

**THE
TECHNICAL
ASSISTANCE
AND RURAL
EXTENSION
(TARE)
VOID**

**Pathways for the
socioeconomic and
environmental inclusion
of smallholder farming**

Solidaridad

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THE TECHNICAL ASSISTANCE AND RURAL EXTENSION (TARE) VOID: PATHWAYS FOR THE SOCIOECONOMIC AND ENVIRONMENTAL INCLUSION OF SMALLHOLDER FARMING

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About Solidaridad

Solidaridad is an international civil society organization that has been active in Brazil in the development of socially inclusive, environmentally responsible, and economically profitable agricultural chains for more than a decade. It proposes to accelerate the transition to inclusive, low-carbon production, contributing to the food and climate security of Brazil and the world. It currently develops sustainability initiatives with its partners in the following chains: cocoa, coffee, sugarcane, yerba mate, orange, livestock and soy.

Across the globe, **Solidaridad** has over half a century of activity in more than 40 countries. It promotes partnerships and innovative solutions with governments, organizations, cooperatives, and companies to support rural men and women producers to produce better and reduce the climatic impact of food production. Its mission is to ensure the transition to an inclusive and sustainable economy, which maximizes the benefit for people and the planet.

Where do we operate?



Livestock



Cocoa



Yerba mate



Coffee



Sugarcane



Soybean



Orange



Preface

How valuable is Technical Assistance and Rural Extension (TARE) for sustainable rural development? Can an ongoing, quality TARE system manage to lessen inequalities in the countryside? What influence does TARE have over transforming the lives of smallholder farmers in the Amazon?

Solidaridad has sought answers to these questions in the last six years through its Amazon Programme, which focuses on developing and implementing a TARE model that benefits smallholder farmers.

The results and findings of this work have shown that investing in a quality TARE system like the one developed in the Trans-Amazonian region generates great social, economic and environmental benefits. The sustainability of TARE services over time depends on their quality, longevity, and economic viability, per a cost-effectiveness analysis of smallholder farmers.

This publication presents unprecedented results for the region and for the smallholder-farming segment. For the first time, smallholder farmers are paying for TARE and are aware of its financial capacity and how it affects their properties and lives. This is a promising experience developed as part of a partnership between **Solidaridad**, Cocoa Producers and the Agricultural Development Cooperative of the Amazon (Cooperativa dos Produtores de

Cacau e Desenvolvimento Agrícola da Amazônia – COOPERCAU) and smallholder farmers and has enormous potential to be replicated in the region. We hope this successful model and its proven positive effect can be spread across the Amazon.

We move forward on this journey, focused on strengthening smallholder farming as an irrefutable means of lessening inequalities and fostering social inclusion in rural areas. Supporting it efficiently and effectively guarantees food security, combats the climate crisis and contributes to the environmental balance of our country.

Enjoy the read!



Rodrigo Castro

Country Manager

Solidaridad

1.

Introduction



When devising strategies for production-chain sustainability and the socioeconomic inclusion of smallholder farmers, discussing the challenges and ways to expand their access to Technical Assistance and Rural Extension (TARE)¹ is inevitable. Ensuring smallholder farming access to knowledge and technology is fundamental for sustainable rural development and establishing conditions for a more socially just, environmentally, and economically viable production.

However, the public TARE system has shown that it cannot serve most agricultural establishments. The coverage data from Brazil's TARE service reveals a lack of assistance and a service void

that primarily falls on the smallholder-farming sector. While larger properties with more capital fill this void by hiring private technical assistance services, smallholder farmers—dependent on public TARE systems—remain unassisted.

“Misinformation is what most impoverishes farmers. When we have information, we start to dream higher, to go further.”

Clóvis Rios, smallholder farmer

In the Amazonian reality, the search for solutions to offer more TARE service becomes even more vital because

Smallholder farmers in the Amazon are among those with the most difficulties in accessing the TARE system

¹ Assistência Técnica e Extensão Rural, in Portuguese, or ATER

the region's smallholder farmers are challenged with poor infrastructure and poor access to education and healthcare in addition to the lack of Technical Service.

Despite being relatively recent, the public policies on TARE in Brazil have a winding trajectory, with several changes in course, in the approach and institutional structure. Although this path has led to advances and significant achievements for smallholder farming,

this audience and their needs were often not covered in these policies.

This study offers a current account of the situation focused on the Amazon—and more specifically on Pará—to understand the offer and chronology of TARE policies in Brazil and to outline strategies for transforming the present scenario. It proposes an intervention model that has proven strategic in improving smallholder farming's access to the TARE service.

Defining Technical Assistance and Rural Extension

Although often confused or used synonymously, the terms technical assistance and rural extension have distinct meanings and, consequently, different scopes and effects on the farmers' daily routines.

Rural Extension is understood as an intervention for changing the rural population's production process or other sociocultural and economic processes through communication between actors with different knowledge and positions of power (Caporal, 2009). Thus, it is an ongoing, collective and cooperative process in which families are equipped to improve their working and living conditions from an integrated perspective on property and production systems (Montardo, 2005). According to Paulo Freire (Freire, 1983), it is a **process for technicians and farmers to exchange** knowledge and dialogue and put together what they know.

Often encompassed by rural extension activities, **Technical Assistance** is not necessarily educational by nature or geared towards training the producer. It is characterized by more prompt and specific actions for

resolving immediate, specific and individual issues (Peixoto, 2008). Technicians assume the role of knowledge-holder and restrict themselves to applying their expertise to solve a specific problem (Peixoto, 2009) without transferring knowledge or autonomy to the farmers.

Therefore, rural extension has a broader scope and reach over the served population and territory than technical assistance.

Law No. 12888/2010 defines "Technical Assistance and Rural Extension" as "a non-formal, ongoing education service in rural areas that promotes the management, production, processing and commercialization of agricultural and non-agricultural activities and services, including agro-extractivism, forestry and artisanal activities."

Solidaridad believes that TARE must involve permanent and ongoing education that considers the entire property and integrates the extension technicians' wisdom with the smallholder farmers' knowledge and experiences.

TARE's history and status in Brazil



History shows that TARE's public policies were at the mercy of the country's political and economic changes

2.1 History

Although Brazil is one of the largest agricultural producers in the world, and one of its main economic activities is agriculture, the public policies on technical support for farming in rural areas are relatively young. The first only appeared in the late 19th century. Since then, the initiatives have undergone a nonlinear evolution. They have adopted different approaches that strongly reflected the prevailing views in each of Brazil's historical and political periods. These approaches follow two main lines, diffusionism and humanism.

Diffusionism is based on disseminating ideas, practices and technology for modernizing the agricultural and livestock sector by using developmental logic inserted in an industrial development and economic growth model (Caporal, 2009). Especially after the Second World War and

the Green Revolution, this approach has been based on acquiring a modernizing technological package. TARE would use it to increase productivity and insert the rural producer inside the dynamics of the market economy ("productionist diffusionism").

In turn, **humanism** brings a broader perspective that views productivity increase less as an end goal and more as a means to improve rural families' incomes and well-being (Rodrigues, 1997). This approach emerged in Brazil between the 1940s and 1950s with a welfarist character and the creation of Rural Credit and Assistance Associations (*Associações de Crédito e Assistência Rural - ACARs*). From the 1980s onwards, this approach took a more inquisitive stance on diffusionism ("critical humanism"), seeing it as a process that spawned social exclusion and environmental impacts (Rodrigues, 1997). In this context, TARE is part of a

rural development perspective in which smallholder farmers are subject to their actions as citizens, understanding and complicating their situations and making conscious decisions (Rodrigues, 1999).

Figure 1 traces the history of TARE's main milestones in Brazil. Since they began at the end of the 19th century until almost the middle of the following century, technical support efforts for rural producers only disseminated information. Teaching and research institutes initially played this role. Later, once the Agricultural Information Service (*Serviço de Informação Agrícola*) and municipal associations of rural producers were established in the 1940s, the information was disseminated by demonstration units, experimental farms and via radio (Bordenave, 1985; Peixoto, 2008).

Brazil's agricultural technical support profile changed after WWII ended (1945) and the Cold War began (1947). That's when the US began fostering developmental actions for countries like Brazil (to expand markets for US-produced inputs, machinery and equipment) as part of its political and commercial strategy (Pettan, 2010 apud Alves, 2018; ROS, 2012 apud Quidá, 2017). In the same context, in collaboration with the American International Association for Economic and Social Development (AIA)², the first Credit and Rural Assistance Association (ACAR-MG) was established in the state of Minas Gerais in 1948. It was structured according to the existing model in the USA, which combined technical assistance and supervised credit to smallholder farmers through credit associations (Castro & Pereira, 2017; Alves, 2018). Creating ACAR-MG paved the way for similar associations in several other states in the following years, culminating with the 1956 creation of the Brazilian Association of Rural Credit and Assistance (*Associação Brasileira de Crédito e Assistência Rural – ABCAR*) (Alves, 2018). ABCAR is considered the first institutionalized TARE and credit experiment in the country.

From 1956 onwards, aligned with the

Green Revolution and that period's common developmental strategy, TARE actions focused on modernizing agriculture, increasing land and labor productivity (Delgado, 2012) and “overcoming lags in rural areas” (Quidá, 2017). It involved incentives for mechanization and using fertilizers and hybrid seeds.

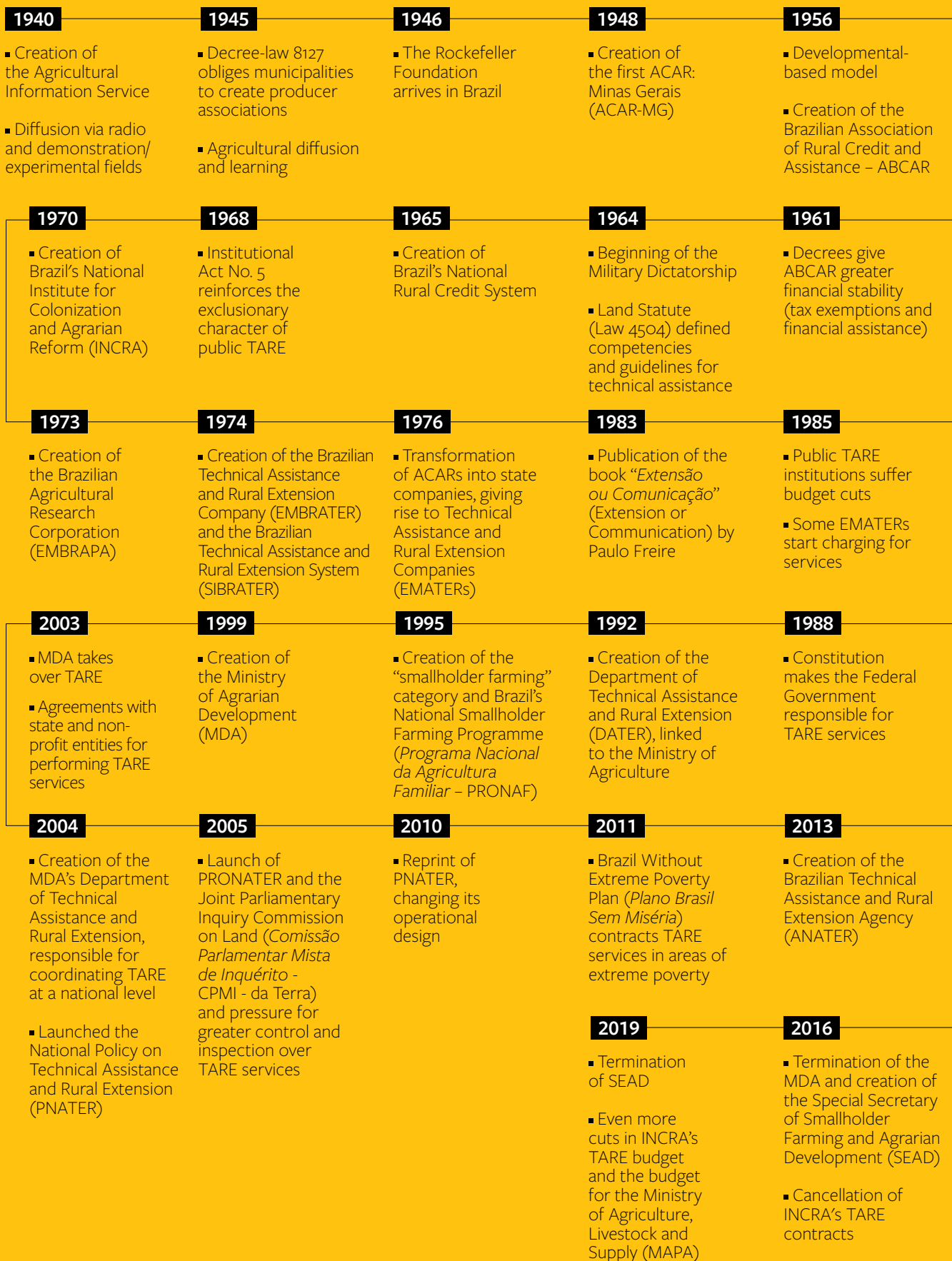


Initially focused on disseminating information, TARE has become strategic for the growth of Brazilian agriculture over the years

² A philanthropic entity founded by American businessman and politician Nelson Rockefeller. The AIA designed the United States' foreign policy strategy regarding rural areas (Quidá, 2017).

