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(Im)Pertinences of a theoretical approach: the neoliberalization of nature

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Abstract
The increasing incorporation of biophysical processes into the market since the late 1980s, especially those related to agricultural frontiers, has been interpreted by some authors in terms of "neoliberalization of nature". Such a perspective has been quite fertile in critical studies of contemporary environmental issues, but it has been questionned by suffering serious objections. Some of these objections question the theoretical foundations of the neoliberalization of nature thesis and point to a certain conceptual lack in view of the diversity of definitions of the main concepts. Another type of objection refers to its low potential for empirical analysis, since it is so broad that it does not help to understand an inevitably incomplete and partial set of processes. The present contribution proposes a balance of the theoretical and empirical debates about the neoliberalization of nature, passing by its main authors and taking as reference some empirical researches that we have carried out about agribusiness in Brazil. We will discuss about how far its limits are due to inconsistencies pointed out by its critics or, instead (and beyond), to the lack of precautions in mobilizing an approach that deserves attention and interest nonetheless.

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INTRODUCTION

The deep effects of human activities upon nature, whose intensity has been directly proportional to the development of the capitalist economy, are not new. In parallel to the accelerating degradation of the environment, instruments were created to soften it, signaling that societies were becoming aware of its effects. However, the limited effectiveness of the measures taken to preserve biophysical systems would be the sign of the incapacity of capitalism to secure the conditions of its very reproduction over time. The emergence of neoliberalism in the 1980s put in practice an ideology that not only discerned free market as the best way to regulate economic transactions, but also extended market logic to different spheres of social life. As globalization deepened, along with its developments in the environmental field, in the end of the 1990s several attempts were made to incorporate a series of "nature" objects to the market, in legal and practical terms – management, exploration and regulation instruments – as well as in rhetorical ones. We thus come to a paradoxical situation in which the exploration of nature by neoliberal capitalism impairs its own reproduction in the long term. In parallel, neoliberalism aims to alleviate its negative effects by fostering environmental regulatory devices that can be integrated to its logic of accumulation. It means that by promoting such regulatory devices, neoliberalism aims to assure its reproduction, creating new sources of profit. It is within this context that the expression "neoliberalization of nature" spreads in the 2000s, under the auspices of social movements that denounce the highly economicist treatment of the environmental question associated to the interference of international capital in the exploration of natural resources in the countries of the global South. The expression emerges within academia, from critical theoreticians, as an extension of the readings done by researchers such as Neil Brenner about the neoliberal city. In this scope, scholars are aiming to critically analyze the new contours of the relationship that capitalism establishes with nature in the turn of the century, with the commodification of biodiversity or the climate. This way, three main dimensions are targeted by such approach: the introduction of market mechanisms in the framework of environmental regulation; the deregulation and change in state functions; the commodification of elements of nature.

However, the "neoliberalization of nature" approach came to be criticized and challenged by objections that questioned its theoretical foundations, and pointed to a certain conceptual slackness, as it refers to a great diversity of processes, not all of them mutually connected. The concept of nature can also be defined in different ways, depending on the author's perspective. Another objection is the difficulty in applying such approach to empirical observations, as it is so ample and ambitious, turning out to be inoperative.

This contribution proposes an account of the advances and limitations of the "neoliberalization of nature" approach, based on a theorical and conceptual debate, illustrated by empirical observations obtained in research carried out by the authors since 2011. After presenting its theoretical foundations and contributions, we will analyze the criticism it has been subject to, trying to highlight the extent to which its limits are due to the inconsistencies denounced by its critics or, more precisely, to a somewhat ill-advised use of an approach that, after all, deserves attention and interest. In this sense, even if we acknowledge and incorporate such objections, we defend that the theory of neoliberalization of nature is a powerful resource in the contemporary analysis of the relationship between market, state, and the environment.

WHEN NEOLIBERALISM REACHES NATURE

Theoretical and historical marks

By considering the market as the most efficient mechanism in the regulation of human transactions, and in opposition to state interventionism, neoliberalism draws on the work of Adam Smith as one of its foundations. But the influence of the classical author of liberalism does not go much beyond it. While these conceived individual liberties beyond the economic dimension, neoliberals advocated for economic liberalism and the introduction of an institutional and juridical environment aligned to neoclassical economics (HARVEY, 2011). Neoliberalism is the result of an ideology cultivated by economists from the Chicago School in the 1940s and 1950s, that attributes collective well-being to the generalization of economic exchange undertaken in a free, competitive market (MORANGE; FOL, 2014). In this sense, it works as "an ideal that expresses a utopian project of reorganizing capitalism at

multiple scales (…) around the logic and the *ethos* of the market", whose manifestations reach different spheres of social life (FREITAS et al., 2015, p. 240). It conjugates action and thought as a result of a sophisticated theoretical construction that, despite allegation of objectivity and efficiency, represents social and economic interests of a particular nature.

