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Through the Paradigm of Ecological Sustainability

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Abstract

International environmental law is undergoing a serious crisis. In order to improve its “environmental effectiveness”, the adoption of a new founding paradigm is necessary. The new paradigm ought to be based on the concept of “ecological sustainability”, grounded on the duty to protect and restore the integrity of the eco-systems.

Besides setting the framework for the revision of international environmental law on the basis of the “ecological sustainability” paradigm, this paper focuses on its application in climate change law. In this sense, a critical analysis is provided on the application of the most relevant flexibility mechanisms foreseen at international level by the Kyoto Protocol, namely the Clean Development Mechanism (CDM) and Emissions Trading, as well as of the most interesting instruments applied at EU level, namely the European Union Emissions Trading Scheme (EU ETS) and Carbon Capture and Storage (CCS).

Keywords

International environmental law, environmental effectiveness, sustainable development, ecological sustainability, climate change law.

REVISING INTERNATIONAL ENVIRONMENTAL LAW THROUGH THE PARADIGM OF ECOLOGICAL SUSTAINABILITY

Massimiliano Montini *

I. Introduction

Despite the impressive existing framework of international environmental law, large amounts of scientific evidence show that the global environmental situation is declining. There is a growing perception that most of the existing multilateral environmental agreements (MEAs) are not very effective in either preventing or reducing environmental pollution, or in promoting more careful and sustainable use of natural resources. In other words, international environmental law is undergoing a serious “crisis”, essentially related to its “environmental effectiveness”, which is its capacity to achieve environmental protection objectives.

In order to improve its “environmental effectiveness”, the adoption of a new grounding paradigm for international environmental law is necessary. Such a paradigm should guide the interpretation and enforcement of existing legislation, as well as the development of new environmental legislation. The new paradigm should be based on the recognition of the ecological core of sustainable development and aim to the creation of a virtuous link between sustainable development, ecological sustainability and environmental law. Therefore, the new paradigm ought to be based on the concept of “ecological sustainability”, which should become the reference standard for the revision of international environmental law grounded on the duty to protect and restore the integrity of the eco-systems which support life on the planet.

Besides setting the framework for the revision of international environmental law on the basis of the “ecological sustainability” paradigm, this paper focuses on the terms for its meaningful application in a key area, namely climate change law. In this sense, various examples are given as to how the application of the existing legislation and the related instruments presently applied in this field could be revised in order to truly promote sustainability. In fact, especially with regard to some of the new instruments established under climate change legislation, both at international and at EU level, there is sometimes the perception that they really pursue neither environmental protection objectives nor ecological sustainability goals. In order to start to address this matter, a brief critical analysis is provided of the main issues related to the application of the most relevant flexibility mechanisms foreseen at international level by the Kyoto Protocol, namely the Clean Development Mechanism (CDM) and Emissions Trading, as well as of the most interesting EU instruments applied at EU level, namely the European Union Emissions Trading Scheme (EU ETS) and Carbon Capture and Storage (CCS).

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II. The Lack of Effectiveness of International Environmental Law

The Fifth Global Environment Outlook, issued by UNEP in June 2012, shows that the global environmental situation is declining in many areas, despite the impressive existing framework of international environmental policy and law.¹

In the four decades since the 1972 Stockholm Conference, which is normally said to coincide with the foundation of international environmental law, a huge number of treaties and soft law instruments have been concluded at international level. However, despite the rapid and impressive proliferation of international environmental law, D. Bodansky has posed the question as to whether “the accumulating mass of international environmental law has done very much to improve the environment”. There is in fact a growing perception that international environmental law has become overdeveloped over the years, and that this has happened in quite an uncoordinated way. The result is a sort of “treaty congestion”, which “creates the potential for duplication of efforts, lack of coordination, and even conflict between different legal regimes” within the environmental law field.²

A different reading of the unsatisfactory state of international environmental law, which focuses on the persistent institutional deficit at international level in environmental governance and on the lack of compulsory dispute settlement mechanisms, is provided by F. Francioni, who argues that: “In spite of the progressive development at the level of treaty law and soft law, international environmental law remains a weak and under-developed body of law”.³

A similar line of reasoning is put forward by U. Beyerlin and T. Marahun, who argue that despite “some success stories in specific fields, such as combating ozone depletion or trans-boundary air pollution”, “the normative system of international environmental law is far from perfect and shows severe gaps”. Moreover, being “aware of the fact that humankind today faces an ever-growing number of global environmental problems with tremendous threat potential”, they conclude that the “progress achieved to date is too fragmentary and sporadic”.⁴

These three ways of presenting and analysing the “crisis” currently affecting international environmental law focus on different aspects and raise various questions. In particular, the first highlights the treaty congestion which characterises the environmental sector, causing overlapping and sometimes conflicts between parallel treaty regimes, without necessarily making a positive contribution to the protection of the environment. The second raises the issue that this sector, despite the enormous quantity of existing legal instruments, remains rather weak due to the well-documented lack of appropriate international institutions with the capacity to authoritatively steer actions in this field, as well as the lack of compulsory dispute settlement mechanisms. The third perspective stresses the fact that the international environmental legal regime still has severe gaps and, with a few exceptions, is not able to tackle some of the most serious environmental problems effectively.

