Rethinking regulation for promoting an ecologically based approach to sustainability

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Abstract

The present paper argues for the necessity to rethink regulation in order to effectively promote a new ecologically based approach to sustainability. The paper firstly focuses on the following fundamental question: what is the original and correct meaning of sustainability? In order to try and answer such question, the historical origin of the term sustainability is traced back and analysed. Secondly, on the basis of the findings of the analysis on the original and correct meaning of the term sustainability, an essential and foremost research question is investigated: sustainability of what? This is a crucial issue, given the fact that, despite the widespread use of the term sustainability, it is evident that a general understanding of what should be sustained or, in other terms, of what should be the object and the aim of sustainability, is missing. Then, on the basis of the findings of the two above mentioned questions, the issue of how to rethink regulation for promoting a new ecologically based approach to sustainability is tackled. In such a context, a triple change of perspective is proposed, with the aim to contribute to the shift from the current economic model, based on the mantra of an infinite economic growth, to a more balanced approach, based on the concept of ecological integrity, aimed at promoting human development in harmony with nature.

***Keywords**: environmental law, regulation, ecological sustainability, ecological integrity, nature.*

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1. INTRODUCTION

In the last few years, we have witnessed a sharp increase in the use of the term sustainability in the political debate. Sustainability has recently become a general objective of the international community as well as of many business activities, NGOs initiatives and civil society at large. Such a progressive gain of importance has been marked in 2015 by the United Nations General Assembly adoption of the Sustainable Development Goals (SDGs) and the related 2030 Agenda for Sustainable Development.[1] Such an agenda aims at providing guidance and a reference framework for the development of international as well as domestic policies finalised to the pursuit of sustainability in connection with economic and developmental policies.[2]

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1 United Nations General Assembly (UNGA), *Transforming Our World: the 2030 Agenda for Sustainable Development*, Resolution adopted on 25 September 2015. The 2030 Agenda encompasses 17 goals and several related targets that will be monitored through a complex set of indicators. All States of the international community are called upon to elaborate national action plans aimed at implementing the 2030 Agenda.

2 See M. Montini and F. Volpe, *Sustainable Development Goals: much ado about nothing?*, in Environmental Liability, 2015, issue 4, pp. 141-147.

However, the recent success of the terms sustainability and sustainable from the political and planning point of view has not been followed by an adequate process of refinement in the full understanding and consciousness, of both policymakers and the public at large, of the proper meaning of such a concept. For this reason, our current age has been defined by Engelmann "the age of sustainababble, a cacophonous profusion of uses of the word sustainable to mean anything from environmentally better to cool".[3] In order to reverse the tendency to a distorted, "overused and misunderstood" use of the terms sustainability and sustainable, well identified by Engelmann, it is therefore absolutely necessary to understand the true nature of sustainability and its scope in order to be able to properly assess the limits and the shortcomings of its present use and rethink the regulatory system in a way that may effectively pursuit sustainability, beyond the political slogans and the mere planning objectives.

In this sense, in our opinion, the preliminary focus of the analysis should be on the following fundamental question: what is the original and correct meaning of sustainability? In order to try and answer such question, the historical origin of the term sustainability will be traced back and analysed. Within such a context, we will try to determine whether an original and correct meaning of the concept of sustainability exists or whether, quite on the contrary, it should be concluded that there are several possible meanings of such concept, as it seems to emerge from the current political debate and widespread use of the term in so many different contexts and with sometimes quite diverging meanings and objectives.

On the basis of the findings of the preliminary analysis on the original and correct meaning of the term sustainability, we should be able to address an even more fundamental issue. In such a context, the essential and foremost question that will guide our analysis is the following one: sustainability of what? This is a truly fundamental question. In fact, the major problem that we are currently witnessing with regard to the use of the term sustainability in the contemporary political debate is related to the fact that it is not immediately evident from a comparative analysis of all the possible uses of the term what should be sustained. Nowadays, we are in the paradoxical situation that almost everybody agrees that sustainability should be pursued. However, it is not clear at all and there is no general understanding of what should be sustained or, in other terms, of what should be the object and the aim of sustainability. For many people, in fact,

3 See R. Engelmann, *Beyond Sustainababble*, State of the World, 2013, pp. 3-16, at p. 3.

sustainability should be primarily understood as sustainability of the current economic model, that is premised on the promotion of an infinite economic growth. However, we are not quite sure that this should be the correct understanding of sustainability. In fact, on the basis of our findings on the original meaning of sustainability, sustainability should be essentially referred to as a kind of human development that aims at promoting an ecologically-based idea of sustainability. Such a conception should enable, in our opinion, to overcome the shortcomings of the current economic model and support the necessary shift towards a revised approach to human development.

Finally, on the basis of the outcomes of our analysis on the two essential and fundamental questions raised above, namely the one regarding the determination of the original and correct meaning of sustainability and the one regarding what should be sustained by sustainability, we should then be able to address another key issue, which in fact represents the core part of our analysis. Such a question refers to the need to rethink the current regulatory system, that so far has been strictly related to the promotion of the dominant economic model, based on the mantra of economic growth as its paramount objective. As we will see, rethinking regulation also implies the necessity to promote a marked change of perspective, from a triple point of view. In our opinion, in fact, only if the regulatory system will be substantially revised on the basis of the marked triple change of perspective, that will be presented and examined below, it will be possible to promote a true shift towards a more balanced approach aimed at promoting human development in harmony with nature.

