


THE POTENTIAL OF THE AMAZON DEVELOPMENT FUND IN FOSTERING RESEARCH, DEVELOPMENT AND TECHNOLOGY AT THE AMAZON BIOBUSINESS CENTER

 <https://doi.org/10.56238/arev6n2-148>

Submitted on: 16/09/2024

Publication date: 16/10/2024

Bárbara Dias Cabral Almeida¹, Maria Goretti Falcão de Araújo², Rita de Cássia Pinheiro Machado³, Dimas José Lasmar⁴ and Rosana Zau Mafra⁵

ABSTRACT

The article aims to present the Amazon Development Fund (FDA) as a possible agent for the promotion of science, technology and innovation (ST&I) capable of providing financial resources to the Amazon Biobusiness Center (CBA), highlighting legal points that need to be suppressed, amended or created for legislative improvement, aiming at strategic partnerships between the FDA and CBA. One of the FDA's allocation forecasts is that a part of the proceeds from the return on the operations of financing granted will be allocated to support research, development and technology activities of interest to regional development. This is in line with the objectives of the CBA. It is understood that the conservation of biodiversity, development of sustainable technologies, generation of scientific knowledge and training and stimulation of innovation and entrepreneurship are important for the Amazon region and this is the pillar that supports the CBA. The legislative obstacles that may hinder the above-mentioned partnership are analysed. The study shows

¹ Doctorate student in Biotechnology, in the area of concentration Innovation Management
Graduate Program in Biotechnology (PPGBIOTEC)
Federal University of Amazonas (UFAM), Brazil
E-mail: advbcabral@gmail.com
ORCID: 0000-0002-3221-6282
LATTES: 3409118260768658

² Doctorate student in Biotechnology, in the area of concentration Innovation Management
Graduate Program in Biotechnology (PPGBIOTEC)
Federal University of Amazonas (UFAM), Brazil
E-mail: goretti@ifam.edu.br
ORCID: 0000-0003-3846-0910
LATTES: 1527473024428942

³ Dr. in Biological Chemistry
Federal University of Rio de Janeiro (UFRJ), Brazil
E-mail: ritap@inpi.gov.br
ORCID: 0000-0003-2882-4143
LATTES: 2397508258376320

⁴ Dr. in Production Engineering
Federal University of Rio de Janeiro (UFRJ), Brazil
E-mail: dimas_lasmar@ufam.edu.br
ORCID: 0000-0003-0473-9876
LATTES: 1064512782578721

⁵ Dr. in Biotechnology
Federal University of Amazonas (UFAM), Brazil
E-mail: rosanazau@ufam.edu.br
ORCID: 0000-0002-7133-9824
LATTES: 6557481920689240

that although the funding procedure involves many actors, which can make its implementation complex, bureaucratic and slow, possible solutions to the FDA's legislative obstacles were pointed out, which can make its full potential viable and be an important instrument for promoting ST&I in the Amazon region, favoring the institutions and especially the CBA.

Keywords: Amazon Biobusiness Center. Science. Technology and Innovation. Development Instruments.

INTRODUCTION

The Amazon region is home to one of the greatest biodiversity on the planet, being a fertile field for Science, Technology and Innovation (ST&I) and the development of biobusiness. ST&I plays a crucial role in understanding and preserving this biological heritage, enabling the development of new technologies and sustainable practices. In addition, the biobusiness sector in the Amazon region offers economic and social opportunities, boosting research, production of medicines, food, cosmetics, and other products derived from biodiversity. Investments in ST&I and biobusiness in the region are key to promoting sustainable development, environmental conservation, and the well-being of local communities.

Among the institutions that promote S&IT in the Amazon region, the Amazon Biotechnology Center (CBA), today called the Amazon Biobusiness Center, stands out. Although the National ST&I Policy was only legally established in 2016, through Law No. 13,243/16, which amended Law No. 10,973/04 (Law of incentives for innovation and research), the aforementioned Center was already part of the National ST&I Policy since the publication of the aforementioned law and was responsible for enabling structuring and priority projects for the productive development of products based on local biodiversity (CGEE, 2008). It should be noted that government support for the CBA has suffered ups and downs over time, even though it is a typical basic research program guided by social and technological demands and not only by research itself or by academic curiosity (Premebida, 2021).

For the research developed at the CBA to be successful, there are several factors involved: qualified labor, robust planning and methodology, collaboration and interdisciplinarity, ethics and scientific integrity, and access to sources of information, for example. But, above all, it is necessary to have adequate resources, whether financial, equipment, materials and infrastructure, in addition to qualified labor. This includes access to specific labs, libraries, databases, and technologies. As a public agency currently managed by a Social Organization (Cabral *et al.*, 2023), the CBA lacks funding - which can come from development agencies, government institutions, non-governmental organizations, or partnerships with the private sector.

Among the many public funds existing in Brazil that could provide financial resources to the CBA, the Amazon Development Fund (FDA) stands out, as its purpose is to ensure resources for investments in infrastructure and public services and in productive enterprises

with great germination capacity for new businesses and new productive activities and in financing students regularly enrolled in higher education courses and education courses professional, technical and technological not free (Brazil, 2023). In addition, it provides that a part of the proceeds from the return on financing operations granted will be allocated to support research, development and technology activities of interest to regional development - where the CBA would fit (Brasil, 2019).

Once this information is presented, the following question arises: what legislative changes are necessary for the FDA to become a viable means of promoting ST&I, being applicable to the Amazon Biobusiness Center? Knowing and understanding the scope of such an instrument is fundamental for the implementation and functioning of this Center. These resources can be allocated to infrastructure, technical and scientific training, encouragement of partnerships and collaboration networks, encouragement of entrepreneurship and technology transfer. This instrument also contributes to the promotion of sustainable development and innovation in the Amazon region, fostering the conservation of biodiversity, the development of sustainable technologies, the generation of scientific knowledge and the stimulation of innovation and entrepreneurship.

The search for financial autonomy of the CBA is in charge of the contracted entity, the University Foundation of Amazonian Studies (FUEA), qualified as a Social Organization for this purpose (Brasil, 2023), and will come through public and private sources. The Special Secretariat for Productivity and Competitiveness (SEPEC) intends to allocate, over four (4) years, the amount of 47 million for investment and funding of the CBA (SEPEC, 2022; MDIC, 2023).

Such a study is relevant, because the present phase of government action should be taken advantage of in order to facilitate the raising of funds for the better functioning of the CBA, to seek new financial sources for the Center. An example of the fact that legislation is being changed to favor the raising of funds for the CBA was the publication, in 2023, of the Joint Ordinance of the Ministry of Industry, Commerce and Services (MDIC) and the Superintendence of the Manaus Free Trade Zone (Suframa) (Brazil, 2023), which made the CBA able to develop projects (Suframa, 2024) based on resources defined by the Amazon Information Technology Law (Brazil, 1991).