¹ See UNEP, Fifth Global Environment Outlook (GEO 5), 2012.

² See D. Bodansky, *The Art and Craft of International Environmental Law*, 2010, p. 35.

³ See F. Francioni, *Environmental Law*, in A. Cassese, *Realism, Utopia and the Future of International Law*, 2012, p. 442.

⁴ See U. Beyerlin and T. Marahun, *International Environmental Law*, 2011, p. 439.

The three points of view presented above to describe the current “crisis” of international environmental law all, either implicitly or explicitly, raise the question of the effectiveness of this *corpus* of norms. Nowadays, there is in fact a common understanding that most of the MEAs currently in force at international level are not very effective, be it in preventing or reducing environmental pollution, or in promoting more careful and sustainable use of natural resources. Despite this general common understanding, the question of the effectiveness of the international treaties is not so easy to tackle. Preliminarily, a decision must be reached as to how we define effectiveness and how we can measure it with regard to the environmental field.⁵ To this end, drawing from O. Young’s research, D. Bodansky has proposed to address the question of the effectiveness of international environmental law through three different kinds of effectiveness: legal effectiveness, behavioural effectiveness and problem-solving effectiveness.⁶

The first kind, namely legal effectiveness, refers to the compliance issue and aims to verify whether the official and formal goal of a certain treaty is really being achieved in objective terms. The second, namely behavioural effectiveness, analyses in rather subjective terms the capacity of a particular treaty to affect positive changes in the behaviour of the Parties, be they States or citizens, towards achieving the treaty’s goals. Finally, the third kind, that of problem-solving effectiveness, looks at whether a particular treaty effectively helps to achieve its ultimate objectives, or in other words, whether it contributes to addressing and solving the environmental problems it aims to address.

As D. Bodansky correctly observes, lawyers tend to concentrate on the legal effectiveness of environmental agreements. They normally focus their attention on whether the obligations of a certain treaty are effectively and formally respected by the Parties, and consequently, look at the degree of compliance that a certain agreement may be said to have achieved. This explains why so much effort has been devoted over the last twenty years to the challenge of promoting increased State compliance with international environmental obligations. In particular, given the fact that in the environmental field, maybe even more notably than in other areas of international law, States are quite reluctant to be subjected to traditional dispute settlement mechanisms, the efforts at the international level have mostly concentrated on the development of alternative dispute settlement or dispute avoidance mechanisms, normally called non-compliance regimes.⁷ These non-compliance regimes have proliferated particularly in the environmental field, where some of the most successful examples have taken place, for instance in relation to the Montreal Protocol on the Ozone Layer and the Kyoto Protocol on Climate Change.⁸

However, as D. Bodansky points out, “compliance by itself is a poor indicator of a treaty’s value because it is neither a necessary nor a sufficient condition for behavioural or problem-

⁵ O. R. Young (ed.), *International Governance: Protecting the Environment in a Stateless Society*, 1994, pp. 140-160.

⁶ See D. Bodansky, *cit.*, p. 253.

⁷ T. Treves et al (eds.), *Non-Compliance Procedures and Mechanisms and the Effectiveness of International Environmental Agreements*, 2009; R. B. Mitchell, *Compliance Theory: Compliance, Effectiveness, and Behaviour Change in International Environmental Law*, in D. Bodansky, J. Brunnée and E. Hey (eds.), *The Oxford Handbook of International Environmental Law*, 2007. p. 893-921; U. Beyerlin, P. T. Stoll, R. Wolfrum (eds.), *Ensuring Compliance with Multilateral Environmental Agreements*, 2006.

