



## IRACAMBI CONSERVATION AND RESEARCH CENTER

### RESEARCH PRIORITIES

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Rosário da Limeira, Minas Gerais, Brazil

[iracambi@iracambi.com](mailto:iracambi@iracambi.com)

[lara@iracambi.com](mailto:lara@iracambi.com)

## Our vision

Iracambi's mission is "Saving Forests, Changing Lives!" Our research program supports this mission through transdisciplinary participatory science inquiry. Our driving question is 'How can people and ecosystems coexist and thrive together?'

Brazil is one of the seventeen mega-diverse countries in the world, and home to an exceptional and unique range of biodiversity as well as cultural diversity. In this context, our vision is **to see societies and ecosystems thriving together**, focusing on addressing locally identified problems that lead to deforestation, land degradation and inequality. Through a humane, collaborative, data-driven understanding of the Atlantic Forest and the communities living there, we aim to strengthen local capacity to identify constraints and create solutions towards fighting climate change and establishing and promoting sustainable agriculture and economic development. Our goal is to continually improve conservation, education and research activities, and communicate the results in a manner that is both accessible and inspirational to an audience that includes both local stakeholders and the scientific community.

We strongly believe that the best way to solve local problems is through combining popular knowledge and action science with creative thinking by bright, diverse people from across the world. In that context our role is to act as a catalyst for change, facilitating a clear understanding of the issues and helping implement solutions. The results are twofold. First, the local communities feel valued as they are seen, heard and supported in their educational and environmental development. This reinforces and encourages sustainable management of natural resources by local people, benefiting both themselves and also the wider world. Secondly, students, researchers and volunteers gain invaluable, transformational insight into the complexity of tropical ecosystems and community livelihoods on the front line of conservation in Minas Gerais.

## Where everything happens

The Atlantic Forest, where Iracambi is located, is the second largest forest in South America. Today, only 12.5% remains of the original area of 1.6 million hectares which was stretched across Brazil (93%), Paraguay (5.3%) and Argentina (1.7%). The remaining area of Atlantic Forest is largely composed of isolated forest remnants, separated by large areas of agriculture or urban settlement. Despite a high level of disturbance, this highly threatened biome still holds extraordinary rates of

biodiversity and endemism that reflect its complex evolutionary history. The estimates are around 250 species of mammals (55 endemic), 1,023 birds (188 endemic), 340 amphibians (90 endemic), and 20,000 tree species, (10,000 endemic). In addition to this, the vast majority of the animals and plants threatened with extinction in Brazil are found in the Atlantic Forest. The Iracambi Conservation and Research Center is situated in the state of Minas Gerais, in an important area of Atlantic Forest bordering the 15,000 hectare Serra do Brigadeiro State Park.

Listed among the state's highest priority conservation areas, the Atlantic Forest of the Serra do Brigadeiro mountain range is characterized as sub-tropical seasonal semi-deciduous forest which contributes to two major watersheds, supports about 10,000 family farms and shelters the largest surviving population of the Woolly Spider monkey (the most endangered primate species in the New World). In this coffee growing region, which is also one of the poorest in the state, there is growing interest in the importance of preserving the extraordinary natural resources, in particular the water, the forest, and rural livelihoods. For more than two decades, Iracambi has played a catalytic role alongside the local community in shaping initiatives in public policy, ecological restoration, environmental education, sustainable agriculture and natural resource management in the region.

## **Research opportunities at Iracambi**

When considering how to answer our main question 'how can people and ecosystems coexist and thrive together?', we focus on multidisciplinary, collaborative environmental and sociological research, to help us understand ecosystem functioning and socio-ecological dynamics and improve our efforts in conservation, environmental education and reforestation. We welcome projects that help us keep track of ecosystem features and surrounding communities, specifically soil quality, water quality and flow, forest growth and cover, wildlife diversity and ecology, and the socio-economic aspects of rural livelihoods in relation to ecological restoration.

