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Embrapa and the construction of scientific heritage in Brazilian agriculture: Sowing memory

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Abstract

Motivation: The Brazilian Agricultural Research Corporation, Embrapa, is well known for incorporating the Cerrado into Brazil's modern agriculture through its discoveries of how to improve infertile soils and to develop soybean seeds adapted to the tropics. Known as the Tropical Revolution, Brazil's own Green Revolution, this past episode continues to define Embrapa's identity and Brazil's agricultural science and technology, reinforcing a view of agricultural development while neglecting alternatives.

Purpose: This article seeks to understand how Embrapa has carved its name in Brazil's agricultural history, creating a powerful national brand with global recognition. It explores what constitutes Embrapa's "organizational heritage," how this has been built within the organization and to what effect.

Approach and methods: To commemorate Embrapa's 40th anniversary in 2014, an official history ("Memória Embrapa") was written, focusing on the success of the organization and the reasons for this. This source has been reviewed, then combined with evidence from interviews with 29 Embrapa researchers about the strengths and shortcomings of organizational heritage.

Findings: Embrapa's story of success focuses on selected technological breakthroughs, highly trained and motivated scientists, and a sense of mission towards Brazilian society. This omits, however, some successes, challenges and alternative approaches to research that do not fit well with the simplified history. Three such omissions stand out: (1) the official history barely mentions the concerns about the environmental and social impacts of the spread of large-scale farming—which much of Embrapa's research had served; (2) Embrapa created a national seed bank, to which indigenous groups demanded access since they had conserved much of the genetic material in the bank (policy was changed to allow indigenous groups access and to promote a dialogue between the scientists and the farmers); and (3), in similar vein, some scientists in Embrapa endeavour to engage with local expertise, with ethno-science, to enrich and broaden the research.

Policy implications: Rooting Embrapa's brand in history makes the narrative persistent and hard to challenge. This risks creating a simplified, monolithic narrative about Embrapa and Brazilian agriculture that feeds technocratic fixations with high science and transfer of technology as the dominant pathway to agricultural development and food security. This may have been considered necessary in the 1970s, but increasingly the agricultural research agenda must include environmental sustainability and conservation of agricultural biodiversity, climate change, social fairness

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and a respectful engagement with different ways of researching, including learning from the longstanding practices of farmers.

KEY WORDS

agricultural research, Brazil, Embrapa, Green Revolution, heritage, science and technology

1 | INTRODUCTION

The Brazilian Agricultural Research Corporation, better known as Embrapa, is a high profile Brazilian brand. Its scientific production and technological innovations are broadcast daily to the public on the popular TV channel Globo Rural, fruit of considerable investment in communications by this large state-funded agricultural science and technology (S&T) organization. Embrapa is best known for its former role in incorporating the Cerrado into the country's modern agriculture. The Cerrado is the tropical savannah biome located in Brazil's centre-west region. The modernization of the Cerrado, which has been ongoing since the mid-1970s, turned the region into a "global breadbasket" (Hosono & Hongo, 2016). Large-scale soybean plantations and expansive pastures became characteristic features of modern Brazilian agriculture (Wheatley, 2010) and helped turn Brazil into a leading global producer and exporter of agricultural commodities (Contini, 2014). A well-rehearsed narrative puts Embrapa at the centre of Brazil's agricultural success, through scientific and technological breakthroughs that enabled farming in the acid soils of the Cerrado and, specifically, the introduction of soybeans, which had until then been confined to higher latitudes and temperate climate (Arraes Pereira et al., 2012). This is sometimes referred to as the Tropical Revolution, Brazil's Green Revolution. Internationally, it has become known as the "miracle of the Cerrado," which *The Economist* (The miracle of the cerrado, 2010) summarized as follows:

Since 1996 Brazilian farmers have increased the amount of land under cultivation by a third, mostly in the cerrado. That is quite different from other big farm producers, whose amount of land under the plough has either been flat or (in Europe) falling. And it has increased production by ten times that amount. But the availability of farmland is in fact only a secondary reason for the extraordinary growth in Brazilian agriculture. If you want the primary reason in three words, they are Embrapa, Embrapa, Embrapa.

The role of Embrapa in transforming the Cerrado into a soybean landscape has also been highlighted by the World Bank in an eye-catching report, *Awakening Africa's sleeping giant* (World Bank, 2009). In this report, the Brazilian model is put forward as a success story with the potential to guide Africa's quest for a Green Revolution across the Guinea Savannah belt. Yet this success story has been disputed on many grounds, including: the detrimental environmental impact of soybean specialization and agrochemical intensification (Dutra & de Souza, 2018; Fearnside, 2001); land grabbing and wealth concentration (Borras et al., 2012; Clements & Fernandes, 2013); loss of biodiversity (Françoso et al., 2015) and of equally diverse sociocultural practices and identities of rural territories (Borges & Almeida, 2009).

Notwithstanding the critique, the science-driven miracle of the Cerrado remains central to Embrapa's identity and to the historical narrative about Brazilian agriculture and construction of "tropical" science. In Embrapa's 40th anniversary anthology, *Tropical agriculture: Four decades of technological, institutional and policy innovations* (Albuquerque & Silva, 2008), this was articulated in the foreword by the director-president:

Innovation and knowledge are fundamental ingredients in the creation and construction of modern tropical agriculture.

The success of this agriculture in Brazil does not only have a domestic impact, which is great on its own; its successful formulas and products are also available to other tropical societies. Progress in areas where development was initially considered unlikely carries a potential signal for future decisions. What example could be more expressive, in the last 40 years, than the development of the Cerrado, which has a sustainable agriculture and is also highly productive and competitive? (Crestana, 2008, p. 30)

Alves et al. (2008, p. 73) expand on this in their contribution to the anthology:

Applied science unravels the mystery of the acid and previously useless soils of the Cerrado. The new cultivars turn scientific discoveries into production, at increasing rates. The region's inefficient and extensive beef cattle breeding gives way to pioneering and efficient tropical agriculture. More than 200 million hectares become available to be incorporated into Brazilian agriculture. Brazil becomes an example to the world of how to transform worthless natural resources into productive resources.

