions and allowed trade in pollution rights to achieve the mandated reductions; the 1972 US Clean Water Act and amendments in 1997 restrict filling up of wetlands while allowing continued destruction as long as compensation credits are bought and the destruction can be shown to have been compensated with improved wetland functionality elsewhere. By 1993 the transferable "wetland credit", backed up by physical wetland restoration or creation, had become common enough for the Chicago Board of Trade to allow the trading of such credits on the exchange.⁴ The EU is contemplating the use of market-based "no-net-loss" instruments to achieve its 2020 target of halting biodiversity loss after the previous target to halt biodiversity loss by 2010 through the existing set of environmental regulations had been missed.

In all of these instances, the assumption has been that existing regulation or non-market approaches had failed. The possibility that such market-based instruments are introduced precisely because the existing environmental regulation has been effective has rarely been considered. The far more plausible explanation for continued pollution or loss of biological diversity, however, is that existing environmental legislation is effective but not sufficient to halt destruction. Another common experience with these markets so far is that it has proven impossible to establish limits that would make the ecosystem service in question so expensive that unit prices would approach the level that challenges the actual core industrial business model. In the case of greenhouse gas emission trading schemes for example, the price level said to be required for permit prices to act as a "signal" for large energy users to make the sort of investments that are required to avoid runaway climate change is orders of magnitude higher than current carbon market prices, and even an order of magnitude higher than the €30 – €40 that carbon permits fetched at the height of the carbon market in 2008. Today, average prices in the EU Emissions Trading Scheme are around €7, and similar levels can be found in other regional carbon markets.⁵

Economic valuation techniques are in the process of re-defining the previous conception of nature as a complex web of inter-related and ever-changing relationships into an image of nature as a provider of measurable services. Institutional changes are currently introducing commercial principles such as efficiency, methods such as accounting and cost-benefit assessment and the objective of profit maximization into environmental governance and resource management practices. In parallel, the economic value that has been attached to ecosystems is used as the basis for creating tradable instruments, such as carbon or biodiversity credits. These are then marketed as compensation credits and offsets. The units – or rather, the placeholders that represent the units – have become a bearer of economic value; they can now be banked, or traded for profit or for compliance with environmental legislation. *The "green economy" promise thus leads to a re-definition not of "growth" but of "green".*

^{IV} An emissions derivative is a financial contract linked to the *future* value or status of the underlying emissions permit or credit (the asset) to which the contract refers.

Technical disputes over accuracy of the measurement replace political dispute over what is produced, by whom, and for whom

Nature's complexity, interconnectedness and uniqueness mean that no two places are the same. Abstracting or re-defining this such that unique places become comparable providers of "ecosystem services" is easier said than done. The disputes among practitioners attempting to define what actually passes as a "wetland credit" under US Clean Water Act regulations is just one example of the technical complexities.⁶

Why is describing nature in this way so important that those who promote economic valuation of nature are prepared to face all the complexities and contradictions such an endeavor entails? At one level, it is claimed that a nature described through measurable units ("ecosystem services", merchantable timber, coal, oil, iron ore, etc.) is legible for economists and capital markets because a monetary value can be identified for such units. The units – or the placeholders for these units – bear value. Planners and corporations can better appreciate the value of nature in their decisions if it is presented as "a highly efficient and valuable machine"⁷ or a "precious piece of infrastructure"⁸, the argument of advocates of economic valuation of nature goes.

On another level, the challenge is considered worthwhile because a nature presented through quantifiable and comparable units facilitates business-friendly implementation of legally prescribed limits on pollution or destruction, once they exist: If discrete units can be identified, they can be measured and if they can be measured, they can be compared and even swapped – not physically but through exchange of the monetary value that is considered adequate for replacement of the service units elsewhere. Such an exchange of units makes continued pollution or destruction in any one location possible even where it appears legally prohibited.

However, approaches to limiting destruction of nature curtail the rights of those affected by pollution or loss of biodiversity: Citizens lose legal and regulatory avenues to prevent a corporation from taking a specific project or investment forward that would result in pollution or destruction above a legal limit in any particular place because market-based instruments allow such excess pollution as long as it has been compensated elsewhere.⁹ Environmental legislation that relies on such means of implementation also depoliticizes democratic debate: *Fundamental questions of what is produced, by whom, and for whom are circumvented through technical arguments about improving accuracy in measuring the service units or improving accounting rules.*

From place-bound nature to nature defined through a set of indicators

Economic valuation of nature changes our understanding of nature as a particular place (what philosophers call *de re* valuation) to an acceptance that nature is whatever fits a certain description (*de dicto* valuation).¹⁰ Depending on whether nature is valued *de re* or *de dicto*, the type of action pursued to end the manifold environmental crisis will differ substantially. In fact, the conversation about change and how to bring about the desired change will be radically different depending on whether environmental crisis is understood as market failure and incomplete internalization of externalities or whether economic valuation of "natural capital" is considered the 21st century's approach to bringing more of nature under the control of capital markets.

There are also many indications that introducing payments for ecosystem services reduces moral or ethical commitment that is tied to a specific place.¹¹ The emerging consensus among proponents of economic valuation that "we should pay for nature's services" will affect civil society mobilization for change. Economic valuation based on the worldview that nature is "something out there, an external object and separate from human society" leads to entirely different action than mobilizing for change that is rooted in the understanding of nature as unique to any one place, often sacred,

because it is the result of human and non-human entanglements that have come together in this particular place.¹² Can those different worldviews and directions be compatible? Could the resulting policies work together in a "policy mix"? The current debate over eliminating binding national targets for renewable energy and energy efficiency to allow the EU Emissions Trading Scheme "to pull its weight" suggests that such market-based instruments are a poor fit for a "policy mix" (see section "Just another tool in the policy toolbox", below).

