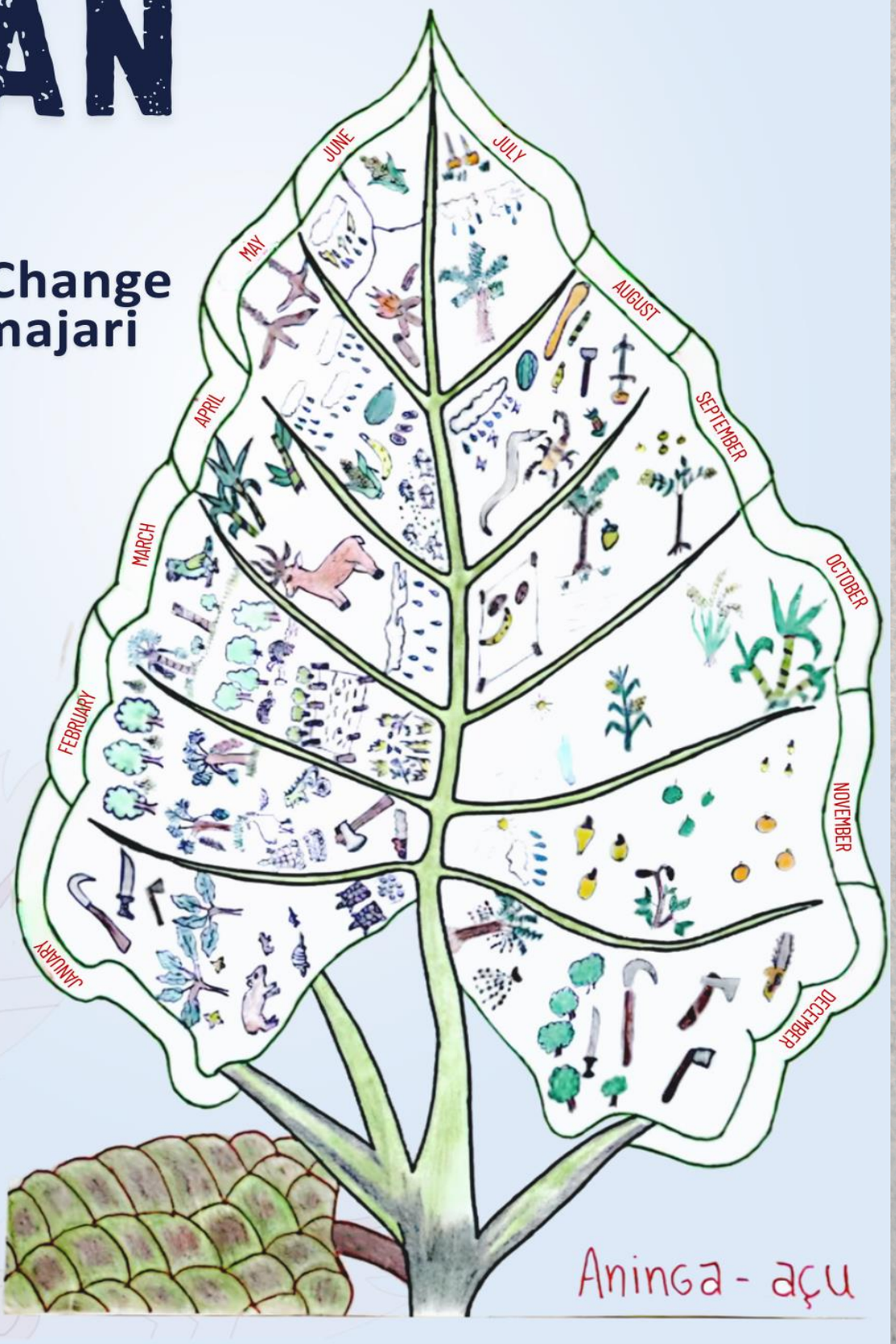
INDIGENOUS ADAPTATION PLAN

Plan to Address Climate Change in the Amajari Region



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Kelliane Cruz – General Tuxaua of the Indigenous Women's Movement

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Enock Barroso Tenente – Vice coordenador Geral

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Leadership (2017–2020):

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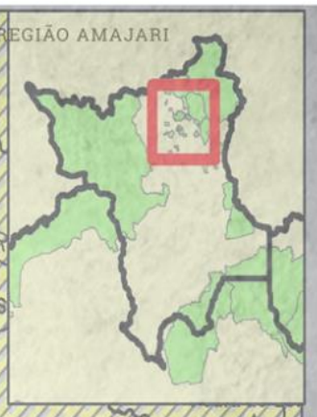

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Fontes: FUNAI,IBGE,; Datum: SIRGAS 2000
Elaboração: Genisvan Andre

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INTRODUCTION

The Indigenous Council of Roraima (CIR) is a grassroots Indigenous organization that was founded in the 1970s following the first Assembly of the Tuxauas. It was officially registered with the Brazilian state in 1990. Its primary objective is to fight for the protection of the rights guaranteed by the Federal Constitution and to strengthen the autonomy of Indigenous peoples in the state of Roraima. To achieve these objectives, CIR carries out activities in areas such as health, education, culture, environmental management, social promotion, sustainable development, and participation in public policies, all while respecting the social and cultural organization of the various Indigenous peoples in the state. CIR is one of the most active Indigenous organizations in Brazil, with operations at the local, regional, national, and international levels.

It was established in 1971 during the first Tuxaua assembly. We gained strength in 1983, when we formed four councils in the regions: Serras, Surumu, Tabaio, Serra da Lua, and Baixo Cotingo. In 1986, it expanded to all regions of Roraima. In 1987, it was registered as the Indigenous Council of the Territory of Roraima (CINTER). In 1990, it changed to the Indigenous Council of Roraima (CIR) when the territory became a state.

The origin of CIR began with the mobilization of leaders in the 1970s, with the Tuxaua Assemblies that initially led to the creation of regional councils and later to the establishment of a statewide organization, the Indigenous Council of the Territory of Roraima – CINTERR. CIR was formally created on August 30, 1990, due to the transformation of the Territory into the State of Roraima as per the 1988 Federal Constitution.

At the outset, CIR's work focused on the struggle for the demarcation of traditional Indigenous territories, with a highlight on the implementation of the cattle project, which aimed to secure territorial occupation and food security in the communities. The work expanded successfully in the areas of health and education, with the formation of Indigenous health agents and teachers. Another significant achievement was the demarcation of the Raposa Serra do Sol Indigenous Land as a continuous area, a struggle that took more than 30 years.

CIR's area of operation covers the 35 Indigenous lands of Roraima, spanning an area of 10 million hectares, where a population of 100,000 Indigenous people live in 260 communities across the state. These people belong to the Macuxi, Wapichana, Ingarikó, Patamona, Sapará, Taurepang, Wai-Wai, Yanomami, Yekuana, and Pirititi peoples.

CIR's direct action is carried out through 10 regional councils, which form its operational base and involve the ethnoregions of Serras, Surumu, Baixo Cotingo, Raposa, Amajari, Wai Wai, Tabaio, Serra da Lua, Murupu, and Alto Cauamé.

Since 2011, CIR has been supporting Indigenous communities in the development of their life plans and conducting studies on Indigenous perspectives regarding the global issue of climate change, which inform regional plans to address these changes.

Over the past decade, the Department of Territorial Management, Environment, and Climate Change, coordinated by environmental manager Sineia Bezerra do Vale, has been developing the training of Territorial and Environmental Agents (ATAIs) as local researchers on the subject of climate change. They are the direct liaisons for their communities and are responsible for systematizing traditional knowledge and perceptions about the effects of climate change on the livelihoods of their communities. In this publication, CIR presents the study conducted in the Amajari region, coordinated by DGTAMC and led by the ATAIs of the region. This study is accompanied by a regional plan to address climate change.

INDIGENOUS ADAPTATION PLAN

Plan to Address Climate Change in the Amajari Region

INTRODUCTION

This case study on climate change in the Amajari region was conducted between January and May 2023. The initiative began with a training workshop for Territorial and Environmental Agents (ATAIs) from the region, held in the Araçá community. At that time, the regional coordination selected six ATAIs to be part of the project: Francilene from the Araçá community, Vanderly from the Urucuri community, Nilson from the Ouro community, Laiane from the Aningal community, and Josirene from the Guariba community.

Next, I coordinated the training of these ATAIs, providing the group with general information about the project and explaining the methodology for conducting the case study. Having led the work of the Department of Territorial Management, Environment, and Climate Change at CIR for over ten years, I developed a way to establish dialogue between the technical concepts and notions surrounding climate change and the reality of Indigenous communities, speaking to them as peers. I was responsible for guiding the ATAIs' work from the beginning, providing the necessary instructions for developing the study and presenting the group with the work materials, the handbook, the research outline, and interview forms.

The central idea of the study was to understand how climate change is affecting the lifestyle and culture of the Indigenous population, impacting the dynamics of animal, bird, plant, and fruit tree life, as well as how these changes are affecting livestock and food production within the communities. To this end, the ATAIs were instructed to conduct the studies in a way that reflected the community's perspective, using the methodological tools as support for conducting open conversations with people so that everyone could understand the objective of the study: to develop strategies to face climate change in the region.

During this activity, each ATAI was responsible for conducting the study in a specific number of communities. The participating communities were: Anaro, Juraci, Nova União, Ouro, Ponta da Serra, São Francisco, Urucuri, Ananás, Aningal, Araçá, Cajueiro, Garagem, Guariba, Mangueira, Monte das Oliveiras, Mutamba, Novo Paraíso, Vida Nova, Leão de Ouro, and Santa Inês. The Três Corações community, being part of another organization, did not respond to our contact.

To systematize the information, the ATAIs developed maps and calendars with the collaboration of all the participating communities. During this process, they also conducted interviews with various community members (tuxauas, teachers, health agents, catechists, coordinators), mainly listening to the more experienced individuals to understand their perceptions about climate changes over the past few decades, especially the last twenty years.

This book-document is divided into three parts. The first part is an overview of the Amajari region presented by the Indigenous researchers, where basic information about the eight Indigenous lands that make up the region and the twenty communities that participated in the study can be found. The second part presents data on the perceptions of these communities regarding changes in climate over the past two decades and how this has impacted plantations, hunting, fishing, and the availability of fruit trees and timber species in the region. Finally, the third part is the systematization of the regional plan to address climate change, where we identify the main impacts and the actions that the communities have already put into practice, as well as other actions that study participants identified as important to be implemented to cope with the increasingly present effects of climate change in Indigenous daily life.

