DRAFT FOR COMMENT

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Biodiversity Offsets in National (Brazil) and Regional (EU) Mandatory Arrangements: Towards an International Regime?

ABSTRACT

Biodiversity is essential to maintaining the biosphere in a condition which supports human and other lives. The 2002 World Summit on Sustainable Development held in Johannesburg recognised the urgency of action against biodiversity loss. Biodiversity offset is a mechanism aiming to achieve no net loss or even net gain to biodiversity through the installation of a specific project or the development of general economic activities. The purpose of this paper is to (i) disseminate the understanding of biodiversity offsets; (ii) analyse Brazil's national and the European Union's regional frameworks for biodiversity offsets; and (iii) launch the debate of establishing an international regime for biodiversity offsets. After learning from EU and Brazilian experiences, this paper concludes that an internationally coordinated solution is needed, launching the debate of designing an international regime for biodiversity offsets, or of which biodiversity offsets form a part. However, it also warns that as negotiating international environmental agreements is a complex and time consuming process, it is crucial not to lose the focus on developing national and regional biodiversity offset mandatory arrangements, building on the lessons taken from the case studies analysed.

Table of Contents

1. Introduction

Biodiversity is essential to maintaining the biosphere in a condition which supports human and other lives, providing a large number of goods and services that sustain lives and livelihoods and ensuring the ecological stability of the planet. The 2002 World Summit on Sustainable Development held in Johannesburg recognised the urgency of action against biodiversity loss and endorsed in its Plan of Implementation the achievement by 2010 of a significant reduction in the current rate of loss of biodiversity.[1]

Biodiversity offset is a mechanism aiming to achieve no net loss or even net gain to biodiversity through the installation of a specific project or the development of general economic activities. The first experiences are accounted to the US with its wetlands and threatened species management and conservation banks, followed by subsequent mandatory offset requirements proliferating in several countries, such as Brazil, and in regional blocks, such as the European Union (EU). There are also important experiences relating to voluntary action coordinated, *inter alia*, by multinational companies and the World Conservation Union (IUCN). Despite recognising the key role played by these initiatives, this paper will focus on the outcomes of mandatory offset arrangements, as biodiversity objectives may be otherwise compromised where offsets are adopted voluntarily without regulatory oversight.

The purpose of this paper is to (i) disseminate the understanding of biodiversity offsets; (ii) analyse Brazil's national and the European Union's regional legal frameworks for

[1] The 2002 WSSD endorsed the *Decision VI/26* of the Sixth Conference of the Parties of the Convention on Biological Diversity (CBD) held in April 2002, which adopted the Strategic Plan for the Convention, committing Parties to "*achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth*".

biodiversity offsets; and, (iii) launch the debate about establishing an international regime for biodiversity offsets. Brazil and the EU were selected for many reasons, but primarily because both have existing biodiversity offset mandatory arrangements.

Brazil's case study is of particular interest owing to its wealth of biodiversity. Brazil holds about 30 percent of the Earth's remaining tropical rain forest, harbours many unknown species and is thought to house one-third of the world's bird species, at least one-third of the world's plants and probably the same proportion of other species.[2] In addition, Brazil has a sophisticated biodiversity offset arrangement that warrants in-depth study.

The EU's legal framework is also worthy of analysis for a different reason. It is a successful regional mandatory arrangement, dealing with a wide range of ecosystems and species across countries' borders, and might serve as testing ground for future regional arrangements[3], as well as in designing a future international regime.

Section 2 focuses on understanding biodiversity offsets, their accepted and disputed principles and concepts and the treatment given by existing international law. Sections 3 and 4 respectively provide a detailed study of the EU's and Brazil's mandatory arrangements. Section 5 draws lessons from the EU and Brazil's experiences based on the principles and challenges underscored in Section 2 and then launches the debate of designing an international regime for biodiversity offsets, or of which biodiversity offsets form a part, focusing also on the reasons for and the difficulties of designing such an internationally coordinated solution.

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[2] *Business and Biodiversity – A Guide for the Private Sector*, Published by IUCN – The World Conservation Union and WBCSD – World Business Council for Sustainable Development, 1997, p.

[3] For example, a regional arrangement for biodiversity offsets could be necessary or desirable in the near future to foster biodiversity conservation in the Amazon Basin. The Amazon Basin extends through the territory of 9 different South American nations and produces roughly 20 per cent of Earth's oxygen. (*National Geographic Magazine*, January 2007, p. 54.)

2. Understanding Biodiversity offsets

2.1 Biodiversity loss – an issue demanding immediate response

The term "biodiversity", short for biological diversity, embraces the variety of all life on Earth. Biodiversity is the variability among living organisms and the ecological complexes of which they are part, including diversity within and between species and ecosystems.[4] It can be considered a non-renewable resource since the spectrum of genetic natural capital cannot be replaced. "The diversity of biological resources is a one-time endowment from the evolutionary process".[5] Although difficult to determine specific economic values of the many products and services deriving from biological resources, it is clear that the functions provided could not be replaced. Conservation of biodiversity makes moral, ecological and economic sense.[6]

Sands, elaborating on the CBD definition, understands biodiversity on three levels, which describe different aspects of living systems: genetic diversity (the variation of genes within a species), species diversity (the variety of species within a region) and ecosystem diversity (the variety of ecosystems within a region).[7]

It is agreed that extinction is the final destiny of all species, that is to say a natural process. Nevertheless, due to human depletion of biodiversity resources this process is accelerating and threatening biodiversity. These are eras of "*mass extinctions*", as highlighted

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[4] The 1992 Convention on Biological Diversity (CBD) (Rio de Janeiro, 5 June 1992), article 2, defines biodiversity as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems."

[5] Timothy Swanson, *Global Action for Biodiversity.* Earthscan Publications, London: 1997, p. 9.

[6] R. Turner, D Pearce. and I. Bateman, *Environmental economics: An elementary introduction*, Harveter WheatSheaf, 1994, p. 290 to 298.

[7] P. Sands, *Principles of International Environmental Law* (2nd edition, 2003), p. 499.

by Swanson[8], who points out that the cause of biodiversity decline is the failure of human society to "appreciate and appropriate the values of biological diversity". "Global biodiversity loss is a crisis whose importance is now understood and widely accepted".[9]

This problem is made worse as result of the uneven distribution of biodiversity resources, concentrated in a few very diverse countries. In 2002, the organization *Like-Minded Megadiverse Countries*[10] was formed to recognize a group of countries, which includes Brazil, as biodiversity hotspots. According to the organization, seventeen developing countries, with less than 10% of the global land surface host more than 70% of the land's biodiversity. These same developing countries are privileged with most of the natural resources on Earth.

Addressing this problem requires an internationally coordinated solution. The last section examines the role biodiversity offsets may play in meeting such a challenging objective. Underlying the development of such an international response is the obligation to see this solution to its successful conclusion. After all, this civilization is to be blamed for the mismanagement of natural resources over the last centuries and should design a successful solution. "As human beings, we are endowed with freedom of choice, and we cannot shuffle off our responsibility upon the shoulders of God or nature. We must shoulder it ourselves. It is our responsibility."[11]

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[8] Swanson, *supra* note 5 at 19-43.

[9] *The Root Causes of Biodiversity Loss*, edited by Wood, Alexander; Stedman-Edwards, Pamela; Mang, Johana. Earthscan Publications, London, 2000, p. 1. This book, after conducting case studies in developing countries, identify as causes of biodiversity loss, *inter alia*: demographic pressures, poverty and inequality, trade relationships, international political relationships, policy failures, poor environmental laws and weak enforcement, unsustainable development, lack of control over natural resources.

[10] http://lmmc.nic.in/

[11] Arnold Joseph Toynbee (1889-1975) '*was a British historian whose twelve-volume analysis of the rise and fall of civilizations, A Study of History, 1934-1961, was a synthesis of world history, a metahistory based on universal rhythms of rise, flowering and decline, which examined history from a global perspective.*' Available at: http://en.wikipedia.org/wiki/Arnold_J._Toynbee

2.2 What are biodiversity offsets?

Biodiversity offsets are defined as "conservation actions intended to compensate for the residual, unavoidable harm to biodiversity caused by development projects, so as to ensure no net loss of biodiversity. Before developers contemplate offsets, they should first seek to avoid and minimise harm to biodiversity."[12]

The example of a hydroelectric power plant better illustrates what is biodiversity offset. Without referring to any specific national laws, such infrastructure projects are often scrutinised through an environmental impact assessment, in which alternative solutions are considered, including the possibility of not continuing with the project, and impacts are avoided or minimised. However, there are some impacts, often connected to biodiversity loss, which cannot be avoided or properly minimised. Those impacts on biodiversity must be offset in order to avoid net loss of biodiversity.

In line with sustainable development[13], biodiversity offsets seek to ensure that unavoidable adverse environmental impacts of development are counterbalanced by environmental gains, with the aim of achieving a net neutral or beneficial outcome. Biodiversity offsets were formalised in the USA wetland mitigation and conservation "banking" schemes in the early 1970's[14]. Since then, biodiversity offset schemes have proliferated around the world.[15] This paper focuses on the experiences of Brazil and the EU.

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[12] Kerry ten Kate, Josh Bishop and Ricardo Bayon. *Biodiversity offsets: Views, experience, and the business case*. IUCN and Insight Investment (2004), p. 13.

[13] Although some of the ideas related to sustainable development had already appeared in some international treaties, it is widely considered that the principle of sustainable development was coined in the 1987 *Brundtland Report* as '*the development that meet the needs of the present without compromising the ability of the future generations to meet their own needs*.' The *Brundtland Report* was published as the book *Our Common Future*, Oxford Press, 1987. It was a report published by the World Commission on Environment and Development, known as *Brundtland Commission*, named after its chairman Gro Harlem Brundtland. The sustainable development principle was employed to inform several other principles of the 1992 Rio Declaration.

[14] ten Kate, *supra* note 12 at 22.

[15] Other relevant existing offsets in national laws include: Australia: protection of vegetation in South Australia and Victoria - also guidelines recently released in Western Australia; Canada: fisheries offset laws; New Zealand: tradable fisheries permits; South Africa: Western Cape, 2007 Draft Guidelines (non-binding).

