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Technical Cooperation between Germany and Brazil: an analysis of the Project Development of Environmental Management Capacities in the Amazon (2011-2014)

Cooperação técnica entre Alemanha e Brasil: uma análise do Projeto Desenvolvimento de Capacidades para a Gestão Ambiental na Amazônia (2011-2014)

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Abstract: How are the actions developed under the Capacity Development Project for Environmental Management in the Amazon (PCT Amazônia), coordinated by the Brazilian Ministry of Foreign Affairs and the German Agency for International Cooperation - Gesellschaftfür Internationale Zusammenarbeit (GIZ), structured to contribute to the conservation of Brazil's tropical forests? This study addresses this question by examining international technical cooperation both as a tool for promoting economic and social development and, more importantly, as a mechanism for strengthening bilateral relations between Germany and Brazil. To this end, the article analyzes technical cooperation established between the two countries through the implementation of PCT Amazônia from 2011 to 2014. The research is designed as a single exploratory case study with a qualitative approach. Process tracing was employed to assess the outcomes corresponding to initial expectations, complemented by a bibliographic review and documentary analysis. The findings suggest that the initiatives carried out under PCT Amazônia were the result of a structured monitoring methodology focused on results, aimed at controlling and preventing deforestation while promoting the sustainable management of tropical forests.

Keywords: international technical cooperation; Germany; Brazil; Amazon; tropical forests.

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Resumo: Como se estruturam as ações desenvolvidas no Projeto Desenvolvimento de Capacidades para a Gestão Ambiental na Amazônia (PCT Amazônia), coordenadas pelo Ministério das Relações Exteriores do Brasil e pela Agência Alemã de Cooperação Internacional - GesellschaftfürInternationale Zusammenarbeit (GIZ), para a conservação das florestas tropicais brasileiras? Esta pesquisa busca responder esse questionamento levando em consideração a cooperação técnica internacional como um instrumento auxiliar na promoção do desenvolvimento econômico e social e, principalmente, um mecanismo de estreitamento das relações entre Alemanha e Brasil. Nesse sentido, o artigo analisa a cooperação técnica entre esses países na implementação do PCT Amazônia, entre 2011 e 2014. Trata-se de um estudo de caso único, do tipo exploratória e com abordagem qualitativa. Utilizou-se o process tracing para avaliar em que grau a realidade se conforma com às expectativas. Ademais, foi realizada uma revisão bibliográfica e uma pesquisa é de natureza documental. Conclui-se, portanto, que as ações desenvolvidas no PCT Amazônia resultaram da estruturação de uma metodologia de monitoramento de gestão com foco nos resultados para controle e prevenção do desmatamento, bem como na gestão sustentável das florestas tropicais.

Palavras-chave: cooperação técnica internacional; Alemanha, Brasil; Amazônia; Florestas tropicais.

1. INTRODUCTION

International Development Cooperation (IDC) has become an important instrument for promoting economic and social development within states' policy agendas. Following its institutionalization after the end of the Second World War, IDC expanded considerably, encompassing a wide range of relationships among multiple and diverse international actors (Souza, 2014). Moreover, it can be understood as a unit of analysis composed of several elements, including the actors involved, their interactions and dynamics, as well as the underlying power structure itself (Ayllón, 2013).

Given its broad thematic scope, environmental issues (such as sustainable development, carbon emission reduction, and sustainable agricultural practices) have gained increasing prominence within the IDC agenda, particularly since the 1980s. Brazil is home to approximately 67% of the world's tropical forests, making it a key actor in promoting sustainability and one of the largest recipients of technical cooperation in this field (Imazon, 2020).

Within this context, Brazil has sought to expand international technical cooperation on environmental issues with Germany. This cooperation has been implemented through financial investments and projects carried out by the German Agency for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit – GIZ), aimed at promoting sustainable development.

This article focuses on the Capacity Development for Environmental Management in the Amazon Project (2011–2014) (PCT Amazônia), coordinated by the Brazilian Ministry of the Environment (MMA) with the objective of strengthening the capacities of Brazilian public institutions and their partners to sustainably manage natural resources (Brasil, 2015). The study seeks to answer the following research question: How were the actions developed under the PCT Amazônia project, coordinated by the MMA and GIZ, structured to contribute to the conservation of Brazilian tropical forests?

