



# Conexão Mata Atlântica in Rio de Janeiro: conservation and restoration aligned with sustainable production

## Case Study Database

A compilation of good practices and lessons learned to bring innovative subnational solutions to global problems.



## Introduction

The climate crisis and its associated impacts make the transition to a low-carbon economy urgent.

The goal presented by the government of the state of Rio de Janeiro at the United Nations Climate Change Conference (COP26) was to increase the forest coverage of the Atlantic Forest in the state from 30% to 40% by 2050. In other words, it is estimated that an additional 440,000 hectares will be restored, with the potential to absorb 159 million tons of carbon dioxide.

To achieve this goal, it is necessary to establish the political, social and economic conditions that promote ecosystem resilience, habitat conservation, connectivity of forest fragments, water security and increased carbon stocks.

While it is essential to expand and strengthen public conservation areas, it is indispensable to incentivize and value the environmental actions taken by rural producers in private areas. This approach proves to be crucial for guaranteeing the preservation of forests and the recovery of degraded areas.

The financial mechanism for Payments for Environmental Services (PES) has proven to be an innovative and effective strategy in addressing these challenges, while providing economic, social and environmental benefits.

## Project Summary

The Conexão Mata Atlântica project is an initiative of payments for environmental services (PES) that recognizes priority actions for conservation and restoration in the Atlantic Forest of the state of Rio de Janeiro, Brazil.

Approximately 240 families of farmers are compensated for their contributions to conserving and restoring nearly 2,440 hectares of land, fostering socio-environmental and economic transformation at the local and global levels.

The objective is to contribute to climate change mitigation, biodiversity conservation, and water and food security, with the aim of increasing carbon stocks.

The project is funded by the Global Environment Facility (GEF) in partnership with the Inter-American Development Bank (IDB), along with matching funds from the state government.

## Author

Government of the State of Rio de Janeiro

State Secretariat of Environment and Sustainability of Rio de Janeiro - SEAS

Subsecretariat for Biodiversity Conservation and Climate Change - Sublim

## Key information

### Location

Rio de Janeiro, Brazil

### Areas of focus

biodiversity conservation, ecological restoration;  
agroforestry systems;  
sustainable rural development; water resources,  
food security,  
climate change,  
payments for environmental services.

### Founded in

2017

### Investment

US\$ 8.8 million

### Aichi Biodiversity Targets addressed

Targets 4, 5, 7, 14 and 15

### Sustainable Development Goals addressed

SDGs 2, 6, 8, 12, 13 and 15

### Kunming-Montreal Global Biodiversity Framework targets addressed

Targets 1, 2, 8, 10, 11, 19 and 21



## TABLE OF CONTENTS

---

Background and context	4
Key activities and innovations	5
Environmental impacts	10
Socioeconomic impacts	11
Policy impacts	12
Sustainability	13
Partnerships	14
Replication and applicability	15
Bibliography	15
About Regions4	16



## BACKGROUND AND CONTEXT

The Paraíba do Sul River Basin, which spans the states of Rio de Janeiro, São Paulo and Minas Gerais in Brazil, is located amidst some of the country's largest industrial and population centers. The water resources of the basin are used to supply water to over 14 million people, generate electricity, dilute effluents and serve other purposes. The basin has experienced extensive deforestation in past centuries, particularly during the coffee cycle in the 18th and 19th centuries. Currently, a significant portion of its territory is covered by degraded and unproductive pastures.

The seasonal forests, which originally covered most of the basin's area, currently occupy only 3.5% of the territory. The basin faces problems such as degraded soils, rivers with compromised water quality and water scarcity. This scenario combines a high demand for ecosystem services with a framework of environmental degradation (RODRIGUES et al., 2018; ANA, 2019).

The basin is also inserted in the Atlantic Forest biome, which combines exceptional diversity with a loss of habitat in large proportions. Natural, complex and diverse ecosystems have been extensively and intensely replaced by simplified and poorly diverse agroecosystems – which make up approximately 70% of the basin area (AGEVAP, 2021). In this way, services that depend on processes that happen on a large scale, such as the regulation of the climate and the hydrological cycle, may be compromised, as well as the biodiversity that supports them (RODRIGUES et al., 2018).