⁸ See M. Montini, *Improving Compliance with Multilateral Environmental Agreements through Positive Measures: The Case of the Kyoto Protocol on Climate Change* in A. Kiss, D. Shelton and K. Ishibashi (eds.), *Economic Globalization and Compliance with International Environmental Agreements*, 2003, pp. 157–179.

solving effectiveness”. In fact, “a high degree of compliance (or even perfect compliance) might mean only that an international environmental regime is unambitious and does not require States to do much, if anything, to change their behaviour”.⁹

This is why, in order to determine the effectiveness of a treaty, one also needs to look at the behavioural effectiveness to determine whether a certain agreement has had some recognisable causal effect, in the sense that it has prompted a State to act differently than it would have done otherwise. In this respect, the key question is whether, or to what extent, the obligations contained in a certain treaty have caused the Parties to modify their behaviour and how much this different approach has contributed to solving the underpinning environmental problems. Unfortunately, behavioural effectiveness is more difficult to detect and to measure than legal effectiveness. Despite this, the reference to behavioural effectiveness shows that one cannot be satisfied with a merely “formalistic” approach towards compliance with and effectiveness of a multilateral environmental agreement.

This leads us to the third meaning of effectiveness, namely so-called problem-solving effectiveness. Here, the question of the effectiveness of a treaty relates to the core question of whether a particular agreement concluded in this field effectively contributes to improving the quality of the environment by preventing or reducing environmental pollution, promoting more sustainable use of natural resources or tackling other complex global environmental issues, such as climate change.

The three kinds of effectiveness may in fact be strongly related to one another. For instance, if one looks, as D. Bodansky suggests, at the example of the Kyoto Protocol on climate change, its legal effectiveness has been achieved to the extent that the developed country Parties complied with their emission reduction commitments, as listed in Annex B to the Protocol, during the commitment period 2008-2012. However, in this case, the legal effectiveness may not necessarily derive from a change in the day-to-day business of the Parties, but may also have been brought about by other external factors such as, for instance, the current economic crisis, which has caused a reduction in the industrial output and the related greenhouse gas (GHG) emissions in many countries. In such cases, the behavioural effectiveness requirement may not be necessarily satisfied. Eventually, although legal and behavioural effectiveness may be achieved, a consequence of the emission reductions imposed on developed countries by the Kyoto Protocol may be the “leakage” of certain types of industrial installation to developing countries, giving rise to the possibility of an overall increase, rather than a reduction, in global emissions. This not wholly unrealistic scenario could lead to a situation whereby problem-solving effectiveness is certainly not achieved by the treaty which, despite its positive results with respect to the behaviour of some countries, may fail to contribute effectively to an overall decrease in GHG emission levels in the atmosphere and to effectively tackle the climate change problem.¹⁰

For the purpose of the present analysis, the focus should rest on the third kind of effectiveness, namely problem-solving effectiveness. However, the concept should be adapted and tailored to the environmental field. In this sector, in fact, the key issue is to determine whether a certain international treaty regime is delivering positive results in environmental protection terms. In practice, therefore, in order to assess the effectiveness of multilateral environmental agreements we should essentially determine and evaluate their “environmental effectiveness”, that is their capacity to contribute to the achievement of environmental protection goals.

⁹ See D. Bodansky, *cit.*, p. 254.

¹⁰ See D. Bodansky, *cit.*, p. 256-257.

III. Improving the Effectiveness of International Environmental Law through the Paradigm of Ecological Sustainability

A. The Paradigm of Ecological Sustainability

A necessary preliminary step in the assessment of the environmental effectiveness of MEAs is represented by the identification of the right paradigm to be used as the reference concept for the analysis and as the benchmark for the evaluation of individual treaties. My proposal is that such a paradigm can be identified in the “ecological sustainability” concept.

The concept of “ecological sustainability” may be said to refer essentially to the need for human civilisation to live in harmony with nature and the eco-systems which enable life on the planet and support human development.

The inspiration for the choice of this concept as the possible paradigm for use in assessing the environmental effectiveness of international environmental treaties comes mainly from the work of K. Bosselmann, which refers to the principle of sustainability as the reference concept for transforming law and governance at the global level. In such a context, it should be underlined that the core of the principle of sustainability is represented by ecological sustainability, which is essentially “the duty to protect and restore the integrity of the Earth’s ecological systems”.¹¹ In this respect, it should be noted that, according to K. Bosselmann, the principle of (ecological) sustainability has a normative quality. In fact, it both reflects a fundamental morality (respect for ecological integrity), and requires action (to protect and restore). Therefore it may be inferred that it can have a legal effect.¹²

This duty to protect and restore is grounded in natural law, and the reference to the principle of (ecological) sustainability should help to limit the negative effects of the highly positivist approach towards nature which has characterised the development of international environmental law thus far. This approach, according to K. Bosselmann, has in fact caused widespread “environmental reductionism”, which should now be replaced by “ecological expansionism”.¹³ The proposed new approach should aim to lessen the tendency to perceive the natural environment as a commodity and try to restore a key role for the preservation of eco-systems as the right basis for truly sustainable development.

In this sense, the principle of sustainability, grounded in the concept of ecological sustainability, may be the right paradigm for trying to replace the traditional anthropocentric vision of environmental law with a new approach, based on the recognition of the need to preserve ecological integrity as the main overarching requirement.

