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## **Green Economy and Bio-based Economics: Assessment and Critique of Their Philosophical Assumptions**

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### **Summary**

*The paper aims at establishing a philosophical comparison between the notion of green economy and the concept of bio-based economics. Against the background of the current, devastating economic crisis, they both represent an attempt to overcome a growth impasse through the incorporation of the environmental limit as a new terrain for accumulation and valorization. Otherwise put, both green economy and bio-based economics assume that economic growth and environmental preservation not only are not contradictory, but can actually set in motion – through the discursive formation of sustainability – a virtuous circle in which the increase of one element fosters a parallel increase of the other. The analysis of such an affinity will be historically analyzed by referring to Michel Foucault's biopolitical analyses. Subsequently, the crucial notion of bio-mimicry will be theoretically approached, as will the dangers embodied in the currently under way process of economization of nature. The argument is that by modelling nature according to industrial needs or competitive frameworks a crucial risk emerges: the possibility of tackling an undeniable environmental crisis by deepening an already unjust social polarization. By contrast, a public goods or common-based perspective would provide a theoretical background for tackling the social, economic and ecological crises simultaneously. For such a background to emerge, however, market competitiveness as well as sacred property rights regimes should be substituted by common cooperation and sharing-cultures.*

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# Green Economy and Bio-based Economics: Assessment and Critique of Their Philosophical Assumptions

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## INTRODUCTION

The opening article of the first issue of the journal *Bio-based and Applied Economics* advances the hypothesis that, although there is remarkable evidence about a move towards bio-based economics as a developing disciplinary area being currently under way, it is just as much true that “while a reductionist vision of the bio-economy (i.e. based on a list of sectors) seems to be the most straightforward, a definition based on key technological or institutional characteristics remains a problematic issue” (Viaggi et al., 2012: 9). Similarly, another important contribution to that same first issue emphasizes how the very notion of bio-economy is to be conceived of as a contested terrain upon which different plausible definitions confront each other. Thus, an industrial perspective based on capital-intensive productions and a narrow definition of solely market-driven competitiveness is criticized to argue for an alternative vision, centred around the concept of public goods and oriented towards a broader recognition of the positive function performed by European farmers and SMEs. Such a revised definition of the term bio-economy “may ensure real, continuous short- and long-term economic growth based on ecological, social, and economically sustainable systems” (Schmid et al., 2012: 54).

Far from being an analytical limit or a theoretical bias, such a defintory openness seems to be a constant feature of those categorial apparatuses which concern the relationships between wealth creation and environmental protection. In fact, the notion of green economy is just as much contested: there is no agreed-upon definition of it. Furthermore, just as bio-based economics can be approached through an industrial or public goods perspective, so the green economy can be seen through competitiveness-driven or common-centred heuristic lenses. Although I do realize that green economy and bio-based economics do not fully overlap from a conceptual standpoint (the latter being more specific and, as such, empirically and analytically more operational), it is my conviction that they share a key philosophical assumption. Against the background of the current, devastating economic crisis (whose long-term causes have been silently under way since the early 80s), they both represent an attempt to overcome a growth *impasse* through the incorporation of the environmental limit as a new terrain for accumulation and valorization. Otherwise put, both green economy and bio-based economics assume that economic growth and environmental preservation not only are not contradictory, but can actually set in motion – through the discursive formation of *sustainability* – a virtuous circle in which the increase of one element fosters a parallel increase of the other.

Thus, my research question is the following: what philosophical conditions must be met in order for notions such as green economy or bio-based economics to make practical as well as theoretical sense? In other words: which relations between nature and political economy are they grounded upon? To answer these questions, the exposition will be organized as follows. In the first section, I will briefly sketch an historical overview on said relations by referring to Michel Foucault's biopolitical analyses. In the second section, I will discuss a paradigmatic notion of the current, neoliberal articulation of nature and economic activity, namely *bio-mimicry* or *bio-imitation*. I will try to argue that for such a concept to emerge a profound process of *economization of the nature* must have previously taken place. Finally, I will conclude by suggesting that such an economization of the environment is not to be conceived of as a cruel and dramatic destiny, but as a battlefield upon which different visions of what a sustainable society looks like confront each other.