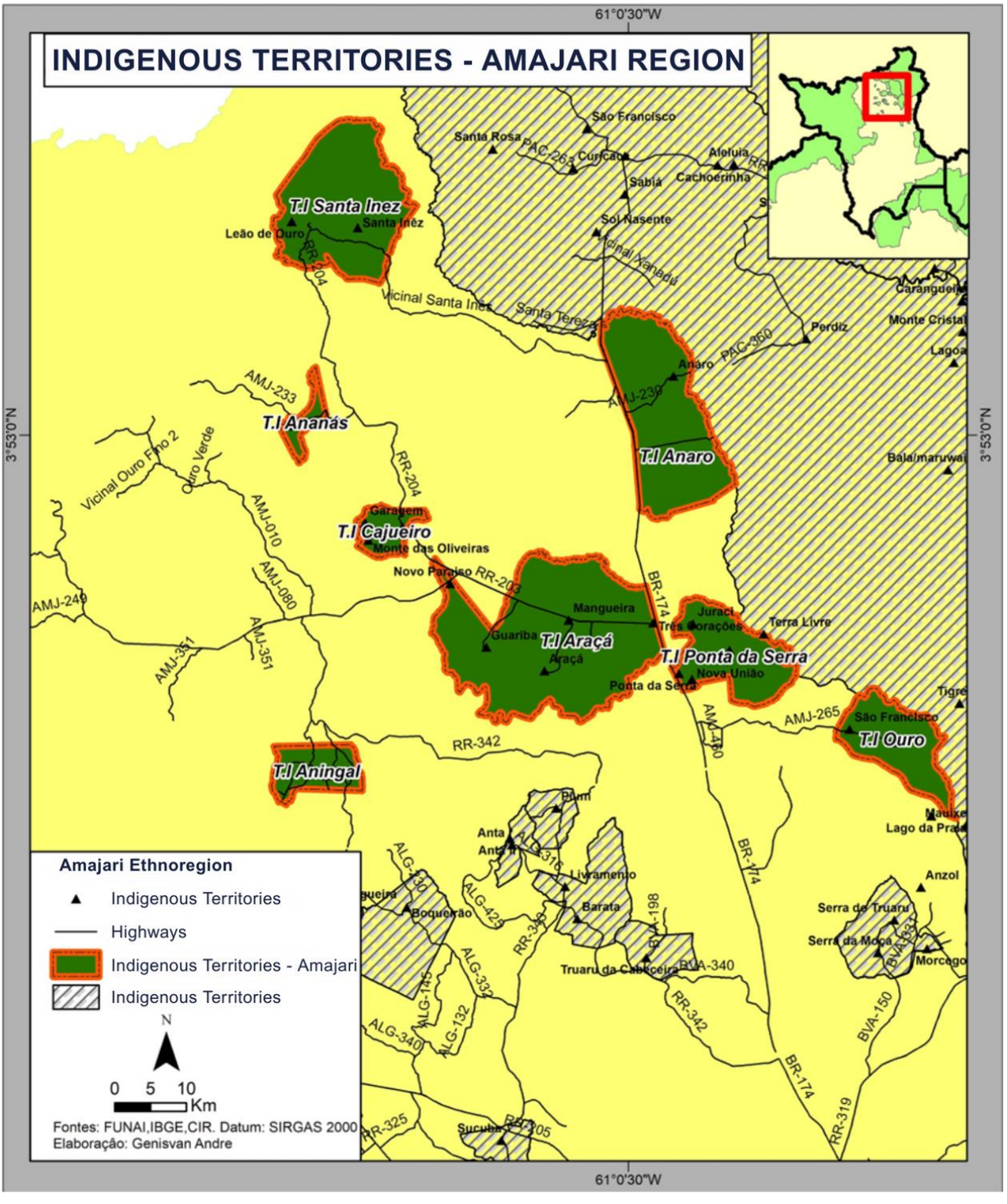
Sineia Bezerra do Vale

Amajari Region:
Indigenous Communities and Lands

The Amajari region is composed of 8 Indigenous lands, where 20 Indigenous communities live, with a population of approximately 4,000 people. Most of these lands can be considered small and were demarcated in the 1980s, a time when there was strong non-Indigenous occupation in the region through farms, which led to a fragmented process of Indigenous land demarcation by the Brazilian State. The BR 174 highway cuts through the Amajari region, marking the boundary of the Ponta da Serra, Araçá, and Anaro Indigenous lands. The state highways RR-203 and RR-204 run through the Araçá, Cajueiro, and Santa Inês Indigenous lands, which is located further north, near the border with Venezuela.

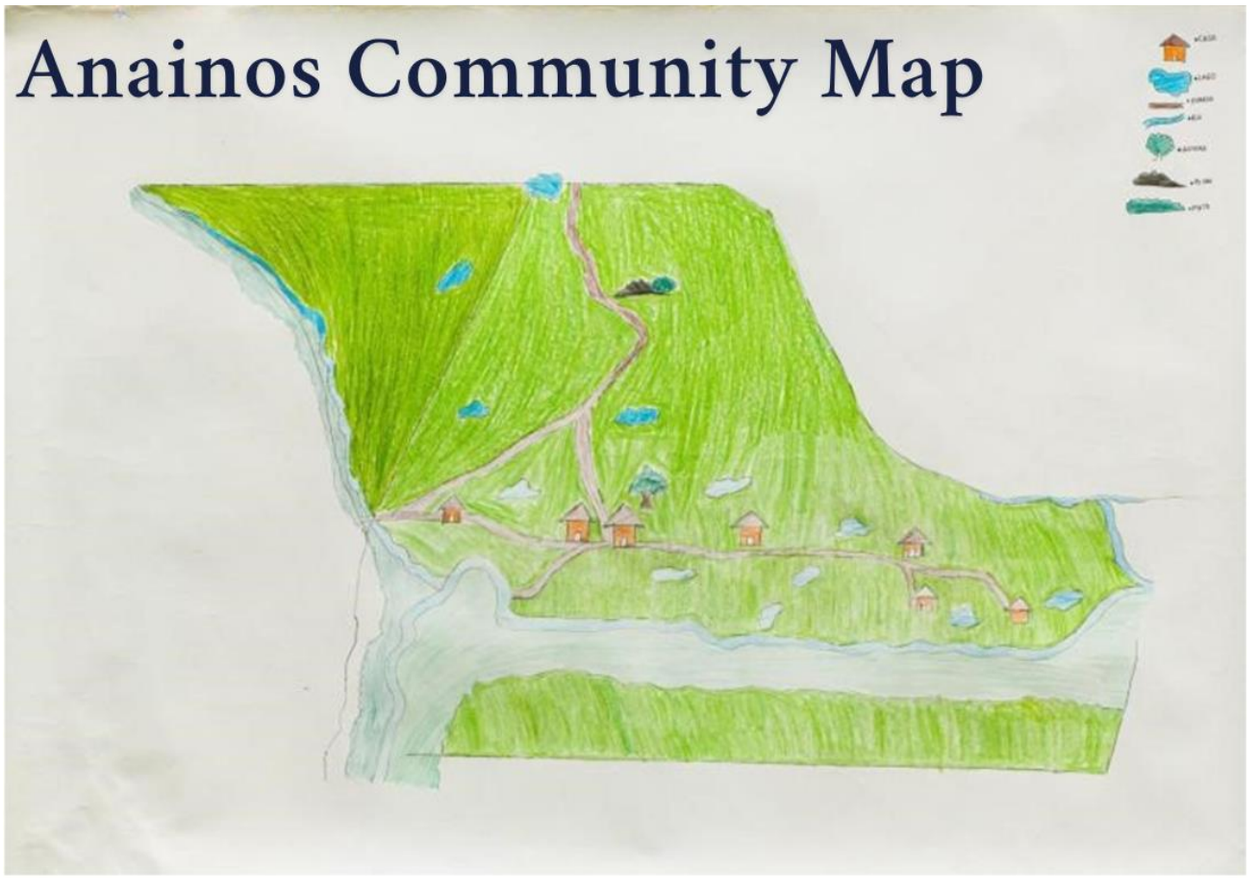
Currently, the communities in Amajari are seeking ways to live well within these lands and with the natural resources available to them, through the planning and execution of their life plans. In addition to this planning, the communities are also noticing the impacts of climate change on their ways of life.

Indigenous Lands	Communities
Ananás	Ananás
Anaro	Anaro
Aningal	Aningal Vida Nova
Araça	Araçá Novo Paraíso Guariba Mangueira Mutamba
Cajueiro	Garagem Cajueiro Monte das Oliveiras
Ponta da Serra	Juraci Urucuri Nova União Ponta da Serra
Santa Inês	Leão de Ouro Santa Inês
Ouro	São Francisco Ouro



Ananás Indigenous Land. The community that gives its name to this land was founded in 1922, but it was only in 1982 that the Indigenous land was officially recognized, with an area of 1,769 hectares.

The Ananás Indigenous land is situated amidst various farms. Access to the community is made via a rural road that crosses these agricultural properties. For this reason, there are issues regarding boundary disputes with the Flores and Acari farms, with the greatest concern being the Flores Farm, which has one of its fences crossing the Indigenous land in half, leaving the community with only half of the legally demarcated area.



The constant conflict with the farmers was one of the main reasons for the intense emigration from the Indigenous land, in addition to the lack of infrastructure. Today, despite this threat still existing, the community is organizing to once again benefit from its land. Since the beginning of the community's existence, its sustenance has come from farming, hunting, fishing, and the cattle project that the community manages. The community also has a health post and a school.

The Anaro Indigenous Land was officially recognized on January 13, 2010, and covers an area of 30,000 hectares. It is home to the community of the same name, with a population of approximately 64 people, including 21 families from the Macuxi, Wapichana, and Taurepang peoples.

The community originated from a property called Monte Vídeo, owned by a man named João Custódio Peres, who settled there with his family. From that point, his children began marrying and forming the core of this community. Today, there are 15 homes made of masonry and straw with adobe, along with houses that were previously owned by farmers and later compensated.

The economy of the residents is characterized by productive activities such as cattle projects, small animal husbandry, hunting, fishing, gathering, and agriculture, among others.

Currently, the community's Tuxaua (chief) is Mr. Cícero João Peres, who has served as Tuxaua for 29 years. In the community, there are Indigenous Health Agents (AIS), Indigenous Basic Sanitation Agents (AISAN), teachers, cowhands, and catechists.

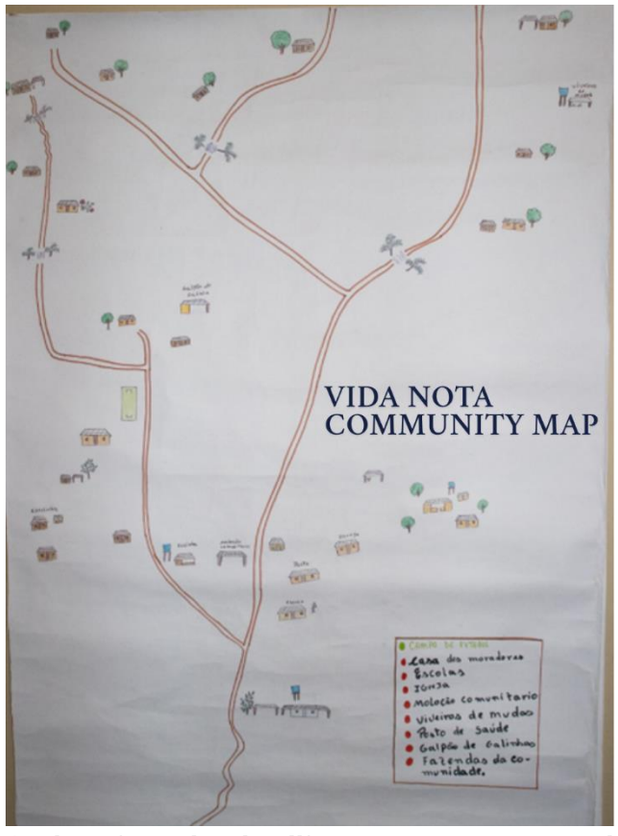
The Aningal Indigenous Land was officially recognized on February 17, 1982, and covers an area of 7,627 hectares. Currently, the population is 251 inhabitants from the Sapará, Macuxi, Wapichana, and Taurepang peoples, divided into two communities: Aningal and Vida Nova. At the time, the demarcation of the Indigenous lands in the Uraricoera River region did not take into account the dynamics of the Indigenous population, denying the recognition of a large portion of the land and reducing the possibility of having a land area with greater availability of natural resources to meet the needs of the Indigenous population. This was the case for Aningal.

In this delimitation, important areas were left out, such as the Santa Rosa River, the Santa Rosa Mountain Range, and the Maracá Island. All of these areas were historically inhabited by the Makuxi, Wapichana, and Sapará peoples.