B. Ecological Sustainability in Relation with Sustainable Development

In order to exploit the full potential of the concept of ecological sustainability as a paradigm and a benchmark for assessing and improving the environmental effectiveness of environmental law, it is necessary to exactly determine its role in relation with the principle of sustainable development.

¹¹ See K. Bosselmann, *The Principle of Sustainability*, 2008, p. 53.

¹² See K. Bosselmann, *The Principle of Sustainability*, cit., p. 53.

¹³ See K. Bosselmann, *Losing the Forest for the Trees: Environmental Reductionism in the Law, in Sustainability*, 2010, p. 2431.

In this sense, it is useful to refer once again to K. Bosselmann's analysis, which identifies the concept of (ecological) sustainability as an idea which has roots in the history of humanity and traces its application in European history to as early as the XIV century.¹⁴

The author builds on the analysis and words of Judge Weeramantry who, in his Separate Opinion in the 1997 *Gabcikovo-Nagymaros* case, affirmed "the need for human activity to respect the requisites for its maintenance and continuance".¹⁵ In such a context, the line of reasoning proposed by Judge Weeramantry, and recalled by K. Bosselman, which locates the foundations for the concept of (ecological) sustainability in the analysis of key features of most of the prosperous ancient civilisations on Earth, is based on the premise that the human sphere should not be separated from the natural sphere. In other words, according to this approach, it is not conceivable to imagine economic development occurring at the expense of ecological sustainability, which essentially consists of the preservation of the integrity of the Earth's eco-systems.¹⁶

As it has been observed by K. Bosselmann, "It is crucial to realise the ecological core of the concept [of sustainable development]. Not realising it means that social, economic and environmental interests have nowhere to go. There is only ecological sustainable development or no sustainable development at all. To perceive environmental, economic and social as equally important components of sustainable development is arguably the greatest misconception of sustainable development and the greatest obstacle to achieving social and economic justice"¹⁷.

This is a good start from which to address the question of the relationship between the concept of ecological sustainability and the principle of sustainable development. In order to support his view that the core of the principle of sustainable development lies in the older concept of (ecological) sustainability, K. Bosselmann puts forward a major conceptual argument.

This argument is based on the fact that the duty of human beings to live in harmony with the planet's eco-systems has been a constant reference for all traditional civilisations on Earth. This connection to the natural resource base for human development has been somehow weakened, if not lost, since the industrialisation period. However, there is inherent value to the proposition that the basis for any kind of development must be found in ecological systems, as being related to local resources, for ancient and more primitive societies, and to global planetary eco-systems, for industrialised societies. On the basis of this assumption, the logical conclusion can only be that the economic and social dimensions which compose the contemporary understanding of the principle of sustainable development should not lead to deviation from the ecological core of the concept. Quite on the contrary, the ecological dimension should play a pivotal role with regard to the other two dimensions, in order to make the sustainable development concept truly operational. Following this line of reasoning, and paraphrasing A. Leopold,¹⁸ K. Bosselmann argues that "development is sustainable if it tends to preserve the integrity and continued existence of ecological systems, it is

¹⁴ See K. Bosselmann, *The Principle of Sustainability*, cit., p. 13. See also J. D. Hughes, *An Environmental History of the World*, 2001; U. Grober, *Sustainability: a Cultural History*, 2012.

¹⁵ See Judge Weeramantry Separate Opinion, ICJ, *Gabcikovo-Nagymaros* Case (1997), p. 18.

¹⁶ See K. Bosselmann, *The Principle of Sustainability*, cit., p. 53.

¹⁷ See K. Bosselmann, *The Principle of Sustainability*, cit., p. 23.

¹⁸ A. Leopold, *A Sand County Almanac*, 1949, p. 262, contains the following well-known statement which summarises Leopold's land ethic: "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise".

unsustainable if it tends to do otherwise”, and says that “this holistic, yet structured, concept of sustainable development equals ecologically sustainable development”.¹⁹

Such an approach, which places the ecological dimension at the centre of the picture, arises from the need to provide clarity regarding the long-debated interpretation of the principle of sustainable development. In this sense, K. Bosselmann proposes a logical interpretation of the term “sustainable development”, which focuses on the need to qualify the term “sustainable”. What is the essence of a sort of development that we can define as “sustainable” as opposed to “unsustainable”? The essence, according to K. Bosselmann, must be defined with respect to the object of the principle. Therefore, it certainly cannot be either “economic development” or “social development”. For the same reason, the essence cannot consist of a combination of the three dimensions of sustainable development, placing them all at the same level. As a consequence, according to the author, only “ecological sustainability” represents the essence of “sustainable development”.²⁰ This is, in fact, the (objective) core of the concept, which can show the right direction for consequent actions. The other two dimensions should be integrated with the ecological, but only the latter should have a prominent role. If this is not the case, it will never be possible to make the principle of sustainable development fully operational.

