



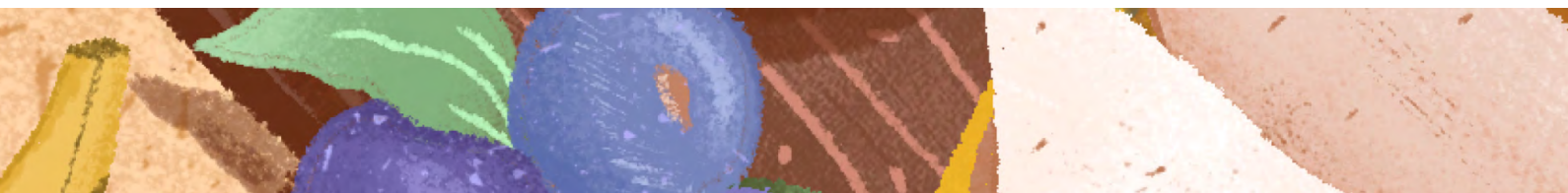
BRAZIL



Introduction

The traditional diets, farming and forest management practices of indigenous peoples and traditional communities represent an impressive array of diverse techniques, knowledge, and social rules associated with local biodiversity and the cosmology of each people. The different food and agricultural systems of these peoples involve material components (organic foods, artifacts, tools) and immaterial components (cosmologies, narratives, knowledge, and traditions) and have therefore been recognized as cultural heritage in Brazil and in different locations around the world (Santilli, 2015; Eidt, Udry, 2019). According to Santilli (2015), the manifestation and preservation of this food knowledge is a form of resistance to the industrial and homogeneous food model. Valuing food traditions is also a way of valuing the cultural identity of peoples, and vice versa. This report aims to contribute to the documentation of IP & LC food systems, with a focus on the indigenous peoples of Brazil, presenting brief recommendations for actions to promote their appreciation.

The study presents case studies of indigenous peoples from different linguistic families in three biomes—the Amazon, Cerrado, and Atlantic Forest—as a sample of the country's geographical and cultural diversity. It is worth noting that several studies have demonstrated the fundamental role of associated indigenous knowledge in the construction of the biodiversity of these biomes (Morim de Lima, Oliveira, Shiratori, 2021). The territorial situation of the peoples that make up the sample ranges from large demarcated areas to small areas, allowing the reader to get a sense of the diversity of the territorial political situation and how this directly impacts the strength or weakness of the food system.



1. The Tukano and Aruak peoples of the Amazon

The Upper and Middle Rio Negro region is located in the northwestern Amazon, on the border between Brazil, Colombia, and Venezuela, comprising a territorial landscape that provides significant protection for the Amazon biome due to the demarcation of three Indigenous Lands that, together, cover more than one million hectares. The territorial guarantee of these Indigenous Lands and their geographical position far from large urban centers has allowed the peoples inhabiting this region to reproduce their traditional ways of life.

The cultural system of the Rio Negro is made up of 24 peoples from three linguistic families. The Eastern Tukano family groups together a total of 16 peoples, such as the Tukano, the Tuyuka, and the Piratapua, while the Aruak are made up of four peoples, such as the Baré and the Tariano, all of whom live on the banks of rivers. Finally, there is the Nadehup family, with four more peoples who live in the interfluves and are traditionally semi-nomadic. There are a number of cultural aspects shared by these Rio Negro peoples, such as kinship patterns, exchange rituals (Dabucuri), shamanism and initiation rituals, as well as agricultural and food systems.

Cassava (*Manihot esculenta*) is the most important food in the social system of the Rio Negro in agricultural, social, cosmological, and dietary terms. This species is planted using cuttings – known as manivas[2] – meaning that genetic clones are reproduced. Despite this, the region is a hub for cassava diversification, with around 140 varieties of manivas throughout the Rio Negro basin and an average of 20 to 50 varieties for each female farmer (Emperaire et al., 2019, França, 2023). This intense diversification of manivas stems from kinship relationships between women: daughters inherit manivas from their mothers when they marry and move to their husbands' villages, and then inherit manivas from their mothers-in-law and sisters-in-law. Each woman's collection is continually expanded throughout her life through her social relationships of friendship, compadrio, and neighborhood.

From a cosmological point of view, manivas and women have a common genesis and their existences are inseparable. In Tuyuka cosmology (ʼtâpinopona), as in that of other Tukano peoples, “from the birth of a girl, at her naming ceremony, the kumu [specialist/healer] includes the maniva in her life as a constitutive element of her existence and her work” (Rezende, 2021, p. 127).



