

AMID HYBRIDISM AND POLYSEMY: A SOCIOLOGICAL ANALYSIS OF SUSTAINABILITIES¹

ROBERTO DONATO DA SILVA JUNIOR²

LEILA DA COSTA FERREIRA³

THOMAS MICHAEL LEWINSOHN⁴

Introduction

In recent years, an ambivalent stance has been promoted around the idea of sustainability: on the one hand, its uses and abuses are generalized, being the term proclaimed as safeguarding different ways of life and economic performance; on the other hand, its detractors are multiplied, who are willing to demonstrate that the term is void of sense and transformative potential and, therefore, unable to provide a conceptual basis for political actions of planetary dimensions that the issue demands. This ambivalence refers to the understanding that the two concepts are part of the same repertoire historically developed around the term, being based, basically, on three foundations. Sustainability: (1) it is presented as an interface issue between “society” and “nature” – and, therefore, hybrid and interdisciplinary (Berkes et al., 2003; McMichael et al., 2003); (2); it was mainly formed by the conceptualization of the natural sciences to the detriment of the social sciences (Drummond, 1997; Palmer et al., 2004) but widespread and suitable for different perspectives and spheres of political action; and, therefore, (3) it appears to be very wide, transiting between the polissemic and the assemic (Nobre, 2002; Redclift, 2007).

Searching for something beyond the ambivalence, this article has as its stimulus the idea that this traffic offers a sociologically interesting perspective for the understanding of the relationships between science and politics in the contemporary world. If we think that late modernity has as one of its pillars the politicization of science and the scientification of politics (Beck, 2010), the semantic dispute around sustainability can express something more than its mere trivialization. How to discern the force lines that constitute these disputes? How is this dynamic expressed in some scientific perspectives that want to participate in the treatment efforts of environmental dilemmas? How do

1. We would like to thank São Paulo Research Foundation (FAPESP) for the financial support received.

2. Professor – School of Applied Science (FCA), University of Campinas (UNICAMP), SP - Brazil – roberto.junior@fca.unicamp.br

3. Full Professor, Institute of Philosophy and Human Sciences (IFCH), Center of Environmental Studies and Research (NEPAM), University of Campinas (UNICAMP) SP, Brazil – leilacf@unicamp.br

4. Full Professor – *Institute of Biology* (IB), Center of Environmental Studies and Research (NEPAM), University of Campinas (UNICAMP), SP - Brazil – thomasl@unicamp.br

the initiatives to appropriate the term articulate epistemological procedures (the tension between disciplinarity and interdisciplinarity) and political procedures (the production of proposals for action on environmental policies) of the different sciences committed to the subject?

We start from the principle that these issues cannot be answered without, first, a methodological strategy that is adequate to the challenge. Thus, the goal is to formulate a proposal for a sociological analysis of the sustainabilities as the basis for the apprehension of their internal senses of conceptual articulation so that we can, in turn, explicit the interdisciplinary inserts and the propositional potentials of the sustainability repertoire. To this end, we explore a few sustainability subjects from the ecological, economic, sociological and anthropological perspectives. The proposal is not to exhaust the theoretical possibilities of the subject in the four fields or enter into the controversies of the positions presented herein. Unfortunately, there is no room for thisⁱ. First, we intend to lead the reader to a “polissemic experience” around some of the different scientific discourse on sustainability to then conceive some possibilities on how such perspectives problematize and thematize the issue. If the path chosen has the desired effect, it is appropriate to search the conditions of analysis of these different sustainabilities under the same analytical view, in order to find a methodological solution to understand the implicit epistemic assumptions and their resulting propositivities.ⁱⁱ

With the result, we expect to contribute to the understanding of the articulation senses between scientific artifactsⁱⁱⁱ and their propositional potentials with the formulation of environmental policies, based on the idea that the first structures the field of possibilities of the second. The issue that a possible sociological analysis of the sustainabilities aims to clarify is: how does this structuring happen?

