



CASE STUDY REPORT

Opportunities and Barriers for the Creation of Habitat Banks as an Environmental Compensation Tool in Brazil

Authors:

Carolina Gueiros
Thais Stoppe
Bruno Arahna
Mariana Sarmiento
Julio Álvarez



Geonoma

TERRASOS



CONTENT

LIST OF CONTENT

5

1. Legal Framework for Environmental Compensation in Brazil

1.1. SNUC Law Compensation

1.2. Forest Code

1.2.1. Legal Reserve Compensation

1.2.2. Forest Reposition

1.3. Water Usage Compensation

1.4. Key aspects of environmental compensation tools in Brazil

1.5. Progress in the implementation of environmental compensation

1.5.1. Relevant Actors

1.5.2. Current state of implementation

1.5.2.1. SNUC Law Compensation

1.5.2.2. Legal Reserve Compensation

1.5.2.3. Forest Reposition

1.5.2.4. Water Usage Compensation

26

2. Establishing Habitat Banks in Brazil using existing environmental compensation tools

2.1. SNUC Law Compensation

2.2. Legal reserve compensation

2.2.1. Cotas de Reserva Ambiental (CRAs)

2.2.2. Lease of areas under environmental servitude or servidão ambiental

2.2.3. Donation of areas inside PAs and registration of areas owned by the same person.

2.3. Forest reposition

2.4. Water Usage Compensation

2.5. Conclusion and recommendations

35

3. References

This document was elaborated thanks to the support of Partnerships for Forests

LIST OF ACRONYMS

- APP** – Permanently Preserved Areas or *Áreas de Preservação Permanente*
- ASV** – Authorization for vegetation removal or *Autorização de Supressão de Vegetação*
- CA** – Amount of the Environmental Compensation or *Valor da Compensação Ambiental*
- CAR** – Rural Environmental Registry or *Cadastro Ambiental Rural*
- CCAF** – Federal Environmental Co mpensation Committee or *Comitê de Compensação Ambiental Federal*
- CRA** – Forest Reserve Credits or *Cotas de Reserva Ambiental*
- EIA** – Environmental Impact Assessment
- GI** – Degree of Impact or *Grau de Impacto*
- Ibama** – *Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis*
- ICMBio** – *Instituto Chico Mendes da Conservação e da Biodiversidade*
- PA** – Protected Area
- PRA** – Environmental Regularization Program or *Programa de Regularização Ambiental*
- PRADA** – Project for the Recovery of Degraded and/or Altered Areas or *Projeto de Recuperação de Áreas Degradadas e/ou Alteradas*
- RL** – Legal Reserve or *Reserva Legal*
- SEMA** – *Secretaria Estadual de Meio Ambiente*
- SNUC** – National System of Protected Areas Law or *Sistema Nacional de Unidades de Conservação*
- UNFCCC** – United Nations Framework Convention on Climate Change
- VR** – Reference Value or *Valor de Referência*

ACRONYMS

LIST OF FIGURES

- Figure 1. Terrestrial Protected Areas in Brazil.
- Figure 2. Legal Reserve Compensation rules.
- Figure 3. Example of CAR.
- Figure 4. Water collection implementation in Brazil.
- Figure 5. Map of priority areas for restoration in São Paulo.

LIST OF TABLES

- Table 1. Legal Reserve Rule
- Table 2. Summary of forest reposition rules by state
- Table 3. Types of environmental compensation and key aspects
- Table 4. Relevant actors involved in environmental compensation and their key responsibilities
- Table 5. Deficit and Excess of Legal Reserve Areas in Brazilian States
- Table 6. Key elements for accommodating the Terrasos habitat banks model in a mandatory environmental compensation scheme.



1. Legal Framework for Environmental Compensation in Brazil

Environmental compensation is an action (service, financial contribution, duty to offset, etc.) that makes a reparation for the adverse environmental impacts of activities that cannot be avoided, remedied, or mitigated. The obligation to compensate for environmental harm usually consists of measures to correct, offset, or attenuate the loss of the natural resource affected, and it exists in many countries (Sarmiento and López, 2015).

In Brazilian law, there are **four main instances** of environmental compensation:

- **National System of Protected Areas Law or Sistema Nacional de Unidades de Conservação (SNUC) Law environmental compensation.** The SNUC Law compensation is required in the context of licensing procedures for activities and projects that pose significant environmental harm. It requires that project owners make a financial contribution in support of Protected Areas (PAs).
- **Legal Reserve Compensation.** The Forest Code requires landowners and landholders whose properties do not comply with the minimum requirements of native vegetation cover to restore or compensate the deficit with similar areas elsewhere.
- **Forest Reposition.** In another instance of compensation required by the Forest Code, holders of an authorization for vegetation removal (Autorização de Supressão de Vegetação - ASV) must compensate by restoring areas elsewhere.
- **Water Usage Compensation.** The National Policy for Water Resources or Política Nacional de Recursos Hídricos establishes the payment of a tariff that acts as compensation for water usage.

The following sections will describe how these obligations to compensate for environmental harm are conceived under Brazilian law and their current implementation status.

1.1. SNUC Law Compensation

Under Brazilian law, the main obligation to compensate for environmental harm is imposed by art. 36 of the National System of Protected Areas Law or *Sistema Nacional de Unidades de Conservação* (SNUC) Law (Federal Law No. 9.985/2000). The SNUC Law determines that one of the conditions for the environmental licensing of projects that result in significant adverse environmental impacts that cannot be mitigated¹ is that the project owner must financially support the implementation and maintenance of PAs in Brazil. This obligation is known as compensation for significant environmental impact or environmental compensation.

All potentially polluting activities, as defined by regulation², are subject to environmental licensing. Municipal, state, or the federal environmental agencies may have competence over the licensing procedure, depending on the scale of environmental impact posed by the project. Licensing is conducted by the municipality when the impact is deemed local (as defined by state legislation), and by the federal environmental agency (*Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis* – Ibama) when the impact crosses state borders or is in federal PAs. In all other cases, the licensing process is conducted by the state environmental agencies, usually named *Secretarias Estaduais de Meio Ambiente* (SEMAs)³. The rules described

in this section apply to federal environmental compensations originating from licensing procedures under Ibama’s competence. Projects licensed by state and municipal environmental agencies must follow the general rules laid out by federal law, as well as the rules imposed by local laws and regulations⁴.

The degree or severity of the negative impacts posed by a project is determined after an environmental impact assessment (EIA) is conducted. The EIA must contain the information needed for the environmental agency in charge of licensing to be able to calculate the project’s Degree of Impact or *Grau de Impacto* (GI) on ecosystems. Federal Decree No. 6.848/2009 determines that the GI is composed of: the project’s impacts on biodiversity in its area of direct and indirect influence; the project’s impact on the Priority Area for Biodiversity Conservation, Sustainable use, and Benefit Sharing in which it is located⁵; and the project’s impact on protected areas and their buffer zones.

According to Federal Decree No. 6.848/2009, the environmental compensation is calculated by using the GI and the project’s Reference Value, and has a ceiling of 0.5% of the latter:

CA = VR x GI, WHERE:

CA = Amount (in R\$) of the Environmental Compensation or *Valor da Compensação Ambiental*;

VR = Reference Value or *Valor de Referência*, equals the sum of the investments needed to implement the project⁶.

1. Despite not being explicitly required by law, environmental agencies in Brazil generally apply the mitigation hierarchy (i.e. compensation is only applied when prevention, mitigation and correction are not possible). Hence, most of the conditions imposed by agencies aim to prevent and/or mitigate adverse environmental impacts. The conditions should be directly related to the negative impacts diagnosed in the environmental assessments, and cannot be implemented in areas outside the zone of direct and indirect impacts identified in the environmental studies.

2. Federal Law No. 6.938/1981 ([National Environmental Policy](#)).

3. Supplementary Law No. 140/2011.

4. For an analysis of the environmental compensation rules issued by different states, see SALVADOR, Aline Valéria Arcanjo et al. (org. Silvia Capelli), *A compensação ambiental*

do SNUC; *manual de atuação do Ministério Público*, 1a ed., Belo Horizonte: ABRAMPA, 2020, available at <https://abrampa.org.br/wp-content/uploads/2023/09/Manual-de-Compensacao-Ambiental-SNUC.pdf>.

5. The Priority Areas for Biodiversity are periodically identified by an ordinance of the Brazilian Environmental Ministry. The latest update of the Priority Areas was concluded in 2018. Maps and more details can be found in <https://www.gov.br/mma/pt-br/assuntos/ecossistemas/conservacao-1/areas-prioritarias/2a-atualizacao-das-areas-prioritarias-para-conservacao-da-biodiversidade-2018>.

6. Excluding investments related to plans, projects and programs required in the environmental licensing process to mitigate impacts caused by the project, as well as the project’s financing costs, including warranties, insurance policies and premiums.

Art. 36 of the SNUC Law

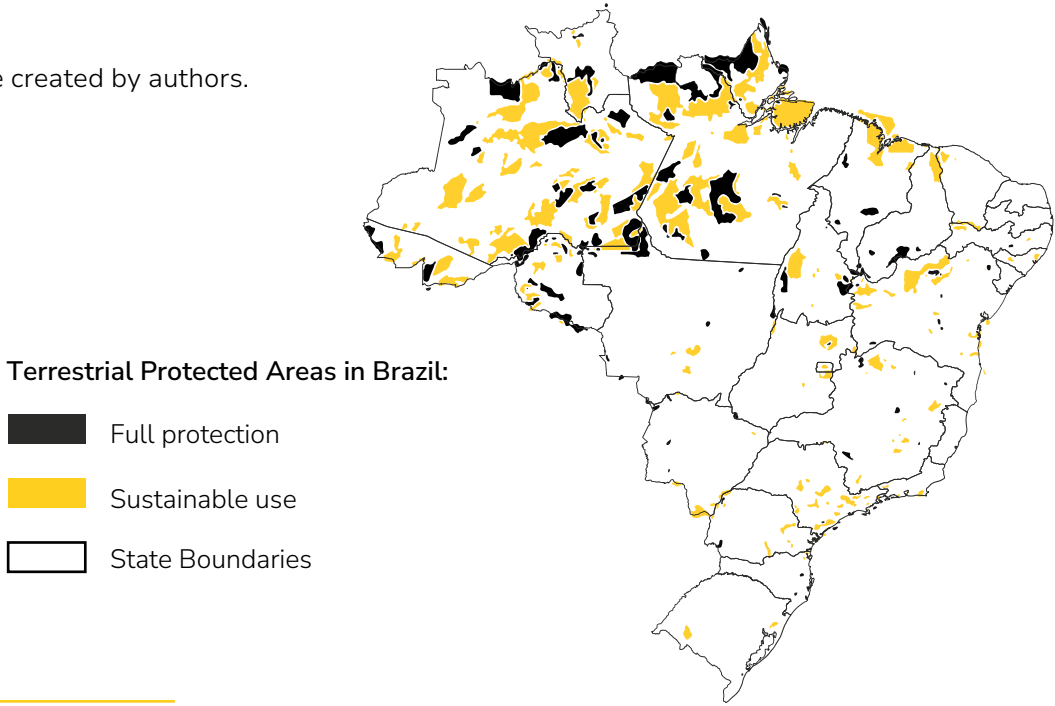
Determines that the proceeds from the environmental compensation payments must be invested primarily in federal, state, and municipal “full protection” PAs, and in “sustainable use” PAs if the project directly affects them⁷. Art. 33 of Federal Decree 4.340/2002 lists five activities where the environmental compensation funds should be spent, in order of priority⁸:

- Land regularization and land demarcation;
- Preparation, review or implementation of a management plan for the PA;
- Purchase of goods and services for implementing, managing, monitoring and protecting the area and its buffer zone;
- Conducting studies for the creation of a new PA;
- Developing research to improve the management of the PA and its buffer zone.