The central hypothesis is that the actions developed under PCT Amazônia resulted from the establishment of a results-oriented management monitoring methodology aimed at controlling and preventing deforestation, while simultaneously promoting the sustainable management of tropical forests.

Accordingly, the main objective of this research is to analyze technical cooperation between Germany and Brazil in the implementation of the Capacity Development for Environmental Management in the Amazon Project (PCT Amazônia) between 2011 and 2014. This temporal scope is justified by the period during which integrated strategies for deforestation prevention and control were implemented.

This study seeks, first, to address a gap in the literature on international technical cooperation, particularly regarding the deepening of bilateral relations between Germany and Brazil in the implementation of policies and programs designed to improve deforestation monitoring systems in the Amazon through the protection and sustainable management of tropical forests. Second, the research has the potential to contribute both theoretically and practically to the fields of Public Management and International Cooperation by highlighting how

domestic initiatives can be aligned with global commitments, thereby enhancing the legitimacy of internal public policies.

Methodologically, this research is defined as: (1) a single case study; (2) exploratory in nature; and (3) based on a qualitative approach. Regarding the first aspect, Mills, Durepos, and Wiebe (2010) argue that a single case study addresses a unique problem whose specificity makes it a singular case. By examining international technical cooperation between Germany and Brazil in the implementation of PCT Amazônia, the study provides a detailed and comprehensive description of the phenomenon. In this regard, the findings are expected to demonstrate how empirical evidence supports or challenges existing theoretical assumptions.

The research is exploratory insofar as it assumes that causal mechanisms operate sequentially. Through the use of process tracing, it becomes possible to assess the extent to which empirical reality conforms to theoretical expectations and, consequently, to produce reliable statements regarding the importance, relevance, and magnitude of the causal mechanism under investigation (Sayer, 2003). Rather than presenting arguments that make exclusive claims about a phenomenon, exploratory research offers more or less plausible, and therefore productive, ways of examining and explaining a limited segment of reality. The variables adopted in this study are therefore: (a) the independent variable, technical cooperation between Germany and Brazil; and (b) the dependent variables, Land and Territorial Planning, Monitoring and Control, and the Promotion of Sustainable Activities.

The qualitative approach enables the use of theory to assess its explanatory strength and predictive capacity while providing meaning to, or explaining, a previously defined segment of reality. Furthermore, it seeks to explain limited portions of reality by suggesting a causal order and sequence of events. This approach involves a continuous process of meaning-making and interpretation of events, processes, and actions (Hendriks, 2007).

Regarding the research methods, a bibliographic review is conducted to establish the theoretical framework on International Development Cooperation. In addition, the study relies on documentary research, with data collected from

official reports produced by the Brazilian Cooperation Agency (ABC) and the Ministry of the Environment (MMA).

To this end, the article is structured as follows. The first section examines the historical evolution of International Development Cooperation, from its consolidation in the aftermath of the Second World War to its more recent configurations. It also highlights the role of International Technical Cooperation, particularly in the Brazilian context, as a central mechanism for knowledge exchange, capacity building, and institutional strengthening. The second section addresses the evolution of German–Brazilian cooperation, emphasizing its significance in the environmental field and in the strengthening of institutional capacities. Finally, the third section analyzes the Capacity Development for Environmental Management in the Amazon Project (PCT Amazônia).

2. INTERNATIONAL DEVELOPMENT COOPERATION

The transformations in the international system during the 1940s and 1950s contributed to the expansion of international cooperation, making it a fundamental component of states' foreign policies and of international relations among both state and non-state actors. International cooperation can be understood as the joint effort undertaken by governments and institutions to formulate programs aimed at benefiting societies or the international community as a whole (Sato, 2010).

In this context, International Development Cooperation (IDC) can be defined as the set of initiatives undertaken by governments and civil society organizations from different countries with the objective of promoting more balanced and inclusive development. This process is grounded in the principles of equality, reciprocity, and the strengthening of local autonomy, seeking to overcome historical asymmetries among nations (Martín, Lo Brutto, & Surasky, 2019).

The institutionalization of IDC took place in the aftermath of the Second World War, with the European Recovery Program (ERP), commonly known as the Marshall Plan, representing the first major example of international

development cooperation aimed at rebuilding the economies of European countries devastated by the war. The ERP was largely driven by the interests of the donor country, often neglecting the actual needs of recipient nations. During this period, development was widely perceived as a consequence of economic growth achieved through state intervention, a view reinforced by the Keynesian economic policies that gained prominence at the time (Leite et al., 2018; Gaspar, 2015).