2. THE CONCEPT OF SUSTAINABILITY

2.1. What is the original and correct meaning of sustainability?

In order to adequately try and define what sustainability is, it seems necessary to focus first of all on the question of the historical and cultural origin and the main characteristics of such a concept. In this sense, it is particularly useful to start from the very accurate analysis on the origin of the concept of sustainability

provided by Grober.[4] From such a detailed analysis, it emerges that the origin of the term sustainability traces back to the writings of the scientist and forestry management expert Hans Carl Von Carlowitz, who for the first time appears to have used the term "sustainable" ("*Nachhaltig"*, in the original German language), in order to refer to the correct forestry management practices advocated in his magisterial work *Sylvicoltura Oeconomica* (*or A Guide to the Cultivation of Native Trees*), published in 1713.[5] Von Carlowitz' work contains a sharp critique of the forestry policies in use at his time, which were too focused on short-term economic gains instead of looking at a long-term proper policy of forestry management and harvesting. He notes that common practices "*use wood wastefully, believing it to be inexhaustible*" and, learning from the wrong practices of his contemporaries, he proposes what has been defined by Grober an "*iron rule against over-exploitation of forests*". To this effect, he starts by arguing that "*wood should be used with care"* ("*pfleglich"*)",[6] and then proceeds to deepening his analysis by proposing "*how such a conservation and cultivation of wood can be arranged to make possible a continuous, steady and sustaining use*" ("*nachhaltende Nutzung*").[7] This is, according to Grober, the first time that the concept of sustainability, or more precisely of sustainable use, is "*used in its modern meaning*".[8]

Since the publication of *Sylvicoltura Oeconomica,* Von Carlowitz's work exercised a great influence on the development of sustainable forestry management policies and practices.[9] However, the most profound roots of the concept of sustainability, although the term itself was not yet in use, may be said to date back to the experiences which occurred much earlier, between the 15th and the 17th centuries, in several European countries. The most relevant of those

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4 U. Grober, *Sustainability. A cultural history*, Green Books, Cambridge, 2010.

5 H. C. Von Carlowitz, *Sylvicoltura Oeconomica oder Naturmaessige Anweisung zur Wilden Baum-Zucht*, Leipzig, 1713, reprinted by Freiberg, TU Bergakademie, 2000.

6 U. Grober, *Sustainability*, cit., p. 82.

7 U. Grober, *Sustainability*, cit., p. 83.

8 U. Grober, *Sustainability*, cit., p. 83.

9 U. Grober, *Sustainability*, cit., pp. 81-89. For instance, Grober recalls that a few decades after the publication of Von Carlowitz's *Sylvicoltura Oeconomica*, the Duchess Anna Amalia of Saxony-Weimar adopted the first forestry reform explicitly aimed at the sustainable management of forests. It is interesting to note that it was probably not a case that this reform took place in the cultural environment of Weimar, shaped by the Romanticism thought of Goethe and Schiller.

experiences, developed in connection with the search for correct forestry management practices, have been well documented by Grober, who analysed the cases of the Republic of Venice, England and France.[10]

The first example of the evolution towards sustainable forestry management practices is represented by the case of the Republic of Venice. Although at a first glance it may not appear so evident, Grober correctly recalls that wood was the "*principal raw material*", which enabled the continued power of Venice over the Mediterranean Sea for several centuries.[11] In fact, wood was both the main material for the construction of the Venetian ships in the *Arsenal* as well as for the foundations of all its buildings. Therefore, it is not a surprise that the Venice Senate in 1458 instituted the office of the "*Provveditori sopra boschi*" (Officers taking care of woods) and about twenty years later, in 1476, passed a comprehensive legislation regulating the use of forests in the mainland under Venetian control, which has been described as "*the most significant piece of forestry law ever passed by the Senate*".[12] Such a modern forestry management legislation, managed by the dedicated officers mentioned above, enabled the Republic of Venice to introduce and maintain for many centuries sustainable forestry practices. However, Grober notes that, unfortunately, through the time the growing affluence of the Venetian society caused a sharp increase in the demand of wood, that ended up causing a progressive deterioration of the Venetian controlled forests and more generally led to "*the carrying capacity of the ecological systems*" being gradually exceeded.[13]

The second example presented and analysed by Grober regards the case of England. Here, the evolution towards the sustainable forestry management is related to John Evelyn, a very influential intellectual and one of the founding members of the *Royal Society.*[14] He is the author of *Sylva (or a Discourse of Forest Trees and the Propagation of Timber)*,[15] a treatise on the correct management of woods and timber, which was published in 1664, on the basis of a

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10 U. Grober, *Sustainability*, cit., pp. 59-75, dealing with the introduction of sustainable forestry management policies in the Republic of Venice, in England and in France.

11 U. Grober, *Sustainability*, cit., pp. 59-63.

12 K. Appuhun, *A Forest on the Sea*, Johns Hopkins Univ. Press, Baltimore, 2009, cited in U. Grober, *Sustainability*, cit., p. 60.

13 U. Grober, *Sustainability*, cit., p. 63.

14 Royal Society of London for Improving Natural Knowledge, commonly known as Royal Society, established in 1660.

paper presented two years earlier at the newly established Royal Society. In his work, John Evelyn focused on a specific urgent enquiry: how to prevent the foreseeable shortage of timber in England, which may have direct negative consequences on the possibility to maintain a great naval fleet. To this effect, he advocated a systematic and orderly plantation of new trees as the best solution to increase the stock of wood in the long term. In such a context, a recurring theme of his work is related to the expected benefits for posterity and he anticipates the modern theme of intergenerational equity by recalling that each generation is "*non sibi solus natus*", or in other words that it is "*not born for itself alone, but rather born for posterity*".[16] In other words, he proposes a careful and sustainable management of forestry, with a long-term perspective in mind and in line with the imperative of obeying to nature. As noted by Grober, the publication of *Sylva* was a great success and the plantation of trees became a sort of national sport in England. This notwithstanding, the subsequent country's policies mostly followed different patterns, by focusing mainly on importing timber resources from all over the globe and gradually substituting wood with other raw materials.[17]

The third example presented and analysed by Grober regards the case of France. Here, in 1669 Louis XIV (the Sun King) issued the *Ordonnances sur le fait des Eaux et Forets*,[18] which had been prepared under the direction and inspiration of Jean-Baptiste Colbert.[19] The new comprehensive forestry laws aimed at repairing the "disorder" in the woods management and restore the power of the State in the control of the woods which belonged to the Crown, so as to avoid the expected timber shortage and ensure enough wood for the national ship-building industry. To this effect, the laws introduced a wise regulated management aimed at making sure that "*the fruits will be passed on posterity*". Although the French reform did not share the broad vision of John Evelyn's proposals, being much more focused on a managerial perspective of forestry management, it clearly emerges from the language used here, that despite the term sustainability is not used yet, the main objective is in fact to promote a wise and sustainable forestry

15 J. Evelyn, *Sylva, or a Discourse of Forest Trees and the Propagation of Timber*, 1664, reprinted in Guy de Bedoyere (ed.), *The writings of John Evelyn*, Boydell Press, 1995.