Conexão Mata Atlântica was created in 2017 through a joint action of the states of Rio de Janeiro, São Paulo, Minas Gerais and the Federal Government<sup>1</sup>, represented by the Ministry of Science, Technology

and Innovation (MCTI). The partnership was made through a Technical Cooperation Agreement and is financed with resources made available by the Global Environmental Facility (GEF). Each state acts independently with the common goal of recovering and preserving ecosystem services associated with biodiversity and carbon capture in priority zones of the Southeast Corridor of the Atlantic Forest.

The MCTI (Component 1) is responsible for the Central Coordination Unit of the Project (UCP), which has among its attributions the development of the system for monitoring and evaluating the results of the project, in addition to defining the protocol for stocks and avoided emissions of greenhouse gases (GHG).

The states of São Paulo, Rio de Janeiro and Minas Gerais (Component 2) act by increasing carbon stocks in the Paraíba do Sul River Basins, through the Payment for Environmental Services (PES) mechanism of protection, multiple use and ecological restoration in private rural properties.

The state of São Paulo also acts on another work front (Component 3), aimed at increasing the effectiveness and financial sustainability of Conservation Units along the Serra do Mar corridor, through certification actions, sustainable value chains and PES in Conservation Units and Buffer Zones.

In Rio de Janeiro, the project has been conducted by the State Management Unit (UGE), coordinated by the State Secretariat for the Environment and Sustainability (SEAS), through the State Institute of the Environment (INEA), and in partnership with the State Secretariat of Agriculture, Livestock, Supply and Fisheries (SEAPPA).

---

**1. In the context of Brazil, the term “Federal Government” refers to the national or central government of the country, whereas “state” refers to the individual regional governments (subnational level).**



## KEY ACTIVITIES AND INNOVATIONS

### PLANNING AND SELECTION OF AREAS

The project Conexão Mata Atlântica adopts the Project Management for Results (PM4R) methodology developed by the IDB, whose focus and logic are structured according to results and products, and not based on activities and the budget cycle.

The planning and preparation of the project encompassed activities such as selecting the areas of operation, hiring a skilled team, structuring local management units and, equally important, mobilizing and coordinating with partners, local stakeholders and other initiatives.

The objective of selecting and prioritizing the areas was to identify where project actions could most efficiently and effectively contribute to the restoration of climate, biodiversity and water-related ecosystem services. This was achieved through a multicriteria and multiscale analysis. To select the seven river basins and sub-basins, located in six municipalities of the state, environmental and social criteria were adopted, including the percentage of preserved areas, priority areas for conservation of endemic flora, connectivity, potential for engagement and organization of farmers, and coordination with local partners. For a more detailed methodology and area diagnosis, please refer to INEA (2021)<sup>2</sup>.

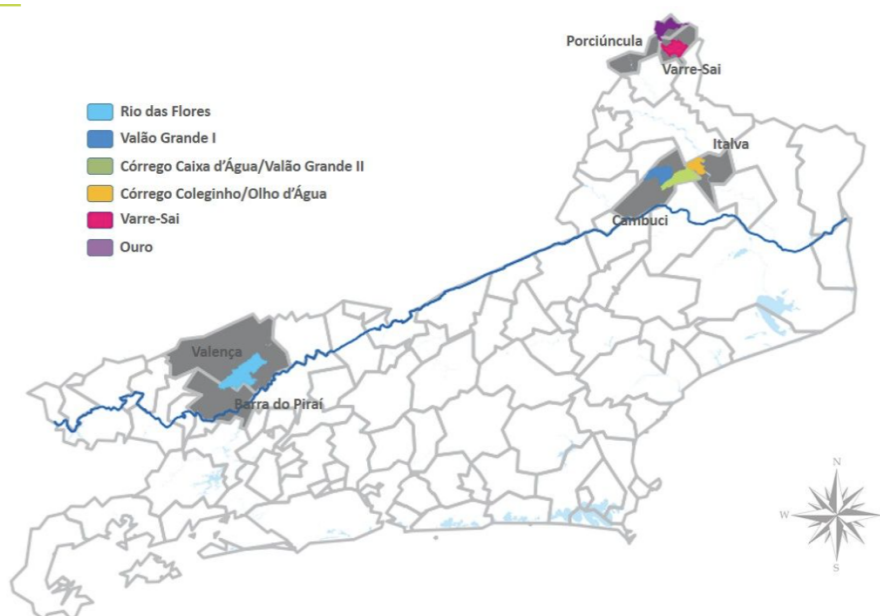


Figure 1. Map of the operational area of the Conexão Mata Atlântica project in the state of Rio de Janeiro

