DEVELOPMENT OF THE BRAZILIAN REDD STRATEGY: THE SIMPLIFICATION OF THE DEBATE WHICH PRIORITIZES THE AMAZON BIOME.[1]

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Introduction

The aim of the REDD mechanism – Reduction of Emissions from Deforestation and Degradation – is to provide financial support to initiatives that help to mitigate predicted climate change situations (UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, 2008; VAN DIJK; SAVENIJE, 2009). This mechanism involves the payment for environmental services which reduce greenhouse gas (GHG) emissions related to land use for conservation or production (CAMPBELL, 2009; VAN DIJK; SAVENIJE, 2009). The REDD mechanism was conceived at the United Nations Framework Convention on Climate Change, in order to complement the Kyoto Protocol in an effort to reduce emissions which further increase global temperatures (UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, 2008).

The concept on which this mechanism is based has been evolving to include various land use options (for conservation and production) that are capable of reducing emissions due to deforestation and forest degradation (CAMPBELL, 2009; VAN NOORDWIJK; MINANG, 2009). Three different approaches have been under discussion over the last few years. The first (known as "REDD") is based on forest protection initiatives which reduce emissions generated by forest degradation and deforestation (VAN NOORDWIJK; MINANG, 2009). The second approach (known as "REDD+") includes the reduction of emissions through REDD initiatives and also

the reduction of emissions through the sustainable management of forests (leading to its regeneration) and through the enhancement in forests carbon stocks (VAN NOORDWIJK; MINANG, 2009). The third approach (known as "REDD++") involves, not only the reduction of emissions included in the previous initiatives, but also reductions resulting from any changes in land cover which affect carbon stocks and which may include, for example, sustainable agriculture, agroforestry systems and planted forests (VAN NOORDWIJK; MINANG, 2009).

How the REDD mechanism works and consequently how a national REDD strategy is to be developed are complex issues because they involve different aspects, agents and approaches. The way in which it is going to work has not yet been fully defined and is the object of research in relation to its political aspects (GHAZOUL et al., 2010; OKEREKE; DOOLEY, 2010; PALMER, 2011; TONI, 2011), social aspects (SINGH, 2008; BLOM; SUNDERLAND; MURDIYARSO, 2010; GHAZOUL et al., 2010), environmental aspects (SINGH, 2008; GRAINGER et al., 2009; GHAZOUL et al., 2010) and economic-financial aspects (STRASSBURG et al., 2009; TACCONI, 2009; BÖRNER et al., 2010). Furthermore, the mechanism needs to be approved via an international agreement which involves reconciling the different interests of future signatory countries. Thus, recognizing what a national REDD strategy should best focus on is not an easy task, it requires careful analysis of the environmental and socio-economic context of the host country.

In face of this scenario, the object of this article is to discuss the simplification of the debate relating to the decision to prioritize the Amazon in developing the Brazilian REDD strategy, taking into account that:

1. The chosen strategy must be compatible with the country's sustainable development strategy and therefore must conform to the National Policy for Climate Change (BRASIL, 2009);
2. The concept of sustainable development adopted here follows that suggested by Robinson (2004), which integrates environmental, social and economic aspects and takes into account the interests of communities and agents involved. It should also be the result of discussions and joint learning strategies about the type of world we want to live in both now and in the future;
3. The possible additional social and environmental benefits resulting from REDD actions – the so-called "co-benefits" which arise from these actions though they are not their main objective (UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, 2008) – are important for producing a national REDD strategy, since they can lead to the optimization of implementation results and contribute towards the sustainable development of the country.
4. It is more likely that the REDD mechanism works as a national strategy – and not as a project – in which the country commits itself to reduce emissions and therefore, the makeup of the REDD strategy is decided by the country itself (SKUTSCH; BA, 2010; TONI, 2011). That is, Brazil needs to decide

on a REDD strategy that is best for the country and not only for the Amazon biome.