The Federal Environmental Compensation Committee or *Comitê de Compensação Ambiental Federal* (CCAF) is responsible for the allocation of federal environmental compensation funds. It is made up of representatives from the Environmental Ministry, the federal environmental agency (Ibama), and the and the *Instituto Chico Mendes da Conservação e da Biodiversidade* (ICMBio), which is the federal agency in charge of managing federal PAs.

Figure 1. Terrestrial Protected Areas in Brazil.

Source: Figure created by authors.



7. The SNUC law created two categories of protected areas: full protection or *proteção integral*, and sustainable use or *desenvolvimento sustentável*. The difference between the two categories is that, in general, the direct use of natural resources and the permanence of residents is prohibited in full protection PAs. In sustainable use PAs, in general, the law allows for the sustainable use of the natural resources in the area, as well as for the permanence of residents.

8. Art. 33’s single paragraph creates an exception to this list. In the cases of a Private Natural Heritage Reserve, Natural Monument, Wildlife Refuge, Area of Relevant Ecological Interest and Environmental Protection Area, where ownership and control of the land are not held by the government, compensation resources may only fund the following activities: (i) preparation of the area’s management plan or implementation of activities to protect the area; (ii) carrying out research for managing the protected area, excluding the purchase of permanent goods and equipment; (iii) implementation of environmental education programs; and (iv) financing of economic feasibility studies for the sustainable use of natural resources in the protected area.

1.2. Forest Code

Federal Law No. 12,651/2012

Also known as the “Forest Code”, establishes the **general rules for the use and protection of native vegetation in Brazil**, including forestry activities, the supply of raw forest materials, control of the origin of forest products, the control and prevention of forest fires, and the provision of economic and financial instruments to implement the law.

The Forest Code contains **two mechanisms** of environmental compensation:

the legal reserve compensation, applicable when a rural property does not preserve the minimum percentage of native vegetation required by law; and forest reposition, related to an authorization for vegetation removal.

The Forest Code allows for the sustainable management of RL vegetation for commercial purposes, subject to the authorization of the competent authority¹², and as long as the landowner or landholder: does not deprive the vegetation cover of its characteristics, does not make the conservation of native vegetation in the area impossible, ensures the maintenance of species diversity, and manages the introduction of exotic species along with measures that favor the regeneration of native species (Art. 22).

If a rural property does not have the mandatory percentage of native vegetation (that is, if there was deforestation beyond what is legally sanctioned), the owner or holder needs to regularize the property's

situation before the state environmental agency. This is an obligation that falls on the landowner or landholder. Although they can hire third parties to conduct the works needed to meet the Forest Code requirements, the landowner or landholder is ultimately responsible for all regularization and compensation measures. For the environmental regularization to take place, two main aspects must be considered: the RL situation on 22 July 2008¹³ and the size of the property in fiscal modules¹⁴. Different rules apply depending on these factors:

1.2.1. Legal Reserve Compensation

The Forest Code created two main obligations regarding the protection of native vegetation, applicable to all rural private properties in the country⁹:

the Permanently Preserved Areas or *Áreas de Preservação Permanente* (APPs) and the Legal Reserve or *Reserva Legal* (RL).

The APPs are protected areas inside rural and urban properties that perform relevant environmental functions such as the preservation of water resources, the landscape, geological stability, biodiversity, the genetic flux of fauna and flora, soil regulation, or

the well-being of human populations (Art. 3o, II)¹⁰. In general, landowners must preserve the native vegetation in APPs within their properties, and if the areas were deforested, they must be restored, without the possibility of compensating with similar areas elsewhere. The RL, on the other hand, can be compensated in some cases.

The RL obligation requires landowners to keep a percentage of their rural property covered by native vegetation, creating a limit of how much deforestation landowners and landholders can legally carry out. The percentage of the rural properties that must keep its native forest cover varies depending on the biome and the region where they are located:

Table 1. Legal Reserve Rule.

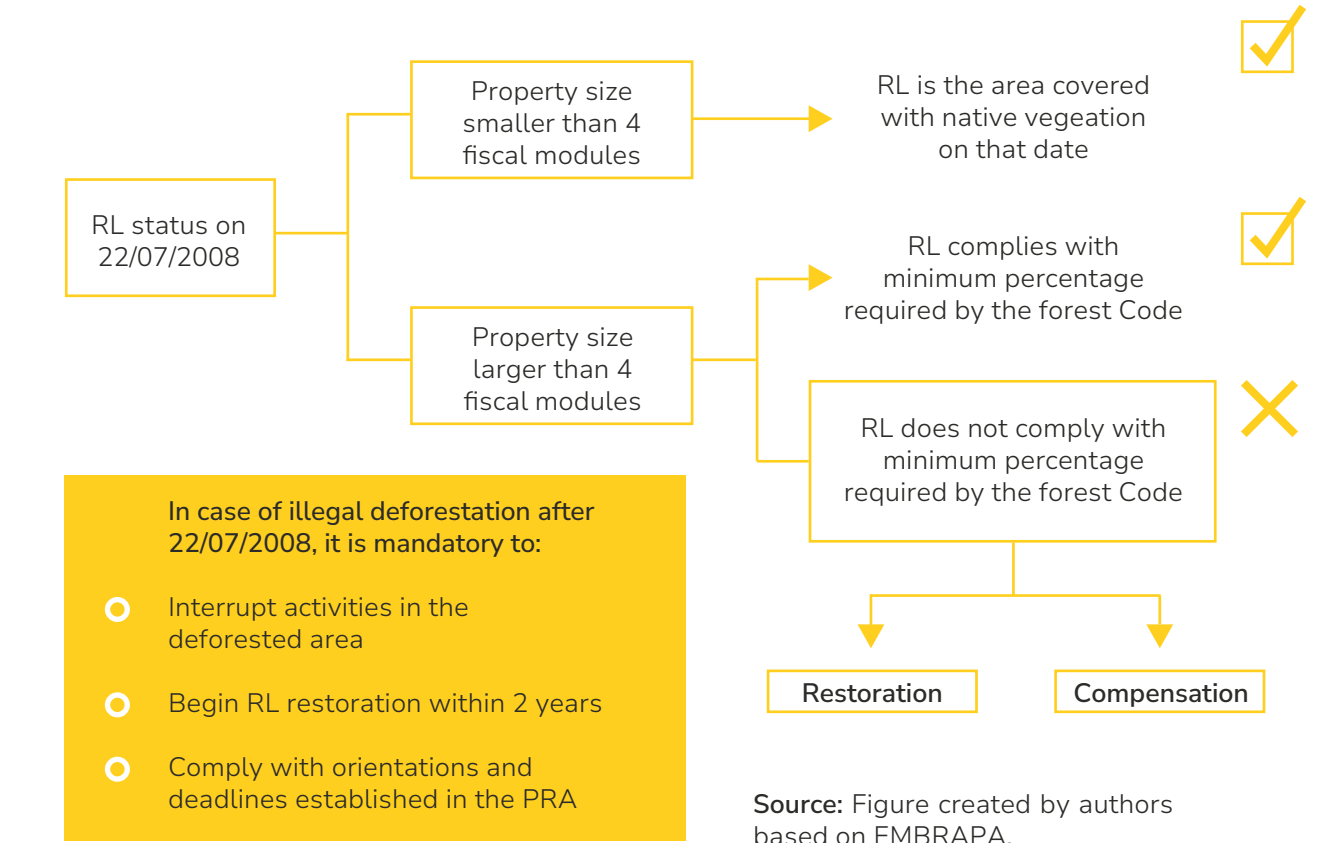
Location	Legal Amazon or Amazônia Legal ¹¹			Rest of Brazil
Biome	Amazon	Cerrado	Campo Gerais	Any
Percentages of native vegetation	80%	35%	20%	20%

9. In the APPs case, it is applicable to urban properties as well.

10. Some examples of the APPs (Art. 4) created by the Forest Code are: marginal areas of water bodies (rivers, streams, lakes, reservoirs, etc.) and springs; areas on the top of mountains and hills, areas on the sides of steep slopes, wetlands, and sandbanks.

11. The Legal Amazon is an area that includes the entire territory of the states of Acre, Amapá, Amazonas, Mato Grosso, Pará, Rondônia, Roraima, Tocantins, and part of Maranhão.

Figure 2. Legal Reserve Compensation rules.



Source: Figure created by authors based on EMBRAPA.

12. The economic use of the RL depends on licensing by the competent federal, state or municipal agency, upon prior approval of a Sustainable Forest Management Plan or Plano de Manejo Florestal Sustentável (PMFS) that describes the conduction, exploration, forest replacement and management techniques the landowner intends to apply in the RL, which must be compatible with the varied ecosystems existing in the forest area (Art. 31).

13. 22 July 2008 is the date of publication of Federal Decree No. 6,514/2008. The Decree created environmental infractions and administrative sanctions, and it regulated the Environmental Crimes Law (Federal Law 9,605/1998).

