# **PART 4** CONCLUSIONS

# CONTRIBUTION TO THE EVALUATION OF THE CLEAN DEVELOPMENT MECHANISM AS A TRANSFORMATIONAL CHANGE CATALYST INSTRUMENT

Flavia Witkowski Frangetto<sup>1</sup> Gustavo Luedemann<sup>2</sup> Ana Paula Beber Veiga<sup>3</sup>

#### **1 INTRODUCTION**

This chapter brings a reflection on the Clean Development Mechanism (CDM) in order to detect if there is a chance to frame the CDM experience into the concept of transformational change (TC). To test whether or not TC has happened, the content of the previous chapters and some CDM history selected by the authors of this chapter will help as subsidies.

This exercise aims at measuring if there was, in fact, a perennial change induced by the CDM implementation, and if, to some extent, this experience can provide inputs – and which inputs, if there is any – for the formulation of new mechanisms under discussion in the international regime of negotiations on climate change.

Let it be said beforehand: analyzing the CDM using the concept of TC becomes a disruptive way of detecting learning. Whether or not some flaws have occurred during implementation, how much of supposed imperfection is attributed to the CDM leaves it free to be, with time, effective in what would have been due to its *raison d'être*. It is worth recalling the very noble purpose of the CDM, which is to reduce greenhouse gas emissions (GHGs) while achieving sustainable development.

At the end of the chapter, an assessment is presented which, gathering the results of the CDM experience, reveals its contribution under various aspects of climate management.

<sup>1.</sup> Lawyer. Ipea Researcher.

<sup>2.</sup> Biologist. Ipea Researcher and Coordinator of the Rede CLIMA public policy sub-network.

<sup>3.</sup> Forest Engineer and Environmental Manager. Ipea Research Assistant.

#### 2 THE TC INITIATIVE AND ITS RELATION WITH THE CDM VERIFIED

#### 2.1 Concept

The concept of TC is under development within the framework of the World Bank initiative, with an indication that its definition should be limited to an abstract concept, since transformational changes imply a temporal issue and a change of a status quo or possible improvement in the face of evidence of damage or risk.<sup>4</sup>

The need for a TC concept arose due to an economic reason. Multilateral development banks (MDBs) have to finance the solutions for various development hurdles over which member countries of the various conventions and agreements, both donor countries and recipient countries, acknowledge they do not have enough approved financial flows to solve them all at the long-term.

In order to achieve goals that would be unattainable only with direct investment from the available resources, the need arose for solutions that could leverage resources beyond those provided from public sources in donor countries. It turned out that it was necessary to focus on large-scale behavioral change as the main objectives and goals, avoiding spending resources with projects with limited boundaries which replication without multilateral resources would be hard to achieve.

In this context, the idea of leveraging resources in a higher level than those agreed between donor countries and recipient countries does not focus only on financial market solutions, such as green bonds, but mainly on changes occurring in the beneficiary territory of the investment projects that cause the largest possible impact. It is expected, therefore, that financing will support a transformation, a deviation from the development path and the private business as usual behaviour, in the sense that all small private efforts will result in a desired change on a much larger scale than what could be achieved only with direct investments of the MDBs.

Notwithstanding the difficulty in qualifying what is transformational, a TC working definition is being thought of, one which can be used, namely: "*strategic changes in targeted markets and other systems with large-scale, sustainable impacts that accelerate or shift the trajectory toward low-carbon and climate-resilient development*"<sup>5</sup> (Dickman, 2018). A report by the Global Environment Fund – GEF brings the following definition:

Transformational interventions are defined as engagements that help achieve deep, systemic, and sustainable change with large-scale impact in an area of global environmental concern. The underlying theory of change is that by strategically identifying and selecting projects that address environmental challenges of global

374

<sup>4.</sup> Available at: https://goo.gl/H3f6va.

<sup>5.</sup> Excerpt from original text.

concern and are purposely designed to support fundamental changes in – i.e., 'flip' – key economic markets or systems, GEF interventions will be more likely to cause a large-scale and sustainable impact, subject to the quality of implementation/execution and supportive contextual conditions<sup>6</sup> (GEF, 2017, p. ii).

In this effort in attempting to have a definition, some elements have been left out,<sup>7</sup> without prejudice; this fact does not prevent the framing of "legacies"<sup>8</sup> in what could be mentioned as *transformational*.

When applying the concept of TC to the need to deal specifically with global climate change, there is fear that the \$100 billion annual flow target will be much lower than necessary to implement proposals for all nationally determined contributions – NDCs, mainly after the global stocktake. Through this exercise, it is intended that the difference in the sum of individual ambitions of each NDC in relation to what the Intergovernmental Panel on Climate Change (IPCC) indicates as indispensable in terms of emission reductions is reduced, based on scientific knowledge (Allen, Mustafa and Shukla, 2018) to achieve the goal of the United Nations Framework Convention on Climate Change (UNFCCC) to stabilize concentrations of GHGs in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

<sup>6.</sup> Excerpt from original text.

<sup>7.</sup> It is worth mentioning, as a record of the reasoning of the construction process of what can be classified as TC, that, at a workshop held at the World Bank headquarters in Washington, the representative of Ipea brought a collection of elements that were discussed, until the configuration of what remained as a possible "definition of work", in the following terms (original text): "Transformational change, in the context of the international climate finance, is defined [by the CIF][by other body/ies] as a significant deviation in terms of greenhouse gas emission reduction, carbon dioxide sequestration or adaptation to a new or a foreseen climatic condition – or a combination between those mitigation and adaptation characteristics – from the "business as usual" scenario of a certain region, country or any subnational division. Significant, in this definition, means that the deviation values from the given time the transformation is said to begin, in terms of GHG emissions, C dioxide sequestration or any adaptation or resilience proxy, do not match to the previous standard values – due to changes in the "business as usual" action scenario, i.e. the observed change can be traced back to a behavioral change, to the use of new technologies or other actions that result from an intervention financed with the aim of mitigating climate change, adapting to new climate circumstances or both. The physical boundaries that should be verified to classify an observed change as transformational or not depends on the applicant to the climate finance body. If a national government's application is supposed to result in transformational change, the observed change is expected to be at national level, at least. The same applies to regional or subnational requests for financing. Transformational change can be assessed in an early phase of the project, in terms of project's design potential to trigger transformational change, and if it presents prerequisites known for transformation to happen in the ground, during and nearly after project implementation by using proxies to evaluate if transformation has the optimal conditions to take place, and after the time the project design has foreseen the transformation to occur. [Despite being possible to assess transformational change only in terms of emission reduction, it is recommended to assess if the observed changes also correlate with distributional disparities of incomes, a negative gender influence, whether negatively affects indigenous people or has any other negative impact on the resilience to climate adversities in any given territory where the transformation occurs.]" (Gustavo Luedemann about the TC definition, as decided at the workshop Exercise on defining Transformational Change, of 2017).

<sup>8.</sup> It is noted that the word "legacy", in the context of the CDM approach to this book, is distinguished from the sense used when designing the universal climate legacy metric (UCLM), which referred to the formation of intergenerational legacies and emerged in the context of the formulation of options to strengthen the Kyoto Protocol, including the prospection of future regime and the implementation of solutions for the efficient implementation of the CDM, within a research supported by the United Nations Foundation (2007-2008), held at the Oxford Institute for Energy Studies (OIES).

Towards new dimensions of climate finance, it should be noted that compilations and syntheses by the UNFCCC Secretariat of submissions from developed countries on their strategies for increasing the scale of climate finance between 2014 and 2020, "many Parties highlighted their pledges and expected future commitments to the Green Climate Fund (GCF), stressing the role of the fund in financing high-impact, transformational projects and catalyzing finance from other sources and noting that the GCF will be the key multilateral fund supporting nationally determined contribution (NDC) implementation"<sup>9</sup> (UNFCCC, 2017, p. 4).

The CDM appeared in a context prior to the discussion on solutions to reinforce climate financing: when the definition of environmental externality and the economic instruments capable of minimizing these market failures were popularized (Motta, 2006). The environmental externality and GHG emissions in the case of climate change are the result of some economic activity, but were, until the CDM operation, invisible to the market because they were not traded in it. A negative externality, such as GHG emissions, causes measurable losses, but the agents that cause the damage to the community do not repair the damage, do not pay for the emission of GHGs or receive for their efforts to reduce their emissions. In this sense, the CDM emerged as an economic instrument to encourage emissions reduction. It promised to generate a great deal of efficiency in the cost of mitigating climate change, because of its voluntary nature and incentive: those who would have the greatest chance of reducing large emissions at low cost would be attracted to participate in the mechanism while helping other stakeholders achieve reduction targets by providing low-cost certified emission reductions.

Although it has emerged as an economic instrument with the specific purpose of optimizing the costs of reducing GHG emissions, it is worth considering whether or not the CDM was a transformative instrument, in the sense and in the current context in which the TC concept arises.

# 2.2 The intricate formation of a different approach

It is worth making some remarks about the need for pre-judging that what may be *transformational* also needs to be *dynamic*, given the temporal question that it is only possible to become a transformation before the world of facts, concrete situations.

In this exercise, with the purpose of raising the legacy left by the implementation of the CDM in Brazil, one is allowed to reflect on the connections between the points considered as legacy throughout the chapters that make this publication up, as well as what the authors of this chapter consider as positive legacies, including

<sup>9.</sup> Excerpt from the original text.

correction reactions (learning) in the face of mistakes, misunderstandings or mistakes made during the CDM practice, historically in the country.

It is possible, according to this exercise proposal, to inquire if errors occurred during the implementation of the CDM, trying to find possible flaws<sup>10</sup> that led, in the worst-case scenario, to what one can, unless considered otherwise, qualify as supposedly flawed certified emission reductions (CERs).

When a flaw arises, in the context of the facts, what would grant legal basis – finally, as a *devoir être* – is disrespected. As a consequence, a disorder is established in what should have been made correctly if the object (tangible and intangible, direct and indirect) sought by the normative protection that gave rise to the creation of the *instrument* was finished, since it was created by a valid norm, enforceable and to which is attributed the indispensable effectiveness on the part of the addressees in making it happen in the real world what the regime was supposed to regulate. In this case, the instrument is the CDM. The norm is the UNFCCC, and the modality is international treaty – *hard law*,<sup>11</sup> of general knowledge, at least in the internationalist circles.

The hypothesis of investigating if there have been cases of flawed CERs does not necessarily reveal a CDM instability, as it is an alternative to a more honorable assessment than to just consider the CDM a not so efficient instrument, just criticizing it. It may be useful to investigate whether, in the past, it would have been possible or not to have given the CDM a different history than the fate of ultimately being criticized as fragile or overly flawed. It is believed to be useful to do so, in principle, according to the perspectives described in previous chapters (Chapters 1 to 15) by Brazilian operators. It can be seen from the synthesis of Table 1 that the texts produced throughout the chapters have identified strengths, weaknesses and legacies. This aimed at restoring the CDM to its essence, in line with the ruling that made it a more flexible mechanism: the Kyoto Protocol.

The collaborating authors of this work, listed in the present chapter, believe the legacies are those briefly described in the following table – all of which could possibly pass the evaluation test and apprenticeship by a transformational note.

<sup>10.</sup> In *Climate Change and International Agreements*, the possibility of correcting possible implementation mistakes within the system itself was reinforced: "in the face of the problem of possible misconstructions as to what the Kyoto Protocol actually requires, legitimized bodies are entitled to act in order to correct them throughout its implementation. In this sense, for correction purposes, access to various authorities is being offered, through the institutional system of the UNFCCC, to existing forums (such as the International Court of Justice and the Facilitating and Coercive Branch of the Kyoto Protocol) and expected arbitration bodies for climate, including within the framework of the United Nations) "(Meira Filho and Frangetto, 2010, p.53). In *Legal Feasibility of the Clean Development Mechanism (CDM) in Brazil: the Kyoto Protocol and international cooperation*, the access channels for the adequacy of the practice to the original CDM theory were explained in the following order: "legal solutions to future conflicts and (...) 1. Limitations of the national jurisdiction (...) 1.1 Relevance of access to administrative proceedings (...) 1.2 Relevance of access to the UM (...) 2.1.1 The need for an organizational structure to overcome setbacks in CDM (...) 2.1.2 Establishment of a CDM feasibility committee (...) 2.2 Hypothetical contributions of an international jurisdiction "(Frangetto and Gazani, 2002, pp. 141-155). 11. See an explanation on *hard law* and *soft law* in Frangetto and Gazani (2002, p. 34-37).