The following section looks at differences between some of the ends that different supporters hope to achieve through economic valuation of nature – and how the common language of economic valuation and abstractions provides room for each of these different expectations.

Economic valuation as an instrument for "full internalization of externalities"

The seminal publication *"The value of the world's ecosystem services and natural capital"* by Robert Costanza *et al.* summarizes the motivation of those who advocate economic valuation of nature as a way of "internalizing externalities": *"Because ecosystem services are not fully 'captured' in commercial markets or adequately quantified in terms comparable with economic services and manufactured capital, they are often given too little weight in policy decisions."*^{13, 14} This perspective was repeated more recently by Pavan Sukhdev who led the compilation of the TEEB report, and who emphatically stated that *"The economic invisibility of nature must end!"*¹⁵ Those who have for decades been engaged in expanding global economic indicators like GDP to better reflect the cost to society from environmental destruction, equally look at economic valuation of nature as a means to "environmentalize" global economic indicators.

But capitalism is dependent on creating externalities, on always internalizing unevenly and always only partially.¹⁶ Defining boundaries around the new "ecosystem services" just creates new "externalities".¹⁷ As Jax and Heink point out in their article "Searching for the place of biodiversity in the ecosystem services discourse", *"No matter how we define 'ecosystem services' in detail, it is always a selection process. Based on human values that selection process – via individual and societal choices – determines what is considered a relevant part of nature in the context of ecosystem services."*¹⁸ Economic valuation thus turns out to be just a repeat of previous rounds of appropriation of nature by capital. A new selection of the human-non-human relations is made accessible by removing its status as "externality". This is done by creating identifiable units that can be measured and become bearers of value. These bearers of value can then be internalized into capital circulation. On closer inspection, the process of economic valuation of nature is comparable to the invention of botanical classification systems which turned some tree species into a "natural resource" or "raw material" and enabled those trees re-defined as timber to enter capital circulation while all the life connected to these trees remained dispensable "externalities".

Furthermore, there is little disagreement, even among advocates of economic valuation, that much (of) nature will continue to remain outside the economic calculus. For example, the social, cultural and spiritual connections and functions that are also part of "nature" will remain "externalities" to economic calculus (see "the language of abstraction" on the ongoing controversy related to measuring ecosystem services). If they remain "externalities", these functions of and relationships with nature will remain invisible to the economic eye. And that in turn means they remain dispensable if one follows the logic of those who claim that "we only treasure what we can measure". This is a central argument made in favor of economic valuation of nature. But: *If only that which is made visible to the economic eye will be treasured in decision-making, these social, cultural and spiritual values and relationships of nature will continue to be threatened with destruction. Economic valuation of nature will not end their invisibility to the economic eye. Consequently, "full internalization of externalities" will remain an illusion.*

The "ecosystem services" regulated by law are the ones economic valuation focuses on – almost exclusively

Looking at which parts of nature are considered for inclusion in the economic calculus also reveals that this new round of "internalizing externalities" will be as partial as previous rounds. Slated for internalization are particularly those "ecosystem services" for which (international) environmental regulation has restricted access or is expected by industry to limit availability in the near future: greenhouse gas emissions have been limited through a UN climate treaty and thus the capacity of trees in a forest to store carbon is of interest as a "carbon offset" that allows industry to exceed the legal limit and still claim to be in compliance with the legal limit because they paid someone elsewhere to make a reduction for them. Or destruction of habitat for rare species is restricted and thus biodiversity banks that offer replacement units which can be swapped for the protected habitat are established. This was the case when in the late 1970s legislation protected many ecological functions of wetlands in the USA, which consequently complicated draining or otherwise destroying these wetlands. Yet the protection the law offered to the ecological functions of wetlands was soon interpreted as being achievable through "net protection". This sparked the creation of wetland credit markets. Such credits allow the destruction of a wetland in one place as long as a wetland is restored or additionally protected elsewhere so that the balance of protection of ecological functions can be shown to be "net zero".

When the problem is mistaken for the solution

Considering these experiences, it is difficult to see how economic valuation of ecosystem services could really address the roots of nature's destruction – an economic system premised on partial and uneven internalization of only those portions of nature that can be described as distinct and measurable units and to which an economic value can be attached. Do schemes like the World Bank's Wealth Accounting and the Valuation of Ecosystem Services (WAVES) initiative, "*a 5-year global program to implement natural accounting in a critical mass of countries*" because "*natural capital is a critical asset, especially for less developed countries*" really contribute to biodiversity conservation? Or is the problem mistaken for the solution? If environmental crises are rooted not in incomplete accounting or other "market failures", but in the expansion of market mechanisms and norms into spheres of society or nature that previously have been protected from markets, as environmental philosopher John O'Neill suggests, isn't the appropriate response "*to resist that expansion, be this in the spirit of resistance to market society or more modestly to maintain the proper boundaries between spheres*"?¹⁹

Economic valuation of nature as a communications tool to raise concern among society, business and politicians over ecosystem functions and the continued loss of biological diversity