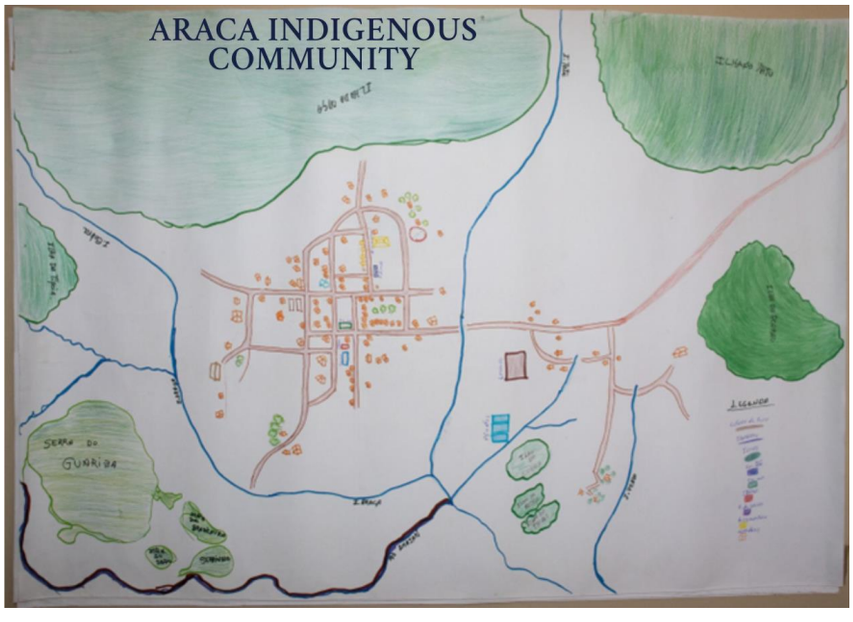
The main access to the Indigenous land is via a local road that connects to RR 342 heading east, with a ferry crossing the Uraricoera River; and heading north, it connects to the municipal seat of Amajari.

The history of the Vida Nova and Aningal communities is dynamic. In their early days, the residents practiced nomadic customs, moving from one place to another. These relocations were motivated by various reasons, including the search for better living conditions or even the marriages of children.

Among the older residents, there are: Manuel Guilherme (known as Seu Manduquinha) and Aniceto Teixeira (known as Capanga), who lived near the Aningal stream; Armando, who lived there for a time and later moved to Araçá; and others such as Antenor, Landolfo, Felix, Aquilino Sampaio (known as Aquilino Roxo), Raimundo Torreia (Raimundo Mocotó), Aquilino Gogo, João Samuel (father of Constantino), José Samuel Nascimento, and Jorge Malhado, who lived in the area and gave the name "Rebolada" to the region where the Rebolada farm is located.



At that time, the dwellings were concentrated along the banks of the Arraia stream, which offered abundant hunting, fishing, and wild fruits, in addition to areas for shifting cultivation on the Carrapato Island and other islands, such as the Ilha da Onça and Ilha da Mata Fome, now known as Contenda.



The Araçá Indigenous Land was officially recognized in 1982 and covers an area of 50,000 hectares. It is located between the Cauaruau and Amajari rivers, and the federal highway BR-174. Currently, the population is approximately 2,400 people from the Macuxi, Wapichana, and Taurepang peoples, living in 5 communities: Araçá, Novo Paraíso, Guariba, Mangueira, and Mutamba.

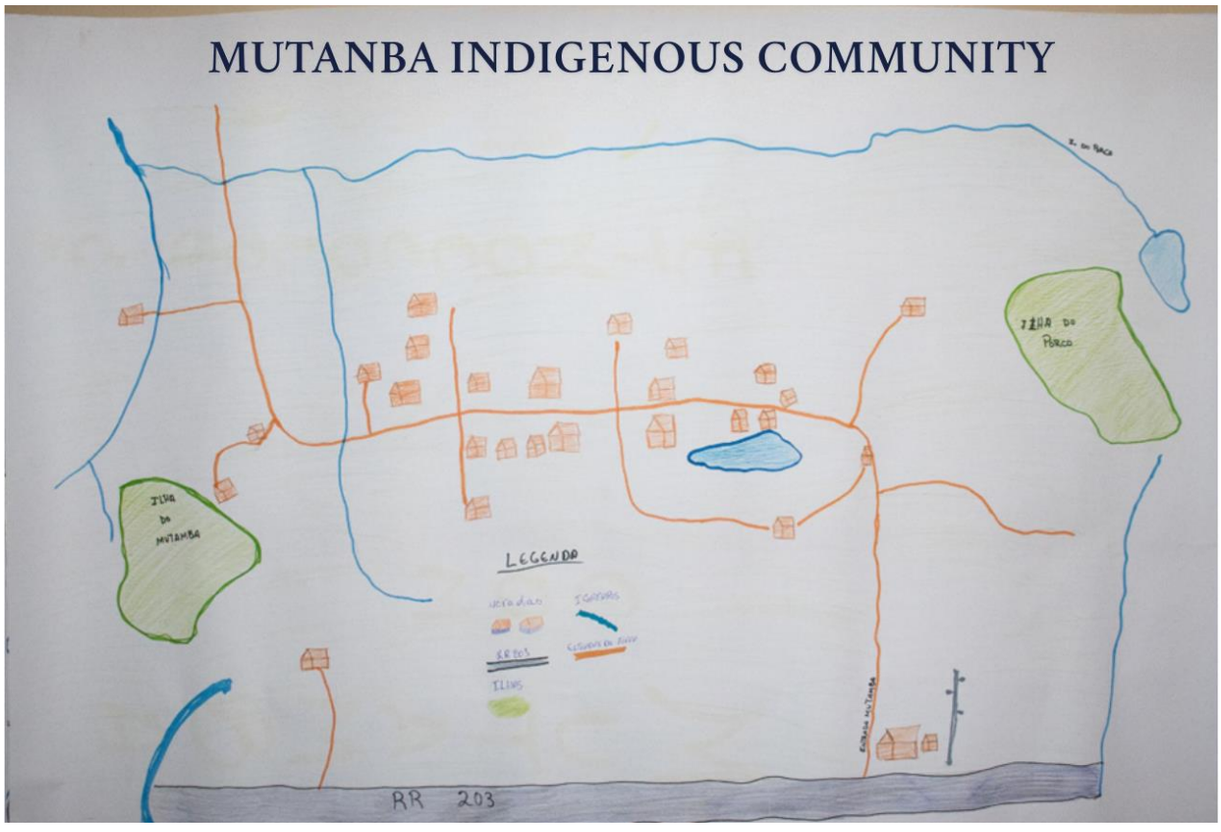
The Araçá community is the regional center of Amajari, where regional meetings and assemblies take place. The community does not have a specific founding date, but according to the records of the older residents, the first inhabitants were the Tenente families in 1960, when they arrived in the region from the Serras and Gran Sabana areas (Venezuela), from the Taurepang and Patamona peoples.

The economic activity is based on agriculture and livestock, with both communal and individual crop fields, three community-owned farms, and seven fishponds for fish farming, as well as mechanized crop plantations.

Mangueira Community Map

The Mangueira community is located on the banks of the RR 203 highway, 112 km from the city of Boa Vista. It is easily accessible, as the highway passes through the community and forms the boundary with the Três Corações and Mutamba communities.

The community is home to three peoples: Macuxi, Wapichana, and Taurepang, with a population of approximately 278 people and 78 families. There are two evangelical churches: the Assembly of God and Adventists. The older residents report that in 1918, there were already people living in this area, but it was occupied by a farmer who lived between Mutamba and Mangueira, in a place called Arurana.



Over time, the population increased and began to divide. The first residents were Mr. Dionizio, Ramiro, Andrade, and Emanuele Ribeiro. The community also has a health post, a state school, and the economic activity is based on agriculture and livestock. There re some projects that support the community's livelihood, such as fish farming and mechanized crop plantations. The community is also home to the Noemia Peres Regional Education Center (CREIANP).

The Cajueiro Indigenous Land was officially recognized in 1982 and covers an area of 4,000 hectares. It is currently home to a population of approximately 250 people, divided among the Cajueiro, Garagem, and Monte das Oliveiras communities.

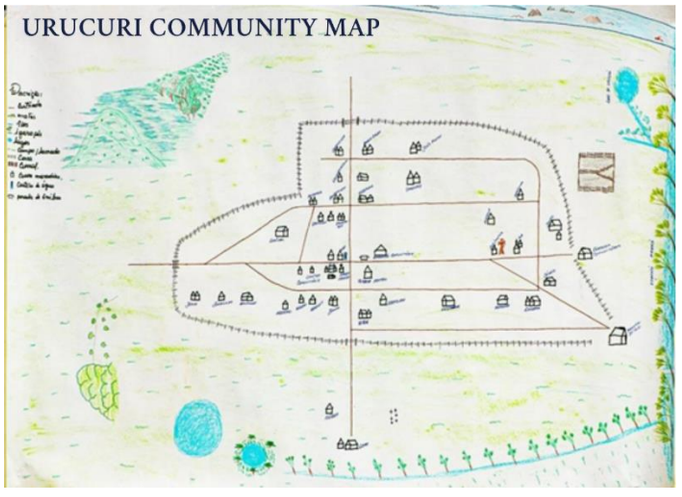
The Ponta da Serra Indigenous Land was officially recognized in 1982 and covers an area of 16,000 hectares. It is home to 5 communities: Juraci, Urucuri, Nova União, and Ponta da Serra, formed by families from the Macuxi and Wapichana peoples.

The first resident of the Ponta da Serra community was Mr. Semestres Rodrigues. In the 1980s, when the Indigenous Land was recognized, the first Tuxaua (chief) was Mr. Joaquim Padilha, along with more than seven families. At that time, the residents' livelihood depended on farming, hunting, and fishing.

Currently, the first Tuxaua of the community is Mr. Pedro Henrique dos Santos Padilha, and there are more than 23 families. Today, the community has infrastructure for electricity and 24-hour piped water, as well as a State school, a Municipal school, and a health post.

The Juraci community was originally considered as the Juraci site. The residents belonged to the Porta da Serra community, as it was organized and had the 1st and 2nd Tuxauas (chiefs). After the demarcation, the residents of the Juraci community decided to organize themselves separately from the Ponta da Serra community, leading to greater territorial occupation, cattle farming, the establishment of a school, church, farming project, basic sanitation, a health post, and the selection of a patron saint for the church.

In 1995, some residents were chosen to participate in an assembly at the Bismarck village for the official recognition of the community by the FUNAI (National Indian Foundation), the Federal Police, and the State Government. Currently, the population consists of 61 Indigenous people, with 16 families from the Macuxi and Wapichana peoples.



The Urucuri community is named after a plant of the same name and was recognized in 1982 by the then government of the State of Roraima, at the time led by Mr. Ottomar de Souza Pinto, along with three families: Mr. Valentino Soares and his family, João Alves and his family, and Edgar Pereira and his family. At that time, the main means of livelihood were farming, fishing, and hunting.

Over the years, the number of families increased, and modernization began to arrive, such as piped water, electricity, communication, internet, and federal and state government benefits like the cattle project. Currently, there are 32 families living in the community.

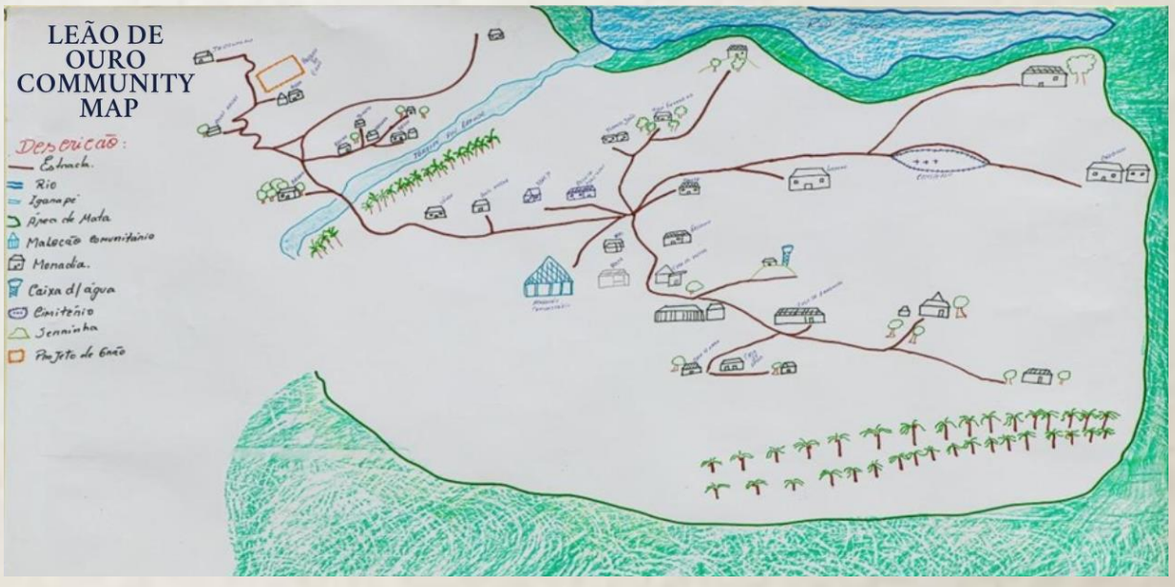
The Nova União community was founded on March 14, 2018, with Mr. Clodomir Penalisa as the first Tuxaua (chief) and Mr. Edmundo dos Santos as the second Tuxaua. At that time, the community had 17 families. The name "Nova União" comes from a union of residents formed to create the community. Today, the community is home to 21 families, totaling 72 people, and the community has a cattle project. In addition to the cattle project and the grain project supported by FUNAI, the community has three internal employees: one Indigenous Health Agent (AIS), one teacher, and one cafeteria worker. There is a health post and a municipal school of Amajari nearby. Two ethnic groups, the Macuxi and Wapichana, live in the community. Some residents still work on the land for their livelihood and receive support from various federal and state government projects.

