

**American University  
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**Deep Sharing**  
A vision for Serra do Brigadeiro State Park Region

For  
Iracambi Research Center

By

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## **Overview:**

The purpose of this report is to provide an external perspective for the potential future of the nine counties surrounding the Serra do Brigadeiro State Park in Minas Gerais. We present these findings in hopes that Iracambi will consider our proposal for a balanced agro-ecological future in the region. We fully support the vision of a more interconnected and fulfilled life through community and recognition of the intrinsic value of the environment. Our recommendations align with a vision for improved land use, increased government effectiveness, a high level of social organization, and a robust response to climate change.

## **Methodology:**

Our research was conducted over a two-week period in the Zona da Mata region of Minas Gerais, Brazil. We visited 5 local small-scale farms and conducted over 15 formal and informal interviews with community members and government officials. Additionally, we consulted with Robin and Binka Le Breton and received guidance from Dr. Eve Bratman. Other research methods included a comprehensive desk review of the relevant academic literature, and lectures from respected scholars at Fundação de Getúlio Vargas examining the social, political, and economic realities of Brazil.

## **Limitations to Research:**

We do not presume to know what the communities' needs are more than the community members themselves. Thus, our role is to offer avenues of potential alternatives for consideration. We recognize the committee is better suited to make future decisions for their own community. Additionally, we believe the committee will be the most effective tool to transform the region using Iracambi as an agent of change.

There are several structural limitations that beg consideration. First, our data was distorted by our lack of agency throughout the design process. For example, we were unable to have a dialogue with all stakeholders including park officials or representatives from various levels of government. Moreover, we were limited by time, the accessibility of certain areas, and in the interview selection process, both in the number of interviews and the lack of diversity among interviewees. Second, our position as an outside research team, closely affiliated with Iracambi, was a significant limitation to our research. As outsiders, we are not best suited to understand inter-community dynamics, needs and priorities. Additionally, because we were based at Iracambi and introduced as a research team working with the NGO, our interviews were inevitably biased.

## **Potential Limitations for Iracambi:**

When considering our findings and recommendations we recognize potential structural barriers the organization may face moving forward. These include neo-liberal economic principles (capitalist growth model), increased rural-urban migration, and ineffective municipal governance, state control over licensing process for mining, preconceived notions of Iracambi's role in the area, and external forces that can exacerbate climate change.

## **Organization of Paper:**

Following this introduction the report will provide a brief contextual background on the region including the expected effects of climate change and an overview of Iracambi's position at an important time of transition. Next, this strategic document discusses our vision regarding future land use which we delineate into three categories: extractive, productive, and ecological function. These land use approaches will be cross-analyzed with three variables: social organization, effective government support in rural areas, and climate change response. The findings will be presented in a series of matrices for easier understanding. Next, we present our perspective on Iracambi's strengths, weaknesses, opportunities, and threats at this time of transition. Last, the report will offer considerations to the committee while discussing the future utility of Iracambi to enhance its potential as a positive agent of change.

## **Regional Context:**

The municipality of Rosário da Limeira consists of 4,525 inhabitants (IBGE, 2015 est). Geographically 44% of the population lives in rural areas and 56% in urban. The area is experiencing a decline in the rural population as residents continue moving to urban areas (Watson, 2008). The rural population of Limeira declined by 12% between 2000 and 2010 (IBGE, 2014). The Municipal Human Development Index (MHDI) is 0,662 compared with a 0,638 MHDI in the state of Minas Gerais (IBGE, 2010). Additionally, Limeira has a 94% literacy rate among individuals 15 years or older, higher than the state rate of 91.4% (KNOEMA, 2013).

Only around ten percent of the current landowners in the region have a farming area bigger than 30 hectares. Land ownership in the region is extremely unequal, with less than 20% of landowners owning more than 60% of the land. This is caused by general income inequality and the high rate of rural to urban migration, which allows large landowners to consolidate their holdings (Wilhelmina van Ree, 2007). The threat of mining expansion in the area also increases as small farmers migrate to urban areas. Mining activities can severely damage the land and vital natural resources, and permanently displace rural residents.