Ecology, scarcity and complexity

Despite the origin of the term being from the 18th century (Ferreira, 2005; Pahlke, 1989), the origin of the contemporary debate about sustainability lies on the (neo) Malthusian notion of incompatibility between “population” and “resources”. Starting from the basic principle that all forms of life have the potential of exponential growth, but they would find limitation in the different forms of competition between species or within the same species (Gotelli, 2007), the “freedom” from the exponential character of the human growth would have put at risk the support ability of ecological systems, either managed or not. Thus, after “humanity” eliminated these ecological barriers, the problems of sustainability would be born precisely from the contradiction that exists between the unrestricted exponentiality of humanity and the limited exponentiality of the other forms of life. From this perspective, the issue would be how to adapt these exponentialities. Often, the purposeful tendency of that design was the creation of policies to contain the human population as a means of solving the environmental crisis (Hardin, 1968). Despite this speech having been gradually weakened within ecology, its echoes were felt throughout the passage between the 20th and 21st centuries (Palmer et al., 2004; Lubchenco et al., 1991).

Concomitant to this debate, focused on the ecology of populations, the ecology of communities added the biodiversity issue to the concerns of sustainability (Rand, 2010; Thompson and Starzomski, 2007). Although the term has a relatively recent origin in ecology (Wilson, 1997), it is the result of a set of research studies dating back to the origins of ecology as a science, from the dimension which shows the wealth of species present in ecological systems. The community approach is benefited by and complexifies the theoretical framework of population studies, in that it emphasizes interactive processes that allow the development of different forms of life. If the different populations make up the dynamic biotic of a community, it would be at this level that the function of ensuring the stability of ecological systems would be present, in order to provide the conditions for their reproduction within a dynamic perspective (Wilson, 1997). Therefore, this approach derives from the basis of environmental conservation policies.

If “population” and “community” are closely linked, the notion of ecosystem would have a decisive weight in the complexity of the ecological perspective on sustainability. Considered by many as the integrative concept of these dimensions (Evans, 1956; Golley, 1993), it can be defined as the “unit (...) covering all organisms that work together (...) interacting with the physical medium so that a flow of energy can produce well-defined biotic structures and a cycling of materials between the living and non-living parts.” (ODUM, 1988, p. 9, our translation). From this perspective, the understanding would prevail that competition – offered by the population dynamics in the formation of the biotic communities – could only be developed from the formation of flows of energy and nutrients, thus integrating a set of interdependent relationships (Chapin et al., 2002). Thus, a sustainable ecosystem could be conceived as one that “(...) over the normal cycle of disturbance events, maintains its characteristic diversity of major functional groups, productivity, soil fertility, and rates of biogeochemical cycling” (CHAPIN et al., 1996).

This has led to the contemporary discussion about sustainability from the understanding and action on “complex adaptive systems” (Levin, 1998), in which a relative regularity of the phenomena would be concurrently associated to events endowed with great unpredictability. This perspective gained momentum with Holling (1973), from the incorporation of the concept of resilience in ecosystem dynamics, in an ecological theoretical scenario excessively centered on the notion of static equilibrium. The incorporation of these concepts led to the emergence of the idea that sustainability practices should be linked to the concept of “adaptive management” (Gunderson, 2000) and its possible variations, such as “adaptive co-management” (Olsson et al., 2004). They are linked to an extension of the systemic perspective to the human dimensions, from the concept of “complex socio-ecological systems” (Berkes et al., 2003).

Recently, there is a significant effort of including a more specialized view on sustainability, offered by the ecology of landscapes, being this term understood as a “heterogeneous mosaic formed by interactive units, and this heterogeneity exists for at least one factor, according to an observer, and on a certain range of observation” (Metzger, 2001, our translation). Having as a focus of analysis the “structure” and “function” of the landscape, this perspective “horizontalizes” the ecological interactions by emphasizing the importance of connectivity between habitats in the process of maintaining diversity.

This approach would, for some, be able to offer an integrated basis between ecological and social events by allowing the capture of landscape changes from the interactive processes between ecological and social events in a given period of time. This would ensure a large opening to inter-/transdisciplinary and the capacity of territorial planning for the description of scenarios of sustainability (Wu, 2006; Naveh, 2007).

Two results are established from these considerations: 1) the sustainability issue in ecology has moved from a neo-Malthusian argument to a systemic and landscaped understanding, which 2) enables the conditions for conceiving the relationships between “society” and “nature” from the perspective of scarcity (Hardin, 1968) for the construction of “socio-ecological complex” (Berkes et al. 2003), in which human events are inserted in the adaptive capacity of ecosystems through adaptive management practices, tendency that is followed by a growing interest in the visualization of landscapes, an instrument by which the “connectivities” would be joining the systemic tendency of the understanding of ecological processes. In this sense, the contemporary environmental agenda would be determined by global environmental changes, when the concepts of “adaptation” and “mitigation” (Klein, 2007) in relation to “planetary boundaries” (Rockström et al., 2009) have been acquiring central importance in proposals for sustainability.