The Santa Inês Indigenous Land, homologada em fevereiro de 1982, possui 30 mil hectares, onde vive uma população de aproximadamente 234 indígenas pertencentes aos povos Macuxi e Wapichana, divididas em duas comunidades:

The Santa Inês community has a social organization that encompasses health, education, sustainability, and other sociocultural and environmental aspects.

The Leão de Ouro community was founded in January 1990. Its first Tuxaua (chief) and founder was Mr. José Ferreira Gomes, along with 5 families, all from the Macuxi ethnicity.

The name "Leão de Ouro" comes from a farm that existed at the time in the same location, although it was initially known by the names Ilha Grande and Saco sem Boca.



Currently, the Leão de Ouro community is home to 22 families and 110 people from the Macuxi and Wapichana peoples. The community has two projects: one for cattle and another for grains. As an institution, the community has two schools—one state-run and one municipal—along with a health post.

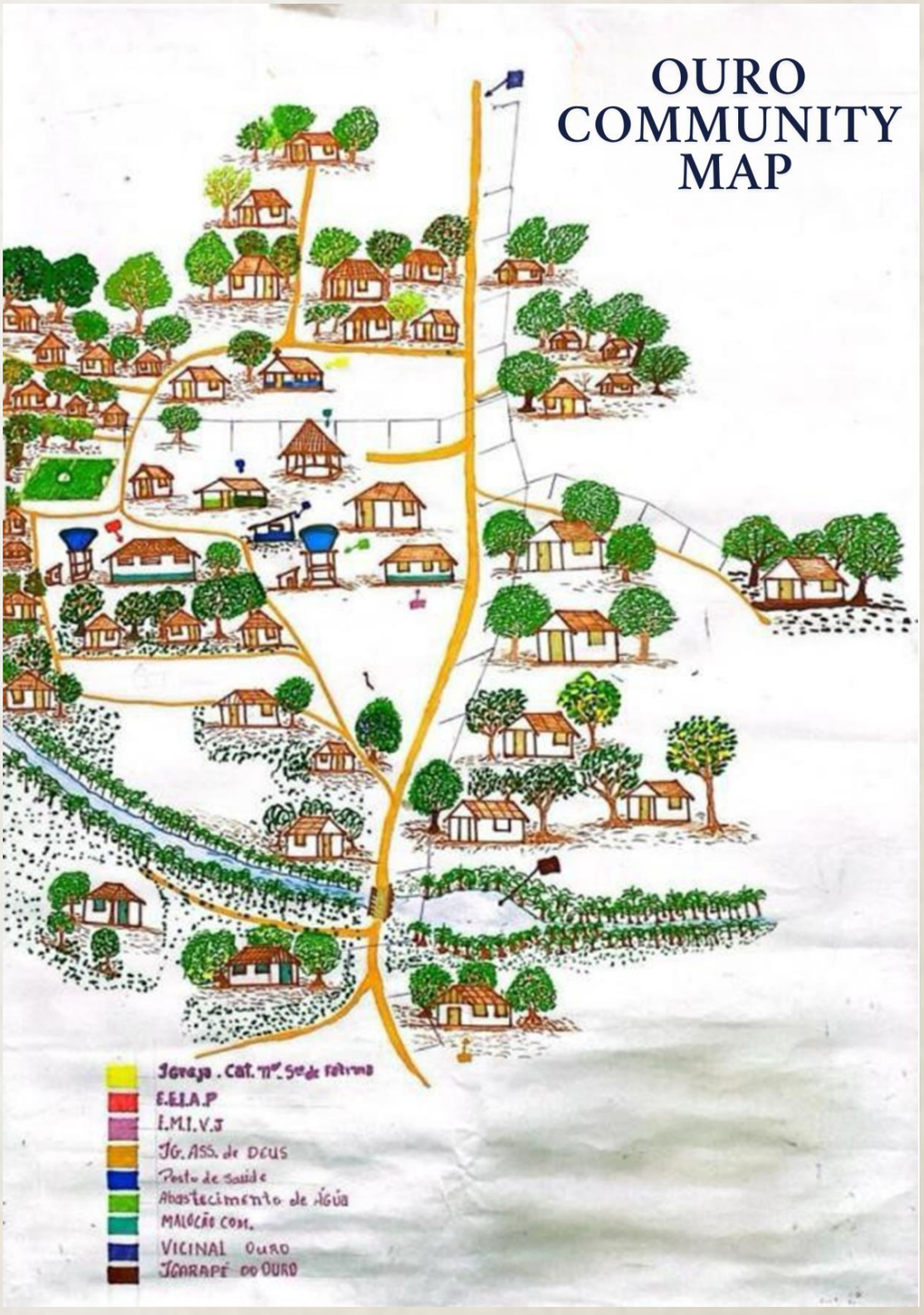
For sustenance, the residents rely on fishing, hunting, and farming..

The Ouro Indigenous Land was officially recognized in 1982 and covers an area of 14,000 hectares. It is home to a population of approximately 291 people. Today, there are two communities: Ouro and São Francisco.

The São Francisco community was populated by the children and grandchildren of Mrs. Joaquina Barnabé through her son Sebastião Barnabé. Currently, the community is inhabited by the children and grandchildren of Mr. Sebastião Barnabé, with a population of approximately 83 residents and 19 families. The community's livelihood is based on hunting, fishing, and farming.

There is a health post with an Indigenous Health Agent (AIS), Mrs. Eliane Thomé da Silva, and an Indigenous Sanitation Agent (AISAN), Moisés da Silva Roberto. The current Tuxaua (chief) is Mr. Moisés Roberto da Silva, and the second Tuxaua is Mr. Narciso Ferreira.

It is a community rich in buriti palms, fauna, flora, and mining, all of which are preserved. The more distant plantations of the community are located in the riparian forest, along the banks of the Parimé and Uraricoera rivers. The buriti palms, which line the fields in multiple rows, are, by excellence, places for harvesting straw fruits used for roofing houses. The adjacent fields are used for small game hunting and grazing cattle belonging to the village.



The Ouro Indigenous Land is composed of a single community of the same name, currently home to 264 inhabitants. Observing the concentration of houses, it can be said that the community's population is subdivided into two residential groups, consisting of 71 families from the Macuxi and Wapichana ethnicities.

The Ouro Indigenous Community was populated between 1910 and 1920, with the arrival of Mrs. Joaquina Barnabé's family, along with her husband Domingo Barnabé and their nine children—five women and four men. They were named: Júlia Barnabé, Lavina Barnabé, Iracema Barnabé, Bibiana Barnabé, and Jandira Barnabé, as well as the men Sebastião Barnabé, Barnabé, Aristide Barnabé, and Januário Barnabé. The family's aim was to raise animals and plant crops.

As the years went by, a man claiming to be a gold miner asked Mrs. Joaquina Barnabé for permission to try his mining tools, and he ended up discovering minerals with traces of gold in the main stream. Since then, the place began to be identified as Ouro (Gold).

Socially, the Ouro Community has a health post, and there are also two churches: Catholic and Evangelical. The Catholic church is well-structured and made of masonry; it was inaugurated on May 13, 2008, and its patron saint is Our Lady of Fatima. In 2002, the Evangelical Church of the Assembly of God was established in the community.

The first large communal building (malocão) was constructed in 1998 by the community itself. In 2007, the community obtained a gravel-paved road, improving access. Currently, the community has the "Luz para Todos" program (electricity for all), which has significantly improved communication

The community's economy is based on hunting, fishing, agriculture, livestock, and social benefits from government programs such as Bolsa Família (Family Allowance), social credit, pensions, as well as income from health agents and education professionals. Agriculture is focused on growing cassava, corn, bananas, pineapples, and sweet potatoes. The community produces a lot of flour and sells small amounts to help cover household expenses. Livestock farming involves raising cattle, pigs, and horses.

In the Indigenous land area, there are two farms built by the community to receive cattle projects from other communities. Community projects include: "Chuva na Roça" (Rain on the Farm), passion fruit cultivation, cattle projects, and a farming project supported by FUNAI (National Indian Foundation) exclusively for women. FUNAI projects and the M+ project last five years in the community before being transferred to other locations.

In the community, a cowboy (vaqueiro) spends one year on the farm. The cattle are divided into thirds with the community. When the cattle are well cared for, the cowboy can brand up to 13 head of cattle, and the community keeps at least 22 head of cattle. The cowboy's stay can be extended for another year if the farm and cattle are well cared for. Every year, cattle branding and cowboy exchanges are carried out when possible.

This is a general overview of the communities and Indigenous lands in the Amajari region. In the next section, we present the results of the study on how the communities are perceiving the effects of climate change through their traditional practices of planting, hunting, fishing, and the extraction of fruit-bearing plants.

Traditional Practices and Climate Change

ANINGAL COMMUNITY CULTURAL CALENDAR

JANUARY
Preparing of the planting fields: machete, woven basket, axe, how, baby agouti, baby armadillo, and nesting yellow-spotted river turtle

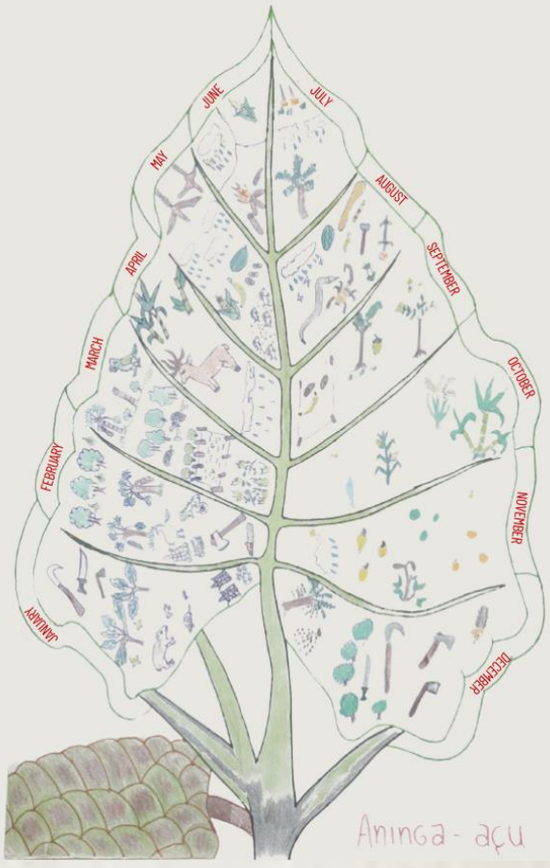
FEBRUARY
Mango tree in bloom, macucau buriti palm fruiting, chameleon laying eggs, and cleaning of the planting field

MARCH
Slash-and-burn of the planting fields, cleaning. Cuivará jabuti laying eggs and parrot laying eggs

APRIL
Winter, sugarcane planting, deer with fawn

MAY
Winter, planting seasoning in the traditional fields and fish spawning season

JUNE
Winter, corn harvest and traditional festivities



JULY
Winter rainy season, cleaning of the planting fields and fruit of the moto tree: tucumã

AUGUST
Harvest of the traditional field crops: watermelon, squash, banana, sugarcane, banana, pineapple. Month of venomous snakes, scorpion clearing, and heavy rains during the winter season oral)

SEPTEMBER
Harvest of the traditional field crops, wild fruits: Jauari, tucumã, pitomba, tangerine. Summer

OCTOBER
Harvesting of corn, rice, sugar cane, summer

NOVEMBER
Boiaçu rain: occasional light drizzle, cashew, jatobá, lime, orange and cajui

DECEMBER
Wood-boring, felling tools: axe, machete, chainsaw, hoe, bacaba

Plantations

Our communities in the Amajari region have their ways of life directly connected to nature and the climate cycles. Virtually all families have their plantations for self-sufficiency, selling the surplus.

