REGULATION OF SMALL-SCALE CARBON SINK PROJECTS IN CDM FROM THE PERSPECTIVE OF MULTIDISCIPLINARY BIODIVERSITY ASPECTS[1]

1 INTRODUCTION

It is apparent that afforestation and reforestation activities can contribute to carbon sequestration, and also by this way to mitigation of global warming. Recently, the tropics in equatorial areas have been suggested to be the real option for carbon sequestration, while planting trees in the mid-latitudes may have even unwanted consequences to global warming. The tropics are mainly situated in developing countries in which the clean development mechanism operates.[2] This has partly boosted up the CDM sink projects versus the JI sink projects. It is well known that the carbon sink projects have made their way into the clean development mechanism via a windy road. It has also been understood along this regulatory process that there is still a need to accumulate more practical experiences in developing countries what comes to implementing forestry projects.

Small-scale implementation in tropical (and subtropical) developing countries is another newer challenge for these research needs in more ways than one; A long history of investment in small-scale forestry is common — for example — for Europe but not for developing countries.[3] The biodiversity levels are generally high in developing countries because of the latitudinal gradient of species diversity.[4] Additionally, no small-scale sink project activity has been registered thus far, while many small-scale project activities

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[2] Developed countries and countries with economies in transition are known as Annex B countries. Within them the Joint Implementation projects are implemented. Developing countries are known as non-annex countries. Huston and Marlan (2003, p. 82) remind that those two classes of countries (Annex B countries and non-annex countries) are approximately analogous to other geopolitical groupings, such as "*North*" and "*South*" or "*Temperate*" and "*Tropical*". Ellis et al. (2007, p. 19) point out that "*the countries expecting to generate the most credits from proposed CDM projects to date are also often countries that are recipients of a significant proportion of total flows of FDI. Many of the poorest nations that are unable to attract flows of FDI do also not appear to be attracting significant interest in investment in CDM projects.*"

[3] Harrison, 2001, p. 202.

[4] "*For most types of plants and animals the number of species found in a fixed area decreases with distance from equator* (Huston and Marlan, 2003, p. 79).

exist in other sectors.[5] All of these are the objects of judicial challenges. To date, only even very few afforestation and reforestation CDM activities in the normal scale have been initiated.[6] This has lead up to the arguments that the current limit of 8 Kton CO_2e ye^{-1} is not high enough and it should be increased exceedingly for improving cost-effectiveness of small-scale projects.[7]

This paper recommends something else: cost-effectiveness of the small-scale projects should be improved by including biodiversity values of the project impacts into the amount/price of tCERs or lCERs – and not by breaking down the original idea of small-scale project implementation which could be beneficial socio-economically and environmentally, too.[8] Consequently, it should be researched more deeply, whether inclusion of biodiversity conservation goal into the carbon sink regulation much more intensively than it is dared to think at the moment could be a better way to dispose of a cost-effectiveness problem than modifying the maximum sequestration limit upwards too much, because then one is facing again the traditional counter-arguments and facts against to large-scale plantations in tropics and subtropics. This may not be wise either politically or environmentally, instead small-scale carbon sinks could be promoted as a local biodiversity-friendly carbon sequestration. Michaelowa´s (2007) argument supports this idea.[9]

The tradition of more local and environmental role of small-scale forestry is beneficial for these kinds of purposes. Harrison et al. (2002) have observed that small-scale forestry

[5] FCCC/SBSTA/2007/MISC.1 "*Implications of possible changes to the limit for small-scale afforestation and reforestation clean development mechanism project activities*", p. 5.
[6] FCCC/SBSTA/2007/MISC.1, p. 10. Transacted CDM volumes in 2006 constitute more than 96 per cent of the total project market of JI and CDM. So, the JI is in marginal in use compared with CDM. In 2006 one per cent of the projects were implemented under the category of land-use and land-use change (Point Carbon, 2007, p. 17.).
[7] The argument "*The marginal cost of removing one ton of CO_{2e} from the atmosphere would decrease, allowing more low-income communities and individuals to participate in small scale project activities and making this type of activities more competitive* (FCCC/SBSTA/2007/MISC:1, p. 5)" behind increasing the current threshold may not be good at all from biodiversity´s point of view. Please see the chapter 2 and 3.
[8] Wilson and Gue'neau (2004, p.3) underline that social and cultural implications of market-based policy instruments on local communities is an important research object regardless of the fact that they have not been widely discussed yet. Boyd et al. (2007, p. 9) note that "*in terms of economic impacts, employment creation is the most visible and is of highest immediate benefit to local communities in all projects.*"
[9] Michaelowa (2007, p. 24)"*In many respects small-scale projects are better suited to contribute sustainable development in the host country than large ones.*"

systems are different in many ways — even without the carbon sink function of them — from industrial large-scale forestry systems.[10] For example, motivations for establishment and management, basis for species selection, social and economic objectives of key stakeholders and the likely markets for products can be mentioned here. The quite new function of carbon sequestration itself induces even more differences. These differences are challenging from the point of view of legislative work, too. In practical terms, one of the most important regulatory challenges in small-scale tree plantations under the CDM scheme is the shortcomings of knowledge about the project´s biodiversity impacts. At the policy level it can be said that the precarious impacts caused by the monocultures and exotic species are the examples which are already very well known also by the conservationists and the general public nowadays. Of course, rather often than seldom application of nutrients, water, pesticides and herbicides are also threats to biodiversity.

In spite of the above mentioned problematic facts, the CDM is optimistically aimed at achieving the ecological sustainability as a part of the sustainable development goal. Consequently, while optimizing carbon sequestration, biodiversity should be maintained among other dimensions of the ecological sustainability. This is not an easy task because carbon sequestration by the means of forestry may easily generate negative biodiversitical externalities. Biodiversitical externalities are the concept introduced for the purposes of this paper by the author. Biodiversitical externalities are that part of the environmental externalities which are connected to the biodiversity issues. It emphasizes that it is important to have a way of thinking which is based on analysis of biodiversitical impacts in this context. For example, fertilization to increase productivity has mostly negative impacts on biodiversity.[11] Additionally, high tree density and even irrigation are many times the goals of the short rotation crops while optimizing carbon sequestration. Intensifying productivity far in excess of the natural carbon carrying capacity has many bad examples: land salinisation and deterioration of drinking water supplies can be mentioned here.[12]

[10] Harrison et al., 2003, p. 3.
[11] Schelhaas et al, 2006, p. 14: "*…many forest plants live in poor sites, fertilization leads to change in species composition of ground vegetation and apparently also to soil fauna*."
[12] Please see more: Jackson et al., 2005: 1944—1947.

Those negative impacts on the nature – and on the people – work like pollution. Hence, many times the developer of the carbon sink project can be seen as polluter from the biodiversity´s point of view. The polluter-pays principle would state that these negative biodiversitical externalities should be internalized. Moreover, the principle of self-sufficiency would state that these negative biodiversitical impacts should be fixed within the region in which they are produced – that means the project area.[13] However, while it is notable to consider these biodiversity impacts as externalities, they remain very difficult to estimate because at the same time the CDM should also be cost-effective for being attractive to the investors.[14] The cost-effectiveness of the CDM is also official goal of this Kyoto Mechanism. It is not easy to achieve. Even the private profitability of traditional small-scale forestry has been generally marginal.[15] Here the reference to "*cost-effectiveness*" introduces also an important term from the theory of regulation. This research paper is based to some extent to the use of the regulation theory. Consequently, one extra goal of this research paper is the following: Identifying some exemplary factors, which encourage or act as a barrier to cost-effective project implementation in the case where biodiversity impacts are also taken well into account during the small-scale project cycle. This is not a new idea or a goal.

