

LUIGI PELLIZZONI

## Commodifying the planet? Beyond the economy of ecosystem services<sup>1</sup>

Published in *Stato e Mercato*, 121, April 2021, pp. 23-50

### Preprint version

#### 1. Introduction: the rise of market-based environmental policy instruments

In 1997, the Kyoto Protocol on the reduction of the emissions of greenhouse gases (GHG) was signed under the United Nations Framework Convention on Climate Change (UNFCCC). The treaty came into force in 2005. Fifteen years later, and with the 2015 Paris Agreement replacing compulsory targets with non-binding commitments, whether Kyoto was a success or a failure is a matter of contention. The three dozen countries that stuck to the treaty reduced emissions well over their targets. Yet, highly polluting countries did not ratify the Protocol (USA) or withdrew (Canada); emissions reductions were significantly helped by contingent events, namely the fall of the Soviet Bloc and the economic crisis begun in 2007; and major polluters with no binding commitments have emerged (China, India). Most importantly, global GHG emissions have been incessantly rising.

There is an inevitable counterfactual element in evaluating Kyoto: we will never know what would have happened without it. According to some commentators, Kyoto should be regarded as a success because its actual goal was not «saving the climate [...] [but] showing the world that a reduction [in emissions] was possible without undermining economic growth»<sup>2</sup>. The Environmental Performance Index (EPI), however, tells another story. A systematic analysis of 180 countries «reveals a tension between two fundamental dimensions of sustainable development: (1) environmental health, which improves with economic growth and prosperity, and (2) ecosystem vitality, which comes under strain from industrialization and expanded economic activity» (Wendling et al. 2018, p. vi). The former includes exposure to particulate matter and heavy metals, access to sanitation and safe drinking water; the latter includes GHG emissions, global and national biome protection, fish stocks and tree cover. A variety of studies (see for example UNEP 2016; Schandl et al. 2018) confirm that GHG emissions, energy use, material extraction and ecological footprint continue to increase together with economic growth, at best reducing their growth rate to some extent. It seems, therefore, that while improvements are being achieved within the socio-technical sphere – where, so to say, nature is already subsumed to economy – major problems persist at the interface of nature and society, where biophysical systems fulfil «tap» and «sink» functions for the latter.

This evidence is to be complemented with a consideration of the evolution of environmental politics. In the 1970s and 1980s, top-down, command-and-control, regulatory approaches dominated at both state and transnational level: just think of the many regulations enforced in the European Community or in the US, or of international regimes like the ones established by the 1979

---

<sup>1</sup> I wish to thank the participants in the seminar «L'impasse ambientale tra sfide e resistenze: un dialogo interdisciplinare» (22 January 2021) for insightful comments to the presentation of the ideas contained in the paper, and the editorial board of *Stato e Mercato* for equally insightful comments to its first version. The final result is of course my own responsibility.

<sup>2</sup> These words come from a delegate from ENEA (Italian Agency for new technologies, energy and sustainable development) to the 2015 Paris summit. See <https://www.qualenergia.it/articoli/20160620-perche-kyoto-un-successo-nonostante-tutto/> [accessed 14 December 2020].

Convention on Long-Range Transboundary Air Pollution («acid rains») and by the 1987 Montreal Protocol on the phasing-out of CFCs. Since the 1990s, however, more «horizontal» modes of governance have gained momentum. Voluntary agreements, labelling schemes, financial incentives, emission trading arrangements like Kyoto and other «market-based instruments» (MBIs) that address environmental problems as externalities received growing academic and policy acclaim. Direct or indirect price signals have been regarded as more effective in regulating behaviours than compulsory instructions (Jordan et al. 2003). The EU's Emissions Trading Scheme (ETS) started in 2005 in the wake of the enforcement of Kyoto. Other compliance or voluntary arrangements (like the Chicago Climate Exchange) emerged in the same period. Today, over 80 countries mention carbon markets as their preferred policy instrument under the Paris Agreement. After some pilot experiences China will also soon launch its own national carbon market (Bayer and Aklin 2020)<sup>3</sup>. Moreover, since the early 2000s the idea of trading or offsetting has been extended to biodiversity. Pioneered in the US in earlier years, the worldwide diffusion of this approach, often referred to as the economy of ecosystem services (ES), has been boosted by transnational organizations, from the United Nations (Millennium Ecosystem Assessment 2005) to the OECD (2008), and by an array of NGOs acting as policy entrepreneurs, such as Forest Trends with its Business and Biodiversity Offsets Program (BBOP), The Nature Conservancy, ECOROPA, the International Union for the nature conservation (IUCN), Friends of the Earth (FOE) and others (Hrabanski et al. 2015). The contrast between this frenzy and the poor performance of ecosystem vitality indicators raises a big question mark about the eventual effectiveness of MBIs when the interface of nature and society is at stake.

The rationale of carbon markets is setting an emissions cap (nation-specific in the Kyoto Protocol's framework), identifying the responsible parties (again, for Kyoto, installations pertaining to a given nation) and assigning them permits that can be traded, so that those who hold too few permits to cover their emissions can buy additional permits from the market (or pay some penalty). Carbon markets, therefore, implement the «Coase Theorem», according to which externalities can be efficiently handled (=internalized) if some authority compels the parties to negotiate the cost allocation for their management. In this way, a market provided with own commodities is created where there was none. What happens is what Michel Callon (1998a; 1998b) calls «framing»: the operation whereby (certain) «overflows» from outside a given arrangement are identified and contained. Framing «demarcates, in regard to the network of relationships, those which are taken into account and those which are ignored» (Callon 1998a, p. 15). This is necessary to calculation, which in turn means listing and ranking possible states of the world, on the basis of which agents can engage in transactions for resolving their conflicts of interest by way of pricing. The Kyoto Protocol includes a variant of the cap-and-trade model, namely the possibility of buying Certified Emission Reduction (CER) units or Emission Reduction Units (ERU) – respectively under the Clean Development Mechanism (CDM) and the Joint Implementation (JI) scheme – released in relation to projects in developing countries ensuring emissions reductions. The reference for calculation in this case is not a cap but a baseline of emissions against which the benefits of a project are gauged.

The Coase Theorem builds on well-known ideal requisites: costless negotiation, complete property rights and an authority capable of setting the cap and sanctioning non-compliance. The state (or equivalent authority) plays therefore a crucial role. Indeed, this applies to all MBIs: their rise does not correspond to a demise of regulatory authorities, as not only compliance but also voluntary arrangements need a backing in legislation to set the framework for exchanges to occur and price signals to operate, beginning with the enforcement and protection of property rights<sup>4</sup>. Emissions

<sup>3</sup> See <https://www.eex.com/en/markets/environmental-markets/chinese-carbon-market>.

<sup>4</sup> All the more so in conditions, such as the declining carbon prices resulting from economic crises or actual success in abating emissions, where only the credibility of a regulator's steady commitment to raising emissions costs can ensure continuity of firms' engagement in carbon trading, which otherwise would incur a typical «market failure» (Bayer and Aklin 2020). One may notice that the crucial role of regulatory

trading and baseline and credit schemes, however, put additional conditions, namely, agreement on expert (highly speculative) arguments about: 1) equivalences of emissions regardless of their location; 2) measurement of the «Global Warming Potential» (GWP) of different GHGs; and 3) baseline conditions and benefits of projects (MacKenzie 2009; Bumpus and Liverman 2011; Leonardi 2019). Hence, the framing operations required by carbon markets are very sophisticated, several of them being nested into one another. In Callon's (2009) perspective, this can be seen as a testimony to how the ingenious construction and refinement of markets leads to their «civilization»: a growing capacity of taking into account the world in its complexity. The performativity of economics, on this view, is socio-ecologically virtuous.