Taking these issues into account, this article is divided in four parts. The first describes and criticises the simplistic focus of the current process of developing the Brazilian REDD strategy which prioritizes the Amazon biome. There follows some analyses about the different priorities of REDD strategies and a chart that synthesizes the possible impacts of these different priorities for the sustainable development of host countries. The objective of this second part is to show that there are different possible priorities for REDD strategies which have already been analyzed in the literature and that their lessons should be taken into account when developing a national REDD strategy. It also reveals that there is no intrinsically ideal priority and therefore it is important to assess the possible results from alternative elements for each REDD strategy before deciding on its design. Then there follows a discussion about how a national REDD strategy geared towards sustainable development in Brazil should be drafted. Based on these discussions, the last part concludes with recommendations for developing a Brazilian REDD strategy which reconciles the reduction of GHG emissions with the promotion of sustainable development, not only for the Amazon biome, but for Brazil as a whole.

Developing a brazilian REDD strategy: focusing on the Amazon biome

The Brazilian government is developing a national REDD strategy based on discussions with stakeholders and the results of three working groups: *Coordenação, Arranjos Institucionais e Participação* [Coordination, Institutional Arrangements and Participation]; *Distribuição de Benefícios, Dominialidade e Salvaguardas* [Benefit Distribution, Domaniality and Safeguards]; and *Fontes de Recursos e Mecanismos Financeiros* [Sources of Resources and Funding Mechanisms] (MINISTÉRIO DO MEIO AMBIENTE, 2011). Up to now, the strategy being produced prioritizes actions in the Amazon and in the *Cerrado* [Brazilian Savannah] biomes, though it is clear that the Amazon biome is the main target of the strategy being produced. This reflects the greater focus on the potential this biome has for REDD initiatives within the Brazilian political context and the predominance of the Amazon in the Brazilian media when REDD is being discussed (MAY; CALIXTO; GEBARA, 2011).

This is understandable, given that the deforestation of the Amazon is responsible for over 50% of total deforestation emissions in Brazil and this biome still has over 80% of its forests preserved. Furthermore, the Amazon shelters the largest remaining area of continuous tropical forest in the world (CENTRO DE GESTÃO E ESTUDOS ESTRATÉGICOS,[Centre for Management and Strategic Studies] 2011) and therefore, within global terms, its carbon stocks are significant. Indeed, it is these characteristics of the Amazon that place Brazil in a priority position for receiving REDD funds, together with countries such as Indonesia and the Democratic Republic of Congo (PHELPS et

al., 2010). Thus, it is natural and necessary that when thinking about a REDD strategy for Brazil, actions for reducing deforestation and degradation emissions for the Amazon immediately come to mind.

Despite the fact that there is no doubt that the Amazon is a priority within the REDD strategy for Brazil, this does not mean that other Brazilian biomes do not have the potential to play an important role within this strategy. The Caatinga (Brazilian semiarid) biome is a case in point. In 2009, the Caatinga biome contained approximately 53% of its native vegetation (INSTITUTO BRASILEIRO DO MEIO AMBIENTE E DOS RECURSOS NATURAIS RENOVÁVEIS, 2011). This vegetation yields significant forestry production (timber and non-timber). The Caatinga non-timber production encompasses approximately 500 enterprises distributed in 250 municipalities. Apicultural production is particularly significant (61% of enterprises) (PAREYN, 2010). Timber production from the Caatinga biome services the need for charcoal and firewood (in particular in the ceramic, steel and plaster industries), and it uses 20 million stere[3] of timber per year (RIEGELHAUPT; PAREYN, 2010) However, only approximately 6% of this demand comes from sustainable sources (through the management of sustainable forest monitored by the appropriate environmental body). Most of this demand is met by timber originating from deforestation (RIEGELHAUPT; PAREYN, 2010). In rural (agrarian reform) settlements, however, sustainable forest management is practiced and is an important source of alternative income for the population during the dry season (RIEGELHAUPT; PAREYN, 2010). Both the high risk of deforestation in large preserved areas and the confirmed potential for sustainable management means that the Caatinga biome has great potential for actions which promote the reduction of emissions through deforestation and forest degradation and associated environmental and socio-economic benefits.

