

# Chapter 18

## Engaging People for Large-Scale Forest Restoration: Governance Lessons from the Atlantic Forest of Brazil



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**Abstract** Large-scale forest restoration strategies should be designed not only in the light of ecological aspects, but also considering the diverse interests and uses of landscape to expand project strategies and methodologies while also supporting a more effective, long-lasting and inclusive restoration. Here, we discuss the process of social engagement through restoration, incorporating this broader view of projects and evaluating restoration initiatives with different spatial scales and objectives within the Atlantic Forest of Brazil. These projects incorporate initiatives from different networks, platforms and sites distributed across regions with high ecological and socioeconomic heterogeneity. Despite the different restoration approaches used, the creation of a common ground for sharing information, communication,

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vision and expectations, as well the continuous dialogue between multiple stakeholders, is a common key factor among projects in the Atlantic Forest. Thus, we aim to shed light on relevant aspects of these strategies, trying to capture the enabling conditions to organizing people in a common view project and argue that transferring or adapting it more broadly could significantly contribute to the success of the national restoration agenda.

**Keywords** Governance · Stakeholder engagement · Large-scale restoration · Atlantic Forest

## 18.1 Introduction

Ecological restoration can be interpreted as the greatest “*mea culpa*” declaration of current civilization on environmental themes. Following on the ideas of Aronson et al. (2007), restoration is the recognition of human overexploitation of natural capital with no consideration of sustainability or future generations. In our crowded world, for our own wellbeing and survival, we must act to recover what has been degraded and lost. The cited phrase presents two interesting pieces of information: it confirms our responsibility for environmental and climatic changes, and indicates that we, as a society, have the challenge of seeking solutions to change this reality. With that said, and agreed upon, how can we put into practice the complex task of restoring degraded ecosystems as complex as tropical rainforests? The good news is that many people are willing to take up this challenge. Over the past 40 years, Brazil has played a prominent role in the development of restoration methods and techniques (Bustamante et al. 2019) and is an internationally recognized player and leader. The question is even more critical in the current context of Brazilian national commitments to restore 12 million hectares in the coming years. How to engage multiple stakeholders and organize people to promote regional strategies such as the Initiative 20x20 for Latin American and Caribbean countries, or the Bonn Challenge, expanded in the New York Declaration on Forests at the United Nations Climate Summit to include a total of 350 million hectares restored and recovered around the world by 2030?

There have been significant advances in ecological restoration in Brazil via the application of restoration concepts, especially in experimental projects, both small- and large-scaled, positioning the country as a global reference source in this field (Crouzeilles et al. 2019). A spatial database of the primary restoration projects in the Atlantic Forest, led by the initiative known as the Atlantic Forest Restoration Pact (PACTO), currently includes records of over 36,000 hectares undergoing restoration in the biome (database: <https://pactoma.esalq.usp.br/pacto/> – accessed on 10/11/2019).

The way stakeholders interact, negotiate and make decisions about the landscape is what is typically referred to as landscape governance (Kusters et al. 2018; van Oosten et al. 2014). The use of the term governance in association with environmen-

tal issues casts light on the challenge faced by humanity, which is experiencing climate change, loss of biodiversity and natural capital and increased complexity, requiring an expansion of understanding and tools to address environmental issues (Ball et al. 2014). The definition of governance one uses should be explicit with regards to the varying ways in which public and private actors from state, market and civil society negotiate and manage public issues (Arts 2014). For a more detailed review about this issue, it is necessary to back in 1968, with the concepts of Garrett Hardin on his classic article “The tragedy of the commons” where he indicates the eminent conflict or collapse due to overuse of shared resources. Alternatively, Elinor Ostrom, the laureate Nobel Prize in economics, suggests an approach in the book “Governing the Commons” (Ostrom 1990) based on large observation on the field, demonstrating how local communities were able to deal with the commons pools, without top-down regulations.