Figure 1.

History of TARE's main milestones in Brazil





Smallholder farming was often excluded from the country's public policies on rural development

Military dictatorship marked the following decades. Government power was centralized and democratic spaces were lost. Despite that, appropriate steps were taken on policies and instruments for rural areas. There was the **Land Statute's unprecedented definition of technical assistance guidelines**. And **direct assistance was provided to families in agrarian reform settlements**, which were then established in Brazil's less-populated regions in an occupy-and-colonize strategy. **This timeframe also saw ACARs transformed into EMATERs**, and other institutions important to rural development in the country and to TARE services were structured, such as EMBRATER and SIBRATER, to name a few³. However, due to

this phase's technology-oriented approach and consequent need for investment, which is unfeasible for smallholder farmers, it generates an exclusory process (Bergamasco et al., 2017; Alves, 2018).

The economic and fiscal crisis in the 1980s profoundly affected TARE's public institutions. Sometimes, they began charging for their services (Dias, 2007). Combined with reestablishing policy after the military dictatorship, it stirred criticism of the rural development and TARE model adopted until then and of the social and environmental problems that had arisen from it. Consequences like the publishing of Paulo Freire's book, "*Extensão ou Comunicação*," and the State undertaking responsibility for TARE services per the

³ E.g., the National Rural Credit System, the National Institute for Colonization and Agrarian Reform (INCRA) and the Brazilian Agricultural Research Corporation (EMBRAPA).

Federal Constitution of 1988 solidified the search for a more democratic and popular Rural Extension to expand the dialogue between the fields of knowledge.

However, with the economic crisis persisting, EMBRATER became extinct in the early 1990s, and the EMATERs came to depend on the interest and resources of state governments. That led to precarious services in several states (ECHENIQUE, 1998 apud Dias, 2007). Later, in 1995, these organizations were again financially strengthened by being entrusted with developing credit projects for the recently

created PRONAF. The creation of MDA and the joint development of PNATER in the early 2000s intensified the adoption of sustainable rural development and agroecology based on TARE experiments conducted a few years earlier by civil society organizations and state governments. TARE established itself that decade as an overarching mechanism for several federal government policies and programmes by having other government agencies establish TARE policies for specific audiences, such as indigenous peoples, quilombolas and women.

PNATER, ATES and other federal public policies

Launched in 2004, PNATER, and its primary instrument, the National Programme for Technical Assistance and Rural Extension in Smallholder Farming and Agrarian Reform (*Programa Nacional de Assistência Técnica e Extensão Rural na Agricultura Familiar e na Reforma Agrária* – PRONATER), consolidated TARE service operations by contracting executor entities: public companies (e.g., EMATERs), non-profit organizations and private companies. Currently operated by MAPA, PNATER's principles are free, quality, accessible TARE services. The beneficiary audiences are the agrarian reform settlers, indigenous peoples, quilombolas and other traditional peoples and communities, and smallholder farmers or rural family enterprises, to name a few. Based on experiences and lessons learned from the Cooperative Account Funding Project (*Projeto Conta Cooperativa de Captação* – CONTACAP) and the Lumiar Project (in the 1990s), INCRA created the Technical, Social and Environmental Assistance Programme for Agrarian Reform (*Programa de Assessoria Técnica, Social e Ambiental à Reforma Agrária* – ATES) in 2003. ATES focused on agrarian reform settlement projects and their specificities and, thus, sought a multidisciplinary and participatory approach that would guarantee more power and participation to

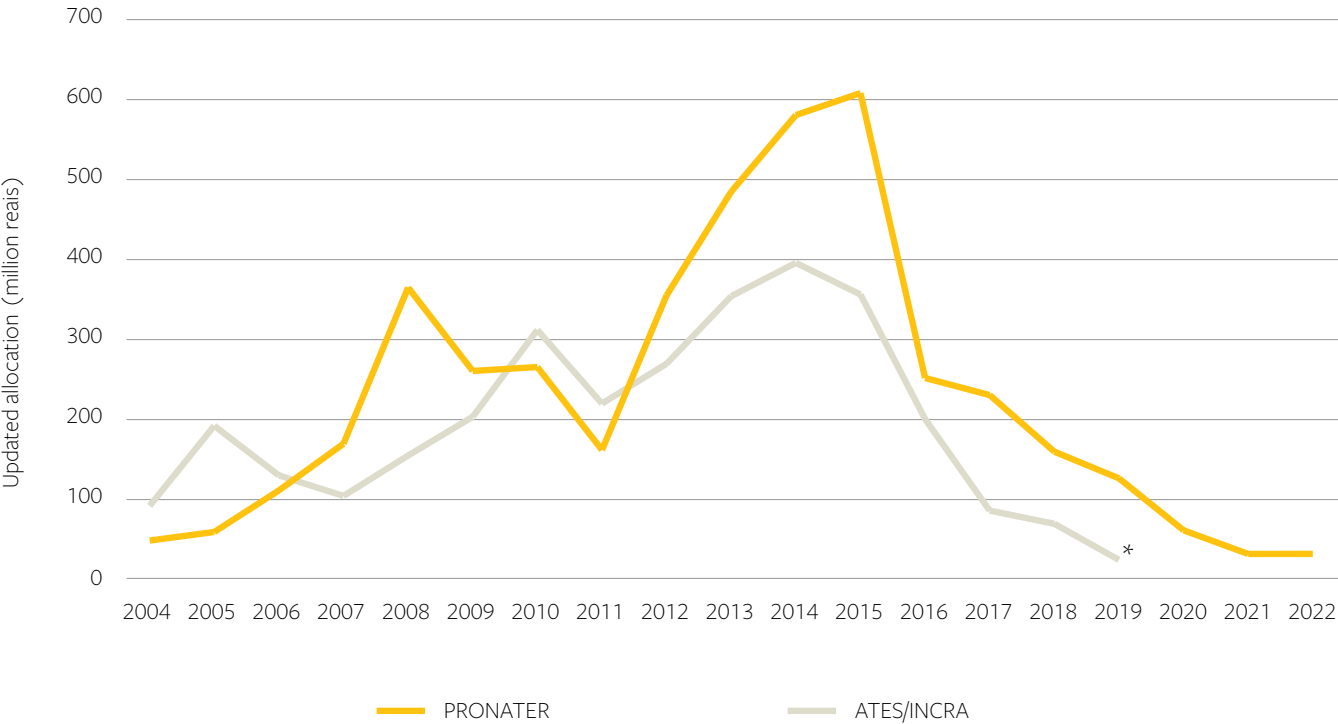
farmers' associations. In addition to these policies, TARE appears as an action mechanism in other government initiatives. For example, the provision of this service is planned —although not as a central instrument—in policies for combating and adapting to climate change, such as the National Programme for Production and Use of Biodiesel (*Programa Nacional de Produção e Uso do Biodiesel* – PNPB), the National Policy on Climate Change (*Política Nacional de Mudança do Clima* – PNMC) and the National Policy for Native Vegetation Recovery (*Política Nacional de Recuperação da Vegetação Nativa* – PROVEG). Furthermore, the National Policy on Agroecology and Organic Production (*Política Nacional de Agroecologia e Produção Orgânica* – PNAPO) established TARE as one of its instruments. PRONAF, a rural credit policy created in 1995 specifically aimed at smallholder farming, is another initiative worth mentioning. Although unquestionably important for this audience, PRONAF's role regarding TARE only finances technical assistance activities related to agricultural credit projects that the programme financed, for example, with no credit lines specific to TARE. The PRONAF budget was halved in 2018-2019, reaching the lowest limit since 2013, not even 10m reais [1 Brazilian real = 0.19 euros].

In 2010, Law No. 12188 instituted new versions of PNATER and PRONATER, introducing changes to the operational design and approach of TARE in Brazil. In 2011, with the beginning of the Brazil Without Extreme Poverty Plan, which focused on specific population segments, the changes made the TARE policy selective rather than universal. However, because of EMATER's historical action and reach across different economic classes, the same changes established these organizations' roles in implementing the PNATER and other socioeconomic development policies in underserved regions, such as the Food Purchase Programme (*Programa de Aquisição de Alimentos – PAA*), National School Meals Programme (*Programa Nacional de Alimentação Escolar – PNAE*) and the Environmental Conservation Support Programme (*Bolsa Verde*).

In 2013, the Brazilian Technical Assistance and Rural Extension Agency (*Agência Nacional de Assistência Técnica e Extensão Rural – ANATER*) was created, which undertook the entire operationalization of TARE contracts for smallholder farming and agrarian reform beneficiaries. The budgets allocated to TARE that same year showed a steeper growth trend, reaching their peak in 2015 (Graph 1). However, that trend was short-lived. In 2016, TARE budgets suffered a sharp drop. With less investment in social policies and the extinction of the MDA, public calls for TARE services were paralyzed (Leite et al., 2018). **The budget reductions from that period that were continued in subsequent years affected the TARE service's coverage, which fell from 22% in 2006 to 20% in 2017, per the IBGE Agricultural Censuses from those two years.**

Graph 1.

Annual TARE budget historical data (2004-2019)



Source: SIOP, 2020, prepared by Solidaridad

* Programme discontinued in 2019

As of 2018, the scenario of reduced investments in social development policies lowered more intensely (Leite et al., 2018), as did the coverage of TARE services. The current scenario is witnessing the scrapping of public TARE entities and watching private organizations having to restrict their services for access to credit, georeferencing, support in preparing the Rural Environmental Registry and environmental licensing.

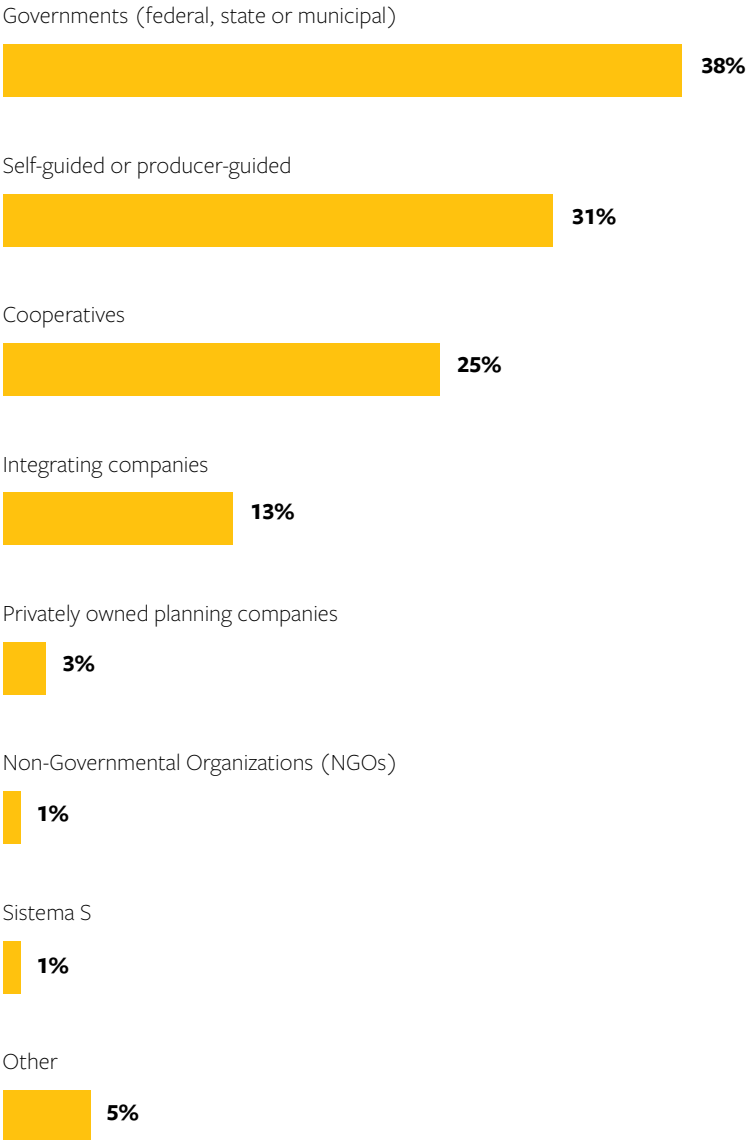
2.2 Who offers TARE

The reduction in the government TARE budget available and the consequent weakening of government institutions that offered this service inevitably led to a reduction in the participation of government agents (federal, state or municipal) and an increase in the importance of other agents. Government agents still represent the largest role in this service in Brazil. However, according to the Agricultural Census, they went from providing some type of technical guidance for 43% of Brazil’s agricultural establishments in 2006 to 38% in 2017 (**Graph 2**).