The celebratory narrative of the transformation of the “worthless” Cerrado plays a role in sustaining the organization's authoritative stance in Brazilian agriculture and asserting it as the (organizational) “brand hero” (Sumberg et al., 2012) of Brazil's Green Revolution.¹ Embrapa's role in agricultural innovation has diminished as a result of the expansion of private S&T following the advent of biotechnology in the 2000s (Bonacelli et al., 2015; Crestana & de Mori, 2015). Multinational agro-chemical and seed corporations have become increasingly dominant in Brazil and globally (Seshia & Scoones, 2003). Having been at the forefront of soybean research for 30 years, Embrapa has been displaced by Monsanto, which currently dominates a growing market for genetically modified soybeans (Bonacelli et al., 2015). From this viewpoint, the celebration of Embrapa's history and the assertion of its past can be seen as an attempt to secure support for the organization as well as to restate the case for public spending on scientific innovation. Embrapa's miracle of the Cerrado also embodies the triumph of modern, internationally connected and vertically integrated agribusiness, which is a feature not only of Brazil (Buainain et al., 2013; Contini, 2014) but of a global corporate agrifood regime (McMichael, 2009).

This article does not centre, however, on the political economy of Brazil's S&T, or on the interaction between Embrapa and corporate agribusiness (see, for example, de Mendonça, 2011, 2012). Instead, the focus is on Embrapa's own representation, and how the organization has imprinted its name in the history of Brazilian agriculture, creating a powerful and globally recognizable brand. As I will analyse, its effective branding has been crafted over time through a narrative of success that combines selective technological breakthroughs, highly trained and motivated scientists, and a sense of mission towards Brazilian society. I will discuss how celebrations like Embrapa's 40th anniversary, through an initiative designated *Memória Embrapa* (Embrapa Memory), have helped cement this narrative and assemble a scientific heritage constituted of technologies, notable

¹The idea of a brand hero draws on Sumberg et al. (2012), who describe brand heroes as individuals with widespread public recognition (celebrities in their field) and with credibility within their community. The authors focus on Norman Borlaug, who is portrayed as the global brand hero of the Green Revolution: “[h]is public recognition (starting with the award of the Nobel Peace Prize in 1970) and his recognition by and credibility within the brand community were all tied directly to his success as a breeder of rust-resistant and then high-yielding, semi-dwarf wheat” (p.1591).

individuals and historic milestones. While seeking to consolidate Embrapa as a brand rooted in history, this initiative bolsters a simplified and hagiographic version of Embrapa's trajectory and, by association, of Brazilian agricultural history. It does so by amplifying achievements that are contested, concealing their flaws and leaving out other milestones and accomplishments. This historical simplification feeds technocratic obsessions with success transfer, including initiatives to replicate Green Revolution-centric visions elsewhere (Blaustein, 2008; World Bank, 2009). This article therefore suggests that, by unravelling how an agricultural research organization engages with its past, we can learn about the complexities of agricultural development history and better appreciate the challenges of using it as a model.

The analysis is guided by the concept of organizational heritage from organizational theory, which emphasizes the significance of longevity and historical rootedness in building the identity and reputation of a product brand or of an organization (Balmer & Burghausen, 2015; Urde et al., 2007). It also builds on perspectives on heritage making as a political process shaped by relations of power (Harrison, 2010, 2012, 2013). The empirical material analysed comes from secondary sources on Embrapa's history (mainly the Memória Embrapa archive) and interviews conducted with a selection of Embrapa researchers between 2018 and 2020.²

To capture different views on the trajectory of Embrapa and Brazilian agriculture, a sampling framework was drawn up to identify key informants among Embrapa researchers. This framework aimed to select researchers at different career stages and from diverse professional fields (as defined by their academic degrees and fields of practice). Based on interviews with an initial set of five respondents, I was able to stratify my sample further to include researchers representing different viewpoints on Embrapa and Brazilian agriculture. Three distinctive strata of informants were identified: Embrapa's so-called "pioneers," comprising the first generation of researchers who joined the organization in the 1970s, who tended to convey a positive and passionate view about the organization and about the modernization of the Cerrado; researchers driven by social justice goals, such as developing technology to assist marginalized farmers, who tended to have a more critical position regarding Embrapa's understanding of success; and environmentalists, who tended to emphasize the negative ecological legacy of modernization but engaged with Embrapa's latest sustainability agenda. I recruited additional respondents using the snowball sampling technique, which led me to a final selection of 29 respondents. These were based at the Embrapa headquarters in Brasília and in seven decentralized units: Embrapa Recursos Genéticos e Biotecnologia (Brasília), Embrapa Amazônia Oriental (Belém), Embrapa Cerrados, Embrapa Solos (Rio de Janeiro), Embrapa Tabuleiros Costeiros (Aracaju), Embrapa Clima Temperado (Pelotas) and Embrapa Territorial (Campinas).

The remainder of the article is organized as follows. Section 2 elaborates the concept of organizational heritage, explaining its relevance to understanding Embrapa's engagement with its history. Section 3 introduces Embrapa and the origins of the brand. It then provides an overview of the success narrative embodied in Memória Embrapa. Section 4 analyses the process of heritage making and Section 5 illustrates why heritage has its limits and curtails the organization's richer, yet more contested, legacy. Section 6 concludes by arguing that a focus on organizations such as Embrapa is important to enable a deeper understanding of change in agricultural development and how history, success narratives and scientific heritage are constructed.

²Most interviews were conducted face-to-face, while a small number used online communication platforms.

2 | ORGANIZATIONAL HERITAGE

As signalled by the quotes from the 40th anniversary anthology, Embrapa is a brand whose strength is derived from history and its claims about a heroic past. The concept of “heritage brand” is appropriate in this regard as it refers to brands that thrive on ideas of longevity and track record. Urde et al. (2007, pp. 4–5) define heritage in relation to brands as “a dimension of a brand’s identity found in its track record, longevity, core values, use of symbols and particularly in an organizational belief that its history is important.” A heritage brand is, then, a brand “with a positioning and a value proposition based on its heritage” (Urde et al., 2007, pp. 4–5). The past is used to establish the reputation and distinctiveness of the brand. In other words, heritage is about invoking the past to project a brand’s value into the present and future. This deliberate connection between past, present and future is designated “omni-temporality” (Balmer & Burghausen, 2015, p. 388).

The notion of heritage has been applied to how organizations construct their identity. “Organizational heritage” accounts for how members of an organization create and reproduce its heritage through a process that involves, according to Balmer and Burghausen (2015), three elements: (a) how members perceive the omni-temporal traits of their organization; (b) their individual identification with those traits; (c) the wider cultural identification within the organization that cuts across different generations of members. It is the selective appropriation and valuing of the past as it is converted into heritage, through identification and memory construction by an organization’s members, that makes the past relevant to the present and future. This means that heritage is more than factual historical reconstruction but has value on its own and performs a role—producing a legacy that can be carried into the future. This process of cognition and identification of heritage is inevitably subjective. It is the result of how individuals make sense of their organization’s past, through processes of remembering, forgetting or ignoring that are shaped by personal experiences and processes of socialization and acculturation within the organization. These processes reflect relations of power and subjugation, as well as inclusion and exclusion. Heritage making is, hence, fundamentally political (Harrison, 2010, 2013).

