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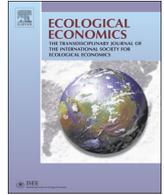
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## Analysis

# Critique and transformation: On the hypothetical nature of ecosystem service value and its neo-Marxist, liberal and pragmatist criticisms



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## ABSTRACT

Ecosystem service valuation (ESV) attempts to transform the opposition of human economic necessity and ecological conservation by valuing the latter in terms of the services rendered by the former. However, despite a number of ESV-inspired sustainability initiatives since the 1990s, global ecological degradation continues to accelerate. This suggests that ESV has fallen far short of its goals of sustainable social transformation—a failure which has generated considerable criticism. This paper reviews three prominent lines of ESV criticism: 1) the neo-Marxist criticism, which emphasizes the “fictitious” character of ecosystem commodities; 2) the liberal criticism through Friedrich Hayek’s concept “scientific objectivism”; and 3) the pragmatist criticism of “value monism”. Although each form of criticism provides insight into the limitations of ESV, all share ESV’s inability to discern what kind of social transformation is possible. Unable to provide an account of their own immersion in social and historical context, these approaches operate in the *hypothetical*. In light of these shortcomings, this paper advances a critical theory approach, which we contend provides conceptual tools uniquely well-suited to more adequately address the question of social transformation.

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## 1. The Hypothetical Character of Ecosystem Service Valuation (ESV)

Increasingly the conservation of ecosystems is justified on the basis of the economic value of the human welfare these ecosystems support. Since many of the “services” supplied by ecosystems (e.g. carbon sequestration, water purification, habitat for insects pollinating nearby crops) are not currently captured in markets, advocates of Ecosystem Service Valuation (ESV hereafter) hope to revitalize conservation efforts by calculating and revealing the associated and hidden welfare benefits (e.g. Armstrong et al., 2007; Costanza, 1996; Daily, 1997; Liu et al., 2010; MEA, 2005).

At the same time, ESV has been unable to address the intricate inter-relationship between social-structure and ecology. While the majority

of ecosystems that contribute to human well-being are currently being degraded, much of this degradation has accelerated throughout the latter half of the twentieth century (MEA, 2005)—*precisely the period in which ESV developed*. This includes the 1980–1990s, a period that Gómez-Baggethun and Ruiz-Pérez (2011) suggest gave rise to myriad of market-based environmental protection initiatives; the immediate precursors of ESV. Yet, many of the initiatives from this period (e.g. managing externalities of pollution through tradable allowances (Newell et al., 2013; Stavins and Schmalensee, 2012), wetland mitigation banking (Robertson, 2006) or promoting local economic development as a means to slow biodiversity loss (Ghazoul, 2007; Muradian et al., 2013)) have fallen far short of their anticipated goals.

ESV initiatives developed in the last decade have fared no better. The first international wave of these initiatives, the Millennium Ecosystem Assessment (MEA, 2005) and The Economics of Ecosystems and Biodiversity (TEEB) (2007), coincided with the failure to meet the

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Millennium global targets on biodiversity (2000–2010) (Butchart et al., 2010). Expectations are high that the accumulation of research, theoretical approaches and practical experience with ESV will finally coalesce under the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES) (Cardinale et al., 2012; Perrings et al., 2011, 2010). This assessment, however, presupposes that the prior limitations of ESV were technical in nature and that future limitations can be resolved by simply *more* research, theory and operationalization (e.g. Daily, 2000; Daily et al., 2009; Kinzig et al., 2011; Kremen, 2005; Kremen and Ostfeld, 2005).

Such a narrow focus on technical and operational shortcomings is indicative of what we will refer to as ESV's *hypothetical* character. The focus on technical progress, we contend, is not incidental, but emerges from an assumed distance from the social–historical context that generates ecological deterioration. ESV, then, operates in the hypothetical insofar as it presupposes a separation between itself and the social–historical context within which its activity takes place. Indeed, ESV advocates are able to think of themselves as making progress, despite their own prognosis that ecological systems are being degraded, because they assume an Archimedean standpoint outside of the ecologically destructive dimensions of society. It is by virtue of this decontextualization that ESV advocates are able to perpetuate the assertion that more and better market valuations of “ecosystem services” will overcome past failures, in spite of any evidence of efficacy (Laurans et al., 2013). However, ESV fails to provide an adequate account of ecological degradation (much less a feasible strategy towards sustainability) because its practitioners are unable to grasp how their activity is *mediated* by a social–historical context deeply connected to patterns of ecological degradation. The ESV approach is *hypothetical* because it lacks the means of discerning how the constitutional logic of modern capitalist society might inhibit: 1) efforts to illuminate this structure and 2) collective efforts to deal with pressing social problems, such as global climate change, in an effective manner (i.e. in a manner that does not regenerate the problem itself in a different form) (Dahms, 2008: 14–15).

Likewise, scholars examining the continual degradation of global ecological systems have not yet fully recognized the social and historical context through which such degradation takes place. Amid historically unprecedented levels of political–economic global interconnectivity following the end of the Second World War (see, e.g., McNeill, 2000), the acceleration of ecological degradation throughout the latter half of the twentieth century appears paradoxical: *In the post-WWII era, degradation is compounded in proportion to our awareness of these problems* (Blühdorn, 2013; Stoner, 2014; Stoner and Melathopoulos, 2015). Following Stoner (2014), we refer to the paradox of increasing ecological degradation amid growing environmental attention and concern as the *environment–society problematic*. Unable to discern this paradoxical historical development, the normative aim of ESV (i.e., sustainability) is not borne out in practice and remains *hypothetical*. The rising tide of ESV—far from indicating an increasing capacity to shape our future towards less ecologically-destructive ends—actually signals a growing inability to shape (let alone understand) the social–historical context that is generative of such runaway ecological degradation.