During the Cold War, the geopolitical context of a bipolar international order divided between the United States and the Soviet Union fostered unequal relationships among countries, resulting in a verticalized cooperation process largely guided by the interests of donor states (Ayllón, 2007). The traditional conception of IDC reveals that development cooperation was closely associated with a hierarchical and assistance-oriented model in which donor countries maintained dependency relationships rather than promoting structural transformation. From this perspective, aid was limited to specific interventions and failed to address the historical roots of underdevelopment, thereby reinforcing global asymmetries and reproducing unequal power relations (Martín, Lo Brutto, & Surasky, 2019).

The end of the Cold War marked a departure from this traditional and predominantly economic understanding of development cooperation. Social dimensions gradually became incorporated into the development agenda, giving rise to a more multidimensional and equitable approach. Consequently, developed countries, traditionally positioned as donors, began to promote new forms of IDC that extended beyond purely financial assistance (Souza, 2014).

In this regard, IDC can be understood as a system that articulates the actions of states and non-governmental actors while disseminating the belief that the promotion of development through solidarity-based initiatives constitutes a desirable response to inequalities generated within the international system (Milani, 2012). Accordingly, IDC encompasses a broad network of public and private national and international organizations, involving both state and non-state actors, including international organizations, non-governmental organizations (NGOs), international non-governmental

organizations (INGOs), national and subnational governments and agencies, and civil society organizations.

Among the various mechanisms of IDC, International Technical Cooperation (ITC) stands out as a central element for understanding the object of study proposed in this article. ITC encompasses bilateral and multilateral intergovernmental projects and programs designed to foster development through the exchange of knowledge and experiences, as well as through training and capacity-building activities (ABC, 2021).

Within the United Nations system, ITC was initially referred to as international technical assistance, as established by United Nations General Assembly Resolution 200 (III) of 1948. This resolution identified the shortage of technical expertise and organizational capacity as major obstacles to development. The emphasis was placed on economic development and the non-commercial transfer of techniques and knowledge to developing countries (Milani, 2017).

Along similar lines, United Nations General Assembly Resolution 521 (VI) led to the establishment of the Expanded Programme of Technical Assistance (EPTA) in 1954. The program aimed to assist underdeveloped countries in strengthening their national economies through the development of industrial and agricultural sectors. This objective was supported by a Special Reserve Fund, developed in cooperation with the World Bank, through which member states contributed resources to sponsor technical cooperation initiatives and provide specialized expertise in specific fields (Milani, 2017). After the first decade of implementation, the term “technical assistance” was formally replaced by “technical cooperation” in 1959.

International Technical Cooperation gradually became a strategic instrument for development by fostering structural transformations in both social and economic sectors. Furthermore, it generated benefits across a wide range of areas (including energy, education, agriculture, and health) thereby contributing to the construction of stronger and more resilient institutions (Souza, 2014).

In the Brazilian context, the Brazilian Cooperation Agency (ABC, 2021) defines ITC as a temporary intervention designed to promote qualitative and/or structural changes within a given socioeconomic context, either by addressing and mitigating specific problems identified therein or by exploring new opportunities and development paradigms.

The Brazilian Cooperation Agency (ABC) is responsible for regulating, implementing, monitoring, and evaluating technical cooperation initiatives carried out with Brazil, whether bilateral or multilateral, provided that such initiatives fall within areas recognized by both international organizations and the Brazilian government (Milani, 2017). Moreover, ITC has become an important instrument for promoting national development and, above all, a mechanism for strengthening relations among countries. Germany, for example, has emerged as one of Brazil's principal strategic partners through cooperation projects in industry, agriculture, and, most notably, the environmental sector.

3. INTERNATIONAL TECHNICAL COOPERATION BETWEEN GERMANY AND BRAZIL

International Technical Cooperation (ITC), particularly through scientific and technological exchange and bilateral agreements between Germany and Brazil, has often transcended political and economic challenges. The Basic Agreement on Technical Cooperation between Brazil and the Federal Republic of Germany, enacted through Decree No. 54,075 of July 30, 1964, constituted the first bilateral agreement signed between the two countries. Among its primary objectives was the establishment of periodic consultations for the preparation of a general cooperation program, including the definition of measures necessary for the implementation of specific projects and programs (Souza, 2014).