In this article, I consider how Memória Embrapa embodies a subjective process of retrieving key historical moments, scientific and technological achievements and heroic figures over 40 years of the life of the organization. This process reaffirms Embrapa as the champion of science-led modernization of Brazilian agriculture, not only in the past, but also at present and in the future. Embrapa’s authority is asserted through the assemblage of a success story rooted in history. The preservation of this authority is linked to the protection of the organization’s heritage. Although this heritage is widely shared within the organization, it is not immune to challenge. Other milestones and recollections emerge that are excluded from the official narrative.

Before considering the process of heritage building and contestation, I first give a brief overview of Embrapa, its branding efforts and the success narrative embodied in Memória Embrapa.

3 | EMBRAPA: RESEARCH CAPABILITY, BRANDING AND CELEBRATION OF HISTORY

Embrapa was established in 1973, at the height of the military regime that ruled Brazil between 1964 and 1985, with the aim of reorganizing agricultural research to make it more fit for purpose. This meant, specifically, contributing to the modernization of agriculture, increase its productivity and competitiveness and strengthening its links with the industry (Mengel, 2015). Its headquarters were located in Brasília, a city that had been founded in 1960 as the country’s new capital and symbol of modernity. Embrapa did not start from zero, inheriting the infrastructure and some of the research

capability of the National Department of Research and Experimentation (DNPEA) of the Ministry of Agriculture. This comprised at the time nine regional institutes, two national centres and 70 experimental stations, distributed across the country. Despite this legacy, Embrapa was to depart from the existing research system in significant ways. Crucially, it created product-focused research centres geared largely towards monoculture commercial farming (Wilkinson & Sorj, 1992) and a postgraduate training programme aimed at establishing a first-rate team of researchers that could deliver its modernization mission. Also, Embrapa soon started paying attention to its image and how to communicate not just with farmers but with Brazilian society more broadly. In this section, I first consider how Embrapa created a tailor-made research capability and a branding culture. I then describe in some depth the element of the success narrative deployed by Memória Embrapa.

3.1 | Embrapa and its tailor-made research capability

Embrapa had solid backing from the military which allowed it to operate with considerable autonomy. It enabled it to pay competitive salaries to its researchers and implement an expensive training programme to attract and retain top scientific talent (Nehring, 2016). A considerable proportion of Embrapa's budget was therefore invested in training to fill perceived gaps in its research capability (Alves, 2010). Diverse research expertise existed in the agricultural research system and in Brazilian universities but, as argued by Mengel (2015), they did not suit Embrapa's mission. This required a new and young team that was not tied to the old system but embraced the new vision for agriculture, which entailed the forging of close alliances with industry.

Between 1974 and 1984, the number of researchers doubled and the share of postgraduates increased massively. Over this 10-year period, the proportion of researchers with MSc degrees jumped from 15% to 62% and that of PhDs from 1.7% to 18% (Table 1). Most newly recruited researchers were sent abroad for training, predominantly to the US.³ In 1979, of the 484 researchers trained or with ongoing training abroad, 380 studied in US universities, notably Florida, Purdue, Wisconsin, Mississippi and California-Davis (Mengel, 2015, pp. 143–144). US universities were favoured over European universities for offering a more structured and directed curriculum aligned with the industrial agriculture setting that Brazil sought to replicate.

The influence of the US in Brazilian agriculture dated back to the period after the Second World War, when philanthropic aid was used as a geopolitical weapon worldwide (Cullather, 2004; Perkins, 1997). Between the late 1950s and late 1960s, while the Green Revolution was consolidating in Mexico, Nelson Rockefeller helped to establish field stations in the Cerrado. With support from USAID and international agribusinesses, a research and extension programme on soil fertility and other issues for the modernization of agriculture in the region was developed (Nehring, 2016). Despite the involvement of US scientists, philanthropy and businesses in Brazilian agriculture, and the role of US universities in training scientists, the strengthening of Embrapa gradually consolidated the view that Brazil's scientific achievements have, by and large, been a domestic endeavour.

Here in Brazil, the American influence was to open universities for us to send people there. But they didn't come to do anything here in Brazil. Embrapa was made only by Brazilians. But which Brazilians? Those who had a doctorate there in the United States. (Interview with former president of Embrapa, September 11, 2019)

³The degree and university were chosen by Embrapa, rather than by researchers themselves, on the basis of perceived gaps.

TABLE 1 Embrapa's researchers (*pesquisadores*) by level of training (selected years)

Year	Graduates	MSc	PhD	Post-doc	Total
1974	832	133	15	0	872
1984	320	1.001	298	0	1.619
2017	0	312	2.100	302	2.430

Sources: Embrapa (2017, p. 29) and Mengel (2015, p. 132) for 1974 and 1984 data and Embrapa (2017, p. 32) for 2017 data.

From the late 1980s and early 1990s, public tendering replaced the system of recruitment by head-hunting at top Brazilian agronomy universities. By then Embrapa recruited mainly postgraduates, although it continued to send new recruits abroad, mainly to the US, for doctoral degrees. By the late 1990s, Embrapa started recruiting fully trained PhDs (with many of these having carried out their doctoral studies in Brazil) and the training programme abroad began to focus on postdoctoral research. Embrapa had in the meantime developed a programme to develop collaborative research with world-leading research organizations, called Embrapa Virtual Laboratory Abroad (Labex). The first Labex was established in 1998 in the US, and since then more have been seen set up in Europe and Asia. The creation of Labex marked a new stage in Embrapa's internationalization. No longer dependent on overseas expertise and training, it was now on a par with leading international research organizations as an authority on tropical agriculture (Nascimento, 2016).

Since the early 2000s, the retirement of Embrapa's pioneers and the recruitment through public tendering has gradually had an impact on the organization. The renewal of the research cadre and new modes of recruitment and training are thought to have contributed to the erosion of emotional attachment to Embrapa that had been so strong for Embrapa's pioneers.