On the other hand, there was an increase in producers contracting their own technical guidance, which rose to 31% in 2017, and in technical guidance offered by cooperatives, which reached 25%.

Other actors represented a portion of the technical guidance given to Brazil’s agricultural establishments, albeit to a lesser extent. The companies among them that integrate and purchase raw materials bear mentioning, which served 13% of the establishments receiving technical guidance. Although, the service in these cases generally focuses more on productivity and the company’s culture of interest. Non-governmental organizations were also noted at a much lower percentage (1%).

Graph 2.
Origin of technical guidance received by agricultural establishments in Brazil (2017)



Source: 2017 Agricultural Census - Table 6780, prepared by Solidaridad

However, they perform a significant role in supporting the socioeconomic development of traditional communities and smallholder farmers and in their defense. Finally, with a focus more on professional training, technical assistance in specific production chains and rural property management, the National Rural Learning Service (*Serviço Nacional de Aprendizagem Rural – SENAR*) or Sistema S also provided guidance to a small portion (1%) of agricultural establishments in Brazil. SENAR operates throughout the country, and its budget has grown in the last decade. In 2019, it surpassed 1.2bn reais, reinforcing its potential to contribute to the technical development of an ever

larger and broader audience of farmers.

Each of these actors' work (however limited it may be in some cases) is significant in this ever-reducing of the already-low coverage of the TARE service, which is even more severe in the Amazon and among smallholder farmers. Therefore, the following chapter closely examines this territory and its people. It will begin with the regional history and TARE policies. Then, it will follow with an analysis of the offer and coverage of the TARE service in the Amazon and the state of Pará. Lastly, it gives a current account of the public and territory served by **Solidaridad** and its *Amazon Programme*—smallholder farmers in Pará.



Other actors, such as NGOs, have played a substantial role in including smallholder farming in TARE activities in recent years

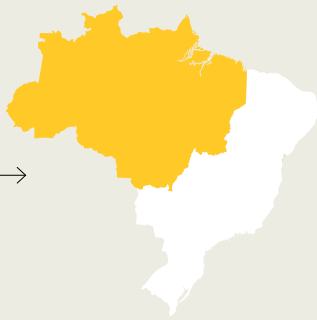
3.

TARE's challenges and opportunities in the Amazon and Pará

3.1 The Amazon's history of occupation and economic development

The Legal Amazon

Comprises the **seven states in the northern region** and part of **Mato Grosso** and **Maranhão** →



59%
of **Brazil**

Area of about
5 mi km²

Source: IBGE, 2018

The region is home to around

28m
people



Responsible for almost 9% of the Brazilian GDP (Santos et al., 2021, based on IBGE data), the Legal Amazon produces a huge diversity of products from extractivism, mining and agricultural activities. The latter account for almost 17% of the region's soil (Santos et al., 2021, based on data from MapBiomas, 2020). The regional agricultural production value reached 84bn reais in cattle ranching in 2019 (IBGE, 2020c). Seasonal crops—primarily soybeans—accounted for 90% of that amount, while year-round crops—especially açai, banana and cocoa—accounted for about 9%. Cattle ranching is also a significant economic activity in the region. In 2019, it accounted for more than 89m head of cattle.

Although significant for the national economy and production, its regional

socioeconomic indicators are less positive and reflect otherwise. For example, the region's per-capita GDP is the same as the national per-capita GDP. In the state of Pará's case, that value is only slightly more than half of Brazil's national average.⁴ (Santos et al., 2021). The Legal Amazon's Municipal Human Development Indexes (MHDI) are also generally below the Brazilian average, despite having grown in recent decades. In 2010⁵, 86% of the municipalities in the Legal Amazon had a low MHDI (Atlas of Human Development in Brazil).

This underprivileged socioeconomic scenario in relation to the rest of the country largely reflects the region's colonization and economic development history. That happened with government incentives for immigration and expanding

⁴ According to data from the IBGE and the Central Bank of Brazil (Santos et al., 2021), the actual per-capita GDP in Brazil in 2018 was 33.6 thousand reais, while in the Legal Amazon, it was 22.3 thousand reais, and it was 19 thousand reais in Pará.

⁵ Most recent IBGE Census.

agricultural production to occupy land, especially during the military regime, and a development model based on the uncontrolled exploitation of natural resources, environmental degradation and violence (BECKER, 2001) and generally poorly aligned with the interests and demands of the Amazonian peoples. However, the 1988 Federal Constitution and the growing concern with environmental issues stimulated projects for supporting traditional communities, smallholder farming, settlements and protected areas to be established in the 1990s. That occurred simultaneously with the regional expansion of a more modern

and capitalized system of agriculture, mainly through the cultivation of soy and the intensification of cattle ranching.

The 2000s saw the development of policies on strengthening traditional peoples and communities in all their diversity (BOITO JÚNIOR & BERRINGER, 2014). However, these have been gradually paralyzed in recent years and currently have little prospect of progress. The region's numerous social and environmental challenges and its history have made the talks on expanding access to TARE to smallholder farming a fundamental part of the socioeconomic and environmental development of the Amazon.



With a history of exploitation of natural resources and barely meeting local demands, developing the Amazon now means expanding TARE access to smallholder farmers



3.2 TARE policies in the Amazon

The Amazon's developmental history also affected the regional TARE policies and access. In addition to the occupation process, often decoupled from investments in infrastructure and services, the region's particularities—which also vary immensely across the vast territory—influence both regional potential and vocations and the most latent bottlenecks and challenges for smallholder farming (BECKER, 2001). Most TARE policies developed in the region historically undervalued those regional, local and family specificities and the traditional lessons and knowledge.

The national rural development and TARE policies also defined differentiated approaches that considered the characteristics of each of Brazil's regions. Not even PNATER, which instituted a more modern and innovative perspective to TARE, guaranteed that the resources transferred to its executor entities were compatible, in the case of the north region, with the low HDI, the access difficulties, the number of agricultural establishments and, mainly, with the historical lack of assistance to that region's farmers.

Although exceptions to the rule, some federal and state initiatives intended to consider the Amazon region's particularities and potential. The Social and Environmental Development Programme for Rural Smallholder Farmers (*Programa de Desenvolvimento Socioambiental da Produção Familiar Rural* - PROAMBIENTE) and the public state policies in Acre and Amapá are some such initiatives that bear mentioning. These initiatives being halted even though they were yielding learning and positive results reinforces how important it is to search for and implement innovative and lasting solutions for expanding the TARE service in the region from a perspective that considers its diversity and complexity.

PROAMBIENTE: Agriculture and conservation in harmony

Implemented in 11 clusters of smallholder farming and agro-extractivism in the Legal Amazon (Almeida et al., 2017), PROAMBIENTE was originally conceived and run by social movements, civil society organizations and traditional peoples and communities. The Ministry of the Environment incorporated it in 2004 (Hirata, 2006; Almeida et al., 2017). The programme aimed to balance the conservation of natural resources and smallholder farming by employing rural territorial environmental management, Payment for Environmental Services (PES) and the integrated planning of production units (PROAMBIENTE, 2003). The programme's instruments and approach were considered innovative as they were based on agroecology, the valorization of traditional knowledge and participatory methodologies (Almeida et al., 2017). It also yielded positive results among the participating farmers, such as reduced deforestation, slash-and-burns and pesticide use, and diversified production. Despite those factors, the programme was not established as a public policy, and its funding was canceled in 2005 (Almeida et al., 2017; Lassmann, 2020). Amapá had a distinguished experience with state initiatives from 2006 to 2007 when it created specific TARE bodies for each rural production sector (forestry, fisheries and agriculture). This division helped establish the Pro-Extractivism

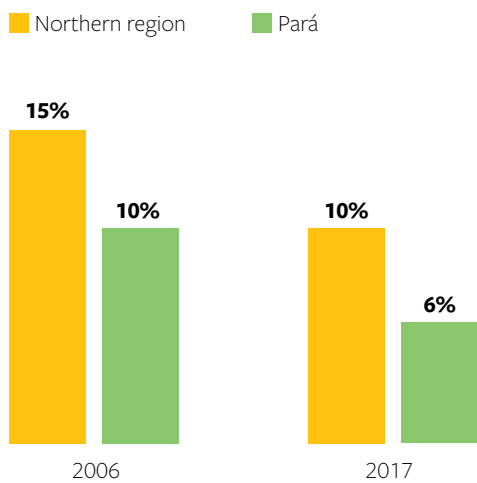
Programme (*Programa Pró-Extrativismo*), a TARE model for strengthening forest management in the state's naturally adept production chains, such as acai, vine, nuts, and timber. The strategy also contained a component for Reducing Emissions from Deforestation and Forest Degradation (REDD) and PES. It paid producers 2 thousand reais to manage 3- to 5-hectare areas of forest. The initiative was stalled after very little implementation time due to a government transition in 2007, as with PROAMBIENTE. On the other hand, as of 2008, the Acre state government structured a local TARE network with support from the United Nations Development Programme (UNDP) to address some of the problems mapped in the Action Plan for Prevention and Control of the Legal Amazon Deforestation (*Plano de Ação para Prevenção e Controle do Desmatamento na Amazônia Legal – PPCDAm*). The TARE component had background support from the socio-biodiversity production chains that involved adding value to environmental assets through a REDD and PES strategy by focusing on the maintenance of Legal Reserve areas and the structuring of an agroforestry agent training programme. The absence of national case law for a PES policy and subsequent revision of the Forest Code hindered the pace and breadth of the proposed actions.

3.3 TARE availability and accessibility in the Amazon and Pará

The 2017 IBGE Agricultural Census revealed that the **TARE coverage in the Amazon is still quite low compared to the rest of the country**. While TARE's national service rate is 20%, it is only 10% in the northern region and even lower in the state of Pará at only 6% (Graph 5). In 2017, coverage in the northern region, Pará and at the national level was even lower than the 2006 Agricultural Census record.

Graph 3.

TARE coverage variation in the northern region and Pará from 2006 to 2017



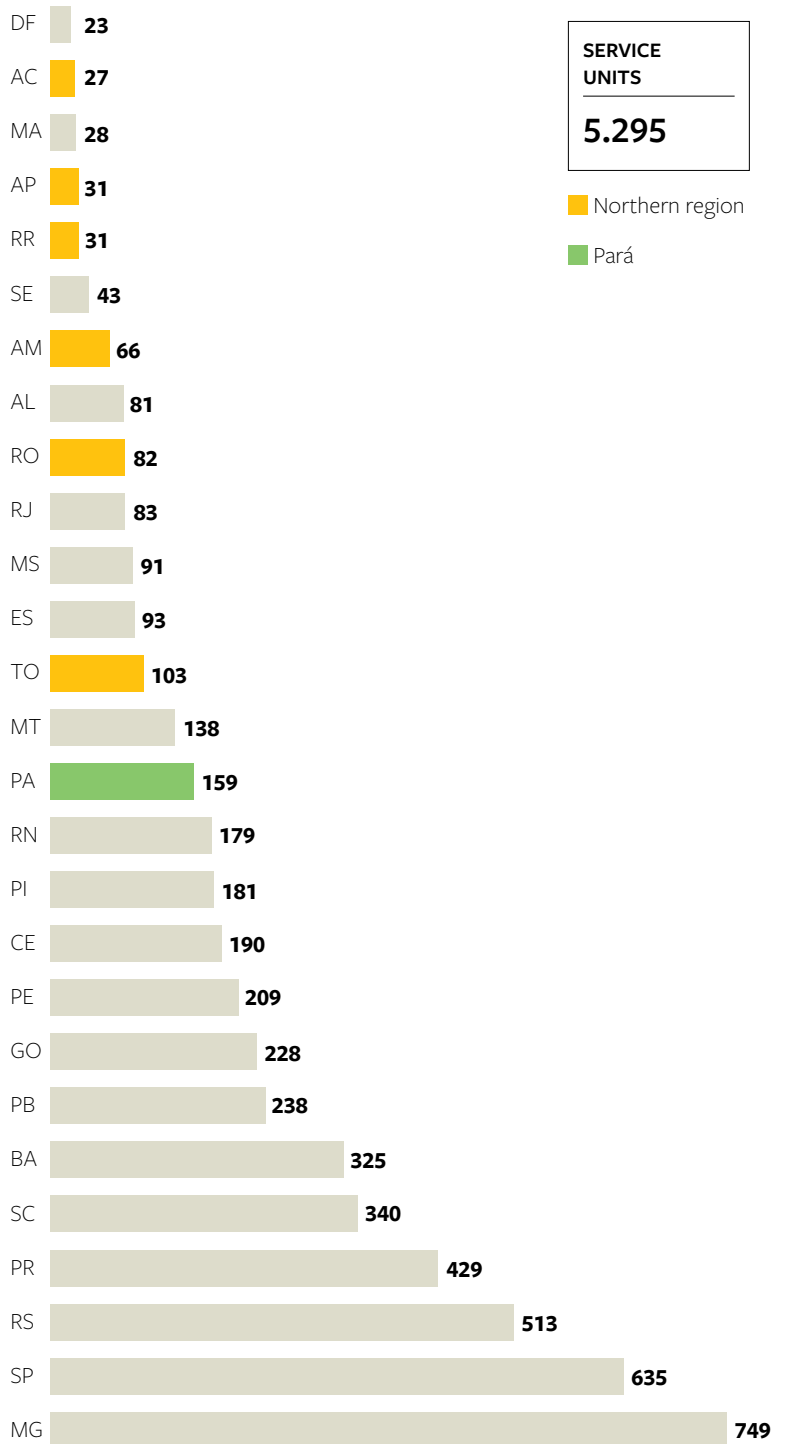
Source: 2006 Agricultural Census - Table 842 and 2017 Agricultural Census - Table 6780, prepared by Solidaridad

The low coverage in the north is consistent with the number of TARE service units in the states of this region, which is lower than the rest of the country. Combined, these states concentrated only 9% of the approximately 5,000 existing units in 2017 (Graph 4) (ASBRAER, 2021). Pará had the largest number of service units among them (159), having at least one EMATER office for each of its 144 municipalities. The

state is also among the country's largest number of TARE service beneficiaries and is the largest in the northern region, approaching 132 thousand (Graph 5).