According to Harvey, so that neoliberalism can operate, three basic pillars are necessary: consolidated property laws; a free-market environment; and a state organization that provides an appropriate institutional context for these practices (HARVEY, 2011). This understanding counters the discourse according to which neoliberalism would coincide with the retreat of the state and the shrinkage of its attributions. On the contrary, it conducts to the redefinition of the focus of state intervention, producing what Dardot (2013, p. 17), based on Foucault, refers as an originality of neoliberalism: the dissociation of the market principle from the *laissez-faire* policy, recommending and putting into practice a vigilant and permanent governmental intervention in favor of the market, something like a "market interventionism". While liberalism attributed to the market the capacity to autoregulate, the market idealized by neoliberalism has the state as the regulator of its functioning. Another difference in relation to liberalism is the intensity of the accumulation process, as the strategies of neoliberalism are more intensive in the realization of profit due to the central role of financial agents, plus greater capital domination and penetration in social life as well as in the individual bodies. As a hegemonic ideology of capitalist development (PECK; BRENNER; THEODORE, 2018), neoliberalism has effects on public policies, actions and social representations, deeply modifying the daily life of individuals and collectivities.

Yet, neoliberalism is hardly ever observed in its purest, final form, so that the notion of neoliberalization can be conceptually more interesting in virtue of its heuristic potential. This notion is focused on a perspective oriented to processes that lead to such ideal type, not to observing a determined configuration in a synchronic approach. As with its ideal type, the process of neoliberalization involves actions and their control, as well as the ideas that legitimate it. Therefore, it must be understood both as a disciplinary mode of regulation and as an accumulation regime (BAKKER, 2010) that redefines the meanings and uses of the space and the resources. Finally, as a political project it aims to assure the conditions for the reproduction and the accumulation of capital in light of the long-lasting social liberal period (HARVEY, 2011). Its implementation presupposes strategies to ensure the realization of profit by means of the appropriation, control, transformation and the exploration or selling of goods whose property is expected to be consolidated throughout the process. Each one of these steps is supported (and conforms) a discourse that reinforces the legitimation of neoliberalism.

Neither homogeneous, nor univocal, neoliberalization can be better represented as a mosaic constituted of phenomena that are diverse, but convergent and relatively recurrent. The experiences of adoption of neoliberalism are not all of them the same, neither are totally different, since they are the result of local trajectories that articulate the institutions inherited from the past with the regulative norms established in each scale. Brenner et al. (2010) stress, in this sense, that each state incorporates the process in a singular way, pressed by rules of the global game that transcend the national borders and that are imposed as tendencies, but that need to adapt to historical, territorial and political specificities of a national character, therefore having to derogate to certain principles of the dogma. As it is inscribed in the dynamics of capitalism, neoliberalism is characterized by expanding in space and into spheres of social life not yet incorporated to its logic, such as culture, the body or nature.

The "neoliberalization of nature" is a consequence of the insertion of nature into the dynamics of market, liable to being bought or sold by means of mechanisms capable of matching supply and demand, as well providing perfect information and freedom of exchange. This phenomenon corresponds, on the one hand, to the extension of a previous process of mobilization of parts of nature in the production of goods (mining, agriculture, livestock etc.), today in a more globalized and market-led scope. On the other hand, neoliberalization of nature may also correspond to the transference of the responsibility for the management and conservation of the environment to the market and its agents. This way, the market would become the sphere and the regulatory mechanism of the conservation of nature, substituting the traditional measures of command and control used by the state.

Thus, a common trend of the authors

inscribed in this theoretical approach is the attempt to understand the present political and economic tendencies that establish environmental regulations based on market mechanisms. Several justifications support this process, which are presented below. In the sequence, we will move on to the arguments aimed at understanding such processes based on the theoretical framework of neoliberalization of nature.