Feng et al. (2007) point out that most economics literature on carbon sequestration has concentrated on its cost-effectiveness.[16] Although simple in concept, the requirement of cost-effective implementation is especially challenging in small-scale context. Low cost-effectiveness of these activities is not a new phenomenom. The smallest of the worries for the project developers is not the large fixed costs which burden many small activities. Small projects are more expensive to implement than few large ones. Perceiving this old and well-known situation, the scientific world has published several articles related to the

[13] The self-sufficiency principle is often related to waste management; it requires "*that most waste should be treated or disposed of within the region in which it is produced* (Correlje et al., 2007, p. 1500).
[14] These difficulties in impact assessment processes include low priority for biodiversity, lack of capacity to carry out the assessments, lack of awareness of biodiversity values, inadequate data and post-project monitoring (please see Choudry et al., 2004, p. 64—65).
[15] Harrison, 2001, p. 203.
[16] Feng et al., 2007, p. 92. Please see also the document of McCarl´s and Schneider´s (2001) which is referred by Feng et al., 2007, p. 92.

transaction costs of the small-scale CDM project cycle since 2004.[17] These publications have demonstrated that transaction costs are indeed significant. Capacity building of local growers to execute the project cycle according to rules and procedures is also one significant institutional transaction cost element. This fact is also important while one is examining the general level of the CDM because it seems that the CDM is going to be used only unilaterally.[18] The unilateral mode of the CDM leaves the whole burden of the project cycle to the developing countries, and the developed countries just buy the credits. The above mentioned burden for the developing countries may not be light. It is not easy for a single low-income community or an individual to understand the whole regulatory framework related to the implementation of the project cycle because there is uncertainty about the same issue even amongst many authorities and companies — and even legal specialists.[19]

And the CDM projects are implemented in the infrastructures of the developing countries. The scale of the transaction costs under those circumstances of different developing countries is unclear. The amount of transaction costs is not important for the discussions in this paper – but rather one source of them, the regulatory framework surrounding project implementation, is a target of the discussions here. The legal complexity of small-scale carbon sinks is evaluated so that the evaluation could give some grounds for discussion about the possibilities to include biodiversity goal more deeply into small-scale project implementation. The phrase "*…are developed or implemented by low-income communities and individuals as determined by the host Party"* in the definition of small-scale carbon sinks is important here.[20] Corbera and Brown (2006) have found out in their research in which Mexico was used as a CDM case study that NGOs and private

[17] See, for example: Cacho et al. (2002, 1—17), and Cacho and Wise (2006, 1—7).
[18] The project development is planned and financed within the developing country in the unilateral mode of CDM (Michaelowa, 2007, p. 1). Michaelowa (2007, p. 1) underlines that it is a fact that industrialized country companies just like to buy Certified Emission Reductions instead of investing in projects by themselves.
[19] Jepma (2003, p. 1) has pointed out this existing uncertainty in rule making of the CDM before the small-scale project types were included in the CDM: *"I believe, having listened to a considerable number of CDM professionals, that this decision and the decision process has, to put it friendly, caused quite some confusion and embarrassment. To put it more bluntly, it may have turned the CDM process into a complete mess*."
[20] Please see the chapter 2 (or Decision 19/CP.9).

organizations claim that the CDM has already become so complex that this is limiting the ability to participate in it.[21] This is against the legislative quality indicator of accessibility.[22] Moreover, the real picture can even be more complex: While there are many estimates of the transaction costs related to carbon sequestration part of the project cycle, the costs related to taking into account the biodiversity issues in the project area have not been addressed empirically – and not so much even in theoretically.

Monitoring biodiversity impacts can be costly. Moreover, the majority of biodiversity values are implicit rather than explicit. This is the reason why they are often not captured by markets.[23] The lack of useful numerics for comparing and valuing biodiversity is also one practical challenge.[24] For example, benefit-cost analysis (BCA) of biodiversity conservation activities are difficult to make because of that, and because biodiversity values are highly context dependent. [25] It is more than certain that thorough inclusion of biodiversity as a parallel goal for the project cycle place new demands on participating institutions — and on the whole regulatory process because lawmaking is a political process. Consequently, even if Kägi and Langauer (2000) are very optimistic in arguing that by formulating proper regulation and guidelines it is possible to avoid the risks of monoculture projects with exotic species, the costs of the regulatory process can be surprisingly high especially if the biodiversity issues are approached as fully as they should.[26] The fact is that biodiversity markets are the newest and most challenging from the ecosystem service markets.[27] Many of the impacts on biodiversity are difficult to predict. While the scale of the biodiversity impacts is hard to predict, the fact that the simplified modalities and procedures of the small-scale carbon sink projects in the CDM may enhance incentives for cursory project implementation suggests that these issues

[21] Corbera, E. and Brown, K. 2006, p. 15.
[22] The legislative quality indicator of accessibility requires that a regulation should be clear and accessible to the people addressed by it (Faure and Niessen, 2006b, p. 267.
[23] Wilson and Gueneau, 2004, p. 11.
[24] Huston and Marlan, 2003, p. 83.
[25] Iovanna and Newbold (2007, p. 1) points out that there has been recently recommendations to replace BCA with other modes of decision analysis. For example, adaptive management is highlighted here as a form of iterative and deliberative process which would involve better stakeholders in a process of learning by doing. They also (2007, p. 3) point out that the relationship between use and nonuse values for ecological endpoints is highly context dependent.
[26] See Kägi, W. and Langauer, O. 2000.
[27] Jenkins et al. (2004, p. 10).

should be researched more deeply – and taken into account much better than is done at the moment.[28] Active biodiversity management approach is needed — and grounds for that in regulation. This work raises the need for new concepts.[29]

In sum, the following specific concern with Kyoto provisions for afforestation and reforestation measures is assessed: how the small-scale implementation of the carbon sink projects is regulated at the moment from the biodiversity conservation´s point of view, and are there any incentives in the regulation to enhance biodiversity levels in project areas. Above all, this article serves as an orientation point for those not familiar with the recent detailed regulations of the small-scale carbon sink projects in the clean development mechanism and its regulatory linkages with biodiversity conservation. Furthermore, this article uses a regulation theory framework to examine those regulations in an integrative and multidisciplinary approach.[30] This is done in the spirit of building bridges by using the concepts well-known in environmental law, ecology and law-and-economics. Some new legal concepts are also recommended for the legal substance of the small-scale CDM regulation. Verboom et al. (2007) remind us that delivering conceptual support is one role of the science.[31]

The existing literature widely is many times in a very important role in multidisciplinary studies. Here it is also. The existing literature relevant for the topic of this article establishes most of the definitions and typologies for analysis. The primary focus of the analysis is on the recent research papers in forest ecology, biodiversity economics, climate policy and law-and-economics. They will be used as secondary data. Added to that, an important framework for analysis is adapted from the source of law itself – here it means the certain carbon sink regulations of the Kyoto Protocol. The procedures and modalities of the CDM afforestation and reforestation activities have been regulated through the negotiations in the COPs since 1997. At the time of writing, the decisions for

[28] Kim (2004, p. 321) has also underlined that the small-scale carbon sinks in CDM are not going to be adequately examined what comes to their impact on biodiversity.
[29] Please see more from the chapter three.
[30] Caparros and Jacquemont (2003, p. 144 and p. 155) state that interdisciplinary work and use of integrated approaches are necessary.
[31] This role is for exploring possible future developments (Verboom et al., 2007, p. 268).

those activities have made only for the first commitment period. Consequently, the process of legal establishment is still in dynamic state. The regulatory process of the CDM sink projects implemented in small-scale – which started in the beginning of the year 2004 – is represented in a chronological framework in the chapter two.