This is not to suggest that the limitations of ESV have gone unnoticed. Criticisms have mounted with recognition that ESV coincides with the deterioration of key biophysical indicators. Chief among these are 1) neo-Marxist; 2) liberal; and 3) pragmatist lines of ESV criticism.<sup>1</sup> Although these three lines of criticism represent the most significant attempts to understand the limitations of ESV to date, none

<sup>1</sup> For the sake of brevity and clarity, we will select authors whose works we believe offer exemplars of each approach, though we certainly recognize that these scholars may or may not self-identify with the labels (neo-Marxist, liberal, and/or pragmatist) we ascribe to them.

are able to make historical sense out of the growing popularity of the ecosystem service approach itself. As we endeavor to demonstrate, this is in large part because the theories underlying each criticism are also unable to grasp their own immersion in society and history. In this way, critics are only able to consider ESV as either “wrong thinking” or determined by agents that somehow stand outside or above society (e.g., market environmentalists, ecological technocrats, hardened ideologues). Consequently, like ESV, the criticisms are restricted to reacting to social transformations, passively describing these changes, but never being able to regard them reflexively — never attaining the level of a theory about how society could potentially change. In other words, both ESV and its criticisms fail to recognize the *potential* for society to *change* because neither can grasp the deeper causes of social discontents (e.g., discontents to which an ecologist who calculates ESV or those who promote their estimates are ultimately responding to) or the ways in which such discontents are integrated back into the structuring logic of modern capitalist society, thereby allowing long-standing socio-ecological problems to be perpetuated.

This paper engages in an immanent critique of the neo-Marxist, liberal, and pragmatist attempts to understand the limitations of ESV in order to illuminate the historical specificity of our current inability to locate a social basis for ecosystem conservation. Our immanent critique reveals how, in opposing ESV, these criticisms reproduce its most problematic feature: environmental degradation is decontextualized and, as a result, sustainability remains hypothetical. Against this background, we outline two key methodological motifs of a critical theory approach, which we contend provides conceptual tools that are uniquely well-suited to more fully comprehend the links between economic progress and ecological deterioration and the discontents this generates.

## 2. The Criticism of Ecosystem Service Valuation (ESV)

### 2.1. The Neo-Marxist Criticism: Ecosystem Services as Commodities

The neo-Marxist line of criticism (exemplified by Kallis et al., 2013; Kosoy and Corbera, 2010; Peterson et al., 2010; Robertson, 2012, 2000) argues that ESV fails because the process of abstracting commodities (i.e., services) from ecosystem functions obscures the complicated interconnections within ecosystems and between society and ecosystems, leaving us to mistakenly “think that capital grapples directly with material nature” (Robertson, 2012: 396). Moreover, the abstraction of value from ecosystems undermines the potential awareness of these interconnections because consumers, land managers, ecologists and others become fixated on ecosystem values in the market, a process Kosoy and Corbera (2010) liken to the worship of a fetish object in pre-modern societies. Kosoy and Corbera's reference to this fetish-like reverence of ecosystem value, like all neo-Marxist criticisms of ESV, draws on Marx's analysis of commodities in *Capital Vol. 1*, specifically the final section of Chapter 1 titled “The Fetish of the Commodity and Its Secret” (Marx (1976 [1867]): 163–177). The criticism, in turn, rests on a careful analysis of the social and ecological implications associated with each of the stages in transforming ecosystems into a commodity that can “bear value” (Robertson, 2012: 388)—that is, the itemization, characterization and spatial mapping of ecosystem functions, their re-categorization as ecosystem services and their packaging or bundling into tradable commodities.

According to the neo-Marxist criticism, the significance of this technical process in creating “a more and more differentiated realm for the circulation of capital” (Kosoy and Corbera, 2010: 1231) is in stark contrast to ESV advocates, who view the process of technical innovation as key to resolving ESV shortcomings. Indeed, the neo-Marxist criticism provides a compelling account for why technical solutions appear efficacious to ESV practitioners. By structuring the way society understands its relationship to ecosystems — in terms of “services” that “bear economic value” — the definition and specification of those

services only appears to be a path leading to sustainability; while in actuality, this path leads to the destruction of ecosystems:

“Bracketing nature as ‘material’ or as an unmediated force in capitalist accumulation prevents us from discerning the struggle over the creation of value bearing abstractions from its materiality (...) In dealing with nature, we are always attended by the invitation to mistake the ordering of appearances for order itself, to mistake the difficulties of classifying and categorising nature for the intransigence of nature itself.” (Robertson, 2012: 397)

On this basis, the neo-Marxist criticism purports to explain a number of problematic aspects of contemporary ESV practices, including: a) how the overwhelming demand for some services (e.g. carbon sequestration) leads to the degradation of other associated ecosystem functions (e.g. reforestation with fast growing trees reduces biodiversity and soil retention) (Kosoy and Corbera, 2010; Peterson et al., 2010) and b) why diverse social and cultural values associated with ecosystems have become less relevant to the assessment of ecosystem value, paving the way for highly asymmetrical power structures for rendering management decisions (Kallis et al., 2013; Kosoy and Corbera, 2010). Moreover, by grounding the emergence of ESV in the rise (1980s–present) of “market environmentalism” (Kosoy and Corbera, 2010) or “neoliberalism” (Kallis et al., 2013; Peterson et al., 2010; Robertson, 2012, 2006) the criticism c) provides an explanation of why ESV has been accompanied by an upward redistribution of wealth.