In order to simultaneously research both ecological and socio-economic conditions, we are designing an integrated monitoring system (Smart Forest) to help us better understand how to enhance ecosystem health and rural livelihoods. Our approach proposes to combine techniques from remote sensing to "boots on the ground" as a way to gather high quality, consistent data. The resulting comprehensive database will be used to refine environmental monitoring protocols and restoration practices, as well as serving as a framework to understand and quantify ecosystem services and scaling restoration efforts at regional scale.

### **In-house research demands**

We warmly invite you to join and develop our ongoing research projects. Their goal is to optimize, document and evaluate Iracambi's projects and activities.

## Restoration

- ❖ Biological control
  - Weed control: mechanical, biological, soil cover. Is it possible to use non-chemical controls in large-scale reforestation projects?
  - Optimizing costs of maintenance in restoration areas: logistics, labor, transport etc.
  
- ❖ Extending planting activities outside the rainy season
  - Availability of water for seedlings
  
- ❖ Sustainable food production systems (agroforestry, agroecology)
  - Agroforestry systems for forest connectivity
  - Agroecology for enhanced income generation
  - Finding common ground with existing food production systems
  - Business planning: financial feasibility, logistics and marketing at local scale
  - Measuring and tracking production
  - Management strategies and costs
  - Studying synergies between different agroforestry/agroecology systems

## Environmental Monitoring

The **Smart Forest Program** includes most of our monitoring objectives, find out more by [clicking here](#).

- ❖ GIS and drone photography to track changes in forest cover
- ❖ Use of camera traps and photography to monitor wildlife – medium and large mammals.
- ❖ Sound recordings and data analysis to further monitor wildlife
- ❖ Periodic monitoring of soils, water and weather conditions

## Ecological Economics

"[focused on] the interfaces and interplay between "nature's household" (ecosystems) and "humanity's household" (the economy). Ecological economics is an interdisciplinary field defined by a set of concrete problems or challenges related to governing economic activity in a way that promotes human well-being, sustainability, and justice. The journal thus emphasizes critical work that draws on and integrates elements of ecological science, economics, and the analysis of values, behaviors, cultural practices, institutional structures, and societal dynamics." ([click here to read more](#))

## Public policy, legal compliance and land tenure issues

- ❖ Processes and protocols for research which involves human beings
- ❖ Collecting data and planning conservation activities for managing water management areas, natural reserves, and Environmental Protection Areas in the region

## Forest-based products: business planning and production processes

- ❖ Cosmetics, essential oils, vegetable butter, self-care products from native plants
- ❖ Sustainable food production systems - see agroforestry/agroecology above

## Independent research

### We welcome projects that relate to our research lines:

- ❖ Ecosystem functioning
- ❖ Natural resource management
- ❖ Development of sustainable communities

## Ecosystem functioning

### Background

In considering best practice community environmental management in the forests of the Serra do Brigadeiro there are two main questions to be asked. Firstly, what resources exist in terms of flora and fauna? Secondly, what are the best management practices for us and our community? Answers to the first require a program of continuous biological inventorying and mapping. Answers to the second lie in understanding local communities and rural livelihood in order to define and prioritize the challenges to environmental sustainable management. After working with local farmers for over two decades, we have jointly identified two interlinked priority areas: managing forest resources and managing water. Our program of environmental monitoring includes observing and tracking changes to forest cover and growth, and monitoring water quantity and quality. We are principally interested in understanding ecosystem functioning and services and how they are affected by human activities and climate change. A practical consequence of these monitoring programs will be the establishment of baseline data to be used in future programs of payment for environmental services.

### Activities

- a) Build and continuously update a database of flora and fauna in the region
- b) Set up monitoring benchmarks against which the environmental health of a forest ecosystem can be measured
- c) Study species richness, abundance and population dynamics to determine which ones hold the largest biodiversity, while gaining useful insights to optimize conservation and habitat connectivity

- d) Use the data to investigate and comprehend the dynamic links between (i) forest composition, vegetation cover and growth stages, and (ii) the forest environment – the status of soils, water and fauna over time across different landscapes within the area
- e) In the context of climate change, establish and continuously improve monitoring guidelines for environmental management, making them publicly available

### **Outcomes**

A series of ecosystem health indicators collected from different areas: mature forest, regenerating native forest, replanted forest, cleared forest land (pastures), plantations (usually coffee monoculture) and agroforestry/agroecology systems.