Following this agreement, several complementary arrangements concerning individual technical cooperation projects were concluded. In 1969, the two countries established another important partnership through the General Agreement on Cooperation in Scientific Research and Technological

Development, also known as the Framework Agreement. Its purpose was to promote the exchange of information among researchers and technical professionals, particularly in the fields of technology and nuclear energy (Oliveira, 2011).

Following its institutional and financial recovery after the Second World War, Germany transitioned from the status of aid recipient to that of donor country. This transformation was made possible by its institutional framework, regarded as "one of the most complex and sophisticated cooperation systems, serving as a model for other countries" (Valente, 2010, p. 90).

One of the principal instruments for channeling these investments was the KfW Banking Group (KfW Bankengruppe), which, between 1948 and 1960, played a central role in revitalizing the German economy (Hernandez & Roehrkasten, 2011). Over time, KfW became a key institution in the promotion of ITC and contributed to the establishment of the Federal Ministry for Economic Cooperation and Development (Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung – BMZ) in 1961 (Valente, 2010).

Initially, the BMZ was responsible for providing technical assistance. However, beginning in 1972, it also assumed responsibility for financial cooperation. Meanwhile, the Federal Foreign Office retained responsibility for defining foreign policy priorities, including the allocation of development assistance to other countries. In 1998, the BMZ became a member of Germany's Federal Security Council, enabling it to contribute more directly to the resolution of global challenges (Hernandez & Roehrkasten, 2011).

As previously discussed, the Brazilian Cooperation Agency (ABC) is the institution responsible for coordinating ITC in Brazil. In Germany, this role is performed by the German Agency for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit – GIZ). The GIZ emerged from the merger of three major technical cooperation organizations: the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), the International Capacity Development Organization (Internationale Weiterbildung und Entwicklung gGmbH – InWent), and the German Development Service (Deutscher Entwicklungsdienst – DED) (Hernandez & Roehrkasten, 2011).

In Brazil, GIZ develops projects primarily in the environmental sector, particularly initiatives aimed at combating climate change and promoting renewable energy, energy efficiency, and the sustainable use of tropical forests (GIZ, 2022). Between 1990 and 2014, approximately one hundred projects were completed, nearly 60% of which were related to environmental and agricultural issues.

One of the most significant initiatives was the Pilot Program to Conserve the Brazilian Rain Forest (Programa Piloto para a Proteção das Florestas Tropicais do Brasil – PPG7), launched in 1990 and financed by the G7 countries (the United States, Germany, France, Japan, the United Kingdom, Canada, and Italy) (Milani, 2017; Lima, 2007). The experience acquired through the implementation of PPG7 provided the foundation for the creation of the Capacity Development for Environmental Management in the Amazon Project (PCT Amazônia), which was implemented between 2011 and 2014.

4. CAPACITY-BUILDING PROJECT FOR ENVIRONMENTAL MANAGEMENT IN THE AMAZON

The Pilot Program for the Protection of Brazil's Tropical Forests (PPG7), which began in the 1990s and concluded in the 2000s, fostered deeper environmental cooperation between Brazil and Germany. The program's objectives were to: balance economic development and environmental protection with a focus on tropical forests; preserve biodiversity; reduce carbon dioxide emissions; and foster cooperation between developed and developing countries on environmental issues (Cepal; IPEA; GIZ, 2011).

Through PPG7, Brazil gained access to a new development model, via market regulation, to promote the region's development, which, until the early 1990s, lacked a market-oriented culture. This moment marked a transition for Brazil, giving the Amazon region the opportunity to enter the international market (Antoni, 2010).

Along these same lines, in 2005, the countries began negotiations for the protection of the Amazon. The goal was to create a program that would build upon the experiences already gained through PPG7 (Brazil, 2010). In 2007, the

two countries developed the Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAm). This plan enabled a wide range of measures, implemented in an integrated manner, resulting, for example, in significant reductions in recorded annual deforestation rates (Brazil, 2015).