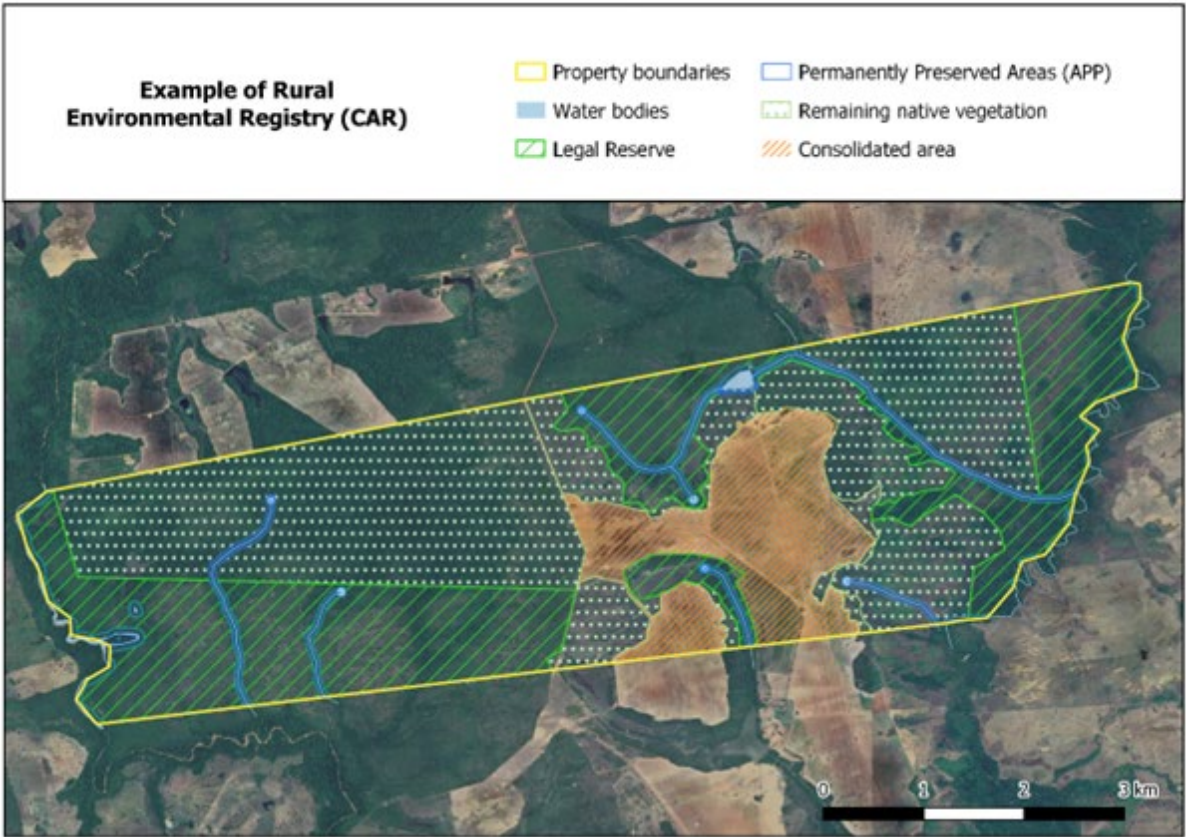
14. The size of rural properties in Brazil is legally defined by land units measured in hectares called fiscal modules (FMs), which have different sizes in different municipalities. Small properties are those smaller or equal to 4 FMs, medium properties are those between 4 and 15 FMs, and large properties are bigger than 15 FMs. The fiscal module may vary from 5 hectares up to 110 hectares. In the South and Southeast regions, the average size is from 5 to 35 hectares, whilst in the Amazon region, it is usually from 70 to 110 hectares. See EMBRAPA's fiscal module calculator: <https://www.embrapa.br/codigo-florestal/area-de-reserva-legal-art/modulo-fiscal>.

Landowners who need to regularize their RL must join the Environmental Regularization Program or *Programa de Regularização Ambiental* (PRA). Federal Decree No. 7.830/2012 lays out the general rules of the PRA, leaving it up to the states to issue detailed rules to implement the program in their territories¹⁵, and to create specific standards that meet their own territorial, climatic, historical, cultural, economic and social characteristics.

The program's implementation happens in **five stages**:

- **CAR Registration:** the first step of the environmental regularization process is to register the property or possession in the Rural Environmental Registry or *Cadastro Ambiental Rural* (CAR). The landholder or landowner presents a map of their land to the state environmental agency, containing the geographic coordinates, along with the location of the remaining native vegetation, the APPs, the restricted use areas¹⁶, the consolidated areas¹⁷, and the RL.

Figure 3. Example of CAR.



Source: Figure created by authors.

¹⁵. There is a National System of Rural Environmental Registry (*Sistema Nacional de Cadastro Ambiental Rural – SICAR*) and the states can implement their own registries, provided that there is interoperability.

¹⁶. Restricted Use Areas or *Áreas de Uso Restrito* are wetlands (*pantaneais*), swamp plains (*planícies pantaneiras*), and areas with a slope between 25° and 45°.

¹⁷. Consolidated areas or *Áreas Consolidadas* are areas within rural properties that were occupied by buildings, improvements, agricultural or ranching activities prior to 22 July 2008.

- **CAR Validation:** the state environmental agency will check the information and maps provided by the landowner or landholder (usually through remote sensing) to attest conformity or nonconformity with the Forest Code rules. During this stage, the agency can request further information and/or rectifications if inconsistencies are found. At the end of this stage, the state agency will have identified any areas within the property that have a native vegetation deficit.
- **PRADA submission:** After the CAR has been validated, landholders or landowners whose properties have a native vegetation deficit in their APP, RL, and/or restricted use areas can request to join the PRA and proceed with their environmental regularization. To join the PRA, they must submit a Project for the Recovery of Degraded and/or Altered Areas or *Projeto de Recuperação de Áreas Degradadas e/ou Alteradas* (PRADA) to the state environmental agency, where they detail how they intend to conform with Forest Code rules. The options are: to promote the natural regeneration of the native vegetation; to restore the area by planting native and/or exotic species as allowed by law; and, in the case of the RL, to compensate the deficit with similar areas of the same size if deforestation occurred before 22 July 2008.
- **Signing the Term of Commitment:** once the PRADA is approved by the state environmental agency, the landholder or landowner signs a Term of Commitment or *Termo de Compromisso*, which is a legally binding agreement with the agency, where they commit to execute the PRADA within a certain timeframe (maximum of 20 years).
- **Monitoring:** the state environmental agency will periodically monitor the PRADA's execution. The landowner or landholder that, on 22 July 2008, had a property with the RL area in nonconformity with the Forest Code percentages of native vegetation has the option to compensate the deficit with a similar area. Properties that were illegally

The landowner or landholder that, on 22 July 2008, had a property with the RL area in nonconformity with the Forest Code percentages of native vegetation has the option to compensate the deficit with a similar area. Properties that were illegally deforested after that date are not eligible for RL compensation and must reach conformity by restoring the RL area.

The RL compensation consists of allocating an area outside of the rural property to be preserved elsewhere. The area must be equivalent to the original RL area in size and ecological characteristics. It must be in the same biome, and usually in the same state. If the area is in a different state, then it must have been identified as a priority area by the federal government or by other state governments. The RL compensation can be done in four ways:

- By purchasing Forest Reserve Credits or *Cotas de Reserva Ambiental* (CRA). CRAs are titles that represent an area of native vegetation in a property that can be used to compensate for the RL deficit in another. Each credit equals 1 hectare, and they can be created by rural landowners who have an excess of RL to negotiate with others with a deficit.
- By leasing areas under an environmental easement or *servidão ambiental* or the RL regimes.
- By donating an area inside a PA of public domain that has not concluded its land regularization process¹⁸.
- By registering another area equivalent to the area in deficit, and in excess of the RL in another property, owned by the same person or acquired from a third-party, in the same biome, with restored native vegetation.

¹⁸. PAs may be created by law or decree, but the private properties located inside shall be expropriated in lawsuits, which can take many years to be concluded. As this land regularization is one of the biggest challenges for protected areas, there are incentives for voluntary donation of properties to the government.

1.2.2. Forest Reposition

The Forest Code determines that anyone who holds an authorization for vegetation removal (ASV), or the use of timber forest products, is required to carry out a forest reposition. Preferably, the obligation shall be complied with through the planting of native species in the same state where the vegetation was removed¹⁹. Forest repositions is, therefore, a compensation for legal deforestation.

When the vegetation removal’s impact is in areas protected due to their environmental function (APPs), the compensation shall consist of restoration of APPs in the same water sub-basin, preferably on headwaters²⁰.

The forest reposition is usually required by state environmental agencies, which are the default environmental licensing authorities. For that reason, the specific rules for forest reposition vary by state. In general, the means of compensation allowed are:

- The development of a restoration project;
- The purchase of forest reposition credits (or equivalent), that prove that a restoration project was executed;
- Payment of an amount in money to an environmental fund; or
- The development of a conservation project.

The direct execution of a project must be formalized by the signing of a Term of Commitment. Forest reposition credits²¹ are developed by a third-party and validated by the environmental agency. Anyone who plants a forest can request the issuance of forest reposition credits , which will be issued based on the estimated wood stock.

The funds collected by the environmental fund may or may not be bound for restoration projects²². The parameters for compensation may be based on

wood stock (measured in metric cubes of wood) or the ecological importance and size of the area. The compensation ratio varies from state to state and depends on the circumstances, but the wood stock parameter is usually a fixed amount that underestimates the actual biomass observed. As an example, the federal rule is that any planting for native forest restoration is assumed to have at least 200m³ of wood per hectare; whereas the removal of a native forest in the Atlantic Rainforest is considered to have only 20 m³/ha. This means that the federal rule results in an undercompensation of at least 10 times.

The Atlantic Rainforest biome, however, is subject to special rules for forest reposition laid out by **Federal Law No. 11,428/2006**. The law restricts the conditions in which vegetation removal is authorized and the compensation measures required in that biome. For all vegetation removal in the Atlantic Rainforest (except for areas in early stages of regeneration), the project owner shall allocate an area equivalent in size, with the same ecological characteristics, in the same water basin (when possible, in the same sub-basin), and when the removal is in an urban area, in the same municipality. As an alternative to this conservation requirement, regulation also allows for the compensation to be completed by the donation of an area located inside a PA that is pending expropriation in the same water basin and state²³ . Only when areas for conservation and donation are proven to be unavailable can the licensing agency demand the forest reposition²⁴.

In the Atlantic Rainforest, forest reposition trough planting is subsidiary to the allocation and protection of an equivalent area, whereas in all other areas in Brazil, **restoration activities are the primary means** of forest reposition. Therefore, the existence of **the Atlantic Rainforest biome in the state is a factor that influences the state requirements** for forest reposition.