## **Natural Resource Management**

### **Background**

In order to protect the core conservation area around the valuable remnant of Atlantic Forest in and around the State Park, Iracambi has been working for two decades with the nine surrounding counties to create and strengthen environmental protection areas and private forest reserves. These initiatives will increase the area of protected land in the buffer zone of the park, and qualify the county government to attract additional funding from the state. At the same time, a large mining company, with concessions on significant areas of land in the buffer zone, has moved into the area and begun mining operations. As mining expands, it has a major impact both on the environment and also on the lives of local farmers, and Iracambi works actively with local communities to ensure that environmental and social impacts can be minimized. A valuable tool in this work is the Iracambi GIS which already covers some of the neighboring communities and is now being extended to cover the area of the buffer zone. Iracambi also works with local farmers and county authorities to identify existing land use, and catalog the forest fragments in order to create land use plans.

### **Activities**

- a) Gather and update data on current and potential land-use strategies, aiming at protecting and connecting forest fragments, water bodies and species reservoirs in the area
- b) Identify, together with the community, the critical areas for management (those defined by nature as well as those defined by law,) with the aim of implementing environmentally sustainable management that supports the continuity and enhancement of rural livelihoods

### **Outcome**

Identifying key areas and establishing management plans with the objective of supporting long term conservation and restoration, while strengthening human communities and ecosystem resilience.

## Developing Sustainable Communities

### Background

Conservation and sustainable management of natural resources are essential practices towards healthier, productive and profitable farming that meets the needs of both people and nature. Since the tradition of colonizing and exploiting natural environments replaced ancestral nature-friendly traditions, it is important to rescue and update such traditional ecological knowledge.

If the forest can provide additional revenue, whether through ecosystem service payments, ecotourism, medicinal plants or income deriving from a private reserve, the likelihood of farmers protecting their forest patches will increase. Environmental awareness, sustainable agricultural practices and proper management plans, combined with economic opportunities, foster progress towards resilient, sustainable communities and societies, as well as ecosystems. Once this process is set in motion, it tends to consolidate and spread.

### Activities

- a) To create economically viable and ecologically sustainable methods of generating forest-based income such as agroforestry and organic horticulture, as a means of increasing sustainability, food safety and income for farmers
- b) To propose methods by which farmers can be paid for the environmental services generated by their land, including carbon sequestration, clean water, soil and biodiversity restoration
- c) To identify other potential income sources, such as the sustainable harvesting (and processing) of the açai juçara fruit, growing ornamental plants and other economically interesting species; or developing educational and ecological tourism
- d) To rescue and pass on traditional and modern knowledge about medicinal plants and how they may be sustainably grown, processed, harvested, packaged, and marketed
- e) Through playing our own part in public policy and educating future environmental leaders to support local communities in their endeavors to have a more active voice in local environmental policies

### Outcomes

Developing the capacity of local communities to maintain sustainable economies in a flourishing landscape. Establishing and communicating knowledge about the ecosystem services generated on the land, using this knowledge as a basis for negotiating ecosystem service payments to sustain community development and economy. Creating data-driven plans for income generating land-use alternatives to inspire and guide the development of sustainable jobs and business.

## How to apply

### In-house research opportunities

Check [here](#) for internal research demands, open calls and the calendar of annual activities.

Do you feel you can help with in-house demands, but can't find an open call that works for you? We would love to hear from you, please send us an e-mail at [lara@iracambi.com](mailto:lara@iracambi.com) or [iracambi@iracambi.com](mailto:iracambi@iracambi.com). Please put in your email heading, the subject that you would like to research.

### Independent research

Found a connection between your project/idea and our research lines? We are always happy to hear from research groups, institutions, professors and students who want to conduct their research at Iracambi!

- ❖ If you are a student aiming to conduct your bachelors, master or Ph.D. research with us, please tell us about yourself and your research by filling in [this form](#).
- ❖ If you are a professor interested in sending your students or coming with your group to Iracambi, please email us at [lara@iracambi.com](mailto:lara@iracambi.com) or [iracambi@iracambi.com](mailto:iracambi@iracambi.com).