This example shows that a national REDD strategy focusing solely on the Amazon may not take full advantage of the potential Brazil has for reducing emissions and promoting sustainable development. It also shows that, clearly, the Brazilian REDD strategy developed does not take into account important issues considered by the REDD literature (as shown in Chart 1), given that: 1) it neglects the role of dry forests in increasing carbon stocks in degraded areas; 2) it disregards the beneficial potential dry forests have for supplying forestry products under sustainable management conditions (without converting the forest for other uses); 3) it neglects opportunities to contribute to the conservation of the biological diversity of dry forests.

THE PROBLEM: What should be the main focus of a REDD strategy for sustainable development in Brazil?

The literature review about REDD presented in this article shows that different priorities for REDD strategies can have different impacts on the sustainable development of host countries. The articles reviewed here refer to analyses of the main priorities considered by REDD strategies. Chart 1 synthesizes the results of these analyses in order to show that there is no intrinsically ideal priority for REDD strategies. That is, it is important to assess possible results from alternative elements for each REDD strategy before deciding on its design. The issue of what REDD strategy should

be adopted by the Brazilian government relates to the decision about the makeup of the strategy to promote relevant socio-environmental benefits for real sustainable development. In order to do this, REDD mechanism financial resources should fund a mix of activities which results in the reduction of GHG emissions and also contribute to dealing with the challenges related to environmental conservation and the socio-economic development of the country.

Ghazoul et al. (2010) and Caplow et al. (2011) analyzed the impacts of implementing REDD initiatives based on the non-exploitation of native forests. The authors emphasized that despite socio-environmental benefits (Chart 1) there are probable indirect social, economic and political impacts which are not always included when the amount paid to compensate the non-exploitation of native forests is calculated. Examples of these impacts are: unemployment in industries associated to forestry products which are no longer exploited (for example, processing of timber forestry products); the consequent lack of opportunities in regional economic growth; and a stimulus to migration to urban areas (GHAZOUL et al., 2010). The combined impact of these actions is reflected in less government investment in infrastructure, leading to a chronic situation of underdevelopment (GHAZOUL et al., 2010). Ghazoul et al. (2010) argue for the sustainable management of forests, highlighting its advantages compared to the non-exploitation of native forests in relation to environmental, social, economic and political impacts (Chart 1).

There are some analyses of REDD strategies focusing on prioritizing the conservation of forests with high rates of deforestation and larger carbon stocks (e.g. GRAINGER et al., 2009). According to these analyses, some forests important for the conservation of biodiversity with low rates of deforestation and/or low levels of carbon stocks are secondary in terms of their protection via the REDD mechanism. Thus, opportunities are missed for preserving forests with significant biodiversity – which are essential for the adaptation of the ecosystem to climate changes – regardless of their rates of deforestation and carbon stocks (GRAINGER et al., 2009). They include dry forests[4] which have the potential for participating in REDD strategies because, despite presenting lower levels of carbon stocks[5] compared to rainforests, they are more populated and are therefore more subject to pressures resulting in forest degradation (MURPHY; LUGO, 1986; SKUTSCH; BA, 2010).

Singh (2008) analyzed the potential of activities which increase carbon stocks in degraded forests managed by rural communities in generating benefits within a REDD strategy. He identifies a number of additional benefits when this strategy is adopted (Chart 1): environmental benefits (e.g. - the recovery of forest density and cover, protection of refuges for the fauna and flora and the promotion of connectivity between forest fragments); socio-economic benefits (the maintenance of agricultural productivity, supply of non-timber forest products (NTFP), the creation of rural assets and the generation of jobs related to planting seedlings); and political benefits (strengthening of governmental programs for the protection and management of forests and reducing the impacts of increased energy demand in developing countries). These benefits show that activities for recovering degraded forest areas have the potential to

play a part in REDD strategies, since they promote an increase in forest carbon stocks and improve the quality of life of rural communities.