The neo-Marxist criticism views the fetish character of putting monetary values on ecosystems as synonymous with the idea that valuation constitutes “commodity fiction”. The idea of a “commodity fiction”, however, does not arise from Marx, but from the thought of Polanyi (2001 [1944]), whose historical sociology sought to ground the underlying dynamic of modern society in the commodification of three things that supposedly cannot be commodities, namely land, labor and money. According to the neo-Marxist criticism, the first of Polanyi’s fictitious commodities (land) can be broadly reinterpreted to encompass ecosystems. Polanyi maintained that any attempt to render these dimension of life as commodities results in a resisting social counter-movement that sets up an oscillating historical dynamic between advancing markets and restricting these markets through public control. Consequently, rather than any form of social transformation, these authors look to a broadly-constituted *resistance* against commodification.

The recourse to resistance, however, misses a key dimension through which social discontents of the 1970s not only failed to reduce ecosystem degradation, but also reproduced capitalism in a new form. While neo-Marxist authors acknowledge that market-oriented utilitarian approaches to environmental and resource management gained popularity just as global neoliberal capitalism was emerging in the 1970s, they attribute this development to forces outside of society. According to the neo-Marxist criticism, the synchronicity of neoliberalism and the growing popularity of utilitarian approaches to the environment during the 1970s involved expanding the scope of markets to incorporate dimensions of life considered public goods or common pool resources. This, in turn, rolled back the scale and scope of national environmental legislation and regulatory agencies, which had been tasked with protecting these resources beginning in early decades of the twentieth century (Peterson et al., 2010). Neo-Marxists typically interpret the declining role of the state in regulating society’s relationship to ecosystems as paving the way for a new round of capital accumulation following the global political and economic crises of the 1970s (Kallis et al., 2013; Kosoy and Corbera, 2010; Peterson et al., 2010; Robertson, 2012, 2000).

The advance of “market environmentalism” and the subsequent appeal of ESV, however, cannot be fully explained with reference to the rolling back of the state-centered conservation framework “from above” (Heynen et al., 2007; McCarthy and Prudham, 2004). Unlike the 1960s, the 1980s witnessed growing public fatigue with

environmental issues, which was combined with a sense of the insufficiency of environmental regulation (the “implementation deficit”, Røpke, 2005: 268). That is to say, popular discontent was an important part of the socio-historical context that gave rise to “market environmentalism”—the seeming opposite of Polanyi’s prediction that social counter-movements push in the direction of restricting markets and placing them under public control. Rather than attempt to grasp the basis of this regulatory roll-back in terms of social mediation (an approach we develop below in our discussion of critical theory below—Section 3), the neo-Marxist criticism relies on the unwarranted assumption that popular discontents (e.g. contemporary environmentalism) stand outside the social structure of capitalism. Such a perspective fails to adequately account for how capitalism itself is transformed (e.g., from its regulatory state form to one in which regulation is rolled back) in and through popular discontents (e.g., 1960s discontents with industrial pollution results in the expansion of state regulation in the 1970s and the disappointment with these regulations, coupled with unease from a severe economic downturn, contributes to their undoing in the 1980s).

What is entirely overlooked by these critics is that Marx’s “economic” categories—value, commodity, capital, labor, surplus value—are not solely economic, but rather *forms of social being* specific to the capitalist mode of production (Postone, 1993). As Postone (2007: 16) observes, “Polanyi’s insistence on the fictitious character of labor, land, and money as commodities obscures Marx’s analysis of the commodity as a form of social relations”. In other words, in contrast to Polanyi, commodity for Marx is not a matter of an underlying social, cultural or ecological foundation made obscure to itself by the “fiction” of exchange. Instead, the peculiar form of social objectivity and subjectivity characteristic of capitalist societies is mediated through the commodity form and must be understood as such. Furthermore, for Marx, the contradictory character of commodities (i.e., how they appear concrete and natural as well as abstract and “fictional”) cannot be separated from the historically unprecedented *social* dynamic (i.e. capital) in which his theory takes root. From this perspective, history is not driven by forces outside society — there is no “natural” ground for discerning a “real” from a “fictitious” commodity, only the changing form of modern society itself.

Although Robertson (2012: 396) comes close to recognizing the distinctly social character of commodities when he states that the necessity for resistance “does not arise from the point at which intransigent nature expresses its material character, but rather at the point at which we (...) retract our consent to the adequacy of social abstractions as bearers of value”, this insight is confined to his Polanyian approach. For Robertson grounds agency in the reaction against the commodity form rather than attempting to recognize the *possibility* for further transformation lying within it. For Marx, on the other hand, the conscious transformation of society—e.g., towards less ecologically destructive ends—requires critically recognizing social context as that which renders possible new (and more adequate) forms of thought and activity.

## 2.2. The Liberal Criticism: Ecosystem Services as “Scientistic Objectivism”

Unlike the neo-Marxist line of criticism, the liberal criticism does not contend that markets obscure social and ecological reality. According to the liberal criticism, exemplified by the prominent environmental philosopher Mark Sagoff, the “fiction” of ESV exists precisely to the extent that ecosystem service values are taken to be as an objective measure of social welfare when in fact they represent the narrow interests of environmentalists. Although taken from this perspective neo-Marxist and liberal criticisms of ESV appear to have little in common, both regard ESV as being imposed on society from “above” (i.e., by “market environmentalists” for neo-Marxists and by ecological economists for liberals). They differ only in how they conceptualize society; neo-Marxists (following Polanyi) understand society in collectivist terms (i.e., society is constituted by shared social values,

particularly among poor and marginalized strata of society) and liberals in terms of the individual (i.e., self-interested individuals generate a social whole that is more than the sum of its parts).