Conservation practitioners and NGOs who support the economic valuation of nature consider the concept to be merely an effective communications tool, a means to getting the message across that "we must pay attention to the environment". From this perspective, the frame of economic valuation just provides the language and methodologies that are needed to calculate figures showing the economic value of (some parts of) nature and biodiversity. The resulting numbers are expected to strengthen the case for conservation where arguments concerned with nature's intrinsic value and its multiple benefits to society have failed to prevent destruction. But what if changing the message to "we must calculate the value of the environment" leads to a different debate altogether than persevering with "we must pay attention to the environment" would? What if "we must calculate the true cost of nature's destruction" merely paves the way for "now we know the price of destruction and can plan accordingly"? If economic valuation helps to re-define nature as "the

largest company on Earth"²⁰, aren't cost-cutting measures and efficiency improvements the future order of the day to keep "company Earth" competitive?

The example of bee pollination payments to protect a native forest in Costa Rica highlights another danger that lies in accepting the discourse of economic valuation as an argument for protection of nature: Devaluation. The argument for protection of the forest was reduced to the forest providing the ecosystem service of bee pollination to nearby coffee plantations, and protection of the forest was paid for through payments from the coffee plantation owner. However, soon after, world prices for coffee plummeted, and the coffee plants were replaced with pineapple plants. But pineapple plants do not need bees for pollination, they rely on bats. Worse still for the forest reduced to the ecosystem service "bee pollination", pollination is actually harmful to pineapple productivity because the presence of seeds negatively affects the quality of the fruit. In this context, the logic of economic valuation of the ecosystem service "(bee) pollination" would have led to an argument for destroying the forest because its value to the previous beneficiary had become negative: a cost, not a benefit.

Providing financial incentives is not the same as valuing ecosystem services

It is also sometimes argued that valuation of ecosystem services is required to accurately determine the financial incentives for, say, a wetlands protection program. If one looks at existing environmental service payment programs, however, these do not require economic valuation of ecosystem services unless their character as subsidy program is changed and they become compensation programs. And even where figures for the economic value of ecosystem services exist, they are rarely used to set the level of payment, as Liu et al. (2010) found: *"[O]ne would imagine that in [environmental service valuation], the process of assessing the benefits of environmental services, must have been applied widely to guide payments for ecosystem services... In practice, however, EsV results have rarely been applied in setting payment amounts. This rarity of use of EsV in PES programs is confirmed by the PES literature."*²¹

In almost all PES programs, the level of the payment is established through negotiation or determined by law; it is usually informed by the cost of alternative means of achieving the same result (cost of water purification through building a treatment plant, e.g.) or the funds available in the public budget. If protection of nature really were the objective of economic valuation of nature, the rush towards economic valuation puts the cart before the horse, as Geoffrey Heal notes: *"Providing the right incentives is not the same as valuing the services: we can provide the incentives without valuing the services, and we can value the services without providing incentives for conserving them. [...]. If our concern is to conserve these services, then valuation is largely irrelevant. Let me emphasize this: Valuation is neither necessary nor sufficient for conservation. We conserve much that we do not value, and do not conserve much that we value."*²²

As environmental activist and writer George Monbiot points out, demonstrating value in money terms does not change power imbalances. He discusses the flawed conclusions the TEEB report draws from the large economic value they calculated for ecosystem services that mangrove forests in Thailand provide. Monbiot notes that the immense figure for the ecosystem services the mangrove forests provide is no protection if a shrimp farm business with the necessary political connections can make even only a fraction of the figure from running a shrimp farm in the middle of the mangrove forest, destroying its use value for everybody else.²³

The "hard facts" that economic valuation provides strengthen the case for conservation

Another crucial assumption by those who see ecosystem service valuation as a communications tool is that decisions about large infrastructure and other activities that destroy nature are taken on the basis of objective assessment of "hard economic facts and figures" and based on economic "cost-benefit" assessments. However, there is little evidence to substantiate that assumption. In France, researchers assessed what role economic cost-benefit analysis had played in decision-making on four examples of controversial and complex large infrastructure projects (a hydroelectric dam, a new motorway, a large-scale drainage scheme and an industrial waste dump site). A striking result from those case studies, from the point of view of ecosystem service valuation, is that decision-makers were ready to fund and implement these infrastructure projects despite a cost-benefit balance that was negative to the order of tens or hundreds of millions of euros. In "Tools for what trade?", Mermet et al. also note *"that if one looks around the world, there are many political and administrative contexts in which it would be hard to argue that economic calculus is one of the most decisive factors in political decisions."*²⁴ Isn't it then unlikely that presenting more detailed figures about the economic value of ecosystem service would make a meaningful difference in such decisions?

Just another tool in the policy toolbox

More policy-oriented arguments also claim that economic valuation is just "another tool in the policy box", and what harm could there be in experimenting with new instruments? One place where the harm from such experimenting with another tool in the policy box is becoming visible is the EU Emissions Trading Scheme, EU ETS. The EU ETS started out as one tool – albeit the favored one by key EU bureaucrats – in the EU's policy package for tackling climate change, alongside binding national targets for renewable energy and energy efficiency. With carbon prices remaining at levels far below the EUR 50+ considered necessary by the architects of the EU ETS to drive the change that was desired, oil companies like Shell have located the problem not with the EU ETS, but with "too many tools in the policy box": *"The ETS has been set up and then other policies do the heavy lifting. We do not let the ETS do the heavy lifting that is why a carbon market with a single target is needed. Get rid of all the other targets and policies and let the carbon market do the technology dispersion"*, David Hone of Shell said at a carbon markets conference organized by the German Government in April 2013.²⁵ And commenting in January 2015 on the EU proposal for the 2030 climate and energy package, which sets a binding target for renewable energy only at the level of the EU but not for each Member State, Hone comments that the *"worst case outcome for the ETS would be one that sees the whole 27% renewable energy goal met with explicit policies at Member State level."*²⁶ It was such explicit policies that were the driver of the rapid installation of non-fossil-fuel energy generation in those Member States that had such policies.