Governance is critical for landscape restoration actions to ensure that the results meet the interests of the inhabitants and users and that, above all, their actions remain sustainable over the years. Regarding this objective, some studies have focused on understanding how the process of organizing stakeholders to reconcile their interests in the landscape occurs. Wilson and Cagalan (2016) conducted a review of several studies and models of governance at the landscape level and found, among other results, that the expansion of more democratic and inclusive governance mechanisms can ensure the success of restoration initiatives. Pistorius and Freiberg (2014) discuss complementary forms of governance for the implementation of top-down models, such as international agreements, in the specific case of the Aichi Target. Forest Certification and Payment for Ecosystem Services are also referred to as forest governance models (Arts 2014). Van Oosten et al. (2014) suggested that governance at the landscape level may be considered according to three approaches: as a management tool; as a multi-stakeholder decision-making process; or as the creation of a new institutional space, known as “institutional bricolage”. Institutional bricolage is a process in which actors consciously and unconsciously reshape or piece together different institutional arrangements. Mansourian et al. (2014) proposed that the factors that influence governance may be described in three pillars that operate at different landscape scales, incorporating stakeholders, processes and structures. Mansourian (2017) conducted a literature review about restoration governance, showing that there are limited guidelines available for practitioners, especially for large-scale restoration initiatives, and then proposed a framework to help fulfil this gap, based on the understanding of stakeholders’ connections, contexts and scale.

In a literature review on how large-scale forest restoration affects local livelihoods, Adams et al. (2016) concluded that restoration should be carried out as a form of investment where the financial, environmental and social benefits are obtained simultaneously, attempting to meet the different demands from a variety of stakeholders. When this challenging task is not properly addressed, as observed by Brancalion and Chazdon (2017) for tropical forest and landscape restoration, the negative effects can include inequality in the distribution and

access to benefits, generating an imbalance among the stakeholders involved. However, the authors indicate that bottom-up processes tend to bring more benefits to the community, which is reinforced by the studies of Pinto et al. (2014) for the Atlantic Forest biome, and by Holl (2017) for other tropical areas. Brancalion and Chazdon (2017) also warn that the assessment of the impacts of restoration initiatives on women groups and other vulnerable groups are underestimated in the literature.

Therefore, restoration governance is an emerging field, with methodological, practical and conceptual challenges ahead. Different approaches and scales are addressed in the process for organizing people and institutions for forest and landscape restoration. Understanding that governance models are fundamentally important in the scaling-up of restoration programs and in increasing the effectiveness of each restoration project is thus crucial. Here, we evaluated the governance mechanisms that operate in different restoration initiatives across the Atlantic Forest region in Brazil, identifying the main characteristics and dimensions of the governance structure and highlighting strategies to upscale restoration. We explored this overarching question in different restoration projects that served as case studies and helped us to illustrate the importance of engaging people for restoration success.

## 18.2 Methodology

### Case Studies

In this chapter, we described the governance approaches employed by four large-scale restoration projects at the Brazilian Atlantic Forest: (1) the Brazilian Ecological Restoration Network (national level, all biomes); (2) The Atlantic Forest Restoration Pact (national level, Atlantic Forest biome); (3) Arboretum program (Atlantic Forest of northeast Brazil); and IV) Ecological Corridor (Atlantic Forest of southeast Brazil) (Fig. 18.1). These case studies were intentionally selected because they represent different governance models, objectives and structure. The information about those case studies was shared from their leaderships, which are co-author in this chapter.

### Brazilian Society for Ecological Restoration

In 2010, a group of professionals and researchers in the field of ecological restoration, from across Brazil, gathered to discuss the creation of a support network and locus for debate on how to confront the challenges associated with restoration. In the same year, the Brazilian Ecological Restoration Network (Rede Brasileira de Restauração Ecológica – REBRE), an open, horizontal and non-hierarchical network, was established to expand the synergy of restoration initiatives and deepen the dialogue among the various stakeholders involved in the restoration process. The creation of REBRE was formalized through the publication of its Charter of Principles, available at <http://www.rebre.org>. Its initial operation comprised a list of



**Fig. 18.1** Location of the four case study areas, Brazil. The National Scale case study (in grey), is represented by the Brazilian Society for Ecological – SOBRE; the Biome Scale case study (in green) is the Atlantic Forest Restoration Pact; and the Regional Scale case studies (in red) are, from north to south, respectively, the Arboretum Program and the Ecological Corridor

email addresses for exchanging information, questions and other subjects and interests shared by the various restoration stakeholders in Brazil. Once the dialogue platform was established, it was possible to move beyond the exchange of experiences and advances towards establishing the necessary basis for the collective construction of knowledge and creating enabling conditions for upscaling restoration in Brazil.