In this section we demonstrate that the collectivist/regulatory state that emerged in the 1930s was not eliminated in the 1980s, as liberals had hoped, but *transformed* such that collectivist and individualist features of societies became deeply integrated. We develop this proposition through the concrete example of a well-studied ecosystem service, the insect pollination of agricultural crops, and show how valuations enabled conservation to be integrated into state-regulation of agricultural markets through agri-environmental initiatives. Integration, however, progressed in-step with the “liberalization” of agriculture in the 1990s, which demonstrates how the liberal criticism cannot be readily separated from its social context. We conclude that the liberal criticism of ESV is hypothetical because, like ESV, it merely reflects (and perpetuates) the social context that is generative not only of ESV and ecological degradation, but the growing illiberal character of society more generally.

The liberal criticism of ESV draws on Friedrich Hayek’s (1899–1992) formulation of “scientistic objectivism”, which he developed in a series of essays written during the Second World War (Hayek, 1942, 1943, 1944). Hayek develops the term “scientistic” (and “scientism”) to describe a form of rational planning in the 1930s that was informed by “objective” laws derived by “impartial” specialists who assume a perspective above society. Such planning purported to act in the name of an objectivity previously accorded only to the physical sciences. But the parallel between Science and “scientism”, Hayek asserts, is illusory. “Scientism”, for him, is but the “slavish imitation of the method and language of science” (Hayek, 1942: 269) and its “objectivity” contributes “scarcely anything to our understanding of social phenomena” (Hayek, 1942: 268).

Take, for example, the case of pollination mentioned previously. Liberal critics claim that while pollination ecologists employ Science to classify patterns of wild bee pollinator biodiversity, they cross over into “scientism” when they extend their “objectivity” into claims of the social welfare benefits for conserving wild bee habitat. It is one thing, the critics suggest, to maintain that bee biodiversity is linked to patterns of uncultivated land-use around agricultural crops, or that the yield of these crops increases in relation to the dynamic and interacting character of this biodiversity (Luck et al., 2009: 228), but it is another to assert that preserving bee habitat is the only avenue available for farmers to increase their profits (Sagoff, 2011). In other words, pollination ecologists engage “scientism” when they extend their objective ecological findings to questions of social necessity.

“Scientistic objectivism” enables liberal critics to account for a key shortcoming of ESV—the “environmentalist’s paradox” whereby human wellbeing appears unconnected to the degradation of ecosystems (Raudsepp-Hearne et al., 2010). Extending the pollination example, the paradox can be expressed as follows: In the face of large and growing estimates of ESV by pollination ecologists (Calderone, 2012; Gallai et al., 2009; Lautenbach et al., 2012), the explosive growth of pollinator-dependent crop output since the 1990s (Aizen et al., 2009) and the relatively slow growth of insect pollinator supply (Aizen and Harder, 2009; Breeze et al., 2011, 2014; Schulp et al., 2014), why do farmers growing pollinator-dependent crops fail to make investments in conserving pollinator habitat (Ghazoul, 2007; Hanes et al., 2013; Melathopoulos et al., 2015)? The liberal critic dissolves this paradox by asserting that production increases with declining pollinator service flow because growers manage pollen limitation dynamically. Growers do more than adjust inputs and adopt new technologies (Boreux et al., 2013; Lundin et al., 2013; Melathopoulos et al., 2014), they also seek to control pollen limitation in relation to society *as a whole* by managing the constant interaction of economic variables: “the elements, components, or units of ecosystems relevant to valuation are determined by and through the economic activity that surrounds them” (Sagoff, 2011: 501). According to the liberal criticism, the “environmentalist’s

paradox” only *appears* to ecologists because in bracketing the activity of many independent actors working within a socially dynamic system, pollinator conservation is equated with static “ecological constants”, derived from seemingly “objective” biophysical laws within which growers are expected to conform (e.g., patterns of bee biodiversity across landscapes and their effect on crop yield (Luck et al., 2009)). Growers do not spend money on pollinator habitat restoration, according to liberal critics, because they are not sound investments. Where pollination exists as a problem, they engage in local and informal negotiations to resolve unpaid externalities: “ecosystem services as a general rule already receive more or less appropriate quantification and pricing either explicitly in market exchange or implicitly in the Coasian bargaining that arises in the penumbra of markets and in the shadow of common law” (Sagoff, 2011: 500). Yet, such a characterization of agricultural markets operating in free and open competition does not withstand scrutiny.

Unlike other sectors of the economy, gains in agricultural productivity are rapidly lost to low prices (Timmer, 2009). The chronic tendency of agriculture towards oversupply has plagued the farm sector through most of the twentieth century and only episodically resulted in short periods of high profits (e.g., 1973–1980 and 2006–2011) (Timmer, 2010), resulting in uneven income distribution between agricultural and non-agricultural sectors (Timmer, 2009: 30–34) and social pressures that emerge from the growing disparity between rural and urban incomes. Pollock (1990 [1941]) would characterize the pattern for resolving these pressures in the early twentieth century as “state capitalist”, in which markets became deeply integrated into the state. As Pollock notes, this trend extended not only to totalitarian countries (e.g., Germany and the Soviet Union, as Hayek (2006 [1944]) notes) but also to democratically-governed countries (e.g., the U.S. following the New Deal). The management of agricultural prices through various forms of subsidization (e.g., import tariffs, supply management programs, payments for removing land from production, and direct payments), following the first major collapse of the newly constituted global market for grain in 1921 is exemplary of this integration (Friedmann, 1982, 1993).

This pattern of integrating agricultural markets into the state has accelerated in recent decades, in a way that increasingly comes to bear on the management of ecosystems. Farm income support programs were themselves drawn into a deep crisis in the mid-1970s along with many other features of the post-WWII political and economic order. As governments in industrialized countries attempted to restructure their economies by reducing government expenditures and promoting global trade liberalization, farm income programs became increasingly difficult to justify to a primarily urbanized tax base already facing deep cuts to their own state welfare benefits (Potter, 1998, 2009). Significantly, the first valuations of insect pollination services emerged in this period as an explicit means by which the U.S. beekeeping sector justified its price support program in the face of mounting public scrutiny (Muth and Thurman, 1995; Robinson et al., 1989).