2 LEGAL CHARACTERICS OF SMALL-SCALE SINK PROJECTS IN CDM — A COMPLETE MESS OR A MESS ALMOST COMPLETED?

This chapter is structured to cover the regulations relevant to the small-scale carbon sinks in the clean development mechanism. At the ninth Conference of the Parties the modalities and procedures regarding inclusion of the carbon sequestration activities in the CDM were adopted. In addition to the normal scale project as determined in the decision 19/CP.9, the small-scale carbon sink projects were also included in the same decision. The simplified modalities and procedures were allowed and started to be developed for the small-scale projects. Given the private sector nature of the CDM, the rationale behind the simplified modalities and procedures was the aim to diminish transaction costs from the projects implemented in small-scale.[32] Fragmentation of a normal large project activity into smaller parts is not allowed because of a debundling clause.[33] The regular modalities remain for those so called normal projects.

Since 2004 it has been clear that industrialized member countries are allowed to meet a part of their greenhouse gas reduction obligations through small-scale afforestation and reforestation projects in developing countries. Afforestation and reforestation differentiate land history. The first-mentioned activity occurs on land that did not contain forest for at least 50 years, while the second-mentioned occurs on land that did not contain forest by the end of 1989.[34] The author (2006) has recommended that the

[32] The simplified modalities and procedures include the following easements: project bundling, simplified project design document´s requirements, simplified baseline methodologies, simplified monitoring plans, common operational entity for validation, verification and certification (please see the regulatory update from the annex of the decision 6/CMP.1).

[33] See the appendix C of the annex of the decision 6/CMP.1.

[34] Please find the exact definitions from the CDM Glossary: Afforestation is "*the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources*", and reforestation is "*the direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested but that has been*

afforestation and reforestation projects could be treated in the CDM as only one shared conceptual project category in order to simplify unnecessary dichotomy.[35] The same has been recommended a year later by Dutchke (2007), too.[36] It should be noted that the projects to prevent deforestation are not eligible in the CDM at least in the first commitment period, 2008-2012. The exclusion is mentioned in the article 12 of the Kyoto Protocol, though logging in developing countries is more than often ad hoc and uncontrolled: About a fifth of global CO2 emissions are generated from deforestation.[37]

The concept of "*small-scale carbon sink*" itself is defined in the annex of the Decision 19/CP.9, additional refinements are still necessary, however. The practices of interpretation of the definition are not determinate yet. For example, the concept of the low income communities and individuals needs criteria after they are defined.[38] However, clarity is of importance, because established interpretation of the definitions is the goal of the small-scale CDM regulation as it would be for any other regulation as well. The principle of legal certainty requires it, too. The definition for small-scale afforestation and reforestation activities is at the moment the below one and it is to be interpreted by the project administration:

> **Small-scale afforestation and reforestation project activities under the CDM are those that are expected to result in net anthropogenic greenhouse gas removals by sinks of less than 8 kilotonnes of CO_2 per year and are developed or implemented by low-income communities and individuals as determined by the host Party. If a small-scale afforestation or reforestation project activity under the CDM results in net anthropogenic greenhouse gas removals by sinks greater than 8 kilotonnes of CO_2 per year, the excess removals will not be eligible for the issuance of tCERs or lCERs.**

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converted to non-forested land. For the first commitment period, reforestation activities will be limited to reforestation occurring on those lands that did not contain forest on 31 December 1989".

[35] Heiskanen, 2006, p. 643.

[36] Dutschke (2007, p. 299): *"For foresters, reforestation is the replantation of trees after harvesting…. ….Under the CDM, both categories are treated in the same way, which is why we will refrain from further differentiation of the two categories in this article.*"

[37] Chomitz et al, 2007, p. 23. Additionally, Huston and Marlan (2003, p. 83) point out that protection of tropical forests is the best land-use strategy that at the same time maximizes carbon sequestration and protects biodiversity.

[38] Minang, 2007, p. 207.

The regulatory update for the decision 19/CP.9 is the decision 6/CMP.1. In it the following four subtypes of the small-scale afforestation or reforestation project activities are made eligible: converting grassland (1), cropland (2), wetland (3) or settlement (4) to forested land.[39] Additionally, project participants may submit new subtypes for the Executive Board to be accepted by.[40] From the point of view of the regulatory history, it should be noted that the Decision 19/CP.9 has been a continuum of the certain decisions of the seventh and eight conferences of the parties. The small-scale afforestation and reforestation projects must be in compliance with all the regulatory requirements mentioned in those decisions.

Such decisions are: The Decision 11/CP.7 "*Land use, land use change and forestry*", the Decision 15/CP.7 "*Modalities and procedures for afforestation and reforestation project activities under the clean development mechanism in the first commitment period of the Kyoto Protocol*", the Decision 17/CP.7 "*Modalities and procedures for a clean development mechanism, as defined in Article 12 of the Kyoto Protocol*", the Decision 19/CP.7 "*Modalities and procedures for a clean development mechanism, as defined in Article 12 of the Kyoto Protocol*", the Decision 20/CP.7 "*Modalities and procedures for afforestation and reforestation project activities under the clean development mechanism in the first commitment period of the Kyoto Protocol*", the Decision 21/CP.7 "*Guidance to the EB*", the Decision 22/CP.7 "*Modalities and procedures for afforestation and reforestation project activities under the clean development mechanism in the first commitment period of the Kyoto Protocol*", the Decision 22/CP.8 "*Additional sections to be incorporated in the guidelines for the preparation of the information required under Article 7, and in the guidelines for the review of information under Article 8, of the Kyoto Protocol*" and the Decision 23/CP.8 "*Guidelines for review under Article 8 of the Kyoto Protocol*". All the regulations are publicly available.[41]

[39] The chapter A(4) of the appendix B "*Indicative simplified baseline and monitoring methodologies for selected types of small-scale afforestation and reforestation project activities under the clean development mechanism*" of the decision 6/CMP.1.
[40] Please see, the chapters 2 and 8 of the appendix B of the decision 6/CMP.1.
[41] See: http://unfccc.int/documentation/decisions/items/3597.php .

The technical work related to the regulations of afforestation and reforestation activities in the CDM is determined to be done by the SBSTA and the IPCC. For example, the definitions and modalities for including afforestation and reforestation activities in the CDM are developed by the SBSTA.[42] Nevertheless, instruments of soft law have provided more flexibility for legislative work because the project developers have had a chance to propose their own methodologies under the simplified rules of the small-scale CDM. There have been also calls for public inputs.[43] These soft approaches to law-making can be seen as a good development from the point of view of operational flexibility.[44] Practical legislative work has continued now three years. For example, the first version of the project design document for small-scale afforestation and reforestation projects is completed just recently.[45] Because of fast drafting of laws the legal security has not been good all the time.[46]

According to this sort of a confirmed self-regulation process, in February 2007, the Conferences of the Parties serving as the Meeting of the Parties to the Kyoto Protocol received submissions about Parties´ views on the implications of changing the limit established for small-scale afforestation and reforestation project activities.[47] Many of the parties agree that increasing current 8 kilotonne limit to 32 kilotonnes would be beneficial for better utilization of the small-scale CDM sink projects in developing countries, because without changes those projects are argumented to be barely cost-efficient.[48] Germany on behalf of the European community and its member states has been much

