

Environmental Reserve Units (CRA)



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EXECUTIVE SUMMARY

The study aims to contribute to the discussion about the opportunities and limits whereby Environmental Reserve Units (CRAs)* can be construed as negotiable securities for offer to the public, attracting the interest of investors not directly or operationally interested in offsetting Legal Reserve deficits.

Several international experiments are presented involving the development of markets for environmental purposes, but it is recommended doing subsequent additional in-depth studies, so that the lessons learned in those other markets can provide inputs for the process of reflecting on the public policies involving this issue in Brazil.

Historically in Brazil, reconciling agribusiness activity with an increase in vegetation cover has been an economic challenge. There is a need to develop financial mechanisms that enable these two agendas to converge, in addition to taking environmental aspects into account in price formation mechanisms. CRAs represent a prime opportunity for attracting large-scale private capital to agribusiness, as well as for the Brazilian forestry and ecosystem services agenda. Other countries have advanced in agendas with similar challenges, engaging the financial markets as partners.

WHAT IS A CRA?

The New Forest Code, as version of the Forest Code revised by Law 12.651 of May 25, 2012, brought several innovations. These include the creation of the **Rural Environmental Register (CAR)**, the program for supporting and encouraging the conservation and recovery of the environment, as well as instituting the **Environmental Reserve Unit (CRA)**.

The CRA has been established as one of the mechanisms provided for in the NFC (article 44) for encouraging the preservation and conservation of ecosystems. It is a nominative security representing an area of native vegetation that already exists or is under recuperation, and it replaces the Forest Reserve Units (CRF) issued under the terms of Law 4.771/1965. CRAs are issued by the National System for the Environment – Sisnama, and must be registered beforehand with the Rural Environmental Register (CAR).

Thus, CRAs are instruments that enable the owner of rural property to offset the Legal Reserve area. Where the owner does not have a LR area, in accordance with the NFC, article 66 thereof stipulates that owners of rural property, who on July 22, 2008 had a Legal Reserve area smaller than that envisaged in the law, could regularize their Legal Reserve (LR) status in three ways: reconstitute the LR, allow the vegetation in the LR area to grow back naturally or offset the LR.

The NFC provides for four possibilities for offsetting the LR: **i)** acquisition of CRAs; **ii)** leasing the area under the environmental servitude system; **iii)** donation to the local government of areas located within Conservation Units in the public domain, where rural regularization is pending; or **iv)** registration of another equivalent area surplus to the LR on property with the same ownership, or acquired on third-party property, where native vegetation is regenerating or recovering, provided it is located in the same biome and state.

The areas used for offset must be equivalent in size to the LR area to be offset, be in the same biome as the LR area to be offset and, if they are located outside the State, they must be in areas identified as priority by the Brazilian government and by the states.

*CRA refers to the initials in portuguese

As provided for in the NFC, the CRA is an instrument that makes it possible to offset LR. It was designed as a bilateral transaction to be undertaken between the owner with a surplus of LR and the one who has a deficit.

Aspects assessed when analyzing the feasibility of CRAs as negotiable assets

Supply and demand: Perhaps the greatest challenge to studying the viability of CRAs becoming negotiable assets is to estimate the potential demand and supply in this market under two scenarios: i) in the scenario where CRAs merely serve to offset Legal Reserve areas (environmental regularization); and ii) CRAs as a subject of interest to investors, as negotiable securities, thereby exceeding environmental offset. Given the scarcity of data, only first scenario is dealt with.

The Environmental Services Management Laboratory and the Remote Sensing Center of the Federal University of Minas Gerais (UFMG) carried out a study into the economic viability of the potential market for Environmental Reserve Units (CRA) in Brazil. The study estimated that, in the manner provided for in the NFC there would be an oversupply of CRAs, namely a total probable offer of CRAs in Brazil of 103.1 million hectares, for a probable demand of 4.6 million hectares. In other words, on a nationwide basis, supply would outstrip demand 22-fold. It should be pointed out the supply and demand scenarios will become clearer once the period for registering rural properties on the Rural Environmental Register (CAR) has ended.

Elements that will influence the price: Besides the behavior of supply and demand, the price of CRAs (as environmental regularization mechanisms) will be influenced by: i) the opportunity cost of the land (comparing the options for using the land, for example, preserving the surplus LR or clearing it for farming) and the market value of the land; ii) the cost of the other options contemplated in the NFC for offsetting the LR areas; iii) the cost incurred by the party offering the CRA in maintaining the surplus LR area that gave rise to the security protected. The UFMG study referred to this as the “cost of ring-fencing”; iv) transaction costs, since issuing CRAs and offsetting LR deficits using CRAs is a complex process involving several players; v) the time scale of the effectiveness period of the contracts.

Features of the negotiable securities: Negotiable securities aim to finance, in a pulverized manner, private investments and by their nature they are collective investment agreements. To tap into collective savings (when offered on public markets), the State has an important role in ensuring equitable treatment among all players involved (suppliers, demanders, custodians, intermediaries and regulators), in addition to ensuring that true information is available to the players, especially that provided by the issuer of the securities. The aim of the State is to curtail situations that might lead to price manipulation by issuers or any other situations that might bar the participant players from access to true and immediate information (which must be made available within the appropriate time frame so that the players can factor it into their decision-making process). The CVM aims to ensure that the savings of the general public are protected¹.

Investments in negotiable securities for public offering have the following characteristics^{2 3}:

- They normally contribute in cash (or monetarily assessable assets) so as to obtain part, proportionately to the investment made, of any earnings from the subject project of the investment;
- The project is managed by third parties with or without participation by the investor in the management;
- A negotiable security presupposes the expectation of gain, unlike purchases for consumption. The profit will appear in cash or assets with a cash value (interest, dividends or any other gain representing a real increase over the capital initially invested); the expectation of gain is one of the core features of a negotiable security. The return must derive from the effort of the entrepreneur or third parties, never from the investor;
- The investor bears the financial risk, which may result in partial or total loss of the

¹ (Mattos Filho, *Direito dos Valores Mobiliários*, 2015)

² (Mattos Filho, *Direito dos Valores Mobiliários*, 2015); (Mattos Filho, *O conceito de valor mobiliário*, 1985)

³ (Comissão de Valores Mobiliários, CVM, 2003)

amount invested. On the other hand, the risks involved in the fate of the project must be extensively disclosed with total transparency, so that the investors can assess the risks involved;

- They are securities or collective investment agreements that must create participative rights, partnership or remuneration in the business or the collective enterprise;
- The offering must be public, with the price established by market forces. There is, therefore, an appeal to public savings.

The CVM has manifested its opinion in two cases involving topics linked to socioenvironmental issues. The first case, in 2003, involves an opinion by the CVM in response to an enquiry from the Prefecture of the City of São Paulo regarding the characterization of CEPACs - Certificates of Additional Construction Potential in the City of São Paulo - as negotiable securities. The second case, in 2009, involved the characterization of RCEs - Certified Emission Reductions, commonly known as “carbon credits”, being considered as negotiable securities.

In the CVM's opinion, CEPACs were considered negotiable securities whose supervision lay within the remit of the CVM on account of three fundamental characteristics: they are publicly tradable; they are investment agreements and the investor expects to make a return. In the opinion of the CVM, RCEs were not considered negotiable securities because: **i)** they were not considered to be derivatives, since the carbon credits are the subject assets themselves (there are no underlying assets); and **(ii)** they were not considered collective investments.

RESULTS

Bearing in mind that CRAs are recent instruments of Brazilian environmental policy still in the early stages, the feasibility of their becoming negotiable securities under the current terms of the New Forest Code is diminished.

The challenges for CRAs (or their derivatives) to become negotiable securities are more than just a handful. They include the design of an economic and financial model capable of attracting investors, while reconciling economic and socioenvironmental objectives. But perhaps the most important involves openness towards society regarding the enforcement and implementation of the New Brazilian Forest Code, defining and extensively disclosing the next steps while pushing ahead with the sanctions and penalties established in law for those in breach of it. This is a material aspect, since it directly affects the supply and demand for those securities.

Even if CRAs could be construed as negotiable securities, it should be pointed out that they would have to be financially attractive for investors. Thus it would be essential for investors to have at their disposal all available information for calculating their risk-return expectations. In addition to these points, the following essential elements must be emphasized: i) the return on the securities must be attractive when compared to investments with similar risk; ii) there must be liquidity, that is, a sufficient number of players and transactions for the market to remain competitive and so that investors can liquidate or swap position; iii) there must be a secondary market so that investors can offload positions; iv) the transaction costs must not prejudice market development; v) ownership rights must be clearly defined and there must be legal certainty; vi) the securities must have underlying transactions that can be reliably and viably monitored without substantially increasing transaction costs.

On the eve of the COP21 in Paris - at which the issue of carbon pricing will be at the center of the international discussions - and bearing in mind the importance of the forests and agribusiness for Brazil, CRAs have become an item of relevance on the Brazilian government's agenda, with the potential for contributing to the country's future economic development of Brazil.