 $B0X\ 1$  CDM impacts: strong points, weak points and legacy

r						
LEGACY	Robustness of the validation, verification and emission sys- tem. Recent initiatives to use CERs, which are internationally acknowledged as real and measurable reductions: voluntary cancellation for emission abatement, CORSIA. The CDM will serve as the basis for the SDM.	CDM progress as a basis for the formulation of new mechanisms, in particular the SDM.	Catalyst of environmental activities in corporate environments. Robust accounting system will serve as the basis for the SDM.	Knowledge generated by the CDM is the basis for formatting voluntary markets and future mechanisms under the Convention.	Made a change in waste management in Brazil possible.	Significant institutional contribution, providing input for improvement of MRV in the forestry sector and construction of new contractual, technological and financial arrangements. Cross-cutting forestry issues indicates that new institutional arrangements are needed if the sector is to effectively contrib- ute to mitigating the effects of climate change and achieving sustainable development goals.
weak point	Regulation may negatively influence the adoption of a given practice/ technology by a particular country (e.g., sugarcane plants).	Negative influence of CER prices on project implementation.	Intense process of revising the meth- odologies can negatively influence project development.	Strict costs and procedures, sometimes preventing the development of projects.	Lack of an agreement on the new commitment period has caused the capture of methane to drastically drop as of 2011.	Regulatory complexity and demand constraints prevented the execution of a larger number of projects.
strong point	Important source of financing for execution of GHG emission reduction projects.	Brazil was the first country in establishing the bases for the adequate domestic implementa- tion of the mechanism. It is the first country to register its DNA on the Executive Board, as well as the first methodology and the first CDM project.	Capacity-building in accounting GHG and other aspects involved in CDM projects (social and economic aspects, for example).	Simplicity in baseline definition, calculation of GHG emission reductions and monitoring contributed to making the sector one of the most benefited by the mechanism.	Success of the CDM experience contributed to the formation of a market for parts, materials and equipment.	Brazil with a prominent role in proposing methodologies and elaboration of forest sector projects, which created the country's technical capacity of excellence.
CHAPTER	The Climate Change Conven- tion and its Kyoto Protocol as action drivers	The Clean Development Mechanism in Brazil	The CDM and Knowledge- Building in Reduction Quan- tification of GHG Emissions: from the initial proposal to the Program of Activities	CDM Experiences and Lessons Learned in the Energy Sector	Improvement of waste man- agement from the CDM: governance, new technologies and best practices in the sector	Forest CDM in Brazili: funda- mentals, legacy and elements for the future
	-	5	Ω.	4	Ь	9

	CHAPTER	strong point	weak point	LEGACY
7	Use of the CDM by the Brazil- ian industry: considerations in favor of energy efficiency and new technologies.	The low implementation of registered CDM project activities evidences barriers (e.g., technical barriers such as operational risk, economic barriers such as low perceived gain, and cultural barriers, such as prioritization of investments in increased production) and methodological issues.	Potential, as a financial incentive, to increase the energy efficiency of the national industry.	Experience shows the need for greater synergy with other policies and economic incentives for the implementation of projects and guarantee the competitiveness of the country's industrial sector.
8	Contribution of the Clean Development Mechanism to sustainable development	The CDM was an innovative instrument that allowed the implementation of practices aimed at sustainability	No requirement to monitor the criteria for contribution to sustainable develop- ment (SD) may have contributed to the poor performance of projects, in terms of their contribution to sustainable development.	Strong learning on DS issues in both the Convention and the CIMGC. Brazil as a reference in defining the DS contribution criteria.
6	Contribution of the CDM to corporate governance, according to a market agent	CDM was a driver of initiatives related to environmental issues inside and outside corporations (ISE, CEBDS, ABEMC).	Lack of multilateral consensus in the latest negotiations caused by largely political discussions/interests that have jeopardized the system as a whole.	Creation of relevant technical capacity in the country to work on climate-change related issues.
10	Regulatory-institutional evolution of the CDM and future prospects	Creation of a relevant institutional structure in Brazil, which was a pioneer country in regulating its DNA.	Deterrent transactional costs. Low demand, due to lack of international consensus on the second period, para-lyzed the market.	High credibility MRV structure should serve as a basis to new mechanisms.
	Legal nature and credit and tax issues of certified emission reductions	Rigor of the framework adopted for project approval and verification of CERs. The experi- ence serves as a basis for shaping the current climate policy.	Absence of a regulatory framework, with impacts on demand issues, and consequently effectiveness of the protocol, as well as uncertainties regarding legal (tax) and credit issues.	Relevant CDM assumptions in the formulation of a future mechanism, such as the SDM, so that the low carbon economy and the Brazilian NDC goals can be implemented.
12	The continuity of the CDM with the Paris Agreement and its articulation with the SDM	The CDM successfully achieved a scale of emission reduction projects in developing countries and was able to inaugurate a fully fungible carbon credits market.	Economic decisions have strongly affected the demand for CERs and discouraged the execution of new projects.	Multilateral supervision model for the issuance of CERs provides a favorable environment and guarantor of the environmental integrity of the projects, anchored in the ITL system.

	CHAPTER	strong point	weak point	LEGACY
13	Global cooperation and the challenges of sustainable development: CDM results and lessons learned for the design of new financial mechanisms	It was able to mobilize an important amount of resources for the mobilization of investments in sustainable infrastructure.	Lack of predictability of the CDM prevented the instrument's incentive to sustainable development.	Experience with the CDM "provided important lessons for the discussion and definition of regulatory strategies, since the main conclusion is that these solutions should be pragmatic, economically efficient and, to the extent possible, free of ideological, political and regulatory risk interferences".
14	Carbon pricing: from the Kyoto Protocol to the Paris Agreement	In addition to EU ETS, the CDM is one of the most expressive experiences with carbon pricing that has been adopted so far.	High transaction costs, which are directly proportional to the rigor needed to ensure integrity of CERs (complex governance).	The increase in standardization, practiced as of 2011, may indicate the solution to reduce transaction costs. "The results of this [CDM] experiment have been improving over time and can now contribute to scaling up these mechanisms".
15	PMR Brazil Project: perspec- tives on the Brazilian Emission Reduction Market	Consolidated CDM procedures (methodologies, mainly) and well-structured and solidified emissions trading and monitoring system.	Specifically, for Brazil, there is a lack of legal and normative definitions about the nature of the assets generated from the implementation of CDM projects.	Experience of the private sector acquired with the CDM on "ap- plication of methodologies, () conducting corporate inventories and () structuring of specialized services in the accounting and verification of emissions ()" will contribute to the future adoption of pricing instruments in Brazil.
	Prepared by the authors.			

Note: CORSIA – Carbon Offsetting and Reduction Scheme for International Aviation; SDM – Sustainable Development Mechanism; DNA – Designated National Authority, ISE – Corporate Sustainability Index; CEBDS – Brazilian Business Council for Sustainable Development; ABEMC – Brazilian Association of Carbon Market Companies; MRV – Measurement, Reporting, Verification; ITL – International Transaction Log; EU ETS – European Union Emissions Trading System. In analyzing the weak points of this table, one can see that there are viable legal solutions for Chapters 1, 3, 5, 6, 7, 8, 11, 13 and 15. Weaknesses are associated with acts and facts that were accomplished with the internalization of the Kyoto Protocol in Brazil. Further, it should be noted that some of these acts and facts were completed by forgetting certain fundamental legal criteria, examples that can be represented as supposed "findings" from a rational examination in order to optimize the potential of the CDM. Thus, the experience of the CDM is a list of findings that may sound critical, not of the CDM, but its underutilization.

#### 2.2.1 Finding 1 - regulation could have been improved

The normative content of the UNFCCC could have been developed without complications in a more dynamic, enlightening and specific way – for example, by providing details of the impact of the CDM on administrative procedures directly linked to the mechanism (such as the approval letter), or indirectly (such as the repercussion of processes that determine environmental licensing constraints in the face of the measurement of sustainable development).

Since the beginning of the regulation of the Kyoto Protocol in the country – for example, the resolution that came to govern the matter, Resolution No. 01/2003 of the Interministerial Commission on Global Climate Change (CIMGC) –, the issuing of normative content that was less than the CIMGC could have done, since it was the DNA responsible for the implementation of the treaty in Brazil. In editing the document, the Commission lost the opportunity to regulate, or even scrutinize, the properties of the CDM in Brazil, and those details could have granted definitive inaugural legal security for the mechanism in the country. For instance, it could have specified situations in which there was synergy among the conditions for meeting the requirement of real, measurable and long-term benefits through the prediction of assumptions for sustainability, in addition to the criteria established and the criteria already formally adopted by the entrepreneur due to environmental licensing. However, the mere translation of almost all the Marrakesh agreements sufficed. The moment for internal regulation was lost, and so far, no initiative has been in force.

In the absence of a determined legal government determination, fundamental questions have been considered less serious or even unnecessary to be discussed

*ex ante*,<sup>12</sup> such as the uncertain distribution of credits in projects involving both public administration and those administered, as in the case of private companies acting as concessionaires of public services and companies benefiting from government incentives. Another example would be the controversial debate on additionality, that it would only exist if there is compliance to an environmental legislation in force that implied in emissions reduction, in a context in which the Federal Constitution of 1988 demands the maintenance of an ecologically-balanced environment, therefore, a progressively less-carbon intense environment. Strictly speaking, such a restrictive interpretation would turn any project non-additional. In the absence of an accurate interpretation, to the extreme, the unconstitutionality of the Kyoto Protocol could be raised, as it is doubtful to use an incentive mechanism for those reducing GHG emissions in a larger proportion based on a less demanding baseline to the environment compared to competitors that has been historically emitting less.

Therefore, other examples can be mentioned, in line with the importance of observing, under the legal perspective, the limits and freedoms allowed in the CDM regime, as follows.

<sup>12.</sup> Regarding the possibilities of considering the CDM legally, see this explanation: "the act of looking at the CDM from an Environmental Law perspective is a means of providing legal certainty to the carbon projects and the certificates thereof. The project may be at a stage of apparent compliance with climate law, and yet, even if relations between project participants and, for example, the CDM Executive Board, have ceased, the validity of what has been obtained may be questioned. The assumption that a developed country will question the certificate that it has acquired is a possibility; or even a third party to do so with respect to another country that wishes to use the benefit to pay off its obligation to reduce greenhouse gas (GHG) emissions. That is, even after the production of the certificate there is continuity of responsibility. It is therefore essential to stick to the legal aspects. For such analysis of the CDM law, it is necessary to reason juridically. Reasoning juridically is an exercise, always based on an object, an objective and at least a certain legal norm and the respective procedure before this norm. The object is related to some problem, consisting of a question. For example, what is the legal context in which the CDM is inserted. In relation to the objective, one always has the intention of seeking a certain purpose that seeks to improve relations in society. One must find out what imposition is necessary to the pursuit of that end. As is well known, the purpose of the CDM is to promote sustainable development and, at the same time, reduce levels of greenhouse gases in the atmosphere, so that the CDM helps developed countries meet their GHG reduction targets. The pursuit of the purpose to which the CDM has been created is irrevocable. Regarding the standards on the question of the legal context of the CDM, there is the Framework Convention (UNFCCC), the Kyoto Protocol and the decisions resulting from the meetings of the conferences of the parties to those treaties" (Frangetto, 2007, p. 36). Also, "if climate change is a problem that has been recognized by the nations, and there is an increasing presence of GHGs in the environment that can cause environmental imbalances, it is true that the role of these gases is no longer the only factor to be considered as elements to be treated in an original way by the Law. Thus, the quality of GHGs being essential for human life is replaced by the debate about the problems of increasing their presence in the atmosphere, focused on the risk of climate change, in the face of a global warming threat. In this context, Law comes to insert a form of behavior that is appropriate to the anthropogenic activities that lead to a GHG increase, which is more than necessary for the environment at the temperature limit in which humans have conditions to live. Law will delimit the behaviors, formalizing them in order to decide what should be done, what is required in relation to this behavior. The UNFCCC then comes up with a series of determinations, linked to specific definitions, principles, objectives and related obligations, annexes with certain references, and the installation of structures in which certain stakeholders will act to achieve the desired result in their objectives. These associated elements condition the possibilities of applying the norm with the intention for which it was created. Thus, it becomes feasible to implement the UNFCCC in certain States that wish to apply it, because they have acceded and ratified it by making it a domestic regulation within their territory. In general terms, these have made a commitment to achieve their goals, seeking their objectives. Achieving the ultimate goal of the UNFCCC, which is to stabilize GHG levels in the atmosphere, is, through the climate legal system, made feasible from an organized way established by it plus its regulations. Based on certain parameters, a language common to States is established; which allows even the comparability between them in the measurements of intensities of implementation of international treaties concerning the climate and effectiveness of its purposes" (Frangetto, 2007, p. 37-38).

2.2.2 Finding 2 – would have been positive if all the relevant stakeholders had coordinated more action in favor of the CDM

The powers that have been established could have further intensified attention to the CDM in order to make it possible<sup>13</sup> in the sense of confirming it for its optimized implementation, and not hinder or discourage its use.

The ideal would have been to have, on the part of the competent agents, more dedicated attention to solve the implications of the duty to reduce GHG emissions in the country. Normatively, in the case of the Legislative. Jurisprudentially, in the case of the Judiciary Branch, and it should be noted that the jurisdictional action rarely happened in the CDM matter – perhaps because the Court needs, except in cases where the judge acts ex officio, to be brought to law enforcement. In the case of the Executive Branch,<sup>14</sup> through clarifications, to entrepreneurs interested in obtaining carbon credits, in order to elucidate that carrying out the reduction stimulated by an international financial mechanism was compatible with the motivation of the trusteeship for an ecologically balanced environment.<sup>15</sup>

Simultaneously with the international rules that are intrinsic to the climate issue governed in the context of the UNFCCC, the CDM projects implemented in the Brazilian territory must fulfill the miscegenated Law of the international

<sup>13.</sup> In this sense, it was recommended: "even in the absence of specific rules, the administrator who is responsible for issuing opinions or decisions on the CDM is bound to carry out administrative acts in full compliance with the legal powers assigned, so that strict legality governs the exercise of their public functions. When it comes to the competent body responsible for implementing the UNFCCC, the Kyoto Protocol, and the CDM, the interministerial commission must pay attention to the internal characteristics of the joint operation of ministries. In that sense, cooperation among them is essential if the Executive Secretariat, elected by the commission, and the commission itself are to exercise their functions in a participatory manner, to act effectively and fairly. Therefore, any CDM-related settlement system necessarily has to undergo a process that is conducive to conducting CDM administrative procedures to decisions that ensure the consonance of the use of the CDM to the objectives of the international and national climate legal system" (Frangetto and Gazani, 2002, p. 145-146).