[42] For example, the SBSTA has been required to examine the application of biome-specific forest definitions for the next commitment periods in the Decision 11 2(b)/CP.7.
[43] One of the most recent calls for public inputs started on 7 May and ends on 18 June 2007 at 17:00 GMT. It is a call for public inputs on the draft procedure to demonstrate the eligibility of lands for A/R project activities under the CDM. See: more from the web site: http://cdm.unfccc.int/public_inputs/EB31_ARWG_Land_egibility/index.html .
[44] When the operational flexibility of a regulation is analysed, one examines how freely a target of a regulation can choose those technical and other means which are used to fulfill the obligations determined by the regulation under analysis. See more, Määttä (2006, p. 25).
[45] The general contents of the project design document is at the moment the following: the general description of the proposed small-scale A/R CDM project activity, the application of a baseline and monitoring methodology, the estimation of the net impacts of the proposed small-scale A/R CDM project activity, the socio-economic impacts of the proposed small-scale A/R CDM project activity and stakeholders´comments (CDM-SSC-AR-PDD, 2007, p. 1).
[46] Because of legal security one must not changes laws too often and quickly (Veerman, 2004, p. 2).
[47] FCCC/KP/CMP/2006/Add.1, para 27.
[48] For example, Australia, Chile is of the view that the current 8 kilotonne limit should be increased.

more conservative by believing that any review or change to the limit for the definition of small-scale afforestation and reforestation project activities should be carefully assessed, "*taking into account possible linkages with and impacts on the overall modalities and procedures for AR project activities under the CDM and should be based on compelling reasons and relevant experiences in order to assure that the appropriate changes result in the expected effects*".[49] It is also underlined as a standpoint of European Union that it is too early to conclude that increasing the maximum carbon sequestration limit will positively affect the development of small-scale AR project activities.[50] This standpoint can be seen to be in accordance with the precautionary principle.

Some of the issues are decided individually in the member country level. The host countries have the right to determine the requirements for sustainable project implementation, so they are allowed to define nationally sustainable development criteria for the small-scale carbon sink projects. So, the assessment of sustainable development is an issue of national sovereignty.[51] The current regulatory framework is inconsistent in that because the decisions require defining nationally sustainable development criteria, yet the legislation does not help much in figuring out how it should be done.[52] Heuberger et al. (2007) also underline that a definition of sustainability is still vague.[53] The imposition of wide and open-ended objectives is likely to be subject to varied interpretation nationally if nothing is done to improve the situation.[54] This is also at the moment a little bit questionable because there is not a tradition of small-scale forestry in tropical developing countries.[55]

[49] FCCC/SBSTA/2007/MISC.1, p. 10.
[50] FCCC/SBSTA/2007/MISC.1, p. 10.
[51] Ellis et al. (2007, p. 26): *"… the current structure of the CDM governance leaves assessment of the sustainable development benefits of a project as an issue of national sovereignty."*
[52] See for example: "*If any negative impact is considered significant by the project participants or the host Party, project participants have undertaken a socio-economic impact assessment and/or an environmental impact assessment in accordance with the procedurues required by the host Party* (The chapter 15(c) of the appendix of the annex of the decision 6/CMP1.)".
[53] Heuberger et al., 2007, p. 33.
[54] Same kind of difficult situation has been reported to have been in the EC Waste Law whose texts and terms have been criticized for their vagueness.
[55] Harrison, 2001, p. 6.

Additionally, the dominating current practice in forestry in developing countries is that different environmental goals are not pursued jointly but rather independently.[56] So, it can be observed that the interplay between the biodiversity and climate change regimes is not very strong at the moment.[57] Consequently, the regulatory framework in this respect is shortsighted. This is not successful from the viewpoint of legislative quality indicator of legality.[58] The visionary work of the CBD Ad Hoc Technical Expert Group (AHTEG) on Biodiversity and Climate Change has been important in this respect;[59] The distribution of regulatory burden related to designing the criteria for biodiversity conservation is not left entirely to the developing countries.[60] Added to this, Ellis et al. (2007) have noted that many developing countries are not able to risk large investments in institutional infrastructure of the CDM.[61] Despite this problem, the rules for impact assessment and for the project approval procedure must be in place at the national and sub-national level.[62] Related to this challenging situation, Faure and Niessen have underlined that foreign legal experts have often underestimated the fragility of institutional frameworks in developing countries.[63] Consequently, use of local expertise and knowledge must be used more thoroughly than we have got accustomed to.

[56] Cowie, 2007, p. 15.
[57] This fact has been highlighted by Kim (2004, p. 316) already in 2004 and not much has happened after it.
[58] Please see more about the element of legality in examining the quality of regulation: Veerman, 2004, p. 1.
[59] Kim, 2004, p. 321.
[60] Faure and Niessen (2006b, p. 265) remind us that the number of laws drafted and enacted is not a success indicator but the quality matters.
[61] Ellis et al., 2007, p. 25.
[62] This absolute necessity has been pointed out by Minang (2007, p. 208). However, the transparency of assessments is very challenging. See, Heuberger et al. (2007, p. 45): "*The major challenge to ensure the transparency of assessments arises from the limited availability of data in the early stages of project development as well as the limited amount of reference projects*".
[63] Faure and Niessen, 2006b, p. 265.

3 ACTIVE BIODIVERSITY MANAGEMENT APPROACH IN SMALL-SCALE PROJECT IMPLEMENTATION — HOW REGULATION COULD SUPPORT IT BETTER?

Harrison et al. (2002) note that the more recent scenario in forestry sector is a paradigm shift to small-scale, multiple-product-based, people-oriented and community based sustainable forest management.[64] Now couple of years after the observation, the CDM has since 2004 expanded the multiple-product-based function of small-scale forestry in the developing countries with the carbon sequestration function. Moreover, regarding the CDM´s dual aim defined in Article 12 of the Kyoto Protocol, biodiversity values are one additional product of a small-scale project which has also legally-binding status. So, the legal sectors of biodiversity conservation and carbon sequestration are tried to be integrated this way. In general, the conceptual framework of this institutional interplay between the biodiversity and climate change regimes is still undergoing development.[65] Despite its incompleteness, this development is in line with the recent trend in environmental law in which environmental law turned from the more sectoral approach towards a more integrated approach.[66]

From the viewpoint of the institutional interplay, the state of readiness diverses much in individual legal issues. What comes especially to the small-scale sink projects in the CDM, one must require active biodiversity management approach on local areas in the host country in much thorough sense than it is encouraged in the regulations at the moment.[67] Much must and can be done; For example, Kim (2004) has discovered just a few years ago that the evolving rules and regulations of the Kyoto Protocol have been increasingly diverging from those of Convention on Biological Diversity.[68]

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[64] Harrison et al, 2002, p. 1—11.
[65] Kim, 2004, p. 316.
[66] Please see more Faure and Niessen (2006a), p. 1.
[67] Niessen (2006, p. 145) points out that Young (2002, p. 55) has concluded that the capacity of environmental regimes to prevent and tackle environmental problems greatly depends on the degree to which the environmental regimes are compatible with the bio-geophysical systems with which they interact. Niessen (2006, p. 145) sums Young´s argument up by stating that "*we should resist the temptation to think that one size fits all when it comes to designing environmental protection regimes*".
[68] Kim, 2004, p. 316.