According to its proponents and political-economic operators, the transference of the environmental regulatory power to the market would be a way to achieve greater involvement of the economic actors and social organizations. It would be a result of the increase in the monetary value of rare or threatened ecosystems, according to the basic mechanism of the supply and demand equilibrium (COSTANZA et al., 1997). Another argument in its favor sustains that market regulation would allow for the resolution of conflicts linked to different conceptions of the environment, once market regulation would attribute a common value to it, synthetized by the price the agents are willing to pay for conservation. Market regulation would be, at last, an alternative to the traditional coercion-based mode of conservation, as the fact of recognizing a price for natural resources would push agents to conserve and value them. According do Martínez Alier et al. (1998), two artifices are necessary to advance this project: commensurability and compensation. The former allows for the comparison between elements of nature that were not previously evaluated by a same unit of measure, putting all of them in the same plan. The latter corresponds to the idea that loss of an element of the environment could be compensated either monetarily or by means of an act of ecological engineering (restoration). The concept of ecosystem services is an emblematic example of such change in the way nature is conceived, once it makes explicit the fact that only the dimensions of the environment that are useful for human well-being are taken into consideration (regulation of climate, water, genetic resources etc.). These serve, on their turn, as the ground for the valuation of nature. Elements of the nature are isolated and acquire an explicit and anthropocentric social sense, which leads to extracting the complexity of ecosystems. Besides the artifices of commensurability and compensation, which render the exchange of natural goods philosophically conceivable and translate them into practice, there are a series of manifestations that refer to these processes. It was in order to make such manifestations inherent to the neoliberization of nature evident that Bakker (2010) has elaborated a typology, in which one can mention privatization, marketization, deregulation and reregulation, externalization of social and environmental costs, and the rescaling of governance. The private appropriation of common or public resources is a precondition for the introduction of a good or service into the market. On its turn, the reformulation of the regulatory frame aims to foster the market and facilitate the action of private agents in a competitive outlook, without bearing the costs of this action (sanitary costs due to pollution or the social impacts of climate change, for example). In consequence, the costs of negative externalities brought up by neoliberalism are shared by the whole society or transferred to future generations. The rescaling involves the strengthening of supranational organizations that formulate the principles, goals, and general standards of the environmental regulation at the international level, while at the same time promoting the decentralization of the devices and practical decisions at local and regional levels. This way, the neoliberalization of nature approach sees the decentralization and participative management as processes aimed at bypassing state action in order to give voice to the populations that are directly involved. However, such process can also strengthen unequal power structures that exist in local societies and attend the interests of the more powerful.

Empirically, Brannstrom (2009) identifies the tendency to the neoliberalization of the environment in Latin America by considering the following aspects: low budgets allocated to institutions in charge of the environment; adoption of market mechanisms to treat environmental problems; the commodification of the resources; and the decentralization of decision making to lower levels of the bureaucracy. In the mid-2000s, neoliberalization also manifested in the process of holding economic agents accountable for the management of the environment, by means of incentive measures. By sparking the economic interest in the conservation of nature, one aims to curb several destructive practices of the biophysical systems and promote the recovery of the environment in the settings where such practices take place. The PES (Payments for Environmental Services), compensation mechanisms or, still, private certificates of good

environmental practices are the most recent examples of such tendency.

In spite of the possibilities opened by such mechanisms, the environmental regulatory instruments that are part of the neoliberalization logic are subject to much criticism at different levels. In practical terms, their efficiency is very limited. The logic of voluntary engagement of the economic agents, for example, is not capable of ensuring the territorial continuity of the environment management measures, much less when one considers the diversity of instruments available in a determined space that would lead to a mosaic of practices with little coordination with one another. Environmental and Social Responsibility (ESR) and PES also respond to an opportunistic logic, in which the actors involved would make a cost-benefit calculation associated to their engagement in a determined measure and would choose the ones with less impact on the existing practices or the ones that are less costly. Such strategies are not able to promote a deeper change in the environmental management by firms (TONNEAU et al., 2017). Socially, decentralization and participative management are considered mechanisms that reinforce the role of local elites of the groups with more social capital *vis-à-vis* other agents that lack knowledge and resources to defend their positions in the participative process (ELOY et al., 2013).

The implementation of ESR practices also shows its limits. Authors such as Godard and Hommel (2006) point out that corporations behave, at least, in a contradictory manner. At the same time that they adopt ESR norms internally, they lobby against more restrictive environmental norms. The participation of corporations in the formulation of environmental regulatory measures is considered one of the ways to consolidate their roles in environmental management, but the empirical studies show that they tend, in reality, to defend their economic interests. Evidences of such process were observed by Gautreau et al. (2016) in the analysis of the participation of economic agents in the definition of norms and laws that regulated forestry and agribusiness in three South American countries. They show that these agents are able to weaken the regulatory power of such instruments, while at the same time portraying a positive image of productive sectors as "eco-efficient".

From a theoretical point of view, one must question the legitimacy of the concepts used to support commodification, as in the case of compensation and comparability – essential to the construction of PES. The supposition that a global or regional compensation would efficiently annihilate the local effects of the environmental degradation is questionable. For example, the possibility opened by the new Forestry Code, law enacted in 2012 that provides for the protection of native vegetation, to locate the mandatory legal reserve in a different state or in a property distant from the production site, as long as situated in the same biome, raises serious criticism as it does not consider other working scales of the ecosystems reached by deforestation. Thus, the dynamics of fragmentation of the landscape, the cycle of water, or the function of the ecological continuities are rendered invisible by the mechanisms of compensation. The REDD+ (reduction of emissions due to deforestation and degradation of forests, plus the conservation of the forest carbon stocks, sustainable management of the forests, increase in the stocks of forest carbon) and the carbon market raise similar questions on a global scale.