2.3 Why should the focus be on mandatory arrangements?

As one of the objectives of this paper is to add to the debate about designing an international legal regime for biodiversity offsets, encouraging further work in this area, the focus is on examining existing mandatory arrangements. However, it is important to recognise that voluntary approaches play a very important role in the protection of global and local biodiversity, and on developing biodiversity offset practices.[16]

Therefore, since it is understood that only mandatory arrangements, backed by enforcement and non-compliance measures, can guarantee biodiversity conservation objectives, even when other important values and competing interests are at stake, this paper focuses exclusively on existing legal and policy guidance governing offsets.

2.4 Biodiversity offsets in international law

There is no agreed international regime for biodiversity offsets. Nevertheless, there are some international legal texts dedicated to the conservation of biodiversity that establish the basis for future utilisation of biodiversity offsets at the international level. This section briefly flags provisions of relevance to biodiversity offsets, leaving to the last section the discussion concerning the feasibility of design such a challenging regime.

As noticed already biodiversity loss was recognised as a serious problem to be tackled by this generation and the ones to come. The 1972 Stockholm Declaration[17] called in its principles for the protection of fauna and flora for the benefit of present and future generations, for the maintenance of the Earth's capacity to produce vital renewable resources and for men "to safeguard and wisely manage the heritage of wildlife and its

[16] The Business and Biodiversity Offset Program (BBOP) is a partnership between companies, governments and conservation experts to explore biodiversity offsets - http://www.forest-trends.org/biodiversityoffsetprogram/. For a detailed study of voluntary actions, see ten Kate et al, *supra* note 12.

[17] 1972 Stockholm Declaration available at1972 Stockholm Declaration http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=97&ArticleID=1503

habitat, which are now gravely imperilled by a combination of adverse factors. Nature conservation, including wildlife, must therefore receive importance in planning for economic development."[18] Inspired by the 1972 Declaration's spirit, the 1973 Convention on International Trade in Endangered Species (CITES) was designed to protect endangered species of fauna and flora from overexploitation by regulating or prohibiting their international trade.

Nevertheless, it was only in 1992, with the Convention on Biological Diversity (CBD), representative of a major development of the international biodiversity law, that more adequate and modern techniques, methods and approaches were adopted to address biodiversity loss. The CBD is a global treaty and framework convention aiming at comprehensive conservation of biodiversity. It articulates as objectives the conservation of biodiversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.[19]

The above-mentioned sustainable development principle[20] can be recognised throughout the text of the CBD[21] in several provisions such as Articles 6, 10 and 14, all calling for the sustainable use of biodiversity. The provisions of Article 6 (a) and (b), Article 8 (c), Article 10 (a) and particularly those of Article 11, on incentive measures, and 14 (2), specifically referring to "compensation", serve as legal basis for the development of national frameworks for biodiversity offsets. As discussed in the last section, these provisions also provide the legal basis for a biodiversity offset international regime.

Finally, it is important to highlight that the CBD Decision VIII/17 on "Private-sector engagement" and CBD Decision VIII/25 on "Incentive measures: application of

[18] 1972 Stockholm Declaration, Principle 4
[19] CBD, Article 1.
[20] See *supra* note 13.
[21] All CBD relevant provisions mentioned in the next two paragraphs are quoted in Appendix A.

tools for valuation of biodiversity and biodiversity resources and functions" inspires further work on biodiversity offsets and that the CBD Decision VIII/28 on "Impact assessment: Voluntary guidelines on biodiversity-inclusive impact assessment" encourages the use of biodiversity offsets and compensation measures linked with environmental impact assessment of plans and projects.

This brief overview of international biodiversity laws will be essential for discussing, in the last section, the feasibility of a more ambitious approach transposing biodiversity offsets to the international sphere, aiming at solving or integrating the solution for the issue of global biodiversity loss.

2.5 Principles of biodiversity offsets

Although not unanimously agreed or precisely defined, it is already possible to identify some emerging principles governing biodiversity offsets that should be born in mind when looking at the Brazilian and EU case studies and when designing an international legal regime. It will be discussed below two of these principles: no net loss or net gain[22], and mitigation hierarchy[23].

2.5.1 No net loss or net gain

There is no consensus on the final goal of biodiversity offsets among different legal frameworks, which range from "no net loss", in which the desired outcome is the maintenance of the same optimal level of biodiversity, to "net gain" [24], where the aim is to improve biodiversity quality rather than simply restore the *status quo ante*. However, the EU and Brazilian biodiversity offset arrangements apply the no net loss principle.

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[22] ten Kate, *supra* note 12 at 11.
[23] Id., p. 9
[24] George W. Bush's administration changes policy goals to "net gain". For more details see M. Coyne, "*Wetlands: Bush Changes Administration Policy to 'Net Gain' of Resource*", Greenwire, April 23, 2004, Natural Resources Vol. 10 No. 9 Environment and Energy Publishing LLC.

2.5.2 Mitigation hierarchy

Biodiversity offsets policies generally follow a mitigation hierarchy, taking into account a three step sequence. Offsets are considered as a "last resort" to address any residual impacts after all efforts have been undertaken first to avoid and secondly to mitigate environmental impacts that could not be avoided. Offsets mean an activity to compensate for residual, unavoidable harm and cannot be used to reduce developers' obligations to avoid and mitigate environmental harm. The term compensate is often used interchangeably with offset.[25]

As detailed below, the EU biodiversity offsets arrangement uses a very strict standard for project acceptance and use of biodiversity offsets, applying the principle of mitigation hierarchy at its most stringent compared to other biodiversity offsets policies.

2.6. Offset Mechanisms: Project-by-Project offsets vs. Third Party approaches

To deal with a project's environmental impacts that may harm the environment and cannot be avoided or satisfactorily mitigated, actions may be taken by actors in two broad different categories: on a project-by-project basis, that is to say by the project proponent himself or by a designated third party.

In project-by-project offsets, project proponents compensate impacts through their own actions developing and submitting an offset proposal, generally along with environmental permit applications for developing a project.

Third party approaches could be sub-divided in banking frameworks and in-lieu arrangements. Banking frameworks are those schemes in which entrepreneurs, by developing their own offset initiatives can earn credits and then recapture their investment

[25] ten Kate et al, *supra* note 12 at 9. It is also important to bear in mind that the term mitigate often has different meanings in Europe and in the US. In the latter, is generally interchangeable with offsets, while in the former, it means to minimise or make harm less severe, and that is the use employed in this paper.

by selling these credits to project developers with offset obligations.[26] Banking approaches were created due to criticisms regarding inefficiencies and poor compensation results of the traditional project-by-project arrangements, offering significant advantages over the traditional approach, such as: greater flexibility for site location; greater geographic scale of compensation; and, more cost-effective conservation (economies of scale, turning liabilities into assets and lower costs for project proponents and regulators). Banking projects are limited to the most developed offset arrangements such as wetland mitigation banking and conservation banking in the US.[27]

In-lieu arrangements are those in which a project developer provides funds to an in-lieu sponsor instead of implementing its own project-specific offset or acquiring credits from banking. As detailed below, Brazilian developer's offset adopts in-lieu arrangements in which the National Protected Areas System is the third party implementing the offset.

2.7 *Some challenging issues for biodiversity offset policy makers and regulators*

After flagging two emerging principles governing biodiversity offsets it is also imperative to point out some of the major challenges faced by stakeholders. Understanding these challenges is crucial when examining Brazilian and EU arrangements and for assessing the feasibility of designing an international legal regime.

2.7.1 Equivalence of impacts with offset (in-kind vs. out-of-kind)

As two areas are never ecologically identical, how can offsets best provide benefits "equivalent"[28] to losses caused by project impacts? In-kind offset policies are those which aim to compensate with similar values, functions, services, habitats or any other attribute to

[26] For more details, see James Salzman and J.B. Ruhl, *"No Net Loss": Instrument Choice in Wetlands Protection*, in *Moving to Markets in* Jody Freeman and Charles D. Kolstad (editors) *Environmental Regulation: Lessons form Twenty Years of Experience*, OUP, 2007, p. 328

[27] For more detailed information on how these banking schemes work, see James Salzman and J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, Stanford Law Review, Vol. 53, No. 3 (Dec., 2000), pp. 607-694.

[28] For more on how to address the issue of establishing "equivalence" see ten Kate et al, *supra* note 12 at 57-61.

those impacted by the relevant project, while out-of-kind arrangements allow for different patterns of offsetting.

Offset policies indicate that in-kind offsets are preferred in most cases, but there is a trend toward more acceptance of out-of-kind mitigation, whenever it can provide greater environmental benefits than in-kind options.

2.7.2 Location of the offset relative to the impact site (on-site vs. off-site)[29]

Do offset benefits need to be channelled to the local area affected by project impacts? What if a proposed "local" offset provides significantly less environmental benefit than other more distant proposed actions?

Designers of offset policies generally prefer on-site mitigation to off-site mitigation because compensation benefits accrue to the project affected area as in the EU offsets arrangement. However, EU off-site offsets may be supported in cases where they are located in the same ecological region or river basin as the project site and can provide greater environmental benefits than on-site mitigation options. This reflects the trend identified in the voluntary business offset activities[30], which main concern is with the biodiversity outcome. The Brazilian developer's offsets take it further, adopting off-site offsetting as a principle, except when a project impacts a specific conservation unit, in which case the offset should be on-site.

2.7.3 "Additionality"

Another challenge faced by offsets policy makers and regulators is how to ensure that additional biodiversity benefits are delivered and that biodiversity loss is not simply transferred from one place to another.[31] Offset frameworks must call for offsets to represent

[29] Id., p. 10.
[30] Id., p. 62-64.
[31] Id., p. 68.

new or additional contributions to conservation, but in many cases there is wide latitude provided regarding what types of offsetting activities are allowable. One survey has concluded that in the end "the issue of additionality [can] only be resolved on a case-by-case basis". [32]

2.7.4 Currency

Currency is crucial in more developed offsets policies such as the wetlands banking and conservation banking established in the US. These are market-based[33] environmental instruments that rely on a well designed currency which is established for incorporating the values of hectare units and those associated with ecological functions and services, quality and integrity of habitats.[34]

Using an appropriate currency, allows mitigation replacement ratios to be adjusted to account for the type of offset, to discourage project impacts to selected habitats, and to reflect the risk that an offset may fail. In practice, the concepts of currency and mitigation ratios are often conflated, with currency values embedded in acreage or hectare ratios.

In spite of not being so important for the analysis of the Brazilian and EU frameworks at their present stage of development, currency is still a crucial issue as these arrangements might develop into market based mechanisms and should be considered when designing an international regime.