C. Revising the Principle of Sustainable Development through Ecological Sustainability

As mentioned above, the analysis provided by K. Bosselmann on the origins and the characteristics of the concept of ecological sustainability in connection with the principle of sustainable development shows that the essence of the latter principle should be found in the former concept. The author also shows that, despite the crucial role played in historical and cultural terms by ecological sustainability in shaping the principle of sustainable development, since the emergence of the Brundtland Report the focus has tended to shift onto the economic dimension of the principle, at the expense of the original ecological core.²¹

Therefore, the origin of misunderstandings and misinterpretations of the concept of sustainable development can be traced back to the Brundtland definition, according to which sustainable development is to be understood as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. This definition should be read in conjunction with Principle 3 of the Rio Declaration, which states that “the right to development must be fulfilled to equitably meet developmental and environmental needs of present and future generations”. These are clearly both concerned primarily, if not almost exclusively, with the anthropocentric approach. In other terms, they tend to promote human development as a primary objective, not necessarily as something limited by environmental considerations. As it has been noted, in such a dominant understanding, “the primary concern of sustainable development is sustained human development”.²² This is confirmed by Principle 1 of the Rio Declaration, which affirms that “human beings are at the centre of concerns for sustainable development”.

¹⁹ See K. Bosselmann, *The Principle of Sustainability*, cit., p. 53.

²⁰ See K. Bosselmann, *The Principle of Sustainability*, cit., p. 53.

²¹ See K. Bosselmann, *The Principle of Sustainability*, cit., p. 53.

²² See K. Bosselmann, *The Concept of Sustainable Development*, in K. Bosselmann and D. Grinlinton (eds.), *Environmental Law for a Sustainable Society*, 2002, p. 84.

However, this anthropocentric approach was not necessarily the only option available for the proper interpretation and application of the concept of sustainable development. In fact, the reference to the rights of future generations could have been interpreted as referring to the need to preserve and protect both the human and the non-human dimension simultaneously, and as a duty for the present generation to maintain “the quality of the planet” or, in other terms, the ecological integrity of the ecosystems on the planet, in order to leave the Earth to future generations in the best possible environmental conditions.²³ In brief, an eco-centric approach could have been chosen instead, or at least should have been used in combination with the prevalent anthropocentric approach.

Instead, the Brundtland definition, being interpreted and applied with an anthropocentric vision in mind, has inevitably tended to reduce sustainable development to a primarily economic concept, barely tempered by some (mostly inter-generational) social considerations and with very limited attention paid to environmental issues. This approach has since been restated and reinforced by the 2002 Political Declaration of the Johannesburg World Summit on Sustainable Development, which embraced an understanding of the concept of sustainable development based on the three interdependent and mutually reinforcing pillars, namely the economic, social and environmental dimensions. Moreover, in the same line of reasoning, the Outcome Document of the 2012 Rio+20 United Nations Conference on Sustainable Development, entitled “The Future We Want”, reaffirmed that “people are at the centre of sustainable development”, and acknowledged “the need to further mainstream sustainable development at all levels, integrating economic, social and environmental aspects and recognizing their interlinkages, so as to achieve sustainable development in all its dimensions”.

The conception of the tripartite structure of sustainable development, which is now dominant, reinforced the anthropocentric view presented in the Brundtland Report and paved the way for the relegation of the environmental protection dimension to a very marginal role. This has had very relevant consequences. In fact, in my opinion, the primary cause for the failure of the concept of sustainable development to contribute to the promotion of a high level of environmental protection during the last twenty-five years is to be found precisely in the marginalisation of the environmental dimension within its context.

As a consequence, if sustainable development is to have a meaningful role in the future, a major effort should be made to urge a more correct interpretation, by promoting the understanding of its correct location, within its natural and historical ecological boundaries. To this effect, it is necessary to minimise the relevance of the anthropocentric approach promoted by the 1987 Brundtland definition, as well as by the ‘three pillars’ (or three dimensions) conception of sustainable development endorsed by the 2002 Johannesburg Political Declaration and the Rio+20 Outcome Declaration. Before -and beyond- addressing the issue of choice between the anthropocentric and eco-centric approaches to sustainable development, there should be widespread recognition of the absolute necessity to interpret and apply the concept of sustainable development through taking into account the need to act within the ecological boundaries of the Earth. In other words, as S. Westerlund aptly points out, “sustainable development cannot take place without ecological sustainability, which in turn is related to environmental quality and natural resources”.²⁴ This line of reasoning makes

²³ See E. Brown Weiss, *In Fairness to Future Generations: International Law, Common Patrimony and Intergenerational Equity*, 1989, p. 38.