Thus, the displacement of the primacy from “volume” and “wealth” to “system” and “landscape” has not eradicated the neo-Malthusian interpretation, but it has allowed the emergence of theoretical-methodological perspectives that seek to incorporate social dimensions to ecological dimensions with a model that can be called “greening of relationships”. From this, there is the acceptance of the idea that proposals for sustainability must be open to an interdisciplinary collaboration with the human and natural sciences (Lubchenco et al., 1991; Berkes et al., 2003), as long as linked to epistemological assumptions operating within ecology.

Economics: internalization, capitalization or (de)commodification of nature?

The view of economy as the study of the allocation of limited/scarc resources between alternative/competing purposes (Daly and Farley, 2004) expresses the concern of analyzing the relationship between “society” and “nature” as a problem of “sustenance”. Already present in Malthus (1996), scarcity is an ontological assumption that builds this allocation problem. How the issue of “sustenance” becomes a problem of “sustainability”?

Even preserving the assumption of scarcity, the emergence of the neoclassical economics (Jevons, 1987; Walras, 1986; Menger, 1986) produced the depuration of the economic elements analyzed in relation to “natural resources”. Free from socio-historical and ecological determinations, the neoclassicals conceived a hypothetical-inductive universe (Bresser-Pereira, 2009) with agents with formal rationality and individual interest, in which the logic of economic operation would be guided by the pursuit of maximizing the benefits and minimizing the costs. This *homo economicus* (Stuart Mill, 1974) would allow an economic system designed by the concept of general equilibrium (Walras, 1986), in which “firms” and “families” would work circularly from the supply of goods, services,

on the one hand, and factors of production, on the other; in “perfect” conditions, this relationship could extend to infinity.

The inevitability of facing the effects of economic activities below and beyond the core of the neoclassical concern made possible the concept of externalities or “external economies” (Marshall, 1982): the result not predicted by the calculation of the economic agent that would affect positively or negatively other agents or the system as a whole. This concept is the starting point for the economic analysis of environmental problems – the “environmental economics” of pollution – having as starting point the Pigouvian analysis of pollution (Amazonas, 2002; Pigou, 1962). The basic idea would be that the marginal social net product (the effect of individual economic action on the public good) would be “displaced” from the marginal individual net product (result appropriated by the economic agent), thus becoming a negative externality. The problem, roughly speaking, would be how to “internalize” the “externality”, either through the elaboration of mechanisms of control, such as rates and taxes (Pigouvian solution) or the complete integration of environmental elements on the market economy, turning them into private goods (Coasian solution). The two ways would seek the restraint of the economic agent to a level that was more advantageous to invest into the private costs of reduced levels of pollution. The balance between social and private costs related to environmental externalities is named, ironically, as “optimal pollution” (Romeiro, 2012).

Simultaneously to the environmental pollution economy, we have a line of analysis focused on ensuring a model that allows the “optimal” inter-temporal allocation of natural resources (Hotelling, 1931). The aim is to avoid an excessive exploitation rate in the present in order to ensure the best performance over time. The choice to make a given resource available or not should follow the expectation of the interest rates practiced in the market (Pearce, 1985). Thus, insofar as the resource becomes scarcer, the trend of rising prices could make impractical the sale of stock. The adaptation of the extraction rate to the interest rate of the economic agents would ensure that the prices charged would acquire the best performance in relation to the progressive scarcity of the good explored, until its complete depletion. This perspective of the environmental economics “of natural resources” demonstrates a “stockist” perception in relation to biophysical processes. Here, the problem of scarcity does not reach the status of civilizational crisis, only a problem of efficient continuity of the market dynamics. What would support this lack of concern is the idea that technological innovation would enable the perfect replacement of a capital good for another. If scarcity does not imply systemic disruption of living conditions, then the “natural” capital could be replaced by manufactured capital, enabling an *ad infinitum* economic growth (Solow, 1974).

Thus, the three theoretical components presented – the internalization of externalities, the inter-temporal allocation of natural resources and the replacement between capitals – link the neoclassical environmental economics to a design commonly called “weak sustainability”, “(...) in that it is based on generous assumptions about substitutability of capital for natural resources in production” (DALY, 1990, p. 34).