2. <http://www.inea.rj.gov.br/wp-content/uploads/2021/05/Livro-Diagn%C3%B3stico-Socioambiental-Conexao-Mata-Atlantica.pdf>



## PAYMENTS FOR ENVIRONMENTAL SERVICES (PES)

The execution of the project includes multiple activities, such as conducting public PES selections, training of technicians and rural owners, rural assistance for the implementation of forest conservation projects, ecological restoration and productive conversion as well as preparation of supervision reports and monitoring, management and payment of PES contracts.

The PES mechanism, directed towards agroecosystems and areas with high anthropogenic impact, adopted by the Conexão Mata Atlântica project, has created conditions for the recognition and financial incentive for rural producers in the state who contribute – through these environmental actions and the consequent increase in soil carbon stocks – to the conservation of biodiversity and the mitigation of climate change.

The project considers three types of practices eligible for PES receipt:



**Figure 2. PES-eligible practices**

Photos by: Gustavo Stephan and Daniella Fernandes



## **FOREST CONSERVATION**

Aims to reduce fragmentation by stimulating the connectivity of biological corridors through the protection and regeneration of forest fragments. The provision of environmental services is carried out through actions of isolation and fencing, implementation of firebreaks and enrichment of forest remnants.

## **ECOLOGICAL RESTORATION**

It is directed at the stimulation, recovery and increase of connectivity between forest fragments and the reduction of the edge effect, which increases forest areas and stimulates the recovery of areas of high importance for water resources and biodiversity conservation. The provision of environmental services is carried out through actions of isolation and fencing, implementation of firebreaks, soil recovery, control of invasive or exotic species and forest restoration.

Rio Paraíba do Sul, em Carmo | Photo by: Gustavo Stephan





## PRODUCTIVE CONVERSION

Aims to promote the conversion of low productivity areas into systems of greater ecological and economic functionality, through the development of agroforestry, silvopastoral systems or forest consortia with tree components of native species or native species intercropped with exotic species.

Two categories of incentives are supported: the annual PES and the PES financial support.

**In the annual PES**, payments are made annually to rural producers through the proven realization of practices and actions encouraged by the project, adopting minimum and maximum values per rural property, and whose valuation of the PES is calculated based on the methodology of the Oasis Project (FGB, 2017). The values of the annual parcels are defined according to the opportunity cost of the land, the area made available and the criteria that seek to stimulate the adoption of environmental practices and the integrated management of the property. In the case of groups of neighboring beneficiary farmers who promote connectivity of their areas of intervention, or who propose investments in collective projects of associations and cooperatives, there is a bonus of 30% of the annual PES value.

**The PES financial support**, in turn, aims to fully or partially mitigate the costs of the implementation (acquisition of inputs and materials) of the eligible environmental practices when carried out by the rural owners. The notices establish the values supported by practice, the minimum eligible area and the maximum values per rural property.

In the project, the owner must obligatorily allocate the resources of the annual PES in investments to improve the productive capacity and economic sustainability of the properties, through a proposal for the application of resources called the Technological Leap. To this end, the owners receive technical assistance and rural extension provided by the project.

The receipt of payments and the guarantee of the maintenance and renewal of the contract are conditioned to the execution of the environmental actions and the Technological Leap project, as well as the accountability of the resources applied.



Varrei-Sai I. José Almeida, family and products. ©Gustavo Stephan



Leandro Gonçalves.