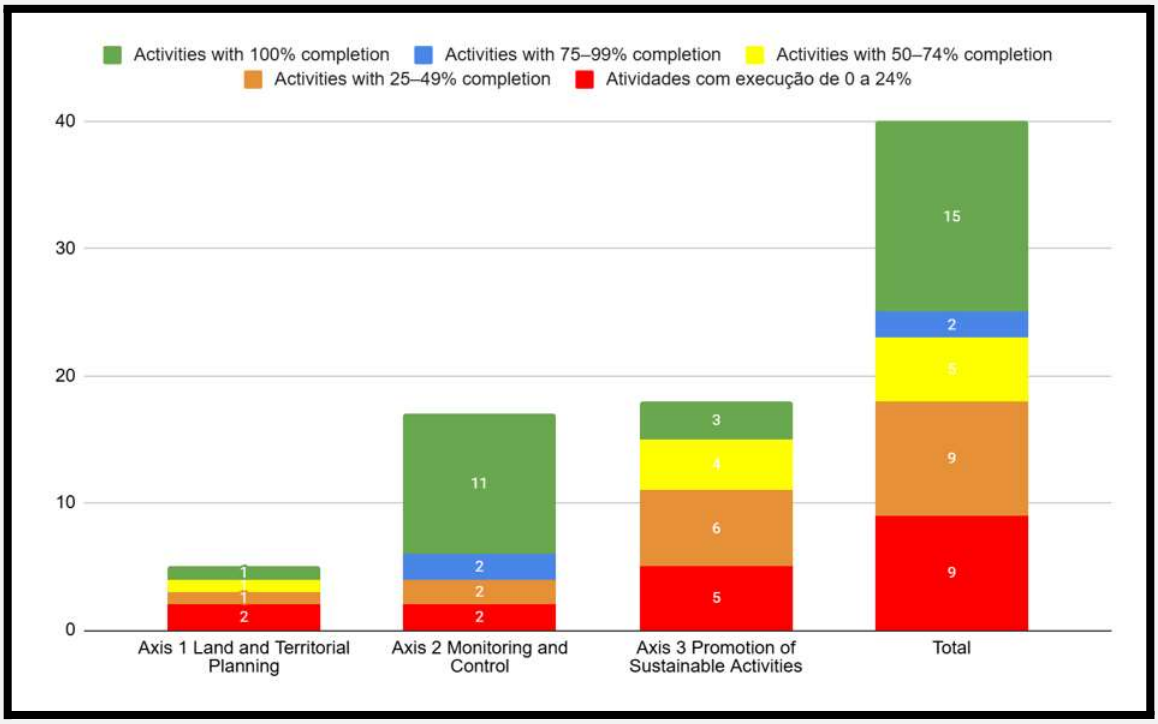
The PPCDAm comprises Phase I (2004–2008), Phase II (2009–2011), and Phase III (2012–2015). Evaluations conducted during Phase II indicated the need to focus on areas that showed the greatest weaknesses in implementation. Consequently, during intergovernmental negotiations between Brazil and Germany in 2010, the possibility of creating a project to take effect the following year was discussed.

Accordingly, the Technical Cooperation Project for Capacity Building under the Amazon Program (PCT Amazon) was established in 2011, coordinated by Brazil's Ministry of the Environment. The objective was to strengthen the capacity of Brazilian government institutions, as well as their nongovernmental and private-sector partners, for the sustainable management of natural resources in line with Brazil's other environmental policies (Brazil, 2015).

PCT Amazon prioritized the conservation of Brazilian tropical forests, particularly the Amazon, to protect biodiversity, mitigate the effects of climate change, and promote sustainable development (GIZ, 2021). Funding for the implementation of these activities came from the BMZ, KfW, GIZ, and Brazilian government institutions, such as the Ministry of the Environment, ABC, the state government secretariats of Acre, Pará, and Amazonas, and the Chico Mendes Institute for Biodiversity Conservation.

The PCT Amazon complemented Phases I and II of the PPCDAm, carrying out specific activities between 2011 and 2014. In addition, the PPCDAm had a budget of approximately 12 million euros to carry out activities in three areas: 1. Land and Territorial Planning; 2. Monitoring and Control; 3. Promotion of Sustainable Activities. In total, 41 activities were carried out, of which 18 were more than 75% complete (MMA, 2010; Cepal; IPEA; GIZ, 2011).

Figure 1: Activity Implementation



Source:Cepal; Ipea; GIZ (2011).

As shown in Figure 1, it is evident that Axis 3, regarding the Promotion of Sustainable Activities, yielded few positive results during the project years. Of the 19 activities, only 4 achieved an implementation rate greater than 75%. Furthermore, these activities were aimed at promoting a development model based on sustainable forest use. However, the 2011 evaluation of the PPCDAm concluded that these efforts were insufficient to directly impact the rate of deforestation.