Or not? This is precisely the point. How should we interpret the inexorable rise of emissions and the worsening of other ecosystem vitality indicators? Is it a sign of insufficient framing – read: commodification – of the biophysical world, or that there is something inherently wrong with it? Wrong in the basic, value-neutral sense that its promise is bound to remain unfulfilled? This paper aims to offer a contribution to addressing this question. I start by dwelling on commodification as a complex process entailing actual or fictional detachment, abstraction and valuation, to which the biophysical world may respond in different ways. Next, I address valuation, showing that the moral economy on which it rests in modern society gives a special role to work as an activity deemed valuable in and for itself, for its world-transformative capacity, and how industrialization has built on the establishment of a circular relation between labour, energy and capital, as equivalences ever amenable to shift and dis-re-aggregation. This process, I claim, has reached a full-fledged expression in the economy of ES. Therein one can detect not only most salient examples of what Polanyi called «fictitious commodities», but also a blurring of the distinction between commodity and non-commodity. This is an especially significant aspect, as once the commodity character of the whole planet is «revealed», the distinction between profit and rent, on which many discussions over ES dwell, blurs, and with it claims about the crisis of capitalism.

Yet, if commodification works fine for capitalism, it hardly does it for the planet. A standard disclaimer is that this is because there is not enough of it. Being impossible to demonstrate otherwise, counter-arguing, I submit, has to be counterfactual, namely that ES are caught in the deadlock of a self-defeating success: the more they spread, the less they are bound to meet their target, because of neglect of the proliferative character of uncertainty. Subscribing to the «Parson's Pact», mainstream economics (and sociologists like Callon) assume uncertainty to be traceable to a single metric. Yet, the economics of conventions, strands of ecological economics and Adorno, with his distinction between identity-thinking and determinate negation, indicate this is hardly the case, pointing to alternative ways of abstracting and comparing, based on the acknowledgment of radical incompleteness of information and incommensurability of values. This arguably leads to different criteria of efficiency, sensitive to reversibility of choices, local conditions, the «not doing» of technical possibilities, and so on. Some emergent mobilizations seem to point to this direction.

## 2. The nature of commodification and the commodification of nature

Standard accounts of commodity define it as an entity the instances of which are treated as equivalent, with no regard to qualitative distinctions, concerning the thing itself, who produced it, or its utility for different users. A commodity has therefore the character of being commensurable and exchangeable, that is detachable from its context, producers or former users (Appadurai 1986). A commodity, moreover, is generally defined as the result of a process – commodification. Things are not inherently commodities but become such (Thomas 1991; Dant 1999).

---

authorities in the working of MBIs is in full accordance with the neoliberal approach to markets as purposeful constructions rather than spontaneous institutions (Dardot and Laval 2014). Said differently, the rise of MBIs is an eminent expression of the «neoliberalization» of environmental regulation (Czarnezki and Fiedler 2016).

Noel Castree has provided an interesting dissection of the process of commodification in capitalist economy. Six are the elements identified. First, privatization: the assignation of a legal title to a named individual, group or institution. Second, alienability: physical and moral separability from the seller. Third, individuation: representational and physical separation of a thing from its context; «a discursive and practical ‘cut’ into the seamless complexity of the world in order to name discrete ‘noun-chunks’ of reality that are deemed to be socially useful» (Castree 2003, p. 280). Fourth, abstraction: assimilation of the features of an individual entity to the homogeneous features of a type. Borrowing from Robertson’s (2000) study of wetland commodification in the USA, Castree distinguishes two types of abstraction: functional and spatial. Functional abstraction «involves looking for real and classifiable *similarities* between otherwise *distinct* entities *as if* the former can be separated out from the latter unproblematically». Spatial abstraction adds to functional one that «any individualized thing in one place be treated as *really the same* as an apparently similar thing located elsewhere» (Castree 2003, p. 281, emphasis original), which allows for offsetting a loss somewhere with a gain somewhere else. Fifth, displacement: the spatio-temporal separation of producers and consumers, which occludes the socio-natural relations that led to, and hence are contained in, the physical form of the commodity. Sixth, valuation expressed in money. This makes things commensurable not only with things of a same type but also with any other type of things. It is this specific way of assessing value, as exchange value, that sets in motion capitalism as the drive to accumulation for accumulation’s sake, for it is through the medium of money that profit can be calculated.

Commodification is not indifferent to its object. «Nature», which western modernity has understood as the non-social/non-technical sphere of material reality, comes into play in commodity production first as externality – «taps» and «sinks» available for free – and second as commodified matter, directly or by proxy. Proxy commodification happens any time markets are fabricated to establish a price, for example by way of contingent valuation or cap-and-trade arrangements, for things unsuitable to commodification, typically because physically indivisible. Direct commodification entails «formal» or «real» subsumption to capital. In the first case, nature is decomposed by way of privatization, physical and symbolic separation and abstraction, which however do not affect its value potentials. In the second case, which until recently coincided with the living world<sup>5</sup>, nature is refashioned to work harder, faster, and more efficiently (Boyd et al. 2001; Smith 2007; Fraser 2014)<sup>6</sup>. Negative externalities, proxy commodification and formal subsumption testify to nature’s varied degrees of «resistance» to commodification. Real subsumption shows capital’s capacity to «penetrate deep ‘inside’ nature, altering its internal grammar» (Fraser 2014, p. 64), intensifying commodification<sup>7</sup>.

### 3. Value, work and industrialization

If privatization is a usual but not strictly necessary condition for commodification (no one properly «owns» the atmosphere), if displacement looks as a by-product of the parcelling of things and if

---

<sup>5</sup> I say «until recently» because the threshold between the living and the non-living world has become in recent years increasingly blurred. I dwelled on that in Pellizzoni (2016; 2020).

<sup>6</sup> The idea of a formal and real subsumption of nature to capital obviously mirrors Marx’s distinction between formal and real subsumption of labour, according to whether workers enter a wage relation with capital while retaining their own skills, hence a creative control over the labour process, or become cogs in the assembly line, their contribution to production being reduced to mere bodily-psycho energy.

<sup>7</sup> This applies also to the human body. Think of «liberal eugenics» (Agar 2004): the marketization of physical and mental «enhancement» or remedy to impairment, including new prosthetics and brain-computer interfaces. Or think of «clinical labour» (Cooper and Waldby 2014), such as gamete donation or gestational surrogacy and the marketization of tissues, cells, genetic information.

parcelling can be obtained also when physically impossible, by way of representational gimmicks, what most deserves investigation is valuation and its relationship with abstraction.

Valuation plays a crucial role not only in commodification but in general in human relations with the world. Different entities (or assemblages of entities) can be regarded as more or less worthy. *Worth*, the French economics of conventions school reminds (Boltanski and Thévenot 2006; Thévenot 2007; Orléan 2014), essentially means a condition of happiness and good, culturally embedded, hence socially acknowledged. *Valuation* is the act of giving worth to states of the world. *Evaluation* is the assessment of the worthiness of a particular state. Hence, value is not a thing or an intrinsic quality of things but a result of acts of valuation and evaluation (Muniesa 2011; Lamont 2012). *Valorisation* is an additional notion, conveying the idea of an increase in worthiness. The state of affairs changes, making it happier: more plentiful, more valuable. What is the source of such change?