From the critique of Georgescu-Roegen (1971) in relation to the neoclassical contempt with the laws of physics, the stimulus for a new trend emerged, which directly

focused on the issues of sustainability, not from an “environmental” perspective but from an “ecological” one. For his supporters, it would not be possible to think the use of these resources only from scarcity but rather from the implications of this use in the systemic character of the ecological relationships, paying attention to its potentially catastrophic and unforeseen consequences (Daly and Farley, 2004). That is why, for them, the ecological dimension must be designed as a “natural capital”, producer of ecosystem “stocks” and “services” (Costanza and Daly, 1992). The delimitation of the scale must be below the potential levels of rupture of the resilience of ecosystems. The allocation of the market, therefore, should be subject to ecological, political and ethical boundaries. Economic efficiency could guide distribution procedures only after ecosystem limits are provided.

Thus, if the macroeconomic growth forces allow the marginal utility to be exceeded by the marginal costs, a type of “non-economic growth” would emerge here (Daly and Farley, 2004), that is, when the economic production sacrifices the social and ecological guarantees of well-being, failing to ensure the ultimate end of the “satisfaction of the needs”. In contrast to it, this economic-ecological framework advocates a zero-growth economy, in which the qualitative dynamism substitutes the quantitative one from the promotion of macroenvironmental policies of three orders: the sustainable scale; the fair distribution; and, the allocative efficiency consistent with the principles of sustainability (Daly and Farley, 2004). Met these conditions, a “strong sustainability” would be achieved, which “(...) is the maintaining intact of natural capital and man-made capital separately (COSTANZA and DALY, 1992, p. 44)”.

Simultaneously to the tension between a neoclassical environmental approach and an economic-ecological approach, a materialistic/Marxist orientation that permeates the contemporary discussion of sustainability can also be described. The starting point is configured on the interpretations of Marx on the relationships between society and nature (Marx, 2004), in the confrontation with the Malthusian ideas (Marx, 2011) and in the inserts on the capitalist exploitation of the soil (Marx, 1968). In general, the writings of Marx would point, according to Foster (2010), to the production of a “metabolic failure” between society and nature under the auspices of the capitalist relationships of production, and the point of division would be the dual process of exploration: worker and nature. O’Connor (1998), a central figure, among others, in the establishment of ecological Marxism, classified this process, respectively, as the first and second contradiction of the capital.

Thus, according to Foladori (1999), these Marx’s insertions would enable four assumptions for a Marxist approach of environmental issues: the growth tendency of the capitalist investment, as a fundamental rule of its dynamics, drives it to natural resources; the spreading of the general principles of added value to the soil and “nature”; the proletarianization process implies the destruction of the cultural diversity and different ecological knowledge and the pauperization as part of the process of environmental degradation; and, the effects of creative self-destruction are a source of waste of human and material resources.

The tendency (with internal controversies^{iv}) about understanding the capitalist relationships of production as structurally expropriating in relation to work and the eco-

gical sphere makes the contemporary Marxist/materialist authors assume the sustainability movements – be it by the paroxysm of the proposal itself (Redclift, 2012), be it by its ideological character (Chesnais and Serfati, 2003) – as unsustainable. In this sense, the conditions for sustainability “in fact” would be conditioned to a revolutionary performance, despite all the complexity that the incorporation of the environmental dimension adds to the project, as symptomatically pointed out by Altvater: “(...) a social and ecological revolution requires a long time. The energy system and a form of production cannot be modified overnight (...). Nevertheless, this is a revolution and it must start now if we are to prevent the climate breakdown” (ALTVATER, p. 1, 2009, our translation).

Finally, being “strong” or “weak” or, conversely, “unsustainable”, the prospects which make up the views of sustainability in economy move around the incorporation, or not, of ecological dimensions within the scope of economic analysis: is it possible to “internalize” the “externalities”? To give value to environmental “assets”? To “capitalize” nature? Or to critique the “commodification” of this same nature? From the point of view of the passage from the ontological distribution to the epistemic organization, these interpretations transit between the acceptance of the “greening” of the economic relationships and the “economization” of ecological relationships, be it a critical perspective or an apologetic perspective.