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[32] Id., p. 69.

[33] Market based instruments are those which encourage behaviours through market signals rather than through explicit sets of rules regarding pollution control levels, patterns, standards or methods. "Such instruments far from 'commanding' a given response on the part of environmental actors, seek rather to influence their behaviour by, alternatively, imposing economic costs or conferring economic benefits." Joanne Scott, *EC Environmental Law*, Longman, London and New York, 1998, p.44.

[34] It must be born in mind that simply creating an environmental market by no means ensures environmental protection. "If the currency cannot incorporate the environmental values we care about, these become external to the exchange and, as a result, trades may actually worsen the environment or natural services delivered. (…) In the extreme case, the currency can actually encourage environmentally harmful behaviour." Salzman and Ruhl, footnote 26 at 330-331. The problem of currency is discussed in depth by the same authors - Salzman and Ruhl, footnote 27 at 607-694. - where they identify issues of currency and exchange adequacy and examine the non-fungibilities of space, type and time.

2.7.5 Temporal issues

An issue that must also be considered by biodiversity offsets policy makers and regulators is the proper time for the compensation to be operational, whether before, concurrent with, or following the impacts caused by a project or activity. Whilst offset arrangements generally prefer for offsets to be in place and effective prior to project impacts, strict adherence to such an approach might discourage the establishment of offset banks in more developed frameworks, since bankers cannot raise capital through early release of credits.[35] It should be recognised that temporal losses may be addressed through adjustments to mitigation replacement ratios.

As discussed below, whilst the EU offsets regime adopts as a principle that offsets should be operational at the time of the damage; both Brazilian offset arrangements are still timid in addressing temporal issues.

2.7.6 Offset sustainability and monitoring

What is the appropriate operable period for an offset? Perpetuity or equal to the duration of project impacts? What management and monitoring requirements, as well as legal assurances and arrangements, are appropriate for ensuring offsets are in compliance? These are only some of the issues that should be born in mind by stakeholders. Most offset policies call for offset protection to be established at the very least for the duration of the impacts generated by a specific project[36], as in the EU arrangement that requires that long term conservation measures should be ensured. There are also some demanding issues that should be considered in designing offset arrangements, such as legal and financial assurances to secure site tenure, restriction of harmful activities, long-term management and monitoring, and cover of contingency and remedial actions in the event of offset failure.

[35] ten Kate et al, *supra* note 12 at 67-68.
[36] Id., p. 66.

These also include effective mechanisms for stakeholders' participation and oversight, an issue addressed when discussing the new Brazilian developer's offset regulation.

3. EU: A regional case study

The purpose of this section is to analyze the treatment given to biodiversity offsets in the EU legal framework. This section starts looking at nature conservation and biodiversity laws, and more deeply into the Natura 2000 network. It discusses the trend to look beyond protected areas in a shift towards the integration of nature conservation in other legal and policy fields – such as the Common Agricultural Policy.[37] This section will also look at other instruments, provided by EU Directives, which are and should be used for a more effective nature conservation and biodiversity policy. Such a comprehensive but condensed analysis is crucial to understand biodiversity offsets in the EU, allowing to envisage desirable developments in EU Conservation Laws and particularly biodiversity offsets.

3.1 Nature Conservation and Biodiversity

As a party to the 1992 CBD, the European Community accepted an international obligation to achieve a significant reduction in rates of biodiversity loss by 2010. However, the European Community, through the 2001 EU Sustainable Development Strategy[38], decided to adopt an even stricter aim by halting biodiversity loss by the same year. This is recognition at the EU level of the "no net loss principle" as commented in Section 2,

[37] For an updated analysis on the integration of nature and biodiversity conservation actions into other European Community Policies, particularly the Common Agricultural Policy see Brian Jack, *The European Community and the Biodiversity Loss: Missing the Target?* Review of European Community and International Environmental Law - RECIEL Volume 15 Issue (3) 2006, Blackwell Publishing.

[38] European Commission, A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development, COM (2001) 264 final at 12. The 2006 Renewed EU Sustainable Development Strategy endorse this objective: http://register.consilium.europa.eu/pdf/en/06/st10/st10117.en06.pdf

requiring quantitative and qualitative aspects of biodiversity to be maintained at a status quo. This aim is also enshrined in the legally binding Decision on the Sixth Environmental Action Programme – 6th EAP (EC 2002) [39].

In order to attain this ambitious target, Natura 2000 is the cornerstone of the European nature conservation and biodiversity policy.[40] Natura 2000 is an European network of nature conservation sites made up of "Special Protection Areas" (SPAs) designated pursuant Directive 79/409 on the conservation of wild birds, adopted in 1979 (hereafter 'Birds Directive') and "Special Areas of Conservation" (SACs) designated pursuant Directive 92/43 on the conservation of natural habitats and of wild fauna and flora, adopted in 1992 (hereafter 'Habitats Directive').

This sophisticated framework for nature conservation places the responsibility for enhancing biodiversity upon Member States' shoulders. This is the reason that the Birds Directive calls for Member States (MS) to designate, as SPAs, their "most suitable territories" for the protection of bird species listed in Annex I to the directive[41] and regularly occurring migratory birds not listed in Annex I whilst the Habitats Directive requires MS to nominate as SACs, to the Commission, potential sites containing either natural habitats listed in Annex I to the directive or habitats of particular species listed in Annex 2.

As detailed below, Natura 2000 relies mainly on a designated areas approach, which remains the core legal technique of nature conservation in Europe. However, since the Habitats Directive with its Article 6 and some related Directives, analyzed below, it is possible to identify a trend in EU nature conservation law, looking beyond such a

[39] Decision No 1600/2002/ EC of the European Parliament and of the Council of 22 July laying down the Sixth Environmental Action Programme, [2002] OJ L242, Article 6 (1).
[40] For a detailed discussion of the legal basis of the Birds and Habitats Directives, see Nicolas de Sadeleer, *EC Law and Biodiversity* (p. 349-369) *in Reflections on 30 Years of EU Environmental Law – A High Level of Protection?* edited by Richard Macrory, Europa Law Publishing, Amsterdam, 2006.
[41] Birds Directive, Article 4 (1)

fragmented approach - that fails to recognise the profound interrelationship between different elements of biodiversity - shifting towards the integration of nature conservation in other legal and policy fields. This more holistic approach relies more on the assumption of a general duty to conserve and foster biodiversity, and less on land apart instruments in the sense of designated areas for special protection.[42]

Despite the efforts outlined above and detailed below, the EC has recently reported that much of the Community's biodiversity remains impoverished and that the 2010 target will be only achieved with greater efforts at both Community and Member State Level[43].

3.1.1 EU Natura 2000 sites – Birds and Habitats Directives

The adoption of the Birds Directive in the very early development of EU environmental laws was remarkable, considering that it happened in 1979, 8 years before the Single European Act (1987) which gave the Community a clear legal basis for measures regarding nature conservation. The Birds Directive requires that MS must preserve, maintain or re-establish a sufficient diversity and area of habitats so that general bird populations are maintained. With respect to endangered bird species (listed in Annex I of the Directive) and regularly occurring migratory birds (not listed in Annex I), the 'most suitable' land and sea territories must be classified as 'special protection areas' (SPAs)[44]. MS are also obliged to 'take appropriate steps to avoid pollution or deterioration of the habitats or any disturbances affecting the birds' in SPAs.[45]

[42] J. Holder and M. Lee, Environmental Protection, Law and Policy (CUP, 2007), Chapter 15.
[43] Commission Communication of 22 May 2006 on Halting the Loss of Biodiversity by 2010 and Beyond, COM (2006) 216 final, at 3.
[44] Birds Directive, Article 4 (2)
[45] Id., Article 4 (4)

The Birds Directive, besides requiring the designation of SPAs, obliges MS to prohibit the capture and hunting[46] of Annex I birds. This Directive was considered a groundbreaking piece of legislation since affected for the first time the MS's land use, setting an absolute approach to nature protection and by introducing a site-based approach to EU conservation policy. It was also remarkable for providing a transboundary answer to the protection of migratory species. However, the Birds Directive had some drawbacks as it did not foresee a specific timeframe and threshold for the final shape of SPAs network, giving, besides, a huge margin of discretion to MS.[47] This lead to poor implementation, resulting in a vast number of cases being brought to the European Court of Justice (ECJ). There are EU Commission statistics identifying nature conservation and biodiversity as one of the most litigated areas at the EC level, accounting for 1/3rd of the environmental complaints, infringements and cases. This is due to a significant impact of nature conservation provisions on planning and projects.[48]

The Habitats Directive, a more modern legislative tool, was largely influenced by the Bern Convention on the Conservation of European Wildlife and Natural Habitats. Designed in an attempt to fulfil the EC's obligations arising from the 1992 CBD, it created the Natura 2000 network. The Habitats Directive seeks to establish a coherent European ecological network[49] of conservation sites throughout Europe, containing specific natural habitat types (listed in Annex I to the Directive) and species (listed in Annex II). As commented on above, the Natura 2000 also encompasses the SPAs established in accordance with the Birds Directive.

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[46] Id., Article 5

[47] As in Brian Jack, *supra* note 37 at 306 referring to a Commission Report [COM (2006) 164 final, at 9]: "the European Commission recently reported that it considered that only four Member States has designated sufficient SPAs".

[48] For statistics, see http://ec.europa.eu/environment/

[49] Habitats Directive, Art. 3 (1)

The Habitats Directive uses the same legal technique of the Birds Directive - the designation of areas. In spite of the similarities, the Habitats Directive represents a significant conceptual shift from the Birds Directive as it aims to conserve biodiversity in recognition that species and habitats are closely connected and dependent upon each other. It also introduces a fresh concept of developing networks and ecological corridors to better integrate and achieve nature conservation objectives.[50] The Habitats Directive thus advances a more holistic and integrated approach to nature conservation. There are also innovative provisions claiming for European Community co-financing of the creation and management of selected sites.[51]

Importantly, the Habitats Directive requires under Articles 6(1) and (2) that MS establish the necessary conservation measures for listed habitats and species, while Article 6(3) calls for 'appropriate assessment' of any plan or project likely to have a significant effect on a Natura 2000 site. Falter and Scheuer suggest that the importance and role of the Environmental Impact Assessment (EIA) and Strategic Impact Assessment (SEA) was strengthened by Article 6 of the Habitats Directive, since it provides for "real juridical impacts and the possibility to complain to the Commission".[52] The relationship with Directive 85/337/EEC (EIA Directive), and Habitats Directive Article 6[53], paragraph 4, the "hook" for biodiversity offsets in EU Conservation Law, are explored below.