Fig. 1: Baré family cutting cassava in the field. Lorena França, 2018

In addition to farming and shamanism, cassava occupies an equally prominent place in food processing. Beijus [flat bread] are the preferred accompaniment for cooked fish and game meat, and are often used as a direct vehicle for eating meat, i.e., they eliminate the need for spoons and plates, even though these items were introduced to the region by the Salesian missions in the early 20th century. Throughout the indigenous food system of the Rio Negro, 12 types of beijus have been cataloged that combine cassava dough and starch

in various ways. Of these, two types mark a cultural difference between the peoples: beiju de massa, which mixes fermented and fresh dough, is often produced especially by the Baré and Baniwa, while beiju that combines dough and starch is made daily by Tukano women (França, 2023).

Among cassava derivatives, flour is currently one of the main products. Flour is used to make chibé (flour submerged in water), a food-drink that quenches thirst and satisfies hunger, considered essential for starting conversations and welcoming visitors. Flour is the main accompaniment to delicious palm wines (açaí, bacaba, buriti, among others) and is also used to make a type of porridge that is widely consumed at breakfast (especially among the Baré and Baniwa). It or beiju are added to quinhapira (pepper and fish broth) and to fish or meat stews. When the meal consists of “city” foods, which in the region are mainly rice, beans, and pasta, flour is a fundamental item to ensure a feeling of “familiarity.” It is an indispensable item for travel food, carried today in plastic buckets with lids, and formerly in woven arumã baskets. Regional cassava flour has, in fact, been the main product traded between indigenous relatives and whites since the late 19th century, during the period of rubber extraction and other colonial enterprises.

Cassava is also used to produce tucupi or manicuera – the juice extracted from the pulp – which is widely used to season fish broth or in porridge (sweet manicuera) boiled with fruits such as pineapple and cubiu. There are also other types of flour, such as massoca and tapioca, which are made using very different technical processes, demonstrating the interest and expertise of these peoples in this highly versatile species. Finally, it is worth mentioning the production of caxiri, a fermented cassava drink made with a variety of beiju, manicuera, and cooked tubers that give the drink its characteristic flavor. Caxiri, consumed in a gourd, is served by the woman who prepared it during ritual ceremonies for various purposes, but usually expresses alliances between brothers-in-law.



Fig 2: Beiju and tukano artifacts. Lorena França, 2018



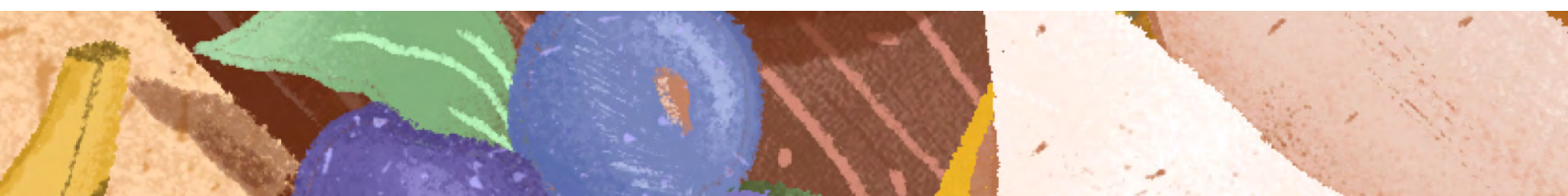
Fig 3: Cassava flour being sifted. Lorena França, 2018



Fig 4: Purple cará caxiri. Lorena França, 2018



Fig 5: Tucupi boiled with pepper. Lorena França, 2018



Cassava is therefore the main crop grown by indigenous communities in the Rio Negro region, but it shares its importance with many other cultivated species, such as pepper (*Capsicum ssp*) – indispensable in fish-based diets –, banana (*Musa ssp*), pineapple (*Ananas ssp*), sugarcane (*Saccharum officinarum*), and various types of yams (*Discorea ssp*) and potatoes (*Ipomea ssp*). There are also more perennial fruit trees that take longer to bear fruit but persist longer in the landscape, such as peach palm (*Bactris gasipaes*), abiu (*Pouteria caimito*), tucumã (*Astrocaryum aculeatum*), among others. Ethnobotanical research in the region has identified 250 species of perennial and annual crops that have been selected and domesticated. All this agribiodiversity is the result of traditional indigenous knowledge, which together characterizes the Traditional Agricultural System of the Rio Negro, a cultural heritage of Brazil (Emperaire et al., 2019).