## MICHEL FOUCAULT: NATURE AND POLITICAL ECONOMY

In the second half of the 1970s, Foucault was primarily concerned with the articulation of what can be defined as *biopolitical hypothesis* (Foucault 1978; 2007; 2008). At stake in this theoretical move is a precise, if necessarily partial, historical account of the emergence over the course of the Eighteenth century of a new form of power that was substantially different from its previously dominant configuration, namely sovereignty. From an empirical perspective it is possible to situate the emergence of biopolitics in the progressive implementation of governmental technologies of power, which aim at the simultaneous empowerment of individual and collective bodies. With the term *governmentality*, Foucault refers to the *ensemble* of institutions, tactics and analyses that allow a specific kind of power to be exercised over the population through a knowledge apparatus defined by political economy and a set of technical *dispositifs* oriented toward security. This set of practices was organized around four main fields of intervention: *natality*, *morbidity*, *ability*, and *environment*. According to Foucault, biopolitics implies the political creation of an intermediate space between natural environment and artificial urbanization, investing in particular the process of shaping natural systems (both at the climatic and hydrographical level) according to the needs of governmental expansion.

At a more speculative level, the core of such a biopolitical hypothesis resides in a novel formulation of the classical theoretical element, which refers to the relationship between *life* and *politics*. To simplify, it might be argued that before the emergence of biopolitics, the relation between life and politics was *extrinsic*, in the sense that the two poles defined different fields of intervention and development, which, although often overlapping each other, were used to be conceived autonomously, as irreducibly distinct. On the contrary, after the “threshold of biological modernity” was crossed, the two fields merged into one set of phenomena within the context of which their respective identities became indistinguishable (Foucault 1978: 143). In other words, life became a specific target of political power and as a consequence, their relationship was configured as *intrinsic*. To put it differently: neither scientific reductionism nor cultural determinism can properly represent the new internal and qualitative connection between life and politics. The governmental *dispositif* through which this epochal passage was accomplished is to be found in the notion of population and, in particular, in its subjective dimension as grounded on the concept of *desire*: population is, in fact, nothing else than a weaving of heterogeneous desires. Some of them are irrepressible but potentially noxious, whereas others might produce, when left free to spontaneously organize, something like a nebulous “general interest of population.” Here governmentality must act as a *translation process* in which the passive acceptance of a plurality of irreducible desires co-exists with the active regulation of their interplay. The interface between artificiality of history and naturalness of species is the battlefield upon which power/knowledge apparatuses (attempt to) tailor governable subjective clothes for the population.

This new concept of natural population inaugurates the history of political economy and opens up the possibility to *govern the environment*, conceived of as nothing more than the principle by means of which a set of heterogeneous elements, both natural and artificial, are formalized to be managed, or subordinated to an abstract *mise en serie* in order to be politically regulated. This is why environmental crises are intrinsically biopolitical: if in the *sovereign paradigm* nature and politics were confronting each other from mutually exclusive standpoints, the *biopolitical paradigm of nature* determines the exact opposite situation: political artificiality and species naturalness melt into a zone of indistinction constitutively exposed to governmental capture. This unavoidable exposition to power is the very condition of possibility for the notion of environmental crisis to appear as a specific political issue: what distinguishes environmental degradation from ecological crisis is the fact that just governmentality necessarily implies a modality of resource-use which describes a systemic tendency towards a constant managerial increase. Environmental degradation belongs to “nature idolatry”, to use Marx's words (Marx 1993); ecological crisis, on the contrary, is a distinctively modern phenomenon.