Graph 4.

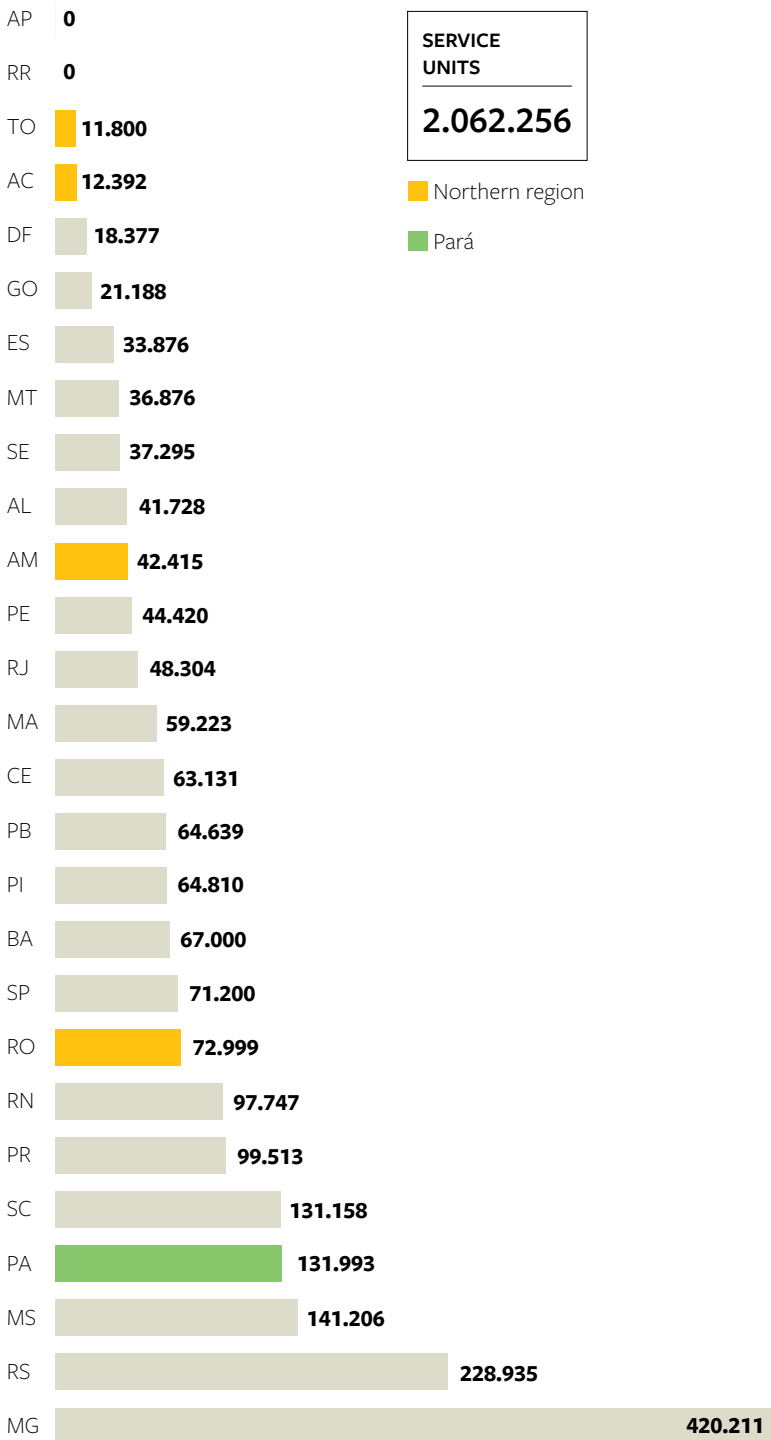
Brazil - Total service units by state (2017)



Source: ASBRAER, 2021

Graph 5.

Beneficiaries served by state



Source: ASBRAER, 2021

This state also had the highest individual-technician service rate per establishment, possibly affecting the personal level and quality of the service provided. While the proportion in the northern region was 158 establishments per technician, in Pará, it was 191, almost twice what the extinct MDA recommended, which was 80 to 100 establishments per technician.

In addition to the notable variation between national coverage and national service structures and those observed in the northern region and Pará, it is also noted that the number of different TARE agents who provided that service also varies between these scales. In the Amazon, the government agents have more relevant roles in providing TARE service. Nationwide, 38% of the establishments received technical guidance from government actors. That rate was 67% in the northern region and 52% in Pará (**Graphs 6 and 7**), indicating that **the producers there rely even more on the policies and resources the government designates to TARE than the rest of the country.**

Even so, 24% of the establishments served in the northern region and 30% in Pará were producers who contracted their own TARE services, a significant representation.

Cooperatives on the other hand, which play a considerable role on a national scale (25% of establishments), provide significantly less technical support to farmers in the northern region and Pará—4 percent and 7%, respectively. Expanding these organizations' performance in the regional TARE activities could guarantee more smallholder farmers access to this service.

Graph 6.

Origin of technical guidance received by agricultural establishments

Northern region Pará

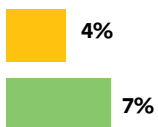
Governments (federal, state or municipal)



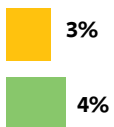
Self-guided or producer-guided



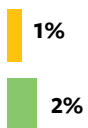
Cooperatives



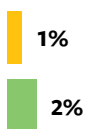
Integrating companies



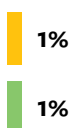
Privately owned planning companies



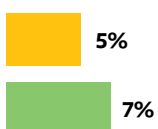
Non-Governmental Organizations (NGOs)



Sistema S



Other



Source: 2017 IBGE Agricultural Census - Table 6780, prepared by Solidaridad

TARE coverage also deviates when comparing different size classes of areas of agricultural establishments: the larger the property, the greater the TARE coverage. In the northern region, while the service for the class of establishments that have between 20 and 50 hectares

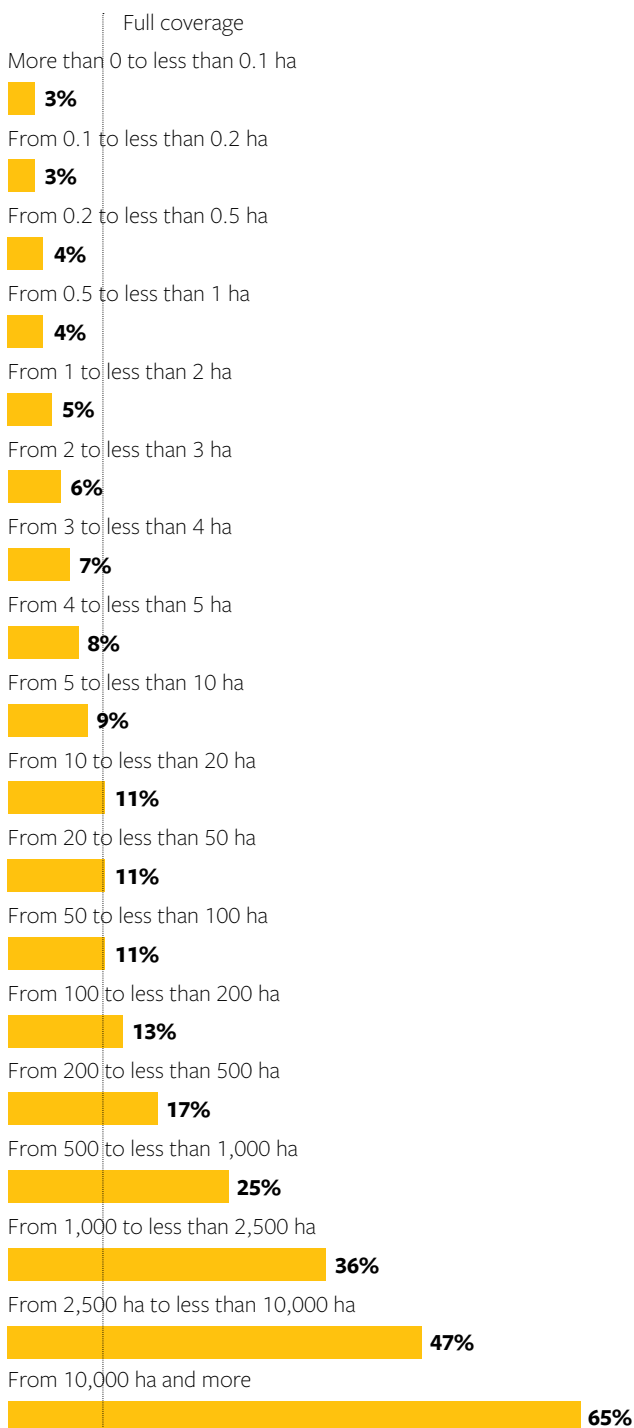
was only 11%, and those with more than 2,500 hectares reached almost 50% (**Graph 8**).

In Pará, the smallest area classes are even more underserved. Only 6% of the establishments with between 20 and 50 hectares received service. Among the establishments with more than 2,500 hectares, the state approached a 42% coverage rate (**Graph 9**).

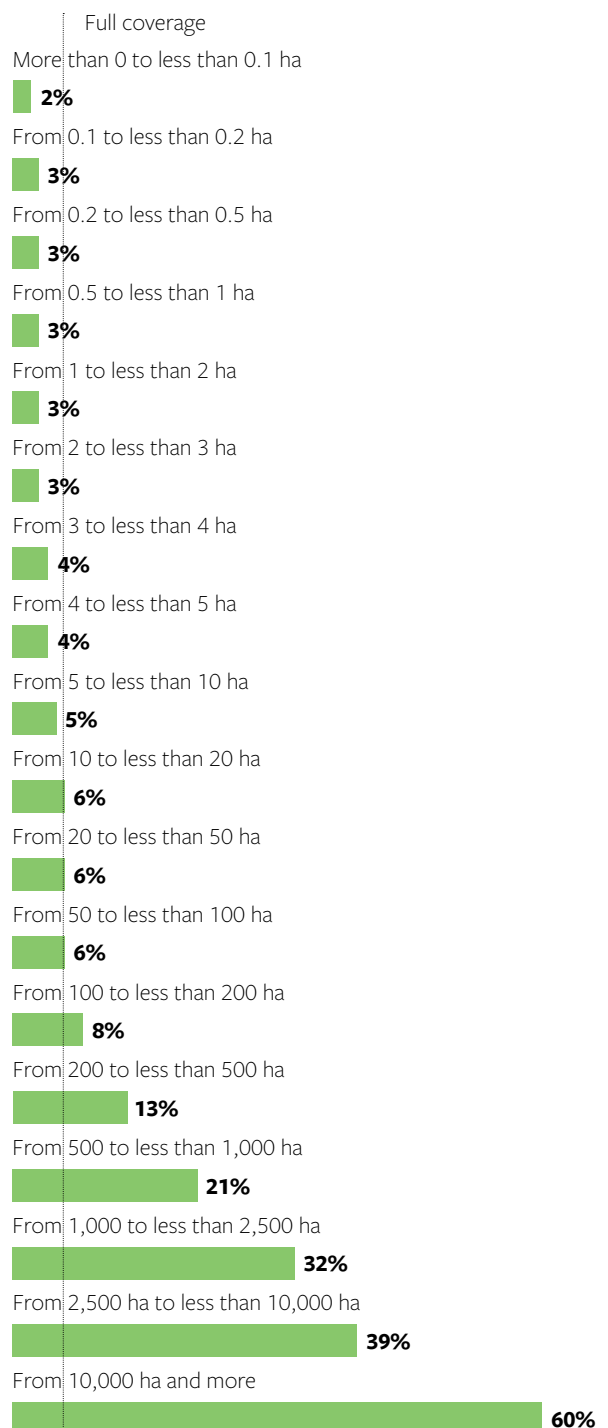
Graphs 8 e 9.