Yet, attempts to liberalize agriculture in the 1990s failed and the agricultural sectors in the U.S. and E.U. remain highly regulated and subsidized (Timmer, 2009). As Friedmann (1993: 29) correctly anticipated, “the choice is not between ‘regulation’ or ‘free trade’ (...) but between new forms of implicit or explicit regulation”. Consequently, while liberal criticisms of ESV presuppose liberalization—that agricultural firms directly and immediately interact with one another (and with surrounding ecosystems)—they ultimately miss how the relationship between agricultural firms and ecosystems are *actually* mediated through social structures (e.g., through state-regulated price control programs) designed to cope with the internal contradictions of capitalism (e.g., the chronic tendency of agriculture towards oversupply). In doing so, liberals not only miss how farm sector lobbyists joined ecologists in advancing their interests using valuations, but also the way in which their interests became increasingly integrated through state-led agri-environmental schemes starting in the 1990s (Potter,

1998). Today, a major source of agricultural price support comes in the form of state-legislated biofuel blending standards in the U.S. (beginning in 2007) and by E.U. members states (2003) that are justified politically in terms of increasing carbon sequestration ecosystem services (Gerasimchuk and Koh, 2013; Tyner, 2008).

Since the sectional interests of farm groups appear better able to control the terms of agri-environmental policies, they are typically accompanied by weak provisions for evaluating conservation outcomes (Kleijn et al., 2011). Yet, in the face of deep cuts in state expenditures after the 2008 global economic crisis, ecologists and conservationists fear that even the meager conservation provisions within existing agri-environmental programs will be disproportionately weakened (Pe'er et al., 2014; Potter, 2009). In this sense ESV may not so much be “scientific” (i.e., advancing an abstract image of how society and ecosystems ought to interact *from above*) as imitating what they correctly deem as the successful rent-seeking strategies coming *from below* (e.g., those used by farm lobbyists competitors) in light of an illiberal social context.

The liberal criticism operates in the hypothetical because it is unable to locate the illiberal features of society *in society*, but instead attributes them to a largely exogenous force (i.e., ESV) and asserts society is otherwise liberal (i.e., governed by common law and constituted by markets). But as we have argued, the growth of ESV reflects a growing integration between conservation and new forms of “implicit” regulation that have advanced alongside “liberalization” (i.e., the dismantling of “explicitly” regulated markets) since the 1990s. Although this enables liberal critics to describe many of the problems associated with ESV it is unable to grasp ESV as symptomatic of a deeper social dynamic. This dynamic—typified by the chronic tendency of agriculture towards oversupply and the perpetual return of regulation—assumes a quasi-objective predictable form, which farmers, conservationists and liberal critics are all subject to. Unable to recognize itself as reflecting this dynamic, the liberal criticism of ESV becomes a way of perpetuating it along with all its contradictions.

### 2.3. The Pragmatist Criticism: Ecosystem Services as “Value Monism”

The pragmatist line of criticism is exemplified by the work of the environmental philosopher Bryan Norton, who draws together American pragmatist philosophy with the thought of the early twentieth century conservationist Aldo Leopold. Whereas neo-Marxists reject the objectivity of ESV on ontological grounds (“fictitious commodities”), and liberals reject ESV as the attempt to undermine the legitimacy of liberal society; pragmatists reject ESV to the extent that it precludes “a more profound reexamination of how one might create a rational process of policy evaluation that truly takes into account both economic and ecological impacts of our decisions” (Norton and Noonan, 2007: 665).

Pragmatists attempt a deep reconsideration of society's relation to ecosystems through a process of rational deliberation (Norton, 2005: 51–56). In this sense, the pragmatist and liberal criticisms bear some resemblance to one another. The difference between the two approaches revolves around their respective assessments of the bitter debates over ecosystem management that characterized the twentieth century. While liberals look to the “moral fervor” of these debates as a progressive social force (Sagoff, 2012), pragmatists view the opposing poles of these debates as being hardened and unresponsive to changes in ecosystems, communities and values. The pragmatist criticism of ESV is distinct in its anticipation of the possibility for a more constructive and open-ended approach to relating ecosystems to society, one that provides: “room for flexibility and for learning from experience” (Norton, 2005: 56).

Pragmatists criticize ESV for assuming that social welfare can be captured through a single dimension—namely, the quantitative and objective measure of individual consumer preferences (Norton and Noonan, 2007). Yet, in practice, the attempt to render the functional complexity of ecosystems, as well as the public and future interests

people ascribe to them, into monetary units demands considerable theoretical abstraction. Paradoxically, such abstraction means relaxing the very neoclassical economic principles of utility ESV looks to employ. Consequently, ecologists who attempt to motivate social demands for conservation by emphasizing the economic benefits of protecting ecosystems face what Norton and Noonan (2007: 668–669) term “the ecologists' dilemma”; they either must restrict the scope of benefits generated by ecosystems in order to fit within the marginal utility framework, or stretch the definition of utility to a point where it is no longer is recognizable as economic value.

While the “ecologists' dilemma” poses a seemingly insoluble trade-off to ecological economists, Norton and Noonan (2007) suggest this is only the case to the extent that they insist that welfare benefits be expressed in terms of a single “objective” dimension of value. Moreover, they assert that breaking with this reductionist approach, which they term “value monism”, is a matter of choice:

“if we recognize that the decision to model ecological values in the economic framework is a choice among multiple possible metaphors and models, then the decision as to what is important to measure rests on a value judgment” (Norton and Noonan, 2007: 670).