Now, let's turn our attention to the constitutive link between nature and political economy in this first phase of biopolitical governmentality, which emerged in the second half of the Eighteenth century and is defined as *liberalism*. How is this relationship enacted? According to Foucault, such a link acquires social effectiveness through the role played by the *market*. Obviously, Foucault refuses to conceptualize the market as a passive, hidden matter progressively brought to light by the improvement of economic theory. Rather, the market is a principle of veridiction that allows the new art of government to concretely work. In other

words, the market is the centrepiece of a new biopolitical regime of truth. From this perspective, the natural traits attributed to market-laws are justified in that they play a *limiting role* with regard to sovereign power. Being unable to fully grasp the opaque totality represented by the economic process, the sovereign must limit its interventions to possible market failures. Those incidental failures, however, do not put into question the spontaneous deployment of the invisible hand that, in connecting individual pursuit of profit to the general interest, naturally leads to the best allocation of social wealth. Thus, the distinctively liberal relationship between nature and governmentality assumes the form of an intrinsic, but nonetheless indirect, principle of limitation. The environment could take the form either of a free source of raw materials, at the beginning of the economic process, or that of an infinite garbage bin, at its end.

One of the main features of the shift from liberalism to neoliberalism concerns a fundamental modification of this relationship. From an environmental perspective, the crisis of liberal governmentality during the 1970s can be interpreted as the result of converging pressures such as (to name just a few): 1) destabilizing antagonism on the part of ecological movements; 2) the rise of new, profoundly invasive biotechnologies; 3) the struggle-induced *impasse* of a regime of accumulation exclusively based on industrial production; 4) the fiscal crisis of the state (and its effects on social legitimation); 5) the Oil Shock and a worldwide increase in conflicts over scarce energetic resources. To sum up, we might say that a governmentality based on nature as internal but indirect limit to power had reached its point of exhaustion: instead of facilitating the production and circulation of wealth, it started to act as an unsurpassable barrier against it.

After two centuries of increasing implementation, this way of governing the process had become more environmentally damaging than economically profitable. A new governmental approach was needed to restore profitability while avoiding unnecessary environmental impacts. In other words, liberalism had made the multifarious phenomenology of ecological crisis visible, but was nevertheless unable to politically manage it. As a consequence, neoliberalism was rapidly approaching. What is the main difference between liberalism and neoliberalism, from an environmental perspective? In liberalism the naturalness of the market is centred around the notion of *exchange* and, as such, it is still clearly distinguished from the artificiality of fluxes of money, commodities and individuals it is supposed to rationally channel. Differently, in neoliberalism the naturalness of the market is directly created in accordance to the artificial principle of formalization represented by *competition*. To put it crudely, nature has to be artificially constructed in order to practically allow the formal structure of economic competition to work. This is why neoliberal thinkers could accuse their liberal predecessors of “naturalistic naïveté”. Another relevant effect of the shift of emphasis from exchange to competition is the necessity of a constant intervention on the part of the state not *on* the market, but rather *within* its conditions of possibility. As Foucault brilliantly summarises, in neoliberalism “one governs for the market, not because of the market” (Foucault 2008: 121). To sum up: whereas in liberalism nature appears as an enacting limit to valorization, in neoliberalism it functions as an actual element of valorization.

## BIO-MIMICRY AND THE ECONOMIZATION OF NATURE

My hypothesis is the following: it is only when nature becomes an element of valorisation – which is to say, it is only with the emergence of neoliberalism – that it is possible to properly talk about notions such as green economy or bio-based economics. To further substantiate such hypothesis, it is important to situate it against the backdrop of the main tendency of contemporary political-economical development, namely the increasing centrality of knowledge as organising principle of production. Knowledge today is not only a precondition of manufacturing, but the veritable centre of the production process. It is, in other terms, the fundamental productive factor, such that the economy can be said to be based on the “production of knowledge by means of knowledge”. It is a circular process whereby the output constantly regenerates the input through relatively cheap innovation based on seemingly endless reproducibility. To use Marx's expression, we might say that *the general intellect is the organising principle of contemporary production* (Marx 1993).