The differentiation of these regulatory regimes is not very justifiable. For example, afforestation of the areas used by intensive agricultural practices has the possibility to bring higher biodiversity.[69] Synergistic possibilities are at the moment not utilized, although these ecosystem services are functionally interdependent due to their ecological interdependence. However, the existing initial integration can already be seen as a good development at project level, because some obstacles confronted by smallholders are to be lessened in carbon markets compared with markets for agricultural and traditional forestry commodities.[70] The basic idea of small-scale implementation is good. Consequently, a system of financial incentives for taking biodiversity impacts seriously into account during small-scale carbon sequestration activity should be created to improve the existing situation. The current incentive structure for small-scale carbon sinks must be restructured.

For instance, the International Finance Corporation of the World Bank has proposed in general level that biodiversity could be marketed in a similar fashion to carbon.[71] And Jenkins et al. (2004) have pointed out that nations affiliated with the Organisation for Economic Co-operation and Development (OECD) should create initiatives to utilize carbon markets for biodiversity conservation.[72] The author recommends for his part that the carbon sink projects implemented in small-scale would be a good and realistic pilot study for this purpose – like the AIJ projects were during the initial development of the CDM and the JI projects previously. The question behind this recommendation is: Can we create a credible, workable system to reward additional efforts to conserve and enhance biodiversity while sequestering carbon? It is at least certain that we can improve the current situation in many ways from the point of view of a developing country. The sort of a holistic approach to CDM regulation for integrating biodiversity and carbon sink

[69] Schelhaas, 2006, p. 11.
[70] Cacho and Wise (2006, p. 1) have pointed out these special characters of carbon sink product: "*The "product" does not need to be transported in order to be sold, and a tonne of carbon removed from the athmosphere has the same effect independently of where it resides. So the problems often faced by smallholders in not being able to obtain transportation to markets for their perishable goods, or too achieve quality required by international markets do not apply.*"
[71] Cowie et al., 2007, p. 15.
[72] Jenkins et al., 2004, p. 10. Jenkins et al. (2004, p. 10) have also encouraged to develop larger program for integrating carbon and biodiversity goals during the second commitment period.

goals at project level should not be left only to the developing countries because that is a lot to answer for.[73] Minang et al. (2007) point that national and sub-national policy considerations have been in marginal during the design of carbon management within the CDM; for example, it is not known enough how much adjustments in carbon sink policies are needed in order to support capacity-building of the developing countries.[74]

There are some well-established benchmarks for assessing felicity of both the CDM and the JI project. Meeting benchmarks of additionality[75], permanence and non-leakage are the main requirements which are imposed to every CDM project during the first phase of CDM until the year 2012. The author of this article argues that is commendable that there should be a clear addition of parallel key terminology regarding the main criteria to be met by the small-scale projects as far as biodiversity is concerned: by this way biodiversity-friendly CDM projects would be able to be pieced together by authorities and project developers. These parallel legislative cornerstones would facilitate both supervision and enforcement: Alongside with the traditional modes of additionality one should demonstrate and assess *biodiversitical additionality*. The enhancement level of the biodiversity values at a project site.

For example, the biodiversity level of degraded lands can often be increased by a small-scale afforestation or reforestation project activity. This is possible when an investor is implementing such a project by a well-designed restoration plan. In those cases, additionality in biodiversity values should be rewarded somehow in the final amount of

[73] Kirk et al. (2007, p. 251): *"…a holistic approach to environmental regulation: that is, an approach that takes account of all aspects of environmental issues, including both the physical science aspects and the socioeconomic aspects*." and Kirk et al. (2007, p. 264): "*In the era of ´sustainability science´, the need to embrace holistic and systems-based solutions to complex environmental issues is clear*".

[74] Minang et al., 2007, p. 205.

[75] "*A small-scale afforestation and reforestation project activity under the CDM is additional if the actual net greenhouse gas removals by sinks are increased above the sum of the changes in carbon stocks in the carbon pools within the project boundary that would have occurred in the absence of the registered small-scale afforestation or reforestation project activity under the CDM* (EB, 2005, p. 2.)". In addition to environmental additionality which has been defined in above, the CDM projects must also fulfill the requirements of financial additionality: the CDM projects should not be financed by official development aid.

tCERs/lCERs acquired from a project.[76] Another possibility would be that developing countries would receive payments/sanctions tied to measured difference in biodiversity level before and after a project. The regulatory alternatives to sanction different biodiversity threats of the project implementation are not discussed in this paper, however. Payments for carbon sequestration at least have been seen quite promising for local people.[77] Dutschke (2007) has recommended that combined mitigation and adaptation activities should exempt from the Marrakech rule over non-diversion of Official Development Assistance and from the adaptation levy.[78] The author agrees with Dutchke (2007): [79] those exemptions would be longed-for extra incentives for small-scale project implementation which is not very cost-effective at the moment because of its present legislative nature.

To operationalise a reward system, is another question; however, it could be called as *biodiversity supplement system* (BSS) and it could be a new additional regulatory goal that is "*capable of being done*". This requires that the not-so-conservative approach is adopted in law-making. [80] For example, Justice et al. (2005) have pointed out that CDM projects could be expanded to include alternative mechanisms.[81] Bailey (2007) has also infused courage into researchers by surveying researches in which there are suggestions that care must be taken to avoid undue pessimism.[82] In those researches it has been stated among others that the utility of the ecological corridors is important conservation tool. Additionally, Kim (2004) has underlined that incentives must be provided for the

[76] The biodiversity benefits need not to be measured in monetary units. The biodiversity impacts should be analysed by the experts from biology and ecology, and then cost-effective small-scale carbon sink projects would be those which can give the most biodiversity benefits at a given budget constraint or those which can achieve a given level of biodiversity benefit at the least costs..

[77] Pfaff et al. (2007, p. 600): "*Payments for carbon sequestration appear attractive for local incomes and for ecosystem services. Yet tradeoffs may exist. The policies that most alleviate poverty may not most cost-effectively sequester carbon*."

[78] Dutschke, 2007, p. 298.

[79] Dutschke, 2007, p. 298.

[80] Kirk et al. (2007, p. 256): ""*Knowing that "the law is nervous about ´new´ science because it is seen as risky*" *(Raitt and Zeedyk, 2000, p. 28), there may be a tendency on the part of the system to adopt a scientifically conservative approach (Hawkins, 1984)."*

[81] Justice et al. 2005, p. 175.

[82] Bailey (2007, p. 11) highlights the studies of Beier and Noss (1998) and Bennet (2004). Vice versa, Dutschke (2007, p. 298) is pessimistic about rules for international compensation scheme could be found.

biodiversity and climate change regimes to coordinate their activities.[83] One could talk about biodiversity-friendly CDM credits whose use would require project developers to achieve a minimum standard of permanent biodiversity enhancement while implementing a carbon sink project.

In the beginning, the recommendations of the biodiversity-friendly subtypes of the small-scale CDM sink projects could be submitted to the Executive Board as it is recommended in the appendix B of the annex of the decision 6/CMP.1.[84] Vice versa, if the biodiversity level is reduced because of the carbon sink project, then a separate biodiversity enhancement project could be implemented in order to offset the damage caused by the carbon sink project. Chomitz (2007) points out that to date there has been no large-scale financing mechanism even for the payments which concentrate only on biodiversity conservation. Some discussions about them have been in Australia in recent years.[85] So, it is probably the reason why there is no good incentives to protect or enhance biodiversity values during the CDM project at the moment, too. In spite of this fact – and exactly because of it, conceptualizing biodiversity protection and enhancement is important in carbon sink context generally and in the context of the relevant regulation especially.