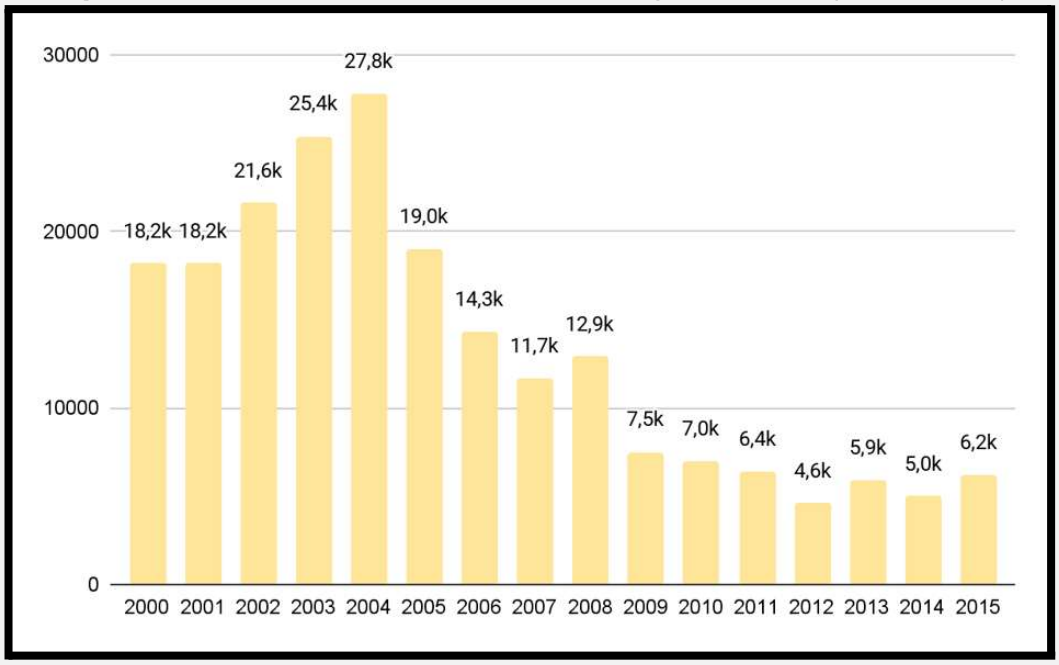
Axis 1, Land and Territorial Planning, also showed low implementation rates, with only one of the five proposed activities achieving an implementation rate of more than 75%. It can be argued that these results were affected by public policies regarding the regularization of land parcels and environmental issues (Cepal; IPEA; GIZ, 2011). Thus, to achieve better results in this pillar, it was important to reform the institutional structure.

It is worth noting that the best results were achieved in Axis 2, Monitoring and Control, with 11 activities showing full implementation, although certain improvements were recommended, such as greater integrated planning among the responsible agencies and improved management of the Rural Environmental Registry (CAR) (Cepal; IPEA; GIZ, 2011).

The PPCDAm shows a reduction in the deforestation rate in the Brazilian Amazon. According to the National Institute for Space Research (INPE, 2022), this rate, measured in km², fell from 11,651 in 2007 to 7,000 in 2010, as shown in Figure 2. This positive result indicates that cooperation with Germany may have contributed to mitigating the problem of deforestation in the Amazon.

The PPCDAm's actions focused on command and control issues, rather than prioritizing implementation based on a sustainable development model for the Amazon region. The main problem identified involved issues related to strategy and governance (Cepal; IPEA; GIZ, 2011).

Figure 2: Trends in deforestation in the Legal Amazon (2000–2015)



Source: Inpe (2022).

The creation of the PPCDAm is therefore due to the situation in the Amazon, which is characterized by a growing population and a haphazard pattern of land use marked by the exploitation of natural resources by farmers, loggers, miners, and others who use this area and harm its biodiversity (Brazil, 2010).

As shown in Figure 2, between 2004 and 2008 (Phase I of the PPCDAm), a significant reduction in deforestation can be observed. Between 2009 and 2011 (Phase II of the PPCDAm), the figures still showed a slight decrease. Finally, between 2012 and 2015, there was a slight increase

compared to Phase II. Consequently, the need to promote the transition from the current predatory production model to a sustainable development model became evident, integrating the actions of the federal government with those of states and municipalities (Brazil, 2010).