Households in the rural area are heavily dependent upon the agricultural sector for their livelihoods. Ninety percent of residents rely on agriculture and agricultural services for their income (Watson & Achinelli, 2008). Coffee is the main cash crop in the region, as it is well suited to the local climate and there is constant demand in the global market. Coffee is the primary source of cash income for households, with 74% of agricultural income derived from coffee production (FAEMG, 2005). Coffee farmers struggle to command premium prices because of the low quality of their harvest, lack of product quality certification and value-added processes.

A second significant livelihood in the area is dairy farming. Dairy farming has expanded in the region, helping to diversify the regional economy but contributing to further degradation of soils. Through our interviews with dairy farmers we saw opportunities for the creation of farmer cooperatives, the adoption of new technologies, and other improvements to the value

chain (Christiano, 2016). Non-coffee or dairy production is limited, and other food crops are grown primarily for household consumption. Local markets for basic produce are small and specialty markets, such as for organic produce, are difficult to access. Some farmers have planted eucalyptus trees to harvest for timber, however eucalyptus plantations can be damaging to soil and water resources if they are not sustainably managed. Wage labor in neighboring farms or in urban areas is a significant source of additional household income for many smallholders in the region (Wilhelmina van Ree, 2007).

### **Expected Effects of Climate Change:**

Residents of the region are increasingly becoming aware of climate change and the effect it is having on local weather patterns, the natural environment, and their livelihoods. Climate scientists predict that the southern region of Minas Gerais will see a significant rise in temperature in the next two decades (Hagggar and Schepp, 2012). Soil degradation is a major problem in the region as a result of monocropping, high use of agrottoxins, poor erosion control measures, and the intense rains and flooding caused by unusual weather conditions. The recent drought in the region dried up many springs which further damaged soil quality and raised concerns among local farmers. Sustained soil degradation is expected to significantly affect coffee farming through decreased yields and quality. According to one report, temperature increases coupled with increased risk of drought and flooding could result in the loss of up to 33% of low-risk range for coffee in Minas Gerais by the end of the century (Hagggar and Schepp, 2012). The importance of coffee production for the rural economy necessitates the implementation of adaptive methods to mitigate losses. Possible adaptive measures to limit economic and environmental losses include shade management, irrigation, vegetated soil, planting at higher densities, reforestation, and agroecology (Hagggar and Schepp, 2012).

### **Iracambi in Transition:**

Just as the region is undergoing significant change, so too is Iracambi. Founders Binka and Robin Le Breton will be stepping down from their active positions in the coming year, and they have selected a transition manager and convened a committee of employees and friends of the organization to help guide Iracambi into the future. The shared values and vision of this group of people will play an important role in determining the strength and direction of the organization going forward. There is much potential to build on: Iracambi has already proven itself as a catalyst for positive change, and projects such as Forests4Water have shown that rural farmers can indeed benefit from replanting trees around rivers, springs and other ecologically sensitive areas. At the same time, there is much work to be done. Through our interviews with community members we have determined that Iracambi is generally respected and seen as a force for good in the region, but can also be viewed as distant and paternalistic. Constantly changing volunteers and reliance on grant funding have led to a perception that the organization starts many projects but does not always follow through. More can be done to build closer ties to the community and ensure that work is concentrated on the values that matter to the local population.

## **Introducing Our Scenario Matrices: Three Competing Perspectives on Land Use**

The following sections present related matrices that seek to outline plausible future development scenarios for the region. Based on our research and interviews, we have identified three key variables that will play an important role in influencing the future development of the region. These are: (1) the strength of social bonds and organizations, (2) the effectiveness of government in rural areas, and (3) the degree of organized response to climate change. Each of these variables is divided into a “high” or “low” category. Each scenario matrix is then devoted to exploring how these variables play out under three competing paradigms of land use and developmental emphasis, which we refer to as “Extractive”, “Productive”, and “Ecological Function.” In each matrix we highlight ecological function with high social organization, high effective government, and high climate change response as the best possible scenarios. These recommended scenarios will require a change in values that emphasizes healthy ecosystems and community over the production of goods and services.