PRESENTATION

In 2014, FEBRABAN and GVces agreed to a partnership to analyze possible ways forward for leveraging the transition to a Green Economy in Brazil, through the Brazilian Banking Sector.

The outcome of this partnership was the publication, in April 2015, of a book that presented the results of three supplementary studies on the issue: the volume of funds allocated by the financial industry to the “Green Economy” as of 12/31/2013, the institutional and regulatory framework for the Brazilian Banking Sector regarding this issue, and the relationship between finance and sustainability in two sectors and on two economic issues: agribusiness, renewable energy, biodiversity and cities.

Continuing the partnership between FEBRABAN and GVces, this study aims to contribute to the discussion about the opportunities and limits whereby Environmental Reserve Units (CRAs) can be construed as negotiable securities, for offer to the public, attracting the interest of investors not directly or operationally interested in offsetting Legal Reserve deficits. The potential benefits from developing a CRA-linked securities market are: i) expanding the base of those interested in the maintenance, recuperation and growth of LR areas, fostering higher demand and supply for these securities, making forestry assets a subject of interest to a wider universe of individuals, over and above landowners; ii) attracting investors seeking to invest in the maintenance and growth of Brazilian forestry assets and who currently lack the structures for going about this, as well as the legal certainty for doing so; iii) sharing with the capital markets the risks of forestry assets appreciating or depreciating – the risk currently incurred by the landowner. This aspect would offer the landowner with a Legal Reserve the opportunity to protect himself against variances in the expected appreciation or depreciation of the land (the so-called hedge).

There are provisions for CRAs in the New Brazilian Forest Code (NFC, Law 12.651/2012) for environmental offset mechanisms. This report analyses the current feasibility for these securities to be also construed as tradable assets on the capital markets so that, over and beyond environmental offset, they can contribute to the development of a market for forestry securities in Brazil. Similar to other markets created for environmental purposes, when investors find it easy to enter, the liquidity of those markets increases and enables new financial resources to be channeled towards environmental gains. In such cases, these markets are highly regulated so that the environmental objectives (be it lower pollution, reduction in greenhouse gases or higher fish stocks, among others examples) are achieved, while at the same time providing an opportunity for returns for investors interested in investing in this asset category.

The study was carried out using: **i) bibliographic review; ii) interviews** with specialists in CRA- and capital market-related issues, including private sector companies, sectorial organizations, banks, investors and government; **iii) discussions** with the members of FEBRABAN comprising the Working Group assembled for this project; **iv) internal discussions** among the GVces team.

This report is organized as follows: the first part introduces CRAs and how they relate to public policies for environmental regularization. The second part analyses the current feasibility of CRAs becoming attractive for securities investors (public placement). The third part presents the conclusions.





I. CRAs AND ENVIRONMENTAL REGULARIZATION

A. INTRODUCTION: ENVIRONMENTAL RESERVE UNITS (CRA)

The original Forest Code dates from 1934, having been subsequently revised in 1965. In 2012, it was revised yet again under Law 12.651 of May 25, 2012. The Code of 1965, governed by Law 4.771/1965, had been proposed in a context where the Brazilian population was concentrated in coastal areas, and at a time when there were extensive ecosystem areas like the Cerrado (tropical savanna), Pantanal (wetlands), the Atlantic Forest and the Amazon Jungle.

But the Brazilian reality became transformed in such a manner over time – massive migration to urban areas, the expansion of agribusiness to the hinterland, mechanization of agriculture, among other aspects – that in 2012 Brazilian society approved the revised version of the Forest Code, known as the “New Forest Code” (NFC).

Among the innovations of the New Forest Code (NFC), chapter VI deals with the creation of a Rural Environmental Register (local acronym, CAR) within the scope of the National System for Information about the Environment (local acronym, SINIMA). The CAR is a nationwide electronic public register, mandatory for all rural properties, created for the purpose of collecting environmental information about rural properties and possessions, so as to comprise a data base for environmental, economic and anti-deforestation control, monitoring and planning.⁴ Also innovative in nature, Chapter X of the NFC deals with the program for supporting and encouraging conservation and recovery of the environment, in addition to payments or incentives for environmental services associated with conservation activities and ecosystem enhancement and which generate environmental services, such as carbon mitigation, conservation of natural scenic beauty, biodiversity conservation, conservation of water and water services and climate regulation, among others.⁵ As one of the ways envisaged for encouraging ecosystem preservation and conservation, article 44 of the NFC institutes the Environmental Reserve Unit (CRA), a nominative security representing an area of native vegetation, already existing or in the process of recovery, in succession to the Forestry Reserve Unit (local acronym, CRF) issued in accordance with Law 4.771/1965. CRAs are issued by a body of the National System for the Environment – Sisnama. It should be pointed out that CRAs must be preceded by Rural Environmental Register (CAR).

WHAT IS THE PURPOSE OF CRAs?

CRAs are instruments that enable the owner of rural property to offset the Legal Reserve area.

Article 12 of the NFC stipulates that every rural property must maintain an area of native cover by way of a Legal Reserve, in accordance with the following minimum percentages in relation to the area of the property:

- If located in the Legal Amazon region
 - 80% for property in forest areas;
 - 35% for property in areas of the Cerrado;
 - 20% for property on open fields;
 - 20% for property located in the other regions of the country.

⁴ Idem, Section 41

⁵ Idem, Section 41

Where the owner does not have a LR area in accordance with the NFC, article 66 thereof stipulates that owners of rural property, who on July 22, 2008 had a Legal Reserve area smaller than that envisaged in the law, could regularize their Legal Reserve (local acronym, LR) status in three ways: reconstitute the LR, allow the vegetation in the LR area to grow back naturally or offset the LR.

The NFC provides for four possibilities for offsetting the LR: i) acquisition of CRAs; ii) leasing the area under the environmental servitude system; iii) donation to the local government of areas located within Conservation Units in the public domain, where rural regularization is pending; or iv) registration of another equivalent area surplus to the LR on property with the same ownership, or acquired on third-party property, where native vegetation is regenerating or recovering, provided it is located in the same biome and state.

The areas used for offset must be equivalent in size to the LR area to be offset, be in the same biome as the LR area to be offset and, if they are located outside the State, they must be in areas identified as priority by the Brazilian government and by the states⁶.

Thus CRAs were created to operate as mechanisms for offsetting LR areas. Generally speaking, the features of CRAs⁷ according to the NFC are:

- **They represent a native vegetation area:** i) protected as a Privately-owned Nature Reserve (provided they are superimposed on the Legal Reserve area); ii) under the environmental servitude system; iii) on rural property located within the Conservation Unit; or iv) represent the Legal Reserve instituted voluntarily over vegetation areas **exceeding the minimum percentages of the law;**
- They are preceded by registration on the **CAR;**
- The linkage of the area to the CRA **will be endorsed on the property registration;**
- The federal body can delegate to the state body of jurisdiction the attributions for issuing, canceling and transferring the CRA;
- Each CRA represents 1 hectare;
- It is mandatory for the issuing environmental body to register the CRA within 30 days from the date of issuance, **on domestic commodity exchanges or on asset registration and financial settlement systems approved by the Central Bank of Brazil;**
- CRAs can be transferred, with or without consideration, to individuals or legal entities of public or private law. They can also be canceled;
 - **CRAs can only be used to offset Legal Reserves if the rural property is located in the same biome** and state of the area to which the security is linked (this offset of the Legal Reserve deficit using CRAs will be endorsed on the property deeds of the two properties involved in the offset transaction, namely the one with surplus Legal Reserve and the one in deficit that is using the CRA as set-off)If they are outside the state, the areas must be located in regions identified as priority by the federal or state governments⁸.

As provided for in the NFC, the CRA is an instrument that makes it possible to offset LRs. It was designed as a bilateral transaction to be undertaken between the owner with a surplus of LR and the one who has a deficit.

Nevertheless, the possibility of using CRAs to create a market for assets linked to forested lands - allocating a monetary value to native vegetation and facilitating exchanges not only between holders of surplus and deficit balances of LRs, but also between potential investors in negotiable assets - would attract more private resources for vegetation recuperation insofar as the investors would provide the market with greater liquidity. Perhaps it was the intention of the legislator to create this market, since he envisaged that CRAs can be registered on commodity exchanges in Brazil, or with asset registration and financial settlement system approved by the Central Bank of Brazil.

⁶ Law 12.651/2012 section 66

⁷ Law 12.651/2012 sections 44 to 50 and section 12

⁸ Law 12.651/2012 section 66

The potential of CRAs for becoming the subject of a market for trading forest assets has not gone unnoticed. Although the implementation of the CAR is still a work in progress (the deadline for registration ends on May 5, 2016), the Rio de Janeiro Stock Exchange (BVRio), a not-for-profit organization created for the purpose of developing market mechanisms for environmental services and assets, in addition to providing platforms on which to trade those assets, has developed a futures market in CRAs (CRAFs) in the expectation that CRAs will become widely tradable assets.