Also remarkable is the fact that, differently from the Birds Directive, there are strict timeframes provided in the Habitats Directive. However, it must be recognised that the

[50] Id., Article 10
[51] Id., Article 8
[52] Christine Falter and Stefan Scheuer, in EU Environmental Policy Handbook – A Critical Analysis of EU Environmental Legislation, edited by Stefan Scheuer, European Environmental Bureau, September 2005, Brussels, Belgium, p. 40
[53] See Appendix B.

Habitats Directive faces serious implementation problems[54], as all MS failed to meet the 1995 deadline to nominate sites to the Commission. Even today, although a large number of sites have been chosen, the selection process has not been yet completed, as sites of Community importance need to be pointed out for the Pannonian biogeographical region[55]. The lack of or limited cooperation provided by MS has been delaying the final selection of the Natura 2000 network well beyond the original target year, 1998.[56]

Finally, the Habitats Directive shows the influence of sustainable development, including within its provisions many limitations and compromises arisen from such an idea. Therefore the Habitats Directive is considered a multilayer instrument with new environmental governance techniques – making use of procedural, designative and substantive legal techniques - which advances a more negotiative and 'trade-off' approach in contrast with the straightforward and absolutist approach to nature conservation provided by the Birds Directive. The sustainable development principle is particularly apparent in the Habitats Directive Article 6 (4) which calls for offsets for the loss of habitats and species[57]. As explored below, the danger of such an approach is to allow unacceptable development.

3.1.2 *Other Directives related to Natura 2000*

Notwithstanding all the developments and contributions of the Birds Directive and particularly the more modern Habitats Directive, it is necessary to also look at some other EU directives to understand the case for the shift departing from a simple protected areas approach towards a more holistic view of nature conservation in Europe.

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[54] "There have been enormous delays in the Member States concerning the implementation of the Birds and Habitats Directives, an both are amongst the most litigated directives of the EU." *EU Environmental Policy Handbook – A Critical Analysis of EU Environmental Legislation*, Edited by Stefan Scheuer, European Environmental Bureau, September 2005, Brussels, Belgium, p. 40

[55] For more information on the biogeographical regions and selected sites, see http://ec.europa.eu/environment/nature/nature_conservation/natura_2000_network/biogeographic_regions (last accessed 1st May 2007).

[56] Habitats Directive, Art. 4 (4)

[57] This influence is also made clear by its Preamble and Article 2 (3).

3.1.2.1Water Framework Directive

On 23 October 2000, the Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (hereafter "Water Framework Directive" or "WFD") was finally adopted. The WFD is the most substantial and comprehensive piece of EC water legislation and requires all surface, groundwater and coastal waters to reach "good status" by 2015[58].

Under the WFD MS have to register and monitor all protected areas and achieve their respective objectives by 2015 if no other deadlines are provided for. It is expected that the 2015 objective of 'good ecological status' for water may substantially support and raise the state of sites under Natura 2000, many of which are dependent on the services delivered by their aquatic component. It is also expected that the WFD objective must have a strong influence on the improvement of nature and biodiversity status outside designated areas.[59]

3.1.2.2 Environmental Impact Assessment and Strategic Environmental Assessment Directives

On 27 June 1985, the Council of the European Communities' Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment was adopted (hereafter "EIA Directive"). The EIA Directive was amended for the first time in 1997 and again, in 2003 (Directive 2003/35/EC), in order to align the provisions on public participation in accordance with the Aarhus Convention on public participation in decision-making and access to justice in environmental matters. The Strategic Environmental Assessment Directive (hereafter "SEA Directive"), Directive 2001/42/EC, is considered an extension of the EIA Directive, from the individual project

[58] WFD, Article 4.1. It is important to notice that there follow a number of exemptions to the general objectives that allow for less stringent objectives, extension of deadline beyond 2015, or the implementation of new projects, provided a set of conditions are fulfilled.

[59] For more information on the WFD, see Chapter IV.5, EU Environmental Policy Handbook – A Critical Analysis of EU Environmental Legislation, Edited by Stefan Scheuer, European Environmental Bureau, September 2005, Brussels, Belgium. See also http://ec.europa.eu/environment/water/water-framework/index_en.html

approach to the level of public programmes and plans, focusing on political decision-making, but not including policies.[60]

The EIA procedure ensures that environmental consequences of projects are identified and assessed before authorisation is given. The EIA Directive outlines which project categories shall be made subject to an EIA, which procedure shall be followed and the content of the assessment.

As seen above, Article 6(3) of the Habitats Directive calls for 'appropriate assessment' of any plan or project likely to have a significant effect for a Natura 2000 site. It is still uncertain the precise relationship between 'appropriate assessment' and the assessments foreseen by the EIA and SEA Directives. However, it is indisputable that the procedures provided for in these directives are crucial supporting instruments for the protection of designated areas from developments harmful to their environment. Furthermore, the SEA Directive (Whereas (10)) explicitly requires environmental assessment in the case of plans or programmes affecting Natura 2000 sites.[61] The EIA and SEA Directives provide therefore significant support for the achievement of Natura 2000 objectives.

3.1.2.3 Environmental Liability Directive

On 30 April 2004 Directive 2004/35/EC of the European Parliament and of the Council on "environmental liability with regard to the prevention and remediation of environmental damage" (hereafter 'ELD') entered into force, with a three year implementation period. ELD aims for the prevention and remediation of environmental

[60] For more on the EIA and SEA Directives see Joanne Scott and Jane Holder, *Law and New Environmental Governance in the European Union* in Grainne de Burca and Joanne Scott, *Law and New Governance in the EU and the US*. Oxford and Portland, Oregon: Hart Publishing, 2006, p. 211-242.
[61] For more information on the WFD, see Chapter V.3.5, EU Environmental Policy Handbook – A Critical Analysis of EU Environmental Legislation, Edited by Stefan Scheuer, European Environmental Bureau, September 2005, Brussels, Belgium.

damage, enforcing the polluter-pays principle, however, does not apply retroactively to past damage.

It is remarkable that ELD defines environmental damage in a way that covers species and habitats protected by Natura 2000, thus innovatively protecting biodiversity. However, the damage to biodiversity is only relevant if it 'has significant adverse effects on reaching or maintaining the favourable conservation status of such habitats or species'[62], thus establishing a threshold that must be met. The new regime represents an additional instrument for the implementation of Europe's nature conservation policy, particularly relevant to support biodiversity offsets objectives.

3.1.3 Biodiversity Offsets in the EU

3.1.3.1 General Aspects

As noticed, Article 6(3) of the Habitats Directive calls for an 'appropriate assessment' of any plan or project likely to have a significant effect[63] for a Natura 2000 site, establishing the general rule according to which authorisation can only be granted to plans and projects not affecting concerned sites. Article 6(4) addresses exceptions to this rule determining that even with a negative assessment, and 'in the absence of **alternative solutions**, a plan or project must nevertheless be carried out for **imperative reasons of overriding public interest**, including those of a **social or economic nature**, but the Member State shall take all **compensatory measures** necessary to ensure that the **overall coherence** of Natura 2000 is protected.' (emphasis added)

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62 ELD Directive, Article 2.1.(a)

63 Regarding 'effect', the Court has already held, in the case *Waddenvereniging and Vogelbeschermingsvereniging* (Judgement of the Court of 7 September 2004 in case C-127/02, paragraphs 57 and 61) and confirmed more recently on the Judgement of the Court of 26 October in the case C-239/04 regarding the construction of a motorway in Portugal (paragraph 24), that Article 6(3) of the Habitats Directive makes the requirement for an appropriate assessment of the implications of a plan or project conditional upon there being a probability, or a risk, that it will have a significant effect on the site concerned. According to the precautionary principle, such a risk is considered to exist if it cannot be excluded, on the basis of objective information, that the plan or project will have a significant effect on the site concerned.

The aforementioned compensatory measures are the biodiversity offsets, which forms the focal point of this paper. Article 6(4) establishes a second more limitative exception for paramount sites, providing that 'where the site concerned hosts a priority natural habitat type and/or a priority species', as marked in Annex I of the Directive, 'the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.'[64] The Commission's opinion is not binding, but legal action might be taken if understood that Community law is being violated.

Being an exception to Article 6(3), Article 6 (4) can only be applied if all conditions are fulfilled, falling on the party interested in the plan or project to prove that required conditions are met in the particular case. Furthermore, an EU Commission Guidance Document[65] (hereafter 'Guidance Document'), which has no-binding effect, clarifies the provisions of Article 6(4) underscoring that: 'compensatory measures should be considered only when the application of other safeguards, such as mitigation measures, is not sufficient. The compensatory measures adopted must always be communicated to the Commission.' The Guidance Document clarifies that the compensatory measures should be submitted to the Commission after the decision authorising the realisation of the plan or project and before its actual realisation and implementation of the concerned measures.[66] It also

[64] Since the Birds Directive does not rank any species as priority, compensatory measures aiming to offset effects on SPAs' bird populations would never require the Commissions' opinion
[65] Guidance Document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (Clarification of the Concepts of: *Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensation Measures, Overall Coherence, Opinion of the Commission*, January 2007, (hereafter "Guidance Document") p. 4 accessed on http://ec.europa.eu/environment/nature/nature_conservation/eu_nature_legislation/specific_articles/art6/pdf/guidance_art6_4_en.pdf
[66] *Id.*, p. 21

elucidates that it is not the Commission's role to suggest the compensatory measures, but only to appreciate if the conservation aims of a specific site are being pursued.[67]

3.1.3.2 Clarifying key concepts

It is important to analyze four key concepts used in Article 6(4) for a better understanding of its provisions: 'alternative solutions'; 'imperative reasons of overriding public interest'; 'compensatory measures'; and 'overall coherence'. It must be instantly empathized that all feasible 'alternative solutions' must be analyzed by the competent authorities' appraisal, including the zero option – option of not authorising a plan or project. The competent authority should not, therefore, limit its considerations of alternative solutions to those suggested by the project proponent. Furthermore, the Advocate General, in its Opinion in the case C-239/04[68], considers that among the options listed "the choice requires a balance to be struck between the adverse effect on the integrity of the SPA and the relevant reasons of overriding public interest".