The experience of how a major fossil fuel company like Shell has been able to frame the failure of the EU ETS to produce the carbon price that had been expected as a problem not with the ETS but with other policy approaches such as binding targets for renewable energy or energy efficiency – and how the EU proposal for the next climate and energy policy package is suggesting to scale back the "competition" by scrapping nationally binding targets for renewable energy – provides a stark lesson on what could be at stake in the experiment with economic valuation of nature as "just another tool in the policy box".

Economic valuation as a way to "transform environmental legislation into tradable instruments"²⁷

Few who share his objective have been as explicit about the purpose they see for economic valuation of nature as Pedro Moura Costa, co-founder of Bolsa Verde Rio (BVRio). *"The objective is to*

transform environmental legislation into tradable instruments,” Moura Costa has said on various occasions.²⁸ His BVRio is a platform which aims to lay the groundwork for trading of legally recognized units that companies bound by environmental limits can use to exceed these and still claim to be in compliance with the law. Such a transformation turns a "zero biodiversity loss" or "zero land sealing" policy goal into "*net* zero biodiversity loss" or "*net* zero land sealing" where exceeding the limit in one place is acceptable if it is compensated by extra protection or less pollution elsewhere. Such a transformation requires measurable units that are comparable to each other so they can be traded between those who pollute less than the law allows and want to sell their excess "pollution rights" and those who wish to exceed pollution limits and can do so legally by acquiring additional "pollution rights" or "rights to destroy". These units are often referred to as "offset credits".

Examples where environmental legislation has already been transformed or newly designed to include a prominent role for tradable instruments include the UN's Kyoto Protocol, the Brazilian Forest Code, a State System of Incentives for Environmental Services (SISA) in the Brazilian state of Acre, a Sustainable Development law in Gabon, or the 1977 Clean Water Act in the USA that explicitly protects the many functions performed by wetlands. Construction firms, regulators, bankers and conservationists collaborated to find ways to make implementation of this law more "flexible", so that building could go forward on protected wetland sites, compensated for by "wetland credits" generated through improvement, creation or additional protection of wetlands elsewhere.²⁹

In a similar manner, the Clean Development Mechanism, one of the "flexible mechanisms" under the Kyoto Protocol, allowed companies in industrialized countries to pay someone elsewhere in the global South to reduce emissions for them while they exceeded the greenhouse gas emissions limit by continuing to burn fossil fuels as before.³⁰ Carbon offsets were also an attractive option for industrialized countries whose greenhouse gas emissions were limited by the Protocol. The offset mechanism allowed an industrialized country or a company in these countries to emit more CO₂ than the Protocol permitted. Despite overshooting the limit they could still claim to have complied with their Kyoto Protocol reduction target because they had paid someone elsewhere to make a reduction for them.

The Brazilian Forest Code requires that rural properties maintain between 20% and 80% forest cover, depending on forest type. The 2012 revision of the Code enables land owners who had previously destroyed more forest than allowed by law to avoid restoring the illegally destroyed forest on their own land and instead buy "forest restoration credits" from someone elsewhere who had destroyed less forest than the law allowed.³¹ Moura-Costa's BVRio brings together buyers and sellers of such "forest restoration credits".

Maximum levels of destruction or pollution become the new minimum

One result of such changes in environmental legislation: maximum levels of destruction or pollution become the new minimum because every unit of pollution or destruction below the legal maximum acquires an economic value as a tradable right to pollute. Instead of reducing pollution or destruction of nature, such changes to environmental legislation thus will always ultimately result in higher levels of pollution and destruction compared to standard "command-and-control" approaches: Every unused legal permission that previously would have led to levels of pollution or destruction staying below the legal maximum if the right was not exercised in a specific location can now be transferred to those wanting to pollute or destroy more than the law allows and for whom the cost of acquiring the credit is less than the profit made with continued pollution or destruction at their production site.

