Supplementary Material

General Approach to Dataset Structuration

Our database was structured according to four categories: project, municipality, main component, and activity (specific-component) (Figure S1). Data collection for the different variables in these categories came from 5 different origins, namely (1) the website or annual reports of the Amazon Fund, (2) field research in the Brazilian Development Bank (BNDES), (3) Spatial information obtained from various sources (see Figure S1) and processed with GIS, Geographic Information System software, (4) mathematical propositions based on decision rules, and (5) assumptions adopted by the authors of this study. In order to process and organize the data, we followed a series of steps, as depicted in Figure S2.

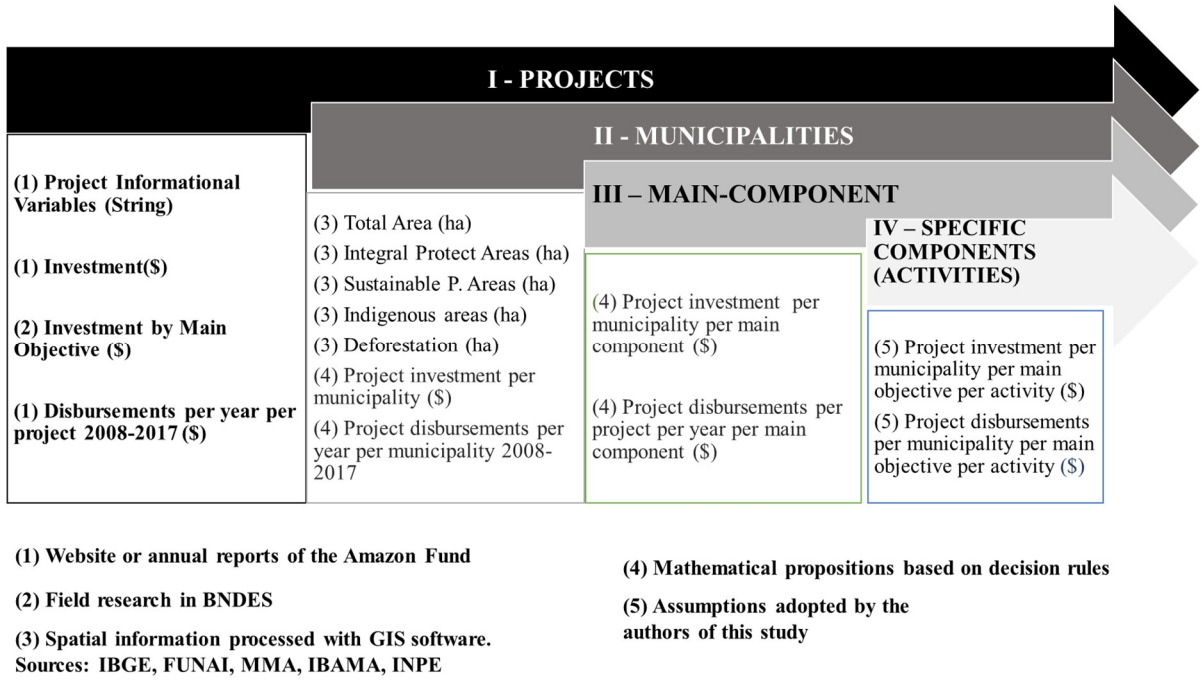

Figure S1 Model for Database Structuration.

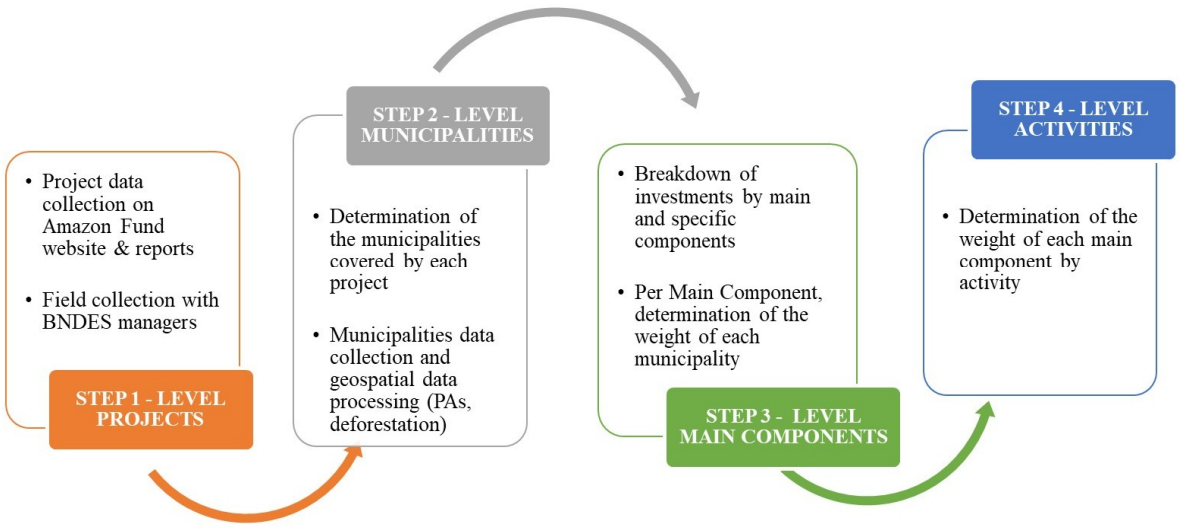

Figure S2 Steps to collect the variables.