In the early years of operation of the REBRE, the desire of the restoration community to establish more structured dialogue channels (especially a Brazilian Conference on Ecological Restoration) was growing, as was the search by restoration experts for public agencies that could publish technical positions, as the network format is limited in this respect. Thus, during the third REBRE workshop in 2014, the participants founded the Brazilian Society for Ecological Restoration

(*Sociedade Brasileira de Restauração Ecológica – SOBRE*), as registered in the *Antonina Charter*. As a not-for-profit civil association, SOBRE is a scientific, cultural and educational association promoting ecological restoration in Brazil, seeking to expand knowledge in the area, support the training of human resources and contribute to decision-making and public policies. Its main characteristic is its governance model, with an evident bottom-up logic, developed from a base with broad national representation, after a process of collective maturity. Since its creation, it has informed policy through technical advice, when demanded by governments, NGOs and others, both for encouraging new policies, such as offsetting mechanisms for restoration and prioritizing criteria, and for avoiding setbacks such as weakening legislation on restoration. As an institution, with more than 400 associates, it is managed by a board of directors, supported by councillors from every region of the country (see [www.sobrestauracao.org](http://www.sobrestauracao.org)).

SOBRE is therefore an institution that brings together restoration stakeholders in Brazil while maintaining a commitment to the collective and democratic principles that guide it, since before its creation, based on dialogue and synergy in the pursuit of economies of scale in restoration actions, with quality and benefits for people and the environment.

### **The Atlantic Forest Restoration Pact**

The Atlantic Forest Restoration (hereafter Pact) is a multi-stakeholder platform that aims to restore and reforest 15 million hectares in the Atlantic Forest biome by 2050, integrating the efforts of its members and enabling large-scale restoration with socioeconomic benefits. The Pact is presented in several studies as an example of a process built from the bottom up in a collaborative and dynamic way (Calmon et al. 2011; Crouzeilles et al. 2019; Holl 2017). The initiative is based on a governance model that takes advantage of its more than 280 members from different sectors, active in the chain of restoration and reforestation in the 17 states of the Atlantic Forest biome, thus allowing the engagement of a diverse group of experts acting in working groups (WGs) according to the movement's strategic themes.

In constructing the connections necessary to address gaps, the platform brings together different sectors for the consolidation of a strategy based on an innovative approach. Brancalion et al. (2016) referred the main innovations on the Pact's governance to promote large-scale restoration. Thus, a pioneering Geospatial Working Group was established, which was responsible for preparing the first product of this coalition, a map of potential restoration areas in the Atlantic Forest biome. As a result of this mapping initiative, an initial effort was also made to register the restoration initiatives that have occurred in the Atlantic Forest biome since 2009, because the institutions involved and actions being taken were previously unknown, and this was the first basis for sharing actions and a vision. Currently, this registry of projects is consolidated in an online geospatial platform that allows projects to be registered, as well as queries and cross-checking to be performed with other databases, in addition to monitoring the progress made in areas and their level of quality according to a protocol defined for restoration actions.

Based on these initial surveys, the importance of understanding and managing the efforts being made towards achieving the expected results of restoration initiatives was observed, and a monitoring protocol for assessing the success of these actions was established. The Pact then began to gather experts in the field to consolidate knowledge on the science and practice of restoration. Important publications include the Theoretical Framework of Forest Restoration Concepts and the Monitoring Protocol (Viani et al. 2017). The set of maps, geospatial platform, reference documents and monitoring protocol is what is referred to as the Pact “toolbox”, which serves as a system of governance, aligning strategies and establishing a common vision shared by the participating members.

In addition to an internal governance structure composed of a National Coordination, Executive Secretariat and Coordination Council, a network of regional units (RUs) was established and are considered operational bodies of the Pact. These RUs include partner institutions, whose legitimacy and local actions are in accordance with the strategies established by the movement, possessing national influence, to the extent that they identify barriers or opportunities, bringing these issues to the movement and the Pact overarching body. However, forest and landscape restoration not only address environmental aspects but also include a socio-economic component, considering the various stakeholders and interests within a territory. Thus, the Pact understands that it is essential to consider restoration in a more holistic and innovative manner, integrating many different perspectives in its scope of action. Based on this new perspective, the platform initiated a more inclusive approach, with the Gender and Diversity Working Group (PACTO and IUCN 2017).