As far as modern society is concerned, the answer seems straightforward: work, human transformative intervention in the world. In modern society work is not just functional to satisfying needs and wants but comprises an ethic (Week 2011). Max Weber has famously argued how some Protestant sects regarded work as an end in itself, a sign of salvation, and how this particular outlook has affected the rise of capitalism. The centrality of work can even be traced back to early Christian Trinitarian doctrine. The latter, for Giorgio Agamben (2013), split creation and economy (= administration) of life, consigning the historical world to the latter, which led to a conception of being as contingent on the effects it produces. For this «ontology of operativity», being means acting on, transforming the world, as a general command prior to any specific targeting.

One may object that labour-theories of value, like those of Smith, Ricardo and Marx, are challenged by utility-theories of value, for which what counts are individual preferences. However, a labour-theory of value assumes, at its most basic, that work is judged worthy for the results it obtains. A utility-theory of value, in turn, assumes that preferences are not totally erratic, otherwise organising production would be impossible. Said differently, there is no value of something if not for someone; and there is no utility in things if not because of their arrangement, nor an increase in utility if not through a change in such arrangement<sup>8</sup>. Hence, the contrast between labour- and utility-theories of value is less dramatic than often portrayed. Yet, one may further object, what about changes that happen only in the eyes of the onlooker, by way of a cognitive act, a reinterpretation of the scarcity, or utility, of things? Well, cognitive processes are themselves a form of labour, immaterial but in many ways related to materiality. Mental processes consume energy, which needs to be restored. Furthermore, a change in the appraisal of things usually leads to behavioural change. And labour can always be found lurking at the grounds of the appreciation of things. Think of an old piece of furniture, changing its status from scrap to antique. Such reappraisal cannot but ultimately concern the work it contains or expresses, for its rarity, craftsmanship, and so on.

In short, no theory of value can do without labour. In the modern *Weltanschauung*, world transformation is the individual and collective destiny and duty of humans, who, in order to be, have to become ever more, or otherwise (see also D'Andrea 2021). Work is deemed conducive to independence, self-development and self-expression. It is a right and a requirement, ensuring social recognition and full citizenship (Weeks 2011; Chamberlain 2018). This moral economy of work, whereby its world-transformative, agent-enhancing potential and promise is valuable as such, and hence underlies all operations of valuation, evaluation and valorisation<sup>9</sup>, has imposed itself all over the world, first through colonial imperialism, then through post-colonial «modernization» programs,

---

<sup>8</sup> Whatever the contribution to such arrangement and its change coming from nature's own «work» (on which see below). Labour time, note Walker and Moore, «is always unified labour-nature time» (2018, p. 50).

<sup>9</sup> In this sense, the moral economy of work bears analogy with the moral economy of money (Feinig 2020) as store of value, that is potential or promise of realization of achievements. On the notion of moral economy see the classic work of Thompson (1971) and recent discussions such as Palomera and Vetta (2016) and Carrier (2018).

and lastly through globalization (Dardot and Laval 2014). Yet, it would be incorrect to see it coincide with capitalist ideology. What is special to capitalism is its making the case for the *value of transformation* in its purest, most abstract form, as endless *transformation of value*, any particular state of affairs being instrumental to the realization of further value (M-C-M'). Yet, Marx hardly provides an alternative account of work. For him the purposeful transformation and organisation of nature to satisfy needs is a quintessential anthropological feature. After capitalism, work will return to workers as a «self-activity» (Marx and Engels 1998, p. 91), crucial to «the full development of the individual» (Marx 1973, p. 711). And if Marx talks of a constitutive nexus between human societies and their biophysical milieu, nowhere – as far as I know – does he appear to withdraw from the western account of nature as a realm of mere reactivity to human action. Nature is there to be refashioned according to human needs and desires. Productivism is the normative standpoint about the good of humanity that leads Marx and numberless Marxists, up to current Accelerationists (Srniczek and Williams 2015), to think of the overcoming of capitalism as an unleashing of its technological and organizational forces, hampered by exploitative labour relations; an unleashing that promises a relentless intensification of world transformation, with annoying, fatiguing tasks increasingly offloaded to machines.

The underpinnings of the productivist a priori that the capitalist world and this post-capitalist utopia share lie in the relationship between work and industrialization established in the 19<sup>th</sup> century by way of a newly emerged medium: energy. As concepts, both work and energy boast a long history, yet their meaning underwent a crucial twist in this period. According to Raymond Williams (1983), «work» was originally a general word for doing something, while «labour» conveyed the idea of hard work, pain and trouble. In the 16<sup>th</sup> century labour begins to be used in abstract sense, as productive work, and late 18<sup>th</sup> century economists (beginning with Adam Smith) start to apply it to denote a measurable, calculable component of commodity production, beside land and machinery. Likewise, the Aristotelian account of energy as applied force bears only a generic affinity with how the term becomes to be understood in the 19<sup>th</sup> century. Historical inquiries show the close connection between the development of industry and thermodynamics. «Economic and physical ideas grew up together, sharing a common context» (Porter 1994, p. 141). On one side, «prior to its emergence in thermodynamics, energy did not have a strong association with fuel, nor a scientific definition»; on the other, «energy became tightly bound by the governing logic of work, [while] work increasingly came to be governed through the metaphors and physics of energy» (Daggett 2019, pp. 3-4) – hence the notion of «labour power», eminently used by Marx. Thermodynamic theorists like Carnot, Watt, Thomson and Joule «organized their new concept of ‘energy’ around the emerging idea of industrial labour, especially how to control it and maximize its benefits for factory owners» (Lohmann 2014, p. 28). The First Law of thermodynamics expressed the idea of a single, abstract force that can take any shape and can be combined and exchanged in any way, forming «a single, liquid, commodifiable whole that [can] be circulated, aggregated and subdivided» (*ivi*, p. 33).

In short, energy, and human and nonhuman labour came to be seen as flows of equivalences that can be composed, decomposed, moved freely in space and time, just like money and capital<sup>10</sup>. Work came to be described as the application of energy, and energy as the capacity of a physical system to do work; a circularity one finds reproduced in current textbook definitions. The Second Law of thermodynamics reminds that any equivalence is imperfect, any transformation is incomplete, and that the physical features of energy sources put different sorts of resistance to their commodification (with major political effects: see e.g. Mitchell 2011). Nonetheless, the energy/work compound, its assemblage of nature and culture, metaphor and reality, abstract and concrete, has enabled «the imperial governance of labour, both human and more-than-human»; it has allowed «putting the

---

<sup>10</sup> The same happened recently with biological information. The combination of biosciences and ICTs into «biotech» has led to conceive such information as simultaneously material and immaterial, capable of moving fluidly across media, from living cell to test tube, to digital database, enabling a worldwide biological exchange (Thacker 2006).

world to work» (Daggett 2019, p. 8, 12). The circular imbrication of capital, work and energy accounts for how, in commodity production, abstraction and monetary valuation appear two sides of a same coin. The economy of ES ostensibly represents the most accomplished application of this ontology.