Data Collection

In the initial step, the core source was the Amazon Fund website (Figure S3). We collected all of the data available on all of the 96 projects. The variables included for the project level are:

- Stakeholder (Project Manager): Shows the name of the entities that receive the financial support and are responsible for the project implementation. Occasionally, secondary organizations are used to sub-allocate the funds to several small associations without the formal structure required to receive funds directly from the Amazon Fund (e.g., local traditional population NGO's);
- Stakeholder category: Federal Government, States Government, Municipalities Government, NGO, Universities or International
- Territorial Scope (text characters): Represents the area covered by the project. It may be a state administrative region, one or several states, biomes, hydrographic basins, protected areas, indigenous territories;
- Beneficiary (text characters): Population that will be directly benefited by the project, like the traditional populations that live in the area, ranchers, indigenous people;
- Objective (text characters): reflects the project objectives;
- Total Cost of the Project (numeric): The total cost of the project is presented, that is, the sum of the amounts financed by the Amazon Fund added by the counterpart of project implementer;
- $AFInv_p$—Amazon Fund investments per project p (numeric);
- Estimation Completion Data (numeric): Estimated duration of the project from the date that the project was signed with Amazon Fund;
- Date approved (date): Date of approval in the Amazon Fund;
- Date awarded (date): Contracted date, starting the project and disbursements;
- Disbursements (numeric / date): Amazon Fund disbursements for the project;
- D_{pt} - Disbursements per project per year (numeric), calculated as:

$$D_{pt} = \sum_{\substack{p=1 \\ y=2008}}^{\substack{p=96 \\ a=2017}} d_{pt}$$

where d reflects the disbursements from Amazon Fund to the project p, and $p \in \{1, 2, \dots, 96\}$ represents the 96 approved projects from Amazon Fund in the year t, and $t \in \{2008, 2009, \dots, 2017\}$.

Figure S3 Individual Project Page on Amazon Fund website.

The Amazon Fund website only contains the supported amount per project, lacking information on how much was committed for each main component. We conducted one interview by email with a BNDES manager, the managing organization of the Amazon Fund, who replied with a spreadsheet that included data dividing the investments of each Amazon Fund project by main component. Thus, the following variables were added to each project:

- Per project support to Main Component 1 (numeric): Sustainable Production Activities;
- Per project support to Main Component 2 (numeric): Land Tenure Regularization;
- Per project support to Main Component 3 (numeric): Monitoring and Control;
- Per project support to Main Component 4 (numeric): Scientific and Technological Development.

The sum of the values of these four columns, per project, should be the same as the variable $AFInv_p$—Amazon Investments per project. This completes the database structuring for the level Projects, as highlighted in Figure S4, in which there are 96 lines in the database, one for each approved project.

Figure S4 Database structured at Level I—Projects.

Dataset Structuration

Once all data was collected, we started to structure the dataset by defining which municipalities are encompassed by each project (step 2 in the overall process, see Figure S2). The reliable information on the projects of the Amazon Fund at the municipal level are the basis for the construction of our research database. The information made available by the Amazon Fund through its annual activity reports and on its website, however, are organized by project. As the vast majority of these projects cover areas like watersheds, indigenous territories, or environmental conservation units, they commonly encompass several municipalities.

One of the main challenges of this research, therefore, is to construct a database that distinguishes the municipalities that were considered by each project. For this purpose, we designed decision rules based on the literature to identify the municipalities that were covered by each project (PRn) of the Amazon Fund, which is visualized in diagram 1. We applied this tool to our primary data sources (see Table S2). In addition, we added spatial data obtained from various Brazilian agencies (see Table S1) that were processed with the ARGIS, a platform to manage and treat spatial and satelities images, supported by Python, a program packages in order to include, for each municipality (m), supported directly or indirectly by the Amazon Fund, the following variables:

A_m	Total area (ha) for the municipality m (Numeric);
PAi_m	Integral Protected area (ha) for the municipality m (Numeric);
PAs_m	Sustainable Protected area (ha) for the municipality m (Numeric);
IT_m	Indigenous Territory area (ha) for the municipality m (Numeric);
DE_m	Deforestation for the municipality m 2002-2017 (Numeric).

Table S1. Municipalities geospatial information sources.

GEOSPATIAL MAP (SHAPES)	RESPONSIBLE ENTITIES	PERIOD
Political Administrative Maps (Municipalities)	Geographic and Statistic Brazilian Institute - IBGE	2014
Legal Amazon Boundaries	Ministry of Environment - MMA	2008
Amazon Biome Boundaries	Ministry of Environment - MMA	2008
Indigenous Territories	Brazilian Environment Institute - IBAMA	2014
Protected Areas	Brazilian Environment Institute - IBAMA	2014
Deforestation	Project for Estimate the Amazon Deforestation – PRODES, developed by the National Institute of Space Research – INPE	2002-2017

