



AUGUST / 2023

TECHNICAL ASSISTANCE FOR THE BIOECONOMY IN THE AMAZON:

from challenges to solution

INSTITUTO
ESCOLHAS



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1. Introduction



In this paper, **bioeconomy** refers to economic activities that encompass all biodiversity value chains, driven by traditional knowledge, science and the search for innovation in the use of biological and renewable resources. The bioeconomy aims at generating circular, regenerative, sustainable, and inclusive economic activity, with collective and local benefits. The following are examples of bioeconomy:

- Activities that carry out sustainable forest management to extract products such as nuts, fruits, rubber, oils, wood, fish, fibers and medicinal plants; and the industries that process these products (food, beverages, cosmetics, pharmaceuticals, fashion, construction).
- Sustainable agriculture, fish farming and tourism, environmental services, research and education for the development of the bioeconomy in the region.

The offer of qualified technical assistance¹ directed to the producers' demands is one of the main bottlenecks for the consolidation of productive chains, the transition to production systems that promote the conservation and regeneration of ecosystems, social inclusion, and the fight against poverty in rural areas.

This document will provide information on how technical assistance services are offered today to producers of açaí (*euterpe oleracea*), crabwood (andiroba, *carapa guianensis*), cocoa (*theobroma cacao*), Brazil nuts (*bertholletia excelsa*), and pirarucu fish (*arapaima giga*) in specific territories in the Amazon. Successful and innovative experiences have paved the way for years for the employment of technical assistance in that territory². However, we will review the gaps and bottlenecks that must be discussed so that technical assistance can fulfil its role as a structuring element of a strong bioeconomy in the Amazon, capable of generating jobs and income for the local population by keeping the forest alive and thriving.

¹ According to Law No. 12188/2010, Technical Assistance and Rural Development (ATER in Portuguese) is defined as a non-formal, continuous education service in rural areas, which promotes management, production, processing and commercialization processes of activities and agricultural and non-agricultural services, including agricultural extractive, forestry and artisanal activities.

² Examples include the Associação dos Produtores de Carauari (Carauari Producers Association, ASPROC), founded thirty years ago, and the Instituto Conexões Sustentáveis (Sustainable Connections Institute, Conexsus).

According to our collected information, the fragmentation of actions is central to this debate. In the açai chain, for example, the Study acknowledged a set of organizations that offer technical assistance services for managing açai groves. However, the Study did not identify any organization that offered it aimed at workers' protection equipment or even the financial management of enterprises in the studied territories.

Likely, the scenario is not very different in the rest of the country, with the aggravating factor that, in the Amazon, the specific demands of non-timber forestry production still revolve around products that are not well-established in the market in a region with massive logistical challenges and without access to appropriate production techniques to boost their production chains.

Therefore, only State action can provide the necessary coordination to optimize and expand the use of financial and human resources and the knowledge accrued about technical assistance in the Amazon, ensuring the productive inclusion of local populations. The following pages will also provide suggestions on how this can be achieved.