The old generation has an emotional attachment to Embrapa because the organization invested heavily in their training and it was very generous in the support provided. Researchers could take their families abroad with them. The younger generations have a more calculating attitude towards the organization. (Interview with Human Resources Manager at Embrapa, February 6, 2019)

Reflecting on the challenges facing Embrapa in recent years, which include the loss of relevance in the face of an expanding private sector offering cutting-edge agricultural S&T, Navarro and Alves (2014) similarly express how younger researchers are disconnected from Embrapa's past:

Embrapa is facing the challenge of strong staff turnover that renewed by two thirds in the last 10 years. The organization is today driven by a generation of young researchers with excellent academic training yet detached from the epic past that established the organization and Brazil's rural history in the last half century. (Navarro & Alves, 2014, p. 8)

As Embrapa celebrated its 40th anniversary, an initiative to disseminate its history and legacy was developed under the name of Memória Embrapa. The anniversary not only celebrated Embrapa's achievements, it also produced a record of its history (or a version of it) forgotten or overlooked by newer generations of staff. Before introducing this initiative, I first consider briefly the origins of a culture of branding inside the organization.

3.2 | The origins of a brand

Alongside its massive investment in research capability, Embrapa also paid considerable attention to its image. The organization's second president, Dr. Eliseu Alves, played a central role in building Embrapa as something akin to a "grand mission" of scientific innovation (Wright, 2012), with both highly trained and motivated scientists and a strong brand recognized and respected by the public. Dr. Alves prioritized communication with society—going beyond farmers to reach out to Brazilian citizens as a whole. For that purpose, Embrapa hired journalists, public relations and communication specialists and created communication departments across the organization. A policy for communication was formulated in the early 1990s, at a time when public funding was under threat, during the neoliberal regime of President Collor de Mello. From this time onwards, connections with the media intensified with the aim of reaching out to the average Brazilian. In Dr. Alves' own words:

One of Embrapa's priorities was communication with society, to be able to create a mentality favourable to science here in Brazil. Embrapa's president started liaising with Globo [a leading TV channel] and with other media outlets with the aim of creating a space to talk about science. It was a success. Especially with the creation of Globo Rural. (Interview, September 11, 2019)

TV programme Globo Rural became a leading platform for showcasing Embrapa's breakthroughs and reaching out to the public in Brazil. Embrapa also became increasingly known internationally, as reflected by the article in *The Economist* (The miracle of the cerrado, 2010). President Lula da Silva frequently praised Embrapa as one of the most high profile brands of Brazilian diplomacy, particularly during his visit to Africa (Cabral, 2016).

Memória Embrapa, that I now turn to, is one of several branding exercises conducted by the organization. It stands out particularly for its emphasis on history and an associated sense of heritage.

3.3 | Memória Embrapa: An account of success rooted in history

Memória Embrapa is a celebratory account of the technological achievements, key figures and milestones in the history of the organization. Spearheaded by Embrapa's first president, Irineu Cabral, Memória Embrapa aimed to educate and inspire younger researchers, who were disconnected from the organization's heritage and identity; in the words of a manager at Embrapa Tabuleiros Costeiros:

Project Memória was part of an effort to sensitize the new generation of researchers, especially those hired after 2007 and 2008, and give them a sense of belonging and pride in the organization. (personal communication, November 8, 2019)

Embrapa's history was therefore assembled in an online platform (Embrapa, n.d.) that sought to value the organization's identity and "help build the historical heritage of the largest tropical research company in the world." Memória Embrapa developed into a repository of historical milestones, technological achievements and individuals. This was crafted around a timeline with short descriptions of selected milestones related to scientific and technological achievements, illustrated with photographs and video footage. The timeline was complemented with the profiles of a selection of distinguished individuals in Embrapa's history, and brief congratulatory testimonies from Embrapa professionals

and collaborators. Together this material created an official version via a celebratory history of the organization.

The timeline of Memória Embrapa tells a story of heroic feats and groundbreaking contributions. It starts by alluding to the bravery of pioneers and pathfinders (*desbravadores*) who laid the groundwork for the scientific transformation of Brazilian agriculture back in the 1970s. The pioneers were the visionary team that created Embrapa, whereas the pathfinders were soil scientists whose research enabled the expansion of the agricultural frontier into the centre and north of the country, particularly the Cerrado and the Amazon. An account from Humberto Gonçalves dos Santos, a soil scientist with Embrapa Soils, included in the Memória Embrapa webpage, recalls that earlier stage:

When Embrapa started there was insufficient knowledge about soils to meet the demands of the time, regarding development and opening of new areas for production. This was a time of colonization during the military regime when there was a commitment to occupy the Amazon with Brazilians. So they started building roads, like the Transamazonica, Manaus–Porto Velho, Cuiaba–Santarem, which marked the dawn of a new era. This enabled us to go to the Amazon to examine soils. Our mission was to characterize, collect and analyse soils and interpret their potential for agricultural production.⁴

The story moves on to describe the consolidation in the Cerrado and the tropicalization of grains, particularly soybeans, throughout the 1980s. The technological success of soybeans in the Cerrado is closely linked to biological nitrogen fixation and the pioneering research of Johanna Döbereiner, who is recognized as having revolutionized soybean as a successful tropical crop. Other achievements highlighted for this period were the development of new forages, which increased pasture and livestock productivity. Powered by state subsidies as well as aid (Hosono & Hongo, 2012), the Cerrado turned into a land of soybeans and livestock where farming became a professionalised business where only the best could succeed, as summarized by the eminent soil specialist, Edson Lobato, for Memória Embrapa:

With cheap land and high subsidies, we were able to attract experienced farmers from the South and Southeast. A farmer in Mato Grosso harvesting 20 sacks of soybean per hectare would have a return of 20%. (...) By the 1980s and after the end of subsidies, the same return required harvesting 50 sacks per hectare. This was now for professionals only. This was a milestone. At the end of the 1970s, beginning of the 1980s, there was no longer a place for amateur farming. Agriculture had to be professional and substitute guesswork with science. Those who had not prepared for this change did not succeed.

Building on these successes, Embrapa was ready to face the world with confidence and start working alongside prestigious international organizations on the front line of agricultural S&T. The creation of Labex in the 1990s is this era's milestone, projecting Brazilian science and Embrapa internationally. This was key to consolidating Embrapa's germplasm bank through the exchange of genetic material internationally, which boosted its breeding programme. From this moment onwards the story focuses on scientific and technological achievements that placed Embrapa in the frontline of agricultural science—for example, the cloning of the first bovine in Latin America and the development of new pest resistant and

⁴This is a striking remark as the Amazon was not an uninhabited region but home to many and diverse indigenous communities.

market competitive varieties and breeds (such as cotton, rice, beans and low-fat content pork). With the advent of biotechnology, the 2000s are described as the era of “technology revolution.” The birth of the cloned heifer Victoria in March 2001 (using the same method that produced the cloned sheep Dolly at the University of Edinburgh in 1996) was symbolic of Embrapa’s capability. Other achievements in biotechnology and nanotechnology are highlighted to illustrate how Brazilian science was capable of generating cutting-edge technological innovation.