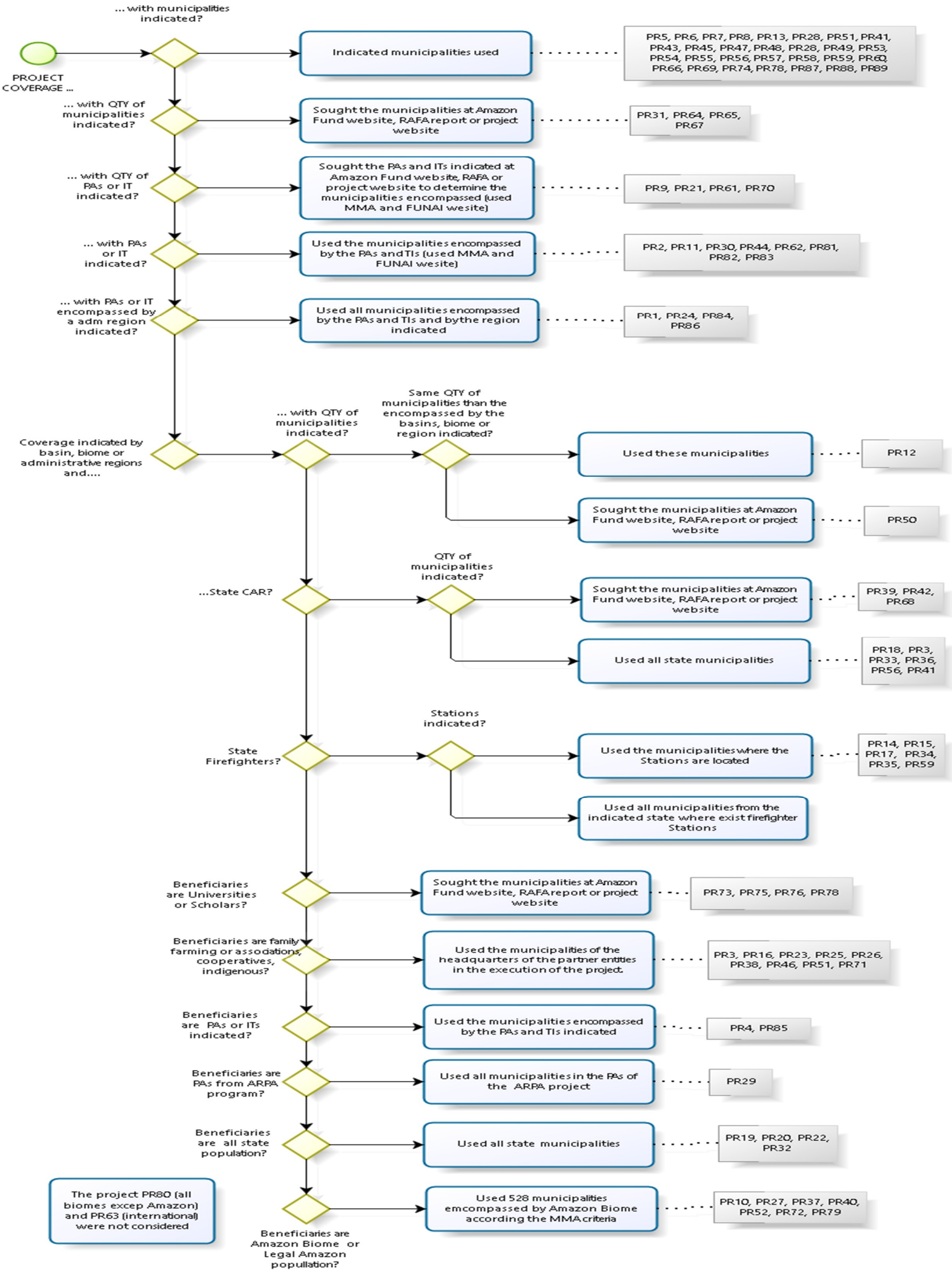

Figure S5: Diagram of rules to determine municipalities encompassed by projects

Table S2. Municipalities Data Source.

INFORMATION	SOURCE	RESPONSIBLE ENTITY	PERIOD
Amazon Biome Municipalities	Ordinance n. 96 MMA 03/27/2008	Ministry of Environment- MMA	2008
Municipalities encompassed by Protected Areas	CNUC-Protected Areas National Registry	Ministry of Environment- MMA	2015
Municipalities encompassed by Indigenous Territories	Indigenous Territories National Registry	Indigenous National Foundation - FUNAI	2015
Municipalities from the administrative regions of Alto Acre, Baixo Acre and Purus	Acre in Numbers Report	Planning State Secretariat from - SEPLAM, state government of Acre	2013
Municipalities per Brazilian States	City System	Geographic and Statistic Brazilian Institute - IBGE	2015
Protected Areas Supported by ARPA Project	ARPA spreadsheet	Amazon Protected Areas Program - ARPA, Ministry of Environment - MMA	2015
Municipalities encompassed by State Protected Areas of Pará in the North Channel of the Amazon River	Report State Protected Areas of Para in the North Channel of the Amazon River	Institute of Man and Environment of the Amazon – IMAZON Geographic and Statistic Brazilian Institute - IBGE	2013
Green Municipalities Program of Pará	Website with the enrolled municipalities	Green Municipalities State Secretariat - SEPMV, state government of Pará	2017
Headquarters municipalities of associations and entities partners for the implementation of projects	Amazon Fund Annual Report - RAFA	National Bank of Socio-Economic Development - BNDES	2010, 2011, 2012, 2013, 2014
Municipalities encompassed by Amazon Fund projects	Amazon Fund Annual Website and annual Report - RAFA	National Bank of Socio-Economic Development - BNDES	2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017
List of critical municipalities for deforestation	Report MMA	Ministry of Environment - MMA	2014
Municipalities encompassed by Amazon Fund projects	Websites from the project managers entities	Several	2017

The next step for dataset structuration (step 3 in Figure S2), is to identify the main components per municipality for each project. Beyond the project information from the Amazon Fund website, each project in the Amazon Fund presents a tree diagram to show their activities contribute to the main-components of the Amazon Fund, which reflects their intervention logic or theory of change (see Figure S6 for an example). In order to identify how the financial resources of each project were divided over the main-components per municipality, we designed a second set of decision rules for determining their weights, as shown in diagram 2. In this way, the following variables were added to the main-component dataset (Table S3):

Table S3. Variables included in the main-component level.