ATER coverage variation by area classes of agricultural establishments

Northern region



Pará



Gender bias in TARE access

Access to TARE services is also gender-biased. Women's work, especially in rural areas, has been—and still is, to a large extent—historically considered secondary when compared to men's work, undervaluing their significance and contribution to agricultural production and family income. Based on the perception that women would only have reproductive and domestic roles, management and decision-making are mainly concentrated in the hands of men, which reinforces women's vulnerability and dependence, especially in isolated hard-to-reach communities. Although PNATER and specific calls to women have addressed this topic, it is still a predominant concept in TARE policies, which, like other rural development policies, generally have men as the main interlocutor. This is reflected in the TARE services offered to women, as proven by the 2017 Agricultural Census: despite managing 19% of establishments in Brazil, women represent only 11% of the public benefited from TARE services. Although they run

an equal share of establishments in the northern region and Pará, female representation in the TARE audience is only slightly higher, reaching 15% and 16%, respectively (IBGE, 2018). A TARE committed to fostering women's economic autonomy and recognizing them as farmers is fundamental for reducing gender inequalities in the countryside and can promote women's access to public policies and reduce the challenges and risks to which they are exposed. It could also push the positive results beyond the gender issue, for example, in a collective organization, verticalization of production, access to education and family succession. That makes it important for TARE initiatives to include affirmative actions that are formulated and executed taking into account inclusive methodologies and approaches that recognize women and guarantee they participate and take the lead in TARE actions and, consequently, in agricultural and livestock establishments and the production process (Butto & Hora, 2008).



A TARE service committed to women's economic autonomy yields positive results that surpass the gender issue

3.4 Smallholder farmers' access to TARE in Pará

The data above shows that the lack of assistance for smallholder farmers—83% of the northern region's agricultural establishments and 85% of Pará's—is more severe for smaller properties.

This section seeks to further analyze these establishments' access to TARE, with a precise focus on the state of Pará. This Agricultural Census analyzed data on smallholder-farming establishments with an area from 200 to 500 hectares and all classes below it.

How Pará's smallholder-farming establishments are defined in this study

Two premises were considered to determine the IBGE area classes for smallholder-farming establishments:

i) The Smallholder Farming Act (Law 11326/2006), which defines a smallholder farmer and smallholder entrepreneur as one with an area of less than four fiscal modules and predominantly uses family labor;

ii) the size of the fiscal module in the municipalities of Pará—a maximum of 75 hectares.

Considering these premises*, the maximum size of smallholder-farming properties in Pará would be 300 hectares.

This point of view notes that TARE service coverage for smallholder-farming properties is only about 5%. That's even lower than the statewide agricultural establishment coverage, which is 6%. I.e., **95% of smallholder-farming establishments in Pará have zero access to any type of TARE service.**

However, those who are assisted show variations in the service origin and coverage, depending on the property's profile.

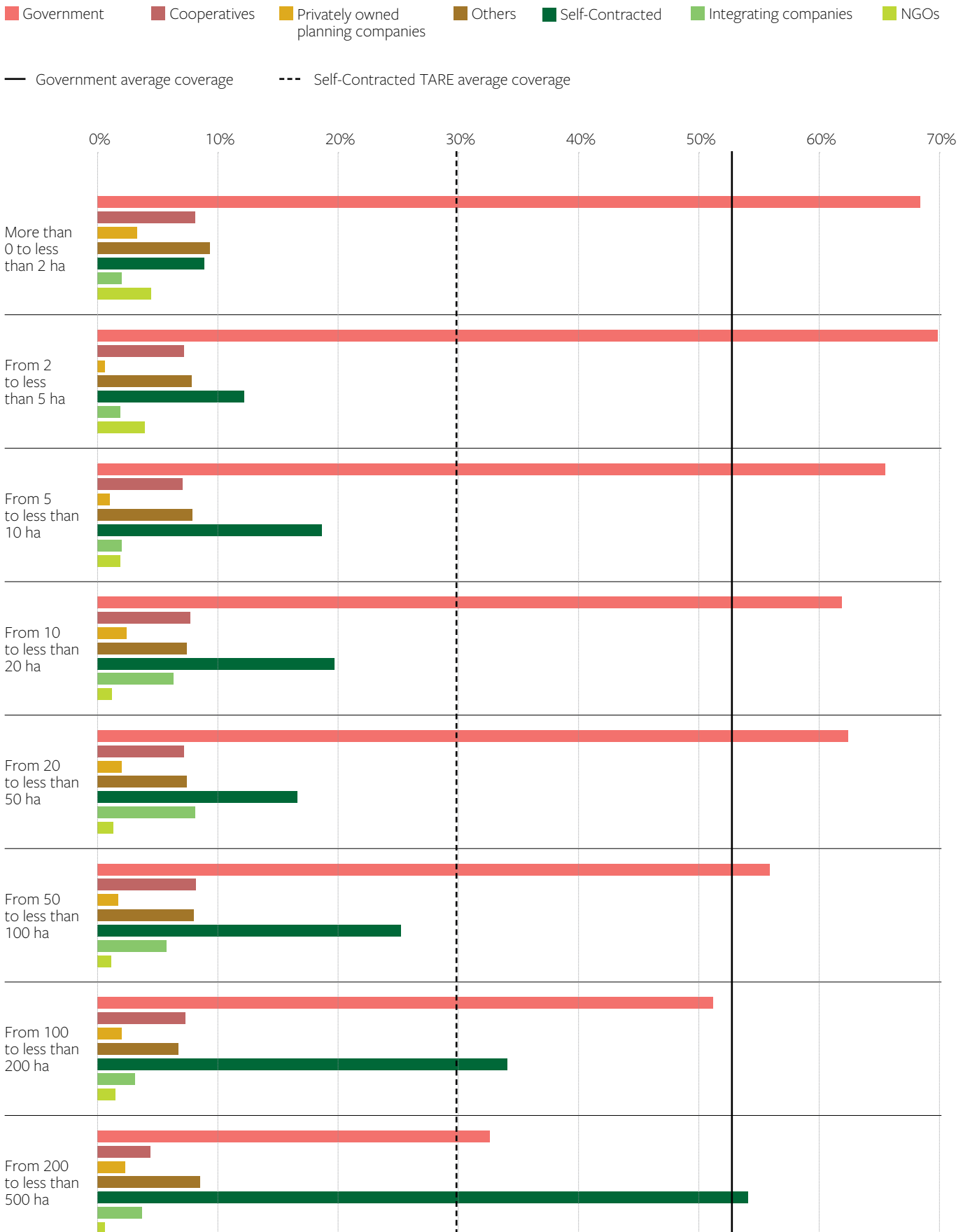
For example, even though government agents are the main TARE source for smallholder-farming establishments in the state (58%), they become less significant as the establishment grows (**Graph 10**). The opposite is observed in establishments that contract their own TARE provider, which becomes more relevant in larger establishments and even surpasses the public TARE service in establishments from 200 to 500 hectares.

Similarly, establishments with lower production values tend to depend more on government TARE systems, which work less with these establishments, while those with higher production values tend to hire their own TARE provider (**Graph 11**).

**However, using these premises prevents several establishments from being excluded from the analysis that obtain a relevant part of their income from social security benefits and that may not be classified as smallholder-farming establishments since the law also establishes that the farmer must have a minimum percentage of family income that originates from their establishment's or enterprise's economic activities to meet the requirement to be classified as a smallholder-farming establishment. Likewise, establishments with an area between 300 and 500 hectares were included, which would thus have an area greater than four fiscal modules and, therefore, would not be considered a smallholder-farming establishment.*

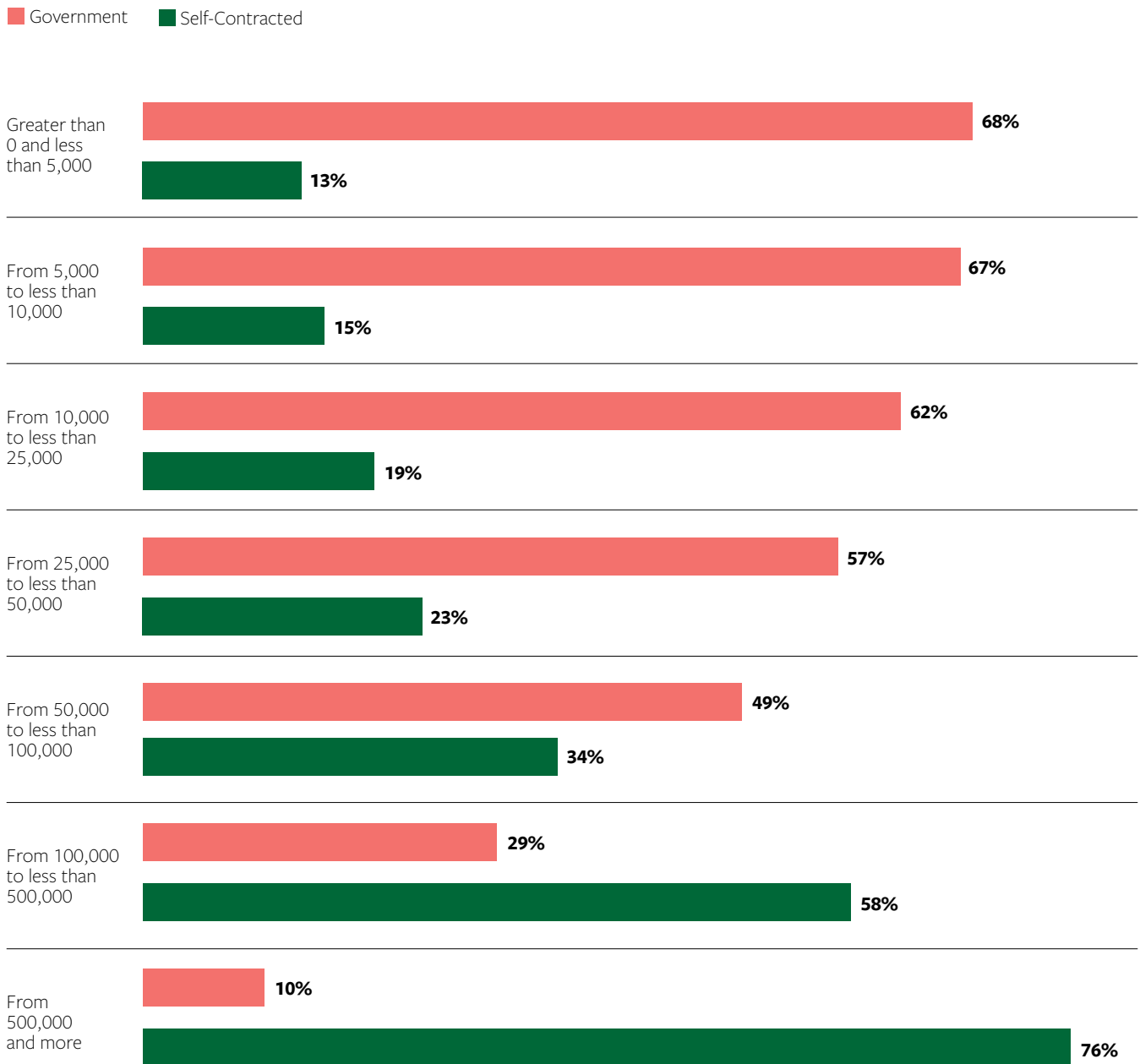
Graph 10.

TARE coverage from different sources by area classes of smallholder-farming establishments in Pará (2017)



Graph 11.

TARE coverage (governmental and self-contracted) by production value classes of agricultural establishments in Pará (2017)



Source: 2017 IBGE Agricultural Census - Table 6789, prepared by Solidaridad

This data suggests that farmers with larger areas and that are more capitalized recognize that TARE is important enough to improving their productivity and profitability that they will pay for it and no longer rely on an insufficient public service.

“Large producers often access private technical assistance. Small producers rely on public assistance, which is increasingly scarce.”

Rodrigo Castro, Solidaridad’s Country Manager of Brazil

4.

Filling the TARE void in the Amazon



The data shows disparities in TARE access and a coverage gap that has increased in recent years, especially regarding smallholder farming in the Amazon. It also demonstrates that, while smallholder farmers still depend on the public TARE system and are most often unassisted, larger and more capitalized establishments have recognized the importance of these services for improving their productivity and income and have filled this hole on their own by hiring private agents. Cooperatives could also increase their performance, especially in the Amazon, where they still have a nominal participation rate in supplying TARE services.