The biodiversity supplement system (BSS) would be the legislative institution for integrating biodiversitical additionality into the general "*additionality*" criterion of the CDM. In similar vein, the second new concept "*biodiversitical permanence"* should be demanded from every small-scale afforestation or reforestation project activity under the CDM from the early stage of a project to the end of it: the biodiversity level should not be allowed to be diminished in the course of time because of a carbon sequestration project. Ecosystem resilience should be taken into account and not expose in imbalance. Actually, this is important because the ecological dimension of sustainability is closely related to

[83] Kim, 2004, p. 320.
[84] See the chapters 2 and 8 of the appendix B of the annex of the decision 6/CMP.1.
[85] Jones (2003, p.134) points out that the development of "*biodiversity credits*" has been under discussion in Australia because they are seen as a necessary incentive for effective conservation.

this concept of ecosystem resilience.[86] For example, the neighbouring areas of the protected areas are fragile in this respect.[87] Aquatic environments are one special group of those kinds of areas important to be mentioned in this context.[88] Consequently, the permanence of biodiversity is also a concept that is needed in the carbon sink regulation. Determining biodiversitical baseline of the individual project is then the starting point which must be compiled into the baseline study report.[89] Time scale for monitoring biodiversitical permanence must be longer than for monitoring permanence of carbon sequestration.[90]

These new terms will structure and emphasize better — as the terms already in use do in their own context — the importance of biodiversity as a goal of an individual small-scale project. This emphasis is not unwarranted. And it is also important to remember that it was the developing country which is entitled to define ecological sustainability in its land. In fact, this is likely to be impediment to biodiversity-friendly implementation of small-scale carbon sink projects if nothing is done. By creating above mentioned legislative framework, biodiversity impacts would not be anymore externalities of the carbon sink project because they would be internalized within the decision-making process of the project cycle and they would be seen as direct impacts of the project. In the absence of such regulation, the project implementation will be driven by economic consideration related only to optimizing carbon sequestration.

For example, Dutchke (2002) has warned about the following: There is a possibility for perverse incentives to convert natural ecosystems with relatively low tree cover to high-tree-density plantations because of freedom to choose the parameters defining a forest in

[86] Iovanna and Newbold (2007, p. 2) "*ecosystem resilience, a natural system´s ability to withstand stress before collapsing to a less desirable state*".
[87] Wilson and Gueneau, 2004, p. 14. Usually protected areas are categorised using World Conservation Union (IUCN) protection categories (Wilson and Gueneau, 2004, p. 14).
[88] For example, fertilization can lead to eutrophication of waterways (Cowie et al., 2007, p. 11.).
[89] Sauer and Abdallah (2007, p. 425) have mentioned that the studies (See Pearce and Moran, 1994) related to tobacco production have shown that estimates of precise loss rates with respect to biological diversity are hampered by the absence of any baseline measurement. Consequently, the same mistake should not be done again when one is implementing carbon sequestration projects.
[90] Carbon stocks can be recovered on deforested land within 15-30 years by natural succession in the tropics. However, for several centuries human intervention can be traced from biodiversity and soil indicators. Please see more Dutchke (2007, p. 278) and Chazdon (2003, p. 51—71).

a country.[91] Of course, one could also argue that the precautionary principle could require this kind of development of terminology, too.[92] Reformulating regulation of small-scale carbon sink projects by adding more requirements for biodiversity monitoring, may raise monitoring costs because aerial methods are generally used in monitoring carbon sequestration, whereas monitoring biodiversity impacts needs more labour-intensive down-to-earth methods. In general, implications for biodiversity are dependent on the previous land use, previous biodiversity values and the surrounding landscape.[93] Another issue which is worth mentioning here is that carbon sequestration monitoring is representative of a quantitative project assessment, whereas biodiversity monitoring represents more the qualitative project assessment. Heuberger et al. (2007) have stated that a quantitative approach for project assessment is more able to provide transparency and validity in the CDM approval process.[94]

Maintaining transparency and validity because of including biodiversity assessment into the project cycle will increase working hours for project developers. However, the required increase in effort and complexity because of biodiversity monitoring may give a reason to develop simplified modalities for it, too.[95] This is because one has to be realistic.[96] The competing goals of carbon sequestration, biodiversity conservation and cost-effectiveness of the CDM must be compromised on and on.[97] However, the increasing complexities of integrated regulation must be accepted to some extent, too. Non-binding best practice documents is also one important alternative outside the legal

[91] See the page 419 of the article of Verchot et al. (2007) on which there is a reference to Dutchke´s (2002) article.
[92] *"The "Precautionary" Principle requires that the risk and environmental impact of normal and accident conditions be assessed, understood and accepted before proceeding* (Riley, 1999, p. 2)"
[93] Schelhaas, 2006, p. 11.
[94] Heuberger et al., 2007, p. 34.
[95] Until now there are several different biodiversity indeces: Simpson´s Diversity Index, Species Richness Index, Shannon Weaver Index, Patil and Taillie Index and Modified Hill´s Ratio. They have been applied to mathematically to combine the effects of species´richness and evenness (Sauer and Abdallah, 2007, p. 425).
[96] Many times regulation in developing countries have started with the latest standards that were applied in developed countries. Without the developed countries´ experience, they have not been achievable. See: King and Mori (2007, p. 9).
[97] In general level, Iovanna and Newbold (2007, p. 4) have pointed out that "*while a certain amount of simplification always will be necessary in any assessment, further effort is nevertheless needed to incorporate ecological research into policy assessments, both directly to reduce oversimplification and indirectly to substantiate the necessary simplifications that will remain*."

framework of the demonstration of additionality to assist the development of project design documents. The Executive Board is already encouraged to provide the above mentioned support for the traditional modes of additionality.[98]

The Executive Board is one of the institutions of the Kyoto Protocol. In a mechanism level, the institutional rationale behind the introduced terms is the assumption that they are valuable for national organizations of the CDM when they are offering workable small-scale project ideas to potential investors. One is able to get a better biodiversitical picture what is going to be done during the project. Niessen (2006) has stressed FAO´s point of view that usually institutional arrangements must be developed at multiple levels to cope with the specificity of the environmental issues and to provide the correct incentives to the users at each level of the hierarchy.[99] This must be remembered in a unique situation like this; Jenkins et al. (2004) state that new institutions have to be created for this purpose, too.[100] Minang et al. (2007) have stated that particular attention should be given to institutional development.[101]

From the point of view of the existing institutions, one CDM institution for this purpose is the Designated National Authority (DNA). Information on environmental impacts must be submitted to this authority anyway. Consequently, it should play a more important and clearer role in integrating biodiversity and carbon sequestration goals of a project in order to enhance multifunctionality of the CDM forests. This would also be a good development from the principle of legality´s point of view. The proactive role of the DNA is important here also because then CDM institutions would not go to the direction of institutional compartmentalization.[102] Skjaerseth (2006) has pointed out that duplicated

[98] 15(a) of the Decision -/CMP.2.
[99] Niessen, 2006, p. 145.
[100] Jenkins et al. (2004, p. 11).
[101] Minang, 2007, p. 214.
[102] Michaelowa (2007, p. 25) has pointed out that a proactive DNA could have many important roles: providing technical and financial expertise, organizing capacity building activities for project participants and marketing generated CERs. The author would add the purpose to include gradually biodiversity aspects in its decision-making and work. In 2005, 90 Parties – among them 72 developing country Parties – had already established DNAs (The decision 7/CMP.1). Please see more about the piecemeal nature of this kind of institutional compartmentalization from Iovanna and Newbold (2007, p. 4).

work and coordination problems lead to low effectiveness.[103] This is not desirable from the administrative efficiency´s point of view.[104]

The institution with the above-mentioned reformulated mission could have many new pragmatic regulatory functions for integrating biodiversity goals into a small-scale carbon sink project. One practical example about such an integration in a project level could be the following: One of the new regulatory functions of project bundling co-ordinated by the DNA would be to design and to create biodiversity-rich ecological corridors while sequestering carbon. The space between the borders of the individual small-scale project areas could be seen as areas of particular importance to biodiversity.[105] This kind of biodiversitical activity on the border areas of individual small-scale carbon sink projects is closely linked with the term "*connectivity*" which refers to the arrangements of habitats that allows organisms and ecological processes to move across the landscape.[106] The author argues that the above mentioned proposal is a good example about the integrative legislative work which could have pragmatic influence on the impacts of project implementation.[107] By this way, some biodiversity concerns are to be enforced together with carbon sequestration.