### **Arboretum Programme**

The Arboretum Programme is a public and inter-institutional programme that operates in the Atlantic Forest biome in the territory of Hileia Baiana (north of Espírito Santo and south of Bahia), whose focus is on the conservation and valorization of forest biodiversity. The proposal of the Arboretum was developed by the Brazilian Forest Service and made feasible by the Public Prosecution Office of the state of Bahia through a conduct adjustment agreement (*Termo de Ajustamento de Conduta – TAC*, in Portuguese) signed by pulp companies, by financing the implementation and maintenance costs of the Arboretum Programme. This TAC allowed a seed money for the construction of the physical structure of the program and the maintenance of basic activities for 10 years. The programme is currently managed by a council composed of representatives from research, outreach and normalization institutions in a structural arrangement that is being replicated in other regions of Brazil and is recognized as a model of public policy, referred to as the Centre for Sustainable Forest Development by the Brazilian Forest Service.

The Arboretum program established a seed network that comprises seven communities and more than 40 active seed collectors, which have sold by 2018 more than five tons of seeds from 393 native forest species. Most of these species had never been priced or marketed before. Currently, their forest nursery has approximately 300 native tree species in production. Among the four nurseries established

in local communities, the production focus is species with greater market demand, without abandoning the conservationist approach. This seedling network adds value to the community centres, involving more than 30 nursery workers and has an approximate annual production capacity of 500,000 seedlings per year.

The impact of the programme has important significance for forests and the people living nearby them. The seed collectors and nursery workers who work in the programme experience forests in their daily activities, and based on this relationship, they value forests beyond only an economic context. Establishing a relationship between people with forests is undoubtedly one of the best mechanisms for forest protection and possibly even one of the least widespread, especially in the Atlantic Forest. The Arboretum Programme initiated this process through seeds and seedlings. However, many value niches still require exploration, from the perspective of practical and palpable fundamentals for sustainable forests.

### **Ecological Corridor**

Remnant fragments of the Atlantic Forest in the São Paulo portion of the Paraíba do Sul River valley constitute a complex mosaic, composed of pastures and urban areas, whose land-use history has led to the region's forest suitability, which is currently characterized as a strategic region for large-scale forest restoration. In addition to the natural suitability of the region, the 2013–2014 water crisis brought special attention to this region due to its significance to the public water supply of the metropolitan region of Rio de Janeiro and the city of São Paulo, which contribute considerably to the national Gross Domestic Product. As a result, among the initiatives proposed for confronting the water crisis, some public policies and efforts from national and international non-governmental organizations have focused on leveraging numerous forest restoration projects in the region. These projects are motivated not only by the water crisis but also by the international commitments made by Brazil and the state of São Paulo to address the international restoration challenges previously mentioned in this chapter. In this context, in 2009, the Paraíba Valley Ecological Corridor was established, an organization created with the mission of reconnecting these isolated fragments by planting an estimated 6000 hectares of native forest species, thus promoting the reconnection of approximately 150,000 hectares in the region. In its first 10 years, the Ecological Corridor and its partners planted 523,000 native seedlings on 430 hectares in the Paraíba Valley region.

In 2016, the Oikos Institute of Agroecology began a preliminary diagnosis of Paraíba Valley's forest restoration chain, which detected that "regionally, the forest restoration segment is very disconnected and local stakeholders are unprepared to face the challenge and the opportunity to promote large-scale forest restoration. This perception is shared by many regional stakeholders – from seed collectors and seedling producers, to companies that plan and execute projects, and organizations that promote and foster forest restoration in Paraíba Valley" (Andrade et al. 2019). Thus, based on this diagnosis, a popular movement initiated by a group known as "Paraíba Valley Restoration Stakeholders", a network established based on the workshops promoted by the Restoration Opportunities Assessment Methodology – ROAM workshops in the region, conducted by World Resources Institute – WRI



Brazil, led to the beginning of conversations and coordination in favour of synergies for the effectiveness of actions in the region.