²⁴ S. Westerlund, *Theory for Sustainable Development*, in H.C. Bugge & C.Voigt (eds.), *Sustainable Development in International and National Law*, 2008, p. 52.

plain the non-negotiable need to protect and preserve the ecological integrity of the ecosystems, which ensure life on the planet and enable human development.

The analysis conducted above has tried to demonstrate that the failure of the concept of sustainable development to contribute to the promotion of a high level of environmental protection has its origin in the misunderstanding and misinterpretation of the concept which, under the pressure of a markedly anthropocentric approach, has lost its essence, which ought to be based in the concept of ecological sustainability.

This leads me to formulate the hypothesis that a connection may exist between the failure to properly understand, interpret and promote sustainable development and the parallel widespread lack of effectiveness of international environmental law, which is often unable to deliver satisfactory results in terms of environmental protection.

D. Applying the Paradigm of Ecological Sustainability for the Revision of International Environmental Law

The hypothesis made above - that a connection may exist between the failure to correctly understand, interpret and promote sustainable development and the parallel widespread lack of environmental effectiveness of international environmental law - should be now analysed and tested.

In this respect, the analysis should start with a verification of whether or not the two situations really have anything in common. In this sense, it seems to me that the similarity and connection between the two cases can be found in the failures in both contexts to recognise an adequate role for the previously analysed concept of ecological sustainability.

In the first case, in fact, the failure to recognise a core role for ecological sustainability within the concept of sustainable development has led to the marginalisation of the environmental dimension within the framework of the concept, which has resulted in its failure to contribute to the promotion of a high level of environmental protection.

Quite similarly, in the second case, it may be argued that the diffuse lack of environmental effectiveness of many international environmental treaties has been caused by the absence of a reference to a guiding paradigm, such as the concept of ecological sustainability, in the definition, interpretation and application of the agreements.

Therefore, in attempting to assess the environmental effectiveness of most environmental treaties in light of the principle of ecological sustainability, the conclusion that international environmental law is often ineffective in pursuing and reaching its environmental goals, insofar as it is not adequately grounded in ecological sustainability, will be probably reached in the majority of cases.

This leads us to the conclusion that, in order to increase the environmental effectiveness of MEAs, the “ecological ignorance” of international environmental law must be addressed and overcome. Such “ecological ignorance” essentially derives from the failure to ground the development and implementation of the *corpus* of law devoted to environmental protection in the concept of ecological sustainability.

With this reasoning in mind, I will now propose a series of final considerations, before moving in Section IV of this contribution to discuss the concrete application of the concept of ecological sustainability as the new paradigm to be used in order to improve the environmental effectiveness of climate change legislation, which is considered here as a

paramount example of a specific sector in the framework of international environmental law. In this respect, my final considerations may be summarised as follows:

- 1) International environmental law is characterised by a widespread lack of effectiveness, which is mostly related to the failure to achieve “environmental effectiveness”, the capacity to achieve environmental protection objectives.
- 2) In order to improve its “environmental effectiveness”, the adoption of a new grounding paradigm for international environmental law is necessary. Such a paradigm should guide the interpretation and enforcement of existing legislation, as well as the development of new environmental legislation.
- 3) The ecological core of sustainable development should be adequately recognised. As argued by K. Bosselmann, “It is crucial to realise the ecological core of the concept of sustainable development. Not realising it means that social, economic and environmental interests have nowhere to go. There is only ecological sustainable development or no sustainable development at all”.²⁵
- 4) There is a clear link between sustainable development, ecological sustainability and environmental law. As highlighted by S. Westerlund, “sustainable development cannot take place without ecological sustainability, which in turn is related to environmental quality and natural resources”. Moreover, law needs to be made more sustainable, both in its definition and its application, as “unless law is made sustainable, it protects unsustainable conduct”.²⁶
- 5) The new ecological sustainability paradigm should constitute a basic reference rule, which ought to represent an environmental *Grundnorm*. Such a *Grundnorm* should “underpin and guide the interpretation of existing and the creation of new laws”.²⁷ In other words, it should become the paradigm for creating new environmental legislation, as well as for revising and interpreting the existing environmental law provisions.
- 6) A complete revision of the existing international environmental law is necessary in order to promote increased environmental effectiveness. In the absence of such a revision, all the possible fine-tuning of existing institutions, instruments and issues, such as the improvement of international institutional settings (e.g. the never-ending UNEP’s reform), or the reorganisation of the roles and functioning of the market-based mechanisms in the environmental law sphere, will not deliver significant positive results.