Finally, by observing the effects of the neoliberal ideology manifested in the reductionism and utilitarianism regarding the social construction of the environmental question, its translation into concrete conservation devices conducts to a conception of nature that is limited and economicist. The cultural or moral dimensions of the relationship between society and nature become peripheral, since commodification would be allegedly the best way to ensure conservation in the long run. Nature comes to be conceived through isolated processes that respond to a merely utilitarian and functional logic (MARIS, 2014) and operate in an essentialist perspective of reality, without considering the complexity of the ecosystem working as a whole. The "reductionism" that consists in translating climate change as a mere matter of management of greenhouse effect gas emissions is one of the manifestations of such process, conducting to what Swyngedouw (2018) has qualified as a fetishist invocation of CO2. For the author, reductionism leads to focusing only in the pathological syndrome, reducing it to an objective and fetishized "thing", in addition to obscuring the power relations that permeate the environmental question.

Thanks to the incorporation of the means (productive margins, protected areas) and objects (biodiversity, carbon etc.) to which neoliberal strategies had no access until then, "new natures" are created, which are in the origin of such new markets. Nature provides a

palliative solution for the contradictions of capitalism, creating opportunities for the emergence of an "environmental fix", in which capitalism generates, in a single movement, the destruction of nature, its conservation and the creation of new biophysical resources (CASTREE, 2008; EKERS; PRUDHAM, 2015). The broad reach of such change in the way of thinking about conservation has also an impact on the production of knowledge, as it is redirected towards market priorities or for an instrumental end, privileging once again a technocratic view of the relationship between society and environment.

Therefore, research that adopts the theoretical framework of the neoliberalization of nature tends to focus on the negative effects produced by its commodification, decentralization or by the successive episodes of deregulation and reregulation.

A CONTESTED ANALYTICAL FIELD

Compared to the market-oriented discourse of the great international arenas of negotiation of environmental issues, the approach in terms of neoliberalization of nature has raised an increasing interest in social sciences and humanities throughout the 2000s, which has motivated the achievement of much research in this field. However, a critical debate took shape, questioning the pertinence and, therefore, the validity of such interpretative scheme.

Criticism to the imprecision of the theoretical framework

Much of the criticism towards the neoliberalization approach refers to a certain imprecision in the way its central concepts are mobilized, impairing its theoretical framework. In this sense, Bakker (2010) points to the great heterogeneity of works about neoliberalization of nature that, because they adopt quite different analytical frameworks and objects, do not allow for comparisons or the elaboration of a true theoretical balance. She also notes that the concepts are used in different ways and refer to varied definitions. According to her, nature can be understood either as a primary good, or as a resource, an ecosystemic or, still, as a socio-natural arrangement. The conceptions of neoliberalism are also distinct – and sometimes even divergent, as it can be understood "as political doctrine, as economic project, as regulatory practice, or as process of governmentalization" (BAKKER, 2010, p. 34). The use of the concept in a disembodied way, as a general process that operates in macro scales, not linked to the actual processes under analysis, can reinforce such imprecisions.

We should highlight, however, that besides the incautious use, imprecisions can be induced by the very theoretical texts aimed at conceptual building, once they conduct to a certain amount of semantic inflation. For example, Neil Brenner, one of the main thinkers about the spaces of neoliberalism, considers that its implementation admits diversified modalities over time, according to geographical environments. These particular configurations confer what he designates as a plasticity forged by what institutionalists call "path dependency" (BRENNER; THEODORE, 2002). Years later, Brenner et al. (2010) would defend the idea of a neoliberal "variegation", defined as the production of geo-institutional differences inherent to the diversity of particular processes in their implementation at every geographical scale. More recently, these authors proposed the idea of "actually existing neoliberalism", in order to avoid essentialist designations and to reinforce that neoliberalism only takes form in conjunctural forms (PECK; BRENNER; THEODORE, 2018). Other authors have tried to think about neoliberalism in its diversity, suggesting the occurrence of varieties of neoliberalism in the sequence of the debate on varieties of capitalism. Bakker highlights, thus, a hybrid form of neoliberalism, while Freitas et al. (2015) prefer the periphrasis *not-quite-neoliberal natures*, referring to the Latin American countries in the 2000s, mainly those that have gone through the "pink tide". *Not-quite-neoliberal natures* expresses a return to state interventionism in the economy and in the management of the territory without, however, breaking with the neoliberal means of managing natural resources and the environment. It indicates, in practice, that both a neoliberal and a "post-neoliberal" regulation of the nature have co-existed, being implemented in a differentiated manner according to the actions, the pressure and the interests at stake. Post-neoliberalism and social-neoliberalism are also notions used by other authors that designate similar contexts.