#### 4. Commodifying the planet

The notion of natural capital started to gain traction around 1970 (Gómez-Baggethun et al. 2010). For Herman Daly, one of the founders of ecological economics, the whole biophysical environment is to be regarded as capital, since «it is only through the agency of air, soil, and water that plant life is able to capture the solar energy upon which the whole hierarchy of life (and value) depends» (Daly 1968, p. 397). In subsequent years, the notion spread at a growing pace. Of wide resonance was an article published in *Nature*, where the entire biosphere was valued at \$33 trillion (Costanza 1997). As for the concept of ES, it appeared in the early 1980s (Ehrlich and Ehrlich 1981). According to an influential definition, ES are the benefits biophysical systems give to humans, from resource provision to regulative and supporting functions like carbon sequestration, waste decomposition, soil formation, crop pollination, to cultural and recreational ones (Millennium Ecosystem Assessment 2005).

Similarly to natural capital, the initial meaning of ES was metaphorical; its aim was pedagogical. Framing ecological issues in utilitarian terms was expected to raise attention in economic and policy circles, «using a language that reflects dominant political and economic views» (Gómez-Baggethun et al. 2010, p. 1215). In the 1990s, however, monetary valuation techniques spread, leading to the oblivion of metaphorical meanings and the replacement of pedagogical with policy purposes (Craig et al. 2019). The idea of compensation for damage to biodiversity present in international agreements was reframed as «no net loss» or even «net gain» for damaged ecosystems<sup>11</sup>, while a «mitigation hierarchy» was established: avoiding, reducing, offsetting or repairing impacts (see e.g. Forest Trends 2009).

Two main strands in the economy of ES can be distinguished. On one side we have markets (MES). The idea is that ES can be bought and sold just like any other commodity. The classic case is that of tradable permits. An early example is the US Clean Water Act (1972), which introduced permits to damage wetlands in exchange of creating or restoring wetlands elsewhere. The other strand of ES is that of payments (PES). These are defined as voluntary transaction where a well-defined ecosystem service is bought by a buyer from a service provider if the provider secures its provision (Engel et al. 2008). In most cases, we are talking of carbon sequestration in biomass or soils, provision of habitat for endangered species, protection of landscapes and freshwater flows from upstream areas to downstream users. Coming back to Castree's account of commodification, we can say MES perform a functional and spatial abstraction, cutting and moving portions of reality, while PES perform only a functional one, as they identify services by just disentangling them from the networks of functionings and relations in which such services are immersed.

A variety of criticisms of ES have been raised over time, reformist or radical in tone (Hrabanski 2015). Frequently stressed are the asymmetries and inequalities in the access to resources that PES and MES produce. MES entail additional spatial and temporal asymmetries, since impacted and benefitted constituencies can be, and often are, disconnected, while the expected offsetting is usually delayed in time, with related uncertainties on its actual entity and occurrence (Curran et al. 2014). Often remarked is also the insufficient monitoring of project implementation, as well as the poor assessment, hence comparability, of outcomes. Manuals have been worked out by

---

<sup>11</sup> This evolution is visible, for example, in the implementation of the Ramsar Convention on Wetlands (1971). The Convention originally talked of compensation, while the Conference of the Contracting Parties (COP) of 2012 adopted the notion of no net loss. See <https://www.ramsar.org/sites/default/files/documents/library/cop11-res09-e.pdf> [accessed 20 February 2021].

transnational actors (see e.g. BBOP 2009; 2012). However, no rock-solid metrics exist, and the process of assessing equivalences and assigning monetary value is fraught with tensions and contradictions (Robertson 2012). National legislations and recommendations also play a role, yet solutions are eventually tailor-made to individual projects (Quétier et al. 2014).

Criticisms also question the reductionism implied in the measurement and monetization of ES. As said, to identify and quantify a service, one has to neglect, «cut away», the variety of (known and unknown) functionings a given portion of biophysical materiality enacts, or of the values attributed by different users to a certain functioning or bundle of functionings (Robertson 2000; Norgaard 2010; Kosoy and Corbera 2010; Battistoni 2017). A non-negligible implication of such reductionism is that it leads people to see more and more elements of the world in this way, as a service, rather than a matter of moral obligation or shared belonging, promoting individualism and self-interest in social contexts where these were absent (Gómez-Baggethun et al. 2010). In other words, the economy of ES produces at the same time commodities and subjectivities ready to regard nature as a commodity. Which of course is just as well if one equates *market* civilization (= accounting for more services, or more accurately) with *civilization* as such. Indeed, any framing of ecosystem vitality overflows presupposes a master-frame, a narrative whereby economic growth is deemed inevitable, desirable and universally beneficial, the task thus being just to manage its ecologically damaging side effects (Benabou 2014).

A further major (re)framing is ostensibly implied in the ES economy. Both MES and PES entail, as noted, sophisticated operations, often fraught with speculative claims (Curran et al. 2014). The problem of measurement and monetization, however, is especially intriguing in the case of PES. While MES treat biophysical functionings like Polanyian fictitious commodities that can be decomposed, traded and recomposed, PES commodify nature by way of a mere symbolic gesture, a cognitive interpretation, an ontological redefinition, thanks to which things «reveal» their character of commodity – with which therefore they have to be endowed since the beginning. This shakes the foundations of the theory of value and commodification, as always entailing labour. Following Marxian orthodoxy, radical critics often hold that the ES economy corresponds to a resurgence of rent; a «value grabbing» (Andreucci et al. 2017; Felli 2014)<sup>12</sup>. Buying emissions rights or paying for a forest, a water basin, or a recreational amenity would intercept part of the surplus value produced by connected activities and services (industrial production, carbon sequestration, freshwater, tourism). A possible objection is that measurement and monetization of ES is also labour – a complex intellectual one, which includes taxonomies, definition of functions, a breaking down and recomposition of processes to assign them values and packaging such values into financial instruments (Robertson 2012; Turnpenny and Russell 2017). The striking point, then, is that differently from the classic techno-scientific labour, which identifies natural forces to funnel them into machines, such labour does nothing to ecosystem vitality but to analyse it in order to bring to light its value, as yet unrecognized. The very distinction between rent and profit seems in this way to collapse. The idea of a world entirely commodified – made equivalent, hence fungible, disposable – and «put to work» turns from (dreamy or nightmarish) phantasy into accurate description, at the same time that nature becomes «liquid», its value «circulat[ing] through the capital embodied in and implied by its environmental services» (Büscher 2013, p. 22). If the rise of rent is usually taken as a signal of capital's crisis (see e.g. Vercellone 2007), of its lessening ability to engender surplus value, the accelerated unveiling of the commodity character of the planet – in and for itself – challenges claims about capitalist crisis. The socialisation of nature announced by the Anthropocene narrative (Bonneuil and Fressoz 2016) shows its actual shape: that of the commodity-form. Market «civilization» appears virtually accomplished. Proper overflows no longer exist; only differentiations within a unified domain, endlessly reworked by framing operations.

---

<sup>12</sup> Marx famously claimed that «the waterfall, like the earth in general and every natural force, has no value, since it represents no objectified labour and hence no price, this being in the normal case nothing but value expressed in money. Where there is no value, there is *eo ipso* nothing to be expressed in money. This price is nothing but capitalized rent» (1981, p. 787).