In this arrangement, the Ecological Corridor realized that it played a fundamental role in promoting the connection between people of the valley, not only to raise community awareness about the importance of having a forest stand and all the benefits it provides but also to promote dialogue and partnerships between different “valley stakeholders” to seek convergence and synergy between forest restoration actions, the mobilization of rural producers and national and international opportunities and public policies. The Ecological Corridor performs forest restoration activities by engaging the population in this context, helping local governments understand the importance of strategic landscape planning, aligning the actions performed in the region to enhance results. The Ecological Corridor is part of a network of approximately 200 stakeholders, including local, national and international organizations, universities, institutions, producers, nurseries, public authorities and companies. Their actions are led primarily by women, who occupy prominent positions in the governance structure of the projects.

### 18.3 Results and Discussion

Based on these studies and the conceptual frameworks of Mansourian et al. (2014), Mansourian and Rambeloarisoa (2005), Sapkota et al. (2018) and Van Oosten et al. (2014), we developed a matrix to consider the different relevant aspects in the case studies. Thus, the pillars of components, structure and stakeholders were considered, in addition to the scale of action, which is fundamental in the case studies presented. These comparisons are presented in Table 18.1.

The case studies employed different approaches to engage society to expand restoration initiatives. The analyses suggest that such models must be associated with the specific conditions of each landscape, according to their components, structure, stakeholders and scale. Contextual factors also should be included in these analyses, as historical and cultural aspects, as well the understanding of political and socioeconomic issues (Mansourian et al. 2014). The initial conditions, collaborative process and leadership are some of the factors strongly relevant for the results of restoration actions (Ansell and Gash 2008). The initial conditions refer to the existence of conflicts or cooperation that determine the degree of trust between stakeholders.

The initial conditions and context of the related studies are rather heterogeneous among the presented cases because they address different scales and regions. However, in general, defining a common goal and sharing perspectives promoted collaboration among the stakeholders. This favourable condition is not as evident in projects such as the Corridors or in PACT, where it is imperative to equalize divergent interests, such as that of businesses, NGOs and government in determining the application of efforts and resources. This becomes even more critical in the case of the Arboretum Programme, where the origin of the project is associated with com-

**Table 18.1** Matrix of comparison among the different governance models, based on strategies and components of governance

Case study	Components <sup>a</sup>	Structure <sup>b</sup>	Stakeholders	Scale
Arboretum	Economical and social	Governmental	Public Prosecutor's office and Forest Service, businesses, local community, traditional communities, fomented groups, NGOs and local and international universities	Regional
Corridors	Social	NGOs	State Department of the environment, businesses, universities, national and international NGOs, landowners	Regional
PACT	Science, social, political and economical	Coalition or institutional bricolage <sup>c</sup>	National Coordination Council, regional units and working groups, members,	Biome
SOBRE	Science and political	Society of researchers, practitioners and policy makers	National Board, regional Councillors, associated members (persons and institutions)	National

<sup>a</sup>Representing major focus: Science, Social, Economic, Political (Sapkota et al. 2018)

<sup>b</sup>Relevant bodies that help to organize the initiative (Mansourian et al. 2014)

<sup>c</sup>Institutional Bricolage: a creation of institutional space (Van Oosten et al. 2014)

pliance with a Conduct Adjustment Agreement. The subsequent involvement of the pulp and paper companies in the region indicates that the initial obstacles were overcome, and it was possible to advance a propositional agenda for the region. In these cases, the key role played by the initiatives' leaders is clear, as they are responsible for gathering the best strategies and convincing stakeholders of themes relevant to the landscape.

Case study	Objective	Context
Arboretum	The arboretum Programme is a public and inter-institutional initiative focusing on biodiversity conservation and restoration, by promoting seed and seedling network	The proposal of the arboretum was developed by the Brazilian forestry service and made feasible by the public prosecutor of the state of Bahia through a conduct adjustment agreement (TAC) signed by the pulp companies, by financing the implementation and maintenance costs of the arboretum Programme.
Corridors	The Parafba Valley ecological corridor is an NGO that was established with the mission of reconnecting isolated fragments planting an estimated 6000 hectares of native forest species to reconnect 150,000 hectares of isolated fragments	Restoration projects were proposed for confronting the water crisis and to increase the vegetation connection by some public policies and efforts from national and international non-governmental organizations