The diversity of neoliberalism constitutes, thus, a theoretical limit, as it is not capable of minimally establishing a typology, or a ranking of its inherent processes. Its extreme variability would conduct to the dissolution of the concept in a multitude of variations according to the diversity of situations to which it applies, being

always pertinent at some level, even if only partially so. We identify, on the one hand, a series of contributions that, by adopting a cautious attitude, end up diluting neoliberalization in a multitude of variations that move it away from a minimal common ground of understanding of the concept. On the other hand, we find authors that apply neoliberalization mechanically to numberless case studies lacking reflexivity, treating it as a given, reified, and essentialized phenomenon. In both cases, the concept loses its heuristic potential and becomes little appropriate to understand the processes underway.

Limits due to its operationalization

Another strand of criticism addresses the empirical reality associated to the attempts to implement environmental markets and, in particular, the Payments for Environmental Services (PES). In the case of Brazil, the literature that aims to assess the neoliberal character of the implementation of PES leads to a skeptical appreciation of its real nature. It seems that the translation of the principles that sustain a market for environmental services into actually implemented instruments leads to their adulteration, changing them into conventional programs of subsidies or in social programs of income redistribution.

A first example can be found in the grants for agriculture provided by the Low-Carbon Agriculture (ABC Plan). This plan aims the reduction in carbon emissions in agriculture by means of a voluntary adoption of paid mitigation measures, targeting preferentially at larger producers. Rosa (2017) shows that such grants correspond, in fact, to a subsidized credit for larger producers that were not able to access other public funding programs. In the state of Minas Gerais, the implemented instruments are circumvented from their objective as they are destined to producers that ignore their actual goal and whose agricultural practices already correspond to the objectives pursued by the plan.

Another emblematic case is analyzed by Aubertin et al. (2014), who studied the implementation of PES in the Amazon to fight climate change and capture carbon. For the authors, Brazil has taken advantage of such programs as a way to reinforce its sovereignty over the management of the forest against international pressure (thanks to the Amazon Fund, that has a national management, but gives access to international funds) and used the PES as a disguise for redistributive and inclusive policies aimed at aboriginal populations, small farmers, and traditional communities. A detailed analysis of the instruments that were implemented, their objectives and the main goal of the funding shows that they are, in practice, similar to traditional subsidies, financing, in this case, the ecological transition, forest restoration or avoided deforestation. The payment is destined, in fact, to finance change in the practices and not to the purchase of a hypothetical service. Thus, the value of PESs is established in function of the opportunity cost in adopting a particular practice and accessing an available resource, instead of being built as a remuneration for a service. Additionally, it is worth considering that the market, even if it existed, would have the government as the only "client". For Aubertin et al. (2014), the reference to PESs is qualified as a strategic rhetoric, as it is more a strategy to access international funds than an actual worry with the implementation of an environmental market.

In another article, Aubertin et al. (2016) confront the project of neoliberalization of nature built into the formulation of the PESs with the pragmatism of reality. The authors conclude that one cannot create a market for ecosystem services simply because they do not generate enough profitability: the elements of nature that are of interest to the agents of capitalism are those liable to an attractive tax of profit (oil, steel, soybean etc.). Neither the market characteristics, nor the instrumental approach of the nature by capitalist society, have allowed the fulfillment of such objective. For this reason, the transactions are actually assumed by agents that are not mainly profit-oriented when they perform the transaction. In a proximate perspective, Foyer et al. (2017) refer to an "economy of promises" to designate the paradox between the promise of PSA in its theoretical formulation versus its implementation:

> if some hegemonic forms of neoliberalization are observed in certain scales (international forums, among others), these are not synonymous to commodification in their implementation […] and if bioprospection or REDD resemble a sort of neoliberal governance, such governance has a dimension that is mostly virtual (FOYER et al., 2017, p. 245).

However, Aubertin et al. (2016) do not conclude that the PSAs are a mere change of

legitimation applied to old instruments. This mechanism leads to hybrid governance, as they incorporate a greater diversity of agents when compared to the classic model of command and control.

Still, the limits met in the operationalization of the political project of neoliberalization of nature should not downplay the performative effects of the discourse that has been produced, once it has motivated new types of public policies, as well as the creation of unheard of instruments with goals that have been reformulated in relation to the public policies based on *command and control*. Even though they do not work as expected, they end up changing the way the environmental question is formulated, and certainly the perception of nature by the involved agents in all scales.

REDEEMING AN ANALYTICAL POTENTIAL TO THE CONCEPT

We estimate that the criticism against the "neoliberalization of nature" approach do not fully invalidate its pertinence to describe certain dimensions of the contemporary processes of incorporation of the biophysical world to capitalism, as long as one takes some analytical precautions.