The ECJ has never given clear clues for interpreting the concept of 'imperative reasons of overriding public interest'. Nevertheless, the Guidance Document considers 'imperative reasons of overriding public interest' as those in which plans or projects prove to be indispensable for the protection of fundamental citizens' values such as health, safety and environment; to fundamental State and Society's policies; or to fulfill specific obligations of public service. Several clarifying examples are listed and commented on in the referred document. [69]

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67 To access the European Commission Opinions relevant to Article 6 (4) of the Habitats Directive, see http://ec.europa.eu/environment/nature/nature_conservation/eu_nature_legislation/specific_articles/art6/index_en.htm

[68] Case C-239/04, *supr*a footnote 63 at paragraph 44.

[69] Guidance Document, *supra* note 65 at 8-9.

The Habitats Directive also provides no definition for 'compensatory measures'. However, the Guidance Document defines compensatory measures as being those measures "independent of the project" and "intended to offset the negative effects of the plan or project so that the overall ecological coherence of the Natura 2000 Network is maintained".[70] It is widely recognised that the compensatory measures must be additional to the normal practices foreseen by EU Conservation Law, aiming ultimately at offsetting the negative effects of a project, conforming to the additionality principle. Another basic principle of biodiversity offsets recognised by EC laws - mitigation hierarchy principle - requires that offsetting must constitute a last resort, only exercised to offset the negative effects of an indispensable plan or project ('of overriding public interest') for which no alternative solutions could be envisaged.

Once more, in the lack of ECJ orientation on how to interpret key concepts of Article 6(4) - 'overall coherence' – the Guidance Document sheds some light on the concept stating that:

> "In order to ensure the overall coherence of Natura 2000, the compensatory measures proposed for a project should therefore: a) address, in comparable proportions, the habitats and species negatively affected; b) provide functions comparable to those which had justified the selection criteria of the original site, particularly regarding the adequate geographical distribution. Thus, it would not be enough that the compensatory measures concern the same biogeographical region in the same Member State. The distance between the original site and the place of the compensatory measures is not necessarily an obstacle as long as it does not affect the functionality of the

[70] Id., p. 10

site, its role in the geographical distribution and the reasons for its initial selection."

The Guidance Document recognises that on-site offsets are preferred, but are not an absolute criterion for allocating compensatory measures[71].

3.2 Final Considerations

In order to tackle the fragmentation and degradation of habitats and the loss of biodiversity, it is imperative to look beyond the boundaries of protected areas – designated areas or enclave approach – in order to provide functional linkages among protected areas and effective conservation actions considering the whole natural habitat, not only the designated land. As discussed, particularly the Habitats Directive – with its new environmental governance techniques such as ecological corridors (Article 10) – when combined with other innovative techniques and more traditional instruments (such as environmental impact assessment) provides a more holistic and integrated approach to EU Conservation Laws. It is possible to identify a trend looking beyond a fragmented approach - that fails to recognise the profound interrelationship between different elements of nature and biodiversity - shifting towards the integration of nature conservation in other legal and policy disciplines.

Article 6 of the Habitats Directive, discussed above, is intimately linked with the concept of sustainable development, departing from the more absolutist approach towards nature conservation adopted by the Birds Directive and adopting a more holistic but "shallower" (i.e. less protection) approach to nature conservation. It was also seen that biodiversity offsets arrangement relies on the principles and most concepts studied in Section 2 such as "no net loss", mitigation hierarchy, additionality, and preference for on-site

[71] Id., p. 18.

offsetting. The EU biodiversity offsets is at the same time restrictive and flexible. In theory it is very restrictive, as it only allows biodiversity offsets as a 'last resort', requiring that the 'no-go' option should be seriously considered, but it is also flexible inasmuch as its terms are defined in a non-binding fashion, giving significant room for manoeuvre, sometimes undesirable political influence in technical environmental issues.

Non-binding documents such as the Guidance Document provide useful clarification on how the provisions of Article 6 of the Habitats Directive must be interpreted. Nevertheless, MS have a fundamental role to play when implementing these provisions at the national level, giving binding meaning and coherence to conservation policies. Besides, in spite of some important judgments connected with Nature Conservation Law in the last 5 years, the ECJ still have a considerable task ahead in clarifying many concepts and terms of Article 6 (4) and restricting the amount of discretion given to MS. The ECJ, however, is not denying its responsibilities. On the recent judgement in the commented case concerning the construction of a motorway in Portugal, the Court provided a precise interpretation for 'alternative solutions'. This case also seems to represent a 'new wave' of EU case law in which the ECJ scrutinises assessments conducted by Member State authorities, reviewing to what extent MS are exceeding their discretion in sanctioning projects.

Biodiversity offsets are a key technique not only assuring the overall coherence of the Natura 2000 network, but also confirming the new trend of EU nature and biodiversity conservation policies towards a more holistic approach, integrating nature conservation and biodiversity actions into other Community disciplines. There is, however, considerable work to be done in shaping its character and effects. Importantly, it must be effectively assured that offsets are used as a 'last resort', requiring the serious consideration of the 'no-go'

option. Biodiversity offsets cannot provide means for unacceptable development to go ahead. It is also expected that this regional case study will provide relevant contributions to assessing the feasibility of developing an international regime.

4. Brazil: A national case study

The purpose of this section is to understand how the two Brazilian biodiversity offset arrangements work: developer's offset and forest set-aside offset. The section starts briefly looking at the country's general environmental framework with special attention given to environmental licensing and environmental impact assessment, as intimately linked to the developer's offset arrangement, and then progresses to shedding light on Brazilian nature conservation laws. The following sub-section is dedicated to examine separately the two offsets arrangements in order to understand them and to identify a trend for possible developments.

4.1 General environmental law and regulation

The first attempt to systemize the regulation of environmental protection occurred with the enactment of Federal Law No. 6,938/1981, in 31 August 1981 – the National Environmental Policy Act (*Lei da Política Nacional do Meio Ambiente* - "LPNMA") which is the basis for the Brazilian Environmental Policy. The LPNMA also sets up the National Environment System (*Sistema Nacional do Meio Ambiente* – "SISNAMA") which is constituted of all environmental bodies and entities of federal, state and local governments responsible for the improvement of environmental quality.

However, the 1988 Brazilian Federal Constitution (*Constituição da República Federativa do Brasil de* 1988 - "CRFB") is the groundbreaking legal text, providing the basis for a

Brazilian programme for the conservation of biodiversity. The protection of the environment was accorded a full Section in the CRFB. Its Article 225[72] provides for environmental protection, stating that every person has the right to an ecologically well-balanced environment. Environmental protection is the responsibility of the government, as well as of the entire community. According to the CRFB, this implies a duty to "preserve and restore the essential ecological processes and provide for the ecological treatment of species and ecosystems," (Article 225, paragraph 1st, I) and to "preserve the diversity and integrity of the genetic patrimony of the country" (Article 225, paragraph 1st, II), in addition to defining "territorial spaces and their components which are to receive special protection" (Article 225, paragraph 1st, III).

4.2 The Environmental Licensing System – Environmental Impact Assessment

The Environmental Licensing System deserves special attention as intimately related to the developer's offsets arrangement. Article 225, § 1st, IV of the CFRB states that it is incumbent upon the Government to "require, in the manner prescribed by law, for the installation of works and activities **which may potentially cause significant degradation to the environment**, **a prior environmental impact study**, which shall be made public." (emphasis added)

The "prior environmental impact study" referred to by the CRFB is the Environmental Impact Assessment Study (*Estudo de Impacto Ambiental* – "EIA") and its respective Report (*Relatório de Impactos ao Meio Ambiente* - "RIMA"), that are jointly referred as "EIA/RIMA". Environmental impact assessment is conducted through an environmental licensing procedure, the basic steps of which are briefly described below. However, only in some specific cases, a proper EIA/RIMA is required. With a great amount of discretion to

[72] Full text of the CRFB in English, including article 225 (the environmental chapter), available at http://www.v-brazil.com/government/laws/titleVIII.html, (last visited 01 June 2007).

the environmental agency responsible for the environmental licensing, EIA/RIMA is only required in those cases in which a project or activity "may potentially cause significant degradation of the environment".

In line with the Constitutional provision commented upon above and with the LPNMA (art. 10), the National Council for the Environment (*Conselho Nacional do Meio Ambiente* – "CONAMA") Resolution N. 237/1997 regulated the Environmental Licensing System at the federal level, setting the guidelines to be observed at the state level.

Under the referred Resolution (art. 8) three environmental licenses are required. At the preliminary stage of a project or activity, a Previous License (*Licença Previa* – "LP") is granted approving its location and conception, certifying its environmental feasibility and establishing basic conditions to be met at the next stages of its implementation. At this stage, the EIA/RIMA might be required.

The following step is the Installation License (*Licença de Instalação* – "LI") which authorises the installation of the project or activity in accordance with the specifications contained in the approved plans, programs and projects, including the environmental control measures and other conditions.

Finally, after the verification of the effective compliance with the conditions set forth in the previous licenses, an Operation License (*Licença de Operação* – "LO") is granted, authorising the operation of the projector activity.

It is crucial to understand these basic features of the Brazilian environmental licensing system since it is closely linked with the developer's offsets.

4.3 Nature Conservation Law

Brazilian Nature Conservation Law has its origin in the 1934 National Forest Code[73] later replaced by the 1965 Forest Code (Federal Law N. 4.771/65 – hereafter "Forest Code"), in effect today with subsequent amendments by Federal Law N. 7.803/89 and Provisional Measure N. 2.166-67/2001. The Forest Code determined that all forests and vegetations are "assets of common interest to all the inhabitants of the country"[74]. Brazilian Nature Conservation Laws was elevated to constitutional status in 1988 by the aforementioned CFRB. Relying on designated areas as its core legal technique, it provides for three general categories of environmentally protected territorial spaces: Permanent Protected Areas; Legal Forest Reserves; and Conservation Units.

4.3.1 Permanent Protected Areas

Permanent Protected Areas (PPAs) are areas with the function of providing several environmental services as described in Article 1 of the Forest Code. PPAs can be established by two different ways: by the enactment of the Forest Code itself, which provided a list (Article 2) of PPAs such as, *inter alia*, rivers' margins, mountain tops and areas lodging mangrove vegetation; or by a specific legislative act for other areas also listed in the Code (Article 3). An important feature of PPAs is that they must remain untouched. In some exceptional cases (public utility, social interest and in cases of low environmental impact), however, economic activities can be conducted in PPAs, as regulated by CONAMA Resolution N. 369, in effect as of 29 March 2006.