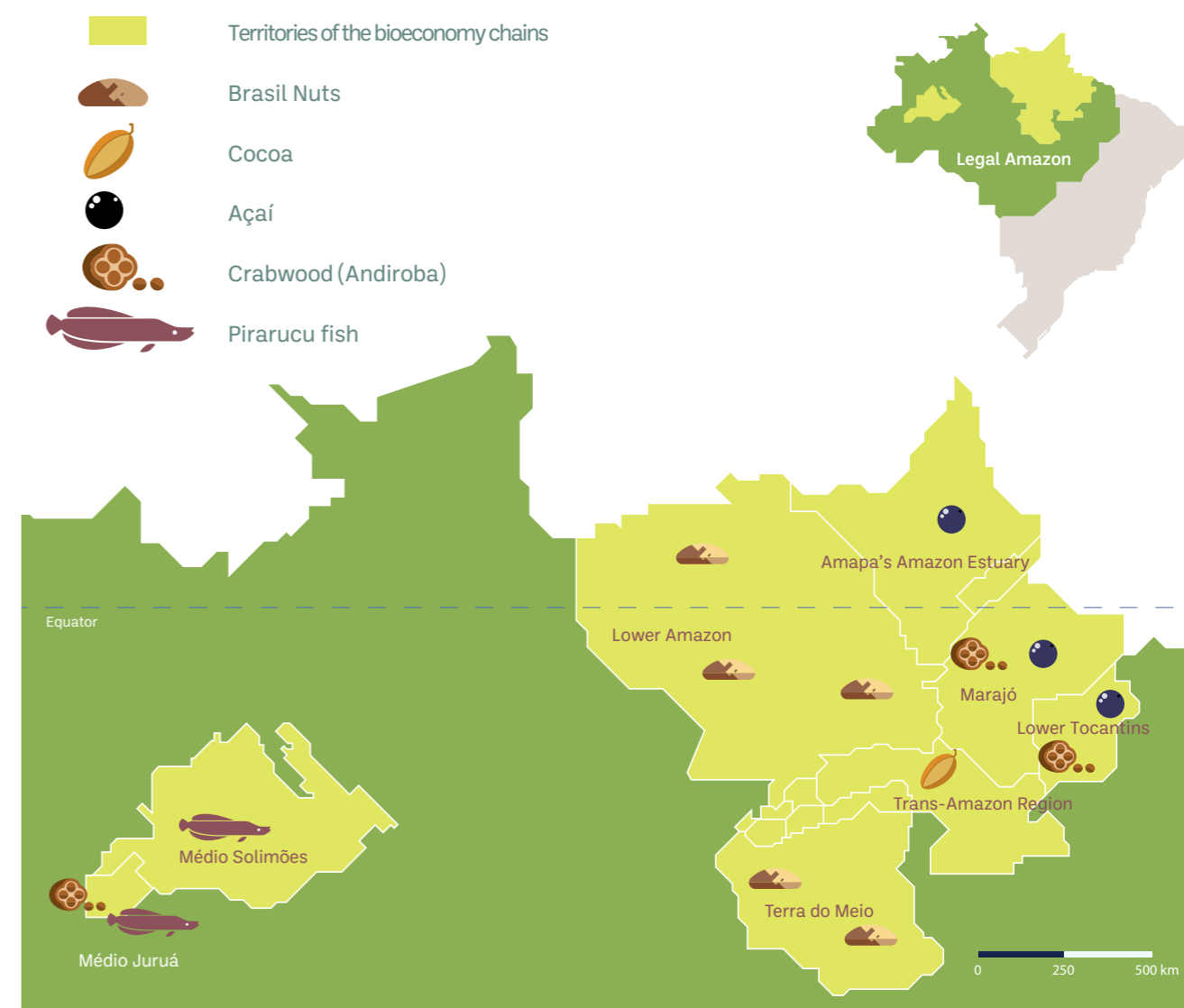


Photo: Ag. Pará

Territories and production chains covered in the Study

The Study worked with ancillary data and collected primary data on supply and demand for technical assistance for the existing bioeconomy in the region, focusing on five non-timber forest products from eight territories in the Amazon (Refer to Map 1).

Map 1 – Territorial section of the Study focused on collecting data on technical assistance demand and supply for producing crabwood (andiroba), açai, Brazil nuts, cocoa, and pirarucu fish.



Altogether, 141 people participated in the Study, whether they were technical assistance applicants (individual producers or enterprise people) or providers (representatives of entities that offer the technical assistance services) operating in the following territories and municipalities:



Lower Amazon (PA): production of Brazil nuts in the municipalities of Oriximiná, Alenquer, and Óbidos.



Lower Tocantins (PA): production of crabwood (andiroba) in the municipalities of Cametá, Barcarena, Mocajuba, and Abaetetuba and production of açai in the municipalities of Igarapé-Miri and Cametá.



Amapá's Amazon Estuary (AP): production of açai in the municipalities of Macapá, including the Bailique archipelago and Santana.



Marajó (PA): production of açai in the municipalities of Afuá, Currealinho, and Portel and production of crabwood (andiroba) in the municipalities of Portel, Gurupá, Breves, and Salvaterra.



Médio Juruá (AM): production of crabwood (andiroba) in the municipalities of Carauari, Juruá, and Lábrea and production of pirarucu fish in the municipalities of Carauari and Juruá.



Médio Solimões (AM): production of pirarucu fish in the municipalities of Fonte Boa and Tefé.



Terra do Meio (PA): production of Brazil nuts in the municipalities of Altamira and São Félix do Xingu.



Trans-Amazon and Xingu (PA): production of açai in the municipalities of Novo Repartimento, Pacajá, Anapu, Vitória do Xingu, Senador José Porfírio, Brasil Novo, Medicilândia, Uruará, Placas, Rurópolis and part of the municipality of Altamira.

Next, we will present the map of technical assistance demands and the characteristics of the organizations that offer these services across these chains and territories.

Specific demands of the production chains and territories covered in the Study

The 81 interviewees – producers (individuals and corporate ones) and specialists in the production chains – indicated 131 demands for technical assistance in the surveyed territories.

Açaí

Surveyed Territory: Marajó and Baixo Tocantins regions and the Amapá's Amazon Estuary. Main municipalities: Macapá (AP), Igarapé-Miri, Cametá, Afuá, and Portel (all located in Pará). The surveyed regions are located near the capital of Pará, a large consumer market.

Pará is the leading producer of açaí in the country, accounting for 94% (1.48 million tons) of the volume of Brazilian production in 2021³. The Bailique archipelago, located in the Amapá's Amazon Estuary, is considered a model of sustainable fruit production, with successful FSC (Forest Stewardship Council) certification experience⁴. More than 12,500 riverside dwellers live in 78 communities in the selected territory. At least 4 thousand people are involved in associations and cooperatives of producers and extractivists⁵.

Characteristics of production: The fruits come mainly from extractivism in the floodplains of rivers and creeks, the natural habitat of the açaí palm trees, and cultivation in solid ground areas. However, the intensification of production has led to the removal of other native forest species in the areas of açaí groves to make room for the monoculture. The harvest is carried out manually by the producers and sold to intermediaries. Some community ventures have small agricultural companies to process the açaí and transform it into pulp.

³ PAM - Municipal Agricultural Production, 2021, Instituto Brasileiro de Geografia e Estatística (IBGE) (Brazilian Institute of Geography and Statistics).

⁴ The FSC is an international organization that certifies, based on severe criteria and standards, sustainable forest practices. Learn more at: www.fsc.org

⁵ Sustainable Community Business Map, Conexsus, 2018.