This Ordinance regulates that Social Organizations that have a management contract with the Ministry and that promote and encourage the realization of research, development and innovation projects in the area of bioeconomy with headquarters or main

activity in the Western Amazon or in the State of Amapá may be contemplated with the R&D resources of companies encouraged by the Manaus Industrial Pole (PIM). In 2024, CBA presented a portfolio of services and projects eligible to receive investments from the Information Technology Law, in an event whose objective is to foster an environment of collaboration and partnerships with local industries aimed at generating solutions and businesses in the field of bioeconomy (Suframa, 2024).

This study should also contribute so that institutions similar to the CBA in other regions of Brazil can use the same arguments to plead for legislative changes that favor their promotion by public funds, in order to intensify their ST&I activities, such as research and activities with the use of Amazonian bioinputs, with a focus on the development of biobusinesses.

Therefore, the performance of this research is broad and comprehensive with a multidisciplinary prospection, being linked to different types of applicability in various sectors and activities focused on biobusiness in the Amazon and Brazil, such as bioprospecting, biotechnology, product development and Environmental Conservation and Preservation. The objective of this work is to identify possible solutions to the legal obstacles located in the legislation related to the FDA, allowing the financial support of the FDA to the CBA, in order to promote biobusiness in the Amazon. To achieve this objective, the work follows the following structure: literature review, methodology and results and discussions.

METHODOLOGY

This is an exploratory, bibliographic, documental study with a qualitative approach. A federal public fund was chosen that provides for non-reimbursable actions to promote ST&I and that, with the necessary adjustments, has the potential to grant financial resources to the CBA. A legal analysis of the main legislative documents was carried out, as shown in Table 1, highlighting the main obstacles to future financial support to the CBA by the Amazon Fund.

TABLE 1 - List of legislation applicable to the FDA and articles with possible obstacles

LEGISLATION	SUBJECT	ARTICLE
Complementary Law No. 124/07	SUDAM Institution Law	Article 3, §2
Decree No. 11,230/22	SUDAM's Regimental Structure	art. 8º, XII, e; art. 17, XVIII e art. 18, IX
Normative Resolution No. 07/22	SUDAM's Internal Regulations	art. 9º, XIV; art. 20, VIII
Decree No. 10,053/19	FDA Regulation	art. 3, II; Article 3, sole paragraph; art. 11, XIII; art. 10, III
MDIR Resolution No. 34/12	Rules for funding research, development and technology activities	Item 6
MIDR Ordinance No. 1533/23	general guidelines and guidance for the application of FDA resources for fiscal years 2022 and 2023	Article 9, items and paragraph 1

Source: The authors, 2024

Chart 1 presents the list of laws that underlie the existence and operation of the FDA, highlighting the subject addressed in each one and its respective articles and presenting the number of articles that have possible obstacles to financing CBA projects with non-reimbursable resources. The deepening of this Table will be done in the chapter that deals with the discussions.

LITERATURE REVIEW

In recent decades, Brazil has been giving importance to the strategic role of ST&I and to the creation of an integrated system for the protection and discipline of the use of natural resources. Programs and projects aimed at the Amazon, with a focus on the entrepreneurship of biodiversity, as an option for regional development, are a result of this attitude (Oliveira, 2021). In this context, the Brazilian Program of Molecular Ecology for the Sustainable Use of the Biodiversity of the Amazon (PROBEM) was born, which generated the Amazon Biotechnology Center (CBA), headquartered in Manaus and, institutionally, under the seal of the Superintendence of the Manaus Free Trade Zone (SUFRAMA), an autarchy linked to the Manaus Free Trade Zone (ZFM). The scope of formulation of its objectives included the creation of conditions to develop a business hub, linked to the bioactive potential of the Amazon.

THE AMAZON BIOBUSINESS CENTER

The Amazon Biobusiness Center (CBA) is part of the government's strategy to take advantage of natural inputs for the creation of new processes and products, within the scope of modernizing programs of developmentalism and biodiversity, in the context of

globalization, ecological imperatives, and a new scientific-technological standard – where the revaluation of natural resources is required (Oliveira, 2021). As stated, the CBA, until May 2023, was a public agency subordinated to SUFRAMA - a federal agency. The consequence of such subordination is the absence of legal, administrative and financial autonomy, which is the responsibility of the managing authority. However, according to the new rule, the CBA adopted a new management model and is expected, consequently, to have greater administrative autonomy - which may allow the expansion and greater use of research (Senado, 2023).

It is expected that, from then on, the CBA will emerge with a new model for using the natural heritage of the Amazon, being mobilized for the knowledge and economic use of biodiversity, transforming learning into innovation and heating up local biobusiness. To this end, it is necessary for the Center to seek public and private resources for its investment and funding - since the budget allocated to the Social Organization that manages the CBA does not reach 48 million reais in 4 years (SEPEC, 2022). The amount is not enough for the full operation of the Center. According to calculations made in 2020, the CBA would need around 14 million reais per year to operate (CIEAM, 2020) - which would result in 56 million reais in 4 years.

Increasing CBA's revenues will bring a series of benefits to both the center and the region. Regarding the benefits for the CBA itself, the following stand out: infrastructure, technical and scientific training, encouragement of partnerships and collaboration networks, and encouragement of entrepreneurship and technology transfer, for example. As for the contributions that the increase in CBA revenues may bring to the Amazon region, the following stand out: Conservation of biodiversity, Development of sustainable technologies, Generation of scientific knowledge and training and stimulation of innovation and entrepreneurship. In short, it is crucial for CBA to seek sources of financial support to carry out its activities and develop its potential for biobusiness, which would help to increase the Amazonian bioeconomy

According to clause 8 of the management contract signed between the Ministry of Development, Industry, Commerce and Services (MDIC) and the University Foundation for Amazonian Studies (FUEA), which aims to manage, operate and maintain the CBA (MDIC, 2023), the following are sources of financial resources for the execution of the object of the contract, among others: investment, development institutions, investment funds and the like. Therefore, it is contractually possible to contribute resources from the FDA to the CBA.

This contract has a series of performance indicators, to assess the level of its execution, one of them being the measurement of the funds raised by the Entity for application in the CBA, from private investors, not arising from RD&I obligations, in addition to the public resources provided for in the Management Agreement (Indicator 17). This indicator only reinforces the importance of the contribution of resources from funds, especially from the FDA.

THE AMAZON DEVELOPMENT FUND

The Ministry of Integration and Regional Development (MDIR) is the direct federal public administration body that establishes the guidelines and priorities in the application of FDA resources (Brasil, 2023). The Superintendence of the Development of the Amazon (SUDAM), a special administratively and financially autonomous autarchy, part of the Federal Planning and Budget System, headquartered in Belém/Pará, is linked to it. It operates in several states of the Legal Amazon, including Amazonas. In conjunction with the competent ministries, SUDAM is responsible for proposing the priorities and criteria for the application of development funds, especially those linked to scientific and technological development - which includes the FDA, which is one of its instruments of action, according to articles 1 to 5 (Brasil, 2007).