Variable	Description	Formula
ω_{pmk}	Weight by project/municipality/main-component (numeric);	See table 5
D_{pmkt}	Annual disbursement by project/municipality/main-component (numeric);	$D_{pmkt} = \sum_{\substack{p=1 \\ k=1 \\ t=2008}}^{\substack{p=96 \\ m \\ k=4 \\ t=2017}} (D_{pt} \times \omega_{pmk})$
$AFInv_{pmk}$	Amazon Fund investments per project/municipality/main-component (numeric);	$AFInv_{pmk} = AFInv_p \times \omega_{pmk}$
$AFInv_m$	Amazon Fund investments per municipality (numeric);	$AFInv_m = \sum_{\substack{p=1 \\ k=1}}^{\substack{p=96 \\ m \\ k=4}} (AFInv_{pmk})$
$AFInv_{mk}$	Amazon Fund investments per municipality/main-component (numeric).	$AFInv_{mk} = \sum_{p=1}^{96} (AFInv_m \times \omega_{pmk})$

Variable ω_{pmk} represents the ratio of representation (%) to be applied for main-component k ($\in \{1,2 \dots 4\}$) in municipality m that were supported by Amazon Fund project p ($\in \{1, 2, \dots, 96\}$) in year t ($\in \{2008, 2009, \dots, 2017\}$). In accordance with the Amazon Fund´s theory of change, the main-components include Sustainable Production Activities (k = 1), Monitoring and Control (k = 2), Land Tenure Regularization (k = 3), and Scientific and Technological Development (k = 4). Monitoring and Control projects are subdivided into Rural Environmental Register (CAR) and no CAR. Finally, the Land Tenure Regularization category was subdivided into activities exclusively related to indigenous territories (IT = 1), protected areas (PA = 1), territorial and ecological zoning or land management, ($OReg$ = 1), related to IT and PA ($ITPA$ = 1), and other projects (Out = 1). The formulas for these main-components are reflected in table S4.

Table S4. Weight calculations per main-component

k=n	Variation	Formula
k=1	No variation	$\omega_{pm1} = \frac{A_{pm} - PAi_{pm}}{\sum A_{pm} - PAi_{pm}}$
k=2	CAR, no CAR	$\omega_{pm2_{NO\_CAR}} = \frac{A_{pm}}{\sum A_{pm}} \quad \cup \quad \omega_{pm2_{CAR}} = \frac{A_{pm} - APi_{pm} - IT_{pm}}{\sum A_{pm} - APi_{pm} - IT_{pm}}$
k=3	$IT = 1$	$\omega_{pm3\ IT=1} = \frac{IT_{pm}}{\sum IT_{pm}}$
	$PA = 1$	$\omega_{pm3\ PA=1} = \frac{PAi_{pm} + PAs_{pm}}{\sum PAi_{pm} + PAs_{pm}}$
	$OReg = 1$	$\omega_{pm3\ Oreg=1} = \frac{A_{pm} - PAi_{pm} - TI_{pm}}{\sum A_{pm} - PAi_{pm} - TI_m}$
	$ITPA = 1$	$\omega_{pm3\ ITPA=1} = \frac{PAi_{pm} + TI_{pm}}{\sum PAi_{pm} + TI_{pm}}$
	$Out = 1$	$\omega_{pm3\ Out=1} \frac{A_{pm}}{\sum A_{pm}}$
k=4		$\omega_{pm4} = \frac{A_{pm}}{\sum A_{pm}}$

Project: Socio-environmental Management in Municipalities of Pará

Project management: IMAZON – Instituto do Homem e Meio Ambiente da Amazônia

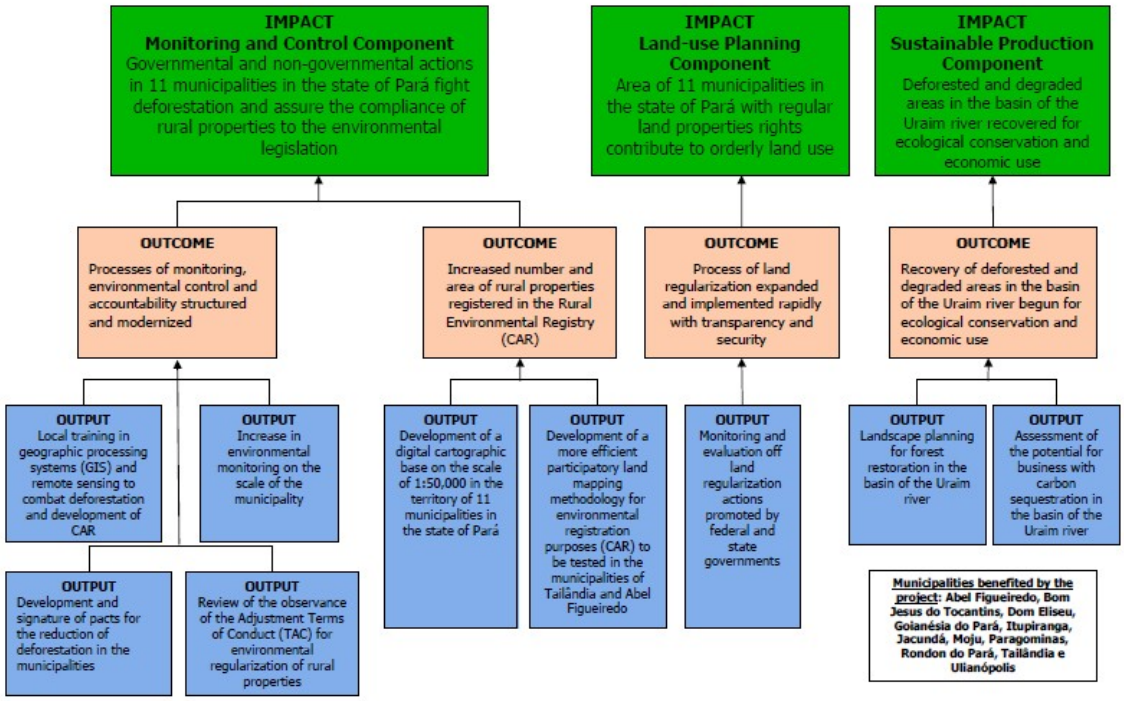

Figure S6 Project Tree.