Main technical assistance demands identified

Cultivation	Harvest	Processing
<p>Minimal impact management of açaí groves (cited ten times):</p> <ul style="list-style-type: none"> - Mapping and inventory of productive areas - Appropriate management of açaí trees and other plant species of economic and ecological interest to increase biodiversity, productivity, and profitability of the area <p>Production diversification (cited five times):</p> <ul style="list-style-type: none"> - Consortium production of açaí with other bioeconomy products, such as crabwood (andiroba) and <i>murumuru</i>, to generate income during the off-season⁶ - Implementation of vegetable gardens in productive areas to promote food security for producers and foster the inclusion of young people and women in work 	<p>Açaí quality guarantee (cited four times):</p> <ul style="list-style-type: none"> - Adequacy of fruit management practices and processes, considering maturation, storage, and transport <p>Promotion of work safety (cited six times):</p> <ul style="list-style-type: none"> - Training for the use of Personal Protective Equipment (PPE) and guidance on the purchase of PPE suitable for extractive work 	<p>Implementation and adequacy of agricultural companies (cited eight times):</p> <ul style="list-style-type: none"> - Adequacy of practices and production processes to the legal requirements for food processing and manufacturing <p>Waste treatment (cited four times):</p> <ul style="list-style-type: none"> - Adequacy of açaí seed disposal

⁶ A major challenge faced by local industries is that, despite that more than 90% of açaí production is in Pará, the suppliers of machinery are mostly in the South and Southeast regions, which makes the assembly of the industry and its maintenance extremely expensive.

⁷ Period in which the production of the açaí fruit is temporarily reduced or interrupted due to seasonal factors, affecting market availability and producer's income.



Crabwood (andiroba)

Surveyed Territory: Médio Juruá region (AM), including the municipalities of Carauari, Jutai, and Lábrea, and the Marajó-Lower Tocantins section, in Pará, where the municipalities of Cametá, Barcarena, Mocajuba, Abaetetuba (Lower Tocantins) are located as well as Portel, Gurupá, Breves and Salvaterra (Marajó). In the Amazonian territory, at least 1,238 extractivists work in community organizations. The Pará hub has 390 extractivists⁸.

Pará is also the leading producer in the country, accounting for 48% of the Brazilian production in 2017⁹.

Production characteristics: direct collection of ripe fruit from the ground near the tree. The collected fruits are opened to remove the seeds, from which the oil is extracted, which undergoes a filtering and purification process. Extractivists and family farmers are primarily responsible for the collection and storage stages. In some communities, the fruit is also processed, individually and/or through cooperatives, in mini-mills for oil extraction.



⁸ Sustainable Community Business Map, Conexsus, 2018.

⁹ 2017 Agricultural Census, Instituto Brasileiro de Geografia e Estatística (IBGE) (Brazilian Institute of Geography and Statistics).

Main technical assistance demands identified

Harvest	Processing	Distribution/ commercialization
<p>Increased productivity (cited 19 times):</p> <ul style="list-style-type: none"> - Training in good practices to avoid seed loss during collection - Mapping of productive areas to identify the productive potential of crabwood trees and promote their conservation - Recovery of degraded areas 	<p>Improved product quality (cited nine times):</p> <ul style="list-style-type: none"> - Training on the types of crabwood, the colours of the oils, evaluation, and control of acidity indexes, humidity, drying - Implementation of low-cost drying techniques and reduction of crabwood perishability <p>Waste treatment (cited three times):</p> <ul style="list-style-type: none"> - Implementation of low-cost techniques aimed at the disposal of waste from pressing the crabwood seed 	<p>Increased quality control in transport (cited four times)</p> <ul style="list-style-type: none"> - Adequacy and training in good storage and transport practices

Cocoa

Surveyed Territory: Trans-Amazon and Xingu Integration region (PA), corresponding to the centre of the Cocoa Route in the Amazon. The surveyed territory encompasses the municipalities of Novo Repartimento, Pacajá, Anapu, Vitória do Xingu, Senador José Porfírio, Brasil Novo, Medicilândia, Uruará, Placas, Rurópolis and part of the municipality of Altamira. This is the main cocoa-producing region in Pará, accounting for 70% of the state's production, which leads the Brazilian ranking.

Characteristics of production: Carried out mainly by family farmers, cocoa production has shown a high potential for forest protection and recovery of degraded areas through the implementation of Agroforestry Systems (SAFs) – a practice that combines the cultivation of cocoa with that of other native tree species, such as the rubber tree, the açai tree, the cupuaçu tree, and the Brazil nut tree. There is also a process of competitive insertion in the domestic and international market of fine chocolates via fair trade and sustainability certifications.

Main technical assistance demands identified

Cultivation	Processing
<p>Increased productivity and quality (cited eight times):</p> <ul style="list-style-type: none"> - Training and technical monitoring for the proper management of trees (soil control, variety and density of plants per hectare, shading, pruning, fertilization) 	<p>Adequacy of processing processes (cited five times):</p> <ul style="list-style-type: none"> - Standardization of almond storage, fermentation, and drying processes - Labor training for agricultural companies



Brazil nut

Surveyed Territory: regions of Baixo Amazonas (PA) and Terra do Meio (PA), and particularly the municipalities of Altamira, São Félix do Xingu, Alenquer, Oriximiná, and Óbidos. Approximately 900 extractivist producers live in the region, including riverside dwellers, quilombolas, and indigenous people¹⁰.

Characteristics of production: the Brazil nut tree grows in a diversified and conserved tropical forest ecosystem. Seeds are collected manually, mainly by riverside dwellers and traditional communities. They remove nut burrs from trees and break them to separate the seeds (nuts); then, the seeds are dried and stored. The nuts are collected throughout the entire Amazon territory, in a capillary way, which makes marketing logistics a challenge. A large volume of nuts is required to cover the high costs of extractive activity in the field and long-distance travel.