16 U. Grober, *Sustainability*, cit., p. 69.

17 U. Grober, *Sustainability*, cit., p. 70.

18 *Ordonnances sur le fait des Eaux et Forets*, 1669.

19 U. Grober, *Sustainability*, cit., pp. 71-75.

use and the maintenance of the forest's capacity to regenerate.[20] Even in the case of the French reform, however, its concrete effects fell short of the expected results and, as a consequence, Grober concludes that "*on the eve of the Revolution in 1789, there was less woodland in France than in 1669*".[21]

So much can be said for the historical roots of the term sustainability. However, as for the "cultural" roots of the concept, these could be traced back a few centuries earlier than the time of the forestry reforms occurred in several European countries between the 15th and 18th centuries. In particular, according to Grober, it can be argued that the idea of sustainability was already present in the *Cantico delle Creature* (*Canticle of the Sun*) of St. Francis, dated 1224, where a new relationship on a equal footing between humans, other living beings and nature is promoted.[22] Such a vision was quite revolutionary and deeply opposed to the traditional idea of dominance of man over nature which had constantly shaped the main Christian culture through the centuries (and unfortunately continued to do also thereafter). Such a vision and culture of dominance, which had been refused by St. Francis several centuries ago, has been only very recently officially rebutted by Pope Francis, in his Encyclical Letter *Laudato Sì* (*On Care For Our Common Home*),[23] clearly inspired by St. Francis *Cantico delle Creature*, where a revised relationship between humans and nature is proposed, based on a more responsible approach to be taken by human beings towards all other creatures and the Earth as a whole.[24]

On the basis of the analysis conducted above on the historical and cultural roots of the term sustainability, it clearly emerges that the concept is deeply rooted in an ecological dimension, which speaks of the need for a wise management of natural resources and a harmonious relationship between humans and nature. Such an important finding opens the way for the analysis of the issue that we would like to address in the next paragraph, namely, what should be sustained by sustainability?

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20 U. Grober, *Sustainability*, cit., pp. 72-73.

21 U. Grober, *Sustainability*, cit., p. 75

22 St. Francis, *Cantico delle Creature* (*Canticle of the Sun or Canticle of Creatures*), 1224.

23 Pope Francis, Encyclical Letter *Laudato Sì. On Care For Our Common Home*, 2015.

24 For a comment on the Encyclical Letter *Laudato Sì*, see M. Montini and F. Volpe, *In Praise of Sustainability: The Encyclical Letter Laudato Sì and its Legal-Economic Implications*, in *Italian Yearbook of International Law*, Vol. XXV (2015), 2016.

2.2. Sustainability of what?

The starting point for the analysis of the present paragraph ought to be the recognition that sustainability is often used in many different ways and for different and sometimes conflicting objectives. In fact, sustainability is often given different meanings depending on the context and the scientific domain in which it is at stake.[25] In our opinion, this variety of approaches should be reduced or at least rationalised. The pursuit of a more correct understanding of sustainability, however, essentially depends on the ability to answer the following fundamental question: what should be sustained by sustainability? In fact, it seems to us that it is not the pursuit of an unlimited growth that should be promoted under the heading of sustainability, as it is unfortunately often argued by many. A true human development, which fully embeds environmental and social considerations, should be pursued instead. This should be premised on the absolute necessity to promote patterns of development which fully respect the maintenance of the integrity and healthy state of the ecosystems which support life on the Planet. It is only by so doing, that humanity will be able to flourish on the Planet and the so-called sixth mass extinction might be avoided.[26]

After this brief introduction to the topic, it is now time to try and answer our basic and fundamental question: what should be sustained by sustainability? Our analysis ought to start from the Brundtland Report, insofar it is from its adoption that the concept of sustainable development has rapidly gained the centre of the stage in the political and scientific debate. In the Brundtland Report's (*Our Common Future*) definition of sustainable development the original strong connection of sustainability with the ecological dimension was already blurred. Thus, despite the explicit call that "*sustainable global development requires that those who are more affluent adopt lifestyles within the planet's*

25 M. R. Engelmann, *Beyond Sustainababble*, cit., pp. 3-16. See also M. Gatto, *Sustainability: Is it a well defined concept?*, in Ecological Applications, 1995, vol. 5, pp. 1181-1183, at p. 1181. The author identifies three main distinct definition of sustainable development: sustained yield of resources that derive from exploitation of populations and ecosystems (applied biologist's definition); sustained abundance and genotypic diversity of individual species in ecosystems subject to human exploitation or, more generally, intervention (ecologist's definition); sustained economic development without compromising the existing resources for future generations (economist's definition).

26 E. Colbert, *The Sixth Extinction. An unnatural history*, Bloomsbury Publishing, London, 2014.

ecological means",[27] sustainable development was turned into the well-known type of development which meets the needs of the present (intra-generational equity) without compromising the ability of future generations to meet their own needs (inter-generational equity).[28] In such a context, any meaningful reference to environmental quality, ecological integrity, ecosystem health or biodiversity is omitted.[29] Furthermore, if from the one side economic growth and resources depletion are detected by the Brundtland Report as the causes of environmental and social problems, from the other side an increased growth is advocated as the solution to poverty and degradation.[30] According to Bosselmann, the vagueness of the sustainable development definition contained in the Brundtland Report "*opened up the possibility of downplaying sustainability*".[31] However, as recognised by the same author, the Brundtland Commission was called to address not only environmental degradation, but also to try and reconcile "*the North's unsustainable 'over-development' with the South's 'under-development'*."[32] Therefore, the Brundtland Report resulted in a "compromise" among the various interests at stake, so as to find a consensus on the term within the international community.[33] By so doing, however, the concept failed to properly recognise that "*human needs can only ever be met within ecological boundaries*".[34] Thus, sustainable development progressively lost its ecological core.[35] In other words, it may be said that it gradually lost its original power that, according to Daly, consisted in its capacity of reflecting and evoking "*a latent shift in our vision of how the economic activities of human beings are related to the natural world – an ecosystem which is finite, non-growing, and materially closed.*" This perspective,

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27 World Commission On Environment And Development, *Our Common Future*, Oxford University Press, 1987, para. IV.3 (29).