Using TARE to promote knowledge and foster access to technology is a powerful catalyst for transformations in the countryside. It can positively affect families and territories in the

productive, socioeconomic and environmental aspects, strengthen social organizations and improve cooperation between farmers. These are fundamental elements for rural development and establishing conditions for a sustainable and inclusive economy.

Despite past advances, the instabilities resulting from changes in government, public policies and increasingly reduced resources designated for TARE have offered unpromising prospects for smallholder farmers' access. This scenario makes it urgent to seek solutions to enable and leverage smallholder farmers' access to this service. More than that, it is necessary to foster facilitative environments to secure a sustainable availability and quality and reach an increasing number of families and introduce benefits on a territorial and regional scale.

With the absence of government, third-sector organizations such as Solidaridad have been providing TARE services to smallholder farmers and promoting their socioeconomic inclusion

“The Brazilian Amazon needs institutional arrangements that strengthen social organizations and, consequently, improve the region’s socioeconomic indicators.”

Mariana Pereira, Environment and Quality Manager at Solidaridad

With this in mind, **Solidaridad** developed an operating model focused on leveraging smallholder farmers’ access to the TARE service, which has been having good results and promising perspectives for expansion and replication.

4.1 TARE as a strategy for inclusive and sustainable territorial development

The operating model **Solidaridad** has developed aims to create an environment that favors the expansion and sustainability of TARE by constructing knowledge and giving autonomy to producers and local organizations. The approach was based on two elements:

- Investment in a free initial cycle of a quality, integrated TARE system;
- Incubation and institutional strengthening of local organizations (such as associations, cooperatives or even small companies and startups) so that they fully assume the service at the end of the model’s implementation cycle.

The proposed model was structured in a five-year cycle. The first three years of initial TARE activities are exclusively performed by the **Solidaridad team** and subsidized. They will foster a first-time service for producers, allowing them to experience the value and potential benefits it can bring to their property and living

conditions. Meanwhile, local organizations will be supported by an incubation process to strengthen their governance structure and trained and equipped to operate a high-quality TARE system with a systemic approach to ownership.

It is therefore expected that a positive experience with TARE will lead producers to realize the benefits of adopting good production practices and technical guidance. As such, the increased productivity and income from adopting better productive practices will make them willing and financially able to invest resources in contracting a TARE service from the fourth year onwards.

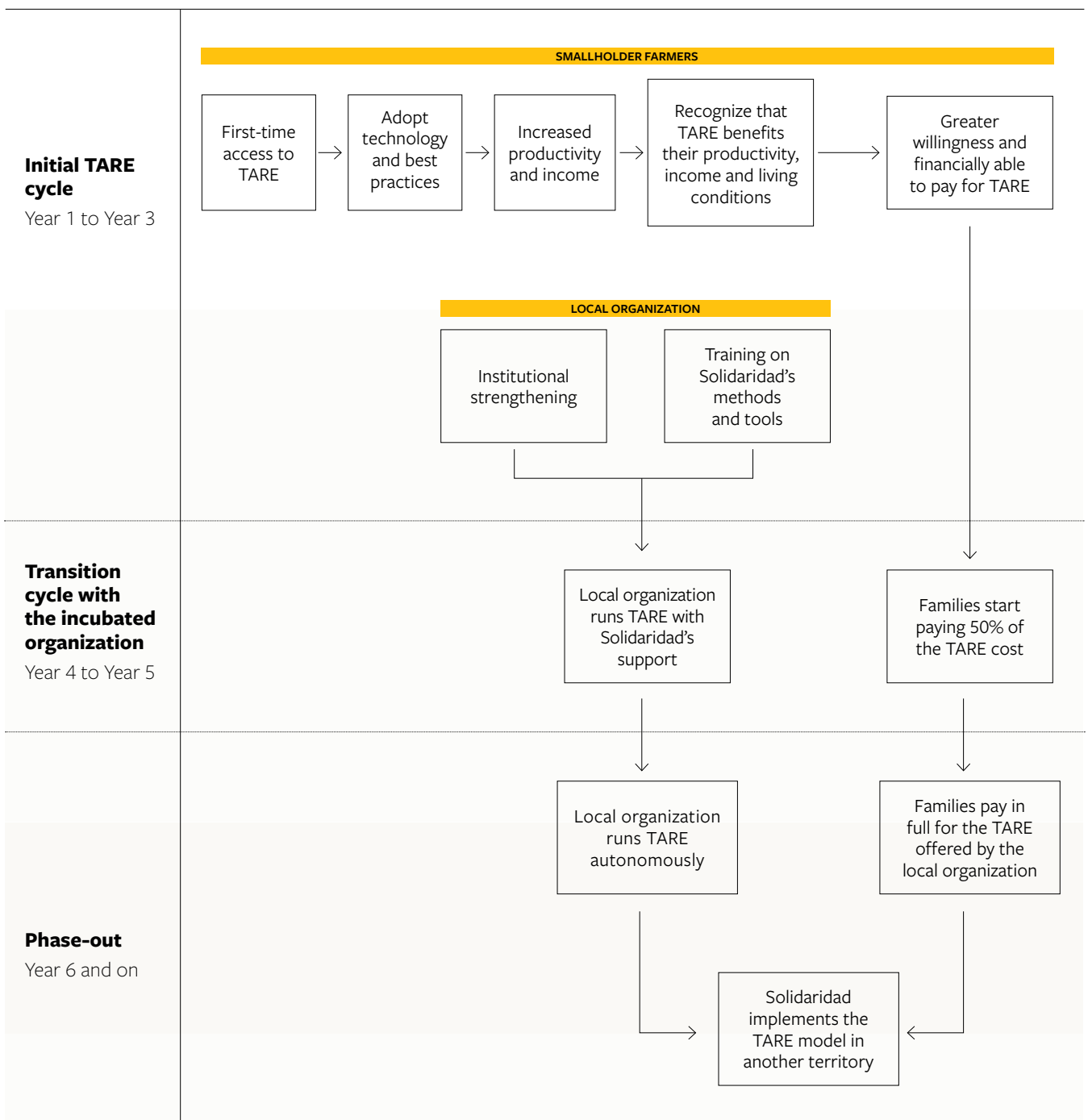
“It is important to put aside the idea that technical assistance should come second when considering agricultural production. Therefore, we must make everyone aware of the importance of investing in TARE.”

Ney Ralison, Vice President of COOPERCAU

Thus, after the initial free cycle, the TARE work is performed by the incubated local organization, and the producer gradually pays its cost. In the fourth year, the cost of TARE is shared between the smallholder farmers and **Solidaridad**, which offers a 50% subsidy, and in the fifth year, the producer starts to make the full payment. Continuous TARE service provision is expected to be financially and operationally viable at the end of five years, with autonomous and sustainable conditions. So, the role of **Solidaridad**—or of another institution that leads the implementation—will no longer be relevant. They will be able to leave the territory and replicate it in other regions and with other local organizations, expanding the smallholder farming’s access to TARE. **Figure 2** demonstrates the proposed model.

Figure 2.

Implementation cycle demo of Solidaridad’s proposed TARE model



4.1.1 The TARE service offered

The model's success primarily depends on improving the producer's productivity and income, leading to their recognition of the TARE benefits and, thus, stimulating their engagement and willingness to pay for it. **The quality of the TARE service provided in the initial years of**

the cycle is fundamental for the proposed model's viability and for strengthening the local organization to continue executing a quality service by using **Solidaridad's** methods and tools, even if they are adapted to the organization's profile and characteristics.

To achieve these objectives, the TARE programme was structured in four pillars (**Figure 3**).

Figure 3.

Pillars of the TARE service offered by Solidaridad



Individual technical visits

TARE technicians visit each assisted family's property four to eight times per year.



Collective training

Families participating in the TARE programme have access to collective training that complements the technical guidance provided in individual visits. They also have the opportunity to exchange experiences and knowledge between farmers and technicians about the proposed production practices.



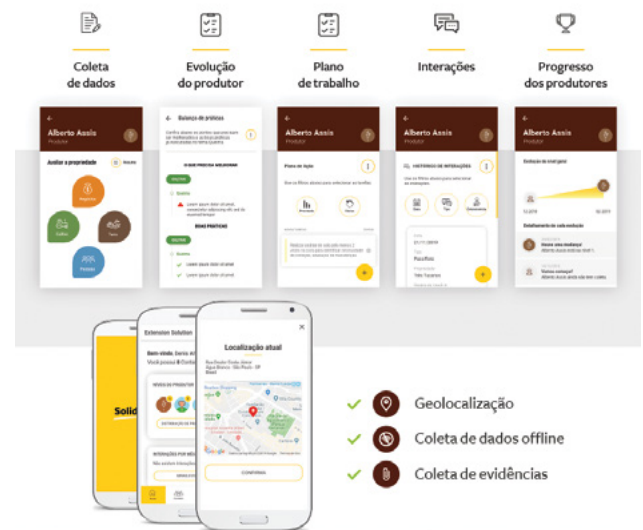
Demonstration Units (DUs)

These are areas within participating properties for testing the proposed practices and conducting collective training. The DUs aim to validate the technical team's proposed management practices, support the economic viability model of these activities and provide spaces for learning and disseminating good practices.



The use of digital tools

Solidaridad developed a digital tool to support TARE technicians: the Extension Solution. The app was developed to assist technicians in planning and managing the TARE programme and monitoring the results obtained by the assisted families.



Extension Solution app command screens

The TARE programme uses these pillars to provide ongoing improvement and continuous learning while considering the property's integrated perspective and appreciating the smallholder farmers' knowledge.



Solidaridad's TARE model provides individual technical visits and the use of digital tools

4.1.2 TARE's effects on household income

Since the success of the proposed business model depended on an increased income from adopting the practices proposed within the TARE programme, the model's economic viability was analyzed against the participating properties' average initial situation in terms of land use and increased productivity and income.

The analysis was based on two scenarios of adopting good practices

and technology (Improved Scenario and Intensely Improved Scenario), which were compared with the properties' initial scenarios before participating in the TARE programme (Baseline). The average smallholder-farmer land use was considered: a 50-hectare plot, 21 hectares for livestock, five for cocoa and 24 are kept with native forest. **Figure 5** describes the technology adoption stages in each of the outlined scenarios.

Figure 5.

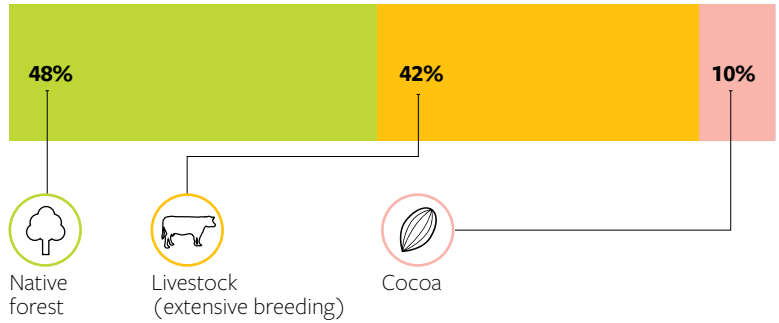
Economic feasibility model scenarios

SCENARIOS

LAND USE

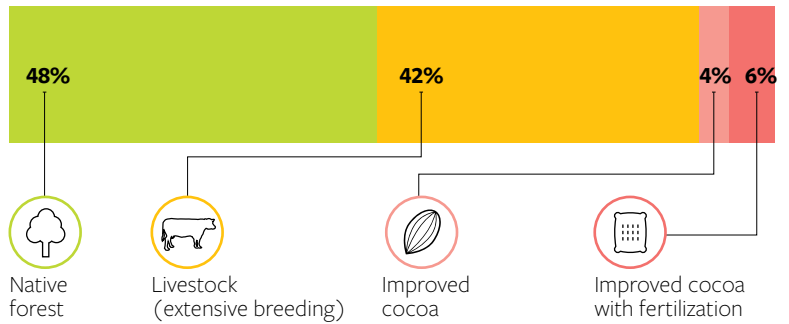
Baseline

The baseline represents the scenario before beginning the programme and its practices—pruning, monitoring and controlling pests and diseases, managing soil fertility on the cocoa plantation, and extensive cattle ranching in the property’s entire pasture area.