The 2010s, as described in *Memória Embrapa*, were dominated by a focus on sustainability, or “sustainable agricultural technology for the tropics.” Not only was Brazil on the frontline of agricultural S&T but it now had unique expertise on sustainability in tropical agriculture. Zero tillage and crop-forestry-livestock integration (known in Brazil as ILPF) are illustrations of farming practices and systems said to combine efficiency with economic and environmental sustainability.⁵ A range of other green technologies (biological carbon sequestration, renewable energy, georeferencing technologies and machinery for the accurate assessment of fertilizer and pesticide needs) are highlighted in a display of Embrapa’s “low carbon agriculture” credentials.

The timeline ends on a Malthusian note that underlines the future role of Embrapa in feeding Brazil and feeding the world. It also emphasizes the links with the private sector in Brazil and abroad, reflecting the very different environment in which Embrapa now operates, in marked contrast to the situation that existed at the time of its creation.

Complementing this historical narrative is an “honours board” of distinguished individuals (four men and two women) who were part of the first team of scientists to join the organization in the 1970s. Among these are Eliseu Alves and Irineu Cabral, two pioneers and founding members of Embrapa, and Johanna Döbereiner for research on biological nitrogen fixation. Intriguingly, an additional selection of nine personalities was added to another section of *Memória Embrapa*. The latter includes two of the above (Alves and Döbereiner) and seven other individuals. Perhaps as an afterthought, the second list adds diversity to the range of Embrapa professionals to be remembered and honoured. Although men continue to dominate (six out of nine individuals), this list includes young researchers and other (non-research) professionals in the organization (e.g. a journalist, a driver and a security warden). One noticeable addition, and a surprising omission from the previous listing, is Edson Lobato, whose research on the soils of the Cerrado was awarded the World Food Prize.

A significant element of *Memória Embrapa* is a collection of brief testimonies from some 80 individuals, who congratulate Embrapa for its anniversary and offer personal accounts relating to its history (two of these mentioned above, and other analysed in Section 4).⁶ Taken together this material both sets in stone the success story of the organization and also creates the perception that this story is widely shared by its members. As I argue in the next section, *Memória Embrapa* is an active exercise in heritage building by the organization and its employees, which frames the Embrapa brand in a history of bravery, dedication and accomplishments. This perpetuates a glorified view of the past and creates a sense of legacy to be harnessed and carried forward as part of its future mission.

⁵Zero tillage is a method of cultivation that involves minimal soil disturbance (no ploughing) and typically the use of soil coverage, used to prevent soil erosion and maximize biological activity. ILPF is farming system that combines crops, livestock and trees. It seeks to explore synergies between the individual systems, while sequestering carbon (through trees and forages) and rescuing degraded pasture land.

⁶These testimonies cut across generations, levels of seniority, professional areas (managers, researchers, administrators) and units of the organisation.

4 | MEMÓRIA EMBRAPA AS AN EXPRESSION OF ORGANIZATIONAL HERITAGE

As outlined earlier, organizational heritage is determined by how members of an organization perceive or recall omni-temporal identity traits in the organization, their individual identification with those traits, and the wider cross-generational identification within the organization. The video-recorded personal testimonies compiled by Memória Embrapa (Embrapa, n.d.) offer a rich illustration of how Embrapa employees recall the organization omni-temporality—Embrapa’s authoritativeness at present and into the future is granted by its heroic past, which the testimonies confirm.

The testimonies also convey a strong sense of identification with the organization, which some express as being Embrapian (*Embrapiano* or *Embrapiana*), as in this comment by Geraldo Baeta da Cruz of Embrapa Agrobiologia, recorded in Memória Embrapa:

I’m not just an employee of Embrapa. I consider myself an Embrapiano. We are part of Embrapa, of this unit, we have helped construct the history of Embrapa, with its challenges and victories.

This identification is articulated as professional, personal and moral. It is professional in terms of the proud descriptions of Embrapa’s scientific and technological contributions to Brazilian agriculture. It is personal as many see their professional careers inside the organization as being intertwined with their personal lives. This can be expressed in terms of belonging to a big Embrapa family that gives shelter and opportunities to grow and accomplish professional and personal dreams. Identification also carries a moral meaning when testimonies refer to Embrapa’s grand mission towards Brazilian society and the sense of fulfilment at having taken part in that mission. Virgínia Columbiano, of Embrapa Cotton, expressed it thus:

I feel passionate about being part of an organization whose mission is to find solutions for the problems facing Brazilian agriculture. I feel this is somewhat heroic.

Being Embrapian is sometimes portrayed as conveying a greater purpose in life—it is “knowing you are fighting the world’s hunger,” in the words of Nizael Rosa, of Embrapa Livestock Southeast, as recorded in Memória Embrapa. This mission sentiment is bolstered by the sense that Embrapa is everywhere—that its contribution has been so great and diverse that it permeates many aspects of people’s lives. Geraldo Baeta da Cruz, from Embrapa Agrobiology, expressed this as follows:

Embrapa is part of everyone’s daily life—what they eat for breakfast, for lunch, the clothes they wear, the energy they need, everything incorporates technology that comes from Embrapa or from a partnership that includes Embrapa.

This view is echoed by Cleber Oliveira Soares, of Embrapa Meat Livestock:

Today in each and every steak eaten across Brazil there is at least one technology produced by our unit.

And Embrapa is not only ubiquitous in Brazil, it also has an increasing international presence and responsibility in helping to address the world's hunger. Here is Geraldo Baeta da Cruz again: "What Embrapa sows, the world harvests."

This identity and sense of mission are linked to the legacy of the organization and its historic role in making Brazil food self-sufficient. Tribute is paid to the generations of researchers who constructed this legacy over the years, stressing that the legacy should be nurtured and carried forward by younger researchers. A researcher working on the development of sparkling wine (Irineo Dallagnol, Embrapa Grapes and Wine) uses his subject matter as a metaphor for Embrapa legacy and omni-temporality (Embrapa, n.d.). He describes Embrapa as glass of sparkling wine where the glass symbolizes the union between its 47 research units; the wine represents the organization's "thinking mass," the research capability nurtured inside Embrapa; the bubbles that rise to the surface, "leaving fragrance and complexity in the wine," represent those who have worked for Embrapa over the years and have left their mark on the organization. This is a mission for life, which carries on after retirement. As one respondent explained further, retiring staff are issued an Embrapa badge with the words "family silver" (*prata da casa*), in recognition of their contribution and their life-long Embrapian identity (personal communications, researcher at Embrapa Tabuleiros Costeiros, Aracaju, November 6, 2019; researcher at Embrapa Clima Temperado, March 17, 2020).