THE ENVIRONMENTAL REGULARIZATION PROGRAM (PRA) FOR RURAL PROPERTIES AND POSSESSIONS

Article 59 of the NFC provides for the implementation of Environmental Regularization Programs (local acronym, PRA) for rural properties and possessions, and it is incumbent on the states and the Federal District to set these in motion. This includes a detailed breakdown of the regulations of the PRAs by publishing specific rules and regulations that take into account the territorial, climatic, historical, cultural, economic and social peculiarities of the states and the Federal District.⁹

Decrees 7.830 of October 2012 and 8.235 of May 2014 deal with PRA instruments. These are: i) the CAR; ii) the term of commitment – the formal document for adhering to the PRA, containing the commitments for the upkeep, recuperation or replanting of areas of permanent preservation, legal reserves and for the restricted use of rural property, or also for offsetting LR areas. The term of commitment has the effectiveness of a judicially enforceable instrument. In case of non-compliance, in addition to administrative proceedings (such as fines and sanctions), there will be criminal proceedings; iii) the Project for Replanting Degraded and Altered Areas and the CRA, when applicable¹⁰.

The PRA applies to owners and those in possession of rural property, but CRAs are only available to owners of rural property. Implementation and deployment of a PRA is fundamental for guiding the demand for CRAs.

The next section analyses the international experience with the development of markets for environmental purposes.

B. THE INTERNATIONAL EXPERIENCE WITH THE DEVELOPMENT OF MARKETS FOR ENVIRONMENTAL PURPOSES

There are two categories of instruments for environmental policy and management: economic instruments and command and control instruments. Command and control instruments are stipulated in law and do not provide flexibility for economic agents to choose the best means for resolving the problem, while economic instruments are those that directly affect the calculation of the costs and benefits of the polluting agent, influencing his decisions and, ultimately, enhancing environmental quality. These instruments seek to build the social costs into the individual decisions of economic agents. The greater part of the discussions about environmental policy at an international level is founded on the economic theory based on the concept of externality¹².

Externalities are defined as effects external to the decision makers, in other words, those effects are not experienced or barely felt by those responsible for generating them, essentially affecting third parties not involved in the decision-making process¹³. Externalities can be positive or negative. Environmental problems are classified in the category of negative externalities, representing, primarily, the social costs of production

⁹ Law 12.651/2012 section 59

¹⁰ Decree 7.830 of October 17, 2012; Decree 8.235 of May 5, 2014.

¹¹ (Varela, 2008)

¹² (Almeida, 1998)

¹³ (Jacobs, 1996)

and consumption decisions, such as the degradation of environmental quality and greater shortages of natural resources.

Environmental degradation reflects the discrepancy between private and social costs. Environmental policy suggests using economic instruments that encourage the players to take social costs into account in their individual, private decisions, internalizing the externalities. Internalization does not imply the elimination of pollution, rather it is the definition of a point of equilibrium between the gains from production and the costs arising from pollution, arriving at what is known as the optimal pollution level¹⁴.

Tradable permit programs, known as Cap & Trade, are gradually being seen as an effective way of attaining optimal levels of pollution, and can be related to a variety of environmental aspects such as greenhouse gas (GHG) emissions, the availability of water and the perpetuation of species.

Cap & Trade programs are classified as quantity mechanisms, since they stipulate quantitative limits for emitting pollutants or using natural resources and, based on the limits established, carbon allowances are issued¹⁵. The permits issued are tradeable pollution permits involving the purchase and sale of pollution quotas.

This market instrument operates via the quantity of pollution, not the cost of pollution, that is: there is a maximum permitted level of pollution that is divided into quotas, which are then traded among producer agents¹⁶. Thus the emission limits ensure that the pre-established levels of reduction are achieved by the market participants, who can define the best way to attain those amounts, provided they are in accordance with the rules of each program.

When a participant wishes to emit a greater quantity than the permits in his possession, he must purchase permits from another participant who, in turn, emitted less. Thus, regardless of which participant is holding the permits, the number available in the market is the same, ensuring that the total quantity of emissions is fulfilled.

The free transacting of permits in Cap & Trade programs, as if they were consumer goods, enables businesses to evaluate whether they can reduce their emissions at a lower cost and sell their permits, or, in the event they have no cheaper way of reducing their emissions, they can choose to purchase permits. In this sense, it is possible to achieve ambitious objectives at a lower cost than what would be necessary under command and control-type regulations. Studies show that the costs of traditional approaches can be anywhere from 2 to 10 times greater than the costs of the actual regulations, such as trading pollutant emissions¹⁷.

Moreover, these programs also enable regulatory bodies to adjust their parameters more quickly and at a lower cost, so that, for example, a bad allocation of permits can be resolved using market mechanisms, such as purchases, sales or redistributions.

EXAMPLES OF CAP & TRADE PROGRAMS

THE FISHERY MARKET IN NEW ZEALAND

New Zealand has developed a permits market for replenishing its fishing stocks.

The New Zealand fishing industry, although not representative at a global level, takes a significant share of the country's GDP¹⁸. The maritime area controlled by New Zealand and which can be commercially exploited is 14 times greater than its land area¹⁹. For decades, the belief was that the fishing industry did not influence fish stocks, but, in the early 1980s,

¹⁴ (Pearce & Turner, 1990)

¹⁵ (Meneguín, 2012)

¹⁶ (Almeida, 1998)

¹⁷ (Samuelson & Nordhaus, 2012)

¹⁸ (Newell, Sanchirico, & Kerr, 2000)

¹⁹ (Statistics New Zealand, 2005)

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with the reduction in coastal stocks, the government and the New Zealand fishing industry understood there was a need for a new fishery management system.

Measures such as moratoriums and controlled fishing failed to work and, therefore, fishing management began to adopt a new approach: instead of controlling fishing methods and the number of boats, the target became limiting how many fish could be taken²⁰. So, in October 1986, the Quota Management System (QMS) was introduced.

Prior to the program coming into effect, fish could be caught by anyone with a permit, provided they complied with the attendant regulations. Under the quota system, based on annual studies and planning, the total sustainable catch is defined for each species and, based on this total, Individual Transferable Quotas (ITQ) in kilos are allocated, which can be purchased by individuals or legal entities. Quotas function as properties that can be sold, rented or assigned.

The value of the quotas depends on the value of the species, the total sustainable catch and market demand. All quota trades are recorded by FishServe, used by the Quota Management System. Moreover, there is a limit on the quantity of quotas than any individual or business can hold, so as to avoid a monopoly on fishing in a given area or of a certain species²¹.

Overall, the New Zealand Cap & Trade program has been successful. Worthy of mention, among its positive aspects are: i) a better economic performance by the industry; ii) a better biological condition of the natural resource, with strategies for replenishing species below the optimum level, so as to perpetuate them; iii) increase in the industry's responsibility in its fishing operations; and iv) a transparent process for evaluating stocks and setting quotas. Among the factors that have contributed to the success of the system one can mention the geographical isolation of New Zealand and the important support from key players in the fishing industry and from politicians, which has led to the institutionalization of the system.

However, also worthy of note are some of the difficulties encountered: the need to clearly define the allocation of fishing rights among competing groups against the ownership rights conferred by the quotas, since unclear ownership rights makes access to resources difficult for all groups; and as the market consolidates, there is the need for a substantial reduction in government intervention over time, by involving the various players in the management process²².

An analysis carried out for the period from 1986 to 2000 shows that a large number of quota owners participate in the market, with an historical average of 1,400. Every year, on average, 90 new participants join the market, whereby since the 1990s, there has been a consolidation of 37% in the number of quota owners. Overall, evidence suggests a reasonably high level of liquidity and economic rationality in the ITQ, where there is a high level of activity; it is also evident that the project has fulfilled its conservation objective, as it has maintained acceptable levels of fish stocks and, in the case of some species, has contributed to growth in population levels²³. According to New Zealand government data, the economic value of fish stocks under the QMS scheme has risen from US\$ 2.7 billion in 1996, to over US\$ 4 billion in 2009 (latest data found in reports published in English)²⁴.

WATER MARKETS IN AUSTRALIA AND CALIFORNIA

Australia has developed a market for water access rights as a water resource risk management tool, and to assist the manufacturing sector to deal with water resource stress. California has also created a market for water access rights, which is still in the maturation stage.

²⁰ (Walrond, 2012)

²¹ (Seafood New Zealand, 2015)

²² (Annala, 1996)

²³ (Ecosystem Market Place)

²⁴ (Ministry of the Environment, New Zealand)

In the 1980s it became clear that many surface and underground water systems in Australia, particularly in the Murray-Darling water basin (MDB), had been fully allocated. Within this context, the deficiencies in the already existing water rights systems became more and more exposed: with the total utilization limit having been reached, the only way for new and existing users to have access to more water to initiate or expand their businesses would be to purchase an existing permit. However, because water permits were linked to land, there were no readily available mechanisms for transferring water permits between users.

Faced with this problem, several users and formulators of public policies began to advocate to be allowed to transfer water between users by negotiation. And so the water trade began, mostly as a pragmatic response by users to the emerging scenario. In search of equitable and efficient allocation system, a Cap & Trade system was created in which the cap represents the total resource available within sustainable pumping levels. Starting from this cap, ownership rights are provided, which are negotiable and whose prices are determined by the market based on the value attributed to the water by buyers and sellers. With every season, the amount of water allocated to each security varies.