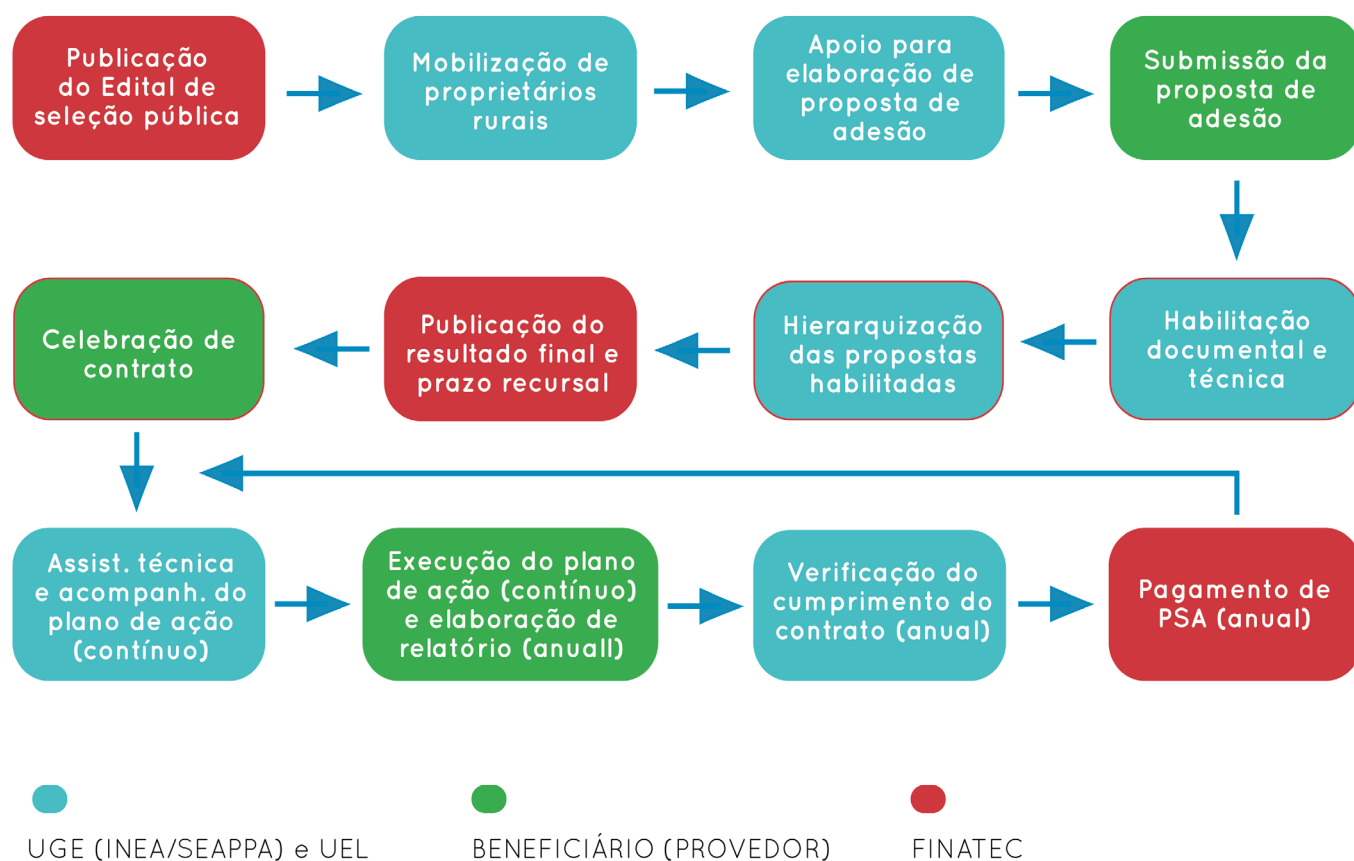


Figure 3. PES mechanism model of project Conexão Mata Atlântica

## INNOVATIONS AND LESSONS LEARNED

Among the innovations and lessons learned in the project, the positive results achieved through productive conversion, financial support through PES and technological advancement stand out, as well as the importance of integrated work between the environmental and agricultural sectors.

The actions of training, technical assistance and dissemination of forest consortiums, silvopastoral and agroforestry systems, associated with the PES aimed at the productive conversion of areas of low productivity into productive systems of greater ecological and economic functionality (agroforestry, silvopastoral systems and forest consortiums), proved to be very successful, with great adhesion on the part of rural owners. This strategy has proven to be effective, especially for the recovery of degraded pastures.