## 5. Beyond a single metric

At this point one may ask: what's wrong with that? One may have principled reservations with the commodification of everything, but if it just *works* why should one complain? After all, as the lay democratic state is capable of accommodating a variety of moral or religious beliefs under same rules of coexistence, being true to none but giving room for all (those ready to respect the rules), so drawing the whole biophysical world to the commodity-form and the variety of its appraisals to preferences amenable to accommodation via market transactions may be argued to ensure the only socio-ecological optimum realistically achievable. What radical criticisms attack, one may submit, is not so much the framing of ecosystem vitality overflows, whatever its perfectibility, as its underlying master-frame, the imperative of growth.

No doubt, behind radical critiques it is often easy to detect an environmental justice outlook, whereby growth is no substitute for distribution and ecological and social deterioration go hand-in-hand (Martinez-Alier 2002). However, there is more to a radical critique of ES than a principled standpoint. Admittedly, challenging the reformist claim is not easy. Ecological indicators are worrisome, but it might well be that commodification has not yet been pursued deeply and broadly enough. According to the standard defence of MBIs, to make the markets work we need more of them; more framing of overflows. To properly demonstrate this is not the case is impossible, as no disconfirm will ever be enough for those unwilling to change their mind. Therefore, a counter-argument cannot be based on facts – ecological indicators – but has to turn to counterfactual reasoning. Which may sound as follows: the more ES are identified and the better they are measured, the *less* they are bound to meet their target; and this because any additional refinement in the framing of reality is bound to engender ever-more nuanced, hard to fathom, overflows, with consequent growth in the number and scope of unforeseen twists, rebounds, amplifications. The more we know, the more the unknown unfolds under our eyes – not as an existential condition, but as a condition for action; and an increasingly salient one, as the more we pretend to control the world, the more what we do not control gains relevance in what we do. One may decide to ignore the self-fuelling production of uncertainty, as irrelevant to one's purposes or amenable to future fixes (= «market civilization»). But once the irredeemable character of uncertainty is acknowledged the fatal flaw of a relentless commodification of the planet becomes apparent.

Admittedly, such acknowledgment is an empirical question: it is impossible to anticipate how many disruptive overflows and how many people making sense of them are needed to produce a domino effect, engendering political action, though number, size and timing are ostensibly crucial to the shape action will take and to its chances of success. The social sciences have their fair share of responsibility in this regard, for the performative effects of the way they address the problematic of value. Mainstream economics, as well as Callon and much economic sociology, adhere to the «Parson's Pact» (Stark 2009). Namely, the assumption is that economic values are embedded in, or presuppose, social values. Such embeddedness or presupposition makes it possible to translate the latter into the former, though of course to varying degrees of adequacy. Callon insists that overflows be regarded not as exceptions but as the rule, not only because framing cannot avoid incompleteness, but because «without this incompleteness [it] would in fact be wholly ineffectual» (Callon 1998b, p. 252). Abstraction, in other words, has continuously to feed on the real. Hence, the deeper the abstraction, the greater its hunger for reality. This explains why commodification is never content with itself, having continuously to expand. However – Parson's pact subscribers can say – all the better with that, as it enables ever-more effective translations of social values into economic values.

Yet, *does* it? Are all sorts of uncertainty amenable to a single type of uncertainty? Because only in such case can present and future fixes of overflows be expected to *really* work – to work in reality, not as «paper offsets» (Quétier et al. 2014). To question this it is not necessary to bring forth

notions of intrinsic value of nature – which, incidentally, is prone to being recast as «existence value» (Krutilla 1967) and monetized via contingent valuation – or accounts of materiality that depart from western naturalism (Descola 2013). For the economics of conventions school (Boltanski and Thévenot 2006; Thévenot 2007), judgments of worth, of good and happiness, are based on incommensurable metrics, each grounded on own criteria of justice, according to which comparison of entities are performed and legitimate orderings are established. Market competition, with its way of establishing equivalences by way of price, is just one. Other criteria to be found in contemporary societies are technical efficiency, creativity, fame, domestic trust, civic solidarity and, lately, nature conservation. There being no hierarchy, disagreement about worth is the order of the day. What is, for example, «wetland»? Is it heritage, biodiversity, wilderness, resource, dwelled place, or else? Additionally, social action does not build only on claims about the public good but also on scopes downsized to those having a stake in the action or those intimate with the action's framework. Incommensurability, so to say, is not only horizontal (between different orders of worth in public engagement) but also vertical (between different types of engagement: public good; interest accommodation; familiarity, i.e. personal attachment). In any framework of meaning agents apply different «tests of reality», different ways to assess the appropriateness of a course of action. Commensuration of values at stake is therefore possible only within each framework, not between them. Sometimes, especially with familiar engagements, the very idea of measurement sounds inappropriate. Nonetheless, social coordination does occur. Yet, what may seem agreement on a common metric often hides mediation and compromise, which moreover, to a significant extent, are culturally embedded, country- and place-specific (Lamont and Thévenot 2000; Fourcade 2011; Centemeri 2015), different salience being given to different orders of worth<sup>13</sup>, or different ways of connecting personal attachment, stakeholder interest and public good being deemed acceptable.

In short, the economics of conventions approach helps make sense of how the unknown is unlikely to ever be amenable to a single metric. Issues are not only ill-known; they are often ambiguous in their actual character, hence also about what is relevant to know and which knowledge is relevant to action (Wynne 1992). Yet a single metric is what «putting the world to work» has fostered by way of a constitutive link between mainstream economic and scientific thinking, and is still fostering to this day<sup>14</sup>. ES can exist only thanks to the establishment and acceptance of scientific and economic abstractions and the translatability of the respective quantifications and uncertainties (Robertson 2012; Büscher 2013). Incommensurability between orders of worth is drawn to imprecise measurements, overflows that ask for framing. Yet, what precisely is lost in translation? The problem, clearly, is not comparison per se. As Adorno (1973, pp. 11 ff., 151 ff.) has stressed, the search for similarities and equivalences in things is an operation needed in order to act in the world. Nor is abstraction, again per se, the problem. Adorno is equally clear that our relationship with the world is always mediated by thought, conceptualization, and that the basic mental act is to bring intuition under concepts by way of judgment, any pretence of, or appeal to, immediacy being illusory. So, in a sense, the more accurate is the conceptualization – the more fine-grained is the abstraction – the better.

However, Adorno is also clear that conceptual mediations are not all of the same kind. A concept can respect or exert violence on the object to which it applies. The difference is between conceiving of the concept as wholly independent from its mediations, hence from the object, and acknowledging the entangled relations which mediations themselves represent. The difference, according to J.M. Bernstein's reading of Adorno, is between «simple» and «complex» concepts. The latter comprise «a logical axis through which thought identifies different particulars

<sup>13</sup> For example, Lamont and Thévenot (2000) found that the market order plays a more central role in the US than in France, where the civic order is more prominent – or at least it was so at the time of the study.

<sup>14</sup> This link is registered within the ES economy as “the alignment of ecologists and neoclassical economics in an economic-utilitarian epistemic community”, which shares a “commitment to quantitative data, the assumption of enduring relationships between well-defined variables, and a positivist belief in the value-neutrality of social research” (Craig et al. 2019, p. 819).