<sup>14.</sup> It is worth mentioning that, in 2014, the CIMGC raised before the Federal Public Prosecutor's Office the concern to increase the institution's relationship with the CDM. There was an approach possibility by means of courses that were to be given to the associations of Prosecution Offices' representatives.

<sup>15. &</sup>quot;The fact that Brazil enjoys a protectionist constitutional legislation of the environment, insofar as it determines all to be holders of the ecologically balanced environment, represents an inadaptability of the Brazilian position regarding the fulfillment of duties, this time, national or international, concerning the fight against climate change. If the primary objective of the Convention under consideration is to stabilize concentrations of greenhouse gases at a level that would prevent dangerous anthropogenic interference with the climate system, whatever the effort in this regard, it will always correspond to the pursuit of an ecologically balanced environment, to which everyone has a right in the Brazilian environmental legal system. (...) Therefore, we cannot exempt ourselves from acting concretely so that there is no warming of the atmosphere, which causes the consequences capable of decreasing the quality of life" (Frangetto and Calasans, 2001, p. 403).

community with Brazilian law.<sup>16</sup> According to the Constitution of 1988, the environment is in the category of common use by the people and essential to a healthy quality of life, being protected under the nature of diffuse and collective rights, and implying all legal protection also applicable to any issues associated with climate change.

# 2.2.3 Finding 3 – the guarantees and the principles and instrumental interfaces of the regime applicable to the CDM could have been more used

Many of the concerns raised by the implementation of the CDM would have been solved by propaedeutics. Perhaps the mechanisms envisaged in Article 6 of the Paris Agreement have resulted from the amalgamation of rights and wrongs of the CDM in the various sectors of the economy, other sciences and ways of thinking about the efficiency of managing the issue of climate change. Let this be read not with a judgmental tone about the procrastination for the configuration of expected transformations in the attempt to face global climate change, but rather for reflection on the establishment of the conditions that would have been favorable to consider the CDM as a global success.

As presumed from the comments made in the analysis of Box 1, due to the explained characteristics of the regime applicable to any CDM project implemented in Brazil, many problems that occurred in CDM practice would have been (and, if the mechanism is not prescribed, may continue to be) solved if the instruments offered by the legal system itself has been observed at the time. Some examples

<sup>16.</sup> In this sense, one can use the academic term mixed law, along the lines of past discussions, when dealing with CDM law: "this refers to a set of legal norms specific to or applicable to the CDM. These standards may be of international and national origin. In addition to the specific CDM standards, those that are already involved in managing environmental resources relevant to climate and sustainable development are associated. They are, for example, standards dealing with air (type, air pollution) or waste. The differential when referring directly to the issue of climate change is that it provides legal input from the international community, to solve a problem that is perceived as being universal, which is global warming. Countries jointly decide on ways to avoid climate change. When international diplomas take effect on national states, the common rule (of the common treaty) merges with the national legal system already in force. Hence the CDM's right to a merged legal system. It has been asserted that the application of the CDM is personalized in each country, since nevertheless always a follower of the legal framework imposed by the international order will receive the contributions of the legal system in which it is executed. There will therefore be particularities in the implementation of the CDM according to the peculiarities of the host CDM project. It is necessary to keep to the importance of international norms, not forgetting in their implementation the effects of the internal rules that they reflect in the former without, however, wishing to detract from them - on the contrary, by attempting to optimize their aims consistent with the legal system national "(Frangetto, 2007, pp. 42-43). In the same sense, it was previously stated: "The Brazilian legal system will take effect on the international treaty in force for the country. Thus, with the entry into force of the Kyoto Protocol, the legal regime of the CDM will come mainly from international environmental law, thus making the legal regime appl

are listed below, all of which are more readily apparent ex post, although types of alerts have been exposed by experts in discussions at certain fora.<sup>17</sup>

Due to the requisite of sustainable development, an example would be exercising the pre-established competencies of licensing environmental bodies in favor of the joint appreciation of social and ecological aspects. Special regulation would have been possible aiming at approaching the two procedures (licensing and approval of a CDM project) regarding the specificities expected in the conditions of the environmental licenses, in cases where the two processes are simultaneously in progress, without compromising the incumbencies of the CIMGC, but assisting it in its work.

1) In some cases where errors or shortcomings had to be corrected in the documentation prepared by the DOEs that worked in the country, the CIMGC was prepared to fill deficiencies in order to contribute to the success of the intended project. In others, projects received criticism even after they generated CERs. It is necessary to ask if in these situations all possible ways of compensation have been explored if it were effectively configured that damage was caused by action or omission of DOE and, in this sense, whether it was possible to see the activation of liability insurance contracted to cover eventual excess CERs issued during the period in which they exercised their mandates in relation to the developer of the CDM project.<sup>18</sup> Maybe these questions would grant more security to the CDM implementation process.

<sup>17.</sup> It is interesting to observe that, among other occasions that are equally worth recalling, in 2003, during the 2<sup>nd</sup> National Conference of Carbon Credits Market: fundamental issues on making this market effective, carried out in São Paulo by the International Business Communications (IBC), a round table on *Carbon Trade: current status of the carbon* credit market, progress and undefined issues, concluded that there are definitions yet to be made so that this market can effectively exist. Fundamental questions were discussed such as: when this market will be effectively consolidated; what are the remaining problems; what stage the negotiations are in; how the market is developing; prospects for the effective functioning of this market in Brazil with the ratification or not of the Kyoto Protocol; whether Brazil can take advantage to establish its position in this market; price formation; and discussions of recent transactions. Marco Antonio Fujihara was the coordinator of the debate and José Domingos Gonzales Miguez, Virgílio Gibbon, Ingo Plöger and Mario Monzoni participated. In 2004, during the event Legal, Financial and Business Prospects for the Consolidation of the Carbon Credit Market: the sustainability of CDM projects in practical presentations by national and international experts, also promoted by the IBC, the session on *Prevention of Legal Risks in CDM projects* addressed the following topics: i) the association of CDM law with the requirements of Brazilian environmental law: administrative procedures and discharge of legal environmental obligations to regulate the GHG reducing activity; ii) the conclusion of legal business based on the potential for generating carbon credits: precautions and contracts related to the expectation of the right to trade CERs; and iii) implementation of CDM projects and legal certainty of the project participants in relations with entities involved in the CDM process: national and international levels (stakeholders, DNA and designated operational entities - DOEs, Executive Board and Compliance Committee of the Kyoto Protocol).

<sup>18.</sup> As per Appendix A (*Standards for the accreditation of operational entities*) of Decision 17/CP.7: "1. An operational entity shall: (...) (c) Have the financial stability, insurance coverage and resources required for its activities". Available at: https://goo.gl/m257EA. It is also worth mentioning that the accreditation manual of DOEs confirms that insurance must be hired as a requisite to protect against financial risks (*liability insurance*). Available at: https://bit.ly/2PHToZN. Accessed on: October 18<sup>th</sup>, 2018.

2) Due to the understanding on how to meet the additionality requirement, methodologies should have been applied without disregarding how incoherent it is to start from baseline scenarios that have been wrongly built based on non-abiding factors.

Some other examples of warnings that were made just in time to correct flaws were the several questions with the wrong understanding about additionality, mentioned above, and the requisite of real, measurable and long-term benefits.

In 2006, the International Emissions Trading Association (IETA) warned:

"At COP/MOP1 [Conference of the Parties/Meeting of the Parties 1] the parties clearly stated their desire for broader input on the additionality tool (...). The COP/MOP asked the EB [Executive Board] to address this issue at its 24th ED meeting. The EB put out a request for input. Input was provided by stakeholders, including IETA. However, the EB will not consider this issue until EB27 meeting (...). By failing to give this issue the higher priority it deserves, IETA feels that the EB failed to live up to the expectation stated during COP/MOP1 that this issue be addressed by EB 24. IETA feels that the EB continues to fail to recognize the fundamental importance of this issue to the long-term development and relevance of the CDM [Clean Development Mechanism]" (IETA, 2006, p. 19).<sup>19</sup>

Additionality, on one hand, was considered as an observed criterium if the financial bias or ineffective norm (in the identification of the baseline scenario)<sup>20</sup> were at stake: the activity that would have not occur in the absence of the project was the one representing a non-compliance trend, as exemplified in the previous item (item 2), when the legal approach was presented below that required for safety in the implementation of the CDM. This is an absolute inconsistency with the Brazilian legal system,<sup>21</sup> according to the interpretation set forth there in. Failure

386

<sup>19.</sup> Excerpt from original text.

<sup>20.</sup> Original text: "The Marrakech Accords define additionality in relation to emission reductions compared to a baseline scenario, but not in relation to a project activity. Once methodologies for baseline calculation are developed, they will be used to ensure that the [conditions of the] additionality test is met. As such the Board should speed up its consideration and adoption of implication of the current additionality as well as alternative ways to the demonstration of additionality provided by stakeholders following the EB's call for input and in line Decision 7 CMP.1" (IETA, 2006, p. 30).

<sup>21.</sup> As a result of legal warnings about the supposedly misleading interpretation of additionality, some progress has been made, although it has been hindered, it has been noted: "CDM applicators are improving, awareness is being spread, in line with the principle of common but differentiated responsibility, there is no point in the CDM finding a deterrent factor to project promotion in the fact that developing countries legislate in favor of the environment (and thereby guide behaviors for the reduction of emissions). Otherwise, the Kyoto Protocol in Brazil could even lead to a declaration of unconstitutionality by the Federal Supreme Court. But the additionality requirement seems to be better understood, so much so that, in the international order, a methodology has been approved for CDM projects for reforestation in a riparian area (where the owner is obliged to allow natural regeneration" (Frangetto, 2005, p. 186-187). Regarding the methodology mentioned, which at the time was being negotiated to prevent the CDM for reforestation, see Manfrinato (2005). In the preface to the publication, Goldemberg (2005, pp. 9-10) explained: "in the run-up to the 9th Conference of the Parties to the Climate Convention held in December 2003 in Milan, the eligibility of protected areas was the subject of a wide debate and intense mobilization involving several governmental and non-governmental Brazilian institutions. The international agreement signed at the time does not preclude the possibility that reforestation of areas under legal protection will generate carbon credits. It is not about weakening or questioning the effectiveness of the command and control instruments provided for in the Forest Code, but rather recognize the need to seek additional instruments that may help the viability of programs for the recovery of degraded areas and the restoration of large-scale native forests. This issue should be analyzed with due attention and care".

to comply with the general duty to maintain an ecologically-balanced environment turned into a claim to justify gains.

Like the understandings about what was eventually taken as "truth" about meeting the additionality requirement. In a previous evaluation, this risk was highlighted:

emission reduction is the difference between a baseline (assumption) and a fact (verified emissions). In this context, it should be clarified that the protocol requires that the reductions be additional to those that would occur in the absence of the project, that is, if the reductions were already taking place, it would be necessary for the project to produce even greater reductions.

The concept of additionality, however, has been misinterpreted as meaning that it is necessary to demonstrate the baseline, which is logically impossible. This fact is responsible for the difficulties of developing methodologies and, therefore, for the low penetration of the CDM in the Brazilian industrial sector – when it is noted that the amount of emission reductions through the CDM (taking into account the potential related to the commitments of reduction or quantified limitation of emissions listed in Annex B to the Protocol) could, with the correct use of the concepts, be much greater if it involved more categories of projects (according to the GHG list and of sectors/source categories, listed in Annex A to the protocol) and fewer concerns about demonstrating additionality. It should also be noted that many times in Kyoto, mention is made of countries or parts of Annex B, as it is in this Annex of the Kyoto Protocol that the quantified emission limitation or reduction commitment are listed (Meira Filho and Frangetto, 2010, p. 53).

In addition, there were several concerns that the CDM would be lost. It is worth remembering, in the passages transcribed below:

the strict application of Public International Law (...) would have allowed the effective implementers (or supposed implementers) of carbon projects in developing countries to make good use of the CDM so as not to let it escape from the legal system reserved for the management of climate change. By virtue of the pressures the CDM has undergone, however, it has gone so far as to be purged of the legal system. And the worst is that this was not due to any factor related to its legal nature, as according to good analysts of the rules and principles it does not contain any flaws. The reason for such criticism was much more related to the loose implementation of its standards than to any "flaw" that the CDM might have (Frangetto, 2009, p. 267-268).

Freestone and Streck affirmed (2007, p. 55):

"The flexible mechanisms of the Kyoto Protocol are the only carbon trading mechanisms that have been recognized and implemented worldwide and as such stand as models for various other markets and initiatives. The mechanisms still show teething problems and continue to be plagued by a number of design failures. However, these failures can be addressed through relatively simple adjustments to the mechanisms. A professional regulatory system, free from political interference (to achieve transparency and a guarantee of administrative due process) and with a long-term perspective of the carbon market (to achieve long-term investment security) are among the most important points on the reform agenda".<sup>22</sup>

Underused, the CDM survived.