"Net zero" is not zero

Changing environmental legislation is a process that does not happen overnight. There are therefore still relatively few examples revealing the *full extent* of how economic valuation and "natural capital" perceptions of nature are transforming environmental legislation into tradable instruments. What is already becoming apparent, however, is that the most popular application of economic valuation of nature is offsetting. World Business Council for Sustainable Development member Rio Tinto, for example, is implementing "biodiversity offset" projects to supposedly compensate environmental destruction caused by its controversial mining sites in Madagascar and Mongolia. Rio Tinto is clear about the end to which it intends to apply economic valuation of ecosystem services: *"The growing focus on exploration in developing countries means that there is potential for land-use conflict to become an increasingly significant issue for Rio Tinto. [...] The Biodiversity Strategy was adopted in 2004 to manage the threats and opportunities presented by biodiversity and ecosystem service issues. [...] Biodiversity offsets will help Rio Tinto achieve the goal of net positive impact, while meeting legal requirements and maximizing conservation gains."*³² Picking up the interest from the mining industry, the World Bank published in March 2015 "A National Biodiversity Offset Scheme: A Road Map for Liberia's Mining Sector", a report that *"explores the feasibility of implementing a national biodiversity offset scheme in Liberia"*.³³ The proposal will help mining companies operating in Liberia present themselves as saviors of biodiversity even though their operations will continue to destroy some of the country's most biodiverse forests. The World Bank sees potential not only for the mining industry but also for oil palm and forestry corporations to profit from such a plan. In the EU, the European Commission is exploring ways to extend to other environmental policy areas the pollution trading approach introduced with the EU Emissions Trading Scheme, the central policy instrument for reducing greenhouse gas emission reductions in the Union's industrial sectors. "No biodiversity loss" targets have been changed to "no net biodiversity loss" targets in the most recent revision of the EU Biodiversity Strategy and offset mechanisms are being explored to implement the new "no net biodiversity loss" policy goal. In 2014, the European Commission also explored proposals for introducing a trade-off scheme for pollutants in the EU's Clean Air Package. A policy change to "no net air pollution" would make the existing policy instrument that regulates air pollutants in the EU, the National Emissions Ceiling (NEC) Directive, largely ineffective in restricting pollution at the most polluted sites because excess pollution in one place could be compensated with "below-maximum" levels of pollution elsewhere in the EU.³⁴

While the application of these new market-based mechanisms is still at an early stage, what is beyond doubt is that "net zero" is not zero. "Net zero" allows destruction or pollution in one place on the assumption that the (environmental) damage can be offset elsewhere. It allows the continuation of business-as-usual industrial production that depends on destroying or polluting nature in places where legal or moral restrictions limit the destruction. Offsetting can thus help corporations maintain a social license to destroy which in turn undermines local resistance to such destruction: "Where's the problem", a mining company or a palm oil trader might argue, "the ecosystem service units we have destroyed here will be recreated or preserved elsewhere".

Economic valuation as a tool to achieve fairer compensation for victims of environmental catastrophes or those affected by ecological destruction

Another important argument for economic valuation of "ecosystem services" is its application as a tool to achieve fairer compensation for victims of environmental catastrophes or for communities negotiating compensation packages, e.g. with oil or mining corporations. Judges or negotiators for these communities, it is argued, would benefit from better information about the economic value of

the ecosystem services the land provided and that the communities are forced to give up, or that was destroyed by an oil or chemical spill. In such cases, would more detailed accounts of the economic value of the nature in question really contribute to a better outcome? Or might providing economic figures derived from the new techniques of valuing "ecosystem services" only muddy the discussion over the nature of the fine or compensation and elevate monetary payments above non-monetary components of compensation?

In "The Price of an Apology"³⁵ environmental philosopher John O'Neill explains why economic valuation of nature is unlikely to improve implementation of the "polluter pays" principle. He does so by exploring the role economic estimates play in elaborating judgements in different judicial traditions. He shows that in most if not all judicial traditions, monetary compensation may play a role but that the issue is not the economic "accuracy" of the fine (even if this could be determined – which is impossible), but its place in a larger, socially-accepted process to right a wrong. The state's judicial system and the common or traditional processes set up to determine the action needed to right a wrong will each have their own set of procedures. These procedures, *and the numbers they produce*, will not be "clarified" or "improved" or "made more exact" by new economic valuation techniques, simply because these procedures are rooted in different logics than the economic valuation of nature. Applying new "ecosystem service" valuation methodologies may not be of much use to judges involved in setting penalties for polluters whose actions have permanently damaged a fishery upon which a community has always depended. Worse, insofar as economic valuation involves creating new points of consensus and building faith in the "accuracy" of ever more elaborate and technical ecosystem service accounts, judges and juries may begin to place more emphasis on the monetary payment aspect of legal judgements. This risks reducing the importance of non-monetary aspects, such as public apologies, public recognition of the wrong and commitment to change future behavior.

Another consideration often overlooked by advocates of economic valuation of nature as a means to improve implementation of the polluter pays principle is that (monetary) compensation is used in two very different contexts. One context is retrospective: Courts have to determine what losses or damage individuals or communities have suffered because of an oil spill or other accident. The Chevron-Texaco case in Ecuador and the Exxon Valdez case in Alaska are familiar examples. Even in those cases, compensation is understood to consist of much more than a mere transfer of money from one bank account to another, as briefly touched on above. In the other context, compensation becomes part of a forward-looking project evaluation, in which a decision has to be made whether to allow future destruction. In many such examples, the people to be compensated reject the idea of monetary compensation altogether. The response of a member of an adivasi (tribal) community in the Narmada Valley in western India who was offered compensation for displacement as a result of the Sardar Sarovar Dam is indicative:

"You tell us to take compensation. What is the state compensating us for? For our land, for our fields, for the trees along our fields. But we don't live only by this. Are you going to compensate us for our forest?...Or are you going to compensate us for our great river – for her fish, her water, for vegetables that grow along her banks, for the joy of living beside her? What is the price of this? ...How are you compensating us for our fields – we didn't buy this land; our forefathers cleared it and settled here. What price this land? Our gods, the support of those who are our kin – what price do you have for these? Our adivasi life – what price do you put on it?"³⁶

For many who support the use of economic valuation as a way of presenting more accurate compensation estimates for damage after, say, an oil spill, the use of economic valuation to serve to justify future destruction is problematic. But it is in this prospective context of compensation, for

future damages, that most economic valuation initiatives are taking place. Here, economic valuation serves to justify future destruction through advance payment in the form of compensation packages, biodiversity banking and conservation "offsets". And – there is no firewall between the methodologies used or the institutions involved: The same economic valuation techniques and methodologies will be used irrespective of whether the context is retrospective or prospective – where the calculations help pave the way for more destruction of nature where otherwise such destruction would jeopardize a companies' social license to operate.