Skutsch and Ba (2010) analyzed the potential of rural communities to sustainably manage dry forests as an element of REDD strategies. The authors observed that, in general, the forests analyzed increased their carbon stocks when managed so as to restore their productive potential and maintain the subsistence of rural communities. They stressed that the potential of dry forests in REDD strategies is based on their capacity to increase carbon stocks in degraded areas where regeneration is still possible. They highlighted the importance of measures to prevent migration of degrading forest activities (carbon leakage[6]), such as promoting alternatives to income generation in order to substitute the predatory exploitation which occurred before forest management was introduced. The inclusion of this type of management in REDD strategies would thus bring extra benefits to rural communities involved, as well as increase government funding capacity to implement actions in support of sustainable forest management (Chart 1).

Hayes and Persha (2010) also analyzed the possible impacts of including sustainable community forest management in REDD strategies (Chart 1). According to these authors, the inclusion of sustainable community forest management in REDD strategies could promote effective forest conservation, as rules are developed and monitored by and for the community, therefore they tend to be better implemented and respected than when applied by forest authorities. Despite these benefits,Hayes and Persha point to the fact that this may cause the unfair distribution of benefits among community members. the authors highlight that, in the case analysed, it is possible that there was inequitable distribution of benefits among the members of the community. This demonstrates that the issue of equitable distribution of benefits needs to be very well defined so as to ensure that more influential and powerful members do not benefit more than others.

Likewise, Cronkleton, Bray and Medina (2011) analyzed the potential impacts of including community forest management within REDD strategies. They also pointed to benefits such as the conservation of forest landscape, diversifying income for rural communities and ensuring the access and use of forest resources (Chart 1). However, they warned that the success of this type of management depends on complying with certain conditions. According to the authors, the main ones would be: 1) Ensuring property rights of forest resources to communities involved in their management and 2) the presence of strong governance adapted to the local context and linked to various levels to stimulate sustainable development. Otherwise, community forest management can lead to forest degradation instead of conservation (CRONKLETON; BRAY; MEDINA, 2011).

Some analyses refer to the effectiveness of forest conservation promoted by establishing protection areas within a regime of shared management between communities and the government. These analyses are useful in order to observe how the inclusion of this type of forest conservation in REDD strategies can contribute to the conservation of forests in a particular country. Oestreicher et al. (2009) show that areas protected under this regime are important for the effective conservation of forests

because they take into account the needs of local communities, including the promotion of alternative means of income generation and the provision of basic infrastructure. These are important in order to prevent deforestation or minimize its migration to other forest areas due to the creation of protected regions (OESTREICHER et al., 2009). Hayes and Persha (2010), on the other hand, have noted disadvantages in the system of co-management of protected areas, such as the continuity of illegal timber exploitation due to corruption and the inefficacy of forest monitoring for the application of management rules. Therefore, it is not enough to establish protected areas to ensure forest conservation. It is necessary to take into account the context in which they are set up to define which factors hinder the effectiveness of conservation, so that REDD mechanism resources can assist in overcoming them and thus contribute effectively towards the conservation of forests (OESTREICHER et al., 2009).

Van Noordwijk et al. (2010) analyzed the potential of REDD strategies which included all land cover changes impacting on carbon stocks. The analysis of GHG emissions dynamics in the landscape observed in four case studies highlighted the contribution of different land uses in order to produce an effective REDD strategy. Among the types of land uses which could potentially reduce GHG emissions in the landscapes analysed, there were agro-forestry systems, the inclusion of trees in the landscape and the management of peatland – land uses associated to maintaining the livelihood of rural communities (VAN NOORDWIJK et al., 2010). The authors proposed that the mechanism for reducing emissions due to deforestation and degradation should move towards reducing global emissions, taking into account reductions related to agriculture, the management of peatland and increases in carbon stocks in trees and soils both within and outside forests. The authors cite the following extra benefits of including all types of land uses within REDD strategies: Van Noordwijk et al. cite the following as additional benefits resulting from the inclusion of different uses of soil within the REDD strategy: an increase in resilience to climate change, promotion of rural development with high carbon stocks, respect to access to natural resources and a contribution towards reducing poverty.