Some methodological and analytical precautions

A first precaution consists in giving a more rigorous sense to terms widely used in the field of political action and militancy that, in the scientific field, need to be clearly conceptualized. One of the characteristics of the social criticism to neoliberalism during the 2000s-2010s was attributing an anti-neoliberal sense to forms of management of nature that had been set forth during the neoliberal decade, thus performing a patent anachronism. For example, the conservation units are generally presented as instruments that contribute to slow the advance of "neoliberal" agricultural frontiers in Latin America. By the same token, multiculturalism, inscribed in a great number of Latin American constitutions during the 1980s-1990s, is presented as a means of resistance to neoliberalism. Such resignification fails to remember, however, that the diffusion of conservation units in the continent was implemented by neoliberal agents in the 1990s: the NGOs from the international conservation sector (DUMOULIN KERVRAN; RODARY, 2005) or even the World Bank, that conditioned the support to development to the creation of such units. Conservation Units are, thus, intimately associated to the period of extreme economic dependence of the Latin-American countries to the international financial institutions and the structural adjustment policies (DUMOULIN KERVRAN, 2006). Although part of the Conservation Units created in this period constitute, in fact, a limit to the expansion of agriculture, particularly in Brazil, most of them were located in areas that were not under threat at that time. A similar process took place with multiculturalism. Such process is – correctly – understood today as the result of secular struggles in favor of the recognition of the rights of pre-Colombian and African-origin populations. However, the influence of international agents was, once again, a decisive factor for its inscription in the law. With the emergence of the paradigm of "integrated conservation", according to which one needs to support the participation of local communities in the conservation of nature (RODARY, 2003), these agents encouraged the acknowledgment of the indigenous territories in order to allow such populations to obtain monetary gains for its involvement in conservation. This way, multiculturalism is, also, a co-invention of neoliberalism that concedes the integration into markets of spaces and populations that were until then excluded from them (GROS et al., 2011).

A second precaution consists in avoiding to essentialize forms of management of nature as neoliberal, including when they do seem to clearly favor a process of neoliberalization. One of the essential techniques to introduce nature in the market consists in "translating" it as information and, concretely, as databases. Castree (2003) identifies five key processes in its commodification: privatization, alienability, individuation, abstraction and valuation. In each one of these three phases, the implementation of informational devices is necessary to allow the codification of goods to be exchanged, their legal status and their valuation. To each one of these states, the implementation of informational devices is necessary in order to uphold its circulation. One can say that information allows to disembed nature from its geographical context, thus performing its integration into global flows:

> With the ability to abstract and disembed environment from its sensory experiences and local contextualities and *include it in*

> *symbolic tokens based on information*, it can be transferred through time and space and is thus included in the space of flows. (BUTTEL, 2006).

The cartography of such particular dimensions of the living being, in the form of a device that allows to abstract from the real the elements of interest to capital, could correspond to this situation: cartography of biodiversity, ecosystem services, carbon capture, all of them contributing to disembed nature from the complex arrangement to which it belongs. By acquiescing to the formalization of abstract entities (an ecosystem service, for example), these devices allow for the comparison of them in different scales without the need to physically cover the space to know it and, therefore, create an environment with a monetary base (the market for forest carbon, for example). We notice, therefore, how the informational devices can participate, at least in theory, in the process of commensurability of the values operated by "economic language", according to Martínez-Alier (2004). Consequently, one can contend that the informational devices of the environmental institutions contribute to a process of neoliberal cultural reformulation when implemented, by propagating a simplified and fragmented view of an environment that is, in fact, infinitely more complex.

Nonetheless, information, particularly when digital, should not be understood solely as an essentially neoliberal technique. The construction of databases about the human being and nature started with the emergence of the modern state and its will to control and take charge of the social and biophysical reality (SCOTT, 1998). The creation of cartographic registration between the 17th and 19th centuries depicts such change. At that time, the goals of the state were mainly social and fiscal control, as well as the improvement of agricultural production. Registered information also played an important role in the democratization of western societies, by introducing a more egalitarian concept of taxation, based on a more objective calculation of wealth. Today, information is, in some circumstances, an essential factor for accretion of environmental justice, as it allows a better distribution of risk. Social movements, in particular, conceive it as a tool of resistance to neoliberalism when it makes the advancement of extractivism more visible and, hence, denounces it, as in the case of the militant sites of cartography and of analyses of the environmental conflicts, such as the Latin American Observatory of Environmental Conflicts (http://olca.cl), the Latin American Observatory of Mining Conflicts (http://ocmal.cl), and the Brazilian Map of Conflicts involving Environmental and Health Injustices (http://mapadeconflitos.ensp.fiocruz.br/).