Farming is done in a traditional way, using tools like hoes, clearings, burning, and swiddens. The most commonly cultivated agricultural products are: corn, rice, beans, bananas, cassava, manioc, sugarcane, watermelon, pumpkin, pineapple, sweet potatoes, yam, papaya, and chili peppers.

Cassava plays a central role in our production system. In the communities, various products derived from cassava are found, such as flour, tapioca flour, caxiri (a traditional drink), and manioc cake.

In general, Indigenous farmers throughout the region have noticed a decline in soil fertility in the areas of fallow land used for cultivating crops, associated with increasingly shorter resting cycles. Climate change is also impacting these dynamics, altering the timing of each stage of work in the plantations.

In the reports from the residents of the Vida Nova community, Aningal Indigenous Land, they stated that the climate has changed significantly in recent times. Twelve years ago, the traditional calendar worked, and they knew the right time to plant and harvest. One of the main perceptions in recent times is the heat and out-of-season rain.

Wendy Loyane da Silva, 28 years old, Wapichana, who lives in the Anaro Indigenous Land, observes that:

> *""I noticed that the weather has changed. We used to have distinct seasons, like summer and winter, but today the weather is unpredictable. For almost three years now, the rivers haven't dried up. And all these changes have indeed affected the community. What happened is that with the extended winter, many residents couldn't plant their crops, and because of that, today here in the community, we don't have any flour. It's quite critical, and in order to avoid being without flour, many have gone to buy it in other places, like in the city."*

This is also observed by José Guilherme, 64 years old, from the Health Council and Catechist:

> *""Before, we had a set time for farming, planting, and harvesting. Today, we can say that not everything is going well. In these times of change, our productivity is not of good quality. When it rains, it rains too much, and when it's summer, it gets too hot, which affects the crops and causes them to spoil. Because of this, today I no longer have any plantations due to the uncertain weather."*

Mrs. Dejanira Maria da Cruz, 90 years old, also observes that the climate has changed a lot, especially during the rainy season. In recent years, it has rained a lot, and the rivers no longer seem to dry up. For her, nature is different; the plants no longer bear fruit at the right time. The summer is very hot—when there is summer, it is extremely hot—and when it rains, it rains excessively. Due to these changes, she has seen that many people have been affected, such as with farming, where many were unable to prepare the land for planting.

Maniocas (cassava roots) are essential for the reproduction of various types of cassava plantations and are the foundation of Indigenous agriculture.

If the weather continues like this, these maniocas may be lost, as it is making planting more difficult.

Main Types of Maniocas in Amajari		
Types of Maniocas	**Característica**	**Type of Use**
Amazonas	Yellow cassava, thin leaves	Caxiri and Flour
Cariri	White cassava	Caxiri and Beiju
Tucumã	Yellow cassava	Caxiri and Beiju
Seis meses	Branchy, heavy, white	Flour, Caxiri, and Beiju
Buriti	Large leaves	Flour
Urubu		Flour and Caxiri
Camaleão	Tall stems, climbing	Carimã and Flour
Vermelhão	Red manioca, white cassava	Caxiri and Flour
Macaxeira	White, white leaves	White Flour
Lamparina	Red skin, purple manioca	Flour and Carimã
Cariri	Red	Flour
Caititu	Red manioca, white cassava	Flour and Caxiri
Maracanã	White manioca	Beiju
Traíra		Flour, Caxiri, and Beiju
Jiju		Flour, Caxiri, and Beiju
Pato	Yellow	Flour and Caxiri
Veado	Yellow	Flour and Caxiri

The same perception is shared by the residents of the Araçá Indigenous Land. Valdecir Bento Filho, 46 years old, a teacher, observes that the climate has changed a lot in recent years. "We no longer know when it is winter or summer, and during the summer, it has caused many wildfires."

According to the teacher, "In the past, we had a cultural calendar and knew the winter and summer periods, but today we don't. We no longer know when to plant; everything has become uncertain.

Before, we would plan month by month, knowing exactly when to plant. In 2018, our community suffered greatly from the summer, the streams dried up completely, and our territory now only has two islands that can't be preserved. The land is already degraded, and we've suffered a lot in our region. The land is small, so many people stop planting crops, and we have fewer varieties of maniocas."

Residents of the Ouro Indigenous Community scraping cassave – Archive/CIR

The following are other reports from residents of different communities in our region, confirming the same perceptions:

Edilson Dilson dos Santos, 44 years old, Tuxaua (chief) of the Mutamba community, school manager, and coordinator of the grain project. The weather has changed a lot, and wildfires have been a factor in this transformation. This has interfered a lot and caused me to lose all my bean crops last year, in 2022. We try to preserve the seeds in PET bottles so they don't get lost.

Charlene Carla de Campos, 42 years old, teacher, Mutamba community. I live in the Mutamba community, and I see that in recent years, the temperature has become very hot, which could even cause diseases in humans, plants, and all living beings. In 2011, there was a lot of flooding, and since that time, everything changed. There have been times of heavy rains, times of severe drought, and out-of-season rains, which have caused a lot of disruption. With the droughts, the crops didn't yield, the land dried up, it was tough, and with the wildfires, the land became even more degraded. The maniocas I know are the six-month type, which is good and grows fast. Here in the backyard, we mainly plant manioc, bananas, and sugarcane, which I brought from other communities, and they adapted well to the area here. I believe the best way to preserve seeds is by replanting them every year.

Sheila dos Santos, 48 years old, teacher. Climate change has been a factor in the destruction of forests, the drying up of rivers and streams, and the changes in weather. We no longer know when it will rain or when it will be summer. This has interfered with crop planting and food production; the plants can't withstand so much heat. Few people have plantations nowadays, as many couldn't plant. In the past, maniocas came from other communities, brought by the elders, but now everything they have is passed down from generation to generation in the community.

Antônia da Conceição Pereira da Silva, school manager, 62 years old, living in the Mangueira community. The weather has changed a lot in the last 20 years, and sometimes we don't notice what is happening—the climate has gone off track. Pollution has been one of the impacts on nature, and waste is a very serious problem. I believe that since the advent of technology, things started to change, like air pollution from cars. In our community, there hasn't been much drought; in 2021 and 2022, it rained heavily, and this year, 2023, seems to be normal. Climate changes have interfered a lot in our communities, especially in agriculture—sometimes drought and then heavy rain, which can cause thermal shock in the land, making our crops 'cook.'

Today, the practice of preserving seeds has been lost, as few families still have this tradition. In the past, we used 'atilhado,' which was a way to store corn.

Clemildes Melissa Duarte da Silva, housewife, 26 years old. The weather has changed; the temperature has been very high, and it feels like the sun is closer to the earth, just like the cold is also more intense. I think that since our community is right by the highway, cars pass by constantly, and the air becomes polluted. The wildfires are also polluting the air, which is pure, and this is degrading and affecting the forests. Now, we only use the fallow land, and production isn't as good.

Marinalda Lourenço Tenente, 48 years old, teacher, highlights that Climate change has caused a lot of disruption in the communities, and it has affected our traditional knowledge.

planting and harvesting have changed a lot. Today, when there is production, it's not good quality. For example, bananas and manioc, even in the backyard, don't produce good results, even with irrigation.

Olgaildes Ribeiro dos Santos, 68 years old, farmer: I've never seen the weather change this way. Climate changes used to happen according to summer and winter, but now it's different. The weather has become unpredictable, it's raining out of season, and this affects the way we live in our communities. Due to our cultural calendars for planting, it's no longer possible to plant at the right time, and the production is of poor quality. During this period of rain, the cassava spoiled, and we couldn't take advantage of it

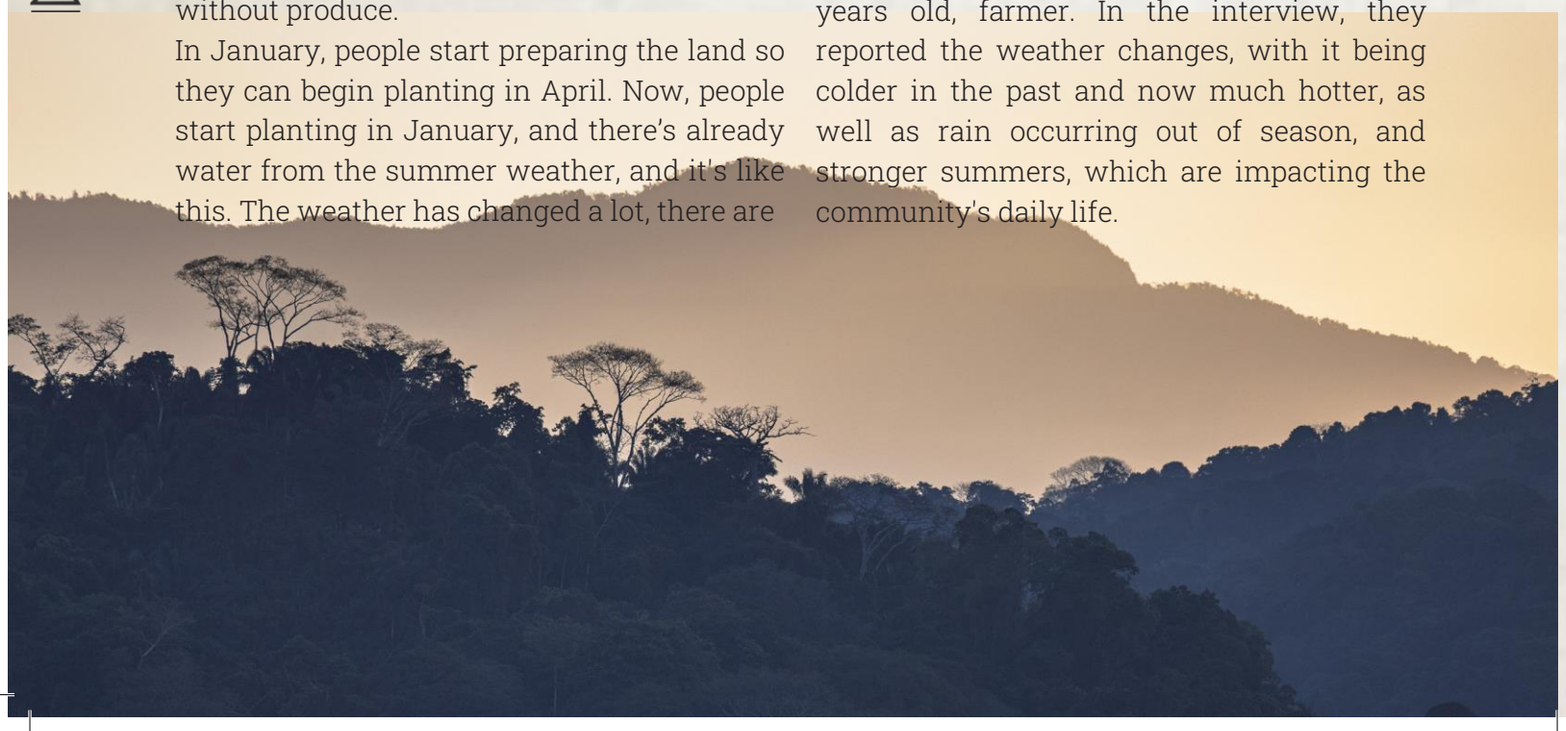
Many people in our community have the habit of storing seeds in glass bottles, like beans, watermelon, and melon. Corn ears are stored in kitchen shelves, as the smoke helps prevent pests and preserves them.