The financial support through PES proved to be a crucial incentive for achieving scalability since it enables the landowner to directly implement the supported environmental practices at a reduced cost compared to third-party execution, particularly for small rural properties. As a lesson learned, there is an intention to expand this type of incentive in new PES projects.

The Technological Leap represented a timely strategy to overcome a context of low technological level in production systems, with low average productivity per hectare in rural areas and subsequent pressure on natural resources and areas. As a result, it ensured greater social, economic and environmental sustainability of the property.

## ENVIRONMENTAL IMPACTS

---

Two public selections for PES were conducted, resulting in a total of 237 contracts. The implemented and monitored environmental actions cover nearly 2,440 hectares, including 1,562 hectares of conserved forests, 321 hectares of forest restoration, and 542 hectares of conversion from low-productivity areas to more sustainable systems, such as agroforestry and silvopastoral systems, which integrate native trees with crops and pasture.

The interventions were concentrated in 6 previously selected micro-basins in order to potentiate the following expected environmental benefits:

- Increased resilience and/or reduced risk to extreme weather events
  - GHG mitigation
  - Water regulation
- Increased connectivity between forest remnants
- Recovery and maintenance of biodiversity of flora and fauna
- Preservation of the physical, chemical and biological properties of the soil

The project promoted support for the registration of rural properties in the Rural Environmental Registry<sup>3</sup> and for the environmental adequacy of rural properties for all 237 benefited owners. The interventions prioritized the recovery of permanent preservation areas, that is, areas of slope greater than 45 degrees, river banks, springs and hilltops, in which there is a legal obligation to recompose the vegetation. According to the National Law for the Protection of Native Vegetation<sup>4</sup>, these areas constitute strategic zones for preserving water resources, the landscape, geological stability and biodiversity. They facilitate the gene flow of fauna and flora, protect the soil and ensure the well-being of human populations.

It should be noted that the Ministry of Science, Technology and Innovation (MCTI) is responsible for the development of research to monitor ecosystem services and indicate the changes resulting from the implementation of the project. Data were generated on (i) carbon stocks and sinks, (ii) estimates of greenhouse gas (GHG) emission reductions, (iii) changes in biodiversity (fauna and flora), (iv) soil conservation status and (v) water production/quality. The analyses and results are in the final stages of consolidation<sup>5</sup>.

---

**3. Electronic public registry of national scope, mandatory for all rural properties, in order to integrate the environmental information of rural properties and possessions, composing a database for control, monitoring, environmental and economic planning and combating deforestation.**

**4. Law No. 12,651, of May 25, 2012.**

**5. More information and updates can be obtained at the link: <https://conexaomataatlantica.mctic.gov.br/cma/>**

## SOCIOECONOMIC IMPACTS

The project has generated several direct and indirect benefits to rural landowners, including training activities and dissemination of knowledge, financial support, support for the environmental adequacy of rural property, support in the legalization of the management of agroforestry systems, access to specialized consultancies and technical assistance and rural extension, among others.

The project has contributed to the greater diversification of production systems and the diffusion of agroforestry systems in the region. Through productive conversion, the conversion of 542 hectares of degraded pastures of low productivity into agroforestry and silvopastoral systems was promoted, promoting environmental gains and increasing the income of producers. In this way, economic, social and environmental benefits are simultaneously generated.

PES investments in the project totaled US\$1.7 million. These resources have contributed to changing the reality of farming families who lack their own funds or access to credit lines to implement environmental practices or improvements in production systems. Additionally, it has helped stimulate the local economy.

The rural producers who benefited from the annual PES amount (Technological Leap) invested the funds in various ways. The majority of the resources were invested in improving production capacity, mainly through the acquisition of agricultural equipment, construction or renovation of support structures for agricultural activities (corrals, sheds, coffee drying patios, storage facilities, etc.), purchase of inputs and pasture and soil management. Some of the incentivized actions involved using the funds for the implementation of solar energy systems, rural sanitation, silvopastoral systems, agroforestry systems (SAFs) and organic agriculture. Additionally, funds were used for acquiring seedlings and fencing for conservation or forest restoration purposes.