28 World Commission On Environment And Development, *Our Common Future*, cit., para IV.3 (27).

29 B. Callicott and K. Mumford, *Ecological Sustainability as a Conservation Concept*, in Conservation Biology, 1997, vol. 11, No. 1, pp. 32-40, at p. 35.

30 D. C. Korten, *Sustainable Development: A Review Essay*, in World Policy Journal, 1991-92, pp. 157-190, p. 161.

31 K. Bosselmann, *The principle of sustainability. Transforming law and governance*, 2nd. ed., Routledge, 2016, p. 5.

32 K. Bosselmann, *The principle of sustainability. Transforming law and governance*, cit., p. 50.

33 R. W. Kates T. M. Parris and A. Leiserowitz *What is sustainable development? Goals, indicators, values, and practice*, in Environment, 2005, vol. 47, issue 3, pp. 8-21, at p. 19.

34 K. Bosselmann, *The principle of sustainability. Transforming law and governance*, cit., p. 52.

35 K. Bosselmann, *The principle of sustainability. Transforming law and governance*, cit., pp. 114-115.

according to Daly, should involve "*replacing the economic norm of quantitative expansion (growth) with that of qualitative improvement (development), as the path of future progress.*"[36]

Instead, the compromising three-pillars structure (environmental, economic and social) has gradually prevailed in the last few decades. The practice of the recent years, in fact, has shown that, within such a tripartite structure, the environmental dimension tends to be dominated and marginalised by the two other dimensions, which, by jointly promoting development at all costs, contribute to downgrade the relevance of the environmental requirements.[37] In order to solve such a criticality, some scholars suggested alternative tri-partitions for the sustainable development concept. For instance, Pulselli, Bastianoni, Marchettini and Tiezzi proposed a tri-partition based on three biophysical pillars: the biophysical limits, the relations within the living systems and the time.[38] Another interesting alternative formulation is the one developed by Robinson and Tinker, which consists in the so-called "three imperatives": the ecological imperative to live within the carrying capacity of the Earth; the economic imperative to secure adequate living standards to all human beings; the social imperative to promote social structures and governance systems that can spread the values upon which people would like to live.[39]

The experience in the last few decades shows, however, that when the quest for sustainability is merged into the pursuit of sustainable development, there is a very high risk that sustainability is not correctly understood.[40] In our opinion, the main reason for that is related to the fact that sustainability is often used not so much in the form of a noun, but rather in the form of an adjective. In fact, if the accent is posed on the noun *development* rather than on the adjective *sustainable* this may easily lead to the wrong perception that what should be sustained is

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36 H. E. Daly, *Beyond Growth. The Economics of Sustainable Development*, Beacon Press, 1996, p. 1.

37 M. Montini, *Investimenti internazionali, protezione dell'ambiente e sviluppo sostenibile*, Giuffré, Milano, 2015, pp. 27-28.

38 F. Pulselli, S. Bastianoni, N. Marchettini & E. Tiezzi, La soglia della sostenibilità. Quello che il PIL non dice, Donzelli, Roma, 2011, pp. 54 ff. See also E. Tiezzi, *Tempi storici, tempi biologici*, Donzelli editore, 2005, p. 28.

39 J. Robinson and J. Tinker, *Reconciling Ecological, Economic, and Social Imperatives*, in J. Schnurr and S. Holtz (eds.), The Cornerstone of Development. Integrating Environmental, Social and Economic Policies, Lewis Publishers, 1998, pp. 9-44, at p. 22.

40 R. Engelmann, *Beyond Sustainababble*, cit., pp. 3-16.

development as such, which is often understood as referring mainly, if not exclusively, to economic growth and the progressive increase of GDP. This is not, however, the correct interpretation. In this sense, it appears that sustainable development should not refer to a kind of economic development that may endure over a long time. Instead, it should indicate a sort of human development that is capable to promote and achieve in a combined manner both economic objectives as well as social and environmental goals. This is (or should be) the right interpretation of the concept of sustainable development, which may give a significant role to the term sustainable and enable a meaningful interpretation of the three pillars structure, according to which sustainable development should be the product of the inter-linked promotion of its economic, social and environmental dimensions. Therefore, if sustainable is intended in a qualitative rather than a quantitative sense, it appears immediately clear that what should be sustained is not economic development (or growth) at all costs, rather a sort of human development which is premised on the objective to maintain the ecological integrity and health of ecosystems.[41] In other words, the quest for sustainability should relate to the attempt to achieve a dynamic equilibrium (in a good status) of the ecosystems that support life on the Planet, on the basis of ecologically-driven reasons. In this way, the concept should be essentially intended in qualitative rather than in quantitative terms.

This is not all, however. There are, in fact, also physical reasons why a qualitative rather than quantitative interpretation of sustainability in the context of the expression of sustainable development should be preferred. Such reasons relate to the second principle of thermodynamics, which embeds the so-called entropy law. This demonstrates that the quantity of available energy to perform work useful for human purposes is progressively reduced each time it undergoes transformations such the ones caused by economic activities. Each process of exploitation of natural resources by human activities implies a transformation of energy and matter and leads to a decrease in the quantity of the available energy. Thus, there is an inevitably process of progressive decrease of the available energy on the Planet. The entropy law has been relied upon in order to explain why the pursuit of an infinite economic growth on a limited planet is physically impossible. In this sense, one should refer in particular to the seminal work of Georgescu-

41 On the ecological integrity concept see, for instance, L. Westra, *Ecological Integrity and Global Governance. Science, ethics and the law*, Routledge, Abingdon, 2016.