A third precaution consists in analyzing particular events in which one can observe in detail the forms of hybridization between the neoliberal logic and other logics. Environmental sociology, for instance, gives a particular importance to conflicts. From a methodological point of view, such interest is linked to the fact that in such situations, agents argue about their positions vigorously. Researchers have access to important discourses that allow to understand the complexity of the "languages of valuation" (MARTINEZ-ALIER, 2004) or systems of values that are in opposition to one another. In contrast with the previous two situations, that valued the contextualization of the process in the long run, here it is the case to detect short periods during which important decisions are taken. The study of the construction of contemporary systems of management of the biodiversity constitute, for example, an opportunity for the comprehension of the neoliberalization of nature. Regarding the Mexican programs of payment for ecosystem services, McAfee and Shapiro (2010) show that they were the object of controversies that opposed different views of the role of peasant populations in relation to biodiversity. Such positions referred to the divergencies regarding the objectives of commodification of the living being. Those that conceived the peasants as a threat for the biodiversity defended the payment for ecosystem services to promote the abandonment of their agricultural practices (move them away from the forest). On the contrary, those that conceived these very same peasants as agents that had co-built the forest biodiversity for centuries, saw the payments for ecosystem services to support their traditional practices. In this work, McAfee and Shapiro (2010) show how two radically opposed perspectives on the relationship between man and nature, from a philosophical point of view, could converge towards a common trust in the role of the market to achieve the objectives of conservation.

Presently, most of the countries in Latin America adapt their legal provisions and instruments of monitoring of the environmental changes in order to contribute to the conservation of the biodiversity and to the struggle against climate change (GAUTREAU

et al., 2016). The debates undertaken in these "events" offer an opportunity to follow in detail the process of neoliberalization. For example, Latin America and the Caribbean have recently adopted a "Regional Agreement on access to information, participation and justice in environmental matters in Latin America and the Caribbean" (2018). The agreement apparently represents a victory for the social movements because it becomes a means to strengthen citizen's control over environmental degradation. However, in reality, the agreement has also been defended by part of the business community, which sees this agreement as a way to drop invisible barriers to free market: differences in access to information, for example, are seen as unfair asymmetries that harm free competition and pure and perfect information (GAUTREAU; MONEBHURRUN, 2017).

A useful resource to analyze the meaning of "neo"

The immoderate use of the category "neoliberalization" to describe whatever processes of commodified use of nature impairs, in our view, its heuristic strength. It is necessary, therefore, to bring back the notion's scientific "value" to reinforce its explanatory power about the recent process that have the market as the main mediator in the relationship between society and nature. For instance, we can consider the notion of "neoliberal frontiers" applied to the new territories of agribusiness in the 2000s in South America (BRANNSTROM, 2009) quite "ineffective". In fact, it describes, in principle, classical processes of expansion of modern agriculture in detriment to areas covered with vegetation and used by rural or pre-Colombian populations, which means that it does not seem to help understand new phenomena or dimensions that can distinguish present reality from those of the past. The fact that such modern agriculture is, in part, carried out by globalized agents does not prove the neoliberal character of the process. Since the 16th century, the increasing incorporation of the natural environment to the sphere of the western market seems to follow along similar modalities.

In our view, it would be more precise to follow these processes conducted and delimited by the state so that one could read their actual neoliberal dimension. For instance, the Brazilian state has developed since 2012 (with the new Forest Code) an instrument of agri-environmental regulation called "Rural Environmental Registry" (in Portuguese, CAR), that provides information on the environmental situation of each establishment and verifies whether it is in accordance to the legislation on this issue or not. It is, apparently, an instrument aimed at slowing down deforestation and giving order to the exploration of the territory in a rational way. The empirical observation of its effects, however, is different, since this instrument is also a source of information that allows investors, including foreign ones, to "read" the territory. In the Cerrado, in particular, marked by the illegal acquisition of land, the indetermination of the property of land constitutes a barrier to entry of foreign capital worried with juridical safety. The implementation of Rural Environmental Registry is an occasion for the state to confirm a general amnesty of the illegal deforestation prior to 2008, but also to "launder" the areas that were acquired illegally. Producers that have benefited from the necessary political and juridical support can, by means of their register at CAR, reinforce the legitimacy of their property titles (BÜHLER; OLIVEIRA, 2018). This way, such instrument is neoliberal in the sense of Bakker (2010), since it institutes a way of "disciplining" older norms – in this case, local arrangements to illegally and massively have access to land – as it fosters the emergence of new forms that are more adequate to the demands of the international agricultural market, as they are readable from a distance by this market. The discourse of Izabella Teixeira (former minister of the Environment, in charge of the completion of the reform of the Forest Code) when taking office at the National Academy of Agriculture in 2015 makes such view explicit:

> *"Technology is useful for the best, not only to audit, but, for that, we need to have a political-institutional discourse very well constructed, in which the private sector sees conditions for competitivity and not red tape and barriers […]*". She adds: "*We need to be transparent in the results, to focus on results rather than on problems, we need to re-equilibrate this equation*". (SNA, 2015).