(individuals or properties of individuals) as belonging to the same ‘concept’» – simple conceptualization stops here – and a material axis composed of the mediating moments (objects known, sensorily appraised, articulated in languages and social practices), which «are not mere factual conditions of the concept, but ingredients in it, ingredients that do cognitive work». The logical axis «demands a radical transitivity of understanding, while the material axis aims at a form of intransitive understanding [...] [which is] object-depending or object-involved» (Bernstein 2001, pp. 33-34). Simple concepts, we may say borrowing from pragmatism, start from an intuitive appraisal of the surrounding world in terms of a «problem-situation» to which unreflective routine is inadequate, but cut the tie with it when they presume to «know enough» to define and address the problem effectively, claiming full adequacy of the representation of the world for the purpose at stake. Complex concepts, instead, acknowledge the irreducible presence and relevance, *here and now*, of aspects of the world that remain unaccounted for, unaddressed or ill-addressed. Both simple and complex concepts are faced with the remainder of the object, what is left outside conceptualization. Simple concepts, however, entail «identity-thinking»: a «repressive mimesis» (Horkheimer and Adorno 2002), whereby what is perceived and represented by the subject is taken as proper to the object itself. «Remainder» becomes «overflow», acknowledged but already assimilated in an anticipatory manner, precisely for its being described as such. Complex concepts, instead, entail «determinate negation»: a constant alertness to «non-identity», the incompleteness of any conceptualization. This not in the obvious sense by which science acknowledges and builds on awareness of the ever-incomplete state of knowledge, as in such case completeness works as an anticipated matter-of-factness that retroacts on the present justifying, for example, neglect of early warnings, preference for amount of yield against resilience and reversibility, assumption of resolute technical progress, and so on. Acknowledgment of incompleteness, in the Adornian account of non-identity, means instead that the anticipated matter-of-factness to which action should conform is incompleteness itself. This entails an empathic, rather than repressive, mimesis: not a drawing of the object to the subject but a going of the subject towards the object, with an attitude of humbleness stemming from the acknowledgement of the impossibility of doing full justice to it; a care in avoiding smugness and assimilation; a demand of friendship rather than an attempt at lordship.

Hence, one may say there are repressive and empathic comparisons and abstractions. Ecological economics, it has been claimed, «rests on a foundation of weak comparability» (Martinez-Alier et al. 1998, p. 278), against assumptions that strong comparability, based either on a cardinal or an ordinal scale of measurement (strong or weak commensurability), is the only way to rational action<sup>15</sup>. Weak comparability, in turn, calls for multicriteria evaluation methods (Munda 2008). These do not rule out and indeed entail compromise between incommensurable values, hence allow for and demand forms of «offsetting», yet, arguably, quite different from those promoted in the current ES economy, beginning with the search for criteria of efficiency that acknowledge radical incompleteness, hence privilege reversibility and resilience, are sensitive to local conditions and place-dwelling (Centemeri 2015), give relevance to the co-development of innovation (see e.g. Ceccarelli and Grando 2009), to the «not doing» of things technically possible (Pellizzoni 2021), and so on.

## 6. Conclusion

In this paper I have argued that the ever-growing commodification of the biophysical world, as a means for giving it its «proper» value and in this way protecting or preserving it, is caught in the

---

<sup>15</sup> In this regard, Martinez-Alier et al. (1998) recall Aristotle’s distinction between economy and chrematistics and Otto Neurath’s remarks about how economic commensurations build on incommensurable assumptions, such as those concerning the scope of future technical advancements.

deadlock of a self-defeating success. The more it (fictitiously) works, the more it is bound to (really) fail. Among the structural hurdles to an ecological transition (Mah 2021) this appears to be a fundamental one.

The rise of MBIs and the activism of transnational actors have challenged the primacy of the state in environmental politics. Yet, this hardly corresponds to its demise (Mol 2016; Hausknost and Hammond 2020): we have noticed the state's role in the overseeing of ecosystem vitality offsetting. In this sense, improving coordination between local, state and transnational authorities and policy entrepreneurs may pay dividends in addressing, in a reformist key, criticisms over the functioning of the ES economy. Likewise, the (relative) rise in policy relevance of a «value-pluralist» epistemic community (Craig et al. 2019) may signal a growing acknowledgment of the limits of sharp quantitative reductionism. As for a radical critique, the point is not to deny that the marketization of nature can work in some circumstances. Limits in the assessment and comparability of experiences make it difficult to say exactly which; yet, generally speaking, one may argue that the lesser is the effort in framing overflows, the more sensible its results can be. Said differently, the more accomplished is the commodification of the surrounding socio-material entanglements, the greater should be the possibility of success of addressing a given manifestation of ecosystem vitality as a monetizable service. Yet the proliferative logic of commodification makes unavoidable the question of what is one ultimately to mean by success. The performativity of economics begins with its «procedural power» (Martinez-Alier 2002): the valuation language it manages to impose and the underlying «value-ontology» (Craig et al. 2019) – what, in essence, is deemed worthy. What is problematic, then, is the value-ontology conveyed by the very notion of ES. That climate change and other aspects of ecological deterioration proceed undisturbed by, and indeed in consort with, the financialization of environmental policies can hardly be regarded as accidental, or just a matter of improvement, but rather as the indication that drawing the entire world to a play of equivalences, ever to be moved, decomposed and reassembled, is not the path towards a sustainable, decent life for all on the planet. At the same time this suggests that ingrained assumptions about the need for capitalism of a non-commodified world available «for free», hence the coincidence between planetary and capitalist crisis (Fraser 2014; Moore 2015), should be reconsidered. As it turns out with growing evidence, there is no necessary correspondence between accumulation and persistence of a commodity frontier, or between downfall of the planet and downfall of capitalism.

The case I made is for the acknowledgment of the radical incompleteness of knowledge and incommensurability of values as not necessarily hampering conceptualizations and comparisons of things. This is a distinctive feature of humans which not only is indispensable to survival but, if applied in the form of an empathic rather than a repressive mimesis, may engender a kind of labour or technology that, as Walter Benjamin said, «far from exploiting nature, is capable of delivering her of the creations which lie dormant in her womb as potentials» (2019, p. 203). Moreover, how to deal with radical incompleteness and incommensurability has not to be invented from scratch. As hinted, the social sciences offer precious insights for rethinking and enacting the interface of society and an ecosystem vitality which is far more than a «service» to humans. Glimpses of an empathic mimesis can be found in mobilisations from the Global South and North, such as permaculture, participatory plant breeding, community supported agriculture, frugal innovation, *zones à défendre*, that point to a «sustainable materialism» (Schlosberg 2019) by altering the dominant grammar of goals, values and relations among people and with things. The if, when and how of their upscaling as political forces remains an open question.

## References

- Agamben, G. (2013), *Opus Dei*, Stanford: Stanford University Press.  
 Agar, N. (2004), *Liberal Eugenics. In Defence of Human Enhancement*, Oxford: Blackwell.