# **3 COMPARISON WITH THE CDM LEGACY:** *EVALUATION & LEARNING* **DIAGNOSIS AND TRANSFORMATIONAL EFFECTS**

# 3.1 Perspectives of framing the CDM into a TC experience

It is not necessary that the tone be too critical, to the point of becoming intolerant. While it is possible to assess what could have been better, it is commendable to acknowledge the efforts that have been made in several of the CDM implementation experiences. The advances occurred especially under the performance of the private enterprise, so enthusiastic about a mechanism of international origin that came to Brazil to enable sustainable actions.<sup>23</sup> The public authority, in turn, had its undeniable cumulative share in this effort. In fact, the very existence of the CDM is due to the relevant role of Brazilian negotiators and scientists.<sup>24</sup>

There were indeed so many events about the theme that for a few years (the period from 2002 to 2007 stands out), it was difficult to follow the meeting agenda<sup>25</sup> whose subject was the market for carbon credits or the CDM itself. Some explained

<sup>22.</sup> Excerpt from original text.

<sup>23.</sup> See, for instance, Chapter 13, about more investments in sustainable infrastructure in the country.

<sup>24.</sup> The emergence of the CDM is a result of some transformation in the usual positions of the time, with the participation of Brazil: "the country's conservative position in 1997 – which denied any possibility of developing countries to adopt emission reduction targets – was consistent in terms of narrow national interest, given the very high emissions of the land use, land use change and forestry sector at the time. However, there were strong divisions within the Cardoso administration in relation to this definition: while Minister Lampreia was attempting a macro policy more convergent with the positions of the developed world, in the climate area nationalist sectors stood out, aspiring to lead the world and avoiding international regulations on forests. In this sense, the Brazilian delegation was always under the control of the Ministry of Science and Technology (which results from the fundamental role of the president of the Brazilian Space Agency, Luiz Gylvan Meira Filho) in the important aspects and Itamaraty in aspects related to the negotiating process. By 1999, the Presidency of the Republic did not consider the negotiation of the protocol as an important issue on which it should interfere, although the protocol ratification process occurred quickly. The definition of the Brazilian position was very restricted between 1996 and 1999, almost without the participation of state governments, businessmen or NGOs [non-governmental organizations]. As at the year 2000, the definitions have expanded with the inclusion, in a secondary position, of the Ministry of the Environment, the Brazilian Business Council for Sustainable Development, some state governments of the Amazon and several NGOs. In June 1997, Brazil made an original proposal, the Clean Development Fund, which had strong support from emerging and poor countries, but was strongly criticized by all developed countries. However, in October 1997, following an unexpected development, the United States and Brazil articulated an amended version of the Fund, which was renamed the Clean Development Mechanism (CDM), considering one of the novelties of the Kyoto Protocol and a notable moment of cooperation between US and Brazilian diplomacies. Because of the CDM, Brazil accepted the proposal of market-based mechanisms to complement emission reduction commitments of developed countries, which meant the country's rupture with its historical position, marked by opposition to joint implementation (as established by the Rio de Janeiro Convention) and marketable quotas among Annex I countries. Between 1999 and 2001, the country led a successful bid for the CDM to be the first of the three flexibilizing mechanisms to be implemented and, in for emerging and poor countries (non-Annex I) to have a stronger representation than that achieved in the Global Environment Fund (GEF)" (Viola, Franchini and Ribeiro, 2013, p. 280-281). 25. See Chapter 9 herein.

how far the actions were being pursued with a view to making the CDM feasible nation-wise. Strengthening the CDM has become part of the agenda of various agencies and entities, as well as being present at the Conference of Parties/Meeting of the Parties 1 (COP/MOP1). The CDM practice has produced knowledge, enabled individuals to act spontaneously in favor of preventing climate change.<sup>26</sup>

# 3.2 Contribution of the CDM to TC

The CDM sequence was expected with a view to regulating additional protocols<sup>27</sup> and led to the Paris Agreement.

The new forms of financial mechanisms will follow the example of valuing climate change management under the positive perspective of, through mitigation actions of net greenhouse gas emissions, combining ecological, social and economic returns in the same business model.

In the midst of the economic crisis that destroys relations between countries, a sustainable way is certainly to seek the balance of relations among those who are classified as developed and those in development, in the alternatives with which the most articulate teach the most disabled how to generate wealth based on the promotion of environmental improvement initiatives.

This is the logic of the CDM which, in the long run, could benefit all if it were everlasting. Maybe a CDM of the 21<sup>st</sup> century would be the hero of the partnership between rich and poor parts of an international treaty as infinite as the UNFCCC.

In this case, in order to maintain the logic of the CDM, connections would be necessary for its materialization in a global market. How timely it would be if those

<sup>26. &</sup>quot;We'd better be optimistic about the Kyoto Protocol. The way the world is affected by natural disasters, the context is favorable to comment on this international treaty that allows the sale of goods from a correct attitude towards the environment. The Clean Development Mechanism (CDM), a financial instrument created by the Kyoto Protocol, seems to project a change of scene in Brazil: from the poor waste pickers to the illustrative image of shouting executives on the Stock Exchange & Futures (BM&F) "(Frangetto, 2005, p. 186). About BM&F, it is worth remembering that there was an effort to call for the trade of credits (BM&F)" (Frangetto, 2005, p. 186). Notice of Invitation to Tender n° 001/2007; *seller:* São Paulo Municipal Government; *marketplace:* Brazilian Mercantile & Futures Exchange – *auction for the sale of certified emission reductions (CERs)*, for CERs from de Bandeirantes Landfill Gas Project and Energy Generation, in São Paulo, Brazil.

<sup>27. &</sup>quot;A new protocol is being thought of to be added to the UNFCCC. One that reinforces measures of non-financial support to the Kyoto Protocol may be a good solution for raising consumer awareness that influences decision-making by producing, purchasing or using a less greenhouse-gas-emitting system. The organization of a system of circulation of information concerning the prevention of climate change remains crucial. Finally, the new additional protocols to the UNFCCC should lead to ancillary and complementary issues to the Kyoto Protocol itself. Thus, a protocol could be concluded that solves the impasse of the difficulty of implementing the Rio-92 Conventions (climate, biodiversity, desertification) in synergy, considering that activities are in line with the objectives of the three legal texts without compromising one or the other, but rather combining them in searching for sustainable development. Another bold but timely regulation under the Climate Convention is the definition of liability for damage or threat of ecological imbalance due to the benefit of the activity of emitting greenhouse gases. The attribution of an emissions quota by individual or sector of activity can be a matter of national debate, to the point that internal emissions trading markets can be created. It may also have its relevance at the international level, when means of voluntary proportional application of the degree of negative impact of global warming can be instituted to avoid attitudes that might increase the concentration of greenhouse gases. The measure of objective environmental accountability would be in the definition (possibly by arbitration) of the minimum necessary for healthy living in a more or less developed country" (Frangetto, 2005, p. 187).

still weak to reduce emissions in industrialized countries would do so, and if an individual concentrator of wealth in a late industrialized country decided to pay for the world to have the effects of climate change avoided. Effective international cooperation – noting that stabilization results are not dependent on new quantified commitments – with which it becomes feasible to reduce emissions globally is the only way to achieve the ultimate goal of the UNFCCC.

Imagine the efficiency of a CDM that can be used on a global scale and with which its options for the intergenerational regime are increased, as well as being widely implemented equally by natural persons and environmental protection equivalents in the various forms demanded by nature (Frangetto, 2009, p. 270-271).

Due to a convergence of subjects, between the perception of the recently transcribed section in italics and the analysis made by the authors In Chapter 12 herein, it is worth referring to the statements also transcribed below:

the new mechanism was designed to encourage universal engagement by stakeholders rather than parties, providing a way for countries outside the Paris Agreement and non-state stakeholders to continue to engage in the multilateral environment and thus strengthen the international regime of climate change. (...) Since its inception, the SDM would have allowed certified reductions to be used by any stakeholder – whether state or non-state; public or private – for any purpose that corresponds to the measurement, reporting and verification of action – including for financial instruments, corporate social and environmental responsibility strategies, results-based financing, positive pricing etc (Chapter 12, subsection 3.2).

The SDM should deliver more actions, greater engagement, and greater ambition. First, it should encourage and facilitate action by the private sector, civil society and public authorities (Chapter 12, section 5).

Along these lines, it could be said that the tendency for a broad participation in the CDM, if the interpretation of the mechanism had been different from what it was in practice, had already been signaled. And with the advent of new mechanisms, the idea of involving more stakeholders, is being used.

Moving on, not to record the inglorious struggles of the past, but, rather, historical reflections:

Host countries of CDM projects seem to close their siege, they rejoice in disputing the Treasury's shelves, while, instead of raising doubts as to the size of the piece that they will take to their public coffers, they could take a proactive stance of internationally positioning themselves, restricted by negative international taxation. If this were to be done, and there would be due legal backing and corrective measures needed for the flawed implementations of a poorly applied CDM, there would be love for the cause, and the CDM could survive.

Out of the 1,059 projects registered, totaling 214,692,149 CERs/year and 1,270,000 CERs by 2012, by the mid-2008, there could be a geometric progression of initiatives

to reduce emissions of greenhouse gases. This would encourage CDM supporters to call it "the CDM, the right to the future" and the pessimists or skeptics of its use would be gathering reasons why, as the CDM is in extinction, it deserves more protection – undoubtedly a smarter behavior than the counter-insult of an international disorder of daring to create a financial instrument and then annihilating it (Frangetto, 2009, p. 271).

In the words of Freestone and Streck, however, after listing several of the criticisms that existed in the course of implementing the CDM:

Despite these valid points of criticism, the CDM must be considered a success. The measure of its success lies not only in the reduction of GHG emissions that it has facilitated – for these are still too small to change the emission trends on a global scale – but more importantly in the fact that the CDM has helped to create a global partnership between countless actors united in their efforts to finance emission-reducing projects and create emission reductions. The CDM has proven to be a global market experience of unprecedented scale. It has brought the idea of market-based approaches to parts of the world new to the notion of a global market. It has helped to leverage funds for renewable energy technologies and other emission reducing activities. And, last but not least, it has helped to test methods to calculate emissions and emissions reductions, develop monitoring protocols, and an essential infrastructure of emission registers<sup>28</sup> (Freestone and Streck, 2007, p. 52).<sup>29</sup>

It can be seen from the previous texts that the CDM implemented in Brazil had to deal with external factors to a particular project (transaction cost, crises management, regulatory challenges) and, in doing so, ended up performing lower in terms of benefits of mitigation and sustainable development, to which it would have absolutely favorable conditions to invest in CDM projects. In this sense, answering the question of whether the CDM was able to represent TC is not a simple task. If there were changes in the paths of GHG emissions in the various sectors, has the CDM corroborated the trend towards a progressive reduction of emissions in the long term?

Additional measures to support the implementation of the CDM could have been adopted. Undoubtedly, the adoption of some measures extended the chances of implementing it. For example, the CDM's Programs of Activities (PoAs) indicate a shift from a project-based approach to one that is backed by sectoral initiatives, a trend maintained in the PoA, and thus makes it possible to effectively change GHG emissions from countries in favor of the adoption of less emissions-intensive and durable practices. It is possible that such measures were not enough to configure effective TC.

<sup>28.</sup> The evolution of quantification methods was explored in Chapter 3 herein. For further information about the registration system (ITL), see Chapter 12.

<sup>29.</sup> Original text.

A TC is not evident in terms of emission reductions, since, except for those related to deforestation, Brazilian emissions have increased in all sectors during the period discussed herein. An analysis of sectoral baselines is necessary to evaluate if there was a deviation of the expected paths of emissions increase by sector. Considering that the sectoral reduction targets proposed in the Brazilian Nationally Appropriate Mitigation Actions (NAMAs) have been achieved (Brazil, 2017), it is understood that there was a deviation in the path of expected emission reductions, but an assessment is necessary to ascertain as to whether the deviation is related to the CDM or not. The mechanism is certainly not responsible for all the reductions but it would be reasonable to understand that it had an influence on the acceleration of the learning curve of important technologies and practices that generate emission reductions.

Moreover, as illustrated in table 1, a number of lessons could be drawn from the CDM practice, and lessons learned can serve as lessons to induce course changes, i.e., inflections on the emissions curve that would put the sectors at a higher-level mitigation, which, per se, would be a transformation. Along these lines, an invitation for future analysis of how much the CDM has been, and still is, generating, effective or potential TCs, is in order.

#### 3.3 A new financial system since the CDM

The lesson of the CDM will never perish: at the juncture of the year the UNFCCC Conference of Parties will meet in late 2009 in Copenhagen (Denmark) and at a time when several newspapers extol the initiatives of avoided deforestation in the Amazon Brazil, it is worth – even if it were done for the last time in its full existence under the Kyoto Protocol – to take up the essence of the CDM and verify its power to leave the wisdom of providing viability for the next generations of new market mechanisms particular positive environmental actions.

Taking up the fundamental concepts of the financial instrument in question (...), if it is indeed doomed to be replaced by a distinct mechanism, then it is not plausible to believe that States (consciously or unconsciously) agree, definitively, on an international treaty additional to the UNFCCC that ignores the advantages absorbed from the experience of using the first international legal mechanism capable of assimilating the basic aspects of sustainability, that is, the economic, ecological and social vectors of the environment (Frangetto, 2009, p. 268).

#### 3.4 Individual legitimation

Under the CDM regime, project implementers qualify as holders, claiming to be eligible for carbon credits (in the form of CERs). These could be individuals, physical persons, as well as legal entities. In summary, in the context of comments on transparency, IETA gladly exploited this legitimacy, which in this case was contextualized in relation to the revision of the report issued by the Executive Board: to increase transparency and interaction, IETA recommends that the process to review the EB report at COP/MOP2 in Nairobi include the opportunity for stakeholders, such as IETA, to make presentations to the group undertaking the review on behalf of the COP/MOP. This does not in any way contravene UN procedures and can be seen as necessary given the special nature of the CDM, which is a mechanism under the regulatory authority of the UN, but overwhelmingly implemented by the business sector (IETA, 2006, p. 29).<sup>30</sup>

According to Viola, Franchini and Ribeiro (2013, p. 209-211), alluding to other authors, the role of non-state stakeholders is highlighted:

the important role that some non-state actors have played in building the current governance structure in this subject is widely highlighted in the climate change literature (Okereke and Bulkeley, 2007; Hurrell, 2005; Porter et al., 2000).