Sociology: modernities, constructions and risks

Sociology awakened to the environmental issue as a subject and problem between 1960 and 1970, from the emergence of its environmental aspect. Among the precursors, we can see a radical environmentalism that sought alternatives to adequate society and environment through antagonistic ways: economic and political decentralization (Illich, 1976; Dupuy, 1980; Gorz, 1987) and centralization (Ophuls, 1977). The first part of the critique of the modernization process, technoscientific, was structured in radical monopolies to propose a post-industrial society organized through self-management and mutual help (Illich, 1976). For Illich, the construction of sustainable parameters of environmental and social life should be guided by the principle of cohabitation. On the other hand, from the perspective of centralization, it was sought the constitution of a society in “equilibrium” from the human development needs in a broad sense (Ophuls, 1977). Attributing the scarcity of resources to the cause of conflicts and the rampant environmental degradation, Ophuls uses the Hobbesian conception of politics as a means of adapting the social and ecological “equilibrium”. Here, there are two tendencies that mark the environmental debate within Sociology: one that seeks explanatory reference in the social theory (decentralization) and another linked to the ecological perspective (centralization).

The institutionalization of environmental sociology, between 1970 and 1980, started from the proposal of a paradigmatic transition from the “Human Exceptionalism Paradigm” to a “New Ecological Paradigm” in the social sciences (Dunlap and Catton, 1979). For this new approach, the environmental problems were focused (along with neo-Malthusian discussions) on the issue of population and energy. By putting the environmental sociology

within the ecological paradigm, the authors suggest that a sustainable society must not only “(...) consider the social organizational requirements of such a society – ranging from energy efficient housing patterns to zero population growth – but they must also ask how existing societies might be changed to meet such requirements” (DUNLAP & CATTON, p. 266, 1979).

On the other hand, different theoretical orientations proliferated (Buttel, 1987), linked to a more complex understanding of the relationship between environmental, social and political issues (Paelkhe, 1989; Cahn, 1985). This process can be observed in Buttel (1987), for whom the “ecological” environmental sociology would have little to contribute to the subjects in social theory. Thus, the approach of the environmental sociology is strengthened with subjects concerning the problem of late modernity. From this movement, three perspectives are interesting for the understanding of sustainability from a sociological point of view: ecological modernization (Spaargaren et al., 2000), constructivism (Yearley, 1996; Hannigan, 1995) and the theory of risk (Beck, 2010).

Ecological modernization presents itself as a social theory that takes into account that environmental issues arise as being part of the development of modernity, being the appropriateness of the relationship between society and ecological processes a political issue. Thus, the proponents of ecological modernization believe that environmental issues can be measured as one of the elements of the Government regulation in economy and society relationships (Spaargaren et al., 2000). From that moment on, the premises of sustainability are incorporated into the process of sociopolitical organization of modernity, conceiving “nature” as a “subsystem” belonging to it.

Constructivism seeks to explain how the materiality of environmental issues become socially formulated to, in this way, be transformed into objects of political mobilization. In this sense, a problem does not constitute a fact in itself, but is defined from a broad process of characterization that is dependent on the social players involved (Hannigan, 1995). Scientific knowledge on the risks becomes fundamental to the construction of the speeches on environment. Here, sustainability should be thought as a *construct* formulated through the production of knowledge and the dissemination of risk perception by society. In the search for mediation between ecological processes and political action, Yearley defines sustainability as a great objective, but it is “(...) the minimum threshold which societies must reach” (YEARLEY, 2005a, p. 183). To achieve these minimum conditions we require more than the ecological-economic perspective can offer, taking into account the need to rearrange the complex social practices experienced in high modernity. For the author, sociology has great relevance in this debate and should act in conjunction between “(...) the concrete and the conjectural. Environmental sociology can teach us about how decisions concerning the environment in fact get made today but it can also encourage us to reflect in a novel way on the nature of environmental futures.” (YEARLEY, 2005a, p. 184).

Finally, we approach the perspective of risk. For Beck (2010), the risks inherent to the process of modernization are a central aspect of a new modernity and can be characterized as non-intentional, invisible, unpredictable, incalculable, irreversible and unrestricted (BECK, 2010 p. 27-28). If in the first step of the process of modernization the guiding

principle would be the logic of production and distribution of the wealth compatible with the produced risks, in the era of reflexivity it would be a dynamic of *incompatibility* and *competition* between the production of wealth and risks. From this perspective, the dynamics of the identification/concealment of the risks would become the driving force of the socio-political life. The risks would be thus “open to the social processes of definition” (BECK, 2010, p. 27, our translation). The insertion of the risk as a central element in social dynamics would put at risk the principles established by the enlightenment project, from three major self-involved processes: the generalization of threats of self-destruction, as derivation from the dissolution between “society” and “nature”; the individualization of social inequalities; and, the scientificization and politicization of all dimensions of existence. Here, to live under the “eminence of the disaster” would imply the need for an understanding of the contemporary world without existential borders provided for in the first modernity. The environmental issue, for Beck, ceases to be “one” more element that constitutes modernity to become “the” driving force of its dynamic. The relationship between the definition of risk and governance would, therefore, have great importance in the political processes of the construction of sustainability strategies.