Main technical assistance demands identified

Harvest	Processing	Distribution/ commercialization
<p>Promotion of health security (cited 12 times):</p> <ul style="list-style-type: none"> - Monitoring of contamination by aflatoxin¹¹ - Adoption of good collection practices (handling and selection of nuts, use of clean equipment) and storage (humidity control) to avoid contamination - Implementation of procedures and product quality controls (quick quality tests at the collection site) 	<p>Compliance with food safety standards (cited six times):</p> <ul style="list-style-type: none"> - Implementation of good practices that prevent and identify aflatoxin contamination in the nut processing stage 	<p>Improved transportation logistics (cited three times):</p> <ul style="list-style-type: none"> - Improvement of logistics to increase the cost-effectiveness in the production flow



¹⁰ Sustainable Community Business Map, Conexus, 2018.

¹¹ Toxins produced by fungi of the genus *Aspergillus* that can contaminate nuts in inadequate storage and processing situations.

Pirarucu fish

Surveyed Territory: Médio Juruá and Médio Solimões regions in the State of Amazonas (AM), where there is a benchmark sustainable management initiative of pirarucu fish. Fish management is conducted at different locations on the Solimões, Jutai, and Juruá rivers. The municipalities of Jutai, Fonte Boa, Carauari, and Tefé are outstanding regarding said sustainable management.

Production characteristics: the pirarucu fish management is carried out by riverside populations who live near the temporary fish breeding and feeding lakes during the dry season of the rivers. Specific legislation regulates the activity to ensure the maintenance and sustainability of said species.

Main technical assistance demands identified

Handling	Processing	Distribution/ Commercialization
<p>Greater efficiency in lake management (cited 21 times)</p> <ul style="list-style-type: none"> - Improved lake safety monitoring - Improved fish counting process, with the training of those involved - Greater agility in the development of reports that base requests for fishing authorization to be filed with the relevant environmental agency 	<p>Compliance with food safety standards (cited 18 times):</p> <ul style="list-style-type: none"> - Implementation of physical structures adequate to the health requirements for fish slaughtering, evisceration, bleeding, and cleaning <p>Waste treatment (cited one time):</p> <ul style="list-style-type: none"> - Implementation of processes for the treatment and use of waste disposed of during processing (bones, carcass, skin, and scales) 	<p>Improved transport logistics (cited eight times):</p> <ul style="list-style-type: none"> - Development of adequate logistics for the transport of pirarucu fish (handling and refrigerated packaging) to guarantee the quality of the product and the lowest cost



Cross-disciplinary demands for technical assistance concerning the surveyed productive chains and territories

Some identified demands are common to producers in the surveyed chains and territories, primarily cooperatives, associations, and enterprises.

- Administrative and financial management**
 Control of inputs and outputs of financial resources, tax collection, digitization of records, payment of cooperative members, financial planning
- Access to markets**
 Product pricing, purchase and sale negotiations, market mapping and study, access to institutional markets (governmental purchases), brand strengthening and business plan development
- Research**
 Mapping of productive areas, market studies, development of techniques and good practices, chemical analyses
- Financing**
 Access to resources for funding and investments in various stages of production
- Governance**
 Management of assemblies, management councils, planning, establishment of goals and evaluation of results, engagement, registration and monitoring of cooperative members and associates, creation of cooperatives
- Certification**
 Receipt of FSC and organic certifications, quality seals and geographic identification (designation of origin)
- Regularization**
 Rural Environmental Register (CAR), land regularization, management plans, licensing and regularization of agro-industries

2. Who offers technical assistance for the bioeconomy in the Amazon?



This study identified the following types of organizations that offer technical assistance services across the bioeconomy chains in the Amazon within the surveyed territories:

THIRD-SECTOR ORGANIZATIONS

Non-profit institutions financed through donations and partnerships with private social investment, philanthropy, international cooperation, or agreements with public authorities. In general, said institutions charge no fee from the public they serve. Fundraising is the main challenge pointed out by all third-sector organizations interviewed. They claim that the resources they access often are limited and short-term and generally do not finance infrastructure.

PRIVATE INSTITUTIONS

Companies that provide technical assistance services through direct payment by the producer, other organizations, governments, and companies that purchase the products. In this category of private institutions, there are also purchasing companies whose structure has technicians who assist suppliers in improving the quality of the purchased product and/or guarantee its traceability and/or certification. In the açai chain, for example, purchasing companies offer technical assistance to their suppliers and pay for the certification that is linked to them. In these cases, açai producers depend on the purchaser to continue being a certified producer.

PRODUCERS OR COMMUNITY COOPERATIVES AND ASSOCIATIONS

Producers establish non-profit entities to organize production, marketing, and other issues collectively. Based on this business format, entities hire technicians to assist their cooperative members and associates with technical assistance. The hiring is funded by producers or partnerships with other institutions, such as philanthropic and private social investment institutions.

GOVERNMENT-RUN INSTITUTIONS

Agencies, companies, or government-run independent companies for technical assistance and rural development, and agriculture or rural development departments at Federal, State, or Local levels. These institutions have highly-qualified technician teams (concerning experience and training) and an outstanding infrastructure (cars, boats, equipment, and local offices). However, their human and material resources are often insufficient to meet producers' demand for technical assistance services. The main request made to government-run institutions is the regularization of establishments, primarily through registration with the Brazilian Register of Family Agriculture (Cadastro Nacional da Agricultura Familiar - CAF) and the Rural Environmental Register (Cadastro Ambiental Rural - CAR).

FAMILY EDUCATIONAL CENTERS FOR BLOCK-RELEASE MODE OF TRAINING (CEFFAS)

Community teaching organizations that offer a modality of education aimed at young people and adolescents, integrating general training with technical training in agricultural and extractive practices¹². In Brazil, the Ceffas comprise the Rural Family Houses (CFRs) and the Agricultural Family Schools (EFAs). The public served, in general, does not directly involve rural producers but students, who are usually producers' children. These students are trained to serve said public.