Economic valuation language hides conflict over the use of nature

Talking about "nature" in the language of economists and corporations – as "natural capital", a "highly efficient and valuable factory" producing "ecosystem services" – might appear a minor concession worth making if the result is better protection of nature. However, creating this visibility to the economic eye requires abstractions that may in the end result in much more far-reaching changes to how we understand nature than initially imagined. Many involved in the policy discourse underestimate the agency of abstractions – how abstractions and the application of accounting procedures will shape, not just report how we see nature.

Carrying out the necessary abstractions is already resulting in much conflict and dispute because the phrase "units of ecosystem service" has neither a pre-defined meaning nor a metrical or other unit in which it can be expressed. Creating a nature of "ecosystem services" thus involves choosing exactly which relationships that co-create the complex web of life will symbolize the different ecosystem services that are to represent nature as a whole. It involves defining what parts of a particular nature actually make up the ecosystem service "bee pollination" or "water purification" or "biodiversity" or "carbon cycling capacity" of a forest or peatland, etc..³⁷ All other relationships not included in the definition of the service are made invisible because they will not be measured, not become bearers of economic value. Their presence or absence, scarcity or abundance will be irrelevant to the economic value of nature because that value will be determined exclusively through valuation of the relationships included in the definition of the "ecosystem services" to be measured.³⁸ The units in which these services will be measured also need to be agreed.

The complications of agreeing on abstractions that will work as well as, say, a "unit of grain" that can be uncontroversially identified by naming the type of grain, and the volume measure that was agreed – are well-described in the literature, but largely ignored in the policy debate on ecosystem service valuation. Karl Polanyi's "Great Transformation" and Timothy Mitchell's "Rule of Experts"³⁹ for example, describe how abstraction for recording in accounts will change the relations between goods that are exchanged and the web of relations that created the good. Historian Daniel Speich Chassé describes in "The Use of Global Abstractions" the contradictions that economists encountered who were tasked with abstracting away the differences in national economies so they could be compared in global national income accounts: *"While it seemed extraordinarily difficult to render all economic activities of the Central African territories within one single framework, it clearly turned out impossible to calculate a single figure – a GDP – that could reasonably be compared to other entities, such as the United States or Great Britain."*⁴⁰ Yet, despite the lack of adequate data, a number was produced and the measure of GDP is to this day a key indicator that shapes economic policy making. In "The nature that capital can see", Morgan Robertson describes how the attempts at agreeing on an uncontroversial measure for "functioning wetland ecosystem" related to the US Clean Water Act's option for trading wetland credits have shown *"that legal and capital logics [of selling ecosystem services] require information about ecosystem services that scientists cannot provide in an uncontroversial way."*⁴¹

Conflicts are also inevitable: Management so as to increase those relationships included in the definition and thus maximize their economic value will often lead to negative effects on other relationships that are not measured (because they are not recognized in the definition). And there

are already numerous examples of such conflicts related to forest carbon offset, or REDD+ projects, where the protection of the ecosystem service "carbon cycling capacity" led to the restriction of other "ecosystem services" such as food production from shifting cultivation or hunting.⁴² The political nature of abstraction is also expressed in the following comment on the ecosystem service "high conservation value forest", which an oil palm company was mapping out on land in Indonesia that they intended to use to establish plantations: "[...] *this HCV assessment is only to survey certain areas and only protects certain areas based on their own desires. As for us here, all of the territory of Muara Tae has a high value. The forests in Muara Tae's territory all have great potential. Besides that, it's really for the community. The territory of Muara Tae is a daily source of livelihood. For farming, for gardening. So if you want to find high value, all of Muara Tae has value.*" But for the palm oil company, "ecosystem value" was of interest only if it could be applied to appease international NGOs campaigning for the protection of "HCV" while allowing the company to continue to expand.