Roegen.[42] On the basis of the analysis of the relevance of entropy law for the economic system conducted by Georgescu-Roegen, other authors have subsequently clarified that, in order to promote a correct understanding of sustainable development, it is necessary to firstly recognise that the economic system is a subsystem of the ecological one. In this sense, Daly has noted that the original notion of the environmental sustainability of the economic sub-system has been buried under other (not so helpful) extensions such as "*social sustainability, political sustainability, financial sustainability, cultural sustainability and on and on*".[43] In other words, in his view, the fact that the economic system is a subsystem of the environmental one, from which it depends both as a source of raw materials inputs and as a sink for waste outputs, has not been given proper and adequate consideration.[44] In fact, the mainstream dominant economic theory is still anchored to the traditional view according to which the ecological and natural resources constraints are not relevant and still continues to consider the economic system as *de facto* an isolated one, without any dependency from the ecosystem.[45] Such model, calling for a limitless economic growth, does not take into proper account its inherent contrast with the biosphere, the "*safe-operating space*", characterised by limited natural resources and limited sinks for waste and pollution.[46] The economy, in fact, should be correctly understood as a sub-system

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42 See, for instance, N. Georgescu-Roegen, *The Entropy Law and the Economic Process*, Harvard University Press, 1971; N. Georgescu-Roegen, *The Entropy Law and the Economic Process in Retrospect*, in Eastern Economic Journal, 1986, vol. 12, issue 1, pp. 3-25.

43 H. E. Daly, *Beyond Growth. The Economics of Sustainable Development*, cit., p. 9. In such a context, Daly notes that "*We expected one day to hear about sustainable sustainability" and that "any definition that excludes nothing is a worthless definition*".

44 H. E. Daly, *Beyond Growth. The Economics of Sustainable Development*, cit., p. 6.

45 H. E. Daly, *Beyond Growth. The Economics of Sustainable Development*, cit., p. 49.

46 J. Rockström, W. Steffen, K. Noone, Å. Persson, F. Stuart III Chapin, E. Lambin, T. M. Lenton, M. Scheffer, C. Folke, H. J. Schellnhuber, B. Nykvist, C. A. de Wit, T. Hughes, S. van der Leeuw, H. Rodhe, S. Sörlin, P. K. Snyder, R. Costanza, U. Svedin, M. Falkenmark, L. Karlberg, R. W. Corell, V. J. Fabry, J. Hansen, B. Walker, D. Liverman, K. Richardson, P. Crutzen and J. Foley, *Planetary boundaries: exploring the safe operating space for humanity*, in Ecology and Society, 2009, vol. 14, issue 2, No. 32, at www.ecologyandsociety.org/vol14/iss2/art32/; J. Rockstrom, W. Steffen, K. Noone, Å. Persson, F. Stuart III Chapin, E. Lambin, T. M. Lenton, M. Scheffer, C. Folke, H. J. Schellnhuber, B. Nykvist, C. A. de Wit, T. Hughes, S. van der Leeuw, H. Rodhe, S. Sörlin, P. K. Snyder, R. Costanza, U. Svedin, M. Falkenmark, L. Karlberg, R. W. Corell, V. J. Fabry, J. Hansen, B. Walker, D. Liverman, K. Richardson, P. Crutzen and J. Foley, *A Safe Operating Space for Humanity*, in Nature, 2009, vol. 461, No. 7263, pp. 472-475. On this issue

of the ecosystem and humanity should take into account that "*no subsystem can expand beyond the capacity of the total system of which it is a part*".[47] In this sense, it is interesting to note that Pope Francis in his 2015 Encyclical Letter "Laudato Sì" takes a very similar position, by affirming that "*the idea of infinite or unlimited growth, which proves so attractive to economists, financiers and experts in technology [...] is based on the lie that there is an infinite supply of the earth's goods, and this leads to the planet being squeezed dry beyond every limit. It is the false notion that 'an infinite quantity of energy and resources are available, that it is possible to renew them quickly, and that the negative effects of the exploitation of the natural order can be easily absorbed'*."[48]

We can therefore conclude that there are both ecological reasons as well as physical reasons which explain why an infinite economic growth on a finite planet is physically impossible. This, in turn, seems to provide a clear answer to our initial question, namely what should be sustained by sustainability. In fact, it seems evident that if the human development is not premised on the protection of the health and integrity of the ecosystems that sustain life on the Planet and if it is not promoted in a way which recognises the necessity of a wise, prudent and rational use of the limited natural resources available on Earth, it will never be possible to achieve a truly sustainable development. Moreover, as correctly noted by Bosselmann, sustainability should be understood as a "*prerequisite for development and not a mere aspect*".[49] In sum, it emerges quite clearly that the quest for a correct understanding and interpretation of the term sustainable, within the complex concept of sustainable development, is not merely an academic question, but it is an absolute practical necessity in order to take sustainability seriously and give it a meaningful and relevant role.

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see also E. Tiezzi, *Tempi storici, tempi biologici*, cit.; H. E. Daly, *Beyond Growth. The Economics of Sustainable Development*, cit.; R. Costanza and H. E. Daly, *Natural Capital and Sustainable Development*, in Conservation Biology, 1992, vol. 6, No. 1, pp. 37-46.

47 J. Porritt, *Capitalism As If The World Matters*, London, Earthscan, 2007, p. 56.

48 Pope Francis, *Encyclical Letter "Laudato Sì"*, cit., para. 106.

49 K. Bosselmann, *The Principle of Sustainability*, cit., p. 59.

3. RETHINKING REGULATION FOR SUSTAINABILITY

On the basis of the analysis conducted above on the original and correct meaning of sustainability as well as on the question of what should be sustained by sustainability, it is now time to address the issue of how to rethink regulation for sustainability. As we have clearly seen above, the quest for sustainability should essentially refer to the maintenance of the process of dynamic equilibrium of ecosystems that enable life on the Planet. If this is the correct interpretation, it descends from there that sustainability as such cannot be "regulated" by human activities, but rather just preserved by them, through the conservation in a good status of the health and integrity of the ecosystems.