Table 2. Summary of forest reposition rules by state

State	Means of compensation	Parameter	Regulation
Federal level	Purchase of forest reposition credits.	Wood stock	Resolution No. 6/2006 of the Ministry of the Environment.
Acre	Develop restoration project; or Purchase forest reposition credits.	Wood stock (not detailed)	State Decree No. 9,670/2018
Alagoas	Develop restoration project; or Develop conservation project; or Purchase forest reposition credits; or Payment to the state fund.	Wood stock	State Law No. 5,854/1996
Amapá	Develop restoration project.	Wood stock	State Law No. 702/2002
Amazonas	Develop restoration project; or Purchase forest reposition credits; or Payment to the state fund.	Wood stock (not detailed)	State Law No. 3,789/2012
Bahia	Develop restoration project; or Purchase forest reposition credits; or Payment to the state fund.	Wood stock (not detailed)	State Decree No. 18,140/2018
Ceará	Develop restoration project; or Payment to the state fund.	Wood stock (not detailed)	SEMACE Normative Ruling No. 01/2000
Distrito Federal	Develop restoration project; or Develop conservation project; or Purchase forest reposition credits; or Payment to the state fund.	Parameters based on ecological importance and wood stock.	State Decree No. 39,469/2018
Espírito Santo	Payment to the state fund.	Wood stock	State Decree No. 4,124-N/1997
Goiás	Develop restoration project; or	Wood stock ²⁵	State Law No. 21,231/2022

19. Article 33 of Federal Law No. 12,651/2012.

20. Article 5 of CONAMA Resolution No. 369/2006.

21. There are no requirements regarding location, species, or priority areas. Exotic species may be used in most states, but their wood stock is assumed to be lower (for example, 150 m³/ha at the federal level).

22. Cases where allocation to reforestation is binding: Amazonas, Distrito Federal, Goiás, Minas Gerais, Pernambuco and Roraima.

23. Article 26 of Federal Decree No. 6,660/2008.

24. Article 17 of Federal Law No. 11,428/2006. Despite this rule, states often prefer restoration over conservation projects, as detailed further in this report.

25. Goiás created a parallel instrument to forest reposition (applicable to the use of forest materials), named forest compensation (for the cases of authorization of vegetation removal). Whereas forest reposition in Goiás is based on wood stock, forest compensation requires the restoration of an equivalent area or compensation. However, the law exempts activities that convert forests to farming and breeding from forest compensation, which are the main drivers of deforestation in the state.

Table 2. Summary of forest reposition rules by state

State	Means of compensation	Parameter	Regulation
Federal level	Purchase of forest reposition credits.	Wood stock	Resolution No. 6/2006 of the Ministry of the Environment.
Maranhão	Develop restoration project; or Develop conservation project; or Purchase forest reposition credits; or Payment to the state fund.	Wood stock	SEMA Ordinance No. 380/2023
Mato Grosso	Develop restoration project; or Purchase forest reposition credits; or Payment to the state fund.	Wood stock	State Decree No. 1,313/2022
Mato Grosso do Sul	Development of restoration project; or Purchase of forest reposition credits.	Wood stock	State Law No. 4,163/2012
Minas Gerais	Develop restoration project; or Develop conservation project; or Purchase forest reposition credits; or Payment to the state fund.	Wood stock	Joint Resolution IEF/ SEMAD No. 1,914/2013
Pará	Develop restoration project; or Purchase forest reposition credits; or Payment to the state fund.	Wood stock	State Decree No. 174/2007
Paraíba	Develop restoration project; or Develop conservation project; or Purchase forest reposition credits; or Payment to the state fund.	Wood stock	State Decree No. 24,416/2003
Paraná	Develop restoration project; or Develop conservation project; or	Wood stock	State Decree No. 1,940/1996
Pernambuco	Develop restoration project; or Payment to the state fund.	Wood stock	CPRH Normative Ruling No. 07/2006
Piauí	Develop restoration project; or Purchase forest reposition credits; or Payment to the state fund.	Wood stock	SEMAR Normative Ruling No. 5/2020
Rio de Janeiro	Develop restoration project; Develop conservation project; or Payment to the state fund.	Parameters based on ecological importance.	INEA Resolution No. 89/2014 State Law No. 6,572/2013

Table 2. Summary of forest reposition rules by state

State	Means of compensation	Parameter	Regulation
Federal level	Purchase of forest reposition credits.	Wood stock	Resolution No. 6/2006 of the Ministry of the Environment.
Rio Grande do Norte	Develop restoration project; or Payment to an accredited association.	Wood stock	State Supplementary Law No. 272/2004
Rio Grande do Sul	Develop restoration project; or Develop conservation project; or Payment to the state fund.	Dimension of the area or wood stock	SEMA Normative Ruling No. 01/2018
Rondônia	Develop restoration project; or Purchase forest reposition credits.	Wood stock	SEDAM Ordinance No. 271/2022
Roraima	Develop restoration project; or Develop conservation project; or Payment to the state fund.	Wood stock	State Law No. 1,304/2019
Santa Catarina	Develop restoration project; or Purchase forest reposition credits.	For PPA, parameters are based on ecological importance. For others, parameters based on wood stock.	IMA Normative Rulings No. 46/2007 and 24/2018 IMA Ordinance No. 43/2021
São Paulo	Develop restoration project; or Develop conservation project.	Parameters based on ecological importance.	SEMIL Resolution No. 02/2024
Sergipe	N/A	N/A	No specific regulation
Tocantins	Develop restoration project; or Purchase forest reposition credits.	Wood stock	COEMA Resolution No. 74/2017

The most common parameter used by states is **wood stock**, because the forest reposition mechanism follows the logic of maintaining the supply of raw forest materials, overlooking the other ecosystem services provided by native forests. Only São Paulo, Rio de Janeiro, Rio Grande do Sul and Santa Catarina require that native species be used for compensating for the removal of native vegetation (CPI, 2021). In all other states, exotic species may be used for compensation. The states of São Paulo, Rio de Janeiro, and Distrito Federal stand out as the only ones that consider the ecological importance of the vegetation removed as a parameter for forest reposition. They adopt the principle of “no net loss of vegetation” (CPI, 2021).

In Rio de Janeiro, a factor is assigned to the type of vegetation and its state of conservation, which is multiplied by the factor assigned to the activity’s environmental impact. São Paulo and Distrito Federal prepared a map of priority areas for restoration (divided in categories low, medium, high and very high), so that the size of the area deforested is multiplied by a factor depending on

the location of the vegetation removed and the location of the restoration. For example, in São Paulo, the removal of vegetation in a medium state of regeneration located in a high priority area, must be compensated in the proportion 1:2.5 – if the compensation is carried out in a lower priority area, a percentage is added.

To implement this rule, the São Paulo’s environmental agency promotes the Springs Program or *Programa Nascentes*²⁶, which includes a roster of restoration projects submitted by companies and landowners and approved by the agency. When a project developer needs to carry out a compensation, they can choose to finance one of these projects. There is no bank for conservation areas.

In the State of Rio de Janeiro, there is a Public Bank for Restoration Areas (Banpar)²⁷ to facilitate restoration projects, related or not to forest reposition obligations. The initiative is less successful than in São Paulo. According to publicly available information, only 30 areas were registered, most of which had not been restored²⁸.

1.3. Water Usage Compensation

The National Policy for Water Resources (Federal Law No. 9,433/1997) establishes the collection of a tariff for the use of water resources authorized by a concession. The tariff characterizes water as an economic good and incentivizes its rational use, financing programs from the Water Resources Plan . The National Council of Water Resources Resolution No. 48/2005 further requires that the resources be used to encourage cleaning and reusing water, as well as the conservation, protection and recovery of water resources, especially flooded areas and riparian forests through compensation and incentives to users.

Each water agency establishes an amount to be charged. It is usually a few cents of reais per

metric cube of water and it can vary depending on the use (for example, for industry or for drinkable water supply). These funds are used by the water agency to sponsor studies, programs, projects and works included in the Water Resources Plan²⁹ that benefit the public, the quality, quantity and the flow rate of a water body (Amorim, 2022). The amount collected is used for improving governance, monitoring water quality, controlling industrial pollution, restoring riparian forests and executing construction works. The projects must be approved by the Water Resources Plan, carried out in the same river basin where the water is used and be directly related to the improvement of water quality and/or quantity.

1.4. Key aspects of environmental compensation tools in Brazil

Table 3 summarizes the key aspects of the four types of environmental compensation in Brazil.

Table 3. Types of environmental compensation and key aspects

	SNUC Law compensation	Forest Reposition	Legal Reserve Compensation	Water usage
Legal requirement	SNUC Law Federal Decree n. 6.848/2009 Federal Decree n. 4.340/2002	Forest Code and state regulations	Forest Code and state regulations	National Policy for Water Resources
Compensation measures required by law	Payment of financial compensation to support PAs	Develop or support a conservation or restoration project	Purchase of CRAs, lease of equivalent area, donation of area inside PA, or registration of equivalent restored area	Payment of tariff to fund programs listed in the Water Resources Plan
Compensation criteria	GI and VR	Usually, wood stock consumed	Size and location of area with RL deficit	Amount of water consumed and purpose of consumption
Projects or activities required to compensate	Projects posing significant adverse environmental impact	Projects that remove native vegetation or use forest materials	Properties in noncompliance with minimum percentages of forest cover	Use of water resources in a body of water where the compensation is implemented
	Licensing agency decides the amount of the compensation, CCAF and state and municipal equivalents decide on how the compensation funds will be allocated	Licensing agency	State environmental agencies	Water agency
Timing of compensation decision	Once the Installation License (LI) is issued (once the project receives authorization to be implemented) ³⁰	When ASV is issued	When Term of Commitment is signed	Yearly

30. In Brazil, most environmental licensing procedures for activities with a significant environmental impact follow a three-step approach, where three subsequent environmental licenses are issued by the competent agency, once the conditions of the previous licenses are fulfilled by the project owner:

Provisional License or Licença Prévia (LP): the LP is the first environmental license to be issued. It approves the project’s location and concept, activity or works that are in the preliminary stages of planning. It also attests to the project’s environmental viability, establishing basic conditions that must be met by the project owner before she can fully implement the project.

Installation License or Licença de Instalação (LI): The LI follows the LP, and it authorizes the project’s implementation, according to the with the specifications contained in the plans that were reviewed by the environmental agency. The LP sets a schedule for implementing mitigating measures and environmental control systems.

Operation License or Licença de Operação (LO): The LO authorizes the project’s operation. It also attests to the project’s compliance with the environmental control measures and conditions determined in the previous licenses.