¹² The Ceffas use a teaching method known as "block-release (sandwich) pedagogy", which combines periods of study in the classroom with periods of living and practical learning in communities and families. This training model is based on the principle that knowledge and skills can be acquired both in the formal school environment and the family and community context.

FEDERAL UNIVERSITIES AND INSTITUTES

Public educational institutions with research and extension projects with technical assistance supply components for producers in the bioeconomy chains. In most cases, these works are made possible by public notices for financing studies and projects, such as those made available by the Brazilian Ministry of Science and Technology.

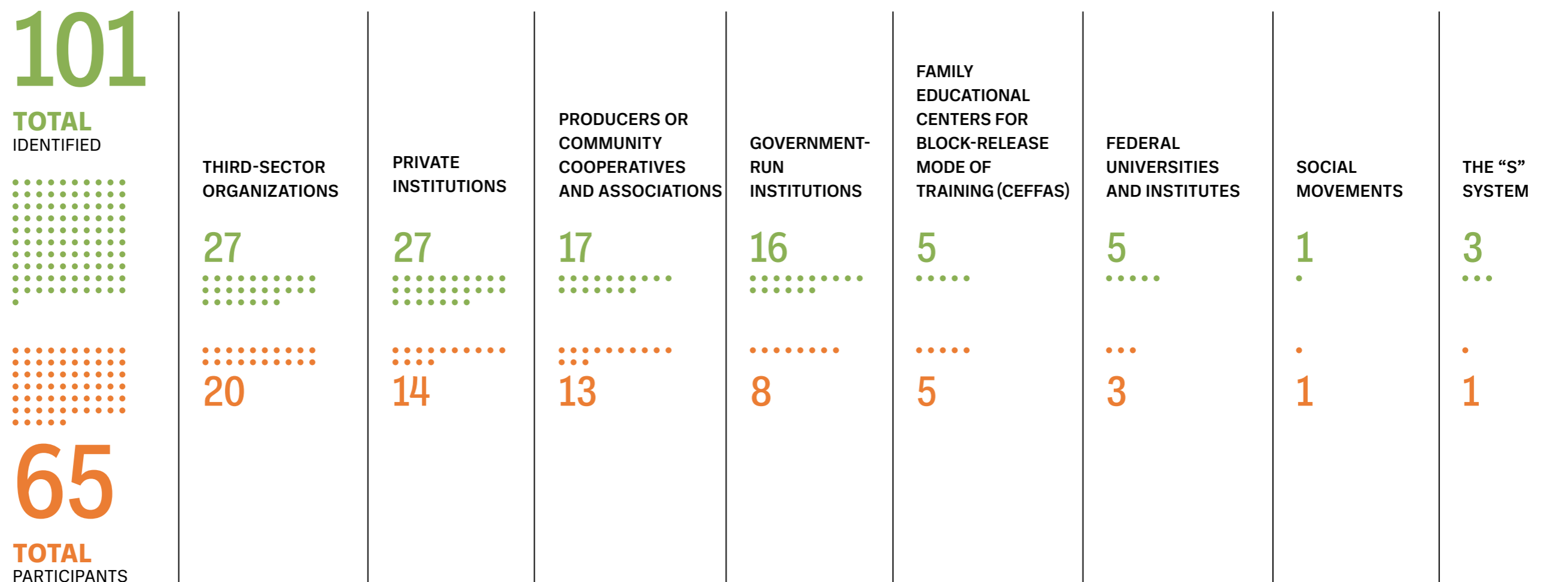
THE "S" SYSTEM

Group of organizations, such as Senar (Brazilian Service for Rural Learning) and Sebrae (Brazilian Support Service for Micro and Small Companies), which, funded by compulsory contributions from companies, provide professional education, training, and social and cultural assistance. The "S" System entities operating in the surveyed territories have many technical professionals — approximately 250 employees in Pará, 90% of whom have higher education. They have a good structure and resources to offer technical assistance services, particularly training. Generally, they work in partnership with city governments.

SOCIAL MOVEMENTS

Non-profit organizations that develop integrated and sustainable agroecological production projects in urban or rural areas.