In the Cajueiro Indigenous Land, Aldenir Santana, 37 years old, farmer, observes planting has changed a lot for those who depend on farming. The areas are already degraded, and now there are wild pigs that have ruined the crops, leaving many people without produce.
In January, people start preparing the land so they can begin planting in April. Now, people start planting in January, and there's already water from the summer weather, and it's like this. The weather has changed a lot, there are no more distinct seasons, and these changes have already interfered with our productive activities.

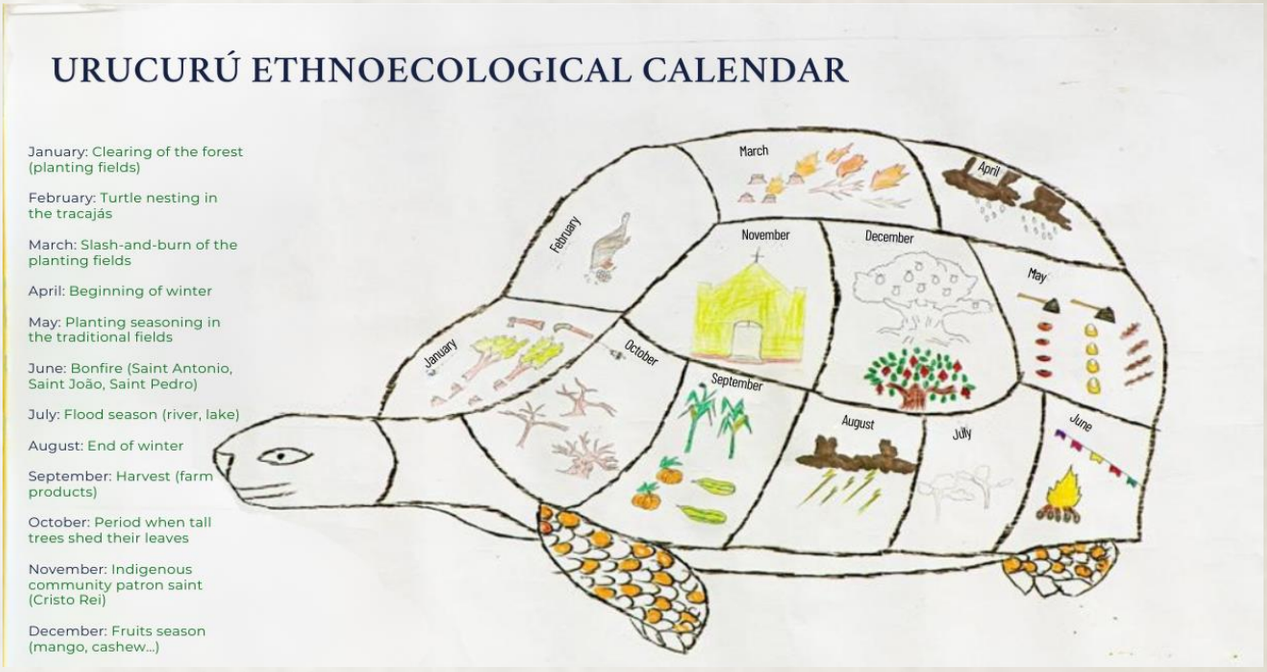
Paulo Arfeles Silva, 62 years old, 2nd Tuxaua of the Monte das Oliveiras community. This year (2023) is very hot, and these climate changes have indeed interfered because the farm is near the river, and last year we had flooding, which destroyed the crops.

Anizio Minguel Simplicio, 71 years old, former first Tuxaua of the Cajueiro community, observes:
"Climate changes have interfered with production, especially too much rain, because the farm is near the river. He also recalls a method of preserving products, which is storing manioc in clay pots; it preserves it well.

Based on the interviews conducted in February 2023 with residents of the São Francisco community in the Ouro Indigenous Land, it is evident that the same climatic reactions are being observed. The rainy season has changed, and the consequences are clearly detected in the plantations. This has affected the residents' lives significantly, as reported by Elmar Rosa, 49 years old, Indigenous Health Agent (AIS), Janaina Silva Souza, 31 years old, municipal teacher, and José Luiz Rosa, 64 years old, farmer. In the interview, they reported the weather changes, with it being colder in the past and now much hotter, as well as rain occurring out of season, and stronger summers, which are impacting the community's daily life.



Hunting



Ethnoecological Calendar of the Urucuri Community – Ponta da Serra Indigenous Land

Hunting is also practiced in a traditional way on the Indigenous lands in our region. Currently, game animals are found more in some lands and less in others due to many factors. It is possible to identify that in some places, there is still a balance in the presence of certain animals, while in others, there is an imbalance, with animals like wild pigs invading and destroying the families' crops.

In the Aningal Indigenous Land, for example, common game animals such as peccary, armadillo, deer, tapir, paca, agouti, and wild boar can be more easily found due to the proximity to the Maracá Island, which is a preservation area, and the farms surrounding the community.

For many of the people interviewed in this area, it is possible to say that some species have remained the same, but others have indeed decreased, primarily due to the presence of farms near the Indigenous communities. Many believe that if the community had support for monitoring, the types of game and fish could increase. It would be beneficial to have a monitoring team stationed at the entrance of the communities.

In any case, in the past, when we went hunting, we could find game easily, but it's no longer like that. The reason is the lack of control over hunters who are not authorized by the community. But we must preserve these animals, otherwise, they will decrease, and it will become even more difficult for us to access this source of food for our families. We need monitoring within our communities.

One of the factors that explain these changes is the increase in the number of residents and more hunters in the community. In addition, the increasingly frequent wildfires drive the game animals away. This is also happening with fish, which has significantly decreased because, in the past, the first residents who went hunting and fishing could find them quickly.

If we don't take care, this availability will decrease even more. That's why we need to preserve, we need monitoring in our communities, and we must discuss all of this in our meetings.

Main Game Species Found in the Region		
Tipo	**Caracterísitics**	**Where It Can Be Found**
Caititu (Collared peccary)	Black	Forest, savannah
Capivara (Capybara)	Red, tailless	Rivers, lakes, and streams
Tatu (Armadillo)	Thick skin	Forest, lakeside, and cerrado
Veado (Deer)	Red with a reddish-brown saddle, dark red bush	Forest, riverside, and cerrado
Jabuti (Brazilian Tortoise)	Hard shell, red and yellow	Forest and cerrado
Jacaré (Caiman)	Greenish leather, rough	Rivers, lakes
Tracajá (River turtle)	Smooth dark shell	Rivers
Paca (Paca)	Red, bi-colored, with spots	Forest, riverside
Marreco (Duck)		Rivers and lakes
Pato (Duck)		Rivers and lakes
Cutia (Agouti)	Small, tailless, red	Mata, beira de rio
Porcão (Wild boar)	Large and black	Forest, lakeside, and rivers
Queijada (Peccary)	Black, with tusks	Forest, savannah

In the Araçá IIn the Araçá community, the perception is that hunting has practically become extinct. Occasionally, a wild boar appears, coming from other islands. Lately, we talk a lot about preserving the forests, but pollution continues to grow. Even though we have many hunters, we no longer have game animals; even the tortoises are disappearing.

In the past, it was common to find game nearby and quickly, but nowadays it's not. In the 1970s, the game would reach the yard of the house; now, it's no longer even found in the forest. We can still find armadillos, tortoises, and pacas, but the wild boars have been a loss for us, as they come fleeing from other places. It is important for us to respect the breeding periods of the animals.

Among the explanations for the scarcity of game, one factor is that in Araçá, we don't have forests, only small riparian forests, and they are always being burned. The wildfires have affected the forests, and the animals have fled to other forests farther from our land.

Another factor is the increase in population. The deer are no longer found, but we can still find armadillos, pacas, and tortoises.

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The hunters did not respect the breeding times of the females. On the islands, we can still find pacas, armadillos, agoutis, and tortoises, but the deer have almost become extinct on our islands.

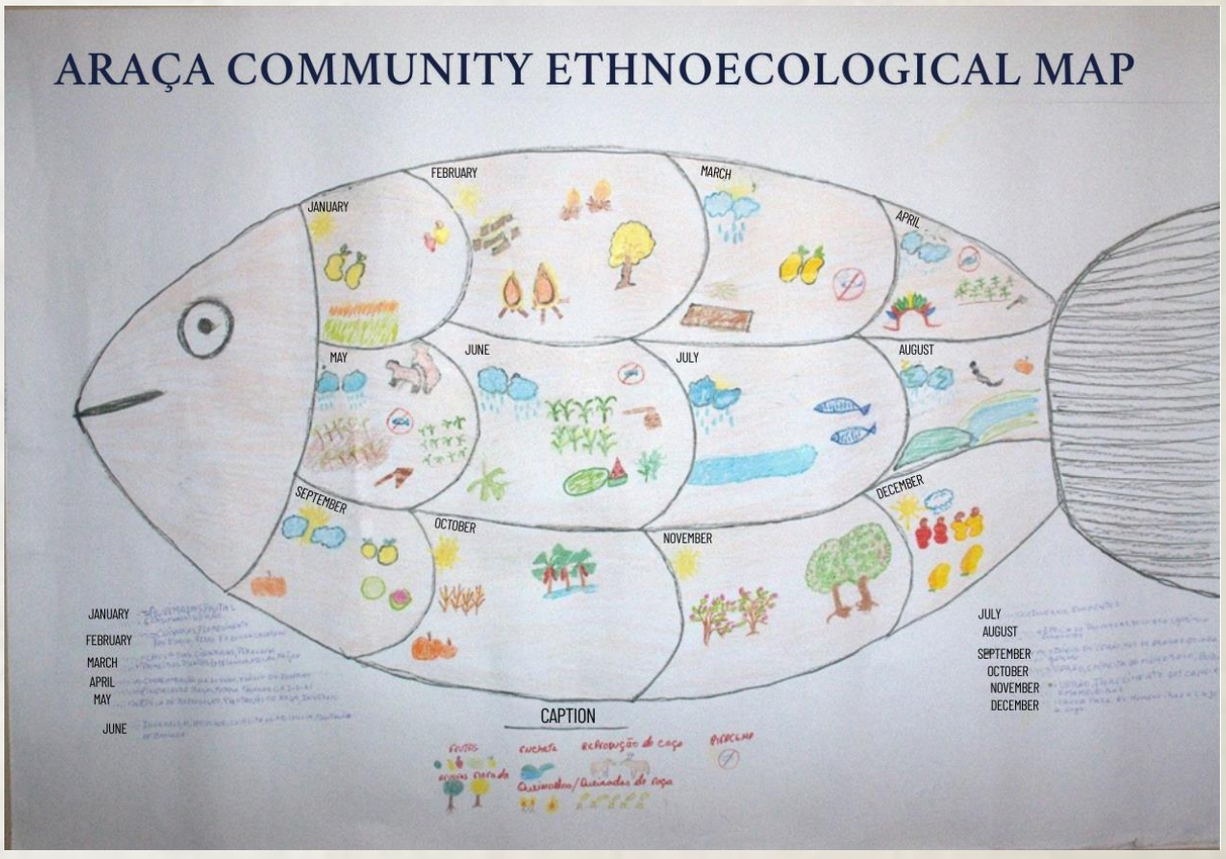
Awareness is the foundation of conservation and preservation of animal species. Respect for game animals is important, remembering that they also have their own breeding periods. Without this, the tendency is for their numbers to keep decreasing.

Things have become more difficult, even

There is no longer space to plant crops in the community, so people start clearing virgin forests, where the animals live, and they get scared and leave.

In the Cajueiro community, the reports indicate that hunting has increased in recent times, such as with wild boars. In the Garagem community, the increase in the presence of wild boars has caused damage to the crops. Some residents no longer plant crops because the wild boars attack the plantations.