Figure 4. Examples of allocation of PES resources (technological leap) in individual and collective projects



In addition to the mentioned impacts, it is worth highlighting among other key results and benefits of the project: strengthening community organization through financial support and incentives for collective projects as well as reducing the vulnerability of the beneficiaries' production, especially in family farming, through the Technological Leap and specialized consultations to diagnose and propose solutions for production system challenges, promoting food and nutritional security. These outcomes have played a significant role in enhancing the resilience and well-being of the project's beneficiaries, fostering sustainable agricultural practices and contributing to the overall development of the region.

## POLICY IMPACTS

The Conexão Mata Atlântica project contributes to expanding and strengthening the State Environmental Payment for Ecosystem Services Program - PRO-PSA (State Decree No. 42.029/2011)<sup>6</sup>, which now includes seven more micro-watersheds and six municipalities in Rio de Janeiro that benefit from this initiative.

In addition, it constitutes the first PES project in the state related to biodiversity conservation services and management of carbon stocks, and the first PES initiative with the integration of state environment and agriculture policy strategies, which have resulted in some innovations in relation to traditional PES approaches.

This project succeeded other successful PES initiatives in the state, making it a case of success and recognition as the primary PSA project - in terms of area coverage and resources allocated - being executed by the regional government.

The development of the financial sustainability system for PRO-PSA, currently being developed within the scope of the project, will contribute to promoting the scalability of interventions at the state level and strengthening sustainable production chains, as detailed below.

---

6. [www.inea.rj.gov.br/propsa](http://www.inea.rj.gov.br/propsa)

Photo by: Gustavo Stephan





## SUSTAINABILITY

---

The resources invested throughout the project (2017-2014) exceed US\$ 8.8 million (R\$ 44 million). More than US\$4.3million comes from the GEF (Global Environment Facility), with the Inter-American Development Bank (IDB) as the implementing agency. The Foundation for Scientific and Technological Enterprises (FINATEC) is the executing institution of the resources.

The state government has contributed over US\$ 5.8 million (R\$ 29 million), allocated through environmental compensation measures and actions implemented by programs preceding the project. Additionally, it receives other parallel and indirect resources from strategic partners through technical cooperation agreements and support for project execution, such as donations of seedlings and capacity-building initiatives.

Among the planned actions in the project is the development of a financial sustainability system to ensure the continuity and expansion of the PES mechanism in the state. For this purpose, two main areas of focus have been addressed: strategies for scalability and strengthening sustainable production chains.

The scalability of interventions aims to meet the demands for environmental restoration and the maintenance and expansion of ecosystem services, associated with the environmental adequacy of rural properties. To achieve this, it is essential to secure funding and optimize the execution of the mechanism at a regional scale.

The PES mechanism has prospects of being expanded and continued through other sources of funding, such as the Mata Atlântica Fund - a mechanism for biodiversity conservation in the state - through the Restoration Portfolio, and the State Fund for Environmental Conservation and

Urban Development (FECAM), both managed by the state government. With resources from the Global Environment Facility (GEF), the institutional, state, legal and operational arrangement for PES execution through these two state funds is being developed, along with the mobilization of complementary resources from other sources.

One of the challenges for gaining scale is to build an adequate and efficient structure for the management of PES contracts and the monitoring of areas of intervention. To this end, SEAS has been developing, in partnership with The Nature Conservancy Brasil (TNC), a system and web portal for the management and monitoring of PES contracts and areas of intervention. The tool will allow you to collect and store data, generate documents, manage process flow, perform queries and calculations and issue reports, among other functionalities. From this solution, it is expected that PES initiatives will be managed, monitored and disseminated in an agile, unified, standardized or even customizable way for different environments and territories.

It is understood that short-term PES interventions may, in some cases, be insufficient to promote the sustainability of rural interventions and enterprises, especially due to obstacles and challenges in the agricultural and forestry production chains. Consequently, structural actions are being developed to strengthen sustainable production chains supported by PES. These actions include the preparation of diagnostics and recommendations to overcome productivity bottlenecks, improve marketing, and expand environmental practices. Additionally, there are plans for mobilization and awareness-raising agendas for marketing channels (both public and private) through a partnership with the Brazilian Micro and Small Business Support Service (SEBRAE).