As each matrix shares the same paradigms of land use/policy emphasis, it is worth briefly outlining each in more detail.

### **Extractive**

The “Extractive” paradigm is characterized by a strong emphasis on economic growth fueled by natural resource extraction and intensive industrial agriculture geared toward export commodities. Social and environmental concerns tend to be viewed as secondary to economic concerns in this paradigm, and production typically requires intensive use of technology and/or use of synthetic fertilizers and pesticides. Production has the potential to generate high economic returns in the short term. In the long term, widespread environmental degradation leads to diminishing returns and increased pressure to expand operations to new areas. Examples of dominant forms of land-use under this paradigm include large-scale mineral mining and massive monoculture plantations.

### **Productive**

The paradigm we refer to as “Productive” is much in line with the mainstream concept of “Sustainable Development.” Here, economic returns are still emphasized, but are balanced by increased recognition of social and environmental needs. Production is somewhat diversified and may still rely on technology and chemical inputs, but stricter labor and environmental regulations are in place. Examples of production might include more stringently regulated mining, limited diversification of large farms, and increased use of erosion control and water conservation practices and technologies. High economic returns may be sustained for longer than in the extractive paradigm, but continued prioritization of production efficiency over ecological function continues to drive slow environmental degradation in the long term.

### **Ecosystem Function**

The “Ecosystem Function” paradigm is inspired by the work of John Liu, and is characterized by recognition that ecosystem function is ultimately more valuable than the

production and consumption of goods and services (Liu, 2011). In this paradigm, the emphasis of human activity is on restoring and preserving ecosystem function, strengthening community bonds, and on designing production systems that work in harmony with natural processes. This paradigm represents a shift from current values that emphasize economic growth and material consumption to values that prioritize community and sustainability. Uptake of such values will tend to lead to development of smaller, more autonomous economic communities that rely on local governance and collective management of resources to meet their needs. Examples of steps in this direction include diverse agroecology and agroforestry systems, collective management of forest and water resources, and restoration and preservation of natural areas.

**Scenario Matrices:**

Social organization, effective government support in rural areas, and climate change adaptation are three factors that will shape future development scenarios for the region. Iracambi is in a unique position to work within the region to accomplish environmental adaptation activities. They have the potential to bring in new and innovative ideas with the partnership of farmers from the 9 municipalities surrounding Serra do Brigadeiro State Park.

**Social Organization:**

Social organization refers to the ability of non-governmental social networks to effectively mobilize and address the needs of communities. Examples of low social organization can include autonomous farming, low cooperative and union activities, and limited interaction between community members. Examples of high social organization may include existence of strong community bonds, active agricultural unions, participation in reciprocal labor exchanges, and revolving loan funds (familiar rotating savings and credit association). Currently, the region has low to moderate levels of social organization.

		Extraction	Production	Ecological Function
<b>Social Organization</b>	<b>Low</b>	<ul style="list-style-type: none"> <li>• High degree of competition amongst individual producers</li> <li>• Widespread degradation of natural ecosystems</li> <li>• Continued rural to urban migration</li> </ul>	<ul style="list-style-type: none"> <li>• High competition amongst producers</li> <li>• Moderate economic returns, moderate risk</li> <li>• Continued consolidation of holdings</li> <li>• Moderate diversification of large-scale farms</li> </ul>	<ul style="list-style-type: none"> <li>• Isolated ecological farms within a landscape dominated by traditional farming</li> <li>• Slow or limited proliferation of sustainable practices</li> <li>• Moderate slowing of pace of environmental degradation</li> </ul>
	<b>High</b>	<ul style="list-style-type: none"> <li>• Social support for extractive activities (mining)</li> <li>• Dependence on corporate royalties and donations for provision of social services</li> <li>• Heightened participation in global export markets</li> </ul>	<ul style="list-style-type: none"> <li>• High participation in cooperatives and unions</li> <li>• High returns to farmers through increased horizontal and vertical integration of production</li> <li>• Emphasis on large-scale monoculture</li> </ul>	<ul style="list-style-type: none"> <li>• Heightened regional autonomy</li> <li>• Coordinated efforts for environmental protection</li> <li>• Increased collective management of natural resources</li> <li>• Network of highly diversified farms</li> <li>• Shift away from commodity-driven growth</li> </ul>