26. Information available at <https://semil.sp.gov.br/sma/programanascentes/>.

27. Created by INEA Resolution No. 140/2016.

28. Available at: <https://florestasrj.wixsite.com/hotsite/banpar>.

29. The Water Resources Plan or *Plano de Recursos Hídricos* is a master plan to guide the management of water resources in the long term. A Water Resources Plan is required for the whole country, for each State and by water basin.

1.5. Progress in the implementation of environmental compensation

1.5.1. Relevant Actors

The implementation of environmental compensation in Brazil depends on three main categories of actors: (i) public entities, which determine and/or approve the appropriate compensation measures, enforce the requirements and, where applicable, use the collected funds for the purposes determined by law; (ii) individuals or companies who have the obligation to compensate, who propose and implement the compensation measures directly or hire others to do so; and (iii) conservation and restoration project developers, who may be NGOs, companies or individuals.

Table 4. Relevant actors involved in environmental compensation and their key responsibilities

Actor	Type of compensation	Key responsibilities
Ibama	SNUC compensation and forest reposition for projects under its competence.	Calculate the amount of SNUC law compensation to be paid; approve and enforce forest reposition measures
CCAF	SNUC compensation	Allocate the amounts calculated by Ibama to different PAs
State environmental agencies (SEMAs)	SNUC compensation for projects under their competence	Calculate the amount of SNUC law compensation and allocate the amounts among PAs
	Forest reposition	Approve and enforce compensation measures. When there is a direct payment, apply the resources as determined by law
	Legal Reserve compensation	Approve and monitor execution of RL compensation measures
ICMBio, state and municipal agencies responsible for managing PAs	SNUC compensation	Disburse compensation funds and monitor the execution of compensation measures in PAs
Water agencies	Compensation for water usage	Allocate and apply the resources for improving water quality

Table 4. Relevant actors involved in environmental compensation and their key responsibilities

Actor	Type of compensation	Key responsibilities
License and authorization holders	Forest reposition	Execute compensation measures directly or by outsourcing
	Compensation for water usage	Payment of tariff
Rural landowners and landholders	Legal Reserve Compensation	Propose and execute compensation measures directly or by outsourcing
Restoration and compensation project developers	Forest reposition and Legal Reserve compensation	Propose and implement conservation and/or restoration projects

1.5.2. Current state of implementation

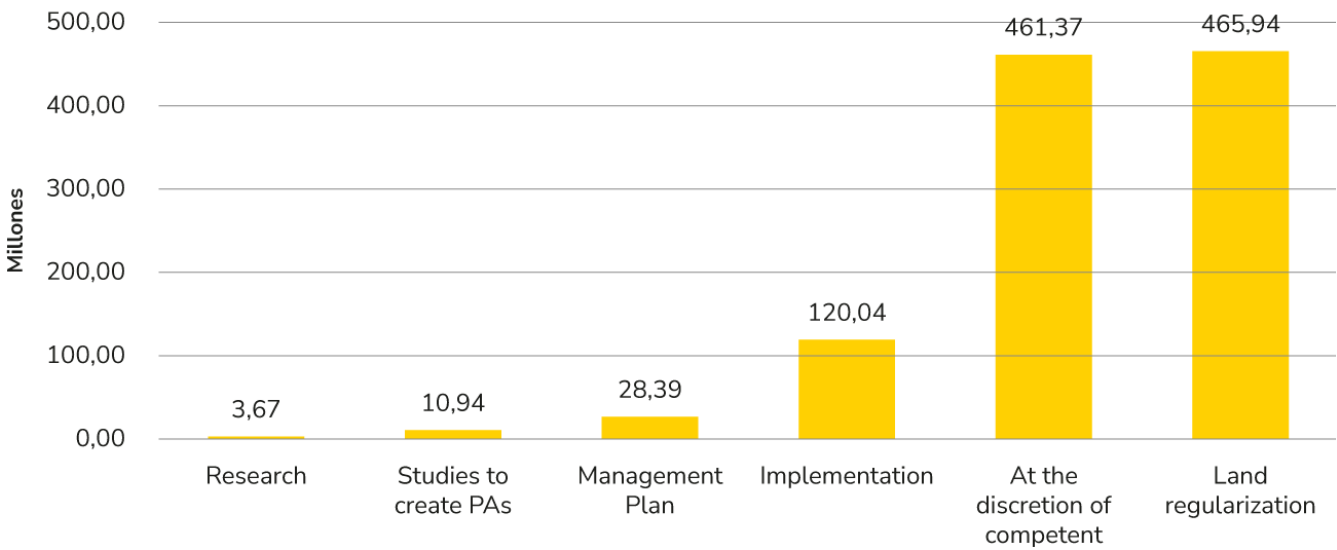
1.5.2.1. SNUC Law Compensation

Ibama is the agency in charge of licensing projects at the federal level. It is responsible for calculating the degree of impact (GI) and the final value of the federal environmental compensation. The Federal Environmental Compensation Committee (CCAF) then deliberates on how the amounts calculated by Ibama will be allocated between different PAs. The funds are disbursed by ICMBio in federal PAs, and by state and municipal environmental agencies managing their respective PAs. States have their own SNUC environmental compensation rules for licensing procedures under the competence of state environmental agencies (Salvador et al., 2020).

In 2015, a study compiled data from the CCAF’s meetings minutes (OLIVEIRA et al., 2015) to show how the funds from the federal environmental compensation had been spent. From 2011 to 2014, a total of R\$ 1,090,350,165.87 had been allocated by CCAF to federal, state, and municipal PAs.

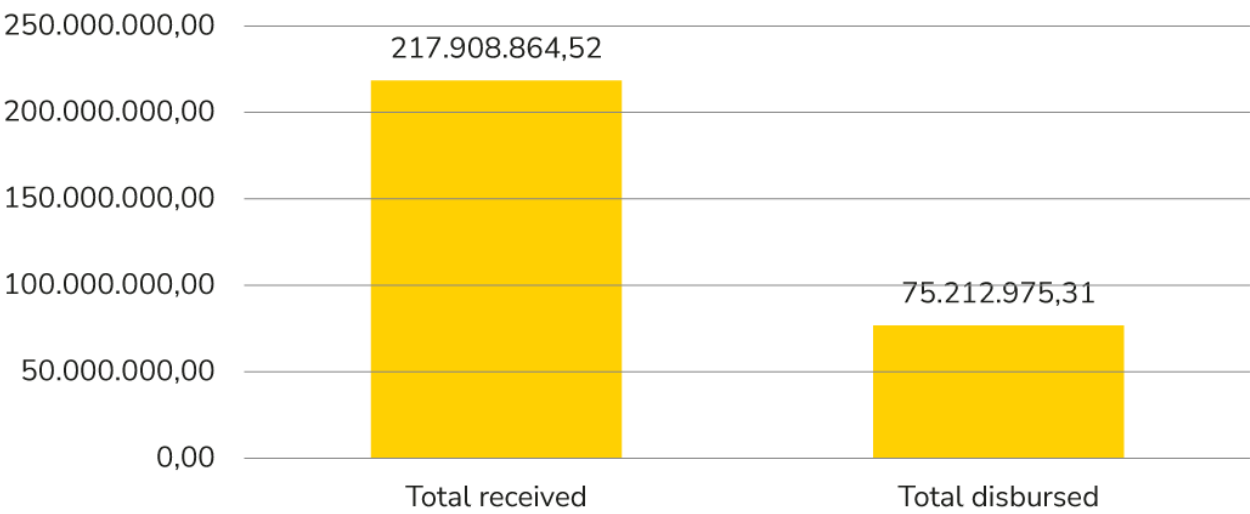
The numbers suggest that disbursement and project implementation are some of the challenges to the effectiveness of the SNUC law compensation at the federal level.

Destination of Federal Environmental Compensation funds by end use (2011 - 2014)



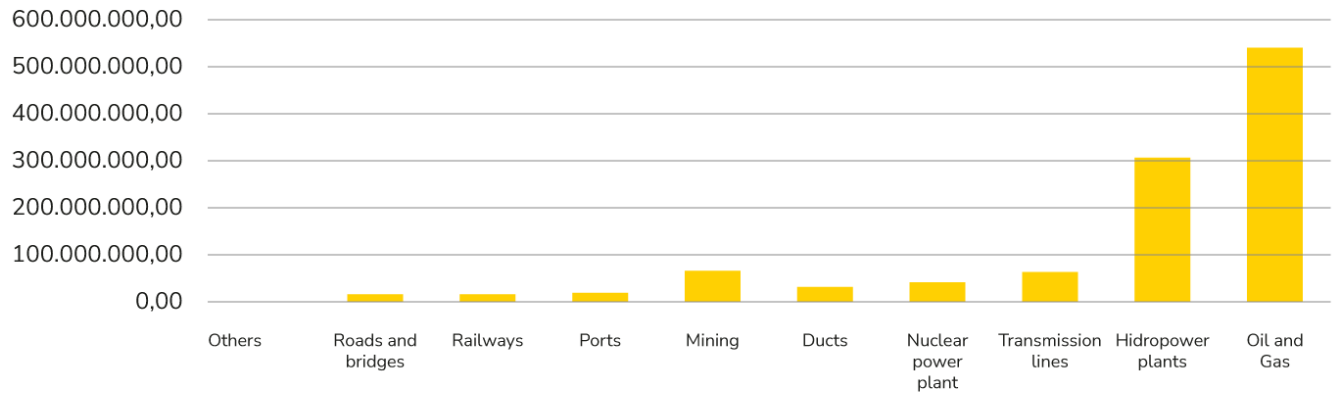
Source: TNC (2015)

Federal Environmental Compensation funds received and disbursed (2009 - 2014)



Source: TNC (2015)

Sources of Federal Environmental Compensation payments by type of project (2011 - 2014)



Source: TNC (2015)

1.5.2.2. Legal Reserve Compensation

Implementing the legal reserve compensation depends on the implementation of the PRA, the environmental regularization program, by state environmental agencies. From the five stages of the PRA (CAR registration, CAR validation, PRADA submission, signing the Term of Commitment, and monitoring), the biggest challenges in implementation currently lie in the CAR validation stage.