IV. Revising Environmental Law through the Paradigm of Ecological Sustainability: The Case of Climate Change

It has been concluded in Section III that in order to increase the environmental effectiveness of international environmental law, this branch of law should be developed, interpreted and applied in light of the ecological sustainability paradigm. In practical terms, such a revision should be grounded in the duty to protect and restore the integrity of the eco-systems, which support life on the planet.

²⁵ See K. Bosselmann, *The Principle of Sustainability*, 2008, p. 53.

²⁶ S. Westerlund, *Theory for Sustainable Development*, in H.C. Bugge & C. Voigt (eds.), *Sustainable Development in International and National Law*, 2008, p. 52-54.

²⁷ K. Bosselmann, *Grounding the Rule of Law*, paper presented at the Conference “Rule of Law for Nature”, Oslo, 9-11 May 2012, p. 5.

In this sense, the climate change sector represents an excellent example of an area which should be completely revised in light of the paradigm of ecological sustainability, in order to promote improvement in its environmental effectiveness.

The climate change sector has grown significantly over the last two decades and nowadays represents one of the most important areas within the environmental law field. New policies and legislation in the climate change sector have been developed over the last twenty years, in particular through some innovative legal instruments and mechanisms, which have sometimes been tested for the first time in this crucial area. Their application has occasionally raised concrete questions about their overall ecological sustainability. Doubts have been raised in many specific cases about the effective contribution of climate change legislation to the fulfilment of the environmental principles underpinning the 1992 Framework Convention on Climate Change, as well as the related 1997 Kyoto Protocol. Moreover, looking at the recent trends emerging from the international negotiations concerning the shaping of the post-2012 legal framework, as well as the developments of climate change legislation at State level and within regional organizations such as the European Union, there is often the perception that many instruments established under climate change legislation fall short of promoting either environmental protection objectives or ecological sustainability goals.

On this basis, some specific examples will be provided, beginning with a short analysis of the flexibility mechanisms foreseen by the Kyoto Protocol.

Firstly, I will look at the ecological sustainability of the Clean Development Mechanism (CDM), which since its establishment has been quite a successful instrument, relied upon by Parties in order to partially meet their emissions reduction commitments under the Kyoto Protocol. The CDM is a project-based flexibility mechanism which aims to promote cost-effective reductions in GHG emissions through engagement in projects in countries not bound by any reduction obligations. There is an evident risk that the realization of CDM projects in developing countries may not contribute to achieving sustainable national or local development in the host country. Those who drafted the rules on the functioning of the CDM projects have always been aware of this risk. In fact, it is prescribed that CDM projects must *inter-alia* fulfil appropriate national sustainable development criteria, to be defined by the Party receiving the international investments related to the CDM projects. In this respect, however, no official or binding guidance was ever adopted by the Conference of the Parties to the Kyoto Protocol. Therefore, the only guidance for potential CDM host countries came from the guidelines issued by UNEP, which contain a set of general and basic sustainable development criteria for CDM project screening, grouped around the three traditional pillars of sustainable development.²⁸ Such criteria, however, are not at all binding for the Parties. As a consequence, despite the positive duty to establish national sustainable development criteria, there is no guarantee that the hosting Party really aims to fulfil the objective of sustainable development when drafting such criteria. Moreover, no specific monitoring duties in respect of such national criteria are imposed on the national authorities of the Parties.

Therefore, there is a serious and concrete risk that engagement in CDM projects does not help to promote national or local ecological sustainability in the hosting country. On the contrary, there might be a paradoxical effect, related to the promotion of a 'race to the bottom' between competing countries, whereby governments may decide not to place much emphasis on the prescribed national sustainability criteria, in order to attract more international investment.²⁹

²⁸ See UNEP, CDM Sustainable Development Impacts, 2004.

²⁹ M. Montini, Sustainable Development Within the Climate Change Regime, in H. C. Bugge and C. Voigt (eds.), Sustainable Development in International and National Law, 2008, p. 523-543.

Different kinds of concerns have been raised with regard to the other most relevant flexibility mechanism foreseen by the Kyoto protocol, namely Emissions Trading. This instrument is a trading scheme which enables countries to buy and sell emission credits, so as to promote cost-effective GHG emission reductions. With regard to this scheme, the international practice in the last few years has shown that the trading regime has evolved into a purely financial market, which operates following traditional financial rules and behaviour, and that there is a tendency to forget the underpinning environmental dimension objective of reducing CO₂ emissions.

Moreover, in contrast to the CDM, the Emissions Trading mechanism does not specify particular sustainability criteria to be respected by the trading partners. Therefore, there is no way to monitor or guarantee that ecological sustainability is being promoted and achieved in the functioning of the emission trading market.