The FDA is a financial instrument of an accounting nature, managed by SUDAM, responsible for ensuring resources for investments in infrastructure and public services and in productive enterprises with a large germination capacity for business and productive activities, according to article 16 (Brasil, 2007). This purpose is related to CBA's new focus on biobusiness. It is a financing instrument of the National Regional Development Policy (PNDR) and aims to ensure resources for investments in the area of operation of SUDAM, according to article 1, caput (BRASIL, 2019). Its operating agents are Banco da Amazônia S/A, Caixa Econômica Federal and Banco do Brasil S/A (SUDAM, 2016).

However, from Law No. 12,712/12 (Brasil, 2012) and CMN Resolution No. 4,171/12 (Banco do Brasil, 2012), what can be called the "financialization" of the FDA took place. The financial autonomy of the FDA was reduced, as it could not accumulate its own assets, since all unspent resources returned to the Government's account. As a result, the FDA remained constantly subject to contingencies by the National Treasury, and the release of funds was always linked to the financial capacity of the public administration. From then on, the FDA resources that are not applied throughout the year (financial year) will remain in a

government sub-account, and, together with the returns from funding, will become part of the FDA's Assets. In this way, the capacity to contribute to new projects may increase every year, expanding the operations and applications of FDA resources (MDIR, 2023). In 2023, R\$ 815.9 million in FDA resources were available (SUDAM, 2023). In 2024, this amount jumped to R\$ 896.3 million (Sudam, 2024) - an increase of 9.5% in financial availability.

Currently, the part of the FDA's resources allocated to research, development and technology (RD&T) are contingent, as they are allocated from the return of operations, that is, when the borrower pays, the bank deducts this percentage. In case there is no application of the resource, there is a return. In addition, the financial resource needs a new budget allocation to be applied, which makes it difficult to operationalize. In a parliamentary speech, Senator Confucius Moura (Moura, 2023) suggested that FDA resources for RD&T be invested in research developed by the CBA, for studies related to the Amazon.

The speech of the aforementioned Senator is in line with two of the sectoral priorities contained in the FDA Guidelines and Priorities - Fiscal Year 2023 (MDIR, 2023): Bioindustry, comprising the pharmaceutical industry, personal hygiene, perfumery and cosmetics, and Biotechnology. It also meets the guidelines established by the National Regional Development Policy (PNDR), in accordance with article 3, IV (Brazil, 2019), the Regional Development Plan for the Amazon (PRDA) (item 3.4) (MDIR, 2019) and the Sustainable Amazon Plan (PAS) (3.0, h) (Brazil, 2008).

FDA Management Reports and Supplementary Information

In relation to the financial resources of the FDA resulting from the returns on the operations of the financing granted for the cost of RD&I activities, they are retained in the Federal Budget Secretariat (SOF), in the approximate amount of R\$30 million. Although this financial is included in the accounting managed by SUSAM, there is no possibility of use, due to the lack of budget allocation available for commitment, since this amount was used for the primary surplus of previous years. There is a need to do this unlocking, according to items 23 to 29 of Technical Note No. 2/2019-COGID/DPROS (MDIR, 2019).

According to information contained in fls. 11 of the most recent report of the financing bank (BASA, 2023), more than six million reais in FDA resources were invested in the cost of RD&T. The aforementioned report does not present information on the beneficiaries of this amount. The fund management report (SUDAM, 2023) states that in 2021 more than

1.4 million reais were disbursed in RD&T funding, reaching 42.84% of the target set for the year. There is also no information to explain the amount.

The SUDAM 2023 Budget Action Booklet (SUDAM, 2023), a document that aims to provide guidance on the budget programs and actions that can be allocated to SUDAM's budget, informs that SUDAM's budget covers a set of programs and actions converging with the guidelines established by the Ministry of Economy, set out in the Federal Multiannual Plan (PPA) 2020-2023. For 2023, one of its budgetary actions, Action 4542 concerns the promotion of Research, Technology and Innovation for the sustainable development of Amazonian biodiversity.

Through this action, SUDAM supports the realization of RD&I projects of public ST&I institutions, as well as RD&I, through the transfer of resources from the Union, with a view to promoting the sustainable use and dynamization, verticalization and increased competitiveness of products from Amazonian biodiversity. in the (inter)national market, focusing on establishing mechanisms for technology transfer from RD&I centers to the regional productive sector. As an example, he cites investment in the implementation or expansion of research laboratories or entrepreneurial and innovative spaces, new machinery and equipment for data processing and laboratories, in addition to the cost of the renovation of research laboratories or entrepreneurial and innovative spaces and the preparation of studies in the area of science and technology.

The 2022 Fiscal Year Management Report (SUDAM, 2023) informs that for Action 4542 (Promotion of Research, Technology and Innovation for the Sustainable Development of Amazonian Biodiversity) the initial allocation was R\$ 1,053,400.00, but the expenses achieved were R\$ 60,000.00, with 11,103.50 being settled (fls. 27). The amount of 60 thousand reais was committed to the cost of a project, since the blocking of appropriations by the MDIR made it impossible to support other projects in this action.

The supported project was "Production of β -carotene crystals of high purity from the bark of the peach palm (*Bactris gasipaes*)", from the Federal University of Pará (UFPA), signed through the decentralization of credits (fls. 30). This project is currently being carried out and aims at inclusive and sustainable development, as it seeks to protect biodiversity, in addition to adding value to a raw material of Amazonian biodiversity, with a view to improving the quality of life of the population, through the development of processes to obtain a natural product of high added commercial value from raw material of very low cost

(peach palm bark) (fls. 51). It can be seen that there was an evolution from 2019 to 2022 in relation to RD&T costing, but there is still a long way to go.

In turn, the 2023 Fiscal Year Management Report (SUDAM, 2024) informs that, for that year, there was a forecast of more than 4.2 million reais in resources for the Costing of Activities in Research, Development and Technology (item III, c), but there was no such expenditure - which was a setback compared to previous years. However, there is a provision in the Regional Development Plan for the Amazon (PRDA) 2024-2027 (SUDAM, 2024) for financing projects with non-reimbursable resources (financed with budgetary resources and other sources) - which would include projects from the CBA.

RESULTS

This section presents the legislative obstacles to the FDA's financial support to the CBA contained in the Sudam Institution Law (BRASIL, 2007), summarized in Chart 2, whose legislation corresponds to Chart 1.

TABLE 2 - Summary list of possible obstacles to the application of non-reimbursable resources from the FDA in CBA projects

LEGISLATION	SUBJECT	ARTICLE	BARRIER
Complementary Law No. 124/07	SUDAM Institution Law	Article 3, §2	Only 1.5% for the cost of RD&T activities
Decree No. 11,230/22	SUDAM's Regimental Structure	art. 8º, XII, e; art. 17, XVIII e art. 18, IX	It only talks about resources for "specific projects".
Normative Resolution No. 07/22	SUDAM's Internal Regulations	art. 9º, XIV; art. 20, VIII	Incomplete criteria for the application of resources.
Decree No. 10,053/19	FDA Regulation	art. 3, II; Article 3, sole paragraph; art. 11, XIII; art. 10, III	There is no provision for a seat in CONDEL for representatives of ST&I in the Amazon; Only specific projects are contemplated with resources; It does not contemplate the modalities of operations applicable to the FDA.
MDIR Resolution No. 34/12	Rules for funding research, development and technology activities	Item 6	Non-reimbursable financing is directed to public institutions, not covering Social Organizations.
MIDR Ordinance No. 1533/23	general guidelines and guidance for the application of FDA resources for fiscal years 2022 and 2023	Article 9, items and paragraph 1	It does not say how the resources should be transferred.