In the end, environmental sociology, which emerged strongly tied to the ecological perspective, approaches the social theory. Either by the path of ecological modernization, constructivism or risk, despite the differences of critical approach about the process, the search of the environmental sociology has been to understand socio-political concepts, values and practices – as well as the relationships between technoscience and socio-economic processes – as a framework resulting from the dynamic of modernity itself. In it, the tendency is the orientation to the dissolution of modern dualisms (such as nature/society, science and politics). Thus, sustainability would go through the redefinition of the public, scientific and political-institutional spheres – around the definitory disputes in relation to environmental dilemmas.

Anthropology, societies and natures

Recently, we can see an effort by anthropologists in participating in discussions related to Western societies in general (Ingold, 2000; Latour, 1994; Wagner, 2010) and environmentalism in particular (Milton, 1996; Descola and Pálsson, 2001). This effort is directly related to the treatment of the relationships between “nature” and “culture”, discussed in turn by two antagonistic anthropological perspectives: one cultural-ecological and the other socio-cultural.

The first one, started as cultural ecology (Steward, 1955), was consolidated as ecological anthropology (Rappaport, 1968) and has recently bifurcated into “old” and “new” (Kottak, 1999). Recently, the new ecological anthropology is home to the “ecosystemic” (Morin, 1999) “ethnoecological” (Nazarea, 1999) and “ecological-historical” approaches (Baleć, 1994), among others. In general, this view comes from the premise that social settings are organized from the environmental regulations governing them, taking the human actions on this environment as adaptive strategies (Seymour-Smith, 1986). Therefore, we have an ecological-materialistic approach of the cultural emergencies without,

however, failing to recognize that they shape the environment in which they are located not only in a negative way but also in a productive way (Baleé, 1994).

The socio-cultural perspective, institutionalized predominantly as social anthropology, goes further into the issue with the structuralism of Lévi-Strauss (1983; 1989 and 1993), with anthropological Marxism (Godelier, 1978) and more recently with post-structuralism (Descola, 2001; Viveiros de Castro, 2002). In general, this tendency addresses the relationships between humans and their environment from the point of view of the “possibilities” of human action derived from the social-symbolic designs produced in the interaction of the universality of cognitive mechanisms (Lévi-Strauss, 1985) in relation to the particularities of experience in historical contexts and ecologically determined (Descola, 2001).

Thus, while “adaptation” – while human adjustment to the ecological settings – would be the fundamental premise of the ecological anthropology, “agency” – while the potentiality of human or non-human performance, not apprehensible by causal models – would be the guiding term of social anthropology. Attempts to overcome this antinomy express a recent passage from the “epistemological” (the different knowledge, the conceptions of “nature” and “culture”) to the “ontological” emphasis (the different experiences, existences and organizations between human and non-human events) (Viveiros de Castro, 2015). The ecology of life (Ingold, 2000) and the actor-network theory (Latour, 1994) would be significant contributions of this tendency.

In common, the two perspectives pay attention to: the analysis of interdependence of the various dimensions of society life; the ethnographic methodology posture, through direct observation and oral scrutiny; and, the articulation between comprehensive and explanatory perspectives oriented by the principle of otherness. The issue, therefore, would be how to transport these elements to the “core” of the contemporary social dynamics, i.e. to its technoscientific processes and environmental consequences, having as a common assumption the attempts to overcome the “great dividers” (nature/culture, tradition/modernity, local/global) as a way of contributing to the construction of integrative models for the treatment efforts of the issues of sustainability.

Finally, from the ecological perspective, we highlight the local treatment of problems that have global reach, such as the processes for the use and occupation of the soil, with direct connection to the problem of deforestation of tropical areas (Moran, 2007) and the analysis of anthropogenic influence on processes of soil formation and biodiversity in the Amazon (Baleé, 1994). In this sense, the ecological contribution in anthropology has been oriented to the enrichment, in terms of diversity of sustainable socio-ecological practices, of the *political ecology*. From the cultural perspective, the project has been discussing the cultural encounters/confrontations involved in the environmental policies themselves – such as, for example, the relationship between scientists and riverine populations put into interaction in the formulation of strategies for the conservation of biodiversity – at a “higher” level of complexity than a conscientious conflict of interest (Blaser, 2009). This has led to attempts to understand and solve the problems of otherness that are implicit in sustainability policies, thus configuring an *ontology policy* of environmental issues.