The choice against valuation is a process of communicative action known as *adaptive management*. Drawing on Pickett and Cadenasso (2002), who emphasize the role of metaphors in generating scientific models of ecosystems and in mediating societal values towards ecological systems, Norton and Noonan envision adaptive management as foregrounding these value-laden metaphors, using them consciously in an iterative, experimental and deliberative process. Here ecosystem service value is re-conceptualized not as an impartial form of objectivity but as one metaphor among many—Norton and Noonan characterize ESV as a metaphor for “ecosystems as a welfare producing machine” (2007: 655)—whose adequacy can be judged not on its own basis (monism) but on its capacity, in relation to other metaphors, to match a constellation of social values with the dynamic and complex processes of ecological systems (pluralism).

The pragmatist criticism is potentially significant for locating the constraints to conscious social transformation in a form of instrumental rationality that gives rise to value monism, and the possibility that inter-subjective deliberation might dissolve the hardened ideologies that perpetuate monistic approaches. However, pragmatists cut short these insights by not reflecting on the grounds of their own thought. The unwavering commitment to communicative action, for example, assumes subjective values (e.g., the different ways people value wild pollinators) exist independently of objective constraints (e.g., the chronic tendency of agriculture towards oversupply—Section 2.2). As such, the pragmatist criticism is ill-equipped to meet the concerns raised by neo-Marxists, whereby the experience of an ecosystem—and by extension one's value of it—is mediated through being considered as a commodity (i.e., “a welfare producing machine”). By extension, the pragmatist emphasis on the autonomy of social values fails to address a key characteristic of the present ecological crisis; if social values offer a path to sustainability how can this be reconciled with the fact of that proliferation of environmental awareness (i.e., environmental values) fails to bring about sustainable practices (Blühdorn, 2013; Stoner, 2014)?

These shortcomings highlight the limitations of defining the environment–society problematic (Section 1) in communicative terms alone. Pragmatism's emphasis on deliberative action falls short insofar as it recasts the classical epistemological subject–object relation in intersubjective and linguistic terms (Nelson, 2011). Significantly, the pragmatist criticism has paid less attention to the elusive processes of *social mediation*, which we return to elaborate below. The separation of subjective values from objective social structure therefore risks sinking into a “self-imposed abstractness” whenever pragmatists attempt to relate their theory to actual practices (Norton, 2005: 389). Not surprisingly, the promise of social transformation, which attended the

communicative shift (see Habermas, 1983 [1981]) during the late 1970s and early 1980s, has failed. Indeed, there is an elective affinity between this failure, on the one hand, and the demand for politics, which has yet to be met. In fact, the increasing demand for social transformation (i.e., the desire for an ecologically “sustainable” society), expressed through the pragmatist proposals for adaptive management—far from facilitating effective communication—may even function to “disperse political responsibility and obscure chains of accountability” (Blühdorn, 2013: 31). In this way, adaptive management may conceal underlying powerlessness through a process that appears as its opposite (i.e., conscious and rational deliberation over ecosystem management). This vulnerability arises from the fact that most adaptive management initiatives claim successful outcomes without adequate implementation studies, leading to unsubstantiated claims that the approach can be readily scaled up to highly complex and large-scale socio-ecological problems (e.g. climate change) (Rist et al., 2013). The interplay between concern for ecological degradation and the uncertain operational parameter of adaptive managements results in what Sagoff (2008: 86) characterizes as an “academic blessing” for entrenched positions that “institutionalize paralysis by analysis and (...) guarantee indecision over the long run”. The growing concern around ecosystem degradation that characterizes the environmental-society problematic finds its full expression in adaptive management. That is to say, adaptive management meets the demand for transformation without, however, having to deliver outcomes. Ironically, this feature of adaptive management does not differentiate it from ESV, but parallels it (Laurans et al., 2013).

### 3. Methodology of Critique

In this paper we have shown how, in criticizing the shortcomings of ESV, neo-Marxist, liberal and pragmatist approaches take a standpoint outside their socio-historical context. As a result, these approaches are unable to address the central question underlying the issue of sustainability—namely, what kind of context might generate the type of transformation that could overcome the opposition of social necessity and ecosystem integrity? Both ESV and its critics proceed without asking what kind of transformation is historically possible; and in this sense, they operate in the *hypothetical*. Notwithstanding their differences, the neo-Marxist, pragmatist, and liberal critics of ecosystem valuation remain a *reflection* of socio-historical context rather than a *critical reflection* on socio-historical context (Dahms, 2008). Unable to grasp their immersion in within the socio-historical context that generates ESV, these critics perpetuate a “sustainability gap” (Fischer et al., 2007) by recourse to nostalgia for past and failed political mediations (liberal), schemes for idealized deliberative spaces (pragmatists), and/or the frustrated call for “resistance” (neo-Marxist).

In light of these shortcomings, this section outlines key aspects of a critical theory approach, which we contend provides conceptual tools uniquely well-suited to more adequately address the question of social transformation. Because an adequate elaboration of critical theory is well beyond the scope of this article, the following focuses on two methodological motifs—*immanent critique* and *mediation*.

#### 3.1. Immanent Critique

As Kuhn's (1996[1962]) famous scientific revolution thesis makes clear, understanding scientific change and development is impossible without an acute comprehension of the significance of historical events and situations in shaping the activity of science. This basic insight is particularly relevant to critical theory, which must be situated in relation to its context—that is, modern capitalist society. Accordingly, one of the central aims of critical theory is to recognize and make explicit how, in an integrated capitalist society, it is impossible to think outside of our societal context. Even thoughts and phenomena which appear transhistorical, such as land, human labor, political legitimacy and human communication, always take place within a given context.