Source: The authors, 2024

- a) Article 3, paragraph 2: for each portion of funds released, 1.5% will be allocated to fund RD&T activities of interest to regional development, in the manner to be

defined by the Deliberative Council (CONDEL). The percentage is low, given the fund's financial volume. The form of calculation is no longer at the time of release of the released funds, but in the portion of the return on the funds (from the amortization of the investments of the projects funded by the FDA).

- The Decree that deals with Sudam's Regimental Structure (Brasil, 2022) provides that:

- b) Article 8, XII, e: It is incumbent upon CONDEL to define the criteria for the application of resources destined to the funding of RD&T activities of interest to regional development, corresponding to 1.5%, calculated on the product of the return on financing operations granted by the FDA. Once again the low percentage is mentioned.
- c) art. 17, XVIII and art. 18, IX: It is incumbent upon the Directorate of Planning and Policy Articulation (DPLAN) to propose to CONDEL the criteria for the application of resources destined to the cost of RD&T activities of interest to regional development. The administration and application of such resources in specific projects is the responsibility of the Directorate for the Promotion of Sustainable Development. The Decree only speaks of resources for "specific projects".

- SUDAM's Internal Regulations (MDIR, 2022) also present obstacles to the investment of its resources in CBA research:

- d) Article 9, XIV: It is incumbent upon CONDEL to define the criteria for the application of resources destined to the cost of RD&T activities of interest to regional development. However, such criteria are defined in an outdated and incomplete document;
- e) Article 20, VIII: there is no updated document that presents procedures to be used in the application of resources destined to the cost of RD&T activities of interest to regional development.
- f) miscellaneous articles: it is incumbent upon the DPLAN, after consulting the Board of Funds and Incentives Management and Investment Attraction, in accordance with the PRDA and the MDIR guidelines: to formulate proposals for guidelines and priorities for the application of FDA resources, benefits and tax incentives (art. 45, VII). This process is coordinated by the General Coordination for the Preparation and Evaluation of Development Plans (CGEAP), a unit that is part of the DPLAN (art. 48, III), specifically by its Coordination for the Preparation,

Monitoring and Evaluation of Development Plans and Programs (CEP), in articulation with the Ministry of Science, Technology and Innovations, when applicable (art. 48, XII) and with the sectoral ministries (art. 48, XIII).

Afterwards, it is up to the Planning Section of Sudam's Action Instruments (SPI) to formulate a proposal for the criteria for the application of these resources (art. 51, V), in conjunction with the General Coordination of Social Inclusion and Sustainable Development. Afterwards, the criteria are prepared by the General Coordination for the Preparation and Evaluation of Development Plans (CGEA), in conjunction with the General Coordination for Social Inclusion and Sustainable Development (art. 48, XIV). Only then will it be up to DPLAN to propose such criteria to CONDEL (art. 45, XVIII).

The adjustment measures for compliance with the guidelines, guidelines and priorities established by CONDEL are the responsibility of the General Coordination of Development and Financing Funds (CGFIN), in addition to coordinating the analysis of prior consultation of claims and claims themselves related to the FDA (art. 59, IV, VII, IX, X). There are still other bodies involved, such as the Coordination of Release and Control of Financing (art. 61) and the General Coordination of Evaluation of Funds and Tax Incentives (CGAVI) (art. 64), Institutional Management Advisory (AGI) (art. 17). It is seen that the procedure involves many actors, which can make its implementation complex, bureaucratic and slow.

- The Amazon Development Fund Regulation (BRASIL, 2019) presents other obstacles to the investment of the above-mentioned resources in CBA research:

- g) Article 3, II: only 1.5% of the value of the proceeds of the return on financing operations granted is allocated to support RD&T activities of interest to regional development (Article 3, II), reaffirming the percentage of the Complementary Law that establishes Sudam;
- h) Article 3, sole paragraph: the value of the proceeds of the return on the financing operations granted shall be held in custody and operated by Banco da Amazônia S.A. and applied in the manner to be defined by CONDEL. It so happens that, according to the Internal Regulations of CONDEL (SUDAM, 2008) there is no provision for a seat for ST&I representatives in the Amazon.
- i) Article 11, XIII: It is incumbent upon Sudam, as manager of the FDA, to administer the application of 1.5% of the value proceeds of the return on financing operations granted in specific RD&T projects of interest to regional development.

Within Sudam, the Directorate of Planning and Policy Articulation (art. 45, XIX, of the SUDAM Internal Regulations) is responsible for such administration, more specifically its Section of Planning of Sudam's Action Instruments (SPI), as an integral unit of the Coordination of Preparation, Monitoring and Evaluation of Development Plans and Programs (art. 51, VI, of Sudam's Internal Regulations). However, only specific projects are contemplated.

j) Article 10, III: It is incumbent upon CONDEL to approve the guidelines and priorities for the application of resources within the scope of the FDA and the modalities of operations that will be supported by it. The Resolution that deals with the guidelines and priorities mentioned predates the current Regulation of the Amazon Development Fund (BRASIL, 2019) and does not contemplate the modalities of operations applicable to the FDA.

- As for the Resolution (MDIR, 2012) that deals with the criteria and priorities for the application of resources intended for the funding of activities in research, development and technology, it predates the current Regulation of the Amazon Development Fund (BRASIL, 2019). One of its objectives is to strengthen support for research in the area of biotechnology, in order to expand the possibilities of using genetic resources associated with Amazonian biodiversity (item 4.5). This objective is in line with the objectives of the CBA. In item 5, it states that the application of resources should be directed to research related to the use of natural resources in the Amazon in order to promote the inclusion of its products in the market. Another point that is in line with the objective of promoting biobusiness of the new CBA. But there are points to improve in a future Resolution on the subject:

- k) item 6: the financing is non-refundable and directed to public institutions, not covering Social Organizations. The CBA is currently managed by a private non-profit Foundation with Social Organization status (Brazil, 2023). Social organizations, although they are entities governed by private law, have the function of providing essential public services, and they do so in place of the Public Power, originally responsible for such services.
- l) The Resolution is silent as to the criteria for judging and selecting the proposals of the institutions to benefit from the resources of the FDA, the publicity of the acts and deadlines for registration, judgment and selection of proposals and the

presentation of the rendering of accounts and deadline for the safekeeping of documents.

m) The Resolution does not say how the resources should be transferred, in addition to providing such resources only for research and not for institutions. The rule is vague with regard to the application of the administrative principles listed in article 37 of the Federal Constitution (Brasil, 1988)

n) The Resolution does not provide for the possibility of inspection to be carried out by the control bodies on the use of the resources to be applied, as well as mechanisms of active transparency, which enable the control of acts by civil society.