Furthermore, definitions described in lengthy ecosystem service valuation handbooks often sound convincing to policy makers and economists but practitioners will immediately recognize them as impossible to apply. The definition of each "ecosystem service" must at the same time be specific enough to separate one kind of "ecosystem service" from a related but distinct kind and general enough to also capture the relations that make up the same "ecosystem service" in different locations. Morgan Robertson describes the difficulty this poses for identification of what passes as a "wetlands credit" under the US Clean Water Act. The herbaceous plant *Aster simplex*, for example, is used in US government regulations as indicator of the presence of a functioning wetland ecosystem. But there remains an unresolved scientific dispute over where one species of *Aster* begins and another ends; *"there is, in fact, no current consensus on the very existence of a coherent and discrete species called Aster simplex"*, Morgan Robertson writes. This scientific dispute now creates a problem for the practitioner who at any time of the year and with a reasonable investment of time (the UK government, e.g., believes that an assessment of ecosystems adequate to determine their usability as biodiversity offset can be performed in 20 minutes)⁴³ has to decide whether the wetland in which s/he stands is a "functioning wetland ecosystem" in line with the law, or not. If *Aster simplex* is present, it does – and the owner of the wetland can sell wetland credits in regional wetland credit markets. The identification of a plant specimen as *Aster simplex* thereby takes on relevance far beyond the scientific dispute over classification – it becomes a question of whether the ecosystem service "functioning wetland ecosystem" exists, and thus the wetland units become bearers of value as tradable credits. The example of wetlands credit trading demonstrates another peculiarity in "ecosystem service" markets that also holds true for carbon or biodiversity credits: The credits are traded even though no-one is quite certain what it is they are trading, or whether there is actually equivalence between the credits that are traded. Robertson writes that in the case of wetland credits, *"the process of asserting and testifying to their equivalence and comparability with other wetland credits is terribly complicated, and almost bespoke. Ecosystem service entrepreneurs continue to offer proposals for categorization and impatient investors push for more abstract definitions of their assets,"* while each attempt at further abstraction has been contested. Assessing the potential of trading the ecosystem service "carbon cycling capacity" of forests in carbon markets, The Munden Project wrote in 2011 that *"forest carbon lacks a clearly defined process that is reliable in producing similar outcomes across different scenarios"*, that *"there is no clearly defined process for forest carbon accounting"* and that *"as an asset, forest carbon is currently created using a vague, malleable and insufficiently repeatable set of processes."* The report concluded that *"forest carbon trading is unworkable as currently constructed."* Yet as with wetland and biodiversity credits traded on regional markets, inadequate measurement, accounting or verification procedures do not prevent the circulation of such credits. As long as the regulators – governments that adopt environmental legislation that includes the option to trade pollution or destruction credits – accept the credits traded as equivalent even when they are not able to verify that such equivalence exists, those interested in continuing to pollute or destroy nature will buy them. For the protection of the

actual "ecosystem service", however, such trading where equivalence cannot be guaranteed – which is the case in all "ecosystem service" compensation schemes in existence – is bad news because it means that no ecosystem service equivalent to what has been destroyed or polluted over and above the legal limit has been protected elsewhere.

Economic valuation of nature – the means to many different ends

Economic valuation combines the appeal of the terms "value" and "nature" but puts them into an exclusively economic context: While "value" has many non-monetary connotations (as proponents of economic valuation of nature are quick to point out), a monetary value – a price – is what matters for economic valuation.⁴⁴ The current debate about economic valuation of nature shows that this combination of "value" and "nature" can be claimed as a means to many different ends.

The financial services industries are interested in economic valuation of nature as a way to create new assets and financial products that might provide new opportunities for investment and speculation. Industrial land users who are increasingly facing sustained resistance to their continued destruction of biodiversity and who fear impending limits that might be put on the "raw materials" and the land that they appropriate hope to use the concept to transform legal restrictions so they ensure access to resources against payment of an additional fee. Ecological economists seek to employ economic valuation of nature as a means to "green GDP" through accounting for the cost of destruction that results from treating nature as an externality. To politicians, economic valuation tools enable environmental regulation that establishes limits to environmental destruction (they are doing something) without unduly restricting economic growth. The World Bank and UNEP as well as international conservation NGOs engaged in land management see economic valuation as a way to increase funding for nature conservation.

Another appeal of the concept of economic valuation of nature resides in the possibility "to get it exactly backwards". Ecological economist Herman Daly, a strong proponent of economic valuation of nature, points out how some fellow proponents of the approach, in his view, "get it exactly backwards": *"The biggest mistake in integrating economics and ecology is confusion about which is the Part and which is the Whole."* He then quotes Dieter Helm, Chairman of the UK's Natural Capital Committee who has said that *"the environment is part of the economy and needs to be properly integrated into it so that growth opportunities will not be missed."* Daly remarks that *"If the Chairman of the UK Natural Capital Committee gets it exactly backwards, then probably others do too. [...]. Given this fundamental misconception, it is not hard to understand how other errors follow, and how some economists, imagining that the ecosphere is part of the economy, get confused about valuation of natural capital."*⁴⁵

More likely than confused misconception, perhaps, is that it's this exactly this openness of the concept to "misunderstanding" that provides its appeal.

Conclusions

*"Sir, my need is sore
Spirits that I've cited
My commands ignore"⁴⁶*

This paper has outlined why economic valuation is much less about recognizing nature's value and much more about putting a price on nature's destruction while leaving questions of power, winners and losers untouched. The numbers that economic valuation of "ecosystem services" produces are everything but "hard facts"; they conceal hidden value judgements and implicit trade-offs.

With regard to the various claims and arguments used to advance the economic valuation of nature, the paper concludes that:

- "Full internalization of externalities" is an illusion in a capitalist economy that is wholly dependent on unevenly and partially internalizing "nature".
- More detailed accounts of the economic value of ecosystem services are unlikely to improve implementation of the "polluter pays" principle, nor will they lead to fairer compensation payments. On the contrary, providing economic figures derived from the new techniques of valuing "ecosystem services" risks reducing the discussion over the nature of the fine or compensation to a matter of settling an amount for a monetary payment with which the company responsible for the damage can settle the case once and for all.
- While economic valuation of nature does not necessarily imply pricing and trading offset credits or setting up biodiversity banks, the particular political and economic context and the balance of power among its proponents is likely to lead to an application of "economic valuation of nature" through pricing and offset trading mechanisms. Examples of this conditioning already exist in the carbon market, the trading of forest restoration credits in Brazil and a proliferation of no-net-loss initiatives at policy (EU) and corporate (deforestation commitments, e.g. Unilever) level. The central appeal of economic valuation of nature thus manifests itself in Moura-Costa's statement that *"the goal is to transform environmental legislation into tradable instruments"*. The result is that environmental legislation is being reformed to reflect the new framing of nature as a collection of measurable "ecosystem services" whose economic value can be captured.