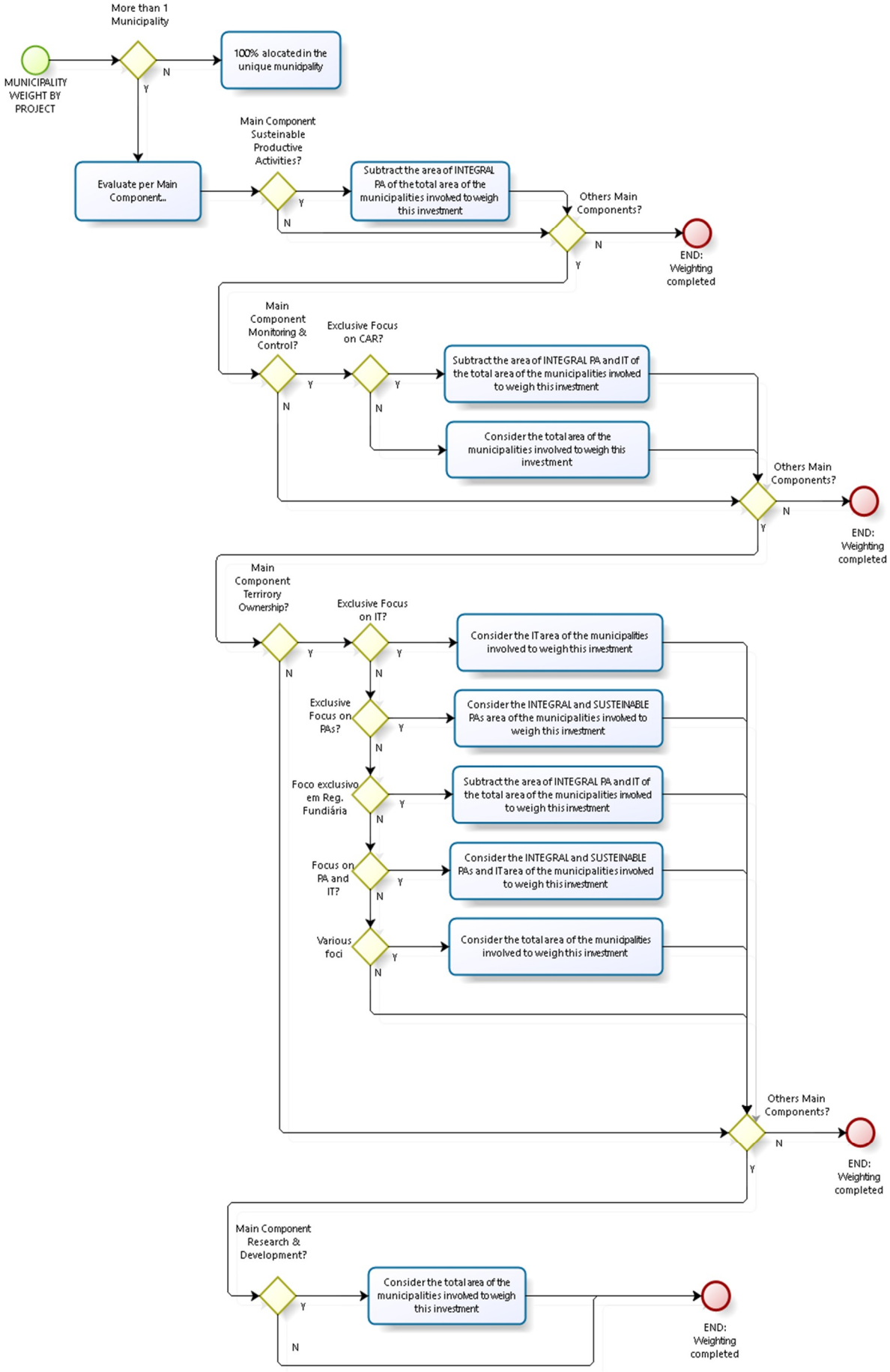

Figure S7: Municipalities weighted by project

The final step for dataset structuration (step 4 in Figure S2) concerns the break-down of the dataset by activity (also called specific-components). As a main-component can be composed by multiple activities, if more than one activity by main-component was verified, then the amounts were equally divided across them**.** The following variables were added:

Variable	Description	Formula
$FAInv_{pmka}$	Investment per project/municipality/main-component/activity (numeric);	$FAInv_{pmks} = \frac{FAInv_{pmk}}{Q}$
D_{pmka}	Annual disbursement per project/municipality/main-component/activity (numeric).	$Des_{pmks} = \frac{Des_{pmkt}}{Q}$

where Q is the quantity of activities s;

With the new rows and variables added, the final database structure now provides very detailed information on how the financial resources from the Amazon Fund were allocated to individual projects and the activities and the municipalities that they support (see Figure S8. for an impression).