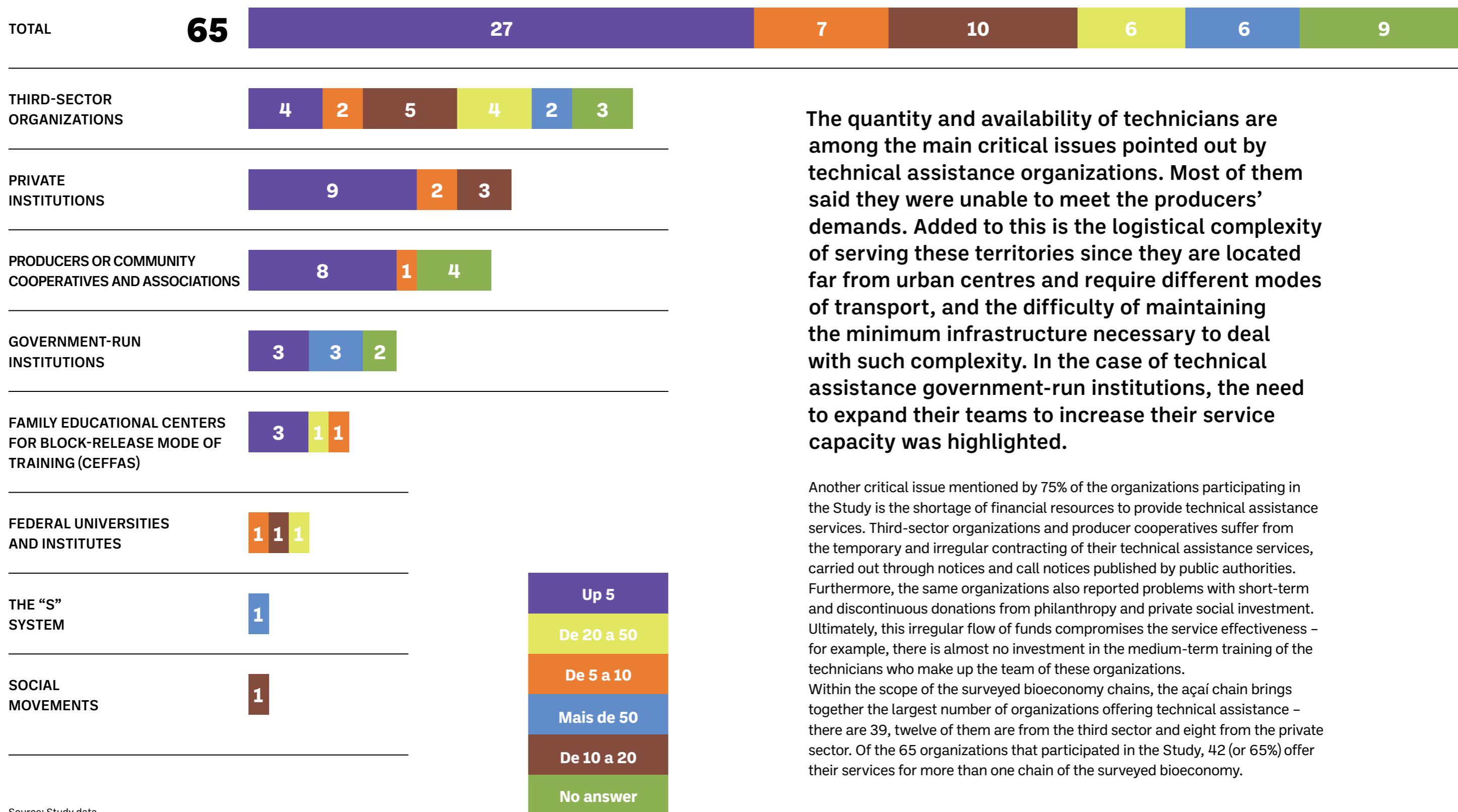
Chart 1 – Total institutions that offer technical assistance services in the surveyed territories (map 1) that have been identified or participated directly in the Study by category



The private sector, whether for-profit (private institutions) or not (third-sector organizations), is the main responsible for the technical assistance offered for the bioeconomy, accounting for 52% (34) of the total number of organizations that participated in the Study (65) since they serve the productive chains across the surveyed territories. Third-sector organizations have more diverse teams of different sizes, while private institutions have smaller teams, with up to five professionals dedicated to technical assistance work.

Source: Study Data.

Chart 2 – Size of the technical teams of organizations that offer technical assistance services by the number of technicians and category

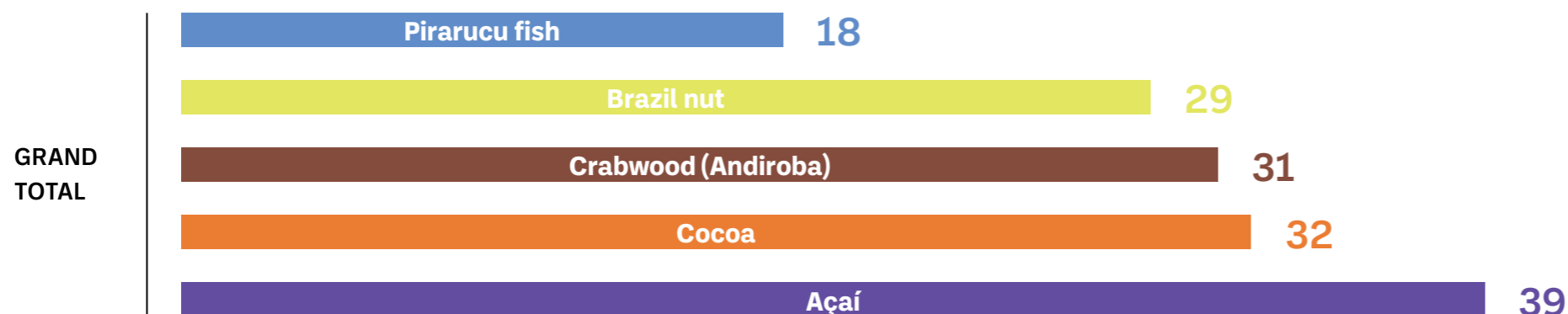


The quantity and availability of technicians are among the main critical issues pointed out by technical assistance organizations. Most of them said they were unable to meet the producers' demands. Added to this is the logistical complexity of serving these territories since they are located far from urban centres and require different modes of transport, and the difficulty of maintaining the minimum infrastructure necessary to deal with such complexity. In the case of technical assistance government-run institutions, the need to expand their teams to increase their service capacity was highlighted.

Another critical issue mentioned by 75% of the organizations participating in the Study is the shortage of financial resources to provide technical assistance services. Third-sector organizations and producer cooperatives suffer from the temporary and irregular contracting of their technical assistance services, carried out through notices and call notices published by public authorities. Furthermore, the same organizations also reported problems with short-term and discontinuous donations from philanthropy and private social investment. Ultimately, this irregular flow of funds compromises the service effectiveness – for example, there is almost no investment in the medium-term training of the technicians who make up the team of these organizations. Within the scope of the surveyed bioeconomy chains, the açai chain brings together the largest number of organizations offering technical assistance – there are 39, twelve of them are from the third sector and eight from the private sector. Of the 65 organizations that participated in the Study, 42 (or 65%) offer their services for more than one chain of the surveyed bioeconomy.