**Effectiveness of Government in Rural Areas:**

Effectiveness of government refers to the ability of local, state, and federal agencies to effectively coordinate amongst themselves and provide for the public good through a transparent and democratic process. Examples of low effectiveness include high levels of corruption and negligence, excessive bureaucratic process, lack of participatory mechanisms, low public outreach, and dominance of a reactive and clientalist model of response to citizen needs. Examples of high effectiveness include high levels of accountability, efficient resource allocation, strong structures in place for high political engagement, and an emphasis on long term strategic planning. The current context of the effectiveness of government falls in the low category.

		Extraction	Production	Ecological Function
<b>Effective Government Support in Rural Areas</b>	<b>Low</b>	<ul style="list-style-type: none"> <li>• Ineffective social services</li> <li>• Large-scale mining</li> <li>• Widespread ecosystem degradation and fragmentation</li> <li>• High dependence on mining royalties and employment</li> </ul>	<ul style="list-style-type: none"> <li>• Ineffective social services</li> <li>• Increased economic vulnerability</li> <li>• Minimal coordination between government and farmers</li> <li>• Short-term specialization</li> <li>• Fluctuating community demographics</li> </ul>	<ul style="list-style-type: none"> <li>• Limited technical and financial support and policies for ecological practices</li> <li>• Self-funded and autonomous producers</li> <li>• Slow transition from market-oriented to ecosystem-oriented production</li> </ul>
	<b>High</b>	<ul style="list-style-type: none"> <li>• Large-scale mining</li> <li>• Low dependence on mining royalties and employment</li> <li>• Devolution of regulatory authority</li> <li>• High consolidation of landholdings</li> </ul>	<ul style="list-style-type: none"> <li>• High coordination between government and producers</li> <li>• Effective technical and financial support and policies</li> <li>• Effective social services</li> <li>• Improvement in infrastructure</li> <li>• Entrepreneurial activities</li> </ul>	<ul style="list-style-type: none"> <li>• Widespread technical and financial support and policies for ecological practices (pilot projects)</li> <li>• Effective and autonomous local government</li> <li>• Rejection of extraction oriented growth model</li> </ul>



**Climate Change Response:**

Climate change response refers to the degree of recognition of the growing threat of climate change and adoption of mitigation and adaptation strategies. Examples of low climate change response include ignoring the threat of climate change, continued growth of carbon emitting activities and extractive methods, and a lack of institutional support for adaptive strategies. Examples of a high climate change response include widespread recognition of the threat of climate change, a multi-stakeholder strategic plan for the region, and active implementation of adaptation and mitigation responses. Presently, there is widespread recognition of climate change but no coordinated strategic response.

		Extraction	Production	Ecological Function
Climate Change Response	<b>Low</b>	<ul style="list-style-type: none"> <li>Widespread mining and industrial monoculture</li> <li>Accelerated rural to urban migration</li> <li>Increased economic and social vulnerability</li> </ul>	<ul style="list-style-type: none"> <li>Dependence on monocrop agriculture for exports</li> <li>Uncoordinated and isolated mitigation efforts</li> <li>Widespread deforestation and land degradation</li> <li>Increased economic and social vulnerability</li> </ul>	<ul style="list-style-type: none"> <li>Lack of coordination and planning for ecological activities</li> <li>Limited innovation and risk taking</li> <li>Moderately reduced economic and social vulnerability</li> </ul>
	<b>High</b>	<ul style="list-style-type: none"> <li>Regulated mining and industrial agriculture with offsets</li> <li>High reliance on technology to offset negative environmental impacts</li> <li>Robust corporate social responsibility and conservation programs</li> </ul>	<ul style="list-style-type: none"> <li>Increased diversification using traditional farming methods</li> <li>Reliance on market-based mechanisms for reforestation and conservation (payments for environmental services, carbon trading)</li> <li>Integrated regional response</li> </ul>	<ul style="list-style-type: none"> <li>Comprehensive strategic climate change response</li> <li>Diverse production coexisting with healthy ecosystems</li> <li>Sustainable rural livelihoods</li> <li>Commitment to ecological and community values</li> </ul>