- In 2017, CONDEL established a provisional committee, through Resolution No. 58/17, and reappointed by Resolution No. 64/17, with the purpose of preparing a proposal for a regulation for the application of 1.5% from the return on financing operations granted by the Amazon Development Fund – FDA, but no new Resolution was created on the subject.

DISCUSSION

This topic discusses the possible solutions to the legislative obstacles to the FDA's financial support to the CBA presented in the previous section. The instruments are replicated in Chart 3.

TABLE 3 - List of possible summary solutions to the obstacles pointed out in Table 2.

LEGISLATION	SUBJECT	ARTICLE	BARRIER	PROPOSAL
Complementary Law No. 124/07	SUDAM Institution Law	Article 3, §2	Only 1.5% for the cost of RD&T activities	Increase to 5%.
Decree No. 11,230/22	SUDAM's Regimental Structure	art. 8º, XII, e; art. 17, XVIII e art. 18, IX	It only talks about resources for "specific projects".	Include provision for support for ST&I institutions
Normative Resolution No. 07/22	SUDAM's Internal Regulations	art. 9º, XIV; art. 20, VIII	Incomplete criteria for the application of resources.	New ordinance that precisely defines such criteria.
Decree No. 10,053/19	FDA Regulation	art. 3, II; Article 3, sole paragraph; art. 11, XIII; art. 10, III	There is no provision for a seat in CONDEL for representatives of ST&I in the Amazon; Only specific projects are contemplated with resources; It does not contemplate the modalities of operations applicable to the FDA.	That 3 chairs be added;
MDIR Resolution No. 34/12	Rules for funding research, development and technology activities	Item 6	Non-reimbursable financing is directed to public institutions, not covering Social Organizations.	Insert Social Organizations as suitable entities
MIDR Ordinance No. 1533/23	general guidelines and guidance for the application of FDA resources for fiscal years 2022 and 2023	Article 9, items and paragraph 1	It does not say how the resources should be transferred.	Well-defined form of transfer of funds

- a) Complementary Law No. 124/07: Increase the percentage from 1.5% to 5% for each portion of funds released to fund RD&T activities of interest to regional development. Since this percentage was once 5%. In 2017, a Law (BRASIL, 2017) came into force setting at 5% the value of the proceeds of the return on financing operations granted to support RD&T activities of interest to regional development. This percentage, which until then would be deducted from the return on operations, is now made available by the budget. However, in the new FDA regulation (Brasil, 2019), the percentage became 1.5%. To improve the quantity and quality of science produced in the Amazon, the aforementioned regulation could be amended to increase the aforementioned percentage to 5%, making such non-reimbursable contributions available annually to the beneficiaries.
- b) The same proposal as the letter a.

- c) In addition to providing resources for specific projects, the document could include a provision for support for ST&I institutions with a focus on the FDA's priority areas.
- d) Repeal MDIR Resolution No. 34/2012, which deals with the change in the criteria and priorities for the application of resources destined to the funding of RD&T activities, replacing it with another that precisely defines such criteria.
- e) Transfer contracts and agreements are two strategies for the transfer of resources destined to the cost of activities in research, development and technology.
- f) Ultimately, the MDIR is responsible for establishing and proposing guidelines, priorities in the application and general guidelines in relation to the resources of the FDA, together with the Secretariat of Funds and Fiscal Incentives and in line with the PNDR and the regional development plans (arts.27, VII, b; 1º, X) (Brazil, 2023). But, within SUDAM, there are many directorates, coordinations, departments, sections, and councils involved in the process of elaborating guidelines and priorities. And the process is still done in conjunction with other Ministries. It would be appropriate to reduce the stages in the process of elaborating the criteria for the application of resources destined to the cost of RD&T activities of interest to regional development.
- g) The need to increase the amount allocated to RD&T in the FDA from 1.5% to 5% is reiterated.
- h) That 3 seats be added to the Deliberative Council for ST&I representatives in the Amazon. And that a new CONDEL document be drafted dealing with the application of such resource with all the details necessary for the transfer of funds to ST&I institutions, especially the CBA.
- i) A new CONDEL Resolution is needed that contemplates the modalities of operations applicable to the FDA (credit, incentives, or public call notices for research institutions).
- j) To include Social Organizations as entities eligible to receive non-reimbursable funding from the FDA.
- k) Insert criteria for judging and selecting the proposals of the institutions to benefit from the FDA's resources, the publicity of the acts and deadlines for registration, judgment and selection of proposals and the presentation of accountability and

deadline for document storage. In addition, it is necessary to develop criteria for selecting entities eligible to receive non-reimbursable funding from the FDA

- l) A well-defined way of transferring resources from the FDA to ST&I projects and institutions, such as the use of direct transfer, Public Call notices or Cooperation Agreements and Agreements, for example.
- m) Provision for inspection to be carried out by the control bodies on the use of resources to be applied, as well as mechanisms for active transparency.

The final objective of all proposals is to enable the use of the percentage destined to the cost of activities in research, development and technology of interest to regional development, both for specific projects and for institutions, especially the CBA.

CONCLUSION

The FDA has the potential to be an important instrument for fostering ST&I in the Amazon region. However, there are some legislative obstacles that need to be overcome so that the fund can be used effectively.

The results of the research highlighted a series of legal obstacles that limit the use of the FDA for the development of CBA. Among the main challenges identified, the following stand out:

- Insufficient resources for RD&I: Currently, only 1.5% of the FDA's resources are allocated to RD&I activities, an amount considered insufficient to boost the technological development of the sector. An increase in this share to 5% is proposed.
- Narrow focus on specific projects: Current legislation limits the use of FDA resources to specific projects, which prevents broader support for ST&I institutions in the region. It is suggested that a provision be included for institutional support, in addition to one-off projects.
- Incomplete resource application criteria: The absence of clear and precise criteria for resource application makes it difficult to use them efficiently and effectively. The publication of a new ordinance that defines these criteria in detail is essential.
- Underrepresentation of the Amazonian scientific community in decision-making bodies: The lack of representatives of the Amazonian scientific community in CONDEL limits the participation of these actors in defining priorities and

strategies for the use of FDA resources. It is proposed to include three new chairs in CONDEL for researchers from the region.

- Restrictions on the modalities of operation and beneficiaries: The current legislation restricts the modalities of operation applicable to the FDA and limits the beneficiaries of non-reimbursable financing to public institutions, excluding Social Organizations. It is suggested to expand the modalities of operation and include Social Organizations as eligible entities.
- Lack of clarity on how to transfer resources: the absence of a clear definition on how FDA resources should be transferred to beneficiaries generates uncertainty and hinders the execution of projects. It is essential to establish a transparent and efficient mechanism for the transfer of resources.

The recommendations presented aim to contribute to the development of strategies that can ensure that the FDA is used effectively to promote ST&I in the Amazon region. These legislative changes would contribute to the development of science, technology, and innovation in the region, which is fundamental for the sustainable development of the Amazon. In this scenario, Sudam financing research, development and technology projects of interest to regional development in the CBA, would contribute to the expansion of knowledge and generation of positive impacts for the sustainable development of the region.