The paper also concludes that making complexity legible – in this case through questionable numbers for a selection of ecosystem services – does not help to resolve questions of winners and losers, trade-offs, and who has the right to decide and the might to enforce a particular land-use change. It may even invite forms of political control and economic commodification that can have pernicious side effects.⁴⁷ Economic valuation of nature thus will likely make it even harder to mobilize around the questions that must be asked when debating how to resolve the manifold dimensions of ecological crisis of our time.

It therefore seems advisable to heed the critical reflection of an economist who was party to the data and methodology production required to invent the GDP: *"These figures have been produced and people use them. They will continue to be produced, and people will continue to use them. If we*

*were starting afresh, I would have a great deal of sympathy with what has been said about not using a single figure, and not even producing one.*¹⁴⁸ While he concluded that that moment had passed in relation to the GDP, the option of not pursuing the path of economic valuation of ecosystem services is still open.

Whether economic valuation of nature is seen as an opportunity to seize or a threat to oppose depends on what we consider a cause and what a symptom of current ecological crises, on motivations and values, and on the kinds of societies and economies we wish to construct. Do we really want to take away the sacred and mysterious and replace it with measurable service units that are swapped on trading screens and pretend the two are the same? Or is it our responsibility towards future generations to resist the temptation of protecting nature by adopting the language and concepts of economists and corporations? It seems more important than ever that, acknowledging that failures, obstacles and resistance will be certain, we must insist on reinserting the political into the environmental discourse. The alternative to economic valuation of nature is to talk about why nature is made invisible in our current economic system, and why it is so appealing to politicians and corporate leaders to re-define nature, not economy: The alternative is to talk about power and privilege, about injustice and ecological debt; to insist that the moment is long overdue to re-define "economy" so as to fit in with nature instead of retreating into an accountant's debate about where one unit of ecosystem service ends and the other begins and which ones can be destroyed because they are being re-created somewhere else.

That does not mean that money is never a useful incentive for protecting nature, or that there is no justification for paying those who guard rather than destroy nature. The point is that no accounting of ecosystem service units is needed to employ financial incentives to protect nature. The shortcomings of such incentives may certainly be addressed and their functioning improved. But they have shown that they can work because they have made it increasingly difficult for those places we commonly refer to as nature to be destroyed without conflict and opposition. It is this effectiveness of existing environmental legislation that the re-definition of nature as a collection of exchangeable service units threatens to eliminate.⁴⁹

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End Notes

- ¹ For more information, see Lohmann, L. (2015): What is the "Green" in "Green Growth"? <http://www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/GREEN%20GROWTH%20web%20version%204.pdf>
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- ⁴ Morgan M. Robertson (2000): Ten Years of Wetland Mitigation Banking in Illinois: Lessons for Wisconsin.
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- ⁶ For an extensive description of these difficulties and scientific dispute that has led to there still not being a definition for "improved wetland functionality" despite wetland credits being traded at regional wetlands credit markets, see e.g. Robertson, M. (2007), Discovering Price in All the Wrong Places: The Work of Commodity Definition and Price under Neoliberal Environmental Policy. *Antipode*, 39, pp. 500–526.
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Annex

Accounting procedures – from naming and measuring to monetizing and commoditizing

Some advocates of economic valuation of nature insist that it is possible to engage in some steps of abstraction of nature as a provider of "ecosystem services" without consenting to the full spectrum from naming to commensuration, monetization, commodification, marketization, and financialization. The differences between these steps are briefly explained below.

Commensuration. Commensuration is the process of turning qualities into quantities and constructing a common metric. This always involves abstraction because its purpose is to reduce the amount of information that has to be processed in order to make comparisons. In economic valuation of nature, it is at this stage in the process that currently most disputes over boundaries and common metrics for "ecosystem services" occur.

Monetization and **commodification** make quantifiable units of a thing or service that used to be free and not available for purchase convertible into money. With this conversion, the units become available for sale. The exchange can happen bilaterally, in a regulated or protected market, or in an integrated larger spot market involving many players.

Marketization and commoditization are terms used for different purposes, including to describe a process aimed at building a large (size) and deep (number and specificity of actors) enough spot market for commodity exchange able to establish the fluctuating commodity price at any time and place. In the process, goods with an economic value which have different attributes are somehow "standardized" and treated as a generic commodity by market and consumers. A well-known historical example is the global oil market. It required decades to build an inter-connected global spot market for crude oil, with a limited number of uploading terminals (about 20-30 in the world today) and a limited number of downloading terminals and refineries. Then a global market was required to define a standardized oil benchmark, the so-called Brent or WTI. From then on any other specific crude oil extracted was priced against the benchmark (Brent +2 US\$, WTI -1 US\$ etc.).

Financialization helps make commodities tradable at a global level (the largest possible market), thus integrating and overcoming barriers among existing smaller markets. It also transforms commodities into an asset class, that means tradable and highly liquid (easy to trade) assets, primarily through the creation of financial products built on physical assets (i.e. futures derivatives on crude oil price).