The Australian Cap & Trade program has turned out to be a water availability risk management tool, while at the same time enabling rural and industrial producers to address external factors, such as drought. During the millennium drought (1997 to 2010), trading in water was vital for ensuring both water supplies to urban areas and irrigation for crops. In social and environmental terms, the implementation of clearly defined market rules and supplementary political tools has contributed to managing the impacts, with the caveat that, given the strong impacts of the drought, it is difficult to clearly attribute regional economic or social change to water trading outside local or regional economies. Nevertheless, there are challenges to developing water markets at the technical level, such as the cost of acquiring the information required for establishing the rules of commercialization; at the political level, such as the local - non-systemic - viewpoint of the states; at the social level, such as the concern of communities regarding water loss in several regions; and at a cultural level, such as the lack of experience in using market-based mechanisms.

Some universal prerequisites for implementing effective water markets include: establishing an effective cap on the total sustainable catchment (preferably before the shortage becomes acute); a clearly specified and monitored definition of ownership rights, so that users know exactly what they can buy and sell; a strong regulatory and governance framework; and the implementation of elements fundamental for water management, such as measurements and accounting procedures²⁵.

Australia is one of the few countries in the world with a solid legal and regulatory framework that enables returns on investment to flow, based on the acquisition and management of water rights. With an estimated capitalization of over US\$ 25 billion, it is a significant opportunity for institutional investors²⁶.

Within this same context of drought-related resource shortages, a growing market has arisen in California. However, it is still in the initial stages and faces the challenge of becoming more liquid²⁷. Although the Cap & Trade system for water in California also allows farmers to buy and sell water rights among themselves or to other cities, the transactions in this market do not take place in a transparent on-line market, as is the case with Australia. The transactions suffer from red tape and high transaction costs, both monetary and non-monetary, which led to a decline in the trading volume between 2006 and 2010.

²⁵ (National Water Commission, 2011)

²⁶ (Brookvine PTY Limited, April, 2011)

²⁷ (Johnson, 2015)

Moreover, at state level, there is a need to deal with the fact that quite frequently the local communities are opposed to water markets, because they consider them to be economically prejudicial. In California, communities have taken steps to block the sale of rights in order to protect the local economy and their own water supplies. Thus, if we are to achieve a more efficient market that encourages water trading, it is necessary to establish standardized rules both across the state as a whole, and from state to state²⁸.

THE CARBON MARKET IN THE EUROPEAN UNION

Notwithstanding the problems that have arisen, especially in the wake of the crisis of 2008, the European Union carbon market is an example of an experiment in creating a market to create environmental and economic benefits.

The carbon market is an economic instrument that seeks to trade on markets lower greenhouse gas (GHG) emissions, thereby assisting in mitigating climate change. There are two kinds of carbon market: regulated and voluntary.

In the regulated carbon market the systems for trading pollution permits are referred to as carbon allowance systems, which are the limits established for GHG emissions. The voluntary carbon market trades carbon offsets, which are certificates that prove the reduction in GHG emissions, representing an equivalent ton of carbon removed from the atmosphere by means of GHG emission reduction projects. In both cases, measurement is in equivalent tons of CO₂ (tCO₂e).

Up to 2014, there were 11 regional, national and sub-national emission trading schemes around the world²⁹. Among them, the highlight is the European Union Emissions Trading System (EU ETS), the first Cap & Trade program set up at multinational level, covering 31 countries and 45% of the carbon dioxide (CO₂) emissions in the European Union (UE). Prices per equivalent ton of carbon vary depending on the market model (for example, if within the institutional arrangement of the Kyoto Protocol or, if outside it, on a voluntary basis).

The EU ETS works on the Cap & Trade principle: the cap is defined based on the total GHG volume that can be emitted by the system, whereby this limit is being gradually reduced over time so as to reduce total emissions. Once the cap is defined, businesses receive or purchase carbon allowances that are tradable, while the setting of a limit for the overall number of permits available ensures they have value.

At the end of each year the business must return sufficient carbon allowances to cover its entire emissions; otherwise it must pay fines. If a business reduces its emissions it can retain its permits to meet future requirements, or sell them to other businesses needing permits. The flexible nature of this trading ensures that emissions are reduced where it costs less to do so.

By pricing carbon, allocating it a financial value for each ton of emissions, the EU ETS has included climate change on the agenda of boards of directors and finance departments throughout Europe, where a sufficiently high carbon price also encourages investment in clean technologies. By allowing businesses to purchase international credits, the market also plays the role of a driver of investment in clean technologies and low-carbon solutions, especially in developing countries.

Private sector participants within the scope of the EU ETS have boosted market liquidity, trading 24,061 million permits between 2008 and 2011, compared with an accumulated cap of 7,437 million permits over the same period. This boost arose because annual compliance targets encouraged rapid actions, in contrast with the targets of the Kyoto Protocol, which only applied during the entire commitment period³⁰.

²⁸ (Bloomberg View , May 15, 2015)
²⁹ (World Bank, 2014)
³⁰ (World Bank, 2014)
³¹ (International Emissions Trading Association - IETA, May, 2015)

However, the EU ETS is also facing challenges on account of the growing surplus of carbon allowances, primarily because of the economic crisis that exploded in 2008 and led to a greater reduction in emissions than had been expected in the short term. This surplus could prejudice the proper functioning of the carbon market and, in the long term, could affect the ability of the EU ETS to profitably meet stricter emission reduction targets³¹.

Similarly, voluntary carbon credits around the world are trading at a substantial discount to the price actually required for effectively transitioning to a low-carbon economy. This is because the low value of the credits reduces demand, implying a reduction in the number of initiatives aimed at reducing GHG emissions.

A more recent carbon market mechanism created in 2007 is the REDD - Reducing Emissions from Deforestation and Forest Degradation. This mechanism provides positive incentives for reducing emissions arising from deforestation and forest degradation by remunerating whoever leaves their forests standing. Later, conservation activities, sustainable stewardship and the increase in forest stands in developing countries were also included, leading to what is called REDD+³².

Estimating the future demand for REDD+ is no easy matter, because of the political uncertainty as to its acceptance and use with new or already existing systems. On current voluntary and future compliance markets the demand for REDD+ will not be static and it will have to compete, based on price and perceived quality, with other types of credits. Although the REDD+ market is still relatively small (supply exceeds demand), there are several types of voluntary demand, especially from the private sector.

Investors are driven primarily by anticipating potential future regulations for which the development of REDD+ projects are useful; by opportunities for on-selling the credits; by corporate social responsibility objectives (especially those involving climate change); and by the commitment of multinational companies to zero deforestation targets. Other less conventional motivations, but which are gaining in importance, are: the contribution by REDD+ investments to improving the performance in sustainability indices, such as the Dow Jones Sustainability Index; facilitating access to credit in banks with sustainability targets; and investment in assets with lower socioenvironmental risk (less carbon intensive), because of the prospect of severe regulations³³. Any connection between CRAs and REDD+ mechanisms is still not clear, but integrating these markets may be a possibility that requires better and more in-depth analysis.

CONDITIONS FOR SUCCESSFUL TRADABLE PERMIT PROGRAMS

Experience with markets for sustainable purposes shows that in order to be successful (from the environmental and economic standpoint), it is necessary to take into account a complex set of elements, including: the physical context involved in the environmental problem in question, defining the proper incentives for the market to take hold, which includes ensuring the market has liquidity, clear ownership rights, and low transaction costs.

Based on the study of some experiments with existing tradable permit programs, it is possible to identify several general criteria required for ensuring the success of these programs. Below is a description of several conditions³⁴ that have been identified as essential for putting in place a successful tradable permits program:

> Physical context: The environmental problem to be covered by the Cap & Trade program must physically lend itself to a trading approach. As an example, in the case of pollution control, the damage must involve the total pollution found in the environment, rather than in private sources. In areas where sensitivity to pollutants varies significantly, trading may not be the most appropriate approach, since trading in quotas would mean

³² (Instituto de Pesquisa Ambiental da Amazônia - IPAM, 2015)

³³ (Laing, et al., May, 2015)

³⁴ (Lind, 1995)

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reallocating sources of pollution and, by extension, would imply reallocating impacts, thereby not contributing to the environmental protection objectives.