This is particularly true with regard of bio-based economics. In fact, one of its definitions asserts that “the modern or new bioeconomy is based on our expanding knowledge of molecular and cell biology and takes advantage of information technology and nanotechnology” (quoted in Esposti 2102: 250). Another relevant

proof of this intertwining of nature and knowledge as elements of valorization can be found, for example, in the EU research policy denominated *Knowledge Based Bio-Economy*. Furthermore, the notion of innovation expands its reach and concerns more and more product and function innovations, rather than solely process innovations (Esposti 2012).

I believe the concept of *bio-mimicry* to be paradigmatic in order to reflect on the processes through which nature shifts from enacting limit to economic activities (liberalism) to actual element of production (neoliberalism). It is now more than a decade that the notion of bio-mimicry has been advanced and discussed in the circles of green economists. At first, the new concept was meant to express a severe criticism to dissipative growth models which were typical of industrial capitalism and, in particular, to oil lobbies which strongly opposed their abandonment (or even their slightest revision). Today, however, with the green economy riding a profitable wave of success – United States *American Clean Energy and Security Act* (2009) doubtlessly represents its apex – bio-mimicry seems to have lost a great deal of its critical potential. Beyond the ups and downs of its reception, however, what is interesting from our perspective is the silent paradox upon which bio-mimicry ultimately rests. In- and for-itself, subtly removed from its material context, this concept is configured as rather linear and self-explanatory: given unsustainable levels of pollution and resource consumption, the industrial system is doomed to fail economically (dramatic rise of raw material's price) and, consequentially, to collapse socially. This is due to the indirect artificiality of such a system, whose indifference towards environmental feedbacks brings about a fatal neglect of natural limits to growth. This issue could easily be solved if *productive systems* are conceived of as *living systems*. In other words, productive systems should imitate living systems and, in so doing, would simply erase the notion of “waste” from their practico-theoretical toolbox. As it is notorious, waste does not exist in nature. Such a model for productive systems “is not reliant on linear processes, which are indifferent to waste; rather, on circular processes (e.g. cradle to cradle), which reuse waste by getting inspiration from the most effective and efficient biological system we have ever encountered: nature” (Reina and Vianello 2011: 50). A deeply significant articulation of the link between green economy and bio-mimicry is proposed by Paolo Ricotti, heterodox economist who has dedicated the last years of his research to this issue: “In green economy there is full awareness of operating with high *strategic and competitive value*. Also in nature there is strategy, intelligence, capability of action in any observed case in point. Also in nature there is competition and, in fact, the fittest and the genetically strongest survives. Or the one who adopts the best procreation strategy [...] The green economy and the social model which it shapes are fully sustainable insofar as their general processes are engrained in a closed-cycle, 'systemic' vision. Such a vision is similar to the natural one, whose basic logics are determined by chemical-physical-biological elements” (Ricotti 2010: 103 / 171. Our translation).

As we see, at a first sight the argument seems reasonable and scientifically sound; moreover, its ostentatious simplicity seems to mantle it with an aura of indisputability: after all, “nature knows better” and all humans should follow its example, re-entering in it, re-integrate the realm of anthropic production within the much broader realm of living production. Things, nonetheless, are not exactly like this. In fact, under which condition is it possible to even “think” that natural cycles work “better” than industrial ones? Obviously, under the condition of their respective *comparability*. What is needed, in other words, is the transformation of nature from material basis of living being's reproduction to *provider of biological services*.<sup>1</sup> For bio-mimicry to become a viable politico-economical platform it is necessary to *have*