In order to clarify further the role of these actors in climate governance, it seems appropriate to refer to the concept of "*transnational climate change governance*" of Andonova *et al.* (2007). Defined as "*transnational government occurs when networks operating in the transnational political sphere purposively steer constituent members or populations to act*" (Andonova *et al.*, 2007:4), the concept refers to relations that occur across state boundaries but are not controlled by central political authorities and bring local and global governance systems in contact through the public and private levels.

According to the authors, climate change is one of the most propitious areas for the expansion of this type of governance. Firstly, it is an arena that is already densely populated with business and defense organizations interested in climate governance issues. Second, because climate change involves multiple sectors, not an industry or few stakeholders as in the case of classical environmental problems. And thirdly because the climate regime itself creates incentives for its participation – especially through the flexible Kyoto mechanisms.

#### 3.5 Transactions in the financial market

From a financial point of view, the availability of resources for the idealization of CDM projects in the country can be discussed. It is pointed out that the projects needed financial resources for the pre-project stage. Investors, however, need security to invest in good projects. It was evident that there was a clear interest in funding the Brazilian CDM projects in Brazil during the first years of CDM implementation (especially from 2000 to 2007), but in several cases, only if they were already set up, idealized and organized – that is, provided that someone had previously paid for all that quality.

30. Original text.

394

In fact, successful projects have received financial and technical support needed to succeed. Project design documents, agreements (from the Emission Reduction Purchase Agreement (ERPA) to the Certified Emission Reduction Sale and Purchase Agreement)<sup>31</sup> were well entered into with the governmental authorities of the various levels (federal, state and municipal) in the areas of administrative, environmental, social, urban, civil, national and international law, along with science – an arsenal of measures forming an arrangement; however, some projects were submitted to the DNA with flaws. Attempts to unite public authority and private enterprise or individual entrepreneurship led to curbs, as being pioneers does not properly capture as spontaneity deserving of immediate and sufficient legal recognition to remove the risks of unfair competition in the practices of sustainability that were emerging in the country at the time.

Brazil was a promising export power of CERs. Only it was not strong enough. It lacked "common sense" in terms of a detectable *mea culpa ex post*, but which, in the course of implementation, was already evident – it had already been the subject of alert and even attempt to correct course. In this sense, it may be the case that the European Union's decision cannot be attributed solely to the decline in the attractiveness of implementing CDM projects in Brazil. Overcoming the problems that could be remedied could have made the CDM stand as a mode of climate governance and generate benefits in reducing emissions.

# 4 FRAGILITIES AND POSITIVE ATTRIBUTES OF THE CDM: LESSONS IN FAVOR OF MANY TCS

In a much larger rhythm, volume and cross-cutting nature, actions could have been taken in order to implement the CDM. In this sense, Frangetto affirmed (2007, p. 40-41):

In the event that a municipality, as a direct administration entity, takes action on the bus fleet, placing ethanol as fuel in the place of diesel oil – should a CDM project be possible, as well as respective carbon credits, due to the exchange of fuels given the lower emission from alcohol – it just so happens that the individuals that make use of that transport act in a certain way as participants in the emission reduction process. In the case of a private individual, it can even be legally inferred that individuals as owners of their vehicles may be able to receive carbon credits.

This is closer to reality than one imagines; tourism agencies have already taken the first step, making an option for the spontaneous acquisition of a right available to consumers of the air transport service. In proportion to the additional figure given

<sup>31.</sup> This contract paradigm model was designed to reflect the particularities and needs of carbon credit sellers. The CERSPA initiative was led by Charlotte Streck and Robert O'Sullivan, made possible by the Inter-American Investment Corporation in 2006, with the participation of lawyers from various parts of the world, especially representing the views of non-Annex I players.

to the ticket, part of the price paid goes to the recomposition of the environment corresponding to the degradation that the travel causes in terms of emission of polluting gases. It is about acquiring an upgrade to be more sustainable. Along the same lines, even in residences, carbon credits can be claimed, due to preferences that imply a smaller reduction, such as the option for solar heating systems in instead of gas heating. It is worth remembering that the pollution caused by fuels used by airlines has already been a concern raised during the Parties' conferences. Are policies relevant in this area – and why not, if technically feasible, have policies that encourage the implementation of CDM projects? – in the scope of the European Community Commission, to reduce emissions through the encouragement of voluntary initiatives which can be adopted by the Association European Airlines (AEA).

Also, in the area of tourism, transportation sectors in locations where winter tourism is strong, such as in the Colorado Ski Resorts, have been promoting programs to prevent climate change. They work, for example, with electric vehicles (lower emission) due to the alarm that snowy periods would be decreasing.

Similar strategies can be set up for other emitter activities besides those that cause fugitive emissions in relation to fossil fuels, oil and natural gas: industrial activities, mineral processes, chemical industry, halocarbon production and hexafluoride. This is a serious problem in the case of the refrigerator industry, considering its high potential for global warming compared to carbon dioxide and even methane.

A reflex of the private sector can be identified to the new environmental conjuncture, with the acting industry at present experiencing an advance of what in the future will be regulated. It should not be forgotten that the same phenomenon comes to occur in the automobile industry to the environmental problem of noise pollution due to the emission of noise. PROCONVE (Program for the Reduction of Vehicle Emissions) is mentioned at this stage, which can certainly be reinforced by the effects of international regulations on the emission of gases.

It should be noted that other sectors are also considered important in the process of reducing emissions, such as agriculture, rice cultivation and agricultural land use. Many of these activities were not even noticed as being environmentally relevant to problems on a global scale such as climate change. Under the new perspective of the Kyoto Protocol, the perception is changed, with the acceptance of manure treatment, so that the carbon capture of methane from it can be obtained. Something that was previously nobody's business, such as waste, is given economic importance thanks to environmental law.

The impact of "upgrading" these previously forgotten activities is translated into conflicts. This is evident in the case of methane from waste decomposition in landfills, which, before the opportunity to generate carbon credits, were almost the subject of a simple treatment of burning flares, but rarely with piping connected to a power generation system. For the purpose of defining who owns the possible carbon credits generated, the question arises as to who would have been entitled to "methane gas" as good, which was practically disregarded in the bidding processes between the public administration, which is competent to pass on the provision of waste treatment services or generation of electric energy, and the concessionaire. The consequence, in cases where the public administration does not foresee in advance the possibility of generating carbon credits, are later agreements that are often subject to questioning, despite the arduous task of promoting the resolution of a problem resulting from the lack of strategic planning in relation to the use of environmental goods, due to lack of knowledge or socio-economic-ecological immaturity, as useless or unusable.

In any case, it seems that now (that the CDM is no longer the apple of the UNFCCC's eyes) emissions reduction practices are becoming more acceptable in relation to the development of technology alternatives, compared to the time when there was expected reduction activities via the CDM, as described by Frangetto (2007). At the time, the potential of the mechanism seemed to be quite promising for all sectors. It would be interesting to analyze each one, but as it is not the scope of this book to verify the presence or absence of TCs, it is enough to try to apprehend, as an illustration, how paradigmatic the waste sector was. In order to do so, from the findings in Chapter 5, the following questions can be asked as a reflection on the contribution of the CDM in favor of improving waste management in the developing country being studied.

Experiences in the urban solid waste sector, described in the reference chapter (Chapter 5), have been successful insofar as the implementation of the CDM contributed to the formation of a market for parts, materials and equipment (table 1 of the said chapter). In a country with a huge sanitation deficit such as Brazil, where regulations in the last decade failed to eradicate the open disposal of urban solid waste (dumps), the CDM favored the allocation of resources to collect landfill gas with energy utilization. Although the availability of resources invested in solid waste in Brazil was below that which would be sufficient for an adequate and widely efficient waste treatment system. In this regard, therefore, the CDM was embodied in a proof that the CDM performed in a way that made possible a partial change in waste management in Brazil.

The CDM contributed so that many landfills in big Brazilian cities could develop methane destruction or energy recovery projects from landfill gas. Undoubtedly, this experience positively influenced capacity building of engineers and technicians who work with solid waste management insofar as the management approach strongly restrained the climate factor.

These aspects show significant learning and behavior-change as a consequence of the CDM in Brazil. Although many landfills that have registered CDM projects are not verifying their emission reductions nor issuing CERs as a result of the fall in demand for credits, which once again generated price stimulus, there are no more learning barriers and behaviors that prevent the due treatment of landfill gas. Thus, the impact of the CDM, we dare to affirm, transcends project boundaries, reaching virtually all types of projects in Brazil, by expanding the notion of emission reduction and its environmental importance to different stakeholders in society.

### 4.1 Highlight – monitoring process

In some cases, there were attempts to solve the CDM implementation problems by means of palliatives, instead of addressing the issues until solving them. One example is based on problems related to functioning of DOEs, as highlighted by IETA in 2006 in discussions on CDM governance:

A disturbing trend at the EB is the introduction of additional layers of bureaucracy to address perceived or actual shortcomings in existing processes. A key example of this trend is the creation of the CDM Registration and Issuance Team (RIT), which appears to be designed to duplicate the role of DOEs [designated operational entities] with respect to the determination of project's eligibility for registration and/ or issuance. DOEs are accredited by the EB precisely so that their judgement can be relied upon. If the EB has concerns within the DOE structure instead creating a duplicative function.

Critically, the perception on the part of developers and investors is that DOE determinations can no longer be relied upon because they are subject to second-guessing.

*This increases perceived regulatory risk and discourages project investment* (IETA, 2006, p. 11-12).<sup>32</sup>

The IETA concludes by recommending that (2006, p. 12), for the purposes of improving CDM governance: *"instead of including more control bodies into the CDM process the EB should put more trust into its own*".<sup>33</sup>

On the other hand, it is necessary to remember that the IETA gathers the DOEs, which means that among its members are the ones that are being evaluated by the RIT. It could be argued that there is a wide debate on the win-win situation between contractors and verifiers, generating undue certifications, and that, in the case of the CDM, could lead to failures in approving projects that are in the baseline or do not meet the prerequisites for participation in the mechanism, based on partial validation reports.

The RIT solution, in this sense, can be seen as a counterbalance in this relationship, an audit of the process prior to the approval of the projects by the Executive Board. The RIT members are individual experts who are usually in continents different from the proponents of the project under analysis, and are unlikely to be related to each other or to the DOEs. Their participation is relatively

<sup>32.</sup> Excerpt from original text.

<sup>33.</sup> Excerpt from original text.

inexpensive, and their comments on the project and its validation are not binding, they only support the decision-making body.

It should be noted that there was, in fact, more rigor in the analysis of the projects. As of 2006, the number of automatic project registrations fell sharply and, on the other hand, revisions requests and proper revisions increased, only returning to the initial levels from 2011 onwards (graph 1). The anticipation of this scenario may have motivated criticism from IETA. Even so, the DOEs remained subject to criticism regarding certain performances, particularly in relation to alleged failures in the validation and verification reports.



Prepared by the authors.

Note: 1 Includes projects that have been registered after the request for review, with or without corrections. Note: <sup>2</sup>See Frondizi (2009) for more details on the development cycle of the CDM project activities.

In this sense, this chapter mentioned that the broad knowledge of DOEs in hiring insurance granted more safety to operations. Another observation would be possible in the context of the institutional structure of the CDM providing successful instrument performance, in terms of sustainable development assessment provided by the implemented CDM project. Much of the criticism towards the CDM in the disagreements between Annex I and non-Annex I countries lie in the fear of interference from developed countries over what represents or should represent sustainable development in the developing or less developed countries.

Regarding degrees of country development and their consequences, by means of the normative discipline in Paragraph 40 item "a"<sup>34</sup> of Decision 17/CP.7 (*Modalities and Procedures for a Clean Development Mechanism*, as defined in Article 12 of the Kyoto Protocol), the risk of the North-South relationship in developed countries has been minimized to prescribe what developing/least developed countries must do to become sustainably developed. Even in terms of sustainable development, the CDM was right when it imposed the host country, through the DNA, to declare the promise of sustainable development designed by the project proponent. The estimate, by itself, showed the adoption, by the protocol, of the bottom up (instead of top down) approach, even before the Durban Platform.

However, it is interesting to note the need for solutions to possible limitations in the institutional capacity of analysis regarding the potential presence of sustainable development, project by project. This theme was highlighted in this book in Chapter 8, when the author discussed the uncertainties that still remain about how to ensure the sustainable development of CDM projects. The multiple and interpersonal nature of what constitutes real sustainable development is addressed in the Sustainable Development Goals (ODS) and, perhaps, the alliance with new parameters could grant new rationalizations about such a synergistic CDM requirement and, perhaps, new mechanisms.

#### **5 FINAL CONSIDERATIONS: LEGACY TOWARDS ROBUSTNESS IN THE TC PROCESS**

Yes, the CDM experience is a legacy. Far from a naive attempt to try and make the CDM of the Kyoto Protocol prevail (1997), this work sought to identify the legacy of the CDM. From the discussions above, which have been debated again in this last chapter of the book, the original capabilities of the CDM were studied.