By celebrating older generations, pioneers and pathfinders, Memória Embrapa cultivates a sense of historical depth and institutional maturity, whose legacy is to be respected, nurtured and carried forward by younger generations. The accounts offered by junior researchers, voicing their pride and honour at being part of Embrapa, reassures the continuity of the organization's scientific heritage. That these testimonies are presented as the voices of men and women, senior and junior members of staff, researchers, managers and support staff, suggests an organization-wide identification with this heritage. Memória Embrapa is, therefore, an exercise in organizational heritage construction that firmly positions Embrapa as the "brand hero" of Brazil's Green Revolution. Elsewhere, Green Revolution histories tend to celebrate the heroic feats of individuals, such as Norman Borlaug or M. S. Swaminathan (Rao, 2015; Schmalzer, 2016; Sumberg et al., 2012), rather than organizations. Yet, as discussed in the next section, this heritage is not quite so clear cut, as the official storyline is disputed and individual identification is not as absolute or straightforward as conveyed by Memória Embrapa.

5 | INTERROGATING EMBRAPA'S ORGANIZATIONAL HERITAGE

Simplification and a reversion to the norm are characteristic of official historical narratives. Yet, there are some significant omissions in Memória Embrapa, brought to light by interviews with Embrapa researchers, that are illustrative of the hidden histories and the contested nature of the celebrated legacy (section 5.1). Also, individual identification with the organization is felt in different ways and not always in line with the official version of heritage (section 5.2).

5.1 | Forgotten milestones, contested legacy

While the official story is echoed by many researchers, others point to other milestones and contrasting legacies, omitted by Memória Embrapa. Three examples stand out. The first concerns the awakening to the social and environmental consequences of agricultural modernization. Hence,

alongside the expansion of the agricultural frontier and consolidation of soybeans as a vanguard tropical crop throughout the 1980s, at the end of the military dictatorship Brazil experienced an unprecedented social mobilization for land reform, rural workers' rights and broader social and political transformation in agriculture (Grzybowski, 1990). The Landless Peoples' Movement (MST) was established in 1984 to fight for land access, agrarian reform and justice in rural areas and it would become a forceful actor in pushing for land reform and for a different understanding of the value of land, to encompass its broader social function (Wolford, 2010). Alongside growing activism for social justice, concerns over the environmental impact of the Tropical Revolution were increasingly voiced, not least by agricultural scientists, including many inside Embrapa. Throughout the 1980s, the "Alternative Agriculture" movement mobilized agricultural, environmental and social scientists to reflect on the legacy of productive intensification (Schmitt et al., 2017). For many agronomists and breeders this was a process of self-reflection and soul-searching. The president of the Federation of Associations of Agricultural Engineers of Brazil (FAEAB), speaking at the second Alternative Agriculture Conference, held in Petropolis in 1984, strongly criticized the regime's agricultural development model:

The model implemented in Brazil by the authoritarian regime brought disastrous consequences for the vast majority of the Brazilians ... The consequences are visible to everyone: monoculture, erosion, environmental dilapidation, increased occurrence of pests and diseases, reduced productivity, economic unfeasibility, rural exodus, misery, malnutrition of the people ... At the 11th Agronomy Congress, held in 1979 in Curitiba, this professional category's strategy was exposed and agronomists, since then, have been self-criticizing their conduct, as no other professional category has done so far. (Pinheiro Machado, 1984, pp. 11–12)

Some of this criticism was disputed, as contending views claimed that the modernization of Brazilian agriculture increased production and productivity of both food crops and commodities, contributing to national food security and improvements in the balance of payments (Alves et al., 2008). Yet, the tone at the Alternative Agriculture Conference reflected a fault line within agricultural sciences that deepened with the growing questioning of a model seen as contributing to exacerbating land grabbing and inequality (Fernandes et al., 2012; Sauer & Pereira Leite, 2011) and concentrating power in the hands of a few agro-industrial conglomerates (Graziano da Silva, 1996, 2010). Embrapa's scientific and technological contribution was intimately connected with the interests of these conglomerates, as illustrated by the massive promotion of modern inputs and machinery produced by these conglomerates and used by a small number of large farms (Aguiar, 1986; de Mendonça, 2012).

Still today, the links between Embrapa, large-scale farmers and corporations are frowned upon by some researchers who are committed to small-scale farming and a range of marginalized social groups. Several respondents acknowledged they actively resist and contest Embrapa's predominant connection with large-scale and corporate farming. A researcher at Embrapa Amazônia Oriental commented:

I know exactly who Embrapa primarily works for and I will never align with that ... My target group is family farming. It is with them that I work and engage. Since 2003, I work with women's groups that collect mangaba [a tropical fruit]. My work is about helping these women to establish themselves. (personal communication, September 16, 2019)

Environmental degradation was another rallying point for the Alternative Agriculture movement, as arguments about the land-saving benefits of productivity enhancing technology were (and continue

to be) countered with evidence of water and soil degradation and loss of biodiversity resulting from productive intensification (Fearnside, 2001; Françoso et al., 2015; Hunke et al., 2015). Fearnside (2001) also describes the additional impacts caused by the massive infrastructure development (in transporting infrastructures for example) that accompanied large-scale soybean farming and “the opportunity cost of lost environmental services caused by the full impact on natural ecosystems” (p. 24).

Besides its push for agrarian justice and ecological integrity, the Alternative Agriculture movement also called for an epistemological turn towards a more bottom up and socially embedded scientific production and technological innovation and the recognition that “not all truth is in the science of laboratories” and that producers are not the object of scientific investigations but are “social agents with their own experiences, cultures, ideas, motivations and skills” (Pinheiro Machado, 1984, p. 11). Some respondents mentioned how this movement constituted a turning point in their careers, which would lead them to question their scientific training and work practice and eventually embrace agroecology ideas (Altieri & Farrell, 1995; Rosset & Altieri, 2017; personal communications, researcher at Embrapa Tabuleiros Costeiros, Aracaju, November 6, 2019; researcher at Embrapa Clima Temperado, March 17, 2020).