It is a known fact that fragmentation is a major threat to biodiversity. So, the creation of biodiversity corridors during implementation of bundled small-scale carbon sink projects would be a step to the right direction, a step to creating additional habitats. These "*corridors*" between the individual small-scale project areas could have a special

[103] Skjaerseth (2006, p. 157).
[104] "*Administrative efficiency implies the minimization of administrative costs incurred both by the regulators and regulates* (Määttä, 1997, p. 17)."
[105] The definition of an ecological corridor is: "*A thin strip of vegetation used by wildlife and potentially allowing movement of biotic factors between two areas.*" Please find the above mentioned definition from the web page of European Environment Agency: http://glossary.eea.europa.eu/EEAGlossary/E/ecological_corridor
[106] Please see the definition of connectivity from the web page of USDA Forest Service (http://www.fs.fed.us/kipz/documents/reference/glossary.shtml): "*Connectivity – The arrangements of habitats that allows organisms and ecological processes to move across the landscape; Patches of similar habitats are either close together or linked by corridors of approved vegetation. The opposite is fragmentation.*"
[107] Opdam and Wascher (2004, p. 293) underline that "*we must accept that conservation of biodiversity is only effective if we integrate it in the dynamic development of the landscape, and develop an offensive strategy based on coalitions with other functions.*"

additional aim to increase species richness which among others enhances invasion resistance.[108]

The above mentioned concept "*connectivity*" comes from well-established terminology related to biodiversity conservation. However, the better term in this new purpose would be the more-detailed term used in landscape ecology — that is functional connectivity which emphasizes process thinking: for example, it refers to how connected a forested area is for a process, such as a white rhino (*Ceratotherium simum*) moving through small-scale forest patches. The advantage of landscape perspective is proven by many researches especially in the context of fragmented forests.[109] It is also a natural common base where both economic and ecological processes take place.[110] Consequently, Hsiaofei (2007) have already mentioned that the principles of landscape ecology are a good and interesting theoretical framework for ecological regulation through the optimization of landscape patterns.[111] By this way here in the context of the small-scale sink projects — improving connectivity between habitat patches, status of threatened species is made better among other things;[112]

Landscape management can enable species migration many times.[113] And a white rhino is not the only species in tropics: tropical forests contain 70 % of the world´s plants and animals, 70 % of all vascular plants in the earth, 30 % of all birds and more than 90 % of all invertebrates.[114] While implementing small-scale afforestation projects in tropics one could concentrate on longer rotations, for example. Schelhaas (2006) has pointed out that

[108] Stachowicz et al. (1999, p. 1577—1579) state that invasion resistance is enhanced by increasing species richness in the area where invader propagules are available. This happens because abiotic and disturbance conditions are kept constant because of high level of different indigenous species.
[109] Please see Paltto et al. (2006, p. 442) and Lindenmayer and Franklin, 2002. Opdam and Wascher (2004, p. 293) have recommended that "*a species-oriented focus should be replaced by a focus on landscape conditions for biodiversity*".
[110] Verboom et al. (2007, p. 275) that landscape level is a good starting point for both economists and ecologists.
[111] Hsiaofei, 2007, p. 26.
[112] This is one of the goals of the global strategy for plant conservation (CBD) to achieve the 2010 target. Please see more from the Decision VII/30 "*Strategic Plan: future evaluation progress*" of the conference of the parties to the convention on biological diversity at its seventh meeting.
[113] Dutschke, 2007, p. 282.
[114] Sands, 2005, p. 49.

trees with larger diameters are exceptionally good for birds and insects.[115] Additionally, pest control should not be used as business-as-usual activity in forest management; the possible role of parasite diversity in controlling invasive species is argumented to be important.[116]

Consequently, the above mentioned examples about taking more seriously into account of the dual aim of the CDM in a project level could not even maintain the biodiversity level but many times enhance it. And in the first phase, the small-scale carbon sink project area itself could be designed mainly for optimizing carbon sequestration while the border areas would be dedicated to conserve or enhance biodiversity. So, the border areas would provide a corridor function – for example – for species migration and gene exchange.[117] These strategically sited biodiversity-friendly belts of trees would be very beneficial for biodiversity. They could be seen as "*living fences*". Opdam and Wascher (2004) have also recommended that there should be a shift in strategy from protected areas towards landscape networks.[118] Project implementation done in small-scale also enhances a well-balanced geographical distribution of projects inside a country than a unique big one.[119] The author points also out that there is likely to be a possibility to improve the values of biodiversitical additionality of large-scale carbon sink projects if debundling of a large scale project is allowed in the case when ecological corridors are designed between the fragmented project area.[120] At the moment, there is a prohibition by the debundling clause to fragment a big project to smaller ones. This clause should be taken under re-examination.

Both terms — biodiversitical additionality and permanence — can be understood in the above mentioned context now. The project-level practicality of those definitions is quite

[115] Schelhaas, 2006, p. 18.
[116] Native parasites´ ability to control pests can be reduced if the native parasites are disrupted. See Klironomos, 2002, p. 67—70 and Rosenheim et al., 1995, p. 303—335.
[117] Cowie et al. (2007, p. 8) state that if the plantation provides a corridor function, biodiversity will be positively affected.
[118] Landscape networks including protected areas, connecting zones and intermediate landscapes (Opdam and Wascher, 2004, p. 293).
[119] This argument has been made by Michaelowa (2007, p. 24).
[120] A debundling clause forbids it at the moment (the appendix C of the annex of the decision 6/CMP.1).

certain. Here it is supportive to mention that Heuberger et al. (2007) have underlined that it is important to discuss the sustainability effects on an operative level.[121] The new concepts enhance cooperation between the experts of carbon sequestration and biodiversity conservation which is not done by the general statement that the ecological sustainability must be taken into account by the host countries as they wish. It is almost possible at the moment that considering biodiversity in an occasional developing country may be even forgotten.

The official unilateral mode of the small-scale CDM is not making the situation better: the project cycle is gone through by the developing countries, and the developed countries are just buying the credits notwithstanding how specious they are from the point of view of biodiversitical additionality or even from the point of view of traditional environmental additionality. In the field of small-scale project management such cooperation between the experts has obvious advantages, because it strengthens project developers´ and authorities´ legal-technical capacity to tackle biodiversity issues. Related to this, Boyd et al. (2007) point out that unavailability of technical assistance to small farmers is one current problem.[122] Here is consolatory to note that a major research area in ecology for the past 10 years has been the role of biodiversity in maintaining ecosystem functioning.[123] In consequence, there is a lot of backup from that sector of research.