The Waste Sector is shown as an example, containing some elements that lead to the belief that a TC was provided by the CDM in Brazil. New assessments would be worthwhile for other sectors, and for now this is the contribution of the authors.

The findings of Chapter 9 confirm this point of view on governance, according to which there was indeed the creation of relevant technical capacity in the country in order to work on issues related to climate change. This demonstrates that the CDM presents its own skills to evolve global management of climate change.

<sup>34.</sup> According to Paragraph 40, item "a", of Decision 17/CP.7, a DOE shall: "prior to the submission of the validation report to the Executive Board, have received from the project participants written approval of voluntary participation from the designated national authority of each Party involved, including *confirmation by the host Party that the project activity assists it in achieving sustainable development*" (UNFCCC, 2002, p. 35, original text with Italics marked by us).

It was also up to the publication to emphasize the obligation to observe the principles, as well as the principle of common but differentiated responsibility (PCDR).<sup>35</sup>

Progresses have been achieved in governance, methodology<sup>36</sup> implementation of UNFCCC. *Mutatis mutandis* the terminology used, when commenting on improvements in the CDM implementation, specifically regarding the timing of approval of methodologies,<sup>37</sup> IETA, either prognostic or intuitively, described the CDM as transformative. Although it was not in the context of CIF, it is worth noting:

"new technologies and project activities can only be applied and carried out under the CDM if new methodologies are developed and approved. Unfortunately, the new methodology approval process is creating a serious bottleneck that is needlessly delaying or discouraging these new types of project activities. At present, approval of a new methodology can take two years or longer (...) and more than one year for methodologies that have already received a 'B' grade from the Meth Panel. Continued delays of this magnitude will cause investors and developers to become disenchanted with the CDM process, and lead to quality projects, with significant sustainable development benefits, to go undeveloped.

400

<sup>35.</sup> It is worth strengthening the understanding that: "The UNFCCC principle is based on the principle of sustainable development in North-South relations (between countries north of the Equator, normally more developed than those in the south, and countries located south of the line, where a large part of the considered underdeveloped or developing countries are located). This is the principle of exception to the principle of reciprocity of obligations among the parties, the principle of common but differentiated responsibility set out in Articles 3, 1 and 3 (2) of the UNFCCC. This principle asserts that the specific needs and special circumstances of the 'developing' countries are taken into account, and that in view of their fragile situation, action to combat climate change and its effects must be taken by developed countries. In line with the polluter pays principle, those countries using polluting techniques (developed countries) longer than developing countries must contribute proportionately to the pollution they caused, bearing the burden of mitigating the adverse effects of climate change. Hence, the adoption of the principle of common but differentiated responsibility, according to the degree of pollution caused by developed countries. It is the evolution from equality of treatment to fair treatment between those who present themselves, in terms of industrial development, at different levels in the international economic and financial system. Article 3, paragraph 5, of the UNFCCC states that the Parties should cooperate to promote a supportive and open international economic system that would lead to sustainable economic growth and development in all Parties, particularly developing country Parties, thus enabling them better to address the problems of climate change. Thus, the principle of common but differentiated responsibility, together with the principle of sustainable development, becomes the basis for true international cooperation, in which the 'weakest' are assisted by the 'strongest'. In this sense, CDM projects - say Clean Development Mechanism (CDM) projects capable of generating CERs - enable international cooperation, insofar as, on the one hand, part of the obligations of a country in Annex I of the UNFCCC can be fulfilled and, on the other, there is an increase in investment in developing countries (macroeconomic measure), through the inflow of foreign capital and the increase of the domestic capital destined to the environmental cause, especially the fight against climate change. The strengthening of macroeconomic measures, transposed to North-South relations between Annex I countries and non-Annex I countries, is complemented by the strengthening of microeconomic measures such as investment in non-financial mechanisms (e.g. education, awareness raising and awareness raising on climate change), which improves the knowledge on this environmental problem and even affects economic improvements, since it creates a demand for capacity building, whose supply acts as a form of internal cooperation, and avoids the overcoming of anthropogenic actions that provoke climate change" (Frangetto and Gazani, 2002, p. 37-39).

<sup>36.</sup> It is interesting to note that "the methodologies for calculating the emission levels reduced from a baseline constructed in a certain reference scenario can be used by third parties other than those who submitted them for approval, without any burden – what can be called socialization of the investments made in CDM, in order to prevent the coming of a sustainable anti-development process - in this case, against the phenomenon of climate change" (Frangetto, 2005, p. 187). Another note that represents the experience generated through the development of a methodology is the repercussion for new options of emission reductions, according to, for example, what Boneti (2007) discussed.

<sup>37.</sup> For further information on the proposition and review of methodologies, see Chapter 3 herein.

New methodologies are the essential building blocks for the success of the CDM as a transformative mechanism" (IETA, 2006, p. 17).<sup>38</sup>

Therefore, taking advantage of the knowledge acquired during the implementation of the CDM for new formatting mechanisms is justified. Numerous methodologies have been developed over the years, which have been applied to the most different sectors of activity. Building new mechanisms from this knowledge would be very efficient.

The plain CDM was differentiated from the one that was put in practice as a CDM, because it was concluded, even with the flaws, and the lessons. Even if a supposedly flawed mechanism – incapable of generating valid CERs – could have been created, the CDM itself was able to provide an institutional structure in which validity assumptions were raised until they were properly resolved, saving the mechanism from any errors or misinterpretations.

This book has provided room for an analysis of emerging subjects in terms of climate financing, and noticed that the financial mechanisms trend, to be regulated under the Paris Agreement, results from the experience of implementing the CDM.

Problems that were not necessarily the CDM's were considered as such, but they were actually application, interpretation and coherence flaws. To some extent, there was a lack of adherence to the climate regime established by the UNFCCC and, from a systemic point of view, there was also a lack of common sense or rationality in a series of episodes of CDM implementation. An emblematic error, which was more evident over the years in climate policy, was to take the implementation of the CDM as a way of controlling emissions, whereas in reality the Kyoto Protocol system was based on valuing emission reduction initiatives (the limitations of Annex I countries were based on the percentage reductions).

In the practical daily language, a habit was to refer to the CDM as a concession of a right to pollute.<sup>39</sup> Pollution is a crime in Brazil, and a negative environmental impact always raises responsibility in the area of environmental protection, so that the sum of environmental impacts does not cause environmental damage. With this, any emission needs a behavior capable of nullifying it, as if it were an act of counter-emission: it would be the emission reduction. In the case of the Kyoto Protocol, Decision 15/CP.17 sought to clarify that the Protocol did not grant or

<sup>38.</sup> Excerpt from original text.

<sup>39.</sup> It is worth recalling the criticism regarding the CDM: "Some sectors in developing countries criticized it under the assertion that it disobeyed the polluter-pays environmental legal principle, as if it rewarded those who emit and authorized emissions" (Frangetto, 2009, p. 269).

authorize any right to issue.<sup>40</sup> The market, however, seems to have been weakened by the fallacy that has arisen in the practice of carbon credits being generated by the right to issue.

As can be seen in the analyzes made throughout the chapters, which were highlighted by the authors, those aspects related to CDM weaknesses (table 1) were recognized as problems. Some aspects of relevance among the problems brought up are listed below. It is important to note that the problems of insecurity in the implementation of CDM projects were recurrent; however correctable.

There was an attempt to avoid the "toxic pest" that poisoned the mechanism since the moment the "plantations" began, meaning, the implementation of projects. Consider the effects of the distortion in basing all the intended action to reduce emissions and contribute to sustainable development on the incapacity or reverse history of the polluting behavior: instead of the mechanism being regarded as award for the fulfillment of the commandment of stabilization and of the exercise of the right to sustainable development, the fact that the baseline is calculated on the reference scenario of the disorder led to the natural consequence of considering the right as wrong (i.e. creditable projects that would prove to improve the environmental quality standard). Legally speaking, the rationale would have been to remember that liability for any and all emissions is already classified as objective and, with this, it was assumed that emissions lead to environmental threat and damage (climate change, in this case) but the non-issuance implies the prevention of damage and non-occurrence of the threat, and the stakeholders of compliance measures are allocated the right to accreditation by means of awards.

Additionality was attempted to be calculated on the basis of the logic of Brazilian law, in which everyone has the right to an ecologically balanced environment and, at the same time, has the duty – especially the public authority and collectivity – to defend and preserve it in favor of present and future generations. Likewise, it was tried that the part of the Brazilian obligation for stabilization, which is a common objective of the parties to the UNFCCC, should be observed as a premise in the granting of procedural authorizations to the progress of the projects in the course of the cycle within Brazil and towards the Secretariat of the Convention.

402

<sup>40.</sup> The protocol only warned about the fundamental aspects. Frangetto (2005, pp. 187-188) states: "the generation of carbon credits under the Kyoto Protocol is coming from a perspective of greater certainty. Risks tend to be minimized. In this respect, two elements are extremely important. First, the elimination of the view that, according to the Kyoto Protocol, poor countries sell pollution credits to rich countries (when in fact, in addition to being illegal, Decision 15/ CP.7 expressly recognizes that the 'Kyoto Protocol did not create or grant the parties included in Annex I any right, title or permit for any type of issue'). Second, the conclusion of legal acts in order to provide risk management guarantees for the commercialization of carbon credits. In the event of extreme risks of the contract leading to hardship and, in the event of the impossibility of delivering certified emission reductions (CERs) as promised to the credit substitution program resulting from CDM projects of the same level of that commercialization. The recommended actions are a means to ensure the success of the CDM negotiations and the consequent effectiveness of the Kyoto Protocol".

Likewise, there was an attempt that part of the Brazilian obligation for stabilization, which is a common objective of the parties to the UNFCCC, be observed as a premise in the granting of procedural authorizations to the progress of projects in the course of the cycle within Brazil and towards the Secretariat of the Convention.

However, these efforts required a shift in the basis of conscious and unconscious deviations of purpose in the CDM implementation process. Also fragmenting international law formed by the influence of the country-parties, the technical reasoning of project development began to bring beliefs that some modes of calculation should become the method in judgments of modalities and procedures. And so, they became. In practice, the sub-rules were met, instead of observing the principles and rules of the legal regime of climate change.

It may be considered that the principles should have been better applied. For example, the principle of sustainable development, the application of which has brought so many questions,<sup>41</sup> could have been explored to the extent where project developers, in line with policy makers in the course of the CDM cycle, have valued the rising levels of sustainable development over time – even if only one of the sustainability items (social, ecological or economic) and only one initiative (for example, increase of the number of species elements in the project's area of influence) was focused. In the context of this line of reasoning:

Thus, development, in environmental terms, can make the classification of countries, in environmental terms, new. They would be classified in relation to sustainable development; all countries would somehow have the ideal profile of moving towards the pursuit of sustainable development until they reached the state of grace of true sustainability, which would be the state of total sustainability, with social, economic and ecological balance throughout the world. This state could be illustrated in specific CDM projects, capable of taking into account the differences between countries and intrinsically making a carbon project a promoter of sustainable development (Frangetto, 2007, p. 52).

Another example of a warning occurred in the area of the definition of ownership over credit, which to some extent is a matter of autonomy of the will. A controversial case occurred in 2007, when the potential of credits generated by the Program for Incentive to Alternative Sources of Electricity (PROINFA) ended up permeating the interests of both Eletrobrás and energy users from alternative sources, interested in receiving their installments on credits. Similarly, in the case of landfills, the granting authority and the waste-disposal concessionaire eventually had to reach an agreement in which each party would receive a proportion of the

<sup>41.</sup> See Chapter 8 herein for a critical and detailed analysis of the criteria and their application in the context of verification of the contribution to the country's sustainable development by CDM projects.

credits generated. Until then, even the bidding document for the installation of a thermoelectric plant from the captured methane resulting from the process of decomposition of the waste provided for the ownership issue over the credits, since it only supported the gain from the energy source to be generated, and not accessories like a carbon credit.

One might agree that mistakes have been made in interpreting CDM standards, misadventures in the world of facts, CDM devaluation in countries that have decided not to buy CERs from Brazil or have bought them in smaller quantities than would be desirable to the country's entrepreneurs who have sought the Kyoto financial instrument to carry out emission-reducing activities and contribute to reducing inequalities.<sup>42</sup>

Ontologically, the *must-be*, the CDM. by nature, has to be perfect; in practice, the CDM experience has shown that its implementation, even in situations of insecurities or application failures, can be guided by the essence of the CDM, so that everything goes well.

The institutional framework within which the CDM is constituted, within the framework of the Convention and the regulatory framework from the international to the national scope, is justified insofar as it works to the benefit of the CDM and therefore has tools and forums, which, developed, would have the ability to correct errors and misunderstandings, saving the mechanism of any negative criticism.

The CDM remains, despite criticism, restrictions imposed by the emissions market for its commercialization, and obstacles in international negotiations. In an *ex post* evaluation, from the contributions of previous chapters herein, it is suggested that the identified contingencies can be overcome. The final recommendation is that the experiences of implementing the mechanism and its projects in Brazil serve as a motivating factor for the improvement of internal markets and new mechanisms within the framework of multilateral governance. As discussed in Chapter 15, possibilities are being studied in the Partnership for Market Readiness (PMR) project in Brazil. Also, the expansion of Brazilian participation in international initiatives – for example, in CORSIA, discussed in Chapter 1 – can benefit from the lessons learned. The CDM, in turn, solving the mistakes of the past, can work again as expected, thus ensuring that the desired TCs are in fact perennial

404

<sup>42.</sup> As stated in 2001: "For the purposes of specific obligations, liability becomes proportional to the degree of development. Paragraph 7 of Article 4 of the Convention is explicit in that regard, stating that the extent to which developing country Parties will effectively implement the commitments undertaken will depend on the effective implementation by the developed country Parties of their programs for the provision of financial resources and transfers of technologies; and will take full account of the fact that economic and social development and the eradication of poverty are the overriding and absolute priorities of developing country Parties" (Frangetto and Calasans, 2001, p. 405).