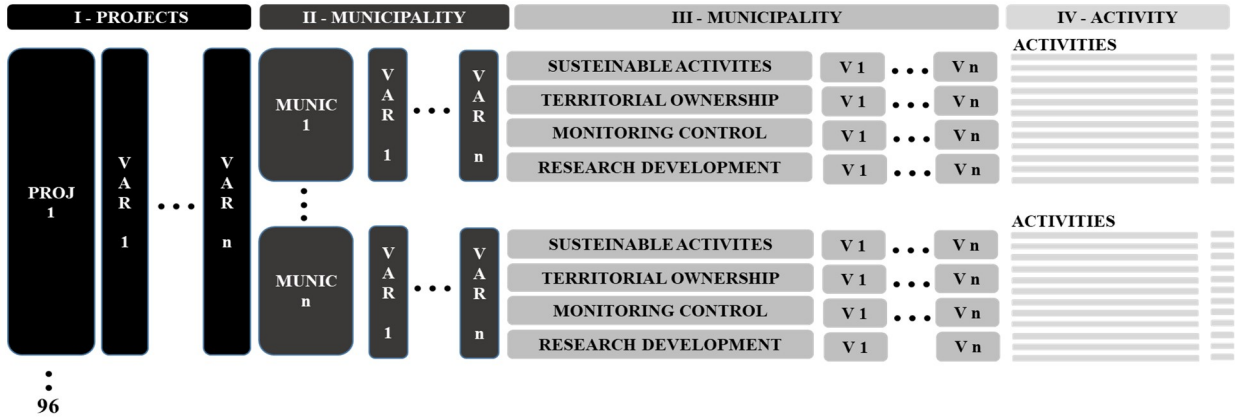

Figure S8 Final Database Structure.

Aditional graphs

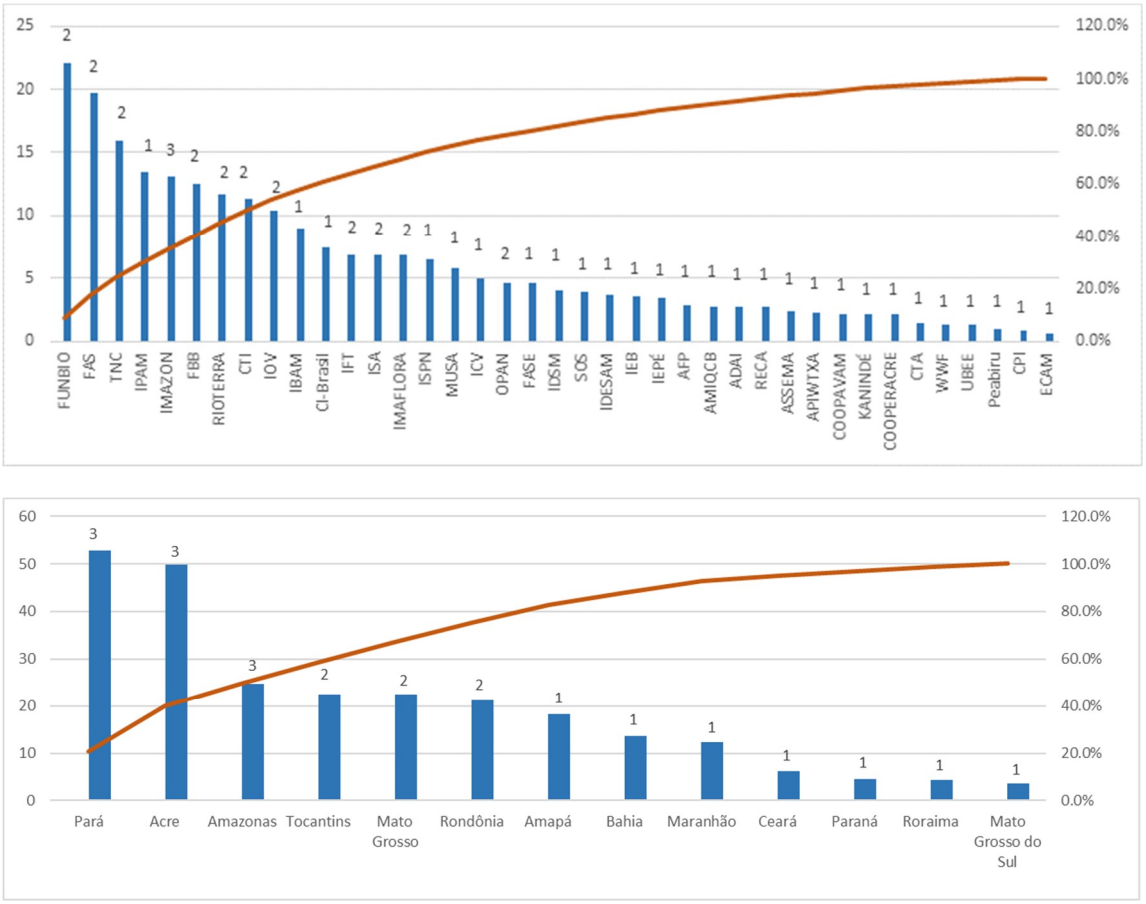

Figure S9 Pareto graft for NGO's and State projects (USD left bar and % of committed amounts right side).