- Andreucci, D., García-Lamarca, M., Wedekind, J. Swyngedouw, E. (2017), “Value grabbing”: a political ecology of rent, in *Capitalism Nature Socialism*, vol. 28, n. 3, pp. 28-47.
- Appadurai, A. (ed.) (1986), *The Social Life of Things*, Cambridge: Cambridge University Press.
- Battistoni, A. (2017), Bringing in the work of nature: from natural capital to hybrid labor, in *Political Theory*, vol. 45, n. 1, pp. 5-31.
- Bayer, P., Aklin, M. (2020), The European Union Emissions Trading System reduced CO2 emissions despite low prices, *PNAS* 1771(16), pp. 8804-8812.
- BBOP (2009), *Biodiversity Offsets Design Book*, Washington, DC: Business and Biodiversity Offsets Programme.
- BBOP (2012), *Standard on Biodiversity Offsets*, Washington, DC: Business and Biodiversity Offsets Programme.
- Benabou, S. (2014), Making up for lost nature? A critical review of the international development of voluntary biodiversity offsets, *Environment and Society*, vol. 5, n. 1, pp. 103-123.
- Benjamin, W. (2019), Theses of the philosophy of history, in Id., *Illuminations*, New York: Houghton Mifflin, pp. 196-209.
- Bernstein, J.M. (2001), *Adorno: Disenchantment and Ethics*, Cambridge: Cambridge University Press.
- Boltanski, L., Thévenot, L. (2006), *On Justification: Economies of Worth*, Princeton, NJ: Princeton University Press.
- Bonneuil, C., Fressoz, J.B. (2016), *The Shock of the Anthropocene*, London: Verso.
- Boyd, W., Prudham, S., Schurman R. (2001), Industrial dynamics and the problem of nature, in *Society and Natural Resources*, vol. 14, pp. 555-570.
- Bumpus, A., Liverman, D. (2011), Accumulation by decarbonization and the governance of carbon offsets, *Economic Geography*, vol. 84, n. 2, pp. 127-155.
- Büscher, B. (2013), Nature on the move I: the value and circulation of liquid nature and the emergence of fictitious conservation, *New Proposals*, vol. 6, n. 1-2, pp. 20-36.
- Callon, M. (1998a), Introduction: the embeddedness of economic markets in economy, in Id. (ed.) *The Laws of the Market*, Oxford: Blackwell, pp. 1-57.
- Callon, M. (1998b), An essay on framing and overflowing: economic externalities revisited by sociology, in Id. (ed.), *The Laws of the Market*, Oxford: Blackwell, pp. 244-269.
- Callon, M. (2009), Civilizing markets: carbon trading between *in vitro* and *in vivo* experiments, in *Accounting, Organizations and Society*, vol. 34, n. 3-4, 535-548.
- Carrier, J. (2018), Moral economy: what’s in a name, in *Anthropological Theory*, vol. 18, n. 1, pp. 18-35.
- Castree, N. (2003), Commodifying what nature?, in *Progress in Human Geography*, vol. 27, n. 3, pp. 273-297.
- Ceccarelli, S., Grando, S. (2009), Participatory plant breeding, in M. Carena (ed.), *Cereals. Handbook of Plant Breeding, Volume 3*, New York: Springer, pp. 395-414.
- Centemeri, L. (2015), Reframing problems of incommensurability in environmental conflicts through pragmatic sociology. From value pluralism to the plurality of modes of engagement with the environment, *Environmental Values*, vol. 24, n. 3, pp. 299-320.
- Chamberlain, J. (2018), *Undoing Work, Rethinking Community*, Ithaca, NY: Cornell University Press.
- Cooper, M., Waldby, C. (2014), *Clinical Labor*, Durham, NC: Duke University Press.
- Costanza, R. (1997), The value of the world’s ecosystem, in *Nature*, vol. 387, pp. 253-260.
- Craig, M., Stevenson, H., Meadowcroft, J. (2019) Debating nature’s value: epistemic strategy and struggle in the story of “ecosystem services”, in *Journal of Environmental Policy & Planning*, vol. 21, n. 6, pp. 811-825.
- Curran, M., Hellweg, S., Beck, J. (2014), Is there any empirical support for biodiversity offset policy?, in *Ecological Applications*, vol. 24, n. 4, pp. 617-632.

- Czarnecki, J., Fiedler, K. (2016), The neoliberal turn in environmental regulation, *Utah Law Review*, vol. 2016, n. 1, Article 1. Available at: <http://dc.law.utah.edu/ulr/vol2016/iss1/1> [accessed 22 February 2021].
- Daggett, C.N. (2019), *The Birth of Energy*, Durham, NC: Duke University Press.
- Daly, H. (1968), On economics as a life science, in *Journal of Political Economy*, vol. 76, pp. 392-406.
- D'Andrea, D. (2021), We are still modern. Cognitive, anthropological and institutional obstacles to the fight against climate change, in *Stato e Mercato*, n. 121, pp. 3-21.
- Dant, T. (1999), *Material Culture in the Social World*, Buckingham: Open University Press
- Dardot, P., Laval, C. (2014), *The New Way of the World: On Neoliberal Society*, London: Verso.
- Descola, P. (2013), *Beyond Nature and Culture*, Chicago: University of Chicago Press.
- Ehrlich, P.R., Ehrlich, A.H. (1981), *Extinction: The Causes and Consequences of the Disappearance of Species*, New York: Random House.
- Engel, S., Pagiola, S., Wunder, S. (2008), Designing payments for environmental services in theory and practice: an overview of the issues, *Ecological Economics*, vol. 65, n.4, pp. 663-674.
- Feinig, J. (2020), Toward a moral economy of money? Money as a creature of democracy, in *Journal of Cultural Economy*, vol. 13, n. 5, pp. 531-547.
- Felli, R. (2014), On climate rent, in *Historical Materialism*, vol. n. 3-4, pp. 251-280.
- Forest Trends (2009), *Business, Biodiversity Offsets and BBOP: An Overview*, Washington, DC: Forest Trends.
- Fourcade, M. (2011), Cents and sensibility: economic valuation and the nature of “nature”, in *American Journal of Sociology*, vol. 116, n. 6, pp.: 1721-1777.
- Fraser, N. (2014), Behind Marx’s hidden abode: for an expanded conception of capitalism, *New Left Review*, vol. 86 (Mar/Apr), pp. 55-72.
- Gómez-Baggethun, E., de Groot, R., Lomas, P.L., Montes, C. (2010), The history of ecosystem services in economic theory and practice: from early notions to markets and payment schemes, in *Ecological Economics*, vol. 69, n. 6, pp. 1209-1218.
- Hausknost, D., Hammond, M. (2020), Beyond the environmental state? The political prospects of a sustainability transformation, *Environmental Politics*, vol. 29, n. 1, pp. 1-16.
- Horkheimer, M., Adorno, T.W. (2002), *Dialectic of Enlightenment: Philosophical Fragments*, Stanford, CA: Stanford University Press.
- Hrabanski, M. (2015), The biodiversity offsets as market-based instruments in global governance: origins, success and controversies, *Ecosystem Services*, vol. 15, pp. 143-151.
- Jordan, A., Wurzel, R., Zito, A. (2003), “New” instruments of environmental governance: patterns and pathways of change, *Environmental Politics*, vol. 12, n. 1, pp. 1-24.
- Kosoy, N., Corbera, E.(2010), Payments for ecosystem services as commodity fetishism, in *Ecological Economics*, vol. 69, n. 6, pp. 1228-1236.
- Krutilla, J. (1967), Conservation reconsidered, in *American Economic Review*, vol. 57, n. 4, pp. 777-786.
- Lamont, M. (2012), Toward a comparative sociology of valuation and evaluation, in *Annual Review of Sociology*, vol. 38, pp. 201-221.
- Lamont, M., Thévenot, L. (eds.) (2000), *Rethinking Comparative Cultural Sociology: Repertoires of Evaluation in France and the United States*, Cambridge: Cambridge University Press.
- Leonardi, E. (2019), Bringing class analysis back in: assessing the transformation of the value-nature nexus to strengthen the connection between degrowth and environmental justice, in *Ecological Economics*, vol. 156, pp. 83-90.
- Lohmann, L. (2014), *Energy, Work and Finance*, Sturminster Newton: The Corner House.
- MacKenzie, D. (2009), Making things the same: gases, emission rights and the politics of carbon markets, in *Accounting, Organizations and Society*, vol. 34, n. 3-4, pp. 440-455.
- Mah, A. (2021), Ecological crisis and the dilemmas of industrial transformation, in *Stato e Mercato*, n. 121, pp. 51-78.