Therefore, there is no ideal activity which should make up a national REDD strategy. This strategy needs to be produced analyzing activities which may potentially have environmental, social, economic and political impacts so the strategy is defined to effectively meet the target of reducing GHG emissions and contribute towards the sustainable development of each country. This means calculating the actual implementation costs and the additional socio-environmental benefits of potential activities which can make up REDD strategies, in order to carry out necessary adjustments so as to minimize negative impacts (environmental, social, economic and political) and maximize benefits.

Thus, data in Chart 1 show the need to diversify land use activities to be part of a national REDD strategy. This is because, even if some activities seem ideal in terms of being part of a REDD strategy – such as those based on the non-exploitation of forests – they can have an undesirable impact on the sustainable development of a particular country. Therefore, data presented in Chart 1 show that exclusively focusing

on a particular type of forest is not ideal, since it may lead to neglecting the importance of other types of forests for the reduction of GHG emissions from deforestation and forest degradation. The task of dealing with the concerns raised in the literature and analyzing the pros and cons of various potential activities will fall on those responsible for developing the Brazilian REDD strategy and establishing the best strategy for Brazil.

Chart 1 – Possible impacts of the main priorities of REDD strategies on the sustainable development of host countries, based on literature analysis.

REDD Strategy Priority	REDD Approach	Positive impacts	Negative impacts	Reference
Protection of native forest (non-exploitation[1])	REDD	Maintenance of carbon stocks; conservation of biodiversity; provision of ecosystemic services; development of economic activities related to environmental conservation; reduction of illnesses related to deforestation; reduction of conflicts arising from negative impacts of deforestation.	Unemployment in industries associated to original forest production; restricted opportunities for regional economic growth; stimulus to migration to urban areas	Ghazoul et al. (2010)
	REDD	Maintenance/increase of carbon stocks; reduction of threats to protected areas; encouraging biodiversity conservation; access to credit for projects developing economic activities related to the conservation of protected areas (e.g. ecotourism, agro-forestry systems, non-timber forest production); employment creation in relation to area monitoring (park rangers); infrastructure building; provision of training, education and health services; land tenure regulation; compensation for population affected by consolidation of protected area; improved social organization; provision of ecotourism infrastructure; creation of nurseries with seedlings useful for the community (e.g. fruit trees, nitrogen-fixing trees); improved income for families involved in strategy; maintenance of use of forest resources for subsistence activities.	Default (on credit for projects implementing economic activities related to conservation of a protected area); unemployment in sectors associated to original forest production (sawmills); unequal distribution of benefits between local residents (the most powerful benefit most); loss of (private) health care services; few land use alternatives; few employment generation alternatives; generation of low wage and undesirable jobs; local population resistance to conservation rules and management of natural resources in protected areas; illegal use of natural resources in protected areas; lack of road maintenance (where previously maintained by sawmills); low economic performance of activities linked to the conservation of the protected area (e.g. ecotourism, agro-forestry systems and non-timber forest production); carbon leakage (increase in deforestation outside protected area); population excluded from strategy implementation stage; affected population unsatisfied in relation to results which impact on their livelihood (insufficient compensation); lack of continuity of resources for sustaining social support to community affected by this strategy; exclusion of women from communities affected by the strategy.	Caplow et al. (2011)
Sustainable forest management	REDD+	Limits to agricultural expansion; maintenance and strengthening of timber industry; multiple forest use (non-timber forest production, ecotourism); economic diversification (service sectors linked to multiple forest use); possibility of participating in PES schemes[2].	-	Ghazoul et al. (2010)
Prioritizing protection of forests with high deforestation rates and larger carbon stocks	REDD	-	Forests with significant biodiversity remain vulnerable	Grainger et al. (2009)
Recovery of degraded forests managed by rural communities	REDD+	Sustaining and strengthening livelihoods of rural communities (provision of NTFP, maintenance of agricultural productivity, flood prevention) deforestation prevention; recovery of forest cover and density; increase in carbon stocks; creation of rural assets; job creation related to planting seedlings in degraded forests; strengthening of government programs of forest protection and management; conservation of biodiversity; reduction of impacts from the increase in energy demand in developing countries; protection of fauna and flora refuges; promotion of connectivity (corridors) between forest fragments; forest fires prevention and control.	-	Singh (2008)
Creation of protected areas under co-management community-government	REDD	Promoting income alternatives; building of basic infrastructure for local communities; reducing the likelihood of deforestation migration to other areas of non-protected forests; support to government forest conservation programs (via REDD funding).	-	Oestreicher et al. (2009)
	REDD+	-	Vulnerability to external timber exploiting pressures (corruption); inefficiency in application of management regulations.	Hayes and Persha (2010)