Fisheries



In all the communities of the Amajari region, fishing is practiced in a traditional way, as one of the alternatives that families use to supplement their food and income. The fishing tools used include: gill nets, longlines, fishing line, hooks, barrels, and canoes.

In the Aningal Indigenous Land, there are three important streams: Saúba, Anigal, and Arraia. For the most part, they are bordered by tree vegetation, primarily the buriti (Mauritia flexuosa), which forms concentrations (buriti groves) along the streams. Together

With the buriti trees, the development of riparian forests may also occur. There are also small depressions that form lakes, which are generally isolated or partially drained by streams: Sela Lake, Alvorada Lake, Aquilino Roxo Lake, Cambú Lake, Tracajá Lake, Salvador Lake, Calixto Lake, and Égua Lake. While some lakes are temporary, filling during the rains and drying up in the summer, others are perennial or dry up during long droughts, occurring at intervals of ten years or more.

summer, others are perennial or dry up during long droughts, occurring at intervals of ten years or more.

The regional perception is that there is a decrease in fish populations. The reasons are likely the same as for the decline in game, such as climate change, primarily the droughts, wildfires, and the increasing population in the communities. However, we need to take action to prevent further reduction.

Main Types of Fish Found in the Region		
Types of Fish	**Característics**	**Where It Can Be Found**
Pacú	Round, shiny	River
Sulamba/Aruana	Long and with thick scales	River
Jaraqui	Shiny scales	River
Cara	Round	River
Curimatã	Shiny, hard scales	River, lake, stream
Aracú	Yellowish scales, spotted	River, lake, stream
Piranha	Black scales, red scales	River, lake, stream
Jaraqui	Shiny scales	River
Cucuiu		River
Jiju	Dark, smooth	Stream, lake
Pirara		
Pirandirá	White, with teeth	River
Pacu	Flat, round, small scales	River, lake
Curimatã	Scales, spotted with a greenish tint	River, lake
Cará	Black scales	River, lake, stream
Jacunda	Reddish scales	River, lake, stream
Pirarucu	Reddish with shiny white	River
Pescada	Shiny, small scales	River
Traíra	Black scales	River, lake, stream
Cascudo	**Cascudo** (species of armored catfish)	Rivers
Jiju	Dark, smooth	Stream, lake
Jaraqui	Small, shiny scales	River and lakes
Pirandirá	White, shiny, with teeth	River
Pongo	Gray	Stream

Jacundá	Red and spotted	River, stream
Cara	Dark scales	River, lake
Aracú	Yellowish scales, spotted	River, lake, stream
Surubim	Black with white spots	River
Tucunaré	Yellow Açu, deer-spotted	River, lake, stream

In Araçá, the fish are no different; we only have two streams that pass through the community. The Amajari River is a bit far, and the fishermen use nets during the piracema season, which has prevented the fish from swimming upstream and spawning. We need more monitoring by environmental authorities during the piracema season.

Fishing during the dry season has not allowed the fish population to increase, so the fish are not

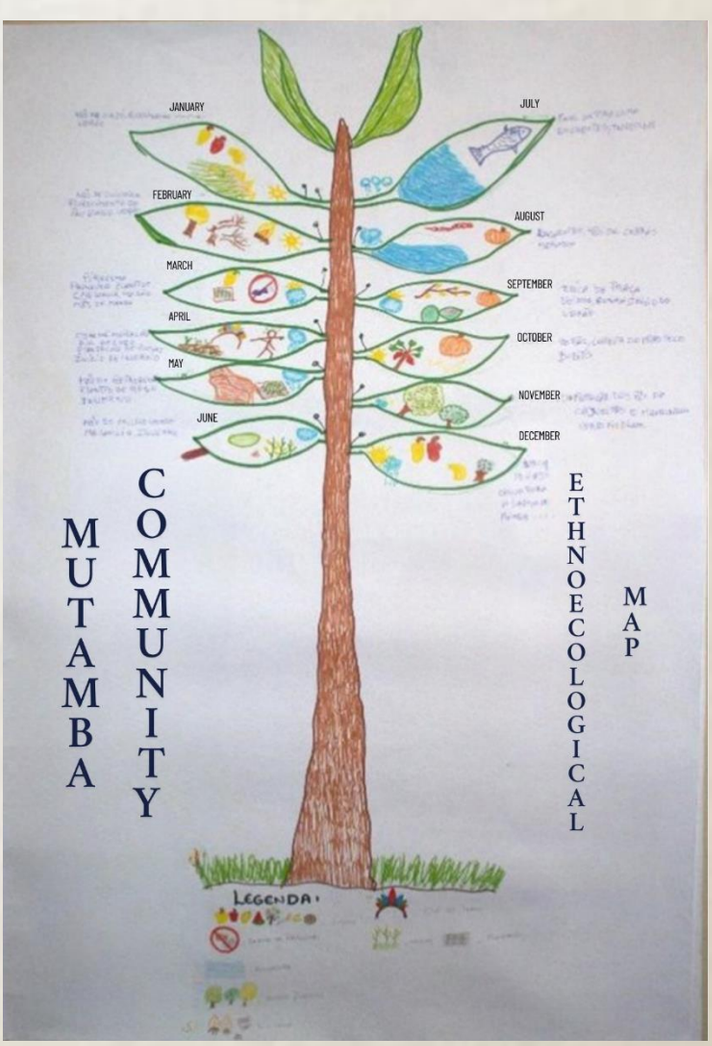
The fish have not been able to swim upstream. One of the interviewees highlighted that increased monitoring can help a lot to prevent these types of fishing practices.

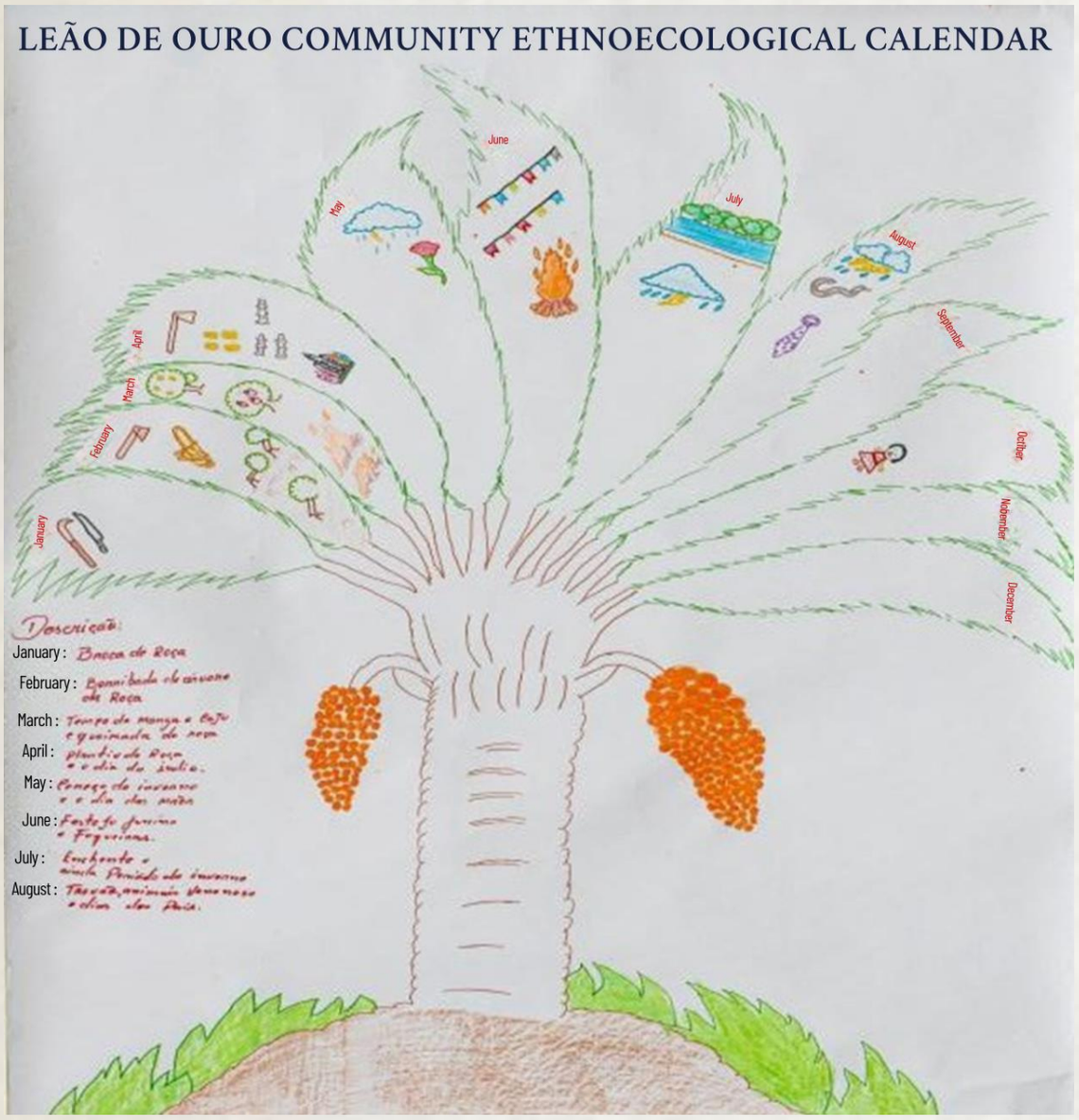
Despite this perception, some people still believe that there are always small fish in the streams, and in the river, they can also find larger fish, such as surubim, filhote, and others. To prevent the fish from disappearing, we should avoid fishing during the piracema season.

Fruit Trees

In the communities, various types of fruit trees are found. In many places, interviewees emphasize that if we don't plant, even the fruit trees will disappear, they will be gone. The residents are noticing that the fruit trees are gradually disappearing.

Similarly, the trees in the forest have also decreased. "I remember that in 2012, I would go out to collect wild fruits, such as jenipapo and mirixi, and find them easily. Today, they are no longer found," reported a resident from Aningal.





There was a time of severe drought in the community, and the trees began to dry up. When the rainy season arrived, there was plenty of rain, but the trees did not revive. It would be good to carry out reforestation of these plants.

In the Araçá community, bacaba, for example, is a wild fruit collected in the forests during the winter and is only for personal consumption. Other typical fruits that serve as food include: tucumã, jatobá, cajuí, jutaí, pitomba-do-mato, mata-fome cabeça-de-macaco, and inajá.

These fruits are dying due to lack of care.

The fruits are also dying due to the age of the plants, and thunderstorms also interfere in this case. Wild fruits are also becoming scarce.

The older residents say that in the past, there were many fruits, but nowadays, they are not seen as often because the younger residents do not want to plant, and the soil is not like it used to be—meaning, it's no longer fertile. There are also many thunderstorms during the winter season.

One solution to this problem would be to establish a nursery planting, and the same applies to the wild fruits..

Main Types of Fruit Trees Found in the Region		
Fruits	**Característics**	**Consumption**
Guava	Branchy	
Orange	Thorny, sweet and sour fruit	Juice, pure, medicine
Banana	Green, large and wide leaves	Porridge, pure, fried, cooked
Cashew	Branchy	Fruit, sweet, juice, mocororo (a type of fruit-based dish)
Lemon	Thorny, sour	Juice, medicine
Olive	Tall, black fruits, small, round	
Mango	Tall, large tree	Juice, sweet, edible
Coconut Tree	Tall, long branches	Coconut candy, water
Guava	Tall, branchy	Sweet
Coconut Tree	Tall, long branches	Coconut candy, water, edible
Ingá	Large, branchy	Juice, sweet, edible, medicine
Papaya	Tall	Juice, sweet, edible, medicine
Pomegranate	Short, full of thorns	Edible, medicine
Araçá	Small, small fruits	Juice,
Ingá	Large, branchy	Edible
Papaya	Tall	Juice, sweet, edible, medicine
Buriti	Tall, red and round fruit	Juice, pulp, uses the straw for covering houses
Pitomba	Tall, brown and round fruits	-
Jatobá	Tall, long fruits	-
Tamarind	Tall, sour fruits	Juice, medicine
Coconut	Tall, green and round fruits	Water
Watermelon	With branching	Juice, fruit

The use of the high forest areas on the islands causes a reduction in the availability of important resources. This implies a decrease in habitats for wild animals, such as agouti, paca, armadillo, deer, peccary, agouti, monkey, howler monkey, tamandua, skunk, irara, marajá cat, fox, and jaguar, as well as bird species: mutum, jacú, aracua, nambu, toucan, parrot, curica, juriti, galega, soco-boi, macaw, heron, curicaca, and plover. Currently, there is some concern about reforestation.

of the fallow lands and the conservation of the forest species on the islands that have more intact vegetation.