## REPLICATION AND APPLICABILITY

The detailed planning with the selection and prioritization of intervention areas, combined with strong stakeholder engagement, partnerships, and funding sources, along with deep knowledge of the intervention areas' characteristics, engagement with the target audience, resource availability and a capable technical team were the main ingredients for the project's success.

The implemented PES model and institutional arrangement adopted by the Conexão Mata Atlântica project can be adapted to similar environmental contexts, such as watersheds with high anthropogenic influence and predominantly agricultural and livestock uses.

However, the innovative aspects (Technological Leap and productive conversion) entail greater execution complexity and require coordinated action from rural extension and environmental conservation and restoration teams. The eligibility criteria for rural producers and the standards required for the implementation of agroforestry systems in the Conexão Mata Atlântica project in Rio de Janeiro were defined based on the state and local environmental regulations and should be adjusted for different contexts.

## BIBLIOGRAPHY

**AGÊNCIA NACIONAL DE ÁGUAS (Brazil).** Situation room: Paraíba do Sul. Brasília, [2019]. Available at: <https://www.ana.gov.br/sala-de-situacao/paraiba-do-sul/paraiba-do-sul-saiba-mais>.

**ASSOCIATION PRO-MANAGEMENT OF THE WATERS OF THE HYDROGRAPHIC BASIN OF THE PARAÍBA DO SUL RIVER.** Integrated Water Resources Plan of the Paraíba do Sul River Basin: executive summary. Resende, RJ, 2021.

**STATE INSTITUTE OF THE ENVIRONMENT.** Socio-environmental diagnosis and prioritization of areas for the implementation of the Atlantic Forest Connection project in the state of Rio de Janeiro. Rio de Janeiro, 2021. Available at: <http://www.inea.rj.gov.br/wp-content/uploads/2021/05/Livro-Diagn%C3%B3stico-Socioambiental-Conexao-Mata-Atlantica.pdf>

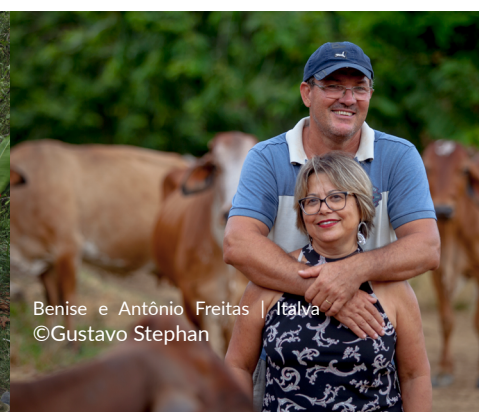
**ROBERTS, A. F.; LATAWIEC, A.** Change in ecosystem services available after changes in land use and cover: the case of the Paraíba do Sul River Valley. In: OLIVEIRA, R. R.; RUIZ, A. E. L. (org.). Historical Geography of Coffee. Rio de Janeiro: Ed. PUC-Rio, 2018.



©Gustavo Stephan



Carlos Martins Rosa e família. ©Gustavo Stephan



Benise e Antônio Freitas | Itaipava  
©Gustavo Stephan

## FOR MORE INFORMATION

For more information about this project, please visit  
[www.inea.rj.gov.br/conexaomataatlantica](http://www.inea.rj.gov.br/conexaomataatlantica)

You can also contact us at [info@regions4.org](mailto:info@regions4.org) to set up an informative meeting, solve doubts and get support in implementing similar projects.



Case  
Study  
Database



## ABOUT

Regions4 (formerly known as the nrg4SD) is a global network that solely represents regional governments (states, regions and provinces) before UN processes, European Union initiatives and global discussions in the fields of climate change, biodiversity and sustainable development. Regions4 was established in 2002 at the World Summit in Johannesburg and currently represents over 40 members from 20 countries in 4 continents. Through advocacy, cooperation and capacity building, Regions4 empowers regional governments to accelerate global action.

For more information visit: [www.regions4.org](http://www.regions4.org)

@Regions4SD | #Regions4Biodiversity #RegionsVoice.

Chaussée d'Alseberg 999- B-1180, Bruselas, Bélgica

[www.regions4.org](http://www.regions4.org)

[info@regions4.org](mailto:info@regions4.org)

@Regions4SD

#Regions4Biodiversity #RegionsVoice