Community-run forest management	REDD+	More effective forest conservation; maintenance of forest products provision for residents of protected area; increase in connectivity between forests; limits to the expansion of agricultural use in protected area.	Unequal distribution of benefits between local residents (most powerful benefit most)	Hayes and Persha (2010)
	REDD+	Increase in carbon stocks; recovery of productive potential of degraded areas; diversification of makeup of total income (collection of non-timber forest products for subsistence and trading, introduction of agriculture); possibility of improving monetary income (through payment for activities related to forest management - forest inventory); incentives for sustainable forest management (government investment and interest on the part of the population due to payment of carbon credits).	Migration of forest degradation activities (carbon leakage) to neighbouring unmanaged forests.	Skutsch and Ba (2010)
	REDD+	Conservation of forest landscape; economic benefits to local community (job and income creation); diversification of income (ecotourism, water bottling and PES programs); more equal distribution of benefits; democratization of natural assets; rural communities ensured right of access and use of forest resources; provision of forest products for subsistence and trading (NTFP and timber for sawmills); setting up of forest community sector.	Difficulties in integrating rural communities in formally managing forests so as to produce timber for sawmills whilst respecting legislation in force (insufficient technical, financial and administrative capacity); maintenance of clandestine forest management with low prices for timber produced; risk of forest degradation due to lack of legal alternative to regulate the use of forest resources; little transparency in decision-making due to lack of expertise on the part of decision-makers in coordinating actions with various rural communities involved in running large areas.	Cronkleton, Bray and Medina (2011)
Different types of land use in landscape (agriculture, trees both inside and outside forest and management of peatland)	REDD++	Fire prevention and control; increase in resilience to climate change; promotion of rural development with high levels of carbon stocks; access to natural resources; assistance in reducing poverty (job creation relating to fire prevention and control activities); improved health (due to fire prevention and control); support in planting useful trees and agro-forestry systems for the use of rural communities.	-	Van Noordwijk et al. (2010)

1   Refers to exploitation relating to the industry, agriculture or other activity which stimulates a change conversion of the forest.

2   PES: Payment for Environmental Services.

Sustainable developmen in Brazil

Sustainable development in Brazil depends on the implementation of different actions within an environmental, social and economic dimension. A national REDD strategy may be a source of resources to promote some of these actions. Indeed, the link between sustainable development and REDD strategies is clear within Brazilian legislation and international agreements relating to climate change. Therefore, the National Policy for Climate Change highlights that actions to mitigate climate change should lead to economic growth, the eradication of poverty and a reduction in social inequalities (BRASIL, 2009). These are the challenges for sustainable development in Brazil. Likewise, the Bali Action Plan[9] points to the need to consider the social and economic consequences of actions to mitigate climate change so that they are in line with the context of sustainable development in host countries (UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, 2008).