CAR validation (the manual or automated analysis of data declared by landholders and landowners when they register in CAR) is the biggest bottleneck in implementing the environmental regularization mandated by the Forest Code, and, consequently, the legal reserve compensation (LOPES et al., 2023). A recent study estimated that only approximately 2.7% or 70,000 of the country's CAR registrations have been validated by state environmental agencies during the 10 years of CAR implementation (LOPES et al., 2023). The numbers also vary widely from state to state: while the state of Espírito Santo has validated around 68% of its registered properties, Mato Grosso do Sul and Pará have finished over 10% of the states' CAR validation backlog, Rio Grande do Sul and Santa Catarina have 0% of their CARs validated (LOPES et al., 2023). The main reasons why CAR validation is going so slowly are:

- The large number of registrations requiring rectification. If rectifications are needed, CAR needs to be “manually” validated by a team and cannot undergo automated analysis.
- Unanswered notifications for rectification due to difficulties in communicating with landholders and landowners.

In addition to the slow progress in CAR validation, the implementation of legal reserve compensation is further complicated by the fact that many states have not issued regulations to fully implement the PRA. Without these regulations and adequate procedures in place, states cannot formally complete the environmental

regularization of properties in their territories. Furthermore, the lack of federal regulation of the CRAs has been keeping this mechanism from being used as a tool for legal reserve compensation in the entire country.

Table 5 shows an estimate of RL deficit and excess percentages, as well as the status of state PRA regulations, indicating the potential for legal reserve compensation in each state. In theory, the bigger the RL deficits and excesses are in a state where the PRA has been regulated, the bigger the potential for RL compensation.

Table 5. Deficit and Excess of Legal Reserve Areas in Brazilian States

State	% of RL Deficit	% of RL Excess	Has State issued PRA regulation?
Acre	4,8%	7%	Yes
Alagoas	3,7%	10%	Yes
Amapá	0,3%	27%	Yes
Amazonas	1,9%	13%	Yes
Bahia	1,1%	36%	Yes
Ceará	0,1%	45%	Yes
Distrito Federal	1,8%	12%	Yes
Espírito Santo	3,4%	10%	No
Goiás	2%	14%	No
Maranhão	5%	19%	Yes
Mato Grosso	7,2%	10%	Yes
Mato Grosso do Sul	20%	2,6%	Yes
Minas Gerais	1,6%	19%	Yes
Pará	9,3%	7,1%	Yes
Paraíba	0,6%	34%	No
Paraná	2,6%	12%	Yes
Pernambuco	1,2%	32%	Yes
Piauí	0,2%	53%	No
Rio de Janeiro	3,5%	12%	Yes
Rio Grande do Norte	0,3%	35%	No

Table 5. Deficit and Excess of Legal Reserve Areas in Brazilian States

State	% of RL Deficit	% of RL Excess	Has State issued PRA regulation?
Rio Grande do Sul	0,9%	33%	No
Rondônia	10,6%	2,8%	Yes
Roraima	1,2%	20%	No
Santa Catarina	0,4%	26%	No
São Paulo	5,4%	5,9%	Yes
Sergipe	2,2%	9,5%	No
Tocantins	4,3%	24%	No

Sources: Observatório do Código Florestal (2023) and Climate Policy Initiative (2023).

1.5.2.3. Forest Reposition

Almost all authorizations for vegetation removal issued in Brazil are conditioned to forest reposition. However, there are many implementation challenges that affect the instrument’s effectiveness.

- First, the use of wood stock as a parameter for compensation disregards all other ecosystem services provided by forests. Also, the reference values used for wood stock are significantly lower than what would be found if actual measurements were made. Finally, forest reposition requirements issued by Ibama, and followed by many states, do not equate the area that was deforested to the area of forest that must be planted: for each hectare of authorized vegetation removal in the Amazon, it would suffice to restore an area of one third of that size elsewhere; in the Cerrado, it would suffice to restore an area equivalent to one fifth of the deforested area (Lopes, 2023).
- Second, license holders often prefer to make payments to an environmental fund in most states where that is an option for complying with the forest reposition obligation (Lopes, 2023). That may be related to the lack of technical knowledge for the implementation of restoration activities and the high financial costs associated. That is aggravated by the fact that the amounts used for reference in the conversion from the compensation required (in metric cubes of wood to money) are underestimated and insufficient for the restoration of an equivalent area (Lopes, 2023). Therefore, it is significantly cheaper for the authorization holders to pay an amount to a fund than to directly implement a project. Also, many states are not required to direct these funds towards restoration, and there is little transparency as to how or whether they are being used.
- Third, even when projects are directly implemented by the authorization holders or by third parties, monitoring is conducted only for one or two years. After that, the compensation is deemed as completed. It can take thirty years or more to achieve maturity in native forests, hence, the risk of non-permanence for most forest repositions is high.

- Finally, with the noteworthy exception of São Paulo, Rio de Janeiro and Distrito Federal, environmental relevance is not a factor considered for ensuring equivalent compensation in forest reposition. Even in the Atlantic Rainforest biome, that has specific legislation based on the stages of vegetation regeneration, environmental relevance is considered only for vegetation removal and not for its compensation.

A great opportunity for improving implementation is the commitment made by Brazil in its Nationally Determined Contribution to the UNFCCC to halt deforestation by 2030. This would include not only stopping illegal deforestation, but also ensuring that 100% of legal deforestation has been properly compensated (Lopes, 2023). Thus, there may be a political window for improving the forest reposition mechanism.

The existence of states with more advanced legislation is also an opportunity for other states to learn from the experience, using similar instruments such as factors assigned to the type of vegetation removed and the location of the restoration to be made (including maps of priority areas).

1.5.2.4. Water Usage Compensation

The collection of the tariff for water usage is conditioned to the definition of uses considered insignificant, the regularization of all uses subject to a grant and registry of all users, an investment plan defined in the Water Resources Plan, a proposition by the Water Basin Committee, approval by the Water Resources Council, and implementation by the local water agency³¹.

For that reason, only a few water basins currently charge for water use, namely, the state water agencies of Ceará, Paraíba, São Paulo, Rio de Janeiro and parts of Minas Gerais and Paraná, as well as the national water agency in the São Francisco Basin, Paranaíba Basin, Verde Grande Basin, Doce Basin, Paraíba do Sul Basin and Piracicaba, Capivari and Jundiá Basin (ANA, 2024).



Figure 4. Water collection implementation in Brazil

Source: ANA, 2024.

In 2023 advances were made for implementation in the states of Alagoas, Goiás, Paraná, Piauí, Rio Grande do Norte, Sergipe, and Tocantins, as well as the water basins of Rio Grande, Rio dos Sinos, Rio Gravataí, Rio Piancó-Piranhas-Açú, and Rio Paranapanema (ANA, 2023).

The destination of the funds collected is defined in the Water Resources Plan, at the discretion of the committee that decides the activities required for the best management of the water bodies. These bodies who are responsible for employing the funds are specialized in water management and have little or no experience with forest conservation and restoration. Although the funds could be partially used for these

types of projects, they are usually not the main focus, and the agencies do not have the expertise to efficiently implement conservation and restoration initiatives.

For example, less than 1% of all the resources collected by the Piracicaba, Capivari and Jundiá Basin from 1994 to 2017 was used for forest restoration. Most funds were used for sewage treatment and loss control (Comitês PCJ, 2020). In that basin, the agency holds a bank of areas open to ecological restoration. However, publicly available information indicates that only a few projects have been implemented³².



31. CNRH Resolution No. 48/2005.

32. Available at: <https://mapas.agenciapcj.org.br/portal/apps/MapSeries/index.htm?appid=2c4d8833f40e439481e0d1824c75e43b>.

2. Establishing Habitat Banks in Brazil using existing environmental compensation tools

Although the four environmental compensation mechanisms discussed in Chapter 1 are well established in Brazil, the Brazilian regulatory framework does not provide a perfect fit for the implementation of the habitat banking model as an environmental compensation tool.

According to Terrasos’ definition of habitat banks³³:

“The Habitat Banks are lands where compensation requirements and actions for the preservation, improvement or restoration of ecosystems are implemented to offset negative impacts on biodiversity. Through Habitat Banks, quantifiable gains in biodiversity are generated, which are later used for companies to offset the environmental damage caused. This mechanism is oriented to generate a payment for environmental results, which makes it possible to achieve increases in productivity, efficiency, and quality of environmental compensations. In order to ensure the success of Habitat Banks, they receive financial, technical and legal guarantees, which are aspects little considered in environmental investment mechanisms.

Therefore, Habitat Banks are intended to serve as aggregate offsetting schemes, where several companies may offset their damages to the environment in a single area. In addition, these banks become a cost-efficient solution, in which whoever generates the impacts only makes payments as different milestones are met in the process of design, and maintenance of biodiversity units, which have their equivalent in terms of hectares.”

We used the above definition and further discussions with Terrasos to identify four key elements for accommodating the habitat banks model in a mandatory environmental compensation scheme:

- A requirement of how much compensation is needed;
- A requirement about where compensation needs to occur;
- A requirement for ecological equivalence of the compensation;
- A requirement to compensate for biodiversity loss;

Our analysis indicates that none of the categories of environmental compensation in Brazil present all four key elements, and hence none is a perfect fit to establish habitat banks. Table 6 summarizes our findings:

Table 6. Key elements for accommodating the Terrasos habitat banks model in a mandatory environmental compensation scheme.

Key elements	Requirement of how much compensation is needed	Requirement about where compensation needs to occur	Requirement for ecological equivalence	Requirement to compensate for biodiversity loss
SNUC Law	⊗	✓	⊗	✓
Legal Reserve Compensation	✓	✓	✓	⊗
Forest Reposition	✓	✓	✓	⊗
Water usage	⊗	✓	⊗	⊗

All four elements should be present in an ideal scenario, where Terrasos’ model of habitat banks could be implemented in Brazil without any adjustments. Nevertheless, a modified habitat banks model could potentially be used to comply with two categories of environmental compensation in Brazil: the legal reserve compensation and forest reposition. The SNUC Law compensation and the compensation for water usage, on the other hand, would not be good fits. The following sections will elaborate on these findings.

2.1. SNUC Law Compensation

The SNUC Law compensation is not a good candidate for establishing habitat banks in Brazil. The SNUC law and its regulations determine that financial payments are the only means of compensation for implementing projects with the potential to cause significant adverse environmental impacts. The legal framework goes further in specifying the destination (maintenance and development of PAs) and the activities that should be financed by the compensation proceeds (land regularization and demarcation; preparation, review or implementation of a management plan for the PA; purchase of goods and services for implementing, managing, monitoring and protecting the area and its buffer zone; conducting studies for the creation of a new PA; or developing research to improve the management of the PA and its buffer zone).