What should be (or could be) then regulated in order to promote sustainability? We are convinced that there is a wide and broad scope for regulation aimed at the promotion of sustainability. Such a scope is related to the regulation of human economic activities or, more generally speaking, of human development with a view to ensure that it does not cause negative effects on the preservation of the health and integrity of ecosystems, as explained above. Grounded on the ecologically based interpretation of sustainability, as proposed above, the second part of the paper discusses the characteristics that a regulatory system aimed at pursuing sustainability should have. In such a framework, we address the issue of "regulation for sustainability". Starting from this point of view, we specify the meaning of the expression "regulation for sustainability", what we intend by regulation and what should be the scope and reach of such a form of regulation.

Firstly, it is necessary to clarify that the expression "regulation for sustainability" is not referred to a legal system aimed at regulating the sustainability of ecosystems. Ecosystems, in fact, are intrinsically sustainable and do not need any kind of human intervention to regulate themselves.[50] Instead, regulation for sustainability refers to an organic and structured normative system aimed at regulating human activities so as to make them not operating in detriment of ecological sustainability. It is a system for the regulation of human

50 See B. C. Patten and E. P. Odum, *The cybernetic nature of ecosystems*, in The American Naturalist, 1981, vol. 118, issue 6, pp. 886-895, at p. 890. On the issue see also F. Capra and P. L. Luisi, *The Systems View of Life. A Unifying Vision*, Cambridge University Press, 2014, pp. 19-44.

activities, which is designed to pursue and guarantee the maintenance of the sustainability of ecosystems. This explains why we chose the expression "regulation *for* sustainability" instead of the most obvious one "regulation *of* sustainability".

Secondly, a premise on the concept of regulation that we assume as the reference point for our analysis is necessary. The issue of regulation has been addressed in the scientific literature mainly from a legal and economic point of view, often with different methodologies and outcomes. The work of Ogus, who tried to combine legal and economic theory in an integrated system, is a fundamental reference point in this context.[51] The analysis of Ogus is grounded in the definition of regulation provided by Selznick, according to which regulation can be defined as a "*sustained and focused control exercised by a public agency over activities that are valued by a community*".[52] Such definition stresses the role of the subjects in charge of regulating, usually public authorities, as well as the activities that are regulated, consisting in the most relevant activities in a given territory. Starting from such a definition, Ogus maintains that "*regulation is a fundamentally politico-economic concept and, as such, can best be understood by reference to different systems of economic organization and the legal forms which maintain them*".[53] Arguing from this definition, he notes that "*in all industrialised societies there is a tension between two systems of economic organizations*", namely the market system and the collectivist system, whose difference essentially lies in the different degree of the State intervention embedded into the system.[54] As a consequence, following Ogus's perspective, the term regulation becomes the reference concept that may be used to describe and analyse the different relationships that in a given context the legal system might have with the underpinning economic systems. On such a basis, we can assert that the importance of regulation lies in the leading role that it can play for the establishment and the evolution of a legal system comprising the whole set of policies and laws aimed at the attainment of a certain given objective.

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51 See A. I. Ogus, *Regulation. Legal Form and Economic Theory*, Clarendon, 1994.

52 See P. Selznick, *Focusing Organizational Research on Regulation*, in R. Noll (ed.), Regulatory Policy and the Social Sciences, University of California Press, 1985, p. 363, cited in A. I. Ogus, *Regulation*, cit., p. 1

53 See A. I. Ogus, *Regulation*, cit., p.1.

54 See A. I. Ogus, *Regulation*, cit., pp. 1-3.

Therefore, with specific reference to the issue of regulation for sustainability, we might argue that the starting point of the analysis should be the acknowledgement that it is not possible to pursue sustainability unless the whole legal and economic regulatory system is correspondingly re-assessed, adequately amended and properly revised. The current regulatory system is, in fact, structured so as to promote the pursuit of the economic objective of the maximisation of growth. However, as mentioned above, the mainstream economic and development model aimed at a potentially limitless economic growth clashes with the biophysical limits of Planet Earth, which is a finite system that cannot grow beyond its boundaries.[55] From such a finding, it originates the necessity to promote the establishment of a new regulatory system for sustainability, aimed at pursuing the long-term objective of sustainability and focused on recognising its ecological core, in connection with the promotion of social and economic goals.

By way of example, one can try to test the above mentioned definition of regulation for sustainability with regard to the current regulatory system in place for environmental protection. In such a case, it clearly appears that the legal regime developed so far, both at international and at national level, is not inspired by the attainment of sustainability. Quite on the contrary, it seems that it is substantially aimed at managing the negative externalities caused by the production and consumption processes of the current economic system. The main shortcoming consists in the piecemeal approach of such a regulatory system, which is mainly designed to cope with the various emergencies rather than to promote a comprehensive, integrated and long-term management of the environmental media.

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55 Already in the 19th century the world renown economist J. S. Mill paved the way for the acknowledgment of the impossibility of a limitless growth on a limited planet, by discussing the idea of a "stationary state": see J. S. Mill, *Principles of Political Economy*, vol. II, J. W. Parker and Son, 1857, pp. 320-326, cited in H. E. Daly, *Introduction*, in H. E. Daly (ed.), Toward a Steady-State Economy, W. H. Freeman and Co., 1973, p. 12. On the issue of the limits to growth see D. H. Meadows, D. L. Meadows and J. Randers, *Limits to Growth: The 30-Year Update, Club of Rome*, 2004; D. H. Meadows, D. L. Meadows and J. Randers, *Beyond the Limits: Confronting Global Collapse, Envisioning a Sustainable Future*, Club of Rome, 1992; D. H. Meadows, D. L. Meadows, J. Randers and W. W. Behrens III, *The Limits to Growth*, Potomac Associates, 1972; C. J. Cleveland and M. Ruth, *When, Where, and by How Much Do Biophysical Limits Constrain the Economic Process? A Survey of Nicholas Georgescu-Roegen's Contribution to Ecological Economics*, in Ecological Economics, 1997, vol. 22, pp. 203 ff; H. E. Daly, *The Economic Growth Debate: What Some Economists Have Learned But Many Have Not*, in Journal of Environmental Economics and Management, 1987, vol. 14, issue 4, pp. 323-336, at p. 325; E. Tiezzi, *Tempi storici. Tempi biologici*, cit.