- > **Market incentives:** For a market to emerge, businesses need an incentive to trade. In allowance trading programs, the primary incentive is the difference between the marginal costs that businesses will have in order to achieve environmental protection targets. Depending on the level of pollution a business needs to reduce, it may be cheaper to purchase allowances than reduce its quota of pollution by other means. Lack of incentives is one of the first barriers to the proper working of an allowances market and, in that sense, the trading of allowances is a crucial point (as well as a challenge) for the market to function, whereas it is necessary to achieve mitigation at the lowest cost for the business, which requires flexible mechanisms. This is because, if costs are very high, the market will not function properly, since mitigation will not be economically viable.
- > **Negotiation opportunity:** It is important to have a supply of surplus tradable reductions so that there is liquidity (but not an excess of it) in the market. The lack of available permits may come about due to the accumulation of securities by the companies, or they are unable to attain a minimum standard of pollution, in many cases on account of the lack of technological capability.
- > **Liquidity:** Besides the availability of permits, there has to be a sufficient number of market agents and transactions in order to clearly set prices, so that a competitive market can function, in addition to not prejudicing the environmental objectives. Markets with no liquidity – where there is low volume and exchanges are infrequent – tend to show distortions in permit prices, which, for example, adds to the costs of reducing emissions in the location where the program is established. In that sense, several measures can be taken to increase the liquidity of the permits market, so that it effectively functions better while moving towards perfect competition, such as allowing and encouraging brokerage houses and derivatives markets for permits, as well as relative ceilings for allocating permits.
- > **Transaction costs:** Transaction costs – namely the costs incurred so that project developers can conclude the phases of the cycle of a project and close the transaction in the market – exist in all markets, but their magnitude can vary according to how the market was designed. Among transaction costs, regulatory costs, especially when excessive, can lead to market failure. Thus low regulatory and transaction costs are acknowledged as important for ensuring the success of the permits program.
- > **Uncertainty and risk:** Uncertainty surrounding the permanent nature of emissions credits and their value under new regulatory regimes functions as a disincentive to trading in permits markets, since market participants fear that the permits may be withdrawn or reduced at the regulator's discretion.
- > **Monitoring:** Besides the uncertainty on the part of market participants, regulators are also uncertain about achieving the environmental objectives. For example, given the difficulties in assessing the success in reducing emissions, regulators quite often stipulate higher proportions for trading in order to achieve the environmental objective. In that sense, the high trading proportions and the uncertainties surrounding the measurement of reduction in emissions directly related to the actions taken by the market participants represent aspects that only discourage trading in permits.
- > **Penalties and sanctions:** For example, at the end of the compliance period, participants whose emissions exceed their permits will be penalized by monetary fines and sanctions. To ensure effective compliance with the reduction target of the program, one must have the option where polluting in excess of the number of permits becomes more costly than the option of reducing emissions. Within this context, it is important to discuss the phenomenon of leakage: industries located within a country or region that imposes restrictions, for example, on emissions or water consumption, move to another location where legislation is less rigorous. The manner in which one goes about

the initial allocation used when introducing a Cap & Trade program can reduce leakage in the country. Some businesses see auction costs as a barrier to their growth and their competitiveness, which in some cases is enough to convince them to relocate their activities to a country or region where they are not exposed to such costs. The most used alternative to auctions are the free allocations, known as grandfathering, which reduce the risk of relocation and the costs incurred by businesses, since they do not have to buy initial permits, which they receive free of charge.

> **Legal, institutional and political conditions:** Lastly, it is worth pointing out that the legal, institutional and political conditions must be appropriate if the development of a tradable permits program is to succeed. In the legal sphere, there must be explicit or implicit approval of market-based approaches. As for the political sphere, there must be support for implementing tradable permits, with the support of the regulatory agencies especially important for institutionalizing the markets where no explicit legislation governing tradable permit programs is in place.

These elements represent salient points for guidance when contemplating setting up a Brazilian market associated with Environmental Reserve Units. Nevertheless, it is worth pointing to the recommendation for future in-depth studies into international experiences in order to contribute to setting up an environmental securities market in Brazil.







II. THE POTENTIAL OF THE CRA MARKET

CRA's were conceived within the scope of the New Forest Code (NFC) as economic instruments for making environmental set-off viable.

The analysis of the potential for CRA's to be attractive to a much wider market than the owners of Legal Reserves (LR), who want to offer surplus LR to those looking to offset their deficit, the following were considered: i) the potential supply and demand for CRA's in hectares, bearing in mind areas with a deficit and a surplus of LR; ii) elements that will influence the prices of the CRA's, considering them to be LR set-off mechanisms; and iii) the current feasibility of CRA's becoming a negotiable security for offer to the public, analyzing the features of negotiable securities and the elements essential for attracting investors.

The scope of this study did not take into account the conditions for CRA's being offered exclusively on the market in private placements. The purpose of analyzing their feasibility as negotiable securities for offer to the public involves expanding the market for environmental assets and attracting a larger portion of the public towards environmental themes.

A. VOLUME OF CRA'S: POTENTIAL SUPPLY AND DEMAND FOR CRA IN HECTARES³⁵

Perhaps the greatest challenge to studying the feasibility of CRA's becoming negotiable assets is that of estimating the potential supply and demand in this market, under two scenarios: i) in the scenario where CRA's merely serve to offset Legal Reserve areas (environmental regularization); and ii) CRA's as a subject of interest to investors, as negotiable securities, thereby going beyond environmental offset. Given the scarcity of data, this section will deal with the first scenario only. The Environmental Services Management Laboratory and the Remote Sensing Center of the Federal University of Minas Gerais (UFMG) carried out a study into the economic viability of the potential market for Environmental Reserve Units (CRA) in Brazil, providing the Finance and Environment Ministries with inputs for their analysis of this issue.

The UFMG study estimated that, in the manner provided for in the NFC, there would be an oversupply of CRA's, namely a total probable offer of CRA's in Brazil of 103.1 million hectares, for a probable demand of 4.6 million hectares. In other words, on a nationwide basis, supply would outstrip demand 22-fold. When analyzed per biome, the best scenario is the Atlantic Forest, where the potential supply and demand would be relatively close to equilibrium when compared with other biomes: the estimated potential supply is 3.9 million hectares, with potential demand at 1.2 million hectares (with supply exceeding demand 3-fold) The figure below shows the data estimated by the UFMG modeling:

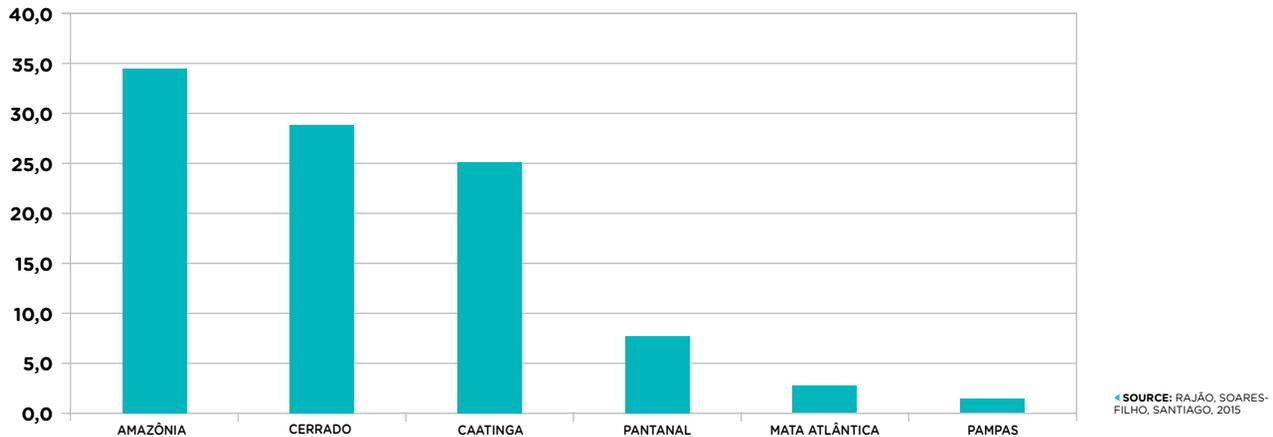
TABLE 1. PROBABLE SUPPLY AND DEMAND FOR CRA'S PER BIOME³²

IN MILLION HECTARES	AMAZÔNIA	CAATINGA	CERRADO	MATA ATLÂNTICA	PAMPAS	PANTANAL	BRASIL TOTAL
Probable supply for CRA's	36.3	25.2	30.3	3.9	0.9	6.2	103.1
Probable Demand for CRA's	1.9	0	1.3	1.2	0.1	0	4.6
Oversupply	34.4	25.2	29.0	2.7	0.8	6.2	98.5

▲ SOURCE: SANTANDER

³⁵ (Rajão, Soares-Filho, & Santiago, 2015)

³⁶ Idem

FIGURE 1. OVERSUPPLY (IN MILLIONS OF HECTARES) PER BIOME³⁷

The reasons for the mismatch between supply and demand are the following:

- CRAs can only be issued on properties whose deeds of ownership are registered with a public notary. This has eliminated from the base, a probable supply of areas arising from possession, with no definitive deeds of ownership;
- The complete implementation of the Forest Code is a relevant scenario for determining the volumes of CRAs on the market. The biomes with the greatest environmental liabilities are the Amazon, the Atlantic Forest and the Cerrado region, while the states with largest areas to be recovered are Mato Grosso, São Paulo, Minas Gerais and Pará. Livestock farming is an important business in those states, with a high opportunity cost for land use. The UFMG study shows that a significant portion of producers with deficits of Legal Reserve who responded to the questionnaires sent by the study team, replied that they will only offset or recover LR when so required by the market, or they will never regularize on account of the high costs involved. Therefore, sanctions and penalties for breaking the law are important weapons for controlling the behavior of demand and supply. In a scenario where the NFC is still in the implementation phase and where uncertainties exist regarding legal enforcement, the propensity to demand CRAs is diminished;
- The UFMG modeling took into account that large farmers with highly profitable land and exposed to market pressure for environmental regularization (such as producers of grains and biofuels) are a potential source of demand for CRAs. However, smaller producers with lower land opportunity costs will recover their LR areas or remain on the wrong side of the law, depending on what the NFC stipulates; and in this case they would be out of the CRA market.
- It should be pointed out that the supply and demand scenarios will become clearer once the period for registering rural properties on the Rural Environmental Register (CAR) ends.