For a common approach to the different sustainabilities

As we have seen, the different scientific initiatives presented – a small sample of the possible insertions on the subject – have a significant semantic, discursive and epistemological diversity and, consequently, a series of possible political developments. How to discern the force lines that constitute this enormous diversity? How to build an “applicable” analysis to different views on sustainability able to recognize the conceptual disciplinary and/or interdisciplinary arrangements that are characteristic to it?

The starting point adopted herein is configured from one of the premises of the theory of reflexive modernization: the idea that the generalization of the threats of self-destruction implies scientificization and politicization in all dimensions of existence (Beck, 2010). That would put a triple responsibility to the scientific configurations. They would be, at the same time, producers, instruments of definition and possible sources of risk treatment. Thus, the recognition of threats and their resolution strategies would, inevitably, go through the scientific sphere. Despite this dominance, the increasing exposure of the sciences to internal and external criticism would not enable a scientific monopoly on the political agenda. Paradoxically, the political sphere would increasingly depend on the scientific authority as a source of validation of courses of action the higher the relevance of “technical” foundations in decision-making. Both, however, would be impregnated by the public debate, in which social players would act on the legitimation between competing “evidence” that underlie political strategies. Thus, the analysis of scientific discourses can present itself as a starting point for the scenario between politicization, scientificization and public debate.

If the understanding that risks, threats and disturbances proliferate in the context of the intersection between social and natural events (Beck, 2010; Latour, 1994), it becomes pertinent to question how proposals for sustainability are able to respond to these hybrid demands. In other words, a possible path to a common view would be to recognize the potential propositivity from the scientific understanding about environmental dilemmas. That is, to seize how *the definition of risks, threats and disturbances* with the formulation of *treatment strategies* of the scientific discourses on sustainability is presented and articulated.

However, on what basis would this view on the processes of identification and treatment of risks happen? For Yearley, (2008), the involvement of the science studies with environmental issues makes it possible to recognize how *a priori* conceptions of “nature” – the ontological landscapes related to an “original condition” – structure the ways of knowing and acting on the environmental context. If sustainabilities can be analyzed by the definitions of threats and their political strategies, their analysis presupposes understanding the ontology that involves the distribution of humans and non-humans in a certain perspective. In this sense, to understand the ways to know “nature” implies not only the significance of non-human events but rather the conception of their interaction with human events. Yearley’s suggestion leads to the reflection that the articulation between “disturbance” and “treatment” should be based on an ontological basis of understanding of the interactions between human and non-human events.

Thus, a way to analyze differently the proposals for sustainability – and its interdisciplinary exercises – would be to watch how they articulate their **conceptions of interaction between human and non-human events**; the **definitions of disturbance, which covers risks and threats**; and, finally, the characterization of the **treatment strategies for environmental dilemmas**. This trinity would enable: the understanding of how these elements are presented and articulated within each proposal from the apprehension of their internal intelligibility; the observation of the different strategies to understand the hybrid dimensions of sustainability; their comparative confrontation as a way to seize the possibilities for the articulation artifact/propositivity and disciplinarity/interdisciplinarity; and, perhaps, its use as a basis for future exercises of interdisciplinarity.

What enables the analysis of scientific perspectives, whether “social” or “natural”, under the same perspective is the idea, from the science studies, that the sciences are not only produced by socio-cultural and political processes, but they are also producers of socio-cultural and political artifacts (Latour, 1994; Knorr-Cetina, 1999; Collins, 1985; Yearley, 2005b; Pickering, 1992). This common condition, which does not deny its differentiated procedures, would conceive them as “epistemic cultures” (Knorr-Cetina, 1999). The concept of “culture” is assumed here as “(...) a set of potential structures of the experience, capable of supporting varied traditional content and absorbing the new” (VIVEIROS DE CASTRO, 2002a, p. 209, our translation). This perspective sees a science by the particular way in which it constructs the arrangements between its internal content and exogenous elements, be they scientific or not. Thus, each science can be seen as a field that is broad, permeable and dynamic and without clearly defined borders. The issue becomes, then, to understand how epistemic cultures formulate their specific structuring processes of experience and seizure of the exogenous. This enables the capture of both its disciplinarity and openings to interdisciplinarity.