Another example that illustrates forgotten milestones and competing S&T visions concerns Embrapa’s germplasm and seed bank. Memória Embrapa puts the bank at the centre of national breeding programmes and international exchanges of genetic material ongoing in the 1990s. Yet, for some researchers, this period was marked by a very peculiar episode which would challenge the conventional view of the bank’s purpose. In 1994, the Krahô indigenous group, from a region within the state of Tocantins, hit the seed conservation chamber of Embrapa Genetic Resources and Biotechnology (Cenargen) in Brasília with an arrow, in a symbolic act meant to denounce their loss of traditional maize genetic material as result of agricultural modernization. The Krahô demanded access to the genetic material of their ancestors, preserved at Cenargen. This led to an unprecedented revision of the national legal framework on seed preservation to enable seeds and traditional genetic material kept in the bank to be shared with (or indeed returned to) these communities. Although not covered in the celebratory history of Embrapa, some consider this as a landmark in extending the purpose of a germplasm and seed bank beyond its scientific use (personal communications, researcher at Embrapa Agrobiologia, Rio de Janeiro, January 29, 2019; researcher at Embrapa Cenargen, Brasília, February 5, 2019; researcher at Embrapa HQ, Brasília, February 5, 2019). Later, in the 2000s, co-operation between Embrapa, the Krahô and other indigenous groups would support the exchange of seeds and empowerment of these communities’ agricultural knowledge. This would also open the ground for ethnosciences to flourish as a new field of applied research connecting indigenous and Embrapa researchers. One Cenargen respondent described these experiences as pioneering:

Embrapa had always worked with collection and ex situ conservation: collecting genetic material and placing it in a chamber. The project [with indigenous communities] promoted local conservation of genetic resources, marking the beginning of a change in Embrapa’s conservation logic ... with a new logic of working with local, in situ, conservation. The aim was to help communities strengthen the conservation of genetic resources locally. This was a very different logic from the one that had been encouraged by the Green Revolution, which was: let’s collect everything and put it in seed banks; we will save the genetic material and we will use this material to make genetic improvements, and we will launch new varieties that will save the world ... But when this project was approved, we brought a tiny drop of a different way of thinking into this research unit. (...) Stimulating communities, strengthening and empowering seed custodians as

part of a local conservation logic is very, very important. (personal communication, September 13, 2019)

Embrapa's work with indigenous and other traditional communities has indeed been well documented and published (Bustamante et al., 2017; Dias et al., 2016; Simoni Eidt & Udry, 2019; Udry & Simoni Eidt, 2015).⁷ Some of this work would later inform the development of a national policy on agroecology. The absence of references to this work in *Memória Embrapa* is a notable omission in Embrapa's historical celebration, especially as the experience relates to Brazil's native population and their own heritage in the country's agricultural, biodiversity and cultural landscape.

A third example of absences and contestations relates to Embrapa's work on social innovation, which is only mentioned in passing by *Memória Embrapa*. While biotechnology advanced throughout the 2000s, so did adaptive research and innovation initiatives targeting social groups that had previously been relatively marginalized. During this period, Embrapa saw the establishment of a new research programme targeting family farmers (known as Macroprograma 6), in line with a range of government policies put in place by the Workers Party-led government to support this category of farmers (Grisa & Schneider, 2015). This programme funded research on sustainable development in family farming and traditional communities, with a rural development (rather than value chain) logic. Since 2016, Embrapa's Social Innovation portfolio has continued this agenda with new elements. Inspired by perspectives on "transformative innovation from below" (Schot & Steinmueller, 2016; Smith & Stirling, 2018), it embraced knowledge production as a co-produced process that facilitates plural pathways rather than favouring predetermined directions in innovation. Its focus on processes of co-producing innovation, involving multiple actors connected by sociotechnical networks (redes socio-técnicas), makes a stark contrast with Embrapa's dominant crop-centred diffusionist model (personal communication, researcher at Embrapa Headquarters, Brasília, February 6, 2019). Despite the groundbreaking character of this approach, it has remained a small area of research inside Embrapa. Because of its focus on marginalized communities, this work is often regarded as Embrapa's corporate social responsibility rather than part of its core (production-oriented) research mission (personal communication, researcher at Embrapa Agrobiology, Rio de Janeiro, January 29, 2019).

It is unclear whether the omission by *Memória Embrapa* of the experiences and milestones outlined above was an oversight or intentional. What is clear is that the neglected events, technologies and methodological approaches are in direct tension with the celebrated model of science-driven modernization. The Alternative Agriculture movement explicitly voiced these tensions in the 1980s, when it called for a revision of the dominant model to address social justice and ecological preservation concerns. In the 2000s, family farming embodied, through a social class perspective, the counterpoint to an S&T system at the service of dominant agribusiness interests. At present, the contestation of the dominant model is best articulated by the agroecology movement, which albeit relatively confined inside Embrapa has in recent years expanded considerably in Brazil (Levidow et al., 2019; Petersen et al., 2013). Embrapa's agroecologists, however, still face considerable internal resistance and prejudice, as a researcher at Embrapa Cerrados explained:

Embrapa was created during the military regime and the training of many researchers was very conventional, very conservative. They have a huge prejudice in relation to agroecology, marginalizing it and claiming it is not science. (personal communication, September 13, 2019)

⁷The National Policy on Agroecology and Organic Production (PNAPO) was approved by the National Congress in 2012.

The scientific legacy assembled by Memória Embrapa is therefore contested, though not to the point of overtaking the prevailing orthodoxy: “Embrapa is not monolithic, it is not a single thought. But there is a predominant view of reality.” (personal communication, researcher at Embrapa Tabuleiros Costeiros, November 6, 2019)

I now consider the basis for epistemological divides inside Embrapa, illustrating that the organization is far from monolithic. I also consider the extent to which internal contestations erode personal identification with the organization, the sense of being Embrapian.

5.2 | Epistemological divides and partial identification

The initial composition of Embrapa’s team was relatively uniform, shaped by a common experience of postgraduate studies in the US. As one researcher at Embrapa Amazônia Oriental put it: “when Embrapa was created it was a monolith of men trained in agronomy in universities with a very mono-disciplinary approach.” (personal communication, November 4, 2019)

The change in recruitment process since the late 1980s contributed to a more plural set of profiles, although the capacity to break with conventional scientific practices and work in more inter- or trans-disciplinary modes remained limited (personal communications, researchers at Embrapa Cerrados, Planaltiva, September 13, 2019; Amazonia Oriental, Belém, September 16, 2019; Aracaju, November 4, 2019). A leading plant breeder at Embrapa Cerrados joined Embrapa in 1989 and brought along his experience with agroecological principles, agrarian reform and participatory methodologies. His work stands in sharp contrast with the dominant approach:

The great achievement of the Green Revolution was in genetics—the construction of genetic materials that adapt to chemical inputs—herbicides, fungicides, insecticides ... What is agroecology’s genetic construction? That is the big question. It is agrobiodiversity. You reconstruct genetics for agroecological systems by recovering local, creole varieties but with an interaction between knowledge, culture, social aspects linked to the seed and its cultivation processes. (personal communication, September 13, 2019)