FUINBIO, Brazilian Biodiversity Fund; IMAZON, Institute of People and the Environment of the Amazon; CTI, Center for Indigenous Work; ECAM, Amazon Conservation Team; FBB, Banco do Brasil Foundation; CI-Brasil, Conservation International of Brazil; IFT, Tropical Forest Institute; FAS, Amazonas Sustainable Foundation; FASE, Federation of Agencies for Social and Educational Assistance; MUSA, The Amazon Museum; TNC Brazil, Environmental Conservation Institute – The Nature Conservancy of Brazil; WWF, World Wildlife Fund Brazil; IOV, Ouro Verde Institute; RIOTERRA, Center for Studies on Culture and the Environment in the Amazon; IDSM, Mamirauá Sustainable Development Institute; ISPN, Society, Population and Nature Institute; IBAM, Brazilian Institute of Municipal Administration; COOPAVAM, Cooperative of the Farmers in the Vale do Amanhecer; Peabiru Institute; IMAFLORA, Institute of Agriculture and Forest Management and Certification; COOPERACRE, Extraction Commercialization Central Cooperative for the State of Acre;; RECA, Association of Small Agro-farmers in the RECA Project; OPAN, Native Amazon Operations; IDESAM, Institute for the Conservation and Sustainable Development of the Amazon; FASE, Federation of Agencies for Social and Educational Assistance; AFP, Protected Forest Association; ICV, Life Center Institute; AMIQCB, Interstate Association of the Movement of Women Babassu Coconut Breakers; ISA, Socioenviromental Institute; IEB, International Institute of Education of Brazil; IEPÉ, Institute of Research and Indigenous Education; APIWTXA, Association of the Ashaninka of the Amônia River; CTA, Alternative Technology Center Association; ASSEMA, Association of Settlement Areas in the state of Maranhão; IPAM, Amazon Environmental Research

Institute; SOS Amazonia Association; KANINDÉ, Association in Defense of Ethno-environmental Kanindé; ADAI, Interstate Agricultural Development Association; CPI, Acre Pro-Indigenous People Commission.

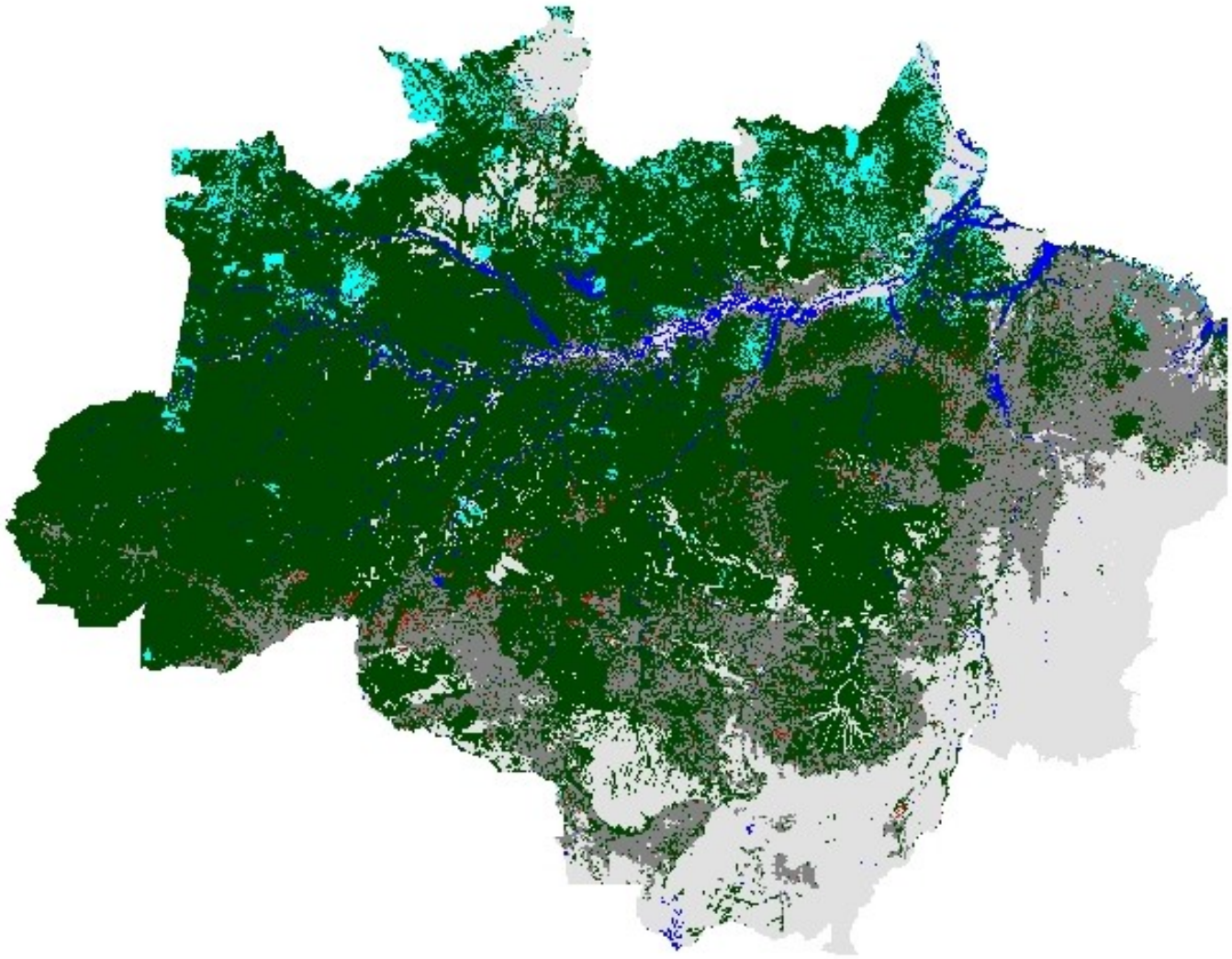

Figure S10 Deforestation in Legal Amazon, PRODES-INPE (2017).