Regarding the actions carried out by the Amazon Technical Cooperation Project (PCT) in the priority area of tropical forests, the following focus areas were developed: 1. Protected areas and sustainable management of natural resources; 2. Demarcation and protection of indigenous lands, planned by the National Indian Foundation (FUNAI); 3. Land-use planning and regional development; 4. The Amazon Fund, managed by the Brazilian Development Bank (BNDES) in partnership with the Norwegian government (Brazil, 2010).

The first three pillars were ongoing initiatives under the PPCDAm. In 2010, the total budget for these initiatives was projected at 14 million euros, with 12 million invested by BMZ and KfW, and the remainder by the Brazilian government. Monitoring was to take place through meetings to discuss the Work Plans and annual Progress Reports, presented by independent consultants or consultants from GIZ, ABC, and other responsible public agencies (Brazil, 2010).

Specifically, the proposed actions included: strengthening the legal framework as part of a strategy for land-use planning and land-use designation in the Amazon; improving the governance of protected areas in the Amazon, by enhancing the planning and management processes for conservation units; creating the necessary conditions for implementing existing regulations and, thereby, reducing illegal deforestation and encroachments on demarcated protected areas, as well as increasing the supply of legal timber; sustainably using and adding value to natural resources, by increasing the competitiveness of sustainable use over predatory use (Brazil, 2015).

Still regarding actions in the priority area of tropical forests, the project's lines of support covered: protected areas and sustainable management of natural resources, which includes the themes of protected area management and forest management; and land-use planning and regional development, with the themes of deforestation prevention and control, land-use planning, and local

and regional economic development, divided into their respective subthemes (Brazil, 2010; Brazil, 2015).

GIZ produced a report in 2016 that systematized the results of the Brazil-Germany Technical Cooperation (2011–2014), broken down by funding lines, their themes, and their subthemes, as shown in Figure 3.

Figure 3: German Technical Cooperation Priority Areas, with Their Themes and Subthemes

Helplines	Topics	Subtopics
Protected Areas and Sustainable Management of Natural Resources	1. Protected Area Management	- Results-based management - Economic sustainability - Planning and governance of conservation areas
	2. Forest Management	- Forest Management -Forest concessions - Forest management - Platform for exchange on forest management
Land Use Planning and Regional Development	3. Prevention and Control of Deforestation	- Integration of deforestation control initiatives - Environmental regularization
	4. Land-Use Planning	- Integration of risk management into land-use planning - Integration of zoning plans in the Amazon - Land and environmental regularization
	Local and Regional Economic Development	- Local and Regional Economic Development -Socio-biodiversity product chains - Cooperation with the business sector

Source: Brasil (2010).

The first priority area—protected areas and sustainable natural resource management—successfully promoted its participating institutions. The topic of protected area management, which focused primarily on Conservation Units and their governance, facilitated—through training and exchanges at both the

international and regional levels—the transfer of data and knowledge among the states of Acre, Amazonas, and Pará (GIZ, 2016).

In this regard, it is still worth considering improvements in the autonomy and management of these units. However, it was noted that there is still a lack of evaluation tools to verify the achievement of the Conservation Units' objectives, as well as low commitment to the development of new public policies (GIZ, 2016).

With regard to the issue of forest management—which prioritized the monitoring, control, and implementation of forest concessions—one of its outcomes was the enactment of the legal framework proposed by the state of Amapá in 2013. The purpose was to guide states in creating or adapting their regulations for the management of public forests under their jurisdiction, thereby achieving alignment between state and federal policies. In addition, a project was developed to integrate data from the National Forest Management Portal into the Forest Origin Document, which enabled data integration and led to improved organization of forest-related information (GIZ, 2016).

However, the basic infrastructure—which relies on public and private actors, as well as communication systems and transportation routes—did not ensure the economic viability of forest management through forest concessions. Furthermore, management plans covering the new concessions had not been developed by 2018—that is, two key steps toward achieving positive project outcomes (GIZ, 2016).

In the Land Use Planning and Regional Development Support Line, the central concern was deforestation. Thus, one of the main milestones of its predecessor project was the long-term reduction of deforestation rates and the more comprehensive implementation of the CAR. Consequently, the Amazon PCT prioritized the development of methodologies, as well as the tools necessary to promote public policies and their implementation, in addition to seeking international support.