Critical theory seeks to go beyond mere historicity (i.e., the past as an accumulation of facts and events) in order take into account how thought itself is historically constituted. Such a critical and reflexive approach can be traced back to G.W.F. Hegel (1770–1831), whose philosophical system was premised on the recognition that ideas about reality are historically situated. Later critical theorist such as Herbert Marcuse, Max Horkheimer, Theodor W. Adorno, and others associated with the Frankfurt Institute for Social Research in the 1930s, 40s, and 50s questioned the notion that researchers can separate themselves from the phenomena and societies they study. The Frankfurt School critical theorists resuscitated the critical impetus of Hegelian-Marxist social theory—an approach they saw as being commensurate with their commitment to social emancipation, particularly in the wake of the German Weimer Republic (1919–1933). In doing so, the Frankfurt School critical theorists sought to specify how ideas such as progress were legitimized through unquestioned authority in a repressive and administered world.

Max Horkheimer laid the groundwork for a methodological approach capable of taking into account the idea that knowledge claims are constrained by the reality perceived in his distinction between traditional theory, on the one hand, and critical theory, on the other (Horkheimer, 1972 [1937]). According to Horkheimer, the social-historical “object” of analysis—namely, modern capitalist society—is in no way separate from the social-historical reality of the researcher's milieu, which in turn defines the reality perceived (Horkheimer, 1972 [1937]). Traditional theory, by contrast, ignores the dualisms between thought and being, on the one hand, and understanding and perception, on the other. Severed from its social-historical context, traditional theory views scientific activity taking place alongside all other activities in society, “*but in no immediately clear connection with them*” (Horkheimer, 1972 [1937]: 197 [emphases added]). Theory must, then, be “critical” enough to account for its immersion in history. Theory, rather than being considered exogenous, must be recognized as an integral part of capitalist society. Critical theory is thus confronted with the twofold task of critique and transformation. Such an approach must provide a critique of its own social-historical context—and it must do so in a radically immanent manner, so as to specify the nature of historical development which must be confronted and overcome (Leiss, 2011) in any attempt to effect sustainable transformation. We contend that a critical theory geared towards sustainability must, at the very least, provide a critical and reflexive account of:

- 1) The conditions of its own possibility (i.e. social context); and
- 2) The immanent possibility of the fundamental transformation of this context (i.e., the notion that social context itself is generative of its own supersession).

Critical theory meets this twofold challenge of critique and transformation by engaging a methodology known as *immanent critique*. To begin, the critical theorist must explain how it is possible to critique capitalism while being a part of capitalism. That the structures and underlying social relations of modern society are contradictory is what generates the possibility of a critical stance towards this context (Postone, 1993: 88). Take, for example, the chronic tendency of agriculture towards oversupply discussed in Section 2.2. The independent activity of freely contracting agricultural firms rapidly increases agricultural output, which in turn, undermines prices leading (in the twentieth century) to decades of low profitability. The discontents associated with this social dynamic are manifold and are not simply associated with the income gap that opens between agricultural and non-agricultural sectors of society. Attempts to regulate this dynamic in industrial countries (e.g., by subsidizing farmers) frequently resulted in increased productivity (i.e., through machinery and agro-chemicals) (Friedmann, 1993; Potter, 1998) that generated new discontents (e.g., environmentalist and consumer responses to the “industrialization” of agriculture, increased costs of farm programs and the backlash by the urban tax base, etc.).

As explained previously, according to Marx's theory, capital, as the structuring principle of underlying social relations, both generates and prevents the possibility of its own supersession. Critical theory's referent of critique, although generated within capitalist society, points outside existing social conditions. In other words, critique's conditions of possibility are socially constituted by the dynamic and contradictory nature of capital itself. For example, the environmentalist ideal of having enough, as opposed to having more, is a real possibility generated by the enormous wealth-producing capacity of industrial capital. But capitalism, as a system of social organization premised on producing more and more *ad infinitum*, simultaneously undermines the possibility that such an ideal will become actual. This contradiction between immanence and transcendence is what normatively compels and analytically enables critical theory to develop tools capable of elucidating critical recognition of the problematic features of modern capitalist society and the related consequences that result from how our lives are created (Postone, 1993; Strydom, 2011).

Critical theory, then, is not a general theory but rather a method of analysis whose core is immanent critique (Antonio, 1981). To reiterate, critical theory confronts the twofold task of critique and transformation via immanent critique, which begins by accounting for its immersion in history. But critical theory is not merely descriptive; it also seeks to specify the possibility of qualitative social transformation, which is necessary if society is to relate to ecosystems in a less ecologically destructive manner.

### 3.2. Mediation

A key shortcoming of the ESV criticisms discussed above is their inability to deal with *social mediation*. By social mediation we are referring to processes whereby social structure constitutes and is constituted by human actors (see Postone, 1993: 216–225). The emphasis on social mediation, which is integral to the methodology of critical theory, is motivated by the recognition that, in modern capitalist society, social relations are constituted in alienated form.<sup>2</sup> Although ecological degradation is a product of human activity, in modern capitalist society, such activity is conditioned by abstract social forces, which appear to be beyond human control (Biro, 2005; Vogel, 2011). Agricultural production, as we have argued, is not simply the immediate interaction among farmers and ecosystems but is strongly mediated through state agricultural policies (e.g., biofuel blending mandates) that are themselves constituted in response to a social dynamic (e.g., the tendency of agriculture to oversupply) that farmers participate in but do not themselves direct—a process Marx referred to as alienation [Entfremdung].