Table S5. 10 Municipalities with the higher deforestation rates between 2016 to 2017. PRODES-INPE (2017)

Municipality	IBGE Code	State	Area Km2	Deforested in 2017	Deforestation Increment 2016-2017	Deforestation rate 2016-2017	Amazon Fund support USD per Ha	Ranking by received support from Amazon Fund
Nova Nazaré	5106174	MT	4042	413.6	211.6	0.511605416	0	>1500
Novo Aripuanã	1303304	AM	41452	1336.3	127.4	0.095337873	1.33	121
Senador José Porfírio	1507805	PA	14389	1040.2	98.9	0.09507787	3.27	40
Tonantins	1304237	AM	6619	93.4	8.1	0.086723769	0.35	981
Portel	1505809	PA	25425	2076.2	167.8	0.08082073	0.46	825
Recursolândia	1718501	TO	2230	41.7	3	0.071942446	0.75	394
Apuí	1300144	AM	54490	2460.2	170	0.069100073	0.99	226
Lábrea	1302405	AM	69672	4459.4	283.7	0.063618424	1.85	83
Trairão	1508050	PA	11997	1407.3	81.5	0.057912314	1.3	125
Medicilândia	1504455	PA	8272	2190.6	116.2	0.053044828	0.76	324

Limitations and considerations

Due to information gaps between the field surveys carried out by the BNDES and the information available on the Amazon Fund website, some premises are identified for the assembly of this database, as shown in Table S6.

Table S6. Research assumptions in response at divergences / limitations of data collection.

There is no value per principal component in field collection with BNDES	The value per main component from the field research at the BNDES worksheet were divided into 2 rows, inside and outside Amazon Biome	Project has more than 1 main component, with some of them ignored in the BNDES field collection	Project Name	Project Number	Author Premises
X			Sustainable Indigenous Amazon Project	2	Prorated 80% for the Main Component "Susteinable Activities" and 20% for "Terrirorial Ownership"
X			High Juruá	4	Prorated 80% for the Main Component "Susteinable Activities" and 20% for "Terrirorial Ownership"
X			Amazonia SAR	10	Prorated 80% for the Main Component "Monitoring & Control" and 20% for "P&D"
X			Value Chains in Indigenous Lands in Acre	11	100% on "Susteinable Acritivies", unique Main Component
X			Amazon Integrated Project	16	100% for "P&D", unique Main Component
			Sustainable Mato Grosso	21	Small divergence of R$0,4
		X	Banco do Brasil Foundation - Amazon Fund	26	Considering the value of the field research at the BNDES worksheet that considers 100% in the "Sustainable Activities" component, ignoring "Territorial Planning", "Monitoring & Control" and "Scientific Development" provided by the Amazon Fund website
			Agroforesty business - Jari		Project considered Canceled...
X			CAR Bahia	31	100% on "Monitoring & Control", unique Main Component
	X		CAR Tocantins	36	The prorated per Main Component was calculated considering the sum of the values inside and outside the Amazon Biome
X			Strengthening environmental management in the Amazon	38	Prorated 40% for the Main Component "Monitoring & Control", 40% for "Territorial Ownership" and 20% for "P&D"
X			Sustainable Bem Viver	44	Prorated 50% for the Main Component "Susteinable Activities" and 50% for "Terrirorial Ownership"
		X	IREHI – Taking Care of Territory	61	Considering the value of the field research at the BNDES worksheet that considers 100% in the "Sustainable Activities" component, ignoring "Territorial Ownership provided by the Amazon Fund website
		X	ARAPAIMA: Production Networks	62	Considering the value of the field research at the BNDES worksheet that considers 100% in the "Sustainable Activities" component, ignoring "Territorial Planning" provided by the Amazon Fund website
		X	Sustainable Environmental Management of Indigenous Lands in the State of Amazonas	65	Considering the value of the field research at the BNDES worksheet that considers 100% in the "Territorial Ownership" component, ignoring "Susteinable Acrivities" provided by the Amazon Fund website
		X	Strengthening Territorial and Environmental Management of Indigenous Land in the Amazon	70	Considering the value of the field research at the BNDES worksheet that considers 100% in the "Territorial Ownership" component, ignoring "Susteinable Acrivities" provided by the Amazon Fund website
X			Fruits from the Forest	71	100% on "Susteinable Acritivies", unique Main Component
X			Environmental Monitoring of Brazilian Biomes	80	Prorated 80% for the Main Component "Monitoring & Control" and 20% for "P&D"
X			Management and governance at Rio Negro Basin and Xingu - PGTAs	81	Prorated 50% for the Main Component "Susteinable Activities" and 50% for "Terrirorial Ownership"
X			Indigenous Territorial Management in the South of Amazonas State	82	Prorated 50% for the Main Component "Susteinable Activities" and 50% for "Terrirorial Ownership"
X			Consolidating Territorial and Environmental Management in Indigenous Lands	83	Prorated 50% for the Main Component "Susteinable Activities" and 50% for "Terrirorial Ownership"
X			Bolsa Floresta+	84	Prorated with same values than the Bolsa Floresta phase 1 Project
X			Valuable Forests - New business models for the Amazon	85	100% on "Susteinable Acritivies", unique Main Component
X			Communal Forests	86	100% on "Susteinable Acritivies", unique Main Component
X			Use of social technologies to reduce deforestation	87	100% on "Susteinable Acritivies", unique Main Component
X			Sustainable Tapajós	88	Prorated 90% for the Main Component "Susteinable Activities" and 10% for "Terrirorial Ownership"
X			Adding Value to Amazonian Socioproductive Chains	89	
X			Everlasting Forest	90	Prorated 90% for the Main Component "Susteinable Activities" and 10% for "R&D"
X			Sowing Rondônia	91	Prorated 80% for the Main Component "Susteinable Activities" and 20% for "Monitoring & Control"
X			Preserving the Babassu Forest	92	100% on "Susteinable Acritivies", unique Main Component
X			Forest Cities	93	Prorated 90% for the Main Component "Susteinable Activities" and 10% for "R&D"