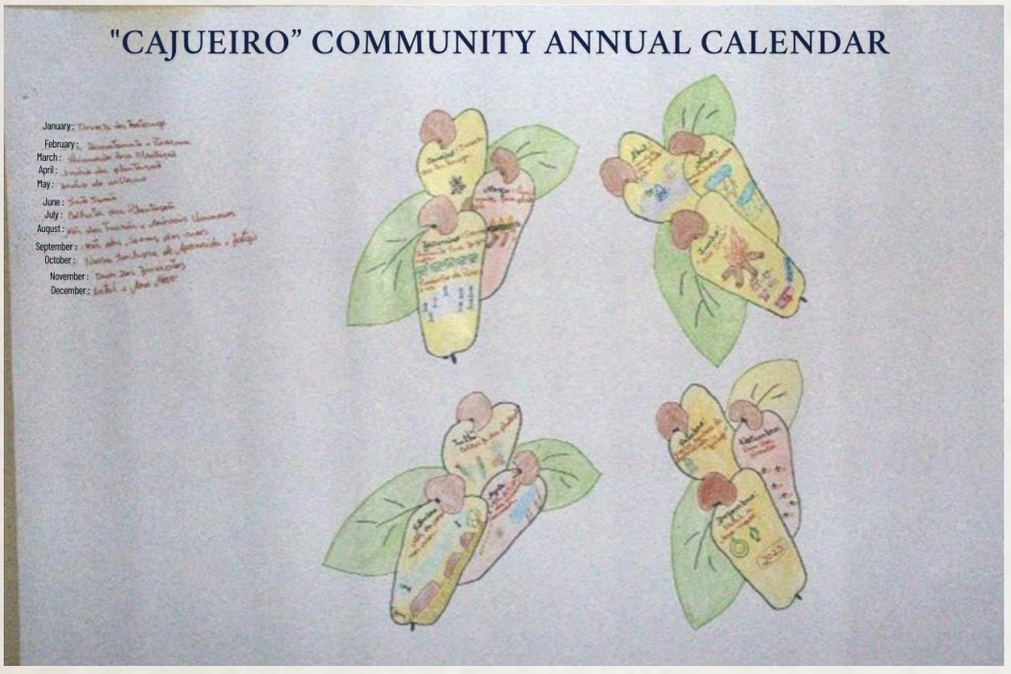
This year, 2023, the buriti harvest is going to be good. Other years, the buriti trees were being burned every year, but I see that with the rain in 2022, the wildfires have slowed down a bit. The cashew trees and mango groves also suffered from the climate changes. Last year, despite a lot of rain, they didn't produce as much.

The fruits, but I believe it is due to the lightning and thunderstorms.

In Araçá, the islands have suffered a lot from wildfires, and the fruits are also scarce. The savannah has been burning a lot around here, and we are trying to raise awareness among the population to avoid burning.

população a não queimar.

Fruits like mango and cashew have decreased significantly due to the severe droughts in recent years, with only in 2022 that there was a lot of rain. As for native fruits like buriti and tucumã, their yield has been low, but I hope this year will be a good year for them.



We have fruit types such as cashew, mango, and lemon, but in 2022, none of these fruits grew. We'll see in the coming years, but I think it won't be different. They suffered a lot, even though it rained a lot, there were also many lightning strikes and thunderstorms. And I see that the trend is only getting worse. When it rains, everything floods, and when it doesn't rain, everything dries up.

It seems that it will rain in April, and the mango trees are all laden with fruit. It is necessary for everyone to be aware of the importance of preserving the environment. The changes in the weather are the results of the actions we humans have made to the earth.

As for the wild fruits, the rains helped the recovery of those that were already dying, such as tucumã, taperebá, and ingá.

And jatobá has been increasing, and the best thing is to educate the population not to burn. We must preserve nature.

In Cajueiro, residents observe that the trees are flowering out of season.

In addition to the fruit trees, the residents also highlight the reduction of timber species used for building houses, fences, and corrals, as well as local species used as firewood: pau-rainha, angico, yellow ipe, itaúba, pau-roxinho, frejó, tatajuba, tauari, estopeira, marupá, cedar, jatobá, pau-louro, pau-veneno, and ripeira.

Main Types of Timber Species Found in the Region		
Timber Species	**Characteristics**	**Mode of Use**
Pau rainha	Tall, thorny seeds	House and corral constructio
Jatobá	Tall, gray and white bark	House and corral construction
Frejo	Tall, gray	House construction
Pau d´arco	Tall, yellow leaves	House construction
Sucubeira	Tall	House and canoe construction
Sucupira	Tall	House and canoe construction
Jatobá	Tall, gray and white bark	House and corral construction
Jenipapo	Tall, gray feet	Medicine

Plan to Address Climate Change

During the activities of this case study, we, the Territorial and Environmental Agents, as researchers on the

.perceptions of our communities regarding climate change, we also asked the people who participated in this

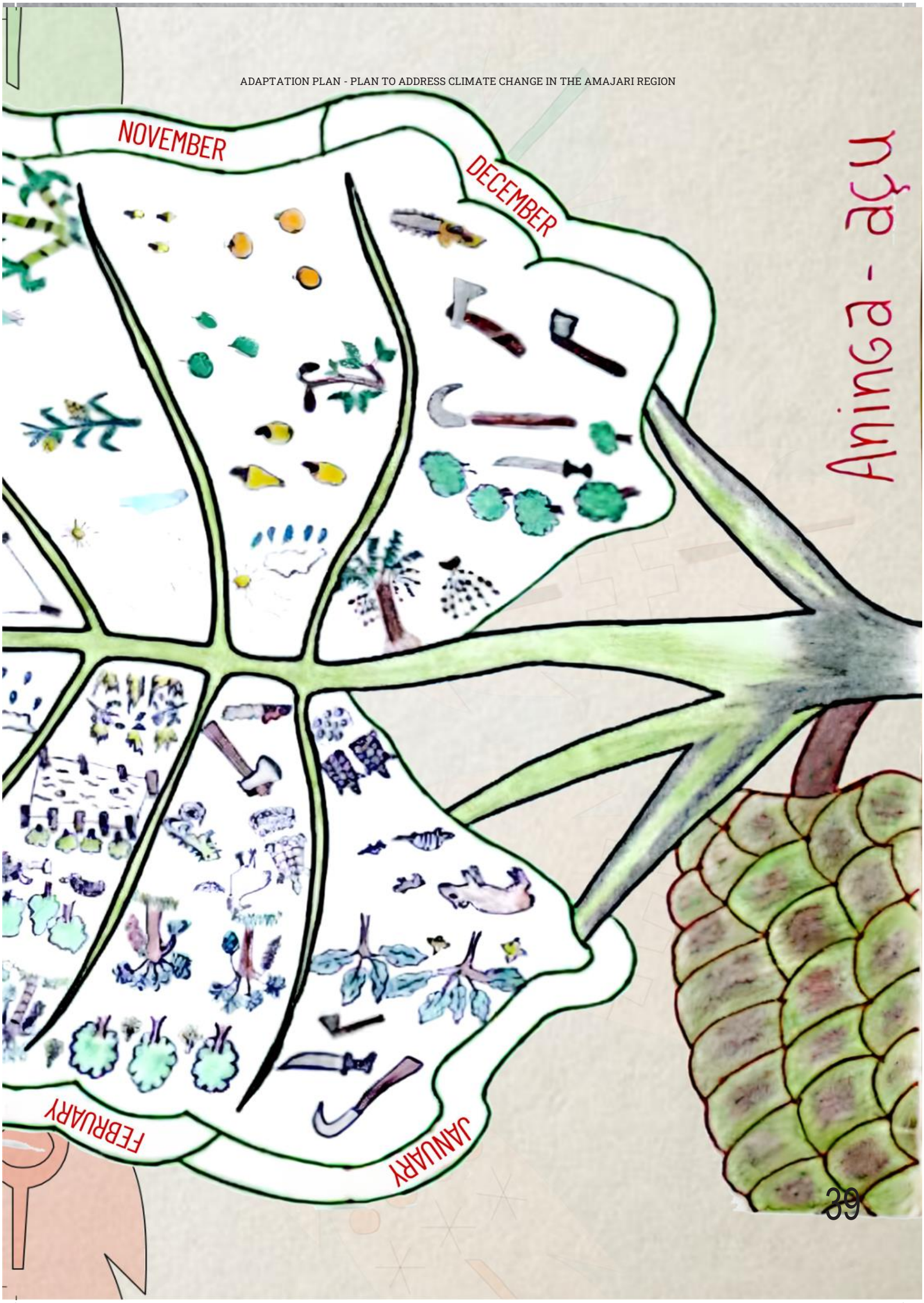
We asked about the main changes in the weather, their main impacts on our ways of life, on the cultivated plants, the wild plants, and also on the animals.

This information was organized into a plan to address climate change in our Amajari region.

Changes in the Weather	Impacts	Necessary Actions
Uncontrolled summer and winter Prolonged winter and flooding Uncontrolled fires Heat and out-of-season rain	Impacts on agricultural production and seed varieties	- Do not stop planting crops; - Work collectively with a self-sustainability planning approach; - Raise awareness about land use; - Clean around the crop fields to protect the planting from fire; - Conserve, replant, and store manioc seeds; - Create cooperatives and encourage the younger generation; - Train agricultural technicians to monitor production; - Expand existing projects in each community; - Store traditional seeds in PET bottles and glass bottles with ashes; - Pass on traditional knowledge to the younger people in the region; - Reforest the lost seeds; - Plan to maintain crop production and prevent loss of seed varieties; - Improve irrigation systems in the community; - Maintain a living seed bank (store manioc in pits, known locally as manicuji); - Seek governmental and non-governmental partnerships to: - Mechanize planting areas (savannah and fallow lands); - Strengthen traditional poultry farming, pig farming, and crop cultivation; - Strengthen projects in Indigenous schools, such as crop farming, gardens, and others; - Acquire transportation to take products to commercial fairs.

	Reduction of Fish in the Summer	- Promote fish management during the piracema season; Surveillance and monitoring to prevent off-season fishing; Respect the breeding season; Build fishponds for fish farming in the communities; - Monitoring by governmental agencies
	Extinction of Animals	- Preserve areas where wild animals live in the region; - Raise awareness among the population for the conservation of animal species; - Educate the population not to set fire to savannahs and forests; - Do not hunt during the breeding season; - Hunting should be responsible (hunt only for subsistence); - Implement projects that help conserve the forests, islands, and streams in the region; - Monitoring by environmental agencies; - Seek specialists in land and environmental studies to give lectures on conservation and forest preservation;
	Reduction of Fruits	- Raise awareness about biodiversity conservation; - Build nurseries; - Monitor and educate the population not to burn forests and savannahs; - Create projects that help conserve forests and savannahs; - Monitoring and surveillance by Territorial and Environmental Agents; - Raise awareness about land use and avoid unnecessary deforestation in the forests; - Ensure that PREVFOGO (Fire Prevention Program) and the Indigenous Community Fire Brigade carry out prescribed burns in the region.


OCTOBER
SEPTEMBER
AUGUST
JULY
JUNE
MAY
APRIL
MARCH


NOVEMBER
DECEMBER
JANUARY
FEBRUARY
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Implementation

Support:

Plan to Address Climate Change
Indigenous Adaptation Plan
Amajari