The same is also true with regard to the European Union Emissions Trading Scheme (EU ETS), which is based on the duty of the industrial sector to contribute to CO₂ reductions through compulsory participation in a “cap and trade” system.³⁰ Within this system, each relevant industrial installation is given a maximum quota of allowed CO₂ emissions, and trading is enabled among the participating installations to help them to reach their targets by selling or buying quotas to or from other participants. Unfortunately, in such a context there is no obligation to fulfil any sustainability criteria. This is certainly a major shortcoming of the EU ETS, which should be addressed and overcome. This could be done, for instance, by imposing an obligation to respect specific sustainability criteria for installations subject to the EU ETS, possibly in combination with a “sustainability” certification or labelling system for the traded allowances.

An example in this sense might come from the experience gained in the biofuels sector. This is an area which has boomed in the last few years, due to the sustained pressure deriving from the duty to reduce GHG emissions, as well as because of necessity deriving from the current energy crisis, which calls for increased production of energy from renewable sources. In this field, in fact, the European Union has set certain specific sustainability criteria which must be fulfilled during the production of biofuels, irrespective of whether the relevant activities take place within or outside European territory. The promotion of biofuels by the EU is linked to the general provision of EU climate change policy and law which prescribes that, by 2020, biofuels ought to account for a minimum of 10% of the total quantity of fuels used in the transport sector.³¹

This represents a positive application of the ecological sustainability paradigm. However, it remains to be seen whether this system will effectively manage to promote ecological sustainability in concrete terms. In such a context, the sustainability criteria are meant to guarantee against the negative spill-over effects caused by the production of biofuels. This notwithstanding, it is questionable as to whether biofuels can be seen as a proper solution in terms of overall ecological sustainability as such. This is due to the fact that, although the promotion of biofuels may be seen as a positive instrument in the fight against climate change, their production could potentially entail severe environmental consequences, which may eventually lead to a negative balance in terms of sustainability.

Carbon Capture and Storage (CCS) represents another interesting example of a new instrument which has been developed at the international level in order to deal in a more effective way with the climate change challenge, and can be analysed with reference to its

³⁰ EU Directive 2009/29 on the improvement of the EU ETS scheme.

³¹ EU Directive 2009/28 on the promotion of renewable energy sources.

ecological sustainability performance. The CCS technology makes possible the sequestration and permanent storage of CO₂ in underground geological formations which should be safe against the risk of leakage over time. This technology is not regulated under international law. However, in the last few years it has been regulated by some of the Parties to the Framework Convention on Climate Change and the Kyoto Protocol. In this sense, the most interesting legal development for the regulation of such a technology is probably represented by the 2009 EU Directive on CCS.³²

The major problem with the development of this technology is, however, not so much related to the risk of leakage, but rather to the necessity to ensure that the authorised CCS installations ultimately operate in a sustainable way. In this sense, the national authorities in charge of issuing authorisations for the construction and operation of CCS installations should assess the ecological sustainability of the plants - or at least make sure that they have no negative effects on the overall sustainability of the territories where they are located. In fact, the existence of specific risks related to the deployment of such technology, in conjunction with questions about its high costs, have raised several doubts about the overall environmental effectiveness of such an instrument. Two of them deserve specific attention. Firstly, CCS projects may not be as beneficial as they might seem in terms of GHG reductions when the energy costs of collecting and managing the emissions, as well as those from transportation, are effectively considered and internalised. Indeed, in this case, the overall balance of GHG emissions related to the development of CCS installations may even be negative. Secondly, the construction and operation of CCS plants, which involve complex activities such as the capture, transportation and storage of CO₂, may have relevant negative side-effects in terms of land planning and management. Ideally, therefore, there should be a preventive evaluation of the negative consequences against the expected benefits in terms of CO₂ reduction, in order to assess the overall level of ecological sustainability. This, however, is not necessarily what happens under the present EU legal regime.³³

V. Conclusion

In sum, it may be said that the few examples mentioned above with regard to the evolution of the climate change legislative framework make clear that there is a concrete risk that this area of environmental law is developing in quite an unsustainable way. Therefore, this is a sector where there should be a change of perspective and a coherent move towards a consistent reference to ecological sustainability as the proper paradigm for the development of new legislation as well as, maybe more importantly, for the interpretation and enforcement of existing environmental legislation.

³² EU Directive 2009/31 on the geological storage of carbon dioxide.

³³ On the issue of balancing climate change mitigation and environmental protection interests, see M. Montini and E. Orlando, *Balancing Climate Change Mitigation and Environmental Protection Interests in the EU Directive on Carbon Capture and Storage*, in *Climate Law*, 2012, p. 165-180.