Conciliating REDD actions with promoting sustainable development in Brazil can be considered in different ways. Examples of this sort of action are activities which contribute to the conservation of Brazilian biomes, sustainable forest production and sustainable agriculture, as well as the recovery of degraded areas. Actions related to the conservation of biomes, such as the expansion of Conservation Unit areas (CUs)

would protect biome forests against deforestation and degradation and preserve genetic heritage. These actions would not only benefit the climate of the planet (global benefit) but also the quality of life of the Brazilian population (local benefit) through the provision of environmental services.

Activities related to sustainable forest production and sustainable agriculture such as the creation of fiscal incentives and payment systems for environmental services related to their implementation could assist with the development of economic activities and reduce forest degradation and GHG emissions. They would also benefit both the global climate and quality of life in Brazil by providing both timber from renewable sources and healthier food, conciliating both quality of life and economic development.

Activities for recovering degraded areas, such as restoring forests for conservation or production purposes, would increase carbon stocks and provide environmental services. Here there are also benefits for the global climate and for quality of life in Brazil, using the potential of both direct and indirect forest resources, including the development of economic activities. As previously discussed, it is important to take into account the possible impacts of potential actions which could make up the REDD strategy so that they can reach their objectives in the most effective way in order to both reduce emissions and attain sustainable development in Brazil.

Actions mentioned in previous paragraphs can be carried out in all Brazilian biomes, not only in the Amazon. Therefore, in order to produce a strategy that meets all expected objectives, decision-makers should carry out an in-depth revision of the immediate potential each Brazilian biome presents, so as to maximize the reduction of emissions and promote activities to support sustainable development. It is not necessary to establish in which biome to invest, nor is it necessary to promote competition for financial resources between the different biomes. It is however important to make use of the immediate potential each biome has to maximise GHG emissions reductions, and thus treat REDD as a national issue and not restrict it to the Amazon biome. For example, with regard to the Caatinga biome, its most important contribution to the Brazilian REDD strategy relates to its immediate potential to expand the adoption of sustainable forest management to supply the demand for the region's firewood. This is because the demand already exists and is currently being met by wood that comes from deforestation. Sustainable forest management promotes the continuous generation of forest products with no land-use change (the area continues to be forest). Moreover, it is a source of alternative income for the local population.

Another example of an important biome for the Brazilian REDD strategy is the Atlantic Forest; despite the fact that its rate of deforestation is comparatively lower than that of the Amazon, any rate of deforestation in this biome is considered a threat since only 7.9% of original forest remains. The Atlantic Forest is considered a biodiversity hotspot[10] (MYERS et al., 2000; MAY; CALIXTO; GEBARA, 2011). Therefore, actions to support forest recovery and the preservation of the remaining forest are part of the immediate potential this biome has to contribute to the Brazilian REDD strategy. The inclusion of these actions within the strategy also means a significant contribution to preserving the biodiversity of the biome by establishing wildlife corridors and expanding habitats.

It is certainly the case that all Brazilian biomes have immediate potential in contributing to the Brazilian REDD strategy. It therefore is clear that during the development process of the Brazilian strategy it is vital to analyse the role of different biomes and consider their potential as part of the strategy. A detailed analysis has become even more important since Brazil signalled, during the Conference of the Parties (COP-17) of the United Nations Framework Convention on Climate Change, its commitment to comply with the compulsory targets for reducing GHG emissions for the period post-2020 (BARBOSA, 2011).

Conclusions

Establishing a national REDD strategy is a complex process and requires detailed consideration of likely impacts in terms of the sustainable development of host countries, particularly given the size and diversity of a country like Brazil. Therefore, it is necessary to conduct a comprehensive review of the potential of Brazilian biomes, both in terms of reducing emissions and in relation to additional socio-environmental benefits. Only after an in-depth analysis will the Brazilian government be able to develop a strategy about which activities should be included, what REDD approaches it should consider and the targets for each Brazilian biome. In this way, the Brazilian government will avoid falling into the trap of not being aware of and not exploiting the full potential of all its biomes in terms of formulating a National REDD strategy so as to comply with its future emissions reduction targets.