Although the SNUC Law has requirements determining how much the payment should be (the formula created by Federal Decree No. 6.848/2009), where the compensation should happen (in a public domain and/or a sustainable use PA, under certain conditions) and that biodiversity loss must be compensated, it does not condition the compensation on actual environmental harm happening. The compensation is due because a potentially polluting activity is being implemented, and its aim is to support PAs. Thus, the SNUC law does not require the project developer to compensate for an actual environmental loss in a specific place, it only requires that a payment be made to benefit a PA because the developer practices a potentially harmful activity. Likewise, there is no requirement for ecological equivalence in the compensation since it consists primarily of a payment to support PAs. Therefore, only two of the key elements to support habitat banks are present in the SNUC law.

33. Terrasos, What are Habitat Banks?, available at <https://en.terrasos.co/bancos-de-habitat>.

Any changes to this legal framework would require **passing a federal law and regulations** (or state laws and regulations, in states that have implemented their own compensation schemes) to allow for means of compensation in the SNUC Law other than payments to support PAs, or to change the priority destination and activities for the proceeds. For example, regulatory changes of the latter type could be made to include the PA category *Reserva Particular do Patrimônio Natural* (RPPN) as eligible and a priority destination to receive environmental compensation funds. A RPPN is a private PA that, if these regulatory changes were made, could work similarly to a habitat bank and received funds from the SNUC law compensation scheme.

This strategy, however, is unlikely to succeed at the federal level, considering that the environmental compensation funds are a **well-established finance mechanism** to support public domain PAs in Brazil. A proposal to reduce or eliminate this financial flow is likely to find strong opposition from IBAMA, ICMBio, state and municipal environmental agencies, environmental groups, and probably attract negative public attention.

Adopting this strategy at the state level would present **its own risks**. In our view, states could only implement these proposed changes to their compensation framework if the SNUC law were also changed, as the states **must follow** the general rules imposed by federal law on this subject. If the SNUC law is not changed to accommodate other options of compensation or to include RPPNs as a priority, we consider it a legally precarious option for states to adopt a habitat banks model through this environmental compensation framework.

2.2. Legal reserve compensation

The legal reserve compensation could be an avenue towards establishing a modified model of habitat banks in Brazil. When creating the possibility to compensate for the legal reserve area in other properties, the Forest Code created a requirement of how much compensation is needed (an area equivalent in size to the legal reserve deficit), a requirement about where the compensation needs to occur (in the same biome and state, and if the area is in another state it must have been identified as a priority area for conservation by the federal government or the other state), and a requirement for ecological equivalence (contained broadly in the requirement for the area to be in the same biome).

The only key element not provided for by the legal reserve compensation legal framework is the requirement to compensate for biodiversity loss.

LR compensation can be accomplished through **four different paths**:

- By purchasing CRAs;
- By leasing areas under an environmental easement or *servidão ambiental* or the RL regimes;
- By donating an area inside a public domain PA;
- By registering an equivalent area in another rural property, belonging to the same owner.

Paths (1) and (2) provide viable options to establish habitat banks in Brazil, while paths (3) and (4) would not be good fits.

2.2.1. Cotas de Reserva Ambiental (CRAs)

Path (1) could be a good fit for establishing habitat banks in Brazil. The CRAs are certificates that represent a forested area or an area undergoing restoration in one property that can be used to compensate for the deficit of LR in another. They can be used as legal reserve “credits” and be transacted directly between landowners or in a marketplace³⁴. An individual or a company could purchase land, issue CRAs over the areas exceeding the minimum LR area and sell them to individuals or companies in need of environmental regularization.

The responsibility for maintaining the forested areas corresponding to the CRAs remains with the owner of the lands where the CRAs were originated. This option could work similarly to a habitat bank: a large property or various properties with a surplus of LR areas could be purchased by an individual or

company, who would issue CRAs over the areas and sell to different owners with a LR deficit. Like a habitat bank, this scheme would result in an aggregate offsetting scheme, where several landowners may offset their RL deficit in a single property or group of properties. The main difference would be that, in the case of CRAs, there would be no measurement or pricing of biodiversity. The unit of compensation would be the hectare of native vegetation in the same biome.

The federal government has issued the general rules for the use of CRAs (Federal Decree n. 9.640/2018), but states are responsible for implementation. Most states are in the early stages of implementing the use of CRAs. Mato Grosso do Sul is the most advanced state, as it had approved the issuance of 300 CRAs by the end of 2023 (LOPES et al., 2023).

2.2.2. Lease of areas under environmental servitude or *servidão ambiental*

Path (2) is also a suitable option for establishing habitat banks in Brazil using the LR compensation regulatory framework. An individual or company could purchase an area with native vegetation cover that exceeds the minimum LR requirements and establish an environmental servitude or *servidão ambiental* in these exceeding parts. The environmental servitude is a legal instrument through which the owner temporarily or permanently renounces the right to use, exploit or suppress the natural resources on certain areas of her property.

The owner can then lease the areas under servitude to owners whose properties have a LR deficit. This option too would work similarly to a habitat bank, except that there would be no measurement or pricing of biodiversity.

Biofílica, a private company, has a bank of areas for LR compensation using the lease option, among others³⁵. It is a bank of areas rather than

a habitat bank: Biofílica acts as an intermediary between owners with RL deficits and surpluses, helping to find “matches” of properties that are suitable for compensation. In this model, Biofílica is not responsible for the maintenance of the forested areas, it acts merely as a liaison between landowners.

It would be possible, however, to implement a model where an individual or company purchases properties with a RL surplus, institutes an environmental servitude over these areas, and leases them to property owners in need of compensation. This model would work similarly to a habitat bank, since the individual or company leasing the areas under servitude would be responsible for their maintenance and could lease them to one or more interested parties. The main difference would be that the unit of compensation would be the hectare of native vegetation in the same biome, without any appraisal of biodiversity.

34. The BVRio, a non-profit organization focused on creating market solutions to environmental problems, had structured a platform where CRAs could be negotiated, but the initiative is currently inactive. See <https://www.bvr.io.org/pt-br/mercado-de-cotas-de-reserva-ambiental/>.

35. See Biofílica’s bank in <https://compensacaodereservalegal.com.br>.

2.2.3.Donation of areas inside PAs and registration of areas owned by the same person.

Paths (3) and (4) would not be suitable options for establishing habitat banks in Brazil. The donation of areas inside public domain PAs is a choice for owners of properties inside PAs that have not undergone land regularization. It does not fit with the habitat banks model to purchase lands inside PAs to then sell them to individuals or companies in need of environmental regularization. In this model, the party responsible for maintaining the forested

areas is the governmental entity in charge of managing the PA. For the same reason, the option to purchase areas with exceeding LR vegetation to then sell the surplus area to owners with a LR deficit does not fit the habitat banks model. Both these paths are more suitable to the Biofílica areas bank model, where the company acts as an intermediary between landowners with RL deficits and surpluses.

The ecological identity controversy

A controversy before the Brazilian Supreme Court or Supremo Tribunal Federal (STF) makes using this path to establish habitat banks momentarily convoluted. In 2023, the STF issued a contradictory decision about the requirement that LR compensation be conducted in the same biome when it comes to using CRAs. The decision was issued in relation to four lawsuits that were filed to question the constitutionality of the Forest Code: Direct Constitutionality Actions or Ações Diretas de Inconstitucionalidade (ADIs) n. 4901/DF; n. 4902/DF; n. 4903/DF; and n. 4937/DF.

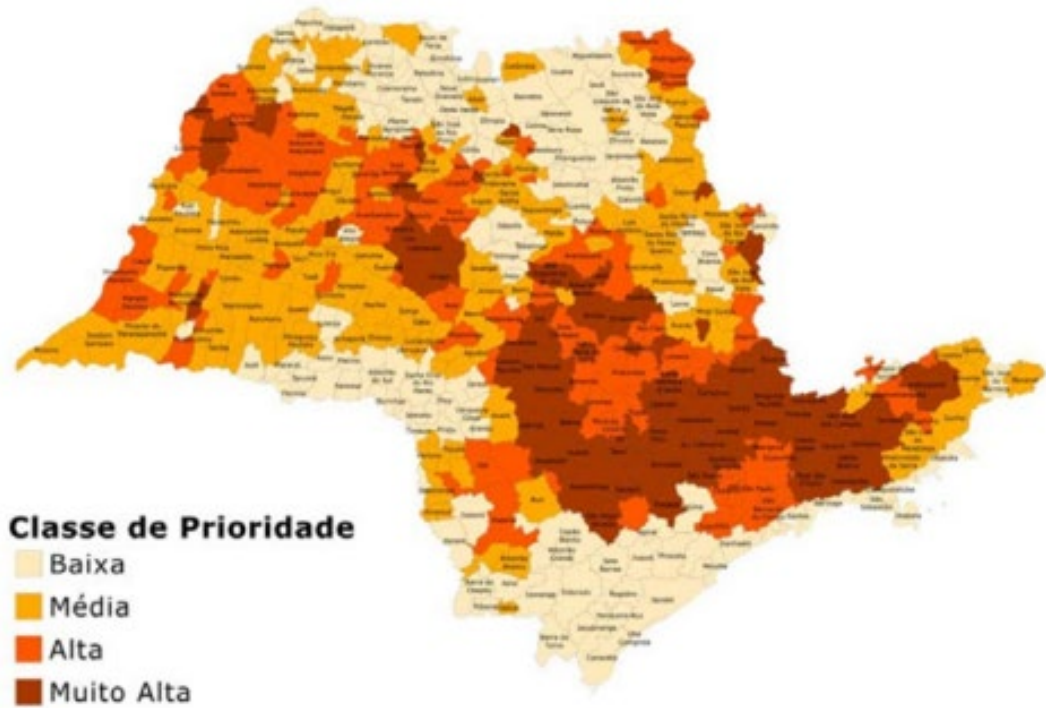
2.3. Forest reposition

The requirements of how much compensation is required, where such compensation shall occur and others vary greatly from state to state. In this section, we will focus on where we find the most potential for establishing habitat banks, especially where ecological equivalence is demanded, and biodiversity concerns are more prominent.

In the state of São Paulo, ecological importance considers the stage of the vegetation removed³⁶, the existence of Permanently Preserved Areas (APPs), and the priority of the area where the removal and where the compensation is carried out. Priority areas were defined by the state environmental agency that created a map based on vegetation cover in the municipality, reduction in the extinction risk, water scarcity, soil susceptibility to erosion, temperature variability, and APP deficit in the municipality.

36. As defined by the Atlantic Rainforest Law, vegetation is classified as primary and secondary in the initial, intermediate, and advanced stages of regeneration. Also, state regulation classifies isolated trees and other biomes.