- Martinez-Alier, J. (2002), *The Environmentalism of the Poor*, London: Elgar.
- Martinez-Alier, J., O'Neill, J., Munda, G. (1998), Weak comparability of values as a foundation for ecological economics, in *Ecological Economics*, vol. 26, n. 3, pp. 277-286.
- Marx, K. (1973), *Grundrisse*, London: Macmillan.
- Marx, K. (1981), *Capital. Vol. 3*, London: Penguin
- Marx, K., Engels, F. (1998), *The German Ideology*. Amherst, NY: Prometheus Books.
- Millennium Ecosystem Assessment (2005), *Ecosystems and Human Well-Being; Synthesis*, Washington, DC: Island Press.
- Mitchell, T. (2011), *Carbon Democracy*, London: Verso.
- Mol, A.P.J. (2016), The environmental nation state in decline, *Environmental Politics*, vol. 25, n. 1, pp. 48–68.
- Moore, J. (2015), *Capitalism in the Web of Life*, London: Verso.
- Munda, G. (2008), *Social Multi-Criteria Evaluation for a Sustainable Economy*, Berlin: Springer.
- Muniesa, F. (2011), A flank movement in the understanding of valuation, in *Sociological Review*, Vol. 59, n. s2, pp. 24-38.
- Norgaard R.B. (2010), Ecosystem services: from eye-opening metaphor to complexity blinder, in *Ecological Economics*, vol. 69, n. 6, pp. 1219-1227.
- OECD (2008), *People and Biodiversity Policies: impacts, Issues and Strategies for Policy Action*, Paris: OECD.
- Orléan, A. (2014), *The empire of Value: A New Foundation for Economics*, Cambridge, MA: MIT Press.
- Palomera, J. Vetta, T. (2016), Moral economy: rethinking a radical concept, in *Anthropological Theory*, vol. 16, n. 4, pp. 413–432.
- Pellizzoni, L. (2016), *Ontological Politics in a Disposable World: The New Mastery of Nature*, London: Routledge.
- Pellizzoni, L. (2020), The environmental state between pre-emption and inoperosity, in *Environmental Politics*, vol. 29, n. 1, pp. 76-95.
- Pellizzoni, L. (2021), Nature, limits and form of life, in *Environmental Politics*, DOI: 10.1080/09644016.2020.1868864
- Porter. T.M. (1994), Rigour and practicality: rival ideals of quantification in nineteenth-century economics, in P. Mirowski (ed.), *Natural Images in Economic Thought*, Cambridge: Cambridge University Press, pp.128-170.
- Quétier, F., Regnery, B., Levrel, H. (2014), No net loss of biodiversity or paper offsets? A critical review of the French no net loss policy, *Environmental Science and Policy*, vol. 38, pp. 120-131.
- Robertson, M. (2000), No net loss, in *Antipode*, vol. 32, n. 4, pp. 463–493.
- Robertson, M. (2012), Measurement and alienation: making a world of ecosystem services, in *Transactions of the Institute of British Geographers*, vol. 37, n. 3, pp. 386-401.
- Schandl, H. et al. (2018), Global material flows and resource productivity: forty years of evidence, *Journal of Industrial Ecology*, vol. 22, n. 4, pp. 827–838.
- Schlosberg, D. (2019), From postmaterialism to sustainable materialism: the environmental politics of practice-based movements, in *Environmental Politics*, DOI: 10.1080/09644016.2019.1587215.
- Smith, N. (2007), Nature as an accumulation strategy, in *Socialist Register*, vol. 43, pp. 17–36.
- Srnicek N., Williams, A. (2015), *Inventing the Future*, London: Verso.
- Stark, D. (2009), *The Sense of Dissonance: Accounts of Worth in Economic Life*, Princeton, NJ: Princeton University Press.
- Thacker, E. (2007), *The Global Genome*, Cambridge, MA: MIT Press.
- Thévenot, L. (2007), The plurality of cognitive formats and engagements: moving between the familiar and the public, in *European Journal of Social Theory* vol. 10, n. 3, pp. 413–427.
- Thomas, N. (1991), *Entangled Objects*, Cambridge, MA: Harvard University Press.
- Thompson, E.P. (1971), The moral economy of the English crowd in the eighteenth century, in *Past and Present*, 50, pp. 76–136.

- Turnpenney, J.R., Russel, D.J. (2017), The idea(s) of “valuing nature”: insights from the UK’s ecosystem services framework, in *Environmental Politics*, vol. 26, n. 6, pp. 973-993.
- UNEP (2016), *Global Material Flows and Resource Productivity. An Assessment Study of the UNEP International Resource Panel*, Paris: UNEP.
- Vercellone, C. (2007), From formal subsumption to general intellect: elements for a Marxist reading of the thesis of cognitive capitalism, in *Historical Materialism*, vol. 15, n. 1, pp. 13-36.
- Walker, R., Moore, J. (2018), Value, nature, and the vortex of accumulation, in H. Ernstson, E. Swyngedouw (eds.), *Urban Political Ecology in the Anthro-po-obscene*, London: Routledge, pp. 48-68.
- Wendling, Z.A., Emerson, J.W., Esty, D.C., Levy, M.A., de Sherbinin, A. (2018), *2018 Environmental Performance Index*, New Haven, CT: Yale Center for Environmental Law and Policy.
- Weeks, K. (2011), *The Problem With Work*, Durham, NC: Duke University Press.
- Williams, R. (1983), *Keywords. A Vocabulary of Culture and Society*, New York: Oxford University Press.
- Wynne, B. (1992), Uncertainty and environmental learning, in *Global Environmental Change*, vol. 2, n. 2, pp. 111-127.

### **Abstract**

The idea of pricing nature for saving it has gained major traction with the rise of carbon trading and the economy of ecosystem services. However, this has not corresponded to significant effects on climate change, biodiversity loss and other ecological challenges. Is this because nature has not been marketized enough, or because of a fundamental flaw in its commodification? To answer, the paper elaborates on valuation, the underlying moral economy of work and the relationship between work and energy established during industrialization. The result is a fully plastic compound, at once material and abstract, natural and social, hence amenable to a single metric. Ecosystem services even question the alleged need for capital of a moveable frontier of commodification, everything resulting already a commodity. Yet, radical incompleteness of information and incommensurability of values makes their success self-defeating. Acknowledging this leads to reframing criteria of efficiency, pointing to a new grammar of goals, values and relations among people and with things.

**Keywords:** Q51 Valuation of Environmental Effects; Q56 Environment and Development • Environment and Trade • Sustainability • Environmental Accounts and Accounting • Environmental Equity • Population Growth; Q57 Ecological Economics: Ecosystem Services • Biodiversity Conservation • Bioeconomics • Industrial Ecology

Luigi Pellizzoni, Dipartimento di Scienze Politiche, Università di Pisa, Palazzo Ricci, Via Collegio Ricci 10, 56126 Pisa. luigi.pellizzoni@unipi.it.