[73] Pereira considers that, at that time, the 1934 Forest Code was the most relevant development towards the protection of Brazilian forests. Osny Duarte Pereira, Direito Florestal Brasileiro. Rio de Janeiro: Editor Borsoi, 1950, p.155.
[74] Forest Code, article 1, caput.

4.3.2 Legal Forest Reserves

Legal Forest Reserves[75] (LFR) are those specially protected territorial spaces situated within rural real estates, aiming at the sustainable use of natural resources, the conservation and rehabilitation of ecological services and biodiversity (Article 2, paragraph 2nd, III). The Forest Code (Article 16) requires that rural landowners must maintain a fixed minimum percentage of natural vegetative cover on their property, ranging from 20% to 80% depending on the region (Amazon Forest = 80%; Amazon Savannah = 35%; all other areas = 20%). On LFR, clearing of forest is not permitted and the only admissible use is through the sustainable forestry regime (Article 16, paragraph 2nd), according to the principles and criteria established by the recently enacted Federal Decree N. 5,975 from 30 November 2006.

The location of LFRs must be approved by the state environmental agency which must take into account the social role of the real estate, its proximity with other LFRs, PPAs, conservation units or other specially protected territorial spaces and any existent environmental spatial planning instrument (Article 16, paragraph 4th). The Forest Code also requires that LFRs must be perpetually recorded in the respective Real State Registry (Article 16, paragraph 8th)[76].

According to the Forest Code (Article 44), those landowners who do not meet the LFR minimum percentage of vegetative cover for their property (forests set-aside obligation) are required to adopt, isolated or jointly, the following measures: (i) replant vegetation to

[75] There is a consensus that the legal nature of LFR is of a general administrative limitation to the use of property; therefore landowners are not entitled of any kind of indemnification. Vladimir Garcia Magalhaes. *Reserva Legal*, Revista de Direitos Difusos, IBAP/APRODAB, São Paulo, Volume 32, July-August/2005, p. 126-127.

[76] The effect of this registry is merely declaratory rather than constitutive, in the sense that the LFR were already created by the enactment of the Forest Code and the registry does not create any new obligation but simply produces the effect of a declaration. Paulo de Bessa Antunes, Direito Ambiental, Editora Lumen Juris, Rio de Janeiro, 9a edição, 2006, p. 533 and 540.

comply with its property LFR obligation; (ii) allow the natural regeneration of vegetation; and/or (iii) compensate. As detailed below, this compensation obligation is one of the two biodiversity offsets arrangements under Brazilian legislation.

4.3.3 Conservation Units

Conservation Units are specially protected territorial spaces divided in two broad groupings: Integral Protection Units (IPU) and Sustainable Use Units (SUU). These groupings are divided in twelve sub-categories that range from areas where no kind of economic activity is allowed to less restrictive sub-categories, where economic activities are restricted, but allowed, in differing degrees. This network of conservation units (*Sistema Nacional de Unidades de Conservação – "SNUC")* was created in 2000 by the Brazilian System of Conservation Units Act (Brazilian Federal Law N. 9,985/2000, hereafter "SNUC Act"), and further regulated in 2002 by the Brazilian System of Conservation Units Decree 2002 (Federal Decree N. 4,340, hereafter "SNUC Decree").

Whilst the IPU grouping relies on an absolute preservation approach, being composed by 5 sub-categories, which are mostly in the public domain and allowing no economic activity (only public visitation and scientific research activities are permitted), the SUU grouping is made up by 7 sub-categories, generally privately owned, which use is based on a sustainable development approach. The conservation units are created by a specific law or decree.

The SNUC Act advances innovative instruments departing from the pure designated areas legal technique towards an integrated approach, following a trend also observed in the EU. These innovative instruments are the ecological corridors and conservation units' buffer zones. Ecological corridors are portions of ecosystems linking conservation units, allowing the adequate flow of genetic resources and movement of species. The buffer zones are those

areas surrounding conservation units, where economic activities are subject to specific rules, aiming at minimizing negative effects to the conservation unit.

However, the most sophisticated instrument advanced by the SNUC Act is the "*compensação ambiental*" (project developer's biodiversity offset arrangement), required for the development of some projects and activities.[77]

4.4 Legal Arrangements for Biodiversity Offsets

As already noted, Brazil has two different mandatory arrangements for biodiversity offsets: forest set-aside biodiversity offset arrangement (hereafter "forest set-aside offset"); and, industrial or project developers' biodiversity offset arrangement (hereafter "developer's offset"). This sub-section will explore both arrangements focusing on future developments and assessing how stakeholders have been applying the principles and facing the difficulties underlined in Section 2.

On the Brazilian framework, biodiversity offsets are grounded in the polluter-pays principle[78]. Modern academics refer to the polluter-pays principle as the user-pays principle as a broader principle which encompasses the former, in an attempt to capture more recent trends that include the user in the general idea of the principle.[79] As seen, the CRFB considers the environment an asset of common use. The 2002 Brazilian Civil Code

[77] During the consolidation and development of the Brazilian environmental licensing system, it became evident that the definition and implementation of mitigation measures were not effective for some kind of environmental impacts, particularly those related to biodiversity loss. In this context environmental compensation, in the shape of project developer's biodiversity offset, was fashioned. CONAMA Resolution N. 010/1987 (article 1st) was the first piece of legislation to foresee this mechanism, albeit with restricted application as the legal text was imperfect and needed clarification. CONAMA Resolution N. 010/1987 was, however, amended by CONAMA Resolution N. 002, from 18 April 1996, but application remained restricted as rules were hitherto obscure.

[78] Ricardo Carneiro. *As Interferências em Áreas de Preservação Permanente em face dos Critérios Compensatórios do Código Florestal e da Lei 9,985/2000*, Revista de Direitos Difusos, IBAP/APRODAB, São Paulo, Volume 31, May-June/2005, p. 171-189.

[79] Paulo Affonso Leme Machado, Direito Ambiental Brasileiro, Malheiros Editores, 14th edição revista, atualizada e ampliada, 2006, p. 59-61.

establishes in its Article 99[80] that assets of common use are public. Thus, the developer of a project that causes unavoidable and immitigable negative impacts to the environment or the rural landowner who does not comply with its obligation of maintaining legal required LFR must offset society in order to avoid misappropriation of public assets and so that society does not have to bear the negative external effects of the developers activities or the illegal use of land.

It should be underlined that the Brazilian biodiversity offset arrangements do not serve uniquely to avoid biodiversity loss, but to broader environmental purposes that take biodiversity conservation as one of its core concerns. The fact of not dealing exclusively with biodiversity loss does not demerit Brazilian offset arrangements, but actually puts them in a position of using a more holistic approach to Nature Conservation Law in line with modern trends also identified in the EU case study.

4.4.1 Forest Set-Aside Offset

As seen above, the Forest Code requires that rural landowners must maintain a fixed minimum percentage of natural vegetative cover on their property. The minimum set-aside area requirement varies by region and can be satisfied through the use of off-site conservation measures. The legal basis for the development of this system is provided by the Forest Code which commands that in-kind solutions must be favoured, as equivalence is handled by requiring that the offset is of the same type of ecosystem within the watershed. If that is not possible due to lack of natural vegetation, the offset should be as close as possible to the land lacking LFR and within the same river basin and State (Article 44, III). The aforementioned provision also foresees that the criteria for determining equivalence and location of the offset must be established by regulation to date inexistent.

[80] Full text of the 2002 Brazilian Civil Code including article 99, although, in Portuguese, *available at* https://www.planalto.gov.br/, (last visited 29 May 2006).

There are two other possibilities for off-setting the required LFR. The first is through the rent of a LFR or a "LFR Equivalent Area"[81]. The second one is through LFR Quota, as detailed below. In one or other case, the environmental agency must approve the offset proposed (Article 44, paragraph 5).

Forest set-aside offset is in place since 28 May 2000, with the amendments to the Forest Code provided by several provisional measures. These culminated in the adoption of the Provisional Measure 2.166-67/2001[82], permanently incorporating those amendments to the Forest Code.

This forest set-aside offset, however, is directly linked to Conservation Laws with no link to environmental impact assessment. It is a considerably different dynamic from the below detailed developer's offset. Nevertheless, parallels can be drawn with the principles (no net loss and mitigation hierarchy) and concepts (additionality, in-kind v. off-kind; on-site v off-site) discussed in Section 2.

Brazilian forest set-aside offset implies the principle of no net loss of habitat under a defined minimum forest cover, but has no direct implications for the principle of mitigation hierarchy, since it is not directly connected with the development of a project or economic

[81] "LFR Equivalent Area" was a new instrument brought about by article 44-A of the Forest Code and is a space, excluding the areas of mandatory LFR and PPAs, voluntarily established by landowners already complying with their properties' LFR obligations and willing to create temporarily or permanently, additional areas equivalent to LFRs. The restrictions to the use of these "LFR Equivalent Area" must be at least as strict as the mandatory LFR regime and it must be also recorded in the competent Real Estate Registry (Article 44-A). For more on "LFR Equivalent Area" see Paulo Roberto Cunha. *Servidão Florestal – Comentários ao Artigo 44-A do Código Florestal*, Revista de Direitos Difusos, IBAP/APRODAB, São Paulo, Volume 32, July-August/2005, p.55-65.

[82] Provisional Measures (*Medidas Provisórias* – "MPs") are Presidential acts which have the same effect of law. For this reason, MPs are only allowed for matters of importance and in urgent situations. However, MPs have been used abusively, as in the case of the Forest Code. Constitutional Amendment N. 32 from 2001, which aimed to discourage the excessive use of MPs, radically changed this dynamic, expressly prohibiting several matters from being regulated by MPs and restricting its validity for a maximum period of 120 days. After this period, the MP should be scrutinised by the Congress to become formal law or to be retracted. Nevertheless, MPs passed before the referred Constitutional Amendment, such as the Provisional Measure N. 2.166-67/2001, remain valid for an indeterminate period of time, unless expressly revoked (Constitutional Amendment N. 32/2001, article 2).

activity, thus not concerned with avoiding or mitigating specific environmental impacts. As seen above, in-kind equivalence is preferred.