### Information for researchers

- ❖ Students will receive orientation regarding potential hazards in the field as well as access to our field first aid-kit
- ❖ Be aware that the Brazilian law requires specific permits for international researchers. You can find [more information here](#)
- ❖ Staff support for project discussion, field work, experiments and trails will be offered weekly. This depends on staff availability, fluctuating demands and weather conditions, particularly during the rainy season. The best option is to plan ahead and remain flexible. But don't worry, we'll support you!
- ❖ Our vehicles can be scheduled to take you and your research materials to distant research areas. Please remember to evaluate your needs (especially for hard-access, off-road places) and schedule the ride ahead, since our vehicles work around the clock and a staff member must be available to drive you. We highly recommend researchers to come in pairs or groups. Here is why:
  - Increased flexibility and potential during field work
  - Networking, extra support and knowledge exchange
  - Connecting and expanding projects, data and publication potential
  - Cultural exchange



### Infrastructure and prices

Service	Description	Cost (USD/EUR)	Note
Iracambi board and lodging	Includes accommodation, 3 meals a day. internet access, water, electricity, transport to the field, and staff support	\$250 per week – up to three weeks	We highly recommend researchers to stay at least three months. Longer stays attract a discount
		\$940	Minimum four weeks stay. Pay through our website.
		\$1600	Minimum eight weeks stay. Pay through our website.
		\$2160	Minimum twelve weeks stay. Pay through our website.
Transport (confirm availability ahead)	Pickup from the Rio airport to Iracambi, and return trip to the airport.	\$2100.00	Caters for a group up to 15 people/single payment. Pay through our website.
Mateiro (i.e., field guide) (confirm availability ahead)	Former hunter who can share knowledge on animal behavior, tracking fauna and the common names of trees.	\$30	Per day; in cash BRL

Check some more information and pictures of our facilities [here](#)

### Interesting reads

- Bustamante, M.M.C., Silva, J.S., Scariot, A. et al. Ecological restoration as a strategy for mitigating and adapting to climate change: lessons and challenges from Brazil. *Mitig Adapt Strateg Glob Change* 24, 1249–1270 (2019). <https://doi.org/10.1007/s11027-018-9837-5>
- de Mello, K., Taniwaki, R. H., de Paula, F. R., Valente, R. A., Randhir, T. O., Macedo, D. R., ... & Hughes, R. M. (2020). Multiscale land use impacts on water quality: Assessment, planning, and future perspectives in Brazil. *Journal of Environmental Management*, 270, 110879.
- Feedback Labs (non-profit): <https://feedbacklabs.org/why-feedback-matters/>

- Marques, M. C., & Grelle, C. E. (Eds.). (2021). *The Atlantic Forest: History, biodiversity, threats and opportunities of the mega-diverse forest*. Springer Nature.
- PERT, PETINA L.(2011) *Participatory Research in Conservation and Rural Livelihoods: Doing Science Together*. Wiley Online Library.
- Schmidt, I.B., de Urzedo, D.I., Piña-Rodrigues, F.C.M., Vieira, D.L.M., de Rezende, G.M., Sampaio, A.B. and Junqueira, R.G.P. (2019), Community-based native seed production for restoration in Brazil – the role of science and policy. *Plant Biol J*, 21: 389-397. <https://doi.org/10.1111/plb.12842>
- Tourinho, L., de Brito Alves, S. M., da Silva, F. B. L., Verdi, M., Roque, N., Conceição, A. A., ... & Vilela, B. (2023). A participatory approach to map strategic areas for conservation and restoration at a regional scale. *Perspectives in Ecology and Conservation*, 21(1), 52-61.
- Tubenclak, F., Badari, C. G., de Freitas Strauch, G., & de Moraes, L. F. D. (2021). Changing the agriculture paradigm in the Brazilian Atlantic Forest: the importance of agroforestry. *The Atlantic Forest: History, Biodiversity, Threats and Opportunities of the Mega-Diverse Forest*, 369-388.
- Viani, R. A., Bracale, H., & Taffarello, D. (2019). Lessons learned from the water producer project in the Atlantic Forest, Brazil. *Forests*, 10(11), 1031.