Figure 5. Key elements Map of priority areas for restoration in São Paulo.



Source: SEMIL Resolution No. 02/2024.

As previously stated, this requirement is connected to the Springs Program or *Programa Nascentes*, an initiative promoted since 2014 by the state secretary for the environment of São Paulo to incentivize restoration projects. Companies and landowners can submit their projects, which are analyzed and approved by the environmental agency. Until September 2023, more than 30,000 hectares were under restoration.

Projects are listed in the digital platform called *Sistema de Apoio à Restauração Ecológica* – SARE. The project proponent is required to submit the shapefile of the area and inform the biome, type of vegetation, a diagnosis (soil conditions, water dynamic, exotic species, use of the area, disturbance factors, natural regeneration potential, slope), and images of the area. Based on the diagnosis, recommendations are given as to the methodology and restoration activities, which need to be chosen by the proponent. Based on all the information, the agency analyzes technically and approves or rejects the project.

The state of São Paulo has regulated the criteria for ecological restoration on SMA Resolution No. 32/2014. This gives project developers guidelines and more certainty on the rules that apply. Most other states do not have similar rules, so that there is less certainty regarding the parameters required.

For that, the São Paulo framework might be the most adequate for establishing a habitat bank as a form of compensation. Although the requirement to compensate for biodiversity loss is not explicit and quantified, the ecological parameters in place can ensure that a habitat bank is not only a viable instrument, but also a desirable one.

It is worth noting that such frameworks are in place for restoration projects. As the regulation allows (and in the case of Atlantic Rainforest prioritizes) conservation projects, a new program or an extension of the Springs Program could be promoted to that end.

In Rio de Janeiro, there are similar initiatives that aim to stimulate restoration, such as the Map of Priority Areas for Forest Restoration in Rio de Janeiro, the State System for Monitoring and Evaluation of Forest Restoration – SEMAR, and the Public Bank for Restoration Areas – BANPAR. However, as there is the possibility of payment to a state fund, although the legislation is advanced and establishes parameters of ecological importance, because of practicality, it is more likely that direct payment is the preferred option for most companies. Thus, the use of habitat banks would be possible, but more challenging.

In Distrito Federal this scenario is even more clear, because the environmental agency promotes the program Restaura Cerrado, through which it directly carries out restoration activities with the funds collected from forest reposition and other types of compensation.

One important difference is that in the current legal framework there is the commitment to preserve one area, without any active obligation.

Even for restoration, where the term of agreement can determine milestones, this is only for monitoring purposes and the compensation is completed when the area is considered restored. For that, each area can only be used for compensation once. In the habitat bank, there would be active management to improve biodiversity and when the milestones are met, compensation can occur. For that,

compensation could happen more than once for the same area (but for different milestones). If Terrasos wishes to establish this second approach, regulatory change would be required so that the same area could compensate for more than one impact and to determine how the verification of milestone would occur.

Regarding the issuance of forest reposition credits, Terrasos could become an issuer of this type of credits through the development of restoration projects. However, the generation of credits does not consider biodiversity aspects (focusing on the wood stock perspective) and can only be issued once, at the time of validation by the environmental agency that the planting was completed. Hence, despite it being an approach that issues credits, the logic of forest reposition credits is very different from that of habitat banks, and thus it is not a good candidate.

Finally, in states where forest reposition can be complied with through payment to an environmental fund³⁷, the funds can be directed to payment for environmental services. This is the practice in the state of Espírito Santo in the Programa Reflorestar, in which the state celebrates agreements with landowners to restore forests in their properties. Priority is given to restoring with native species and for priority areas for recharging water basins. In the state of Rio de Janeiro, funds collected by the Mata Atlântica Fund (including from forest reposition) are privately managed by an organization chosen by competitive bidding. The funds are directed to restoration and conservation projects chosen by public call. We could not find similar initiatives in the remaining states, but they are legally viable.

Therefore, Terrasos could participate in such processes for selection of projects and/or enter into agreements with the state environmental agencies for partnerships for establishing habitat banks using the funds collected from forest reposition. This is a good option because the environmental agencies and secretaries for the environment have discretionary power to decide the allocation of funds, as long as they are technically based.

2.4. Water Usage Compensation

The compensation for water usage is not a good candidate to support the establishment of habitat banks in Brazil. Although the legal framework has requirements determining how much the tariff should be, where the compensation should happen (within the same water basin as the usage), there is no requirement to compensate for biodiversity loss. Also, the requirement of where compensation needs to occur is directed at the competent governmental authority, and not at the company or individual that uses water.

Similar to the SNUC Law compensation, the compensation for water usage consists of financial payments made by the water resources user. The allocation of these financial resources is the water agency’s responsibility, who will decide what initiatives will be supported. This allocation is at the complete discretion of the competent authority. Although there is the requirement that the projects be implemented within the same water basin, it is not mandatory that the funds be used for projects, or that the projects are related to preserving native vegetation or biodiversity.

Because only one of the key elements is offered by the water usage compensation legal framework, it would not be a good candidate for establishing

habitat banks in Brazil. This scenario could be changed if federal and state regulations on the topic were revised. However, we envision the following challenges to adopting such changes:

- Opposition from current beneficiaries of water usage funds: if allocating the funds to projects such as habitat banks became mandatory, the financial flows that support water basin committees and other projects related to water cleaning and infrastructure would be reduced. Companies and organizations that currently receive most of these funds, who are influential over water agencies, are likely to strongly oppose these changes.
- Opposition from water agencies: water agencies in Brazil are focused on finding and implementing solutions to improve water quality, such as riverbank stabilization, sewage treatment and educational initiatives. These agencies could be resistant to redirecting water compensation funds to habitat banks, unless a good case could be made for why they could be characterized primarily as water quality-related initiatives.



37. Alagoas, Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Maranhão, Mato Grosso, Minas Gerais, Pará, Paraíba, Paraná, Pernambuco, Piauí, Rio Grande do Sul, and Roraima.

2.5. Conclusion and recommendations

Our analysis indicates that none of the four main categories of mandatory environmental compensation in Brazil present all four elements³⁸ we identified as key for accommodating the Terrasos habitat banks model. We conclude that, although there is not a perfect fit between the Brazilian environmental compensation regulatory frameworks and habitat banks, at least two categories of compensation are suitable to serve as a canvas to implement a modified version of habitat banks. In this modified version, there would not be any quantification or pricing of biodiversity, since none of the viable compensation options require that element be taken under consideration.

Given these premises, the most promising opportunities for implementing habitat banks as an environmental compensation tool in Brazil would be:

- Creating habitat banks by purchasing properties with LR surpluses and issuing CRAs over these areas to sell them to landholders or landowners that have a RL deficit; or instituting environmental servitudes over the surplus areas to lease them to these landholders or landowners. In theory, the states of São Paulo and Pará would be interesting jurisdictions to implement this option, since both have a high percentage of RL deficits and surpluses that could be used for compensation.
- Creating habitat banks by developing restoration or conservation projects for forest reposition in states where there are requirements for ecological equivalence, especially the State of São Paulo. In the case of conservation projects, new programs would need to be created.
- Creating habitat banks to be financed by payments for environmental services carried out with the funds collected in relation to forest reposition. Depending on the states' current rules, changes may be needed to allow the channeling of financial resources towards restoration and conservation projects.



38. (1) A requirement of how much compensation is needed; (2) A requirement about where compensation needs to occur; (3) A requirement for ecological equivalence of the compensation; and (4) A requirement to compensate for biodiversity loss.

3. References

- Amorim, Marco Antônio Mota. Novas Diretrizes para a Cobrança pelo Uso de Recursos Hídricos no Brasil. Tese (Mestrado em Gestão e Regulação de Recursos Hídricos). Universidade de Brasília. Brasília, 159 p. 2022.
- ANA. Agência Nacional de Águas. Cobrança pelo Uso da Água avança no país e Estados já observam ganhos com a implementação deste instrumento de gestão hídrica. Available at: <https://www.gov.br/ana/pt-br/assuntos/noticias-e-eventos/noticias/cobranca-pelo-uso-da-agua-avanca-no-pais-e-estados-ja-observam-ganhos-com-a-implementacao-deste-instrumento-de-gestao-hidrica>. Access in: 24 jan. 2024.
- ANA. Agência Nacional de Águas. Situação da cobrança pelo uso dos recursos hídricos, 2024. Available at: <https://portal1.snirh.gov.br/ana/apps/webappviewer/index.html?id=e84872e344314a6b822b6ab3d0323937>. Access in: 09 jan. 2024.
- Comitês CPJ. Relatório Final - Plano de Recursos Hídricos das Bacias Hidrográficas dos Rios Piracicaba, Capivari e Jundiá, 2020 a 2035. Piracicaba: Consórcio Profill-Rhama, 2020.
- CPI. Climate Policy Initiative. Reposição Florestal: Panorama da Regulamentação dos Estados. Brasil, 2021.
- CPI. Climate Policy Initiative. Mecanismos Inovadores para a Implementação da Reposição Florestal no Matopiba. Brasil, 2023.
- EMBRAPA. Área de Reserva Legal. Available at: <https://www.embrapa.br/codigo-florestal/area-de-reserva-legal-arl>. Access in: 23 jan. 2024.
- Lopes, Cristina L. Oportunidades e Desafios para a reposição florestal na Amazônia e no Cerrado. Rio de Janeiro: Climate Policy Initiative, 2023.
- Lopes, Cristina L., Maria Eduarda Segovia, and Joana Chiavari. Where Does Brazil Stand in the Implementation of the Forest Code? A Snapshot of CAR and PRA in Brazilian States – 2023 Edition. Rio de Janeiro: Climate Policy Initiative, 2023.
- Oliveira, K.P.; Pinheiro, G.T.; Barros, A.C. Um retrato sobre o cenário brasileiro, 1a edição. Brasília. The Nature Conservancy - TNC. Brasil, 2015.
- Salvador, Aline Valéria Arcanjo et al. (org. Silvia Capelli), A compensação ambiental do SNUC: manual de atuação do Ministério Público, 1a ed., Belo Horizonte: ABRAMPA, 2020. Available at: <https://abrampa.org.br/wp-content/uploads/2023/09/Manual-de-Compensacao-Ambiental-SNUC.pdf>. São Paulo. Manual de Orientação para Cadastro de Projetos de Prateleira – Programa Nascentes. São Paulo, 2019.



TERRASOS 

Environmental investments transforming territories

WWW.TERRASOS.CO



Terrasos



@terrasos_co



Terrasos Colombia