The additionality criterion is addressed as, by requirement of the Forests Code, off-site conservation must be additional to the minimum required conservation land. In other words, landowners accepting offset liabilities from another must comply with its own land set-aside obligation plus offset other landowner obligations. Therefore, any offset is considered additional.

Furthermore, the Brazilian forest set-aside offset is mainly built on the idea of off-site offsetting. The Forest Code foresees in Article 44-B an innovative offset instrument: LFR Quota; a title representing preserved native vegetation, either under the typical LFR regime but voluntarily established, the LFR Equivalent Area regime or under the regime of a *Reserva Particular do Patrimônio Natural* (one specific SNUC conservation unit from the SUU grouping). However, the Forest Code provides that specific regulation, which has not yet been promulgated, will establish the legal nature, characteristics, terms and mechanisms to assure that the LFR Quotas actually represent properly managed protected areas.

These third party offsets (LFR Quota) may eventually evolve into formal banking arrangements with government oversight. Presently, state governments are discussing land and ecosystem registration systems that might make it possible. A variant within this system are "condominium" arrangements where groups of landowners establish private conservation bank to offset their collective liabilities off-site.

4.4.2 Project Developer's Offset

As already noticed, the second biodiversity offset arrangement is closely linked with environmental impact assessment. The SNUC Act (Article 36) provides that developers of projects, for which EIA/RIMA is required, must offset their environmental impacts,

through a payment to the SNUC, fixed at the minimum rate of 0.5% of the total costs of the development (Article 36, paragraph 1st).[83] In other words, in the case of projects which potentially cause significant environmental impact, considered as such by the environmental agency based on the EIA/RIMA, the entrepreneur is required to support the establishment and maintenance of conservation unit(s) of the IPU grouping. As there is no cap established on current legislation, it happened that environmental bodies requested rates much higher than the minimum rate (0.5%). The actual amount is fixed on a case-by-case basis by the environmental agency responsible for licensing a project. To date no definitive guidance for determining the offset amount or attempting to determine equivalence between environmental impact and benefits of offset were issued.

Importantly the whole offset payment must be applied for the creation and maintenance of a conservation unit paramount of the IPU grouping, which aims for absolute nature conservation and does not allow economic activities within its boundaries. The general rule is that the developer of the project proposes how the payment should be spent and the environmental body, with a considerable amount of discretion, makes the final choice (Article 36, paragraph 2nd). Thus, the offset may be directed to any IPU within the SNUC, with the exception that, if the development directly impacts a specific conservation unit or its buffer zone, this unit must be benefited by the payment (Article 36, paragraph 3rd).

[83] The constitutionality of SNUC Act Article 36 is being discussed at the Federal Supreme Court (STF - *Supremo Tribunal Federal*) through the direct remedy of unconstitutionality (ADIN – *Ação Direta de Inconstitucionalidade*) N. 3,378, started in December 2004 by the National Industry Confederation (CNI – *Confederação Nacional das Industrias*) in the basis of violating constitutional principles such as legality, harmony and independence of branches, reasonability and proportionality. The first STF judge (Minister) to vote on the ADIN, Minister Carlos Britto, dismissed the arguments put forward by CNI. The final judgment is pending as Minister Marco Aurelio is considering the merits, however with no effect in the validity and efficacy of SNUC Act Article 36 which remains in force. For the latest status of ADIN N. 3,378 see http://www.stf.gov.br/processos/processo.asp?INTERFACE=1&ARGUMENTO=ADI/3378&PROCESSO=3378&CLASSE=ADI&ORIGEM=AP&RECUR (last visited 5 June 2007).

This is a typical biodiversity offset arrangement which main objective is to compensate for the residual impact to biodiversity that cannot be avoided and mitigated, in light of the mitigation hierarchy principle. The SNUC Decree (Article 31) reinforces this principle adopting offsetting as a last resort, after avoidance and mitigation of the project's impacts were considered.

The SNUC Decree also requires the creation of Environmental Compensation Chambers within environmental agencies, with deliberation function, for determining how payments will be expended (SNUC Decree, Article 32). At the federal level, IBAMA's (the Brazilian Institute for the Environment and Renewable Resources - *Instituto Brasileiro do Meio Ambiente e Recursos Naturais Renováveis*) Environmental Compensation Chamber was created[84] and decides about the distribution of environmental compensation funds to be applied on the existing or future conservation units, and proposing plans for the use of offset payments[85].

At the federal level, the guidance for determining the offset amount and equivalence between environmental impacts and benefits of offset is being discussed. Nevertheless, the order of priority for expenditure is crudely established in Article 33 of the SNUC Decree and encompasses, inter alia: (i) land tenure regularization and land demarcation; (ii) preparation, revision and implementation of the conservation unit's management plan; (iii) acquisition of goods and services for the establishment, management, monitoring and protection of the conservation unit, including its buffer zone; (iv) studies necessary for the

[84] IBAMA Ordinance (*Portaria*) N. 7/2004, from 19 January 2004 creates the Environmental Compensation Chamber within IBAMA. IBAMA Ordinance (*Portaria*) N. 44/2004, from 22 April 2004 approves IBAMA Environmental Compensation Chamber's internal operational rules. IBAMA Ordinance (*Portaria*) N. 49/2005, from 20 June 2005 brought about minor amendments to both IBAMA Ordinances mentioned.
[85] IBAMA Normative Ruling (*Instrução Normativa*) N. 47, from 27 August 2004 establishes IBAMA procedures for dealing with environmental compensation issues.

creation of new conservation unites; and, (v) research necessary for managing the conservation unit and its buffer zone.

CONAMA Resolution N. 371, in effect as of 6 April 2006 (hereafter Offset Resolution) establishes, general criteria for the calculation, charging, expenditure, approval and audition for the developer's offset required by SNUC Act, Article 36.

The Offset Resolution adopts as a general principle that the calculation of the rate to be used for compensation purposes (environmental impact degree rate) must take into account specific technical appraisal criteria (Article 2). While environmental agencies do not disclose their specific methodology with the criteria for calculating the environmental impact degree rate, it is "frozen" at the minimum rate of 0,5% (Article 15).

Nevertheless, the Offset Resolution already establishes guidelines that must be considered by environmental agencies. It acknowledges the principle "*bona fides non patitur, tub is idem exi gatur*", which provides that environmental agencies should avoid redundant criteria for calculating the environmental impact degree rate, in order to avoid excessive burden to the project developer (Article 2, paragraph 1st).

Regarding timing issues, whilst the project's total costs must be presented by the developer before the issuance of the LI (Article 4), the environmental impact degree rate must be fixed by the environmental agency competent for the licensing at the time of the issuance of the LI and its payment can only be required after that (Article 5).

Article 8 reinforces the obligation (established in SNUC Decree, Article 32) of environmental agencies to create Environmental Compensation Chambers. The principle of prioritizing conservation units of the IPU grouping enshrined in both SNUC Act and Decree is ratified by the Offset Resolution (Article 9), observing the general rule that the project developer proposes conservation unit(s) to be benefited and the environmental

agency, with considerable amount of discretion, chooses (Article 10). The innovation brought about by the Resolution consecrates the public participation principle, providing that anyone might suggest the conservation unit(s) to receive the benefit.

The Offsets Resolution is also groundbreaking as it establishes strict transparency and publicity rules for expending payments[86]. It also requires beneficiary conservation units to have detailed plans and projects to be entitled to receive payments (Articles 11 and 12). The Offsets Resolution finally establishes that, based on the principle of *tempus regit actum*, its provisions are non-retroactive, as do not apply to projects already implemented or to which payments were already disbursed or agreed (Articles 6, 7 and 14).

4.5 Final Considerations

Conservation Law formed the embryo of Brazilian Environmental Law which has developed to be a comprehensive, complex and restrictive framework. Brazilian Conservation Law relies on a designated area approach as its main legal technique but is moving towards a more holistic approach to nature conservation, absorbing new instruments and techniques such as ecological corridors and buffer zones, and developing sophisticated arrangements for biodiversity offsets.

Brazilian biodiversity offsets framework is made up of two mandatory arrangements: developers' offset; and, forest set-aside offset, a very peculiar Brazilian arrangement with no connection with environmental impact assessment.

Starting from the latter, it was argued that forest set-aside offset implies the principle of no net loss of habitat, but has no direct implications with the principle of mitigation

[86] In this sense, see http://www.ibama.gov.br/compensacao/index.php?id_menu=167 (last visited 4 June 2007) for a comprehensive list of projects (at the federal level) which made SNUC Act Article 36 developers' offset payments. The list shows detailed information, such as: environmental license data; project's total value; environmental impact degree rate; biodiversity offset amount; conservation units benefited; and, measures adopted.

hierarchy. Besides, in-kind equivalence is privileged and the additionality criterion is addressed. Moreover, forest set-aside offset is mainly built into the idea of off-site offsetting, allowing its development towards using market-based mechanisms to offset biodiversity loss.

Nonetheless, forest set-aside offset needs some urgent developments to take-off, particularly the fashioning of the legally required regulation bringing about criteria for determining equivalence and location of the offset (Forest Code, Article 44, III); and, establishing the legal nature, characteristics, terms and mechanisms to the LFR Quota (Forest Code, Article 44-B). As Brazil is a huge country and environmental inspection efforts are never enough, there are also serious problems with enforcing LFR obligations, which deserves a detailed study not possible in the limitations of this paper.

Regarding project developer's offset the principle of no net loss or net gain is not directly and expressly linked to the offset provision (Article 36). However, the SNUC Act expressly includes as its first objective the maintenance – thus, no net loss principle – of biodiversity (SNUC Act, Article 4, I). Article 36 from the SNUC Act, project developers' offset is, therefore, a typical biodiversity offset as defined in Section 2.

Developer's offset also adopts an out-of-kind approach, as defines no strict linkage between environmental impacts and the benefits of offset payments, hence making it very difficult to measure net difference in environmental values. Additionally, off-site offsetting is adopted as a principle, with the exception of projects directly impacting a specific conservation unit.

Aside from proposing beneficiary conservation unit(s), the only obligation that developers must fulfil is to make offset payments with no requirement to be directly involved in conservation actions. On the one hand it speeds up the availability of payments to be invested in conservation measures, assuming environmental bodies are committed to

promptly apply on conservation measures. On the other hand this does not involve developers in fashioning and putting into practice conservation measures. It gives the wrong idea that mere payments resolve environmental obligations with no need to commit business with environmental initiatives.