Notes

[3] A stere is a cubic metre of stacked timber, which in the case of the Caatinga biome is equivalent to approximately 0.3 m³ of timber. (RIEGELHAUPT; PAREYN, 2010).

[4] Dry forests sites studied present an annual precipitation of between 600 and 1800 mm (distributed between four and nine months), a ratio between evapotranspiration and precipitation greater than one or two dry seasons (MURPHY; LUGO, 1986).

[5] The environmental conditions characteristic of areas with dry forests ensure that these forests are smaller in size, less complex structurally and in terms of their flora and have a lower biomass in comparison with rainforests (MURPHY; LUGO, 1986).

[6] This is the risk of displacing carbon emissions due to the deforestation which used to occur within the area which is now protected by REDD and has migrated to an area of forest that is not protected (AGRAWAL; NEPSTAD; CHHATRE, 2011).

[9] The Bali Action Plan is one of the decisions which resulted from the 13th Conference of Parties at the United Nations Framework Convention on Climate Change (UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, 2008).

[10] Biodiversity hotspots are areas with an exceptional number of endemic species and large loss of habitat (MYERS

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DEVELOPMENT OF THE BRAZILIAN REDD STRATEGY: THE SIMPLIFICATION OF THE DEBATE WHICH PRIORITIZES THE AMAZON BIOME.[1]

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Resumo: Este artigo discute a simplificação do debate relacionado à tomada de decisão de se priorizar a Amazônia na construção da estratégia brasileira de REDD – mecanismo que visa a apoiar financeiramente iniciativas de mitigação das mudanças climáticas. Com base em análises de diversos enfoques para uma estratégia de REDD, critica-se o enfoque da atual construção da estratégia brasileira de REDD que privilegia a Amazônia. Ressalta-se que essa construção não aproveita o potencial imediato dos biomas brasileiros para construir uma estratégia brasileira de REDD que concilie redução de emissões e o desenvolvimento sustentável do Brasil. Recomenda-se que os tomadores de decisão façam uma revisão sobre o potencial imediato de cada bioma brasileiro para colaborar com os objetivos da estratégia brasileira de REDD, antes de se definir o desenho dessa estratégia.

Palavras-chaves: REDD, desenvolvimento sustentável, mudanças climáticas, biomas, Amazônia.

Abstract: This article discusses the simplification of the debate related to decisions which prioritize the Amazon biome when building the Brazilian REDD strategy – a mechanism to fund climate change mitigation initiatives. Based on an analysis of different priorities for a REDD strategy, the article criticizes the present process of developing the Brazilian REDD strategy which focuses on the Amazon. The article highlights that the strategy does not take into account the current potential of each Brazilian biome in developing a national strategy which conciliates emissions reductions and the sustainable development of Brazil. It is recommended that, before defining the design of the strategy, decision-makers study the current potential of each Brazilian biome in contributing to the goals of the Brazilian REDD strategy.

Keywords: REDD, sustainable development, climate change, biomes, Amazon.

Resumen: Este artículo discute la simplificación del debate relacionado a la tomada de decisión de instituir la Amazonia como prioridad en la construcción de la estrategia brasileña de REDD – mecanismo que pretende apoyar financieramente iniciativas de mitigación del cambio climático. Fundamentado en análisis de diversas perspectivas para una estrategia de REDD, criticase la perspectiva actual de la construcción de la estrategia brasileña de REDD que privilegia la Amazonia. Destacase que esa construcción desperdicia la capacidad inmediata de los biomas brasileños para construir una estrategia brasileña de REDD que concilie reducción de emisiones y desarrollo sostenible de Brasil. Recomendase que los tomadores de decisión revisen la capacidad inmediata de cada bioma brasileño para colaborar con los objetivos de la estrategia brasileña de REDD, antes de definir su diseño.

Palabras clave: REDD, desarrollo sostenible, cambio climático, biomas, Amazonia.