B. ELEMENTS THAT WILL INFLUENCE THE PRICE OF CRAs³⁸

Besides the behavior of supply and demand, the price of CRAs (as environmental regularization mechanisms) will be affected by the following aspects:

- The opportunity cost of the land (comparing the options for land use, such as preserving the surplus LR, or opting for agricultural use) and the market value of the land;
- Cost of the other options provided for in the NFC for offsetting LR areas;

³⁷ Idem

³⁸ (Rajão, Soares-Filho, & Santiago, 2015)

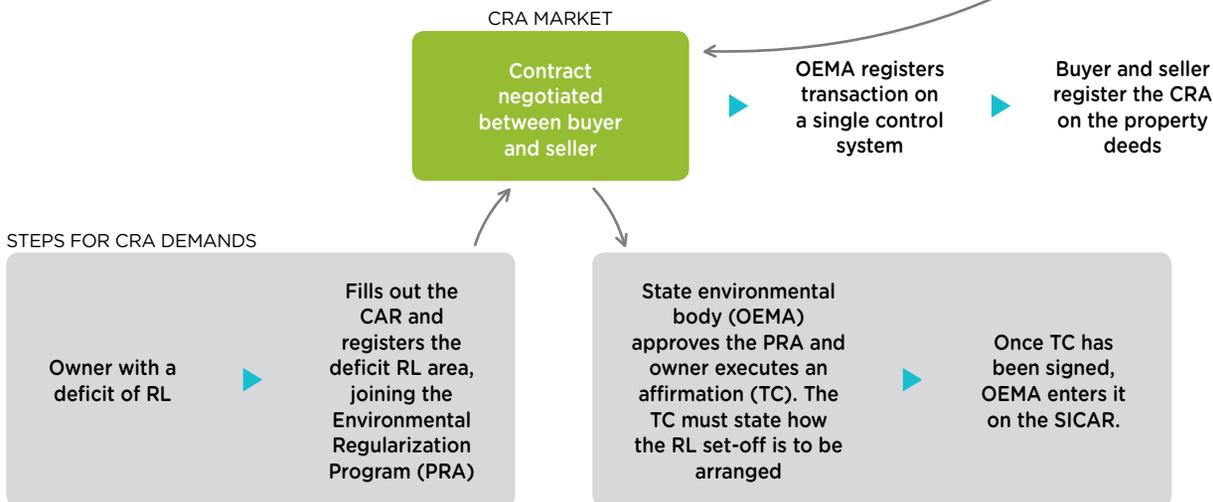
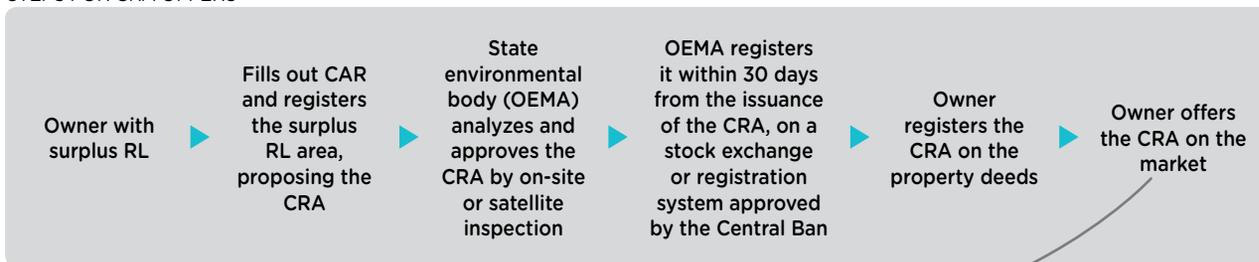
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- Cost incurred by the bidder of the CRA in maintaining intact the surplus LR area that gave rise to the negotiable security. The UFMG study referred to this cost as the “cost of ring-fencing”;
- Transaction costs, since issuing a CRA to offset the LR deficit with a CRA is a complex process involving various players: the CAR has to be filled out; registration on the deeds of the properties (of the issuer and the acquirer); registration on the commodities exchange; owners’ personal documents; proof of payment of Rural Property Tax; a geo-referenced map of the property; and approval by the state environmental body (including on-site or satellite inspection). This process incurs fees (notarization, inspection by the environmental body, preparation of the CRA, registration and custody) that differ from state to state. The UFMG study estimated that transaction costs account for an average of 7.5% of the total CRA price;
- The time horizon of the effectiveness period of the contracts also influences the price. A short-term contract, 5 years for example, on the one hand, encouraging the producer to calculate the value of the CRA based on market prices for leasing, and the income from farming, on the other, also incurs the highest rate of transaction costs mentioned above. In other words, the shorter the maturity period of the contract, the higher the price established by the issuer of the CRA, which could render the market unviable.
- Longer-term contracts (30 years) tend to be viable for market development because their prices are based on the value of the land. It should be stressed that longer-term contracts involve greater risk in maintaining the surplus area of the Legal Reserve and, therefore, tend to increase the investors’ risk perception.

The figure below shows the process for offering and purchasing a CRA, as provided for by the NFC as LR set-off mechanism, and which influences CRA prices:

FIGUR3 2. SCHEMATIC PRESENTATION OF THE CRA SUPPLY AND DEMAND PROCESS ON THE PART OF LANDOWNERS³⁹

STEPS FOR CRA OFFERS



▲ FONTE: GVCES

C. CRAs AS POTENTIAL NEGOTIABLE SECURITIES

Unlike a car, an apartment or other tangible assets, a security traded on the capital markets has no intrinsic price. The price of a security depends on a set of benefits that investors enjoy from acquiring those assets. So the decision to buy or sell securities requires reliable information that is available in such a manner as to enable investors to do their assessments and take their decisions. With information, investors can evaluate the present value of the set of entitlements that possessing a given security affords them⁴⁰.

The capital market can be divided into two kinds of market: the primary and the secondary. The primary market trades securities offered by issuers to investors. This is an important source of financing for manufacturing activities. Issues can be public or private. In private placements the securities are offered to a select number of investors. But there are cases where issuers believe that they will only be able to raise the volume of funds they need if they offer their securities to a large and diverse number of investors: these are public placements. On the secondary market, securities are bought and sold between investors, in other words, there is on-selling of the securities. Investors involved in the secondary market also need proper information if they are to be able to evaluate the value and price of the assets offered⁴¹. The securities can be listed, that is, offered on stock exchanges, or not. The exchange is where those interested in securities interact, with this interaction functioning as an auction. Securities offered on the over-the-counter market are not subject to the same procedures and requirements demanded for stock exchange trading.

In this way, a negotiable security is a capitalization tool that links the corporate demand for funds, to the investor's desire for financial returns and diversification. The profitability an investor expects can be generated by increasing the principal amount of the negotiable security over a given time frame (capital gains) and/or via periodic remuneration, pre-defined payments throughout the period, consisting of dividends and payment of interest via coupons. In Brazil, securities are traded on the capital markets, under the watchful eye of the Central Bank and oversight by the CVM (Brazilian Securities Commission). Law 6.385/76, article 8, attributes to the CVM permanent supervision of the activities and services of the securities market. Formal regulation of securities seeks to meet the need for conceptualizing the term, by creating conditions for protection and equity in the information provided to the market.

According to the CVM⁴², securities are formally defined as **any collective bonds or contracts that create entitlement to participation, partnership or remuneration, including services income, where the earnings are the result of the effort of the entrepreneur or third parties**. Moreover, the CVM defines the securities traded on the Brazilian financial market, namely: shares, debentures and subscription bonuses; coupons, rights, subscription receipts and certificates of stock splits involving securities; securities certificates of deposit; debenture notes; units of securities investment funds or clubs that invest in any assets; commercial papers; futures, options and other derivatives contracts, where the underlying assets are securities; and other derivatives contracts regardless of the underlying assets.

It should be pointed out that securities do not include payment instruments issued to liquidate debts. Objectively speaking, a promissory note issued to collateralize a credit transaction is not considered a negotiable security; however, a promissory note issued as a means of capitalizing an investment is considered a negotiable security⁴³. The term negotiable security also applies to federal, state and municipal debt instruments; and to bills of exchange issued by financial institutions, except debentures.