Developer's offset is a well established instrument that propagates the sustainable development approach into nature conservation law. However, the urgent step required is the definitive shaping and adoption by environmental agencies of methodologies for the calculation of the environmental impact degree rate, taking into account specific technical appraisal criterion. Moreover programmes should be developed to raise consciousness on developers on the crucial role biodiversity offsets play in biodiversity conservation.

5. Conclusion: Towards an international regime?

Together with climate change, global biodiversity loss might be the one of the most dramatic crises to be faced by humanity in the years to come. As noticed, halting biodiversity loss is of additional complexity as result of the uneven distribution of biodiversity resources, concentrated in a few mega diverse developing countries. Therefore, it was the consensus that addressing this problem would require an internationally coordinated solution leading to a first important step: the adoption of the framework Convention on Biological Diversity, which serves as a meeting place for the continued development of global biodiversity solutions. However, as the task is showing to be over challenging, an international regime for biodiversity offsets may play a key role in accomplishing such a demanding objective.

5.1 Lessons from EU and Brazil

After analysing a regional and a national mandatory approach to offset biodiversity loss, some lessons can be drawn. Both the EU and Brazilian case studies are relevant to foster the debate of creating an international regime for biodiversity offsets, as both regimes deal with very diverse ecosystems and species throughout the boundaries of different, respectively, countries and federative states. This suggests that such a system could work at the international level.

The EU biodiversity offset relies on most of the basic principles and concepts studied in Section 2 such as "no net loss", mitigation hierarchy, additionality, and preference for on-site offsetting. It also proved to be at the same time restrictive and flexible and a key technique for assuring the overall coherence of the Natura 2000 network, as long as the mitigation hierarchy principle is effectively respected. There is, however, considerable work to be done in shaping its character and effects.

Brazilian biodiversity offset arrangements – forest set-aside and developer's – imply the principle of no net loss of habitat, but while the forest set-aside regime has no direct implications for the principle of mitigation hierarchy, the developers' offset is intimately linked to this principle. Also, whilst in-kind equivalence is privileged in the forest set-aside regime, developer's offset adopts an out-of-kind approach, as it draws no strict linkage between environmental impacts and benefits of offset payments. Both arrangements however adopt the additionality criterion and are generally built into the idea of off-site offsetting.

Whilst EU arrangement is directly hooked up on conservation laws (Habitats Directive Article 6) with a strong relation with environmental impact assessment, Brazilian framework is made up by two arrangements with very distinct dynamics: developer's offset,

directly linked to environmental impact assessment; and forest set-aside offset, built on conservation laws. These two case studies imply that both conservation laws and environmental impact assessment are key on proliferating and shaping future national and regional biodiversity offset mandatory arrangements.

Finally, both case studies showed that biodiversity offsets are representative of the sustainable development principle. However, such principle can only be attained in its plenitude if offsets are fashioned and employed as a 'last resort', requiring the serious consideration of the 'no-go' option, in line with the debated principle of mitigation hierarchy. The major concern to be born in mind is that biodiversity offsets cannot provide means for unacceptable development to go ahead.

5.2 Designing an international regime

Regarding the design of an international regime, as result of being a naturally complex and time consuming process[87], it is important not to lose the focus on local and regional action and on developing national and regional biodiversity offset mandatory arrangements, mainly in those countries which are hotspots of biodiversity.

Nonetheless, the purpose of this paper is also to launch the debate on fashioning this necessary internationally coordinated solution – an international regime for biodiversity offsets – with no ambition to go further on a detailed proposal. Therefore, some basic ideas should be born in mind.

As discussed in Section 2, the CBD seems to be the logical place to accommodate such a regime, since biodiversity offsets and CBD share the same idea of sustainable use of

[87] For understanding the complexity of negotiating such a ambitious international coordinated solution, see Timothy J. Hodges and Anne Daniel, Promises and pitfalls: First Steps on the Road to the International ABS Regime, RECIEL 14 (2) 2005, p. 148-160.

biodiversity. CBD COP latest decisions seem to ratify this trend and, particularly CBD Articles 11 and 14[88] are the grounds for the development of such a regime.

How would that process be put in place? One option is the adoption of a Protocol to the CBD. Biodiversity offsets might then be the channel for international payments to compensate a biodiversity hotspot State for additional restrictions on the use of its land, for example an additional offset area agreed to with the international community.

It is a consensus that means must be identified to channel resources for biodiversity conservation to biodiversity-rich developing states – to compensate them for any specific obligations undertaken for the purpose of conserving biodiversity. One possibility, as suggested by Swanson is to make use of international franchise agreements – tripartite agreements between an owner-state, an international global planning authority to be created and a franchisee, with the aim of allocating land uses between global and local communities[89]. An existing institution, the Global Environmental Facility (GEF), might take the place of an international planning authority in assessing and facilitating transactions.

There are many challenges that have to be addressed in design an international regime. Many of these challenges are common to national and regional frameworks as already discussed in Section 2, and detailed in the EU and Brazilian case studies, which serve as testing grounds for issues to be faced at the international level.

Other additional barriers could be overcome by borrowing solutions from existing international environmental agreements. Within the CBD, the successful adoption of the

[88] See Appendix A

[89] First proposed by Timothy M. Swanson in a paper presented at a workshop on Financing Biodiversity Conservation in 13-15 September 1995, at Harare, Zimbabwe: *"The Theory and Practice of Transferring Developments Rights: The Institutions for Contracting for Biodiversity"* . This idea was then developed in Swanson, *supra* note 5 at 107-134.

Cartagena Protocol on Biosafety[90] proves that such different agendas and interests can converge to meet a common interest. However, the negotiations for an international regime of access and benefit sharing of genetic resources and associated traditional knowledge, launched in 2001[91], serves as a remainder of the great difficulties to agree on complexes international regimes.

Ideas of institutions such as the ones employed by the 1997 Kyoto Protocol[92] to the United Nations Convention on Climate Change[93] - Clean Development Mechanism Executive Board and Designated National Authorities - could be employed in a future Biodiversity Offsets Protocol. Under the Kyoto Protocol the Clean Development Mechanism Executive Board is accountable for registering projects, validated, verified, registered and monitored by Designated National Authorities. The coordinated work of these institutions assures the accuracy and additionality of credits of reduced carbon emissions generated by projects under the Clean Development Mechanism. This same dynamic might work for biodiversity offsets, with institutions similar to those playing the role of registration and certification authorities.

An additional issue that should be considered pivotal for those negotiating an international regime for biodiversity offsets is to carefully design implementation, enforcement, dispute settlement and non-compliance mechanisms. There is no purpose in creating such a complex international regime if it is not possible to guarantee its implementation and enforcement.[94]

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[90] Biosafety Protocol (Montreal, 29 January 2000)
[91] When the CBD Decision IV/8, paragraph 3 established an Open-Ended Ad Hoc Working Group on Access and Benefit Sharing.
[92] Kyoto Protocol (Kyoto, 11 December 1997)
[93] United Nations Convention on Climate Change (Rio de Janeiro, 5 June 1992)
[94] Sands, *supra* note 7 at 617.

One practical final recommendation would be the establishment of an Open-Ended Ad Hoc Working Group on Biodiversity Offsets under the CBD to foster the debate on biodiversity offsets at the international level. Nevertheless, as the world's biodiversity is at stake, and considering the inherent complexity of such negotiation process, local and regional action should be prioritized, with the EU and Brazil serving as crucial testing grounds.

6. Appendices

Appendix A

Relevant provisions from the 1992 Convention on Biological Diversity

"**Article 6**. General Measures for Conservation and Sustainable Use
Each Contracting Party shall, in accordance with its particular conditions and capabilities:
(a) Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect, inter alia, the measures set out in this Convention relevant to the Contracting Party concerned; and (b) Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies."

"**Article 8**. In-situ Conservation
Each Contracting Party shall, as far as possible and as appropriate: (…) (c) Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use; (…)"

"**Article 10**. Sustainable Use of Components of Biological Diversity
Each Contracting Party shall, as far as possible and as appropriate:
(a) Integrate consideration of the conservation and sustainable use of biological resources into national decision-making; (b) Adopt measures relating to the use of biological resources to avoid or minimize adverse impacts on biological diversity; (c) Protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements; (d) Support local populations to develop and implement remedial action in degraded areas where biological diversity has been reduced; and (e) Encourage cooperation between its governmental authorities and its private sector in developing methods for sustainable use of biological resources."

"**Article 11**. Incentive Measures

Each Contracting Party shall, as far as possible and as appropriate, adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity."

"**Article 14**. Impact Assessment and Minimizing Adverse Impacts

1. Each Contracting Party, as far as possible and as appropriate, shall:

(a) Introduce appropriate procedures requiring environmental impact assessment of its proposed projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects and, where appropriate, allow for public participation in such procedures; (b) Introduce appropriate arrangements to ensure that the environmental consequences of its programmes and policies that are likely to have significant adverse impacts on biological diversity are duly taken into account; (c) Promote, on the basis of reciprocity, notification, exchange of information and consultation on activities under their jurisdiction or control which are likely to significantly affect adversely the biological diversity of other States or areas beyond the limits of national jurisdiction, by encouraging the conclusion of bilateral, regional or multilateral arrangements, as appropriate; (d) In the case of imminent or grave danger or damage, originating under its jurisdiction or control, to biological diversity within the area under jurisdiction of other States or in areas beyond the limits of national jurisdiction, notify immediately the potentially affected States of such danger or damage, as well as initiate action to prevent or minimize such danger or damage; and (e) Promote national arrangements for emergency responses to activities or events, whether caused naturally or otherwise, which present a grave and imminent danger to biological diversity and encourage international cooperation to supplement such national efforts and, where appropriate and agreed by the States or regional economic integration organizations concerned, to establish joint contingency plans.

2. The Conference of the Parties shall examine, on the basis of studies to be carried out, the issue of liability and redress, including restoration and compensation, for damage to biological diversity, except where such liability is a purely internal matter."

Appendix B

Habitats Directive, Article 6:

"1. For special areas of conservation, Member States shall establish the necessary conservation measures involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans, and appropriate statutory, administrative or contractual measures which correspond to the ecological requirements of the natural habitat types in Annex I and the species in Annex II present on the sites.

2. Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive.

3. Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

4. If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."

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