Source: Study data.

Chart 3 – Organizations that offer technical assistance services by surveyed bioeconomy chain



Among the organizations offering the service that participated in the Study, only one stated that the public served fully bears the cost of the service.

SOCIAL MOVEMENTS



Source: Study data.

THE “S” SYSTEM



FEDERAL UNIVERSITIES AND INSTITUTES



FAMILY EDUCATIONAL CENTERS FOR BLOCK-RELEASE MODE OF TRAINING (CEFFAS)



GOVERNMENT-RUN INSTITUTIONS



PRODUCERS OR COMMUNITY COOPERATIVES AND ASSOCIATIONS



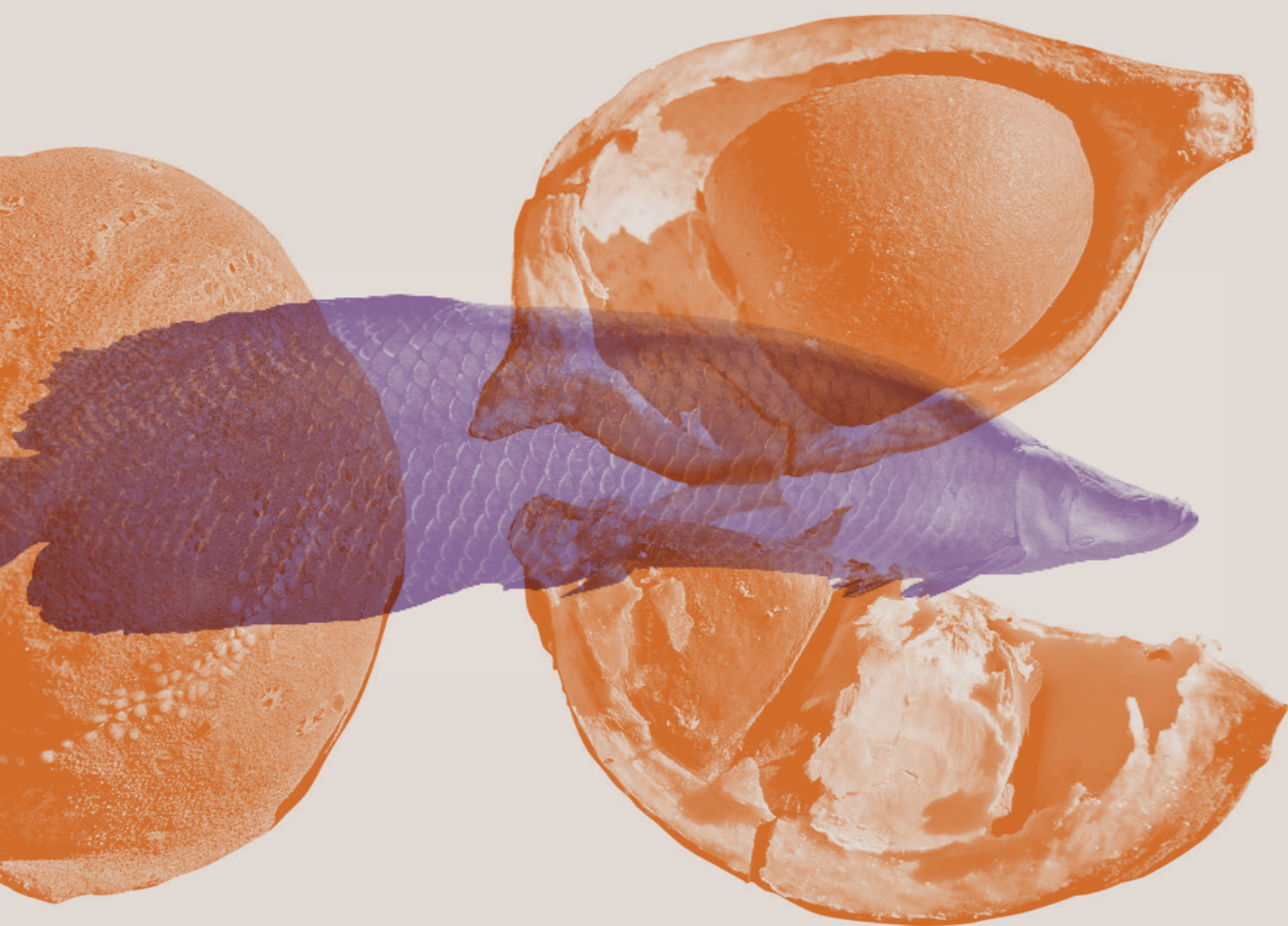
PRIVATE INSTITUTIONS



THIRD-SECTOR ORGANIZATIONS



3. What technical assistance is needed to boost the bioeconomy in the Amazon?



Faced with the fragmentation and insufficiency of the technical assistance services offered for the bioeconomy chains in the Amazon identified by the Study, we highlight the need for the State and public policies to promote changes that involve multiple actors and resources in favour of a joint and coordinated objective: boost the bioeconomy in the Amazon.

Currently, the federal government implemented the Brazilian Policy for Technical Assistance and Rural Extension (Pnater) through the accreditation and hiring, via public notices, of public and private entities that offer technical assistance services and the subsequent monitoring and evaluation of the results. Therefore, cooperation between public and private agents for the provision of technical assistance is already included in the Pnater. The Pnater also establishes a defined territorial base and geographical scope of action as essential requirements for the accreditation of contracted entities. It provides that the Sustainable Rural Development Councils (CDRSs), in their different instances, guide the multi-annual planning that the Pnater executes.