The financial gain for the investor is, however, subject to the risk of economic losses arising from the future variance of the returns. The source of the risk lies especially in the capacity of the issuer of the securities to pay the principal amount plus interest, defined as credit risk on the issuer.

⁴⁰ (Cox, Hillman, & Langevoort, 2013)

⁴¹ (Cox, Hillman, & Langevoort, 2013)

⁴² Provisional Measure (MP). 1.637/98

⁴³ (Mattos Filho, 1985)

Investment in negotiable securities can be characterized by equity interests, loans or speculative investments. These modalities differ in the origin of the remuneration of the securities or contracts. Securities or contracts characterized as equity interest depend on the performance of projects that generate revenues that sufficiently exceed expenses, so as to cover legal costs and remunerate the investors. Securities or loan contracts, in turn, are characterized by the issuer's obligation to remunerate the investors regardless of the performance of the project. In this case, investors may not receive the capital invested, should the issuer default⁴⁴. Speculative investments aim to provide returns on the invested capital based on future expectations, which may be the variance in the price of the security, the price of goods, currencies etc. The activities of those investors is concentrated on futures, option forwards and commodities markets etc. Negotiable securities entail rights and duties, and are issued by businesses and other entities in large quantities. The securities are traded on the stock exchange, enabling them to be bought and sold, and they may be registered on paper, in book form or electronically.

Investments in negotiable securities have the following characteristics^{45 46}:

- Normally contribute in cash (or monetarily assessable assets) so as to obtain part, proportionately to the investment made, of any earnings from the subject project of the investment;
- The project is managed by third parties with or without participation by the investor in the management;
- A negotiable security is built on the expectation of returns, unlike purchases for consumption. The profit will appear in cash or assets with a cash value (interest, dividends or any other earnings representing a real increase over the capital initially invested); the expectation of returns is one of the core features of a negotiable security. The returns must derive from the effort of the entrepreneur or third parties, never from the investor;
- The investor bears the financial risk, which may result in partial or total loss of the amount invested. On the other hand, the risks involved in the fate of the project must be extensively disclosed with total transparency, so that the investors can assess the risks involved;
- They are securities or collective investment agreements that must create participative rights, partnership or remuneration in the business or the collective enterprise;
- The offering must be public, with the price established by market forces. There is, therefore, an appeal to public savings.

Negotiable securities aim to finance, in a pulverized manner, private investments and by their nature they are collective investment agreements. To tap into collective savings (when offered on public markets), the State has an important role in ensuring equitable treatment among all players involved (suppliers, demanders, custodians, intermediaries and regulators), in addition to ensuring that true information is available to the players, especially that provided by the issuer of the securities. The aim of the State is to curtail situations that might lead to price manipulation by issuers or any other situations that might bar the participant players from access to true and immediate information (which must be made available within the appropriate time frame so that the players can factor it into their decision-making process). The CVM aims to ensure that the savings of the general public are protected⁴⁷.

THE CVM AND TWO EXAMPLES OF SECURITIES LINKED TO THE ENVIRONMENT

The CVM has manifested its opinion in two cases involving topics linked to socioenvironmental issues. The first case, in 2003, involved an opinion by the CVM in response to an enquiry from the City of São Paulo regarding the characterization of CEPACs - Certificates of Additional Construction Potential in the City of São Paulo - as negotiable securities. The second case, in 2009, involved the characterization of RCEs - Certified Emission Reductions, commonly known as "carbon credits", being considered as negotiable securities.

⁴⁴ (Mattos Filho, O conceito de valor mobiliário, 1985)

⁴⁵ (Mattos Filho, Direito dos Valores Mobiliários, 2015); (Mattos Filho, O conceito de valor mobiliário, 1985)

⁴⁶ (Comissão de Valores Mobiliários, CVM, 2003)

⁴⁷ (Mattos Filho, Direito dos Valores Mobiliários, 2015)

CEPACs are securities issued exclusively by municipalities that can be sold at auctions or used as payment for the construction work required for the development itself. CEPACs are funding instruments for financing public construction works over and above the limits established under current legislation, and involve additional construction potential. In São Paulo, Municipal Law 13.260 of 12/12/01 regulates CEPACs. CEPACs are to be sold at public auctions and can be freely traded⁴⁸. In 2003, the City of São Paulo consulted CVM about the possibility of considering CEPACs as negotiable securities. In the CVM's opinion, CEPACs were considered negotiable securities whose supervision lay within the remit of the CVM on account of three fundamental characteristics: they are publicly tradable, they are collective investment agreements and the investor expects to make a return. The return in this case would arise from the appreciation in the value of the area and in the demand for the securities by those intending to increase their construction potential in the area⁴⁹.

In CVM Administrative Proceeding RJ 2009/6346, the CVM indicated whether carbon credits could or could not be construed as negotiable securities, using for this purpose two concepts considered fundamental (by the CVM) in interpreting negotiable securities: if they are derivatives and/or if they are collective investment agreements. RCEs are related to the Clean Development Mechanism provided for in the Kyoto Protocol, by which the developed countries whose goal is to reduce greenhouse gases (the so-called Annex I countries) can purchase carbon credits for emissions avoided in developing countries (the so-called non-Annex I countries). In the opinion of the CVM, RCEs were not considered negotiable securities because: i) they were not considered derivatives, since the carbon credits are the assets themselves (there are no underlying assets); and (ii) they were not considered collective investments. The CVM took into account the provisions of article 2 of Law 6.385/76, which deals with instruments intended for investment in a collective enterprise with the expectation of making profits as a result of the efforts of the entrepreneur or third parties, never of the investor himself. Since RCEs have no links to the agents that effectively implemented the reductions (and, therefore, are mutually fungible), and as there is no on-going link between the buyer of the RCE and the agent that implemented the project that generated the reductions, the CVM concluded that RCEs could not be characterized as a collective investment. Also, in its opinion, it pointed out that RCEs are not intended to embody a financial investment as such, thus making it difficult to characterize them as negotiable securities⁵⁰.

These two opinions resulted in fundamental characteristics taken into account by the CVM regarding the essence of a negotiable security: whether it is a collective investment, with the expectation of return for the investor; and whether the security is a derivative (which would lead it to be characterized as a negotiable security). It should be pointed out that in a collective investment agreement, the same agreement is offered to a set of partners so that they take up the public offering, thus making them participants in a common endeavor⁵¹.

Thus it is clear that for CRAs to be considered negotiable securities by the CVM, among others elements they would have to be characterized as collective investment agreements embodying an expectation of returns for the investor. Given the manner in which they are configured nowadays in the NFC, it would be difficult to characterize them as a collective investment agreement. It is therefore reasonable to suppose that CRA derivatives could be designed in the sense of rendering the collective investment agreement viable.

Even if CRAs could be construed as negotiable securities, it should be pointed out that they would have to be financially attractive for investors. Thus it would be essential for investors to have at their disposal all available information for calculating their risk-return expectations. Besides these points, it is also important to stress that:

- The returns on the securities must be attractive when compared with investments of a similar risk; To that end, the design of the CRAs and their derivatives would have to be based not only on environmental regularization - specifically on the reduction in

⁴⁸ (Comissão de Valores Mobiliários, CVM, 2003)

⁴⁹ (Comissão de Valores Mobiliários, CVM, 2003)

⁵⁰ (Comissão de Valores Mobiliários, 2009)

⁵¹ (Mattos Filho, Direito dos Valores Mobiliários, 2015)

liabilities involving deficient Legal Reserve areas – but also as securities linked to the growth and expansion of native vegetation cover;

- There must be liquidity, in other words, a sufficient number of players and transactions for the market to remain competitive and so that investors can liquidate or swap their positions; Liquidity is also important so that the players can price their securities;
- There must be a secondary market so that investors can liquidate their positions;
- Transaction costs must not hinder the development of the market;
- Ownership rights must be clearly defined and no legal uncertainty must exist;
- The securities must be backed by underlying transactions and the latter must be monitored in a reliable and viable manner without substantially increasing the transaction costs.

In light of the what was discussed, and bearing in mind that CRAs are recent instruments of Brazilian environmental policy still in the early stages, the feasibility of their becoming negotiable securities under the current terms of the New Forest Code is diminished. This assessment is based on a series of reasons summarized below:

➤ **Returns must be attractive to investors**

If CRAs or their derivatives are to be interesting to investors in negotiable securities, they would have to be configured in a manner that extrapolates environmental regularization – specifically in reducing the liabilities tied to the deficit of Legal Reserve areas – linked to the growth and expansion of native vegetation cover.

The simulations carried out by the UFMG indicate that there will be an oversupply of CRAs on the domestic market. There are also uncertainties as to whether the potential market for CRAs would have a national or state scope since, generally speaking, LR set-offs must take place within the same biome or state. Furthermore, the CRA pricing model is still an unknown factor.

Another highlight is that legal enforcement of the NFC (penalties and sanctions for whoever fails to comply with the mandatory nature of LRs) is essential for determining the demanders (buyers) of CRAs.