# REFERENCES

ALLEN, M.; MUSTAFA, B.; SHUKLA, P. *et al.* **Global warming of 1.5°C**: an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Incheon: IPCC, 2018. Available at: https://bit.ly/2y7hz9b. Accessed on: October 15<sup>th</sup>, 2018.

BRASIL. Ministério da Ciência, Tecnologia, Inovações e Comunicações. **Estimativas anuais de emissões de gases de efeito estufa no Brasil**. 4. ed. Brasília: MCTIC, 2017. Available at: https://bit.ly/2uGzGjN. Accessed on: October 29<sup>th</sup>, 2018.

BONETI, H. J. **Mecanismo de Desenvolvimento Limpo (MDL) como potencial de geração de créditos de carbono decorrentes de projetos de transporte metroferroviário**: avaliação e aplicabilidade de metodologias empregadas em projetos de transporte rápido por ônibus. 2007. Dissertação (Mestrado) – Instituto de Pesquisas Tecnológicas do Estado de São Paulo, São Paulo, 2007.

DICKMAN, J. CIF Evaluation & learning: what are we learning about the big issues in climate finance? **CIF Blogs**, Oct. 2018. Available at: https://goo.gl/MpVHJF.

FRANGETTO, F. W. Mecanismo de Desenvolvimento Limpo – direito ao futuro. *In:* BATISTA, E.; CAVALCANTI, R. B.; FUJIHARA, M. A. **Caminhos da sustentabilidade no Brasil**. São Paulo: Terra das Artes, 2005.

\_\_\_\_\_. O Mecanismo de Desenvolvimento Limpo sob o olhar do direito ambiental. *In*: KLINK, C. (Org.). **Quanto mais quente, melhor?** Desafiando a sociedade civil a entender as mudanças climáticas. São Paulo: Peirópolis; Brasília: IEB, 2007.

\_\_\_\_\_. MDL (Mecanismo de Desenvolvimento Limpo), uma espécie em extinção: necessidade de seu fortalecimento, ou um último grito de respeito ao tratado. *In*: BRAGA FILHO, E. O. et al. (Coords.). **Advocacia ambiental**: segurança jurídica para empreender. Rio de Janeiro: Lumen Juris Editora, 2009.

FRANGETTO, F. W.; CALASANS, J. T. Efeito estufa: Convenção-Quadro das Nações Unidas sobre as Mudanças Climáticas e Protocolo de Quioto. *In*: BENJAMIN, A. H.; SÍCOLI, J. C. (Coords.). **O futuro do controle da poluição e da implementação ambiental**. São Paulo: Imesp, 2001.

FRANGETTO, F. W.; GAZANI, F. R. **Viabilização jurídica do Mecanismo de Desenvolvimento Limpo (MDL) no Brasil**: o Protocolo de Kyoto e a cooperação internacional. São Paulo: Peirópolis; Brasília: IIEB, 2002.

FREESTONE, D.; STRECK, C. The challenges of implementing the Kyoto mechanism. **Environmental Liability**, Oxon, v. 15, n. 2, p. 47-55, 2007.

FRONDIZI, M. R. (Coord.). **O Mecanismo de Desenvolvimento Limpo**: guia de orientação 2009. Rio de Janeiro: Imperial Novo Milênio, 2009. 131 p. Available at: https://bit.ly/2DONkbw. Accessed on: October 22<sup>nd</sup>, 2018.

GEF – GLOBAL ENVIRONMENT FACILITY. **Review of GEF support for transformational change**. Washington: GEF, May 2017. Available at: https://bit. ly/2BhC456. Accessed on: October 30<sup>th</sup>, 2018.

GOLDEMBERG, J. Prefácio. *In*: MANFRINATO, W. (Coord.). Áreas de preservação permanente e reserva legal no contexto da mitigação de mudanças climáticas: mudanças climáticas, o Código Florestal, o Protocolo de Quioto e o Mecanismo de Desenvolvimento Limpo. Rio de Janeiro; Piracicaba: The Nature Conservancy; Plant Planejamento e Ambiente Ltda., 2005. Available at: https://goo.gl/k9hu3k.

IETA – INTERNATIONAL EMISSIONS TRADING ASSOCIATION. IETA Position on the CDM for COP/MOP2. *In*: IETA – INTERNATIONAL EMISSIONS TRADING ASSOCIATION. **2006 State of the CDM**. [s.l.]: IETA, 2006.

MANFRINATO, W. (Coord.). Áreas de preservação permanente e reserva legal no contexto da mitigação de mudanças climáticas: mudanças climáticas, o Código Florestal, o Protocolo de Quioto e o Mecanismo de Desenvolvimento Limpo. Rio de Janeiro; Piracicaba: The Nature Conservancy; Plant Planejamento e Ambiente Ltda., 2005. Available at: https://goo.gl/k9hu3k.

MEIRA FILHO, G.; FRANGETTO, F. W. Mudança do clima e acordos internacionais. *In*: CGEE – CENTRO DE GESTÃO E ESTUDOS ESTRATÉGICOS. **Manual de capacitação**: mudança climática e projetos de mecanismos de desenvolvimento limpo. Brasília: CGEE, 2010.

MOTTA, R. S. Economia ambiental. São Paulo: FGV, 2006.

UNFCCC – UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE. Report of the Conference of the Parties on its seventh session, held at Marrakesh from 29 October to 10 November 2001.UNFCCC, Jan. 2002. Available at: https://bit.ly/2zljjw6. Accessed on: November 1<sup>th</sup>, 2018.

Biennial submissions from developed country parties on their updated strategies and approaches for scaling up climate finance from 2014 to 2020. Bonn: UNFCCC, 2017. Available at: https://bit.ly/2QawycI.

UNEP – UNITED NATIONS ENVIRONMENT PROGRAMME. **Capacity development for the Clean Development Mechanism (CD4CDM)** – overview of the CDM Pipeline. UNEP, 2018. Available at: https://bit.ly/2DzUJuF. Accessed on: October 22<sup>nd</sup>, 2018.

406

VIOLA, E.; FRANCHINI, M.; RIBEIRO, T. L. **Sistema internacional de hegemonia conservadora**: governança global e democracia na era da crise climática. São Paulo; Brasília: Annablume; IRel/UnB, 2013.

# **BIOGRAPHIC NOTES**

#### **EDITORS**

#### **Gustavo Luedemann**

Gustavo Luedemann coordinates the Public Policy sub-net of Rede Clima and is a researcher at the Coordination of Environmental Sustainability Studies (Cosam) at the Institute for Applied Economic Research (Ipea). He is the former coordinator for Environmental Studies and at the Ministry of Science, Technology and Innovation (MCTI) he acted as general coordinator of global climate change. He has held positions such as: executive secretary of the Interministerial Commission on Global Climate Change; representative of the MCTI at the IPCC; and national director of international cooperation projects, such as the Third Brazilian National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) and the Greenhouse Gas Emissions Mitigation Options project. He is also a member of the advisory board of the Climate Investment Funds' initiative for evaluation and learning.

#### Flavia Witkowski Frangetto

Lawyer, Doctor and Master in Social Relations Law: Diffuse and Collective Rights (Environmental Law) by the Pontifical Catholic University of São Paulo (PUC-SP) and Specialist in Environmental Law by the Université Jean Moulin - Lyon III (France). In 2002, she published "Legal Feasibility of the Clean Development Mechanism (CDM) in Brazil - Kyoto Protocol and international cooperation" (Peirópolis Publisher, 2002), with the support of the then Ministry of Science and Technology and funds from the Embassy of the Netherlands in Brazil. She has been Visiting Research Fellow at the Oxford Institute for Energy Studies (OIES) and Policy Fellow of the Smith School of Enterprise and the Environment (SSEE), at the University of Oxford. She is Legislative Advisor in the Environmental Commission of the Federal Senate in Brazil and has been a Science Correspondent to the UNCCD (United Nations Convention to Combat Desertification) and a UN consultant, from 2007 for the UNF (on future climate change regime), to 2018 for UNDP and UNEP, as Project Manager of the GEF Mitigation Options project (2015), also at Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (GIZ). From 2016 to 2017, she worked as Researcher at the Rede CLIMA Public Policy Sub-network, where she has worked under the "Climate Change - Support to the Technical Focal Point of Brazil to the United Nations Framework Convention on Climate Change" project and is still is as Visiting Researcher from the Senate.

### Ana Paula Beber Veiga

Graduated in Forest Engineering from the Higher School of Agriculture "Luiz de Queiroz" and Environmental Management by the School of Arts, Sciences and Humanities, both at the University of São Paulo, and Master in Energy from Institute of Energy and Environment linked to the same institution. She has worked as a CDM project developer between 2006 and 2015. She is currently a Research Assistant at the Institute for Applied Economic Research (Ipea), where she contributes to research related to climate change.

# **OTHER AUTHORS**

# Adriano Santhiago de Oliveira

Chemical Engineer graduated from the College of Chemistry of the Federal University of Rio de Janeiro (UFRJ), with a Master's Degree in Energy Planning (focused on Environmental Planning) obtained by the Energy Planning Program at COPPE/UFRJ. Environmental Analyst at the Ministry of the Environment since 2005. Seconded to the Ministry of Science and Technology from February 2009 to May 2011, where he served as Substitute Coordinator of Global Climate Change. Incumbent representative of the Ministry of the Environment at the Interministerial Commission on Global Climate Change and substitute representative at the Executive Group on Climate Change and Interministerial Commission on Global Climate. He is also a member of the Brazilian Delegation at the Conferences of the Parties to the United Nations Framework Convention on Climate Change. He is currently the Director of the Department of Climate Change of the Secretariat of Climate Change and Environmental Quality/MMA and Substitute Secretary of the same Secretariat.

#### José Domingos Gonzalez Miguez

Electronic Engineer graduated from the Military Institute of Engineering (IME) in 1977, economist graduated from the University of the State of Rio de Janeiro (UERJ), in 1981. Post-graduated in Electronic Engineering from the Coordination of Graduate Programs in Engineering (COPPE) of the Federal University of Rio de Janeiro (UFRJ), with specialization in Nuclear Fuel Cycle Planning by the Saclay Nuclear Research Center, France, and specialization in Energy Supply Planning Models, by the Jülich Nuclear Research Center, Germany. Master in Operational Research by the Military Institute of Engineering, in 1982. He is currently Director of Climate Change Policy of the National Secretariat of Climate Change and Forestry of the Ministry of the Environment. He co-authored the Brazilian Proposal for Kyoto in 1997 which resulted in the creation of the Clean Development Mechanism (Article 12 of the Kyoto Protocol) and more recently

has contributed with the preparation of the Nationally Determined Contribution to the Paris Agreement and Article 6 of the Paris Agreement, which resulted in the Sustainable Development Mechanism.

# Tulio César Mourthé de Alvim Andrade

Career diplomat with a Law degree from the Federal University of Minas Gerais, Tulio Andrade was a member of the negotiating team of Brazil at the United Nations Framework Convention on Climate Change between 2011 and 2017, and at the United Nations Conference on Sustainable Development (Rio+20, 2012). He served at the Brazilian Embassy in London from 2014 to 2018 and is currently based at the Brazilian Embassy in Tokyo.

# Sonia Regina Bittencourt

Agricultural Engineer, Master and Doctor in Agronomy from the Paulista State University (UNESP). Science and Technology Analyst at the Ministry of Science, Technology, Innovations and Communications since August 2002. She was a member of the National Technical Commission on Biosafety (CTNBio) representing the Ministry at Meetings of the Parties to the Cartagena Protocol on Biosafety and the Global Environmental Facility (GEF). Since 2010, she has been working at the General Coordination of Climate of the Ministry of Science, Technology, Innovations and Communications, especially with the implementation and operationalization of the Clean Development Mechanism and the Technology Mechanism of the Convention on Climate Change in Brazil. She is currently the Executive Secretary of the Interministerial Commission on Global Climate Change.

# Susanna Erica Busch

Biologist by the University of São Paulo (USP), Master in Psychobiology by the Federal University of Rio Grande do Norte (UFRN), specialist in Environmental Management and PhD in Environmental Health from the Faculty of Public Health (FSP) of the University of São Paulo (USP). From May 2008 to February 2013, she worked as Public Executive of the Environmental Secretariat (SMA) of the State of São Paulo (SP) in the areas of environmental education and environmental planning. Since March 2013, she has been a Coordinator of the General Coordination of Climate of the Ministry of Science, Technology, Innovations and Communications, working with the implementation and operationalization of the Clean Development Mechanism in Brazil.

412

#### Márcio Rojas

Biologist, Master in Molecular Biology, specialist and Doctor in Bioethics from the University of Brasília. Analyst in Science and Technology at the Ministry of Science, Technology, Innovations and Communications since August 2003, where he has been General Coordinator of Climate since 2014, being a member of the Ethics Commission (2007-2010 and 2013-2016). He is also a collaborator of the University of Brasília – UnB, with a position in the UNESCO Chair in Bioethics and in the Bioethics Graduate Program, and was a member of the board of the Brazilian Society of Bioethics (SBB) from 2011-2013.