The result is a high level of complexity and an excessive bureaucratic burden placed upon economic actors, often not coupled with an effective attainment of adequate environmental objectives.

Moreover, it has to be highlighted that the criticalities of the current regulatory system for environmental protection have been worsened in the last twenty years by the emergence of a deregulatory trend, which has proceeded in parallel with the progressive globalisation of markets. Such a deregulatory trend has been initially fostered by the liberal agenda promoted by Margaret Thatcher in the United Kingdom and Ronald Reagan in the United States starting from the eighties of last century.[56] At the roots of the deregulatory trend there is the fear that an excess of regulation may hamper the competitiveness of companies, which is connected with the parallel fear that the traditional command and control system may not even be effective in terms of environmental protection. In the last few years, therefore, there has been a substantial "involution" of the regulatory system for the protection of the environment, caused by the progressive implementation of the deregulatory agenda, which is characterised by a high risk of subjugation of environmental considerations to other types of goals, such as most notably economic interests. In such a context, the traditional absence of a unifying vision regarding the general goals which has always characterised environmental regulation has been coupled with the mentioned "involutionary" features of the deregulatory trend.

Therefore, the progressive implementation of the deregulatory trend is leading to the following paradoxical situation: environmental legislation, although correctly applied from a formal point of view, is likely to generate negative effects from a substantial (environmental protection) perspective. In fact, environmental regulation designed on the basis of the deregulatory trend may permit or, worse, even protect, not sustainable conducts. This has been well expressed by Westerlund, according to whom "*unless law is made sustainable, it will protect unsustainable conducts*".[57] In fact, Westerlund was one of the first scholars to

56 On the deregulation and the related risks see K. Bosselmann and B. J. Richardson, *Introduction: New Challenges for Environmental Law and Policy*, in K. Bosselmann and B. J. Richardson (eds.), Environmental Justice and Market Mechanisms, Kluwer Law International, 1999, pp. 3-18, at pp. 3-4; E. Rehbinder, *States Between Economic Deregulation and Environmental Responsibility*, in K. Bosselmann and B. J. Richardson (eds.), Environmental Justice and Market Mechanisms, cit., pp. 93-109.

57 S. Westerlund, *Theory for Sustainable Development*, in H. C. Bugge and C. Voigt (ed.), Sustainable Development in International and National Law, Europa Law Publishing, 2008, pp. 49 ss., at p. 54.

highlight that a complex system of laws is not sufficient to protect the environment if environmental regulation is not framed within a system aimed at pursuing ecological sustainability.[58] Therefore, drawing from Westerlund's analysis, we may argue that the new regulation for sustainability should first reinstate the original and correct ecological core meaning of sustainability and then develop, on this basis, a new regulatory system.

We can therefore conclude that, on the basis of the analysis conducted in the present section, it emerges very clearly the absolute necessity to rethink the current regulatory regime. This is urgently needed in order to make it possible to identify more clearly which practices are sustainable and which ones are not. This change should help to promote a type of regulation which truly aims at achieving sustainability and to this effect promote sustainable patterns of human development. However, as we explain in the next section, in order to successfully rethink and revise regulation and introduce an ecologically-oriented regulatory regime, it is necessary beforehand to promote a preliminary change of perspective in the general approach towards regulation.

4. PROMOTING A TRIPLE CHANGE OF PERSPECTIVE

In order to make it meaningful and effective, the new process of regulation for sustainability advocated above should be necessarily premised on a triple change of perspective, from three different points of view: the methodological perspective, the temporal perspective and the substantial perspective.

As for the methodological perspective, the necessity to reverse the current trend originates from the acknowledgement that ecological problems can hardly be tackled and solved with the traditional disciplinary approach. Such an attitude derives from the Cartesian scientific paradigm in which our society is deeply embedded, which has promoted a mechanistic approach to the world. On the basis of such methodology, nature is addressed through its reduction into parts. This has led to an extreme fragmentation of science within the various, constrained, scientific domains. Quite on the contrary, the sustainability challenge requires

58 *Ibidem*, p. 53.

overcoming the disciplinary fragmentation, combining the insights that can be gained through a disciplinary analysis with the holistic vision that can be reached by means of an inter- and trans- disciplinary approach. Therefore, it can be said that the correct methodology to be used in the regulation for sustainability is aimed at the creation of a comprehensive system, apt to gather within a single conceptual and methodological framework all the issues related to the promotion of sustainability. The adoption of such a methodology, based on the interplay of an "*integrative tendency*", which conceives every element as part of the whole, and a "*self-assertive tendency*", which values the unique features of each element, [59] is the necessary prerequisite for the promotion of a new system of regulation for sustainability which can try to solve the traditional fragmentation of environmental regulation.

As for the temporal perspective, the advocated new regulatory system for sustainability entails the necessity of a clear and sharp shift from the current short-term response approach to a medium-long term planning. Presently, the regulatory system is shaped on the basis of a short-term attitude as a consequence of its "emergency-solving" approach. In such a context, environmental law is designed to tackle the most relevant negative externalities, usually without a medium- or long-term framework and vision. This short-termism, coupled with the absence of a comprehensive vision, necessarily leads to an inherent lack of effectiveness of environmental law. Therefore, in order to properly address such a criticality the new regulatory system should aim at pursuing sustainability in the medium- long-term.