<sup>1</sup> Hawken, Lovins and Hunter Lovins (1999) frame the issue of monetarily measuring nature as provider of biological services in the following terms: “Valuing natural capital is a difficult and imprecise exercise at best. Nonetheless, several recent assessments have estimated that biological services flowing directly into society from the stock of natural capital are worth at least US\$ 36 trillion annually. That figure is close to the annual gross world product of approximately US\$ 39 trillion – a striking measure of the value of natural capital for the economy. If natural capital stocks were given a monetary value, assuming the assets yielded 'interest' of US\$ 36 trillion annually, the world's natural capital would be valued at somewhere between US\$ 400 and US \$500 trillion – tens of thousands of dollars for every person on the planet. That is undoubtedly a conservative figure given the fact that anything we can't live without and can't replace at any price could be said to have an infinite value” (Hawken, Lovins and Hunter Lovins 1999: 5).

*preliminarily economized ecology*. This is a perfect representation of the process through which *neoliberal environments* are created: we are kept in the paradox of proposing a “return to nature” which is nothing else than a further step in the direction of omni-pervasiveness of the subject of economic thinking.

It is instructive to note that, according to bio-mimicry supporters, the best (but most often the only) way to imitate living systems is to *measure and enforce their monetary value*. “Give a price to nature!” was, in fact, one of the slogans of *Grenelle de l’environnement*, an ambitious and world-wide celebrated program – launched in 2007 by newly elected French President Nicolas Sarkozy – whose main goal was to make environmental policies the cornerstone of a new model of economic development, no longer based on a quantitative increase of the volume of exchanges but rather based on a valorization of the quality of life. One of the most interesting aspects of the debates surrounding the event was the argument according to which by considering raw materials “gratuitous”, what is obtained is a series of “*deliberate distortions in the marketplace*” (Hawken, Lovins and Hunter Lovins 1999: 15. Our emphasis). Here we find ourselves in the very core of neoliberal governmentality: by turning the environment from “condition” to “factor” of production, it becomes a crucial element of the process of value creation, opening up unprecedented opportunities for profit-making. It is as though, in a Marxian sense, capital reaches emancipation from nature just to reshape it in its own image and likeness.

## CONCLUSIONS

The process of economization of the environment implied by the concept of bio-mimicry surely entails a number of social risks. Amongst them: it might reduce nature to its monetary measurement; it problematically assimilates a stock value to a flow value; it obstructs the implementation of alternative policies as well as the development of different research agendas. By modelling nature according to industrial needs or competitive frameworks a crucial danger emerges: the possibility of tackling an undeniable environmental crisis by deepening an already unjust social polarization. Even worse, such modelling seems to ignore the manifest short-circuit between the *environmental goals* of green policies and their *economical means*. As a quick example, let me refer to carbon trading, and especially to the EU Emissions Trading Scheme: although no ecological improvement has been made in the almost eight years of its existence, a huge amount of economic value has been created and then transferred to fossil fuel-intensive companies through the production of what can be called *climate rent*.

Clearly, there are good reasons to criticize such outcomes. However, it is my conviction that it would be a mistake to consider this scenario as a necessary one: the internalization of nature within economic circuits of valorization makes both green economy and bio-based economics *productive*, not necessarily *exploitative*. In other words, such concepts should be conceived of as contested struggle terrains rather than flawless strategies of profit-making. A public goods-oriented bioeconomy (such as that proposed by Schmid et al.), as well as a common-based green economy (as that advocated by the global climate justice movement) are actually able – at least in principle – to drive a *just transition* to an ecologically sound society. They could provide the practical as well as theoretical background for tackling the social, economic and ecological crises simultaneously. For such a background to emerge, however, market competitiveness as well as sacred property rights regimes should be counterbalanced by common cooperation and sharing-cultures. The specific modalities of this transitional processes are, of course, much beyond the limited scope of this paper. Simply, my hope is to have roughly delineated a common ground to reflect on notions such as the green economy and bio-based economics in order to envisage a socially viable, environmentally sustainable and economically feasible future.



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