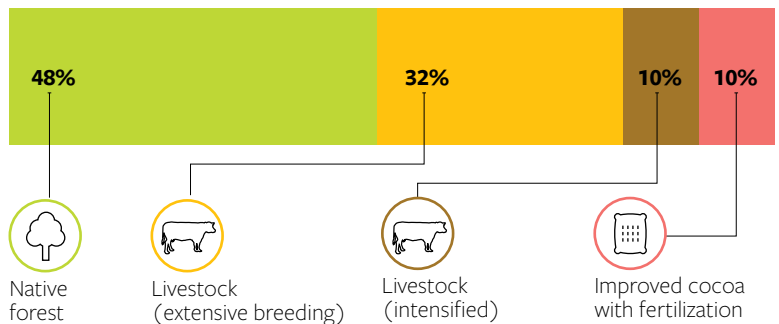
Improved Scenario

The Improved Scenario involves soil nutritional management (fertilization) on 3 hectares of agroforestry system with cocoa and adopting pruning practices and sanitary control in its entirety (5 hectares). This scenario does not include practices for intensifying livestock production, which is more expensive. Therefore, 21 hectares of the property was considered for extensive cattle ranching.



Intensely Improved Scenario

The Intensely Improved Scenario involves adopting pruning practices, pest and disease control and soil fertility management in the entire cocoa area (5 hectares). It also includes intensified livestock production with rotational grazing in five of the 21 hectares of pasture.











The costs of adopting the practices, productivity and profitability gains of the different production models in the participating properties and in the DUs, and the average prices paid for cocoa and cattle to the producer in the region

were used to calculate the total income increase for each of the proposed scenarios. **Figure 6** shows the expected revenues for each scenario and the annual income increase from adopting the proposed practices.

Figure 6.

Land use, productivity and revenues in the proposed model's three scenarios and the TARE service costs

	Baseline		Improved Scenario			Intensely Improved Scenario		
Land use	 Extensive livestock	 Cocoa	 Extensive livestock	 Improved cocoa	 Improved cocoa with fertilization	 Extensive livestock	 Improved cocoa with fertilization	 Rotational Grazing
Area (ha)	21	5	21	2	3	16	5	5
Productivity (kg cocoa/ha/year) or (@/ha/year)	5	700	5	800	1,100	5	1,100	15
Annual net revenue	R\$ 18,091.50	R\$ 26,835.00	R\$ 18,091.50	R\$ 12,130.42	R\$ 27,084.00	R\$ 13,784.00	R\$ 45,140.00	R\$ 16,592.50
Total annual net revenue	R\$ 44,926.50		R\$ 57,305.92			R\$ 75,516.50		
Increase in income with the adoption of technology and good practices disseminated by TARE	R\$ -		R\$ 12,379.42			R\$ 30,590.00		
Annual TARE cost	R\$ -		R\$ 3.500,00			R\$ 3.500,00		
Annual net revenue (the TARE service payment was debited)	R\$ 44.926,50		R\$ 53.805,42			R\$ 72.016,50		
Monthly income	R\$ 3,743.88		R\$ 4,775.49			R\$ 6,293.04		
Monthly cost of TARE	R\$ -		R\$ 291.66			R\$ 291.66		
Monthly income with TARE payment	R\$ -		R\$ 4,483.83			R\$ 6,001.38		



The numbers show that Solidaridad's TARE model increased more income than its cost, proving its economic viability

These results show that the **annual income increase is significantly higher than the estimated annual TARE cost per family**. While the increased income is almost four times the cost of TARE in the Improved Scenario, it is more than nine times that value in the Intensely Improved Scenario. **Each 1 real the family invests in the TARE service will generate a return of 4 reais in the Improved Scenario and more than 9 reais in the Intensely Improved Scenario.** Furthermore, the TARE cost is hardly significant to the

producer's final income after adopting cocoa management practices and the intensification of livestock production on a portion of the property.

The cost of the TARE service in the economic feasibility model was estimated based on the expenses for personnel and logistics for developing the activities and tools of **Solidaridad's** proposed method, with a TARE model that provides eight annual technical visits to each smallholder farmer, collective training and the implementation of DUs. **This cost was estimated at 3,500.00 reais per producer per year in 2022.**

4.2 Case Study: Leveraging access to TARE in the town of Novo Repartimento (PA), partnered with COOPERCAU

In 2016, as part of the Amazon Programme, **Solidaridad** started implementing activities proposed in the initiative's strategic design in the southeastern town of Novo Repartimento in Pará on the shoulders of the Trans-Amazonian Highway (BR-230)—among the highest deforestation rates in Brazil. The programme aims to promote sustainable and low-carbon agriculture for smallholder farmers in the region through efficient land use, practices that foster the mitigation of greenhouse gases and climate adaptation, and strengthening of the territory's environmental governance. The initiative was structured around three areas of work: Productive and Financial Management, Marketing and Environmental Governance. The TARE model was applied in the first axis, considering the following:

- i) **Solidaridad's** offer of an initial free TARE cycle to the families of the Tuerê settlement and
- ii) the incubation of COOPERCAU.

i) Free TARE service

As of 2016, **Solidaridad** structured and started offering a free TARE service to a group of 50 families in the Tuerê settlement. Founded in the 1980s, Tuerê occupies more than 200,000 hectares in the rural area of Novo Repartimento. It is home to about 3,000 families and is an example of the migratory process and disorderly occupation of the Amazon Forest. As with most of the region's smallholder farmers, Tuerê producers are not served by public TARE policies.

Considering the economic

“When we arrived at Novo Repartimento, we found producers eager to work but lacking technical assistance. Although they had very good support from the Executive Committee of the Cocoa Plantation Plan (Comissão Executiva do Plano da Lavoura Cacaueira – CEPLAC) in the early 2000s, they no longer applied even the basics of good practices in cocoa production.”

Paulo Lima, Manager of Solidaridad's Cocoa and Livestock Programmes

activities predominant in the region and among the settlement families, the TARE programme focused mainly on cocoa production and cattle ranching. In cocoa cultivation, technicians' work focused on the adoption of management practices—formation pruning, sanitary control and soil nutritional management—fundamental for increasing productivity on the properties, as well as post-harvest practices (fermentation and drying) and marketing support to attain better prices and access to new markets. Regarding livestock, efforts focused on good pasture management, restoration or recovery of degraded pastures and sustainable intensification of production through the Rotational Grazing System (RGS). Activities aimed at environmental regularization and forest restoration with Agroforestry Systems (AFSs) were also developed and stimulated the property's productive diversification.

In addition to being guided by dialogue and knowledge construction based on local knowledge, the implemented TARE model was based on gender equality, considered fundamental for sustainable development in the production chains in which **Solidaridad** operates. Therefore, a study was conducted to understand the

women's roles, requests, and challenges in the territory. Then, an attempt was made to encourage the inclusion of women in the TARE strategy through approaches and formats that fostered and enabled them to participate in activities—from training technicians and adjusting meeting times to extending invitations to other family members.

ii) Incubation and strengthening of COOPERCAU

Given its history and presence in the territory, COOPERCAU has been considered a key partner for the initiative's success ever since the Amazon Programme was conceived and **Solidaridad** began working in the region. COOPERCAU was created in 2002 in Novo Repartimento. Through contracts with the (now-extinct) MDA, it was the executing entity of PNATER from 2010 to 2016. With PNATER's budget cuts and contract suspensions in 2016, the service was suspended, and its TARE team—which served four thousand families—was demobilized. In recent years, the cooperative's activity has focused mainly on marketing the cocoa from the region's producers.

Solidaridad put COOPERCAU through a period of incubation and organizational development to strengthen it to resume its role as a TARE agent, this time paid by the smallholder farmers in an arrangement independent of the public TARE system.

The partnership between Solidaridad and COOPERCAU enabled producers to develop more technically and provide guidance for their business model

“We have been Solidaridad’s partners since we arrived in the municipality. We have joined forces to make our producers achieve better crop yields and production system results.”

Antônio Queiroz, President of COOPERCAU

That process included several joint activities, such as workshops to identify the institution's potential and maturity level, as well as coordinating partnerships to enter new markets, supplying inputs and organizationally restructuring the cooperative. This partnership aimed to reformulate COOPERCAU's governance system and business model to meet its needs and expectations. **Solidaridad** received support from Conexus to help with this organizational structuring.



“We co-built the new business model with Solidaridad using the foundation they set. They develop more clarity on where they are, where they want to go, and what parts they need to work on to get there.”

Cecília Simões, Conexsus Project Manager

These efforts have already helped the cooperative and its members perform better. They made investments in the verticalization of production, accessed new markets, and standardized the cooperative’s legal and accounting practices. Processing and marketing cocoa by-products (cocoa powder and nibs) on an online platform is an example of

this. The programme also trained 91 technicians from COOPERCAU and the region as part of structuring the institutional environment needed to perpetuate the proposed TARE model.

“Creating this favorable environment for strengthening the local technical assistance service also ensures that this model becomes autonomous and can be replicated by technical assistance agencies and cooperatives after Solidaridad leaves the territory.”

Paulo Lima, Manager of Solidaridad’s Cocoa and Livestock Programmes



4.2.1 Empowering smallholder farmers with technical knowledge and engagement in the environmental cause: Results from being in the TARE programme

Since its 2016 inception, the proposed TARE model has brought promising productive, economic and socio-environmental results, demonstrating its potential to gain scale and be replicated in other territories.

The Amazon Programme currently serves 880 smallholder farmers and has achieved significantly increased productivity on its properties due to adopting cocoa crop management practices—pruning, pest control and soil fertility management—and surpassing 1,000 kg/ha of cocoa. The livestock intensification increased breeding productivity by 20%, reaching 225 kgs per hectare/year (fattening activity) in intensification areas with an RGS.

This increase in productivity is reflected in a higher income increase than TARE's cost, demonstrating the proposed model's cost-effectiveness.

“We had many doubts but no one to clarify them. When you follow the guidelines and know how to handle cocoa correctly, you work much less and increase your production.”

Lucileide Braga, smallholder farmer

“We used to raise a lot of cattle in a very large area, and now we have the same amount in a small area. Now, one person can handle the herd with no difficulty. And that also improved income.”

Ananias Oliveira, smallholder farmer

Based on the average productivity increases among the properties participating in the cocoa plantation (which was 288 kg/ha between 2016 and 2020) and the cattle breeding (which went from 18 calves/property/year to 22 in the same period) (**Figure 3**), **an average income increase was estimated at 24,990 reais per property per year**, while the annual TARE cost for the same period, was estimated at 2,228.48 reais.









Considering the average income increase and TARE cost, the rate of return on a TARE investment was 1,121%. **In other words, each 1 real that Solidaridad invested in TARE promoted a return of 11.21 reais in gross income for the producer.**

This data shows that the increase in income promoted by adopting the TARE service, even if it had been paid by the farmers, would be enough to cover its cost.

In addition to the positive impact on productivity and income, the programme also reduced deforestation on the involved properties. **Figure 6** presents the productivity, income and emissions indices before the programme started in 2016, and in its fourth year of implementation, in 2020:

Figure 6.

Results of the TARE model in Novo Repartimento (PA)

	2016 (Baseline)	2020	Variation
 Average cocoa yield	720 kg/ha	1,008 kg/ha	↑ 40%
 Average gross income of the cocoa plantation (R\$/ha)	R\$ 8,136	R\$ 11,390	↑ 40%
 Average productivity of cattle breeding	18 calves/property/year	22 calves/property/year	↑ 22.2%
 Average gross income from livestock (per property)	R\$ 38,880	R\$ 47,520	↑ 22.2%
 Total average gross income (livestock + cocoa)	R\$ 79,480	R\$ 104,470	↑ 31.4%
 Deforestation rate	15.4%	3.5%	↓ 77%
 Number of properties with deforestation	47	12	↓ 74%
 Total deforested area (hectares)	195.18	70.73	↓ 64%

In addition to these significant results, the TARE service has also positively affected the quality of the cocoa beans, enabling producers to access new markets, such as fine and bean-to-bar chocolates. Chocolates produced with cocoa beans from the smallholder farmers in the project have gained prominence and received national and international awards. This recognition empowers the producers more and further encourages the adoption of good practices

“The continuous and quality technical assistance fostered by Solidaridad in the Tuerê settlement has very positively affected the production practices and developed excellent physical and sensory characteristics for these producers’ cocoa. These qualities are essential for marketing the cocoa beans as fine cocoa.”

Bruno Lasevicius, owner of the Casa Lasevicius Chocolate Shop and Chairman of Bean To Bar Brasil Association



The quality of the cocoa produced has drawn the attention of the fine chocolate market, whose bars produced with Tuerê cocoa beans have been awarded in contests

4.2.2 Model permanence: After TARE's free cycle

As previously described, the proposed business model aims to build a favorable environment for establishing and maintaining an autonomous local TARE arrangement that is operated by the incubated organization and enables **Solidaridad** to gradually step out.

The TARE model in the Tuerê settlement entered its fifth year of implementation at the end of 2021. From then on, as expected, COOPERCAU fully assumed the TARE activities for the initial group of 50 smallholder farmers in the programme, who began paying the cooperative for their service. Payment was made with cocoa beans, a possibility that facilitated the smallholder farmers' perspective of funding.

In view of this transition phase, and considering the TARE service's operational cost and the estimated cost per technical visit, **Solidaridad** helped COOPERCAU strengthen its business model with the provision of TARE services, develop a pricing policy for the service and run a communication campaign with producers.