ACKNOWLEDGMENTS

We thank the Municipal Department of Education (Manaus/AM), the Federal Institute of Amazonas (IFAM), the Federal University of Amazonas (UFAM), the Graduate Program in Biotechnology at UFAM (PPGBIOTEC) and the National Institute of Intellectual Property (INPI) (Rio de Janeiro/RJ).

REFERENCES

1. Banco da Amazônia. (2023). Relatório de gestão do fundo - 2022. Belém: BASA. Disponível em: <http://repositorio.sudam.gov.br/sudam/fda/demonstrativos/relatorio-de-gestao-do-fundo>. Acesso em: 28 set. 2023.
2. Banco do Brasil. (2012). Resolução nº 4.171, de 20 de dezembro de 2012. Estabelece critérios, condições e prazos para a concessão de financiamentos ao amparo de recursos do Fundo de Desenvolvimento da Amazônia (FDA). Disponível em: https://www.bcb.gov.br/pre/normativos/res/2012/pdf/res_4171_v5_P.pdf. Acesso em: 28 set. 2023.
3. Brasil. (1988). Constituição da República Federativa do Brasil. Promulgada em 5 de outubro de 1988.
4. Brasil. (2017). Lei nº 13.530, de 7 de dezembro de 2017. Conversão da Medida Provisória nº 785, de 2017. Disponível em: http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2017/Lei/L13530.htm. Acesso em: 26 set. 2023.
5. Brasil. (2012). Lei nº 12.712, de 30 de agosto de 2012. Autoriza a União a conceder subvenção econômica nas operações de crédito do Fundo de Desenvolvimento da Amazônia - FDA. Disponível em: http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12712.htm. Acesso em: 28 set. 2023.
6. Brasil. (1991). Lei nº 8.387, de 30 de dezembro de 1991. Lei de Informática da Amazônia. Disponível em: https://www.planalto.gov.br/ccivil_03/leis/L8387.htm. Acesso em: 8 jul. 2024.
7. Brasil. (2007). Lei Complementar nº 124, de 3 de janeiro de 2007. Institui, na forma do art. 43 da Constituição Federal, a Superintendência do Desenvolvimento da Amazônia – SUDAM. Disponível em: http://www.planalto.gov.br/ccivil_03/leis/lcp/lcp124.htm. Acesso em: 26 set. 2023.
8. Brasil. (2023). Decreto nº 11.516, de 3 de maio de 2023. Qualifica como organização social a Fundação Universitas de Estudos Amazônicos. Disponível em: http://www.planalto.gov.br/ccivil_03/_ato2023-2026/2023/decreto/D11516.htm. Acesso em: 4 jul. 2023.
9. Brasil. (2023). Decreto nº 11.347, de 1º de janeiro de 2023. Aprova a Estrutura Regimental e o Quadro Demonstrativo dos Cargos em Comissão e das Funções de Confiança do Ministério da Integração e do Desenvolvimento Regional. Disponível em: https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2023/Decreto/D11347.htm. Acesso em: 27 set. 2023.
10. Brasil. (2023). Decreto nº 11.343, de 1º de janeiro de 2023. Aprova a Estrutura Regimental e o Quadro Demonstrativo dos Cargos em Comissão e das Funções de Confiança do Ministério da Integração e do Desenvolvimento Regional. Disponível em: http://www.planalto.gov.br/ccivil_03/_ato2023-2026/2023/decreto/D11347.htm. Acesso em: 6 jul. 2023.

11. Brasil. (2022). Decreto nº 11.230, de 7 de outubro de 2022. Aprova a Estrutura Regimental e o Quadro Demonstrativo dos Cargos em Comissão e das Funções de Confiança da Superintendência do Desenvolvimento da Amazônia - Sudam. Disponível em: http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2022/decreto/D11230.htm. Acesso em: 27 set. 2023.
12. Brasil. (2019). Decreto nº 10.053, de 9 de outubro de 2019. Aprova o Regulamento do Fundo de Desenvolvimento da Amazônia. Disponível em: http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2019/decreto/D10053.htm. Acesso em: 26 set. 2023.
13. Brasil. (2019). Decreto nº 9.810, de 30 de maio de 2019. Institui a Política Nacional de Desenvolvimento Regional. Disponível em: http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2019/decreto/D9810.htm. Acesso em: 26 set. 2023.
14. Brasil. (2017). Medida Provisória nº 785, de 6 de julho de 2017. Altera a Lei nº 10.260, de 12 de julho de 2001, e dá outras providências. Disponível em: http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2017/Mpv/mpv785.htm. Acesso em: 26 set. 2023.
15. Brasil. (2008). Plano Amazônia Sustentável: Diretrizes para o desenvolvimento sustentável da Amazônia Brasileira. Brasília. Disponível em: <https://www.fundoamazonia.gov.br/export/sites/default/pt/galleries/documentos/bibliotec/PAS-Presidencia-Republica.pdf>. Acesso em: 26 set. 2023.
16. Brasil, Ministério da Indústria, Comércio e Serviços. (2023). Portaria Conjunta MDIC/SUFRAMA nº 11 de 27 de dezembro de 2023. Brasília: MDIC. Regulamenta o disposto no inciso III do § 18 do art. 2º da Lei nº 8.387, de 30 de dezembro de 1991. Disponível em: <https://www.legnet.com.br/integra/cliente-1/pais-1/UN77178.htm>. Acesso em: 8 jul. 2024.
17. Brasil, Tribunal de Contas da União. (2017). Acórdão 2388/2017, de 25 de outubro de 2017. Levantamento de Auditoria com a finalidade de produzir diagnóstico sistêmico sobre o tema desenvolvimento com recorte na Região Norte – Fisc Norte. Brasília: TCU. Disponível em: <https://pesquisa.apps.tcu.gov.br/documento/acordao-completo/bruno%2520dantas%2520telemedicina/%2520DTRELEVANCIA%2520desc%2520C%2520NUMACORDAOINT%2520desc/19/%2520>. Acesso em: 4 jul. 2023.
18. Brasil, Superintendência da Zona Franca de Manaus. (2024). Projeto 'CBA Conecta' é apresentado no auditório da Suframa com a presença de secretário do MDIC. Manaus: SUFRAMA. Disponível em: <https://www.gov.br/suframa/pt-br/publicacoes/noticias/projeto-cba-conecta-e-apresentado-no-auditorio-da-suframa-com-presenca-do-secretario-rodrigo-rotemberg-1>. Acesso em: 8 jul. 2024.
19. Brasil, Ministério da Integração e do Desenvolvimento Regional. (2023). Fundos de Desenvolvimento Regional. Brasília: MDIR. Disponível em: <https://www.gov.br/mdr/pt-br/assuntos/fundos-regionais-e-incentivos-fiscais/fundos-de-desenvolvimento-regional>. Acesso em: 30 set. 2024.