During the empirical research that we did on agricultural frontiers, we verified a very clear engagement of the most important agricultural businessmen and their associations in favor of CAR, under the justification that it was an instrument that reinforced regulation, facilitating their capitalization, while at the

same time helping them to erase the very often illicit character of the origin of their property titles when the overlapping of areas claimed by different "owners" was not verified. In this process, the informational character of the CAR is central: the database it provides is based on the limits of the land properties, as well as on the surface of the vegetation put in reserve by the landowners. Hence, we are in front of a new process, in which the information about the state of the environment in a determined property can contribute to forge its land value, insofar as the more it is in conformity to the law, greater will be its value for an investor searching for legal assurance for their investment. The fact of making nature more legible in order to match the interests of the market, while at the same time counting on the protection and monitoring by the state (that manages the information system), allow such frontiers to be conceptually analyzed as "neoliberal frontiers".

One can observe, based on this example, that the organization of the production process and the relationship between society – state – market promoted under the strong influence of the "agribusiness" actors lead to a process of re-enactment of the state regulations of the environment that question and give new direction to the standards of public regulation (OLIVEIRA; BÜHLER, 2016). The actors' strategies imply the action towards the government, on the one hand, in the sense of assuring a freedom of action against certain kinds of regulations or giving preference to deregulation (environmental and labor laws are always contested) or, on the other hand, in order to make political pressure so as to generate re-regulations that benefit the privatization of natural resources. Castree (2008) describes such process as the entitlement of property rights over environmental or social phenomena that were previously controlled by the state or by the community, or else that had never been controlled by anyone at all. State action that facilitated or promoted such processes of privatization has been noted in different empirical contexts. The revision of the forest code concluded in 2012, the new versions of the environmental and land laws promoted by the states of the federation move in the same direction. In both cases, state promoted the *laissez-faire* and turned a blind eye, when it deliberately did not act and hence attended the needs of the agribusiness, either to allow the advancement of the agricultural frontiers, or to promote land-grabbing and the incorporation of such land in the land market. Once the fact was generated, the re-regulation was useful to support tax and punishment remission and to provide legal safety for the larger investors. As previously noted, state intervention is quite meaningful, even (or mainly) when it fails to intervene.

FINAL REMARKS

In short, we defend the pertinence and the heuristic potential of the approaches in terms of neoliberlization of nature, as long as some precautions are taken in its use, starting with an effort to define and make the concepts more explicit. The limits highlighted in the second topic do not invalidate the approach as a whole and, more properly, point to the need to be vigilant in order to avoid whatever normative, anachronic or plastered use of it in an essentialist perspective.

As long as some precautions are taken, the neoliberalization of nature approach can be useful to analyze the changes in the biophysical world, both from a material point of view, and from the point of view of its representations. The commodification of nature, for example, presupposes a set of processes that allow to identify discrete units (a landscape, an ecosystem service, a ton of CO_2) and to attribute to them a monetary value. Neoliberalization leads, therefore, to consider the process of disembedding the environment from its geographic context, since it can be inserted into exchange flows. This approach expresses, for the optimists, the emergence of a capitalism that is more reflexive in relation to is dependence on nature, as a positive sign of a manifest wish for reforms from the part of rational agents confronted with the limits of the economic system (ecological modernization theories). We can also, from a pessimistic look, interpret it in a more cynical way, as the manifestation of a system that takes its predatory logic to the end and to self-sabotage, exhausting its last resources in order to feed new business fronts.

In the political and philosophical field, the mobilization of such approach gives critical point of view about the processes underway and allows to return to the politization of the environmental issue. For many scientists and activists, the idea of an environmental market that would neutralize the socio-environmental conflicts by means of the definition of a fair price eliminates fundamental reflections and

decisions about the responsibility, the coercive strength of the regulation and the need to make collective choices in favor of determined options and in detriment to other ones. Each one of the collective options impairs or even excludes some agents or uses of the space in the name of conservation, while the regulation by means of the market would delegate such decisions to the market. Thus, neoliberalization of nature participates in the individualization and depolitization of environmental management, reducing the biophysical processes to a set of fetishized "things", put apart from the societies to which they belong, privileging a brand and a-geographic view.

The observers of the failed experiences of commodification of the biodiversity can interpret it as the resilience of neoliberalism in the very heart of the so-called South American post-neoliberal experiences of the 2000s (Bolivia, Ecuador), that promoted the strengthening of the utilitarian and commodified relationship with nature. But what is on the way is even more provocative, as it seems that neither the historical model of command and control, nor the attempts to regulate nature by means of the market will resist the neoconservative wave. This wave is standing out for introducing a third, more radical way, which seemed to be overcome: the one of environmental negationism.

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