The pricing policy was based on three criteria:



Type of producer served and their link with the cooperative:

cooperator, in transition (non-cooperator who has formally expressed an intention to become a cooperative member) and non-cooperator.



Producer loyalty level: the volume of cocoa sold through the cooperative.



The producer chose the frequency of technical visits:

eight, six, or four per year.

The first two criteria define discount ranges, which grow as the producer's link with and loyalty to the cooperative increases. The per-visit charge is determined from these ranges, which then defines the final price of the TARE service based on the frequency of visits.

Although the smallholder farmers were engaged in the programme and obtained positive results because they adopted TARE-stimulated practices, an intensely coordinated collection plan had to be implemented for them since they had only used free TARE services until then. The objective was to demonstrate the positive and potential results in productivity and income and the cost-effectiveness of paying for the service. This engagement process involved **Solidaridad** hiring a support company that focused on communicating with families about the results and financial benefits of participating in a paid TARE programme (**Figure 7**).

“We know how much it costs the producer to have a minimum number of individual technical visits and participate in collective training. We also saw how that increased their productivity and how much that increased income and improved their living conditions. Thus, we raised awareness on the financial issue and the importance of paying for the service and strengthening the cooperative.”

Paulo Lima, Manager of Solidaridad's Cocoa and Livestock Programmes

Figure 7.

Communication pieces used to publicize the TARE of a structured COOPERCAU in the incubation process



4.3 Replication

The Novo Repartimento producers' results demonstrate TARE's real-life positive effects on smallholder farmers' livelihoods. Considering that the average cocoa plantation productivity in several Trans-Amazonian municipalities is less than 800 kg/hectare/year and the participating properties' and DUs' increases have topped 1,100 kg/hectare/year, having TARE access is a great opportunity for cocoa producers to gain productivity and income. The same occurred with the intensification of livestock, which has tripled the productivity of beef cattle by employing RGS and increased the breeding activity by 22%.

In addition to the results obtained in the field, the Amazon Programme also demonstrated the proposed model's potential for leveraging smallholder farmers' access to TARE in Pará and in the Amazon by improving productive and financial conditions and the quality of life of historically underserved

communities. In this sense, we hope this experience can assist other organizations in implementing similar arrangements focused on the sustainable rural development of Amazonian communities.

“We are proposing this model as a package that can be applied in other municipalities, as long as it is coordinated with local actors that have a socioeconomic and environmental impact in the region.”

Joyce Brandão, PhD student at ETHZ Zurich and former Agriculture and Conservation Manager at Solidaridad

This first experiment's success in Novo Repartimento enabled the Amazon Programme to gain scale and thus include an even larger territory. The RestaurAmazônia Project began in June 2021. It is supported by the JBS Fund for the Amazon and the Elanco Foundation and will benefit 1,500 smallholder farmers in the transition to sustainable management in the towns of Novo Repartimento, Pacajá and Anapu, covering about 75,000 hectares.

5.

Final considerations



Brazil's history of TARE initiatives and policies reveals that they have been and are quite subject to changes in government and changes in institutional and budgetary arrangements. The comings and goings of prevailing approaches in each period or governmental administration and the unstable nature of TARE policy—which sometimes made advances and achievements and other times lost ground and priority on the governmental agenda—continue putting up obstacles for the technical and social development of smallholder farming, which has been on the sidelines of this system for quite some time, primarily in the Amazon. The recent abandonment of the TARE system because of budget cuts and operational stoppages hinders the overcoming of the decades-old challenges: the services' continuous nature and the need for a creative institutional arrangement that addresses the public

TARE system's challenges and its funding.

There is an undeniable, substantial need to establish a quality TARE service that is public, universal, and free, as proposed by PNATER, primarily for smallholder farmers. However, smallholder farmers cannot and should not remain hostages to this system, which has long neglected them. Private and civil society organizations have a great opportunity in this situation to leverage smallholder farmers' access to TARE and provide (in the short term) better production and living conditions for those who make up the largest portion of farmers in Brazil.

The incubation of local organizations to provide this service is also more than a means to leverage a continuous and quality TARE service and improve farmers' production and living conditions. The possibility of institutional and collective strengthening can positively affect farmers and territories in many other ways.

TARE access is a premise for smallholder farmers to attain better production and living conditions

References

- Almeida, E.N.; Brienza Junior, S.; Ximenes, T.; Poça, R. R. O Modelo de Assistência Técnica e Extensão Rural do PROAMBIENTE: uma inovação na agroecologia. In: 55º Congresso da Sociedade Brasileira de Economia, Administração e Sociologia Rural. Santa Maria/RS, 2017. Available at: <<https://ainfo.cnpia.embrapa.br/digital/bitstream/item/163061/1/7609.pdf>>.
- Alves, N.B.C. Entre ausências e emergências: uma extensão rural pública ou privada? Tese (Doutorado em Extensão Rural). Universidade Federal de Santa Maria, 2008.
- ASBRAER. Indicadores: rede oficial de ATER. Available at: <<http://www.asbraer.org.br/index.php/ind-23>>. Accessed on 02 Sep 2021.
- Atlas do Desenvolvimento Humano no Brasil. PNUD Brasil, Ipea e FJP, 2020. Available at <<http://www.atlasbrasil.org.br/ranking>>.
- BECKER, B. K. Revisão das políticas de ocupação da Amazônia: é possível identificar modelos para projetar cenários? *Parcerias Estratégicas*, n. 12, p. 135-159, 2001.
- BECKER, B. K. Amazônia: desenvolvimento e soberania. In: REZENDE, F.; TAFNER, P. (Eds.). *Brasil: o estado de uma nação*. Rio de Janeiro: IPEA, 2005a, p. 53-66.
- BECKER, B. K. Não basta preservar a floresta. *Desafios do Desenvolvimento*, ano 2, edição 11, 2005b.
- Bergamasco, S.M.P.P.; Thomson, C.R.; Borsatto, R.S. Da extinção da Embrater à criação da Anater: os desafios da política de assistência técnica e extensão rural brasileira. In: Delgado, G.C. Bergamasco, S.M.P.P. (Orgs.). *Agricultura familiar brasileira: desafios e perspectivas de futuro*. Brasília: Ministério do Desenvolvimento Agrário, 2017.
- BRASIL. Lei nº 12.188, de 11 de janeiro de 2010. Institui a Política Nacional de Assistência Técnica e Extensão Rural para a Agricultura Familiar e Reforma Agrária - PNATER e o Programa Nacional de Assistência Técnica e Extensão Rural na Agricultura Familiar e na Reforma Agrária - PRONATER, altera a Lei no 8.666, de 21 de junho de 1993, e dá outras providências. Available at: <http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Lei/L12188.htm>.
- BOITO, A.; BERRINGER, T. Social classes, neodevelopmentalism, and Brazilian foreign policy under Presidents Lula and Dilma. *Latin American Perspectives*, v. 41, n. 5, p. 94-109, 2014.
- Bordenave, J. D. O que é comunicação rural. 2 ed. São Paulo: Brasiliense, 1985. 104p.
- Butto, A.; Hora, K.. ATER para Mulheres - a experiência recente do governo federal. In: *Cadernos Feministas de Economia & Política*. Recife: Casa da Mulher do Nordeste, n.4, 2008 - Semestral.
- Caporal, F.R. Extensão Rural e Agroecologia: temas sobre um novo desenvolvimento rural, necessário e possível / coordenado por Francisco Roberto Caporal. - Brasília: 2009. 398p. Available at: <<https://www.dropbox.com/s/n3b7ogczl9dqxd5/Extens%C3%A3o%20Rural%20e%20Agroecologia%20-%20temas%20sobre%20um%20novo%20desenvolvimetno%20rural.pdf>>.
- Delgado, G.C. Do capital financeiro na agricultura à economia do agronegócio. Porto Alegre: Editora UFRGS, 2012.
- Dias, M.M. As mudanças de direcionamento da Política Nacional de Assistência Técnica e Extensão Rural (PNATER) face ao difusionismo. *Revista Oikos*, 18(2), 11-21, 2007.
- Diniz, R. F. ; Hespanhol, A.N. Reestruturação, reorientação e renovação do serviço extensionista no Brasil: a (difícil) implementação da Política Nacional de Assistência Técnica e Extensão Rural (PNATER). *Extensão Rural, DEAR - CCR - UFSM, Santa Maria*, v.25, n.2, abr./jun. 2018.


- Freire, P. Extensão ou comunicação? 7ª ed. Rio de Janeiro, Paz e Terra, 1983. 93 p (O Mundo, Hoje, v. 24).
- HIRATA, M. F. Proambiente: um programa inovador de desenvolvimento rural. *Agriculturas*, v. 3, n. 1, p. 15-17, 2006.
- IBGE - INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA. Censo Agropecuário 2006. Rio de Janeiro: IBGE, 2007. Available at: <<https://sidra.ibge.gov.br/pesquisa/censo-agropecuario/censo-agropecuario-2006/segunda-apuracao>>.
- IBGE - INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA. Censo Agropecuário 2017. Rio de Janeiro: IBGE, 2018a. Available at: <<https://sidra.ibge.gov.br/pesquisa/censo-agropecuario/censo-agropecuario-2017>>.
- IBGE - INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA. Limite estadual e municipal IBGE. 2018b no prelo. bit.ly/2OoXqH4.
- IBGE - INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA. População residente estimada: Estimativas de População - EstimaPop. 2020a no prelo. bit.ly/2R4jaJe. IBGE.
- IBGE - INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA. Pesquisa Agrícola Municipal (PAM). 2020b no prelo. bit.ly/3rVOjLV.
- IBGE - INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA. Pesquisa Pecuária Municipal (PPM). 2020c no prelo. bit.ly/3fRzvLJ.
- Leite, A.Z.; Freddi, S.M. Desafios para a política de implementação de assentamentos e caminhos trilhados pelo serviço de ATES. *Revista de Políticas Públicas*, 22(e), 1115-1134, 2018.
- Montardo, O.V. Mas afinal... o que é extensão rural? Bebedouro, Scot Consultoria, 27 de nov. de 2005. Available at: <<https://www.scotconsultoria.com.br/noticias/artigos/21318/>>.
- Peixoto, M. Extensão rural no Brasil - uma abordagem histórica da legislação. Textos para discussão, 48, 2008. Available at: <<https://www12.senado.leg.br/publicacoes/estudos-legislativos/tipos-de-estudos/textos-para-discussao/td-48-extensao-rural-no-brasil-uma-abordagem-historica-da-legislacao>>.
- Petarly, R.R. Assistência Técnica e Extensão Rural para quê? O caso da Cooperativa Agropecuária de Patrocínio. Dissertação (Mestrado em Extensão Rural). Universidade Federal de Viçosa, 2013. Available at: <<https://www.locus.ufv.br/bitstream/123456789/4189/1/texto%20completo.pdf>>.
- PROAMBIENTE. Proposta definitiva da sociedade civil organizada entregue ao Governo Federal. Brasília: PROAMBIENTE. 2003, 32p.
- Quidá, M.M. Cabral Filho, A.V. A difusão tecnológica como instrumento de poder no agronegócio brasileiro. In: XVI Congresso Internacional FoMerco. Salvador/BA, 2017.
- Ribeiro, E.C.B.; Moreira, A.C.; Ferreira, L.M.D.F.; César, A.S. Análise dos fatores motivadores, facilitadores e inibidores no relacionamento fornecedor/cliente na cadeia de suprimentos do biodiesel no Brasil. In: LIV Congresso da Sociedade Brasileira de Economia, Administração e Sociologia Rural. Maceió/AL, 2016.
- Rodrigues, C.M. Conceito de seletividade de políticas públicas e sua aplicação no contexto da política de extensão rural no Brasil. *Cadernos de Ciência & Tecnologia*, 14(1), 113-154, 1997.
- Santos, D.; Salomão, R.; Veríssimo, A. Fatos da Amazônia 2021. Amazônia 2030. Centro de Empreendedorismo da Amazônia, Imazon. Março, 2021. 86p. Available at: <<https://amazonia2030.org.br/wp-content/uploads/2021/04/AMZ2030-Fatos-da-Amazonia-2021-3.pdf>>.
- SIOP - Sistema Integrado de Planejamento e Orçamento. 2020. Available at: <https://www1.siop.planejamento.gov.br/QvAJAXZfc/opensoc.htm?document=IAS%2FExecucao_Orcamentaria.qvw&host=QVS%40pqlko4&anonymous=true&sheet=SHO6>.
- Zanetti, A.V. Dalbianco, V.P.; Neumann, P.S.; Fialho, M.A.V. Avanços e retrocessos na política de extensão rural brasileira: análise crítica sobre a ANATER. *Rev. Fac. Agron. La Plata*, 116(e), 107-119, 2017.

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