For Marx, alienation is the foundation of the entire complex of social relations under capitalism, and as such it comprises a set of mediating processes between subject and object. Marx developed his (unfinished) theory of alienation through a critique of G.W.F. Hegel and Adam Smith, and in the process he identified and analyzed the intrinsic contradictions constitutive of modern, bourgeois society (Dahms, 2006: 11). Marx's category of alienation refers to an inherently dynamic set of social processes, constituted by the capitalist mode of production that, in addition to estranging humans from nature, self, consciousness, and others, simultaneously rewrites reality so as to inhibit these very same humans from consciously recognizing that this estrangement is indeed the case.

One of the advantages of Marxian critical theory over ESV and its critics lies in its explicit recognition and critique of alienation. Neo-Marxists, for example, identify ESV with alienation by pointing out that while technical development appears to be leading to

sustainability, they ultimately give rise to entirely unsustainable outcomes (see Section 2.2, but also Robertson, 2012). However, we do not regard this contradiction as proof that ESV is “wrong”. Rather, this shortcoming is a crucial symptomatic fragment of how ecology and society *actually* relate in the present and in this moment of reflection, how they could relate differently in the future. The task, therefore, is not one of flatly opposing ESV. Rather, thought and action must draw on its immediate or superficial appearance so as to press beyond it — to grasp how seemingly unrelated dimensions of social experience are *actually* connected and how *apparently* related dimensions (e.g. ecosystems function and ecosystem service value) are deeply mediated through an alienated social structure.

We suggest Marx's critical theory as a starting point from which interdisciplinary research efforts might begin to address elusive processes of social mediation. Indeed, the focus on social mediation is an insight shared by successive generations of critical theorists (e.g., Lukács, Adorno, Postone) whose work represents the continued relevance of Marx's theory for analyzing the contemporary world.

Marx's critical theory is also a theory of praxis in that it aims to specify exactly how, through concrete forms of social practice, both subject and object are produced. “Praxis,” in this sense, refers to the process whereby forms of social objectivity and social subjectivity are socially constituted *simultaneously*. In other words, praxis, as such, can be analyzed and understood only in terms of structures of social mediation (Postone, 1993: 218, 220). Indeed, it is on this basis that Marx elucidates the link between epistemology and normative action as being rooted in the structure of social relations (Postone, 1993: 219). Since the criterion of validity is social rather than absolute (Postone, 1993: 219), Marx is able to ground his critique without collapsing into relativism—the standards of critique are a function of existing social reality. Again, the dynamism of Marx's theory is grounded in the dynamic and contradictory nature of capital—a historically specific motion generated from within the social context of which the theory itself is an integral part.

Marx's theory of mediation therefore offers an important corrective to the criticisms of ESV discussed above. In contrast to neo-Marxists who ground their criticism of ESV in an underlying subjectivity that is veiled or undermined by objectifying the value of ecosystems, the focus on mediation illuminates such market valuation practices as socially constituting activity. Market valuation of ecosystems is real, to be sure. Yet, Marx's focus on mediation, as discussed above, is also different from those of liberals. Liberal critics are unable to square their assertion that markets reflect society with their attempt to separate a sphere of politics and ethics within which environmental politics should take place. Such a duality of social life needs to be recognized as constituted by people through concrete social practices, which are grasped by the categories (value, etc.) of Marx's critique (Postone, 1993: 220). The pragmatist attempt to generate new mediating practices by foregrounding intersubjective communication (e.g., adaptive management) ignores the constraints imposed by these categories and, as such, unwittingly becomes a means of accommodating transformations necessitated by capital.

### 4. Critique and Transformation

Critique must go beyond simply describing how the shortcomings of ESV (e.g., by describing how ESV redistributes power and wealth (neo-Marxists), undermines political activity (liberal) or reinforces rigid ideologies (pragmatist)). Rather it must press forward to understand the meaning of ESV as an expression of the changing structure of society itself. Critique would need to understand ESV not as an accidental or irrational feature on an otherwise unproblematic social whole, but as an expression of what society *is* and what it *could become*. A critique of ESV, in other words, would need to go beyond describing its effects on society and ecosystems and be able to understand it as the product of tensions and pressures *emerging from this social dynamic*. Insight about the character of this dynamic could then be used to

<sup>2</sup> The mediation between humans and ecosystems is a basic property of human labor, whereby both humans and environment are transformed in the process of meeting a given end. In modern capitalist society, however, human labor takes a particular form, which Marx (1978 [1844]) termed alienation (Stoner and Melathopoulos, 2015).

theoretically illuminate the kind of social transformation that is in fact possible.

The ESV criticisms outlined in this paper have been considered in relation to the question of transformation. Using the methodological motifs of critical theory discussed above—immanent critique and mediation—we can discern three features, which are conspicuously absent in recent attempts to ameliorate societally-induced environmental degradation: 1) a theory of historical dynamics that grasps how ecologically destructive forms of society emerge, transform and reproduce (*against* the neo-Marxist claim of the necessity of “resistance”), 2) a political practice that can render this structure increasingly comprehensible from the starting point of current discontents (*against* the liberal claim of the identity of politics and markets) and 3) a way of mediating the relations between thought and these political forms that does not simply become a hardened ideology (*against* the pragmatist assertion that the overcoming of ideology is merely a matter of correct communicative procedure). The expression of these features—absent in the ESV criticisms discussed above—allows us to identify, albeit very coarsely, key dimensions of our ecologically destructive form of society as a necessary precondition for the possibility of transformation beyond the present form of society. Rather than providing a set of broad prescriptions for reconciling the antagonism between modern capitalist society and ecological well-being, these insights need to be understood as a starting point from which political actors might pursue effective socio-ecological transformation. Although the specifics cannot be predetermined at the outset, such transformation must allow free rational human control over the ceaseless process of capitalist production that characterizes modern society, and by extension, the ecosystems we depend upon.

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