Notes

i In addition, there are significant absences that refer both to other important scientific perspectives for the debate on sustainability (such as demographics, political science, geography, climatology, among others) and to a political-institutional perspective on the subject, which would, for example, involve the debate on the major conferences on environment and development.

ii The term “propositivity” refers to the demands of action implicitly and explicitly derived from scientific artifacts. It intends to offer an alternative in relation to the term “normativity”, insofar as it requires the stimulus to impose “rules”, while the first is based on the establishment of an idea that is closer to the “contribution” to the definitory game of the political action.

iii By ‘scientific artifact’ we understand the product of extensive and complex socio-technical configuration – interactions, for example, between event, experimental manipulation, computer, ordering look, information systematization, theoretical-methodological validation, public presentation of results, etc. – around the constitution, not only statements on the phenomena, but composites amalgamated into “scientific parts.” For this article, these “parts” are oriented towards scientific articles of specialized journals and books on scientific-academic orientation.

iv See, for example, the differences of position between Chesnai and Serfati (2003) and O’Connor (1998) on how environmental issues are, or not, a fundamental contradiction of the capitalist relationships of production.

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AMID HYBRIDISM AND POLYSEMY: A SOCIOLOGICAL ANALYSIS OF SUSTAINABILITIES

ROBERTO DONATO DA SILVA JUNIOR
LEILA DA COSTA FERREIRA
THOMAS MICHAEL LEWINSOHN

Abstract: The objective of this article is to present a sociological analysis about sustainability based on questionings about ecology, economics, sociology and anthropology. From the assumption that its scientific production is polysemic, complex and asymmetrical regarding ecological, economical and socio-anthropological contents, it is important to find a methodology that comprises the internal articulation of the proposals as well as the interdisciplinary practices derived from it. This proposal, based on the reflexive modernization theory and in the social studies of science, suggests that the various sustainability ideas have to be analyzed observing: the ontological conceptions of human and non-human interaction events; the idea of disturbance, including risk and threat situations; and, the derived consequences of the approach of environmental dilemmas. This analysis hopes to contribute with a sociological point of view, focused on the linkage between the scientific artifact and the politic propositivity inside the environmental context.

Key words: anthropology; economics; ecology; sociology; sustainability.

Resumo: O objetivo do artigo é formular uma proposta de análise sociológica sobre sustentabilidade, a partir de sua problematização nas áreas de ecologia, economia, sociologia e antropologia. Partindo do reconhecimento de que sua produção científica apresenta-se polissêmica, híbrida e assimétrica quanto aos conteúdos ecológicos, econômicos e socio-anropológicos, busca-se uma metodologia capaz de apreender a articulação interna das propostas e as práticas interdisciplinares que delas derivam. Fundamentada na teoria da modernização reflexiva e dos estudos sociais das ciências, propõe-se que as diferentes sustentabilidades podem ser analisadas a partir da atenção para: as concepções ontológicas de interação entre eventos humanos e não humanos; a noção de perturbação, que abriga riscos e ameaças; e as consequentes estratégias de tratamento dos dilemas ambientais. Espera-se contribuir para um olhar sociológico atento às articulações entre artefato científico e propositividade política no contexto das questões ambientais.

Palavras-chave: antropologia; ecologia; economia; sociologia; sustentabilidade.

Resumen: Se propone un análisis sociológico sobre sustentabilidad, partiendo de cuestionamientos en ecología, economía, sociología y antropología. Partiendo del presupuesto de que su producción científica es polisémica, compleja y asimétrica en lo que se refiere a contenidos ecológicos, económicos y socioantropológicos, se busca una metodología que abarque tanto la articulación interna de las propuestas como las prácticas interdisciplinarias derivadas de ella. Esta propuesta, fundamentada en aspectos de la teoría de modernización reflexiva y de estudios sociales de la ciencia, sugiere que las diversas sustentabilidades sean analizadas dando atención a: las concepciones ontológicas de la interacción entre eventos humanos y no humanos; la noción de perturbación, incluyendo situaciones de riesgo y amenazas; y a las estrategias consecuentes del tratamiento de los dilemas ambientales. Se espera poder contribuir con una visión sociológica preocupada por las articulaciones entre el artefacto científico y la propositividad política dentro del contexto ambiental.

Palabra clave: antropología; ecología; economía; sociología; sostenibilidad.