The third change of perspective advocated here refers to a change in the substantial perspective: regulation for sustainability should promote the shift from a system aimed at the attainment of economic goals to a system primarily aimed at the meeting of ecological sustainability objectives. Environmental regulation currently in place is characterised by a marked anthropocentric approach, as it emerges from the outcomes and the follow-ups of the 1972 Stockholm Conference, the 1992 Rio Conference and the 1992 Rio +20 Conference.[60] Such anthropocentric

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59 F. Capra and P. L. Luisi, *The Systems View of Life: A Unifying Vision*, Cambridge University Press, 2014, p. 65.

60 *The Future We Want, Report of the United Nations Conference on Environment and Development*, Rio de Janeiro, 27 June 2012, A/RES/66/288. On the Rio+20 Conference see for instance L. Pineschi, L*a Conferenza di Rio 2012: dallo Zero Draft a The Future We Want. Rio+20 o vent'anni trascorsi inutilmente*, in Rivista Giuridica dell'Ambiente, 2012, vol. 6, pp. 795 ff.

approach should be overcome in order to shape the future towards a regulatory system for sustainability, whose primary objective should be the protection of ecosystems and the promotion of a mutually beneficial coexistence between human activities and ecosystems health and integrity. To this effect, the new regulatory regime should be based on the concept of ecological sustainability,[61] so as to give full effect, for instance, to the approach advocated *inter alia* by the 2000 Earth Charter, that includes among its leading principles the respect for the Earth and life in all its variety.[62]

Furthermore, the change of substantial perspective entails the necessity to assess and revise the regulatory instruments used so far for environmental regulation. The current regulatory scenario is characterised by the use of two main types of instruments: command and control and economic instruments. In the last few years, we have witnessed a gradual shift from a rather simple command and control system to a more complex regime, in which the traditional command and control instruments are coupled with or replaced by market based ones.[63] Such an evolutionary process has been mainly driven by the growing worries about the lack of effectiveness and the excessive bureaucratic and economic costs often entailed by the implementation of command and control instruments. These critical features opened up the way to the gradual introduction of market-based instruments for the control of the major negative environmental externalities, in the framework of the deregulatory trend mentioned above.

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61 On the concept of ecological sustainability see K. Bosselmann, *The principle of sustainability. Transforming law and governance*, cit., in particular pp. 59-69; M. Montini, *Investimenti internazionali, protezione dell'ambiente e sviluppo sostenibile*, cit., 2015, in particular pp. 248-261; M. Montini, *Revising International Environmental law through the Paradigm of Ecological Sustainability*, in F. Lenzerini & A. Vrdoljak (eds.), *International Law for Common Goods: Normative Perspectives in Human Rights, Culture and Nature*, Hart Publishing, Oxford, 2014, pp. 271-287, in particular pp. 278-282; S. Westerlund, *Theory for Sustainable Development*, in H. C. Bugge and C. Voigt (eds.), *Sustainable Development in International and National Law, Europa Law Publishing*, Groningen, 2008, p. 47-66, at p. 60.

62 Earth Charter, 2000, www.earthcharter.org. In particular see art. 1 of the Earth Charter, which reads as follows: "1. Respect Earth and life in all its diversity. a. Recognize that all beings are interdependent and every form of life has value regardless of its worth to human beings. b. Affirm faith in the inherent dignity of all human beings and in the intellectual, artistic, ethical, and spiritual potential of humanity". On the Earth Charter see, for instance, K. Bosselmann and R. Engel, *The Earth Charter: a framework for global governance*, KIT Publishers, Amsterdam, 2010.

63 K. Bosselmann and B. J. Richardson, *Introduction: New Challenges for Environmental Law and Policy*, cit., pp. 3-4.

In our opinion, the new regulatory system for the promotion of ecological sustainability should start from a complete re-assessment and revision of the regulatory instruments used so far, in order to revise and improve the balance between command and control and market based instruments. How to proceed to such a rebalance? This is the key question that should be addressed in such a context. The starting point in this sense ought to be the acknowledgement that the new regulatory system should be grounded, as mentioned above, on a new methodology based on a holistic paradigm, which builds on the findings of the disciplinary analysis, but is inspired by a trans-disciplinary vision. This does not necessarily mean that a rejection or a profound revision of all the current regulatory instruments will be needed. Rather, it means that their re-assessment and revision, as well the rebalancing between the different types of instruments, should be conducted with a new approach and within the framework of a new comprehensive vision. Moreover, the success of the various instruments should not be judged from a mere formal point of view. Instead, it should be assessed from a substantial perspective, that aims at verifying the effective contribution of every single regulatory instrument to the attainment of the overall sustainability objective.

5. CONCLUSION

The plethora of the different and often contrasting uses of the term sustainability generates confusion and can paradoxically lead to legitimate every kind of allegedly sustainable conduct. Therefore, there is an absolute necessity to recover and reinstate the original and correct meaning of sustainability, in order to try and set a clear divide between sustainable and unsustainable policies and practices. As it emerges from the analysis conducted above, the core objective of sustainability ought to be an ecological one, aiming at the conservation of the health and integrity of the ecosystems which support life on Planet Earth. Such a finding, which has been aptly recognised and demonstrated by the relevant scientific literature, should be acknowledged also at a political and regulatory level. Science alone is not sufficient to achieve sustainability. This objective will be attained only if the regulatory system will be conceived and designed as to effectively promote the implementation of an ecologically based approach to sustainability. In this sense, in our opinion, a new regulatory system for

sustainability is urgently needed to manage human activities in order to ensure that they do not harm the health and integrity of ecosystems. The introduction of such a new regulatory system should be accompanied by a triple change of perspective, from the methodological, temporal and substantial points of view. The disciplinary, piecemeal and short-term approach which characterises the current regulatory system should be replaced by a trans-disciplinary, comprehensive and long-term perspective and a new balance between market based and command and control instruments should be pursued. The proposed changes seem to be absolutely necessary in order to move from the current regulatory system, that is prone to economic growth dictates, to a new regulatory system that is functional to the promotion of a development model based on ecological sustainability.