Despite decentralization and social participation being principles of the Pnater, we did not notice effective coordination between public and private technical assistance agents and integration with the territory where the service is performed within the surveyed territories. The principles of the policy do not find instances and concrete structures for their implementation. Therefore, let us think: what role can each agent play in a technical assistance strategy coordinated from the territory to boost the bioeconomy in the Amazon?

Encouraged by the successful model of the Brazilian Unified Health System (SUS), the **regionalization** of the service could be a guideline for the technical assistance policy, as a way of promoting equal and integrated access to the service, according to the needs of producers in each location. The division by geographical units would facilitate the organization of the provision of the services based on regional planning with the participation of the local population. Another SUS guideline to inspire us is the services division in levels – that is, organizing the offer of technical assistance services according to their level of complexity, from essential services, such as producer’s monitoring, to the most complex ones, such as the georeferencing of productive areas and laboratory analyses. This means providing direct assistance services to the producer, research, training, and education. In addition, appropriate coordination will ensure that all producers can access the required services, even if they are unavailable at their location.

The **technical assistance government-run institutions in the Amazon**¹³ could fulfil the role of regional coordination, implementing the Pnater in predefined geographic units. Coordination means the planning of technical assistance actions in a given territory – with the mapping of the demands of producers and the capacity of the different entities to meet them –the arrangement and coordination of the technical assistance agents’ work, and the monitoring and evaluation of the results obtained. Official entities and public bodies of technical assistance already prioritize allocating Pnater’s resources with which they carry out extension activities. Under a new format, these entities would gain greater and primary responsibility for coordinating the service in the territory, carrying actions such as the following ones:

- regional, participatory, and multiannual planning;
- coordination of regional social participation with Sustainable Rural Development Councils;
- organization and division of the different types of demands;

¹³
The following are examples: Instituto de Extensão, Assistência e Desenvolvimento Rural do Amapá, Empresa de Assistência Técnica Extrativista Rural do Acre, Empresa de Assistência Técnica e Extensão Rural do Pará.

- identification and organization of technical assistance agents capable of meeting each type of demand identified in the territory;
- hiring of technical assistance agents capable of carrying out the planned actions;
- coordination of technical assistance with other public policies impacting the territory, such as those related to guaranteed access to land, food security and income generation, infrastructure, formal education, and research.

Based on public calls and specific notices, **the teaching and research institutions** in the territory (universities, federal institutes) could carry out research and technological development, training, and qualification actions. These institutions could be responsible for the following:

- provide technical inputs for drafting regional planning of technical assistance;
- develop training and qualification courses for technical assistance agents;
- carry out research and technological development aimed at improving the territory’s production chains;
- develop research on the socioeconomic conditions of technical assistance beneficiaries and the conditions for social inclusion in the territory’s productive chains;
- develop seminars and meetings to exchange experiences between technical assistance agents;
- identify good technical assistance practices and ways to share them;
- support the evaluation of the results of technical assistance actions in the territory.

The **organizations that offer technical assistance in the territory** – private institutions, third-sector organizations, cooperatives, and producers' associations, the S System, and Ceffas – would continue to provide direct assistance to producers, now in a coordinated manner, being responsible for planning and regional supervision. These organizations could be responsible for the following

- participate in the development of territorial planning;
- monitor producers on an ongoing basis;
- implement specific projects and processes that meet the different types of producers' demands;
- carry out training with producers.

Last but not least, **the municipalities** (through the agriculture departments or similar bodies) could guarantee that the proximity is effective, with the maintenance of a municipal office or local basic units of reference, with responsibilities such as:

- maintain a minimum multidisciplinary technical team to coordinate the local work of the contracted technical assistance organizations and the partners in the municipality or locality;
- ensure minimum local infrastructure for partner institutions to operate in the execution of planned technical assistance actions and serve the beneficiary public (office, room for meetings and training);
- receive and direct the demands for technical assistance services from the beneficiaries in consultancy with the regional coordination office;
- carry out local social participation processes;
- support the monitoring and evaluation of the results obtained.

The resources that finance technical assistance in the surveyed territories proved to be scarce and irregular. This scenario shows that the private resources must be redirected, and a more outstanding contribution of public resources to implement a more effective technical assistance public policy for the bioeconomy in the Amazon will be required. This does not seem to be a problem since the State has its resources¹⁴, tools (funds, agreements, bidding waiver, public calls, participatory councils, among others), and capacity to integrate the execution of private resources (from purchasing companies, philanthropy, private social investment) to the territorial and coordinated planning of the technical assistance policy in the territory.

Based on this format, **the Federal Government** would continue to be responsible for formulating the guidelines for implementing the technical assistance policy at the domestic level and transferring resources to states and municipalities. The states and municipalities, in turn, through their bodies responsible for technical assistance, would ensure the coordination and execution of the service, social participation – jointly with the Sustainable Rural Development Councils – and the supplementary action of other organizations that offer technical assistance services by entering into contracts, agreements, and partnerships to expand the service offering capacity.

¹⁴

A Study by Instituto Escolhas showed that the Fundo Constitucional de Financiamento do Norte (FNO) alone had BRL 33 billion in assets in 2020 that could be allocated to bioeconomy activities. Read the Study [here](#).

Study undertaken by the Instituto Escolhas

ISBN Number

978-65-86405-42-2

How to quote

Instituto Escolhas. **Technical assistance for the bioeconomy in the Amazon: from challenges to solution.** Executive Summary. São Paulo, 2023.

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Realization



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