➤ **There must be legal certainty as to the physical assets underlying the security**

CRAs are securities tied to an area of native vegetation surplus to the LR. The supplier of CRAs is legally responsible for preserving the area that gave rise to the security. Uncertainties exist as to how the area underlying the security would be monitored, as well as the penalties and sanctions on suppliers (or sellers of CRAs) who fail to maintain the physical vegetation underlying the CRA. From the point of view of the PRA, cancellation of the CRA as an off-set mechanism is possible and is provided for in the NFC. Nevertheless, from the investor's point of view, there is a lot of uncertainty regarding the fate of the amount originally invested in the CRA should it be canceled.

➤ **Transaction costs must not be too high**

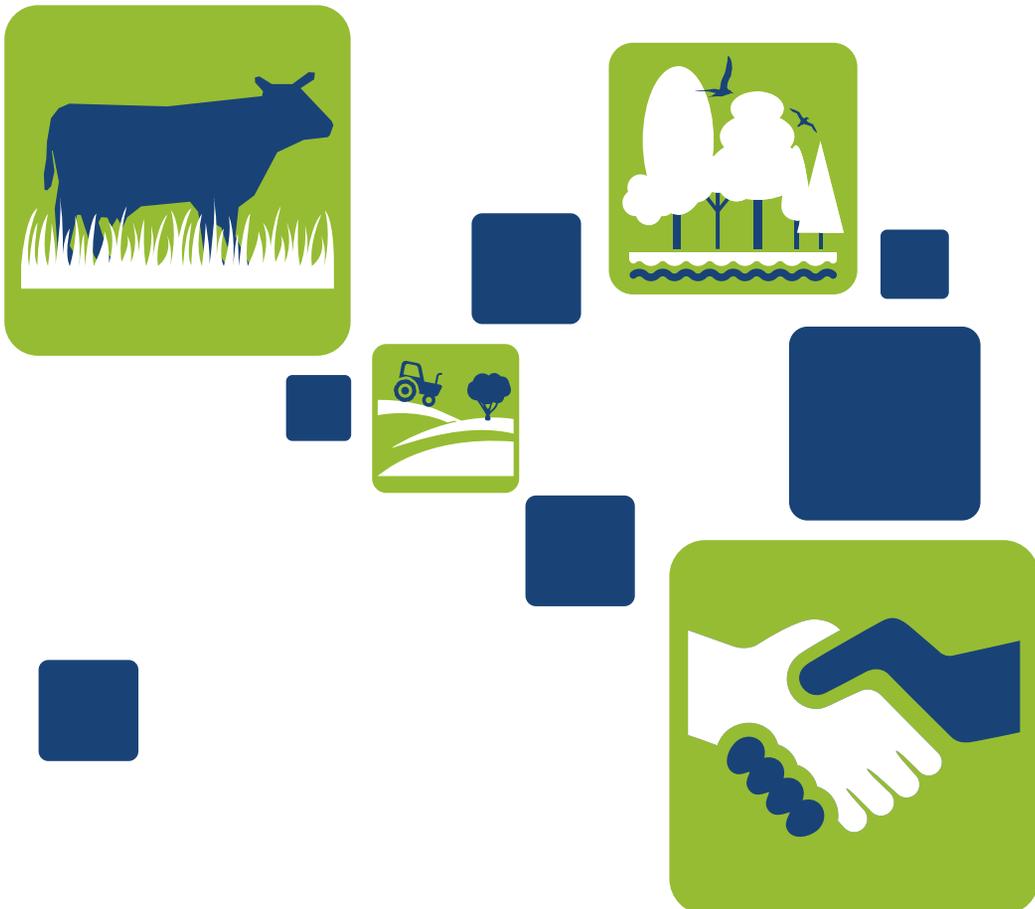
The NFC has made it very clear and has gone into detail on the phases of the process whereby the CRA is offered and demanded as set-off for LRs. It involves, among other aspects, registration on the deeds of the properties (supplier and demander), approval by the State Environmental Body (OEMA), registration on the CAR system (SICAR) AND registration by the OEMA on the exchange within 30 days from issuance of the CRA, among other elements. These phases add to the complexity of the process, especially if they involve different states (in the case of areas considered critical). The complexity of the process, allied with the uncertainty as to whether the OEMAs will respond quickly to requests for inspection, registration and monitoring so that the CRAs are issued, transferred and canceled, increase the transaction costs and the legal uncertainty on the investor's side.

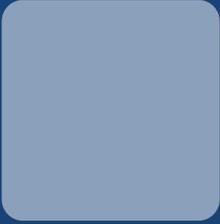
III. FUTURE IN-DEPTH STUDIES

There is no doubt that Brazil would stand to gain from attracting private capital to the forestry agenda. The NFC points to this possibility by having introduced the Environmental Reserve Units. Nevertheless, the uncertainties regarding the potential of CRAs for environmental regularization and as attractive assets for investors are enormous

CRAs depend on across-the-board implementation of the CAR, still in the set-up stage at state level. Below are some suggestions for more in-depth studies in the future regarding CRAs and their connections with the capital markets:

- Map the potential market for CRAs once the CAR has been fully implemented.
- Map the economic and legal fundamentals of a negotiable securities market for CRA-associated forest assets, including key elements for encouraging demand and supply on the part of the investors. Given the uncertainties surrounding the implementation of CRAs, this study did not go into depth on pricing mechanisms for any negotiable securities involving forest assets. Nevertheless, a study along those lines would help advance the forestry agenda in Brazil.







IV. FINAL CONSIDERATIONS

Brazil is the country with the world's second-largest area of forests – behind Russia – with 13% of the world's forests, and is the country with the largest area of tropical forest.

The major Brazilian forest biomes are the Amazon Rainforest and the Atlantic Forest, acknowledged for the enormous diversity they preserve. Both, especially the Atlantic Forest, have experienced a long process whereby their original areas have been converted for other uses, the highlight being agriculture and livestock farming and urban growth. Historically, the Brazilian economic development process has paid little regard to forests as economic assets, insofar as it has limited their value to their logging potential. Logging, however, has never been carried out in a sustainable manner that would ensure a continuous flow of riches and avoid the depletion of the stocks of this resource, and has resulted in significant losses of forested areas.

It is currently recognized that the value of forests far exceeds their logging potential, and that the sustainable exploitation of those other components of the value of forests requires reviewing the current economic development model in those regions where such forests predominate. Several initiatives in sustainable exploitation of timber resources are now in progress, especially in the Amazon, such as the plans for public forest concessions granted by the Brazilian Forestry Service (SFB), as well as low-impact forest stewardship plans certified by the Forest Stewardship Council (FSC). Nevertheless, what is still missing is economic development policies capable of fostering the sustainable exploitation of the other components of the value chain associated with the Brazilian forests.

Forest ecosystems produce a series of benefits, the so-called ecosystem services which, although essential for economic development, are not appropriately valued and, consequently, have not been taken into account in planning and in current economic models. These ecosystem services result in not only the offer of timber and non-timber products, but also in the regularization of natural processes such as those that determine the quality and quantity of water resources, the sequester of atmospheric carbon and the regularization of rainfall regimes, in addition to benefits of a cultural nature, especially tourism.

The issues of vegetation cover, biodiversity and agribusiness are intrinsically linked. Approximately 30% of the land on the planet is used for agriculture and livestock farming, which also consume 70% of fresh water resources. Under pressure from higher food consumption – especially in the emerging economies of southern Asia and Sub-Saharan Africa – and from changes in eating habits, especially higher consumption of protein, the tendency is for agribusiness to continue expanding over the next decades, whether through higher productivity per hectare, or through expansion of land use. A basic component of the Brazilian economy since colonial times, the sector – which includes a production chain ranging from the manufacture of fertilizers and seeds, to the commercialization of food goods – accounts for a quarter of Brazil's GDP.

Historically in Brazil, reconciling agribusiness activity with an increase in vegetation cover has been an economic challenge. There is a need to develop financial mechanisms that enable these two agendas to converge and which take account of environmental aspects in price formation mechanisms. CRAs represent a prime opportunity for attracting large-scale private capital to agribusiness, as well as to the forestry and Brazilian ecosystem services agenda. Other countries have advanced in agendas with similar challenges, reaching out to the financial markets as partners. This report has succinctly presented several international experiments, but it also recommends subsequent additional in-depth studies, so that the lessons learned in those other markets can provide inputs for the process of reflecting on the public policies involving this issue in Brazil.

As this report has tried to show, the challenges for CRAs (or their derivatives) to become negotiable securities are more than just a handful. They include the design of an economic and financial model capable of attracting investors, while reconciling economic and socioenvironmental objectives. But perhaps the most important challenge involves putting society firmly in the picture regarding the enforcement and implementation of Brazil's New Forest Code, defining and extensively disclosing the next steps while pushing ahead with the sanctions and penalties established in law for those in breach of it. This is a material aspect, since it directly affects the supply and demand for those securities.

On the eve of the COP21 in Paris – at which the issue of carbon pricing will be at the center of the international discussions – and bearing in mind the importance of the forests and agribusiness for Brazil, CRAs have become an item of relevance on the government's agenda, with the potential for contributing to the future economic development of Brazil.

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