20. BRASIL. Superintendência da Zona Franca de Manaus. (2023). Próximos passos para a transição da gestão do CBA são discutidos entre Suframa e Fuea. Manaus: SUFRAMA. Disponível em: <https://www.gov.br/suframa/pt-br/publicacoes/noticias/proximos-passos-para-a-transicao-da-gestao-do-cba-sao-discutidos-entre-suframa-e-fuea>. Acesso em: 5 jul. 2023.
21. BRASIL. Secretaria Especial de Produtividade e Competitividade. (2022). Edital de Chamamento Público SEPEC nº 1/2022. Brasília: SEPEC. Disponível em: https://www.gov.br/produtividade-e-comercio-exterior/pt-br/assuntos/servicos-sociais-autonomos/cba/arquivos/sei_me-24249620-edital-de-chamamento-publico.pdf. Acesso em: 4 jul. 2023.
22. BRASIL. Centro de Gestão e Estudos Estratégicos. (2001). Parcerias Estratégicas nº 12. Brasília: CGEE. Disponível em: https://www.cgee.org.br/documents/10195/734063/8.2.2_1890.pdf/6b46abc3-a3ea-4342-8566-351366d772ca?version=1.0. Acesso em: 4 jul. 2023.
23. BRASIL. Centro de Gestão e Estudos Estratégicos. (2008). Avaliação de políticas de ciência, tecnologia e inovação: Diálogo entre experiências internacionais e brasileiras. Brasília: CGEE. Disponível em: <https://livroaberto.ibict.br/bitstream/1/852/1/avalia%C3%A7%C3%A3o%20de%20pol%C3%ADticas.pdf>. Acesso em: 4 jul. 2023.
24. CABRAL, B. D., LASMAR, D. J., MAFRA, R. Z., & ARAÚJO, M. G. F. de. (2023). Centro de Bionegócios da Amazônia: Desdobramentos jurídicos da sua gestão por uma Organização Social. *Concilium*, 23(11), 364–383. <https://doi.org/10.53660/CLM-1472-23G27>. Acesso em: 4 jul. 2023.
25. CANDOTTI, E. (2014). É sustentável o desenvolvimento da Amazônia? In N. SIFFERT, M. CARDOSO, W. A. MAGALHÃES, & M. H. M. LASTRES (Orgs.), *Um olhar territorial para o desenvolvimento: Amazônia* (pp. 336–349). Rio de Janeiro: BNDES. Disponível em: https://web.bndes.gov.br/bib/jspui/bitstream/1408/1787/2/livro_Um%20olhar%20territorial%20para%20o%20desenvolvimento_Amaz%C3%B4nia_P.pdf. Acesso em: 4 jul. 2023.
26. CAVALCANTE, L. (2020). Centro de Biotecnologia da Amazônia depende de aval do Ministério da Economia. Manaus: CIEAM. Disponível em: <https://cieam.com.br/noticias/centro-de-biotecnologia-da-amazonia-depende-de-aval-do-ministerio-da-economia>. Acesso em: 4 jul. 2023.
27. DINIZ, M. B., & DINIZ, M. J. T. (2018). Exploração dos recursos da biodiversidade da Amazônia Legal: Uma avaliação com base na abordagem do Sistema Nacional/Regional de Inovação. *Redes*, 23(2), 210–237. Disponível em: <https://online.unisc.br/seer/index.php/redes/article/view/6867>. Acesso em: 4 jul. 2023.
28. Fundo de Desenvolvimento da Amazônia - FDA. (2023). Belém: SUDAM. Disponível em: <https://www.gov.br/sudam/pt-br/assuntos/fda>. Acesso em: 27 set. 2023.

29. MDIR coordena primeira reunião do Conselho do Fundo de Desenvolvimento da Infraestrutura Regional Sustentável. (2023, 24 de agosto). Brasil 61. Disponível em: <https://brasil61.com/n/midr-coordena-primeira-reuniao-do-conselho-do-fundo-de-desenvolvimento-da-infraestrutura-regional-sustentavel-pMDIR232218>. Acesso em: 25 set. 2023.
30. MINISTÉRIO DA INTEGRAÇÃO E DO DESENVOLVIMENTO REGIONAL. (2022, 15 de agosto). Resolução nº 100, de 15 de agosto de 2022. Diretrizes e Prioridades do Fundo de Desenvolvimento da Amazônia (FDA) - Exercício 2023.
31. MINISTÉRIO DA INTEGRAÇÃO E DO DESENVOLVIMENTO REGIONAL. (2012, 16 de novembro). Resolução nº 34, de 16 de novembro de 2012. Trata da alteração nos critérios e prioridades para aplicação dos recursos destinados ao custeio de atividades em pesquisa, desenvolvimento e tecnologia. Disponível em: http://antigo.sudam.gov.br/conteudo/menus/referencias/condel/arquivos/2012/12reuni_ao_ordinaria_belem_pa_05_11_2012/resolucoes/RESOLUCAO-N34.pdf. Acesso em: 26 set. 2023.
32. MINISTÉRIO DA INTEGRAÇÃO E DO DESENVOLVIMENTO REGIONAL. (2022, 3 de junho). Resolução Normativa nº 07, de 03 de junho de 2022. Consolidação do Regimento Interno (Anexo I). Disponível em: <http://repositorio.sudam.gov.br:8080/sudam/diretoria-colegiada/resolucoes/outros-1/2022/resolucao-normativa-no-07-nova-redacao-do-regimento-interno-da-sudam.pdf>. Acesso em: 26 set. 2023.
33. MINISTÉRIO DA INTEGRAÇÃO E DO DESENVOLVIMENTO REGIONAL. (2023, 27 de abril). Portaria MIDR nº 1533, de 27/04/2023. Estabelece as diretrizes e orientações gerais para a aplicação dos recursos dos Fundos Constitucionais de Financiamento e dos Fundos de Desenvolvimento Regional para os exercícios de 2022 e 2023, bem como para integração com a política de Incentivos Fiscais. Disponível em: <https://www.legisweb.com.br/legislacao/?id=444768>. Acesso em: 27 set. 2023.
34. MINISTÉRIO DA INTEGRAÇÃO E DO DESENVOLVIMENTO REGIONAL. (2019). Plano Regional de Desenvolvimento da Amazônia (PRDA): 2020-2023. Belém: MDIR. Disponível em: <https://www.seducti.am.gov.br/wp-content/uploads/2019/10/PRDA-2020-2023-SUM%C3%81RIO-EXECUTIVO.pdf>. Acesso em: 26 set. 2023.
35. MINISTÉRIO DA INTEGRAÇÃO E DO DESENVOLVIMENTO REGIONAL. (2019). Nota Técnica nº 2/2019- COGID/DPROS. Requerimento de Informações nº 32/2019-CDR, de 2019. Belém: MDIR. Disponível em: <https://legis.senado.leg.br/sdleg-getter/documento?dm=7983161&ts=1574172096842&disposition=inline>. Acesso em: 28 set. 2023.
36. MINISTÉRIO DA INTEGRAÇÃO E DO DESENVOLVIMENTO REGIONAL. (2023). Fundos de Desenvolvimento Regional. Belém: MDIR. Disponível em: <https://www.gov.br/mdr/pt-br/assuntos/fundos-regionais-e-incentivos-fiscais/fundos-de-desenvolvimento-regional>. Acesso em: 28 set. 2023.