Several respondents also described turning points in their careers illustrating how professional trajectories and experiences (positive or negative) mattered in shaping their views and practices. One researcher at Embrapa Cenargen recalled a week of fieldwork among the Krahô as a life-changing experience, prompting a reconsideration of their own worldviews and prejudices:

It was a great learning experience. It made me think about the history I had learnt at school when I was young, how that history lied, created distorted realities and false heroes. Often the real heroes are not the ones put on paper but other, anonymous heroes. I started reflecting, questioning my organization, comparing the research options made of the organization where I worked with the real needs, dreams and demands of that society. (personal communication, September 11, 2019)

Besides personal experiences, the re-democratization process (post-military dictatorship) encouraged the more politically engaged researchers to challenge the dominant model and pursue alternative research pathways. While the 1990s saw the recruitment of environmental scientists and a gradual incorporation of environmental concerns into agricultural research, the 2000s saw the hiring of social scientists and

the expansion of research targeting marginalized groups. A researcher at Embrapa Tabuleiros Costeiros explained:

In the late 1990s, the debate on sustainable development opened the space for me to apply for a doctorate in this area. There was an opening in Embrapa to understand this concept and how this concept could influence agriculture ... With the change of government in 2003, Embrapa becomes more permeable to demands that are in society and that prompted a debate about an agroecological transition, which is a term that has been very present in Embrapa's since 2003. (personal communication, November 6, 2019)

The establishment of research programmes focused on family farming and agroecology created spaces for alternative views from across Embrapa to coalesce. Views converged, for example, around the idea that, as a public entity, Embrapa should address broader societal needs and not just those of well-established farmers. And they converged around more reflexive research practices, such as an understanding of knowledge as co-constructed and responsive to complex social and ecological realities.

Despite being relatively marginal, the critique of Embrapa's success narrative coming from agroecologists and other politically engaged researchers has intensified, particularly as the country's political regime has now become less permeable to social justice and environmental concerns. And yet, the sense of organizational identity is not necessarily eroded by this critique, or at least not entirely. Some respondents conveyed a disconnection between feeling Embrapian and being associated with Embrapa's official heritage. This view depicts Embrapa as a state institution with a mission encompassing all segments of society. A researcher at Embrapa Clima Temperado put it in these terms:

I also consider myself Embrapian. Now I make a distinction between being an Embrapian who works for the system and one who thinks he can change the system. And this is how I see myself. If being Embrapian was to play the system's game, I would have left a long time ago ... Embrapa is a state company, not a government company. And the state must have democratic policies for its entire society. (personal communication, March 16, 2020)

Many have dedicated their careers to researching and, crucially, improving the circumstances of marginal social groups (family farmers, indigenous groups and other rural identities), while being aware that they were steering against the current. The sense of mission is still present, but they see this as serving a particular marginalized group, while resisting the hegemonic regime that favours wealthier farmers and reproduces scientific positivism and technological diffusionism, as a researcher at Embrapa Amazônia Oriental conveyed:

I am a committed Embrapiana. I say committed! But I know exactly what Embrapa is. I know exactly who Embrapa primarily works for and I will never align with that. Embrapa's mission is to target different social groups. I will die saying this, fighting for it. (personal communication, September 16, 2019)

It is unclear whether these dissenting Embrapian voices can help to create a different and more varied memory of Embrapa and agricultural S&T more broadly. For now, the scientific heritage celebrated by Memória Embrapa represents the dominant thinking within the organization, and the popular view about Embrapa and Brazil's tropical agricultural science, both domestically and abroad.

6 | CONCLUSION

This article explored Embrapa's engagement with its past and how the organization has imprinted its name in Brazil's agricultural history, creating a globally recognizable brand. As illustrated, celebrations like Embrapa's 40th anniversary have helped construct a narrative of success and assemble a scientific heritage marked by historic milestones, technologies and heroic individuals. This heritage is to be preserved and carried forward by younger researchers, thereby extending the organization's reputation and *raison d'être*, at a time when the future of publicly funded agricultural research is called into question by the advance of large multinational corporations.

Embrapa's celebratory heritage inevitably simplifies a complex trajectory and purges the organization's history of its tensions, diversity, and experimentation with multiple approaches to scientific research and technological innovation, including different modes of interaction with farmers. It also makes the narrative centred on a legendary Green Revolution difficult to challenge, reinforcing the persisting focus on productive intensification and a view of the farmer as a passive taker of ready-made technologies developed by experts. The problem is that this reduces the space for alternative perspectives on agricultural development and approaches to technological innovation—a worrying prospect at a time when sustainable development demands opening up to plural pathways, rather than getting “locked in” by singular technological packages (Leach et al., 2012).

Outside Brazil, African countries have expressed an ambition to create their own Embrapas, with support from development co-operation programmes (Cabral, 2016). International development agencies, philanthropic organizations and multinational corporations have encouraged success stories like Embrapa's, and spaces like the Africa Green Revolution Forum have nurtured the continuing celebration of Green Revolution and the scientific heritage associated with it. The danger is that a uniform and sanitized version of Embrapa (and Brazilian agricultural history) feeds technocratic fixations with linear success transfer and replicability that are bound to fail.

So what policy lessons might be drawn from this analysis? For Embrapa, while branding may be important to maintain a sense of identity and purpose, the organization should openly embrace its diverse and contested past. Embrapa has a rich history and remarkable research capability. Its heterogeneous heritage—from high-tech lab science to engaging with indigenous knowledge—is the key to the generation of a plurality of solutions that have the potential to cope with the challenges of unsustainable development, in their ecological and social justice dimensions. But this requires accepting alternative ways of producing S&T as legitimate, as well as recognizing that a publicly funded organization has a social function to play, which in a country like Brazil is inevitably about addressing structural inequalities.

More broadly, and particularly in settings where Green Revolution revivalism is apparent, debates on how to move agriculture forward should take a closer look at history and be wary of glorified views of the past. A focus on processes of memory building by agricultural S&T organizations (such as Embrapa) can offer insights into agricultural history and help understand how this history is remembered and forgotten. Such a perspective is relevant not only for understanding how a country like Brazil engages with its past and constructs a scientific heritage but also for thinking about how other countries attracted by the Green Revolution appeal can usefully engage with Brazil's history. If agricultural S&T organizations from other countries (in Africa particularly) are to learn from Embrapa, they should learn about its fuller experience and not just an airbrushed story of success that overlooks plurality and dissent, which may indeed be the finest attributes of Brazil's agricultural heritage.

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