At the international level, these efforts culminated in the Warsaw Framework of 2013, which established the requirements for recognizing results in mitigating forest loss in developing countries. This contributed to the creation

of Reducing Emissions from Deforestation and Forest Degradation plus Forest Conservation, Sustainable Forest Management, and Enhancement of Forest Carbon Stocks (REDD+), which is characterized as a results-based payment mechanism based on forest emissions reference levels. At the international level, there was a reduction in deforestation during the years of its implementation, falling from 6,418 km² in 2011 to 5,012 km² in 2014 (Brazil, 2016; GIZ, 2016).

However, despite these positive results, the proposed objective still faced the challenge of implementing the Rural Environmental Registry (CAR) in Brazil, since the states are responsible for monitoring and formulating the policies to be implemented. Furthermore, the lack of advanced remote monitoring systems hinders the development of strategies that could have been implemented to ensure a more effective and rapid response. Therefore, it became important to realign actions among the states, the federal government, and municipal governments, both for enforcement and for the implementation of public policies.

It is also worth noting the improvements in service delivery and protected area management, as it was possible to reconcile federal and state interests to create a legal framework for developing standards for the efficient management of public forests, namely REDD+. Furthermore, the slow response by the responsible agencies to cases of wildfires or illegal deforestation, as well as the lack of better equipment, hindered efficient systematization, as did the failure to implement the CAR.

It is evident that, after the program's conclusion—despite positive results in several areas—the implementation of a long-term public policy to control and combat deforestation was not achieved. Starting in 2015, deforestation rates increased, rising from 5,000 square kilometers to double that amount by 2019.

Finally, the results of the Amazon PCT show that only through proper coordination of instruments and policies would Brazil be able to achieve a more sustainable and efficient use of the Amazon (GIZ, 2016). The creation of a new technical cooperation project between Brazil and Germany, as well as the

introduction of new analytical tools, could be a way to further advance efforts to manage tropical forests.

5. CONCLUSION

This article analyzed the technical cooperation between Germany and Brazil in the implementation of the Capacity Building for Environmental Management in the Amazon Project (Amazon PCT) between 2011 and 2014.

Environmental cooperation between Brazil and Germany, which began with the PPG7 program in the 1990s, established a model of international partnership focused on the protection of tropical forests and on striking a balance between economic development and environmental conservation. This program allowed Brazil to experiment with new market-based regulatory instruments and paved the way for more structured public policies in the Amazon region.

The creation of the PPCDAm in 2004 marked a milestone in the fight against deforestation. During its three phases (2004–2015), the plan led to significant reductions in annual deforestation rates, particularly during its first phase, although it prioritized command-and-control measures over sustainable development strategies. The best results were achieved in the Monitoring and Control pillar, with full implementation of most activities, while the Land and Territorial Planning and Promotion of Sustainable Activities pillars showed low effectiveness, revealing structural, governance, and institutional integration limitations.

The Amazon PCT (2011–2014) sought to strengthen Brazilian institutional capacities and complement the PPCDAm, with a focus on protected areas, forest management, territorial planning, and regional development. The hypothesis is thus confirmed that the actions carried out under the PCT Amazon resulted from the development of a results-oriented management monitoring methodology aimed at controlling and preventing deforestation, as well as the sustainable management of tropical forests. Among its main advances are: improved management of Conservation Units, although evaluation mechanisms have not yet been fully consolidated; the creation of state-level legal

frameworks for forest concessions and greater data integration in forest monitoring; and the development of policy instruments linked to the Rural Environmental Registry (CAR) and REDD+, aligning national and international efforts to mitigate emissions.

Despite this progress, structural challenges persisted: a lack of adequate infrastructure for forest management, shortcomings in the implementation of the Rural Environmental Registry, poor coordination among federal entities, and limitations in responding to wildfires and illegal deforestation. Furthermore, after 2015, there was a trend toward increased deforestation, indicating that the gains achieved had not been consolidated into a long-term policy.

Therefore, it can be concluded that Brazil–Germany cooperation in the environmental field has yielded significant results, particularly in the initial reduction of deforestation and institutional strengthening, but it has not been sufficient to ensure the transition to a sustainable development model in the Amazon. This experience demonstrates that the continuity of public policies, integration across levels of government, and international coordination are fundamental to ensuring the conservation of tropical forests.

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