Case study	Objective	Context
PACT	PACTO is a multi-stakeholder platform that aims to restore 15 million hectares in the Atlantic Forest biome by 2050, enabling large-scale restoration, socioeconomic benefits	To construct the bridges necessary to address gaps of landscape restoration, PACTO brings together different sectors for the consolidation of a strategy based on an innovative approach
SOBRE	SOBRE aims to promote ecological restoration in Brazil, expanding knowledge and dialogue, supporting the training of human resources and contributing to decision-making and public policies	A group of professionals and researchers in the field of restoration, from across Brazil, gathered to create a support network and locus for debate on how to confront the restoration challenges, ending up establishing an institutional framework to develop science, subsidize policy and share practice experiences on restoration

Nevertheless, none of these projects would be successful if platforms for dialogue and collaboration were not established in support of decision-making and public policies. The PACT information and monitoring database is an interesting example in this direction. Based on this tool, it is possible to create scenarios and develop action strategies in a shared manner among the different stakeholders. The construction of dialogue in a consistent and constant manner could be made with social media or by more traditional approach, as meetings and field visits. In the case of SOBRE, an online net is very efficient, but national and regional conferences occur to improve the synergy and change experience and knowledge.

According to the literature assessing governance can be made through different ways and perspectives (Arts 2014; Lemos and Agrawal 2006). Within case studies governance models could be led initially by government agencies, as in the case of the Arboretum Project, or by civil society, as in the case of Corridors, and in both cases the arrangement encompasses many stakeholders. In the example of SOBRE, researchers and practitioners met in a non-hierarchical manner to discuss and advance central themes for restoration. The PACT is considered more like a coalition, or as an institutional Bricolage, with more flexible forms of institutionalization, rather than formal planning structure. The number of members, close to 300 institutions on PACT and 400 associates on SOBRE, indicates the recognition of these initiatives as legitimate representatives of the interests of their members.

The objective or motivation for each initiative is fundamental to get people involved. In the Arboretum programme, building a network for seed and seedling promotes economic benefits and link to that initiative, which result in a more participatory process of restoration and conservation in that region. In the case of the Ecological Corridor, the motivation was more related to a gap and lack of connection on the value chain. In this way, to face the water crisis and gain more native vegetation in the region, institutions joined on effort to recover and reconnect forest remnants. The case of SOBRE was driven by a science-practice concern that was efficiently addressed in a first moment by a platform for sharing knowledge and experience, and in a second moment by periodic conferences.

The observations suggest that the participatory or collaborative approach should be considered in all processes to enhance results. The sharing of this purpose in a clear manner can be decisive for the involvement of stakeholders. Thus, a geospatial platform presents itself as a visual tool for sharing goals and records of accomplishments. The creation of references, knowledge generation and scientific achievements in understanding can be fuel for others. Supporting policies is certainly one of the roles of academia in its full exercise of activities. Awareness and outreach through training and workshop is what motivates the public in a broader way, as the reality and possibilities of effective actions are presented. This broader scope and heterogeneity of situations suggest a more holistic approach at the governance issue, as in Complex Systems Science (Filotas et al. 2014), which presupposes the integration of landscape properties. This perspective indicates that, perhaps, the challenge of understanding governance is grounded in the question ‘What can engage people?’ rather than ‘How to organize people?’ This study suggests that factors such as vision and shared cause, and creation of a sense of identity and belonging can promote this understanding, connecting people and generating their engagement on forest landscape restoration initiatives.

## 18.4 Key Messages

- To foster frank and fair dialogue among stakeholders, successive interactions are necessary through open meetings, where conflicts – when they arise – are openly confronted and negotiated.
- Objectives should not be set a priori, but rather should be defined during the process, throughout meetings and based on the participation and interaction of different stakeholders. Thus, scientific questions are considered but relevant social aspects are also included.
- The strategical planning of restoration should not be restricted to academia, but a network of stakeholders, including academia, can help promoting effective restoration programs. This allowed to credit different stakeholders outside academia as co-authors of the scientific results obtained in this partnership.
- Academic researchers need to move between scientific and political interfaces and agree to work with data that is not necessarily novel for science but highly critical for guiding best practices and policies.
- The representation of various sectors and interests, as well as gender balance in the links of the restoration chain, are relevant issues that can provide further insight into how to obtain greater involvement of various stakeholders in the expansion of efforts for large-scale restoration.

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