## SWOT Analysis:

The following chart is a brief overview of Iracambi's strengths, weaknesses, opportunities, and threats (S.W.O.T.) at this time of transition. This chart is meant to address Iracambi's positive and negative realities and possibilities in approaching the three scenario matrices described above. While considering Iracambi's current and potential position in Rosário da Limeira and the region, this outlook covers both the short and long terms.

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>· Local Brazilian leaders willing to engage with community/region</li> <li>· Knowledge exchange with external actors (continued learning process with diverse perspectives)</li> <li>· Regional mobilization towards change</li> <li>· Provided support to improve livelihoods</li> <li>· Increased adaptability and mitigation of climate change</li> <li>· Willingness to innovate and take risks</li> </ul>	<ul style="list-style-type: none"> <li>· Conflicting perceptions of Iracambi in the region</li> <li>· Dependent on external funding</li> <li>· Over reliance on current management for international support (existing directors' network)</li> <li>· Lack of organizational cohesiveness and purpose</li> <li>· Centralized knowledge and limited number of bilingual (Portuguese and English) employees</li> <li>· Micromanagement</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>· Strengthening livelihoods through sustainability</li> <li>· Deepen local collaboration</li> <li>· Contribute to ecological and social change</li> <li>· Establish relationship with local government</li> <li>· Partnership with local and international institutions (NGOs, Universities, etc.)</li> <li>· Increase support for local initiatives (i.e. entrepreneurial activities, ecotourism)</li> <li>· Secure sustained financial and human resources</li> <li>· Serve as a agroecological model for the region</li> </ul>	<ul style="list-style-type: none"> <li>· Lack of control over the effects of global climate change</li> <li>· Mining activities</li> <li>· Ineffective government</li> <li>· Political and economic instability</li> <li>· Lack of coordination with external actors (working in isolation)</li> <li>· Uncertainty of transition process (loss of existing networks, management consistency, drifting from core values)</li> </ul>

## Key Considerations:

- Write or re-visit a mission statement and core values that will guide the activities of the organization
- Strengthen emphasis on demonstrating and evaluating the potential of agroecology principles as an alternative farming paradigm for the region.

- Continue to engage in and promote environmental councils and progressive environmental policies for the region
- Support local efforts of rural tourism by facilitating connections between visitors and farmers, and improving tourism infrastructure
- Continue to build formal and informal ties between NGOs, social movements/organizations (e.g. STR, PACTO, etc.)
- Decentralize leadership and responsibility and strengthen institutional knowledge by fostering a culture of organizational knowledge sharing
- Collaborate with local actors on entrepreneurial income-generating activities in order to diversify revenue streams and shift away from NGO model of dependence on external grants
- Expand and enrich environmental education activities for middle and high school youth (e.g. IFET, APAE, etc.)
- Strengthen and establish relationships with universities around the world, particularly in Minas Gerais and Brazil; actively recruit researchers and technicians for better understanding of biodiversity and expected climate change impacts in the region (e.g. Faminas Muriaé, UFV, etc.)
- Iracambi as a community training center for information exchange and collaboration (such as hosting experts from the region to train local farmers)
- Facilitate knowledge sharing about climate change mitigation and adaptation methods (e.g. farm insurance, innovative agroecology practices such as biochar, biodigesters, mist nests)

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