As noted above, project participants should address biodiversitical permanence issues at the project design stage. Here one could utilize the structure of existing management contracts which detail biodiversity management activities.[124] Firstly for example, the management area depends on the tree species used in a small scale plantation; there is the 8 kilotonnes´ yearly limit for carbon sequestered in a small-scale carbon sink project. In parallel with the above mentioned fact, the effects on biodiversity are also determined by the species that are used for carbon sink activities. Evans (1992) notes that a fast growing

[121] Heuberger et al., 2007, p. 34.
[122] Boyd et al., 2007, p. 12.
[123] Savage et al., 2007, p. 1.
[124] Wilson and Gueneau, 2004, p. 14: "*Management contracts detail biodiversity management activities, and payments are attached to the achievement of specified objectives.*"

pine plantation might lock up 5 tonnes CO_2 per hectare in a year, and a eucalypt plantation two or three times as much. Many times pines and eucalypts are not endemic for a project area. Here the nonnative invasive species is the right concept for this concern among the conservationists. They are plant species that are introduced into an area in which they did not evolve, and in which they usually have few or no natural enemies to limit their reproduction and spread. The above mentioned definition is used by the USDA Forest Service.[125] Interestingly, Schelhaas et al. (2006) mention that earlier afforestations in Western Europe were aimed at production and often introduced coniferous tree species were used. Many times the same inconsiderate routine is transferred to the lands of developing countries by the afforestations made by the developed countries.

Currently, indigenous species are more used in afforestation, which can be seen as a good development from biodiversity point of view. For example, figs and palms are keystone species for monkeys, tapirs and peccaries during the periods of fruit scarcity. However, if the carbon sequestrative capacity of exotic species is better than the one of endemic species — and there is no biodiversity supplement system (BSS) in use — indigenous species are not likely to be used. In the situation like the above mentioned, it is more than important that indigenous species are at least used in those corridor areas between different small-scale areas. Here again it must be reminded that small can be beautiful in the eyes of conservationists: even the ecological value of scattered trees is very significant. Their lonely function is often described as "*nurse plants*" or "*fertility islands*".[126] Terborgh (1986) states that the structure of the vertebrate community is in danger to collapse if the keystone plant species are taken away.[127] Consequently, "*a tree here and another there*" is a different observation for biodiversity experts than those who

[125] Please see the definition of "*nonnative invasive species*" from the web page of USDA Forest Service (http://www.fs.fed.us/kipz/documents/reference/glossary.shtml): "*Plant species that are introduced into an area in which they did not evolve, and in which they usually have few or no natural enemies to limit their reproduction and spread. These species can cause environmental harm by significantly changing the ecosystem composition, structure, or processes, and can cause economic harm or harm to human health*"
[126] This is because they provide beneficial conditions for the recruitment of other plants. Manning et al., 2006, p. 314.
[127] Terborgh, 1986, p. 371—384.

are calculating how much absorbed carbon they represent.[128] Integrating carbon and biodiversity assessments needs the motivation to look across the boundaries of different disciplines.[129] Moreover, both ecologists and economists should co-operate in this respect.[130]

Biodiversitical permenance has many examination levels. For example, preferring invasive species to indigenous species is also questionable, because the genetic pool will be decreased in the area where invasive species are used instead of indigenous species. This is a particular concern in cases where large areas are restructured this way. For example, *Eucalyptus tereticornis* hybrid has been very massively planted in India. With genetic improvement and addition of fertilizers, it has been reported to be the most outstanding species for the large-scale afforestation purposes.[131] Ironically, it is not told how many biodiversitical problems were outstanding. It must be underlined here that the gene-level effects to biodiversity are not the easiest sector of the biodiversity impacts to consider. On the contrary, not much is known about the impact of invasive species on carbon cycling in terrestrial ecosystems in the long run.[132] They need significant research undertakings. However, for the meantime a hand of help could be here bioprospecting rights; They could increase the value of biodiversity goal in front of the eyes of the

[128] "*Unlike plantations, that are comprised of a single species, of a uniform age, planted in a regular pattern and invariably in large contiguous blocks, biodiversity plantings invariably comprise many species, of different ages and forms, randomly planted within small plots dispersed across the landscape* (Harper et al., 2007, p. 331)."

[129] Verboom´s et al. (2007, p. 275) study about combining biodiversity modeling with political and economic development scenarios for 25 EU countries is a good example about the good operation of both economists and ecologists.

[130] Iovanna and Newbold (2007, p. 2): *"Because of their varying perspectives, methodological approaches, and other disciplinary biases that often separate ecologists from economists, ecologists may not have felt entirely comfortable or welcome to participate fully in policy assessments, which are often led by economists. In light of their tendency to "constantly unearth complexity", ecologists are naturally uncomfortable with the historic lack of effort towards accounting for uncertainty in BCA, which leads to a false sense of precision in the results (Dovers et al.,1996). Others involved in the assessment process may consider ecologists´ contributions too tentative to influence recommendations. The situation may be changing, however, with calls for ecologists to play a more integral role in policy assessments being heard more often. For example, on the need to accurately characterize the key ecological processes before conducting a valuation exercise, one prominent agricultural economist recently has suggested that ecologists should take greater initiative in the policy assessment process by "locking economists out of the room" until ecological processes are sufficiently understood (Doering,2007).*

[131] Hooda and Rawat, 2006: 453—455.

[132] Litton et al., 2006, p. 105.

project developers. [133] In general level, Ellis et al. (2007) have pointed out that local sustainable benefits are a key to motivating developing countries to implement future mitigation commitments.[134]

[133] Wilson and Gueneau, 2004, p. 14: ”*Bioprospecting rights allow for the collection and testing of genetic material from a designated forest area. Often purchased from a responsible government authority by pharmaceutical and biotechnology companies and research institutes in return for an upfront payment. Agreements may include future rent sharing*”.
[134] Ellis et al.,2007, p. 26.

LEGAL DOCUMENTS

Decision 11/CP.7. Land Use, Land Use Change and Forestry.

Decision 15/CP.7. Modalities and Procedures for Afforestation and Reforestation Project Activities under the Clean Development Mechanism in the First Commitment Period of the Kyoto Protocol.

Decision 17/CP.7. Modalities and Procedures for a Clean Development, as Defined in Article 12 of the Kyoto Protocol.

Decision 19/CP.7. Modalities and Procedures for a Clean Development Mechanism, as Defined in Article 12 of the Kyoto Protocol.

Decision 20/CP.7. Modalities and Procedures for Afforestation and Reforestation Project Activities Under the Clean Development Mechanism in the First Commitment Period of the Kyoto Protocol.

Decision 21/CP.7. Guidance to the EB.

Decision 22/CP.7. Modalities and Procedures for Afforestation and Reforestation Project Activities under the Clean Development Mechanism in the First Commitment Period of the Kyoto Protocol.

Decision 22/CP.8. Additional Sections to be Incorporated in the Guidelines for the Preparation of the Information Required under Article 7, and in the Guidelines for the Review of Information under Article 8, of the Kyoto Protocol.

Decision 23/CP.8. Guidelines for Review under Article 8 of the Kyoto Protocol.

Decision 19/CP.9. Modalities and Procedures for Afforestation and Reforestation Project Activities under the Clean Development Mechanism in the First Commitment Period of the Kyoto Protocol.

Decision 6/CMP.1. Simplified Modalities and Procedures for Small-Scale Afforestation and Reforestation Project Activities under the Clean Development Mechanism in the First Commitment Period of the Kyoto Protocol and Measures to Facilitate Their Implementation.

Decision 7/CMP.1. Further Guidance Relating to the Clean Development Mechanism.

Decision -/CMP.2. Further Guidance Relating to the Clean Development Mechanism.

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