37. MINISTÉRIO DO DESENVOLVIMENTO, INDÚSTRIA, COMÉRCIO E SERVIÇOS. (2023). Contrato nº 1/2023/GM. Contrato de Gestão MDIC, FUEA & SUFRAMA. Disponível em: https://www.gov.br/mdic/pt-br/assuntos/servicos-sociais-autonomos/cba/arquivos/contrato-no-1_2023_gm.pdf. Acesso em: 8 jul. 2024.
38. OLIVEIRA, A. P. de. (2021). Polo industrial de Manaus: A biodiversidade como mercadoria (Tese de doutorado). Universidade Estadual de Campinas, Instituto de Filosofia e Ciências Humanas, Campinas, SP. Disponível em: <https://hdl.handle.net/20.500.12733/1642189>. Acesso em: 4 jul. 2023.
39. PREMEBIDA, A. (2021). Infraestrutura, arranjos sociais e produção científica e tecnológica. In M. BAUMGARTEN & J. GUIVANT (Orgs.), Caminhos da Ciência e Tecnologia no Brasil: Políticas públicas, pesquisas e redes (1ª ed., pp. 93–108). Porto Alegre: Editora da UFRGS. Disponível em: <https://lume.ufrgs.br/bitstream/handle/10183/225849/001130313.pdf?sequence=1&isAllowed=y>. Acesso em: 4 jul. 2023.
40. CONFÚCIO, Senador. (2023, 20 de setembro). Pronunciamento em 20 de setembro de 2023: Desenvolvendo a Amazônia. Disponível em: <https://senadorconfucio.com.br/pronunciamento-20-de-setembro-de-2023-desenvolvimento-da-amazonia/>. Acesso em: 26 set. 2023.
41. RODRIGUES, E. (2004). Vantagem competitiva do ecossistema na Amazônia: O cluster florestal do Acre (Tese de doutorado). Universidade de Brasília, Centro de Desenvolvimento Sustentável, Brasília, DF. Disponível em: http://www.andirobaac.com.br/wp-content/uploads/2015/05/tese_ocio_cap01.pdf. Acesso em: 4 jul. 2023.
42. SENADO. (2023). Chico Rodrigues celebra nova gestão do Centro de Biotecnologia da Amazônia. Brasília. Disponível em: <https://www12.senado.leg.br/noticias/materias/2023/06/14/chico-rodrigues-celebra-nova-gestao-do-centro-de-biotecnologia-da-amazonia>. Acesso em: 4 jul. 2023.
43. SUPERINTENDÊNCIA DA ZONA FRANCA DE MANAUS. (2024). Organização Social de bioeconomia. Manaus: SUFRAMA. Disponível em: <https://www.gov.br/suframa/pt-br/zfm/pdi/modalidades/os>. Acesso em: 8 jul. 2024.
44. SUPERINTENDÊNCIA DO DESENVOLVIMENTO DA AMAZÔNIA. (2024). Fundo de Desenvolvimento da Amazônia - FDA. Belém: SUDAM. Disponível em: <https://www.gov.br/sudam/pt-br/assuntos/fda>. Acesso em: 8 jul. 2024.
45. SUPERINTENDÊNCIA DO DESENVOLVIMENTO DA AMAZÔNIA. (2024). Plano Regional do desenvolvimento da Amazônia (PRDA) 2024-2027. Belém: SUDAM. Disponível em: <http://repositorio.sudam.gov.br/sudam/prda/publicacoes-institucionais/prda-24-27.pdf/@@display-file/file/PRDA%2024-27.pdf>. Acesso em: 8 jul. 2024.
46. SUPERINTENDÊNCIA DO DESENVOLVIMENTO DA AMAZÔNIA. (2016). Plano Regional do desenvolvimento da Amazônia (PRDA) 2016-2019. Belém: SUDAM. Disponível em: <http://antigo.sudam.gov.br/conteudo/menus/retratil/planos->

desenvolvimento/prda/arquivos/prda-2016-2019-versao-final-22-03-2018.pdf. Acesso em: 25 set. 2023.

47. SUPERINTENDÊNCIA DO DESENVOLVIMENTO DA AMAZÔNIA. (2016). Plano Regional do desenvolvimento da Amazônia (PRDA) 2020-2023. Belém: SUDAM. Disponível em: <https://www.seducti.am.gov.br/wp-content/uploads/2019/10/PRDA-2020-2023-SUM%C3%81RIO-EXECUTIVO.pdf>. Acesso em: 25 set. 2023.
48. SUPERINTENDÊNCIA DO DESENVOLVIMENTO DA AMAZÔNIA. (2024, 2 de abril). Resolução nº 940, de 2 de abril de 2024. Relatório de Gestão do FDA 2023. Disponível em: <http://repositorio.sudam.gov.br:8080/sudam/diretoria%20colegiada/resolucoes/fda%20fundo%20de%20desenvolvimento%20da%20amazonia/2024/resolucao%20no%20940%20relatorio%20de%20gestao%20do%20fundo%20de%20desenvolvimento%20da%20amazonia%20rgf%20ref%20exercicio%202023.pdf/@@display%20file/file/Resolu%C3%A7%C3%A3o%20N%C2%BA%20940%20Relat%C3%B3rio%20de%20Gest%C3%A3o%20do%20Fundo%20de%20Desenvolvimento%20da%20Amaz%C3%B4nia%20-RGF%20ref.%20%20exerc%C3%ADcio%202023.pdf>. Acesso em: 8 jul. 2024.
48. SUPERINTENDÊNCIA DO DESENVOLVIMENTO DA AMAZÔNIA. (2023, 23 de junho). Resolução nº 708, de 23 de junho de 2023. Relatório de Gestão de Fundo - 2022. Belém: SUDAM. Disponível em: <http://repositorio.sudam.gov.br/sudam/fda/demonstrativos/relatorio-de-gestao-do-fundo/rgf-2022-e-res-708.pdf/view>. Acesso em: 25 set. 2023.
49. SUPERINTENDÊNCIA DO DESENVOLVIMENTO DA AMAZÔNIA. (2023). Ações Orçamentárias SUDAM 2023. Belém: SUDAM. Disponível em: https://www.gov.br/sudam/pt-br/acesso-a-informacoes/acoes%20e%20programas/programas%20e%20acoes/Cartilha_Acoes_Orcamentarias_2023_FINAL.pdf. Acesso em: 28 set. 2023.
50. SUPERINTENDÊNCIA DO DESENVOLVIMENTO DA AMAZÔNIA. (2023). Relatório de Gestão Exercício 2022. Belém: SUDAM. Disponível em: https://www.gov.br/sudam/pt-br/acesso-a-informacoes/copy2_of_RELATORIO_DE_GESTAO_SUDAM_2022.pdf. Acesso em: 28 set. 2023.