#### Gustavo Barbosa Mozzer

Gustavo Mozzer is a biologist and holds a Doctorate in Society and Environment (Unicamp), and a Masters in Ecology (UnB). He works as a researcher at the Brazilian Agricultural Research Company (Embrapa) in the Secretariat of Intelligence and Strategic Relations, where he develops key activities related to the long-term conception and vision of the Brazilian national climate change policy towards the agricultural sector in accordance with international negotiations, particularly at the multilateral level. Under the United Nations Framework Convention on Climate Change (UNFCCC), he works as an inventory reviewer for Annex I countries, and is a member of the Registration and Issuance Team (RIT) team responsible for analyzing CDM projects for the Executive Board (EB). Additionally, he acts as the main Brazilian negotiator for agriculture-related issues, reporting to the Ministry of Agriculture, as well as to the Ministry of Foreign Affairs. Particularly in relation to the Clean Development Mechanism (CDM), in addition to being a member of the RIT, Gustavo worked for six years as CDM project specialist at the Designated National Authority located at the Ministry of Technology, Innovations and Communications (MCTIC).

#### **Giampaolo Queiroz Pellegrino**

Graduated in Forest Engineering (1991) from the Luiz de Queiroz College of Agriculture

(ESALQ/USP), and Master in Agronomy – Physics of the Agricultural Environment (1995). In parallel, from 1988 to 1989, he specialized in Nuclear Energy in Agriculture - Isotopic Hydrology and Carbon Cycle in the Center for Nuclear Energy in Agriculture, CENA/USP. From 1993 to 2000 he worked as a researcher at the Center for Meteorological and Climate Research Applied to Agriculture at Cepagri/Unicamp. In 2001, he obtained his PhD in Agricultural Engineering - Water and Soil at the State University of Campinas. Seeking to gain experience in the private sector, he retired in 2001 from Unicamp and joined Atech Foundation - Critical Technologies, representing the company in cooperation with the University of California and Lawrence Berkeley Laboratory, where he obtained his Post-Doctoral degree in hydrological modeling. He worked as a consultant in Agrometeorology and Environmental Planning between 2005 and 2006, when, looking to integrate the academic/scientific experience to the corporate one, he joined Embrapa Informática Agropecuária as a researcher on Climate Change in Agriculture, where he has been acting as project coordinator and national action plans (2009-2013), Chair of the Steering Committee of Embrapa's Project Portfolio on Climate Change in Agriculture (2012 - current) and Deputy Head of Research and Development (2015-2018). He works with research on climate change and agriculture, focusing on vulnerability analysis, risk monitoring systems and adaptation to climate change, looking to contribute to the implementation of the prioritized targets for agriculture as per the National Adaptation Plan.

### **Ricardo Esparta**

Technical Director and founder of EQAO and, since January 2016, researcher at the Research Center for Gas Innovation (RCGI). Ricardo is a Chemical Engineer and holds a Master's degree in Engineering from the Polytechnic School of the University of São Paulo (USP) and a Doctorate in Energy from the Interunits Program for Post-Graduation in Energy at the same University. In EQAO, in addition to coordinating the technical staff, he is responsible for evaluating investments in renewable energy and energy efficiency, and analyzing the technical and political aspects of the United Nations Framework Convention on Climate Change (UNFCCC). In RCGI, he works with the modeling of the energy sector in the State of São Paulo and Brazil and develops scenarios and proposes policies to limit greenhouse gas emissions at the medium and long terms. Ricardo is a member of the Accreditation Panel and reviewer of the Panel of Methodologies of the Clean Development Mechanism of the UNFCCC. His prior experience is related to research and development in modeling, simulation, optimization and process control at USP and the University of Stuttgart, Germany.

#### Karen M. Nagai

Graduated in Environmental Management from EACH/USP and postgraduated in "Distributed Generation, Renewable Energy and Energy Efficiency" by Poli/ USP. Karen is currently studying Civil Engineering at Anhembi Morumbi. Her professional experience began at EQAO in 2003. At EQAO, Karen participates in the process of technical analysis and development of projects with potential carbon credits, especially those involving renewable energies. In addition, Karen is involved in the development of inventories of greenhouse gases based on the GHG Protocol criteria and ISO 14.064/14.065 and on the development of training courses for the preparation of these inventories. She also works in the preparation of reports on Climate Change to meet the criteria of the World Commission on Dams.

414

#### João Wagner Alves

Mechanical Engineer from FEG – UNESP in 1999, Doctor in Science from IEE – USP in 2017 and Master in Energy from the same institution in 2000. From 1992 to 2018, he was an Engineer at CETESB. As at 2018, he became an Engineer at Petrobrás. He co-authored the Inventory Methods on Estimation of Greenhouse Gas Emission by Solid Waste Management of the IPCC (2000 and 2006), National Estimates of Greenhouse Gas Emission by Waste Management of the First Three National Communications of Brazil, was the technical coordinator and co-author of the first Greenhouse Gas Emission Inventory of the State of São Paulo (2010) and member of the IPCC EFDB from 2017 to 2020.

#### Adnei Andrade

Physicist graduated from the University of São Paulo (1968) and Doctor in Electrical Engineering from the Polytechnic School of the same institution (1989). He has been a Tenured Professor at the Energy and Environment Institute of USP since 2006, where he worked as Deputy Director of the Institute of Electrotechnics and Energy (2007-2010) and Vice-Rector (International Relations) (2010 to 2013).

#### Fábio Marques

Fábio Marques has been working in the area of climate change and sustainability for more than 18 years. He is currently the Director of Plantar Carbon Ltd, a consulting company of the Plantar Group in the area of climate change. Since founding of the company, he has managed the first Clean Development Mechanism project designed in Brazil, in partnership with the World Bank's Prototype Carbon and Biocarbon Funds, including the development of the first methodologies. He has also worked on other CDM projects and has developed several consulting activities in the area for organizations of various segments. He has consistently monitored multilateral negotiations under the United Nations Framework Convention on Climate Change and related national policies for 15 years. He has worked as expert reviewer for the Intergovernmental Panel on Climate Change for the 5th Assessment Report and the Special Report on Renewable Energy. He was a member of several boards, such as the Climate Fund Steering Committee (MMA/BNDES), the Technical Committee of the Mitigation and Adaptation Industry Plan (CTPIn/ MDIC), the Environmental Policy Council of Minas Gerais, and taught post-University graduate classes. Fábio holds a Masters in Development Studies from the London School of Economics and Political Science, holds an Executive MBA in Finance from Ibmec and holds a Bachelor's Degree in International Relations from PUC Minas.

# Mauro Meirelles de Oliveira Santos

Electronic Engineer from IME, post-graduated in Production Management from FGV-SP and Environmental Management from UFRJ, Master in Urban and Environmental Engineering from PUC-Rio. From 2000 to 2018, he was a member of the team in charge of the Brazilian Inventory of Greenhouse Gases; specialist in the Clean Development Mechanism; lead reviewer of Greenhouse Gas Emissions Inventories of Annex I countries to the United Nations Framework Convention on Climate Change (UNFCCC), specialist for the industrial sector.

# Henrique de A. Pereira

Master in Environment and Development from the London School of Economics and Political Science (LSE) and post-graduated in Environmental Technology from the Federal University of Minas Gerais (UFMG). He is a Managing Partner of WayCarbon and develops studies in the areas of public policies and business strategies, with emphasis on the environment and economic development, sustainability and climate change.

# Ernesto Cavasin Neto

Former ABEMC president, he has worked for 10 years in the carbon market, structuring CDM projects, developing corporate strategies for large companies in Brazil and in several countries, such as Colombia, Bolivia, Argentina, Mozambique, among others. He actively participated in the Conferences of the Parties of the United Nations from 2004 to 2013.

# Pedro Sirgado

Executive Manager of Environment and Sustainability at EDP Energias do Brasil, he began his career as Deputy Director General of the Environment of the Government of Portugal and joined the electricity sector in 2005 when he joined the Portuguese Electricity Generation Company in the environmental area. He then moved to EDP Produção where he worked in the areas of Business Development and Organization and Processes. He was Environmental Head of EDP Energest, Executive Manager of Sustainability of EDP Energias do Brasil and Executive Director of the EDP Institute. He holds a degree in Environmental Engineering from the Faculty of Science and Technology of the Universidade Nova de Lisboa and holds an MBA from the Portuguese Catholic University.

# Maria Bernadete Gomes Pereira Sarmiento Gutierrez

She holds a bachelor's degree in Engineering from the Federal University of Rio de Janeiro (1982), a Master's degree in Economics from the Pontifical Catholic University of Rio de Janeiro (1986), a Master's in Philosophy from the University

of Cambridge, a Master's in Economics (1988) and Doctorate in economics from the University College London (1991). She has currently been a researcher at the Institute of Applied Economic Research (Ipea) since 1996, having been a Professor at the Department of Economics of the Fluminense Federal University from 1994 to 2009.

# Habib Jorge Fraxe Neto

416

Bachelor in Biological Sciences and Master in Animal Biology. He worked as an Expert Analyst in Biology at the Federal Prosecution Service and as a Technician for Planning and Research in Environmental Sustainability at Ipea. He is currently a Legislative Advisor (environmental area) at the Federal Senate.

# Hipólito Gadelha Remígio

Bachelor in Accounting Sciences and Law. Master in Accountancy. He was a professor of investigation and audit at the University of Brasília (UnB). Advisor for Budgets and Audit at the Federal Senate, as well as an accounting expert of the Federal Justice.

# **Philipp Hauser**

Philipp holds a Master's Degree in Chemistry from the University of Freiburg, Germany, and a Master's Degree in Business Administration from the Coppead Institute of the Federal University of Rio de Janeiro, Brazil. Today, he acts as Senior Associate for Agora Energiewende and is responsible for developing and promoting solutions and policies for a rational energy transition in power generation, industry and land use. Before, he worked with Engie as Vice-President of Energy Transition and has designed and implemented several innovative business models in the areas of climate change, biodiversity conservation and sustainable development. His experiences include the development of greenhouse gas mitigation projects with the use of various economic instruments such as the Clean Development Mechanism, innovative financing structures and Green Bonds. Philipp is also engaged in the discussion about the development of carbon market policies in emerging countries and is Vice-President of the Project Developer Forum and Senior Advisor to EcoSecurities.

# **Rafael Tonelli Fonseca**

Rafael is graduating in Chemical Engineering from the Rio de Janeiro State University (UERJ). He started his professional activity in 2014 at the Institute of Radiation Protection and Dosimetry (IRD), where he worked on a Scientific Initiation on the dispersion of radionuclides in sediments and their dynamics in the Saco de Piraquara de For a region (in Angra 1 and 2 plants). In 2015, he moved to the Indústrias Nucleares do Brasil (INB), where he worked as an intern in the area of Environmental and Nuclear Licensing with the Mineral Resources Board, assisting in the technical review of reports. Currently, he is an intern in the ENGIE's Climate Strategy and Carbon Markets sector, where he works on topics related to Brazilian and global climate policy. He has experience with the registration of Renewable Energy projects in the Clean Development Mechanism (CDM) established by the UN, Renewable Energy Certificates, Sustainable Development Goals (SDGs) and project financing through Green Bonds.

# Ronaldo Seroa da Motta

Professor of Economics of the Graduate Program in Economic Sciences (PPGCE) of the State University of Rio de Janeiro (UERJ). Doctor in Economics at the University College London. Former Coordinator of Environmental Studies at Ipea/Rio de Janeiro. He was Lead Author (AR3) and Review Editor (AR5) of the UN Intergovernmental Panel on Climate Change (IPCC). He has published several books and scientific articles on environment regulation and economic valuation.

# Aloísio Lopes Pereira de Melo

Graduated in Agricultural Engineering from the Luiz de Queiroz College of Agriculture - University of São Paulo; Master in Development and Agriculture by the Graduation Program in Social Sciences in Development, Society and Agriculture of the Federal Rural University of Rio de Janeiro; member of the Public Policy and Management Officers Career (EPPGG) since 2002, has been working with environment and climate change policies since 2008.

# Beatriz Soares da Silva

Graduated in Economics from the University of the State of Rio de Janeiro (UERJ); Master in Economics from the University of São Paulo (USP) and a Sustainable Development PhD Candidate at the Center for Sustainable Development of the University of Brasília (CDS/UnB); member of the Public Policy and Management Officers Career (EPPGG) since 2002, she has been working in the area of Economics of Climate Change since 2009.

### Ipea – Institute for Applied Economic Research

#### **Press and Communications Office**

#### PUBLISHING DEPARTMENT

**Coordination** Reginaldo da Silva Domingos

**Coordination Assistant** Rafael Augusto Ferreira Cardoso

**Translator** Mariane Arantes Rocha de Oliveira

**Translation proofreader** Enrique Ezequiel Villamil Famiglietti

**Cover design** Herllyson da Silva Souza

The manuscripts in languages other than Portuguese published herein have not been proofread.

Ipea Bookstore SBS – Quadra 1 – Bloco J – Ed. BNDES, Térreo 70076-900 – Brasília – DF – Brazil Tel.: + 55 (61) 2026 5336 Email: livraria@ipea.gov.br

Composed in adobe garamond 11/13.2 (text) Frutiger 67 bold condensed (headings, graphs and tables) Brasília – DF – Brazil

#### **IPEA'S MISSION**

Improve public policies essential to Brazilian development through the production and dissemination of knowledge and counsel to the State in its strategic decisions.





Institute for Applied Economic Research MINISTRY OF ECONOMY INNOVATIONS AND COMMUNICATIONS