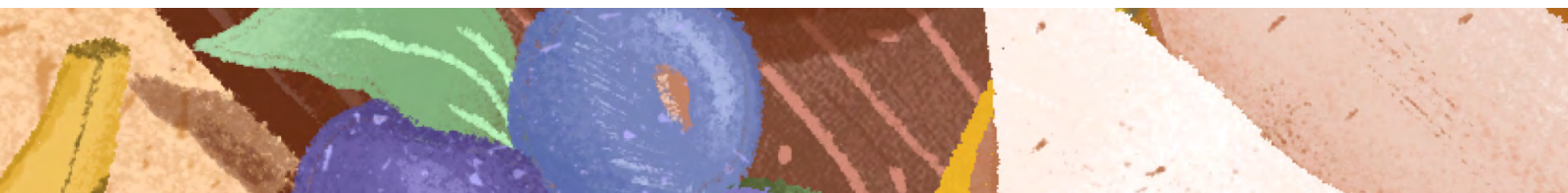
From an ecological point of view, to clear land for farming, there is a sequence of more or less common steps practiced by farmers: 1) in areas of dry land with dense forest, they cut down the tallest and oldest trees, forming a clearing and delineating a circular space – work normally done by men, in a collective effort; 2) they wait for the vegetation to dry; 3) they set fire to the area, which corresponds to approximately half a hectare; 4) they wait for the earth to cool and clear the land, preparing the planting spaces; 5) they then begin planting manioc and other crops. Large trees can be planted before the manioc. Within the circular planted area, the trunks of the large trees cut down during felling remain, crossing the land: this ensures moisture and fertilization for small plants, such as pepper trees. This technique is similar to the intercropping practiced in agroforests; 6) When the cassava is ripe, the roots are harvested and the cuttings are replanted for the next cycles. Considering the different stages of crop maturity (new, mature, and old fields), it is common for each family to maintain at least three distinct fields to ensure food autonomy.



Fig 6: Baré woman managing bananas. Lorena França, 2014



Fig 7: Preparation of açai juice. Lorena França, 2019.



Current issues and challenges

The food system of the peoples of the Rio Negro has shown resilience and vigor in maintaining their traditions, but it still faces impacts and challenges. Recently, the Amazon suffered two consecutive years of historic flooding (2021 and 2022), exceeding the maximum limits of the rivers, followed by two years of historic drought (2023 and 2024). In this context, the farms were severely damaged, either because they were flooded, causing the crops to rot, or because they were dried out in the sun. Almerinda Ramos de Lima, a swidden cultivator and leader of the indigenous movement of the Tariano people, reported in an interview with the consultant:

We have suffered greatly from the drought that hit our fields. For us women, there is a new challenge when selecting manioc roots because some are resistant and others are not. We lose as much from drought as we do from extreme flooding: many fields were washed away. Ori duhku (a white cassava) is very fragile and cannot withstand flooding. I lost a lot in my fields. Some of the pacas manivas resisted. I lost the bahsi duhku during the drought. I lost the pineapple seeds and the fruit trees. The açaí survived the drought, but they dried out so much that the wine had no flavor. I lost a lot of pohko duhku, a type of manioc that I love. It was very sad. It was hard to see the swidden like that... I still haven't been able to recover from the Ori Duhku. (Personal communication, 2025)

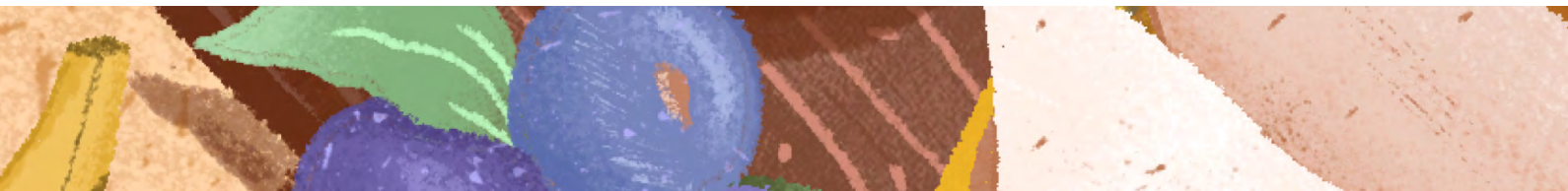
When asked if women have a strategy for maintaining biodiversity in times of climate change, Almerinda was unable to point to one: "We are concerned. How are we going to manage cultivation? I kept my mother's collection. Our mothers selected the manioc shoots..." Now, Almerinda and her relatives need to observe and identify the varieties that are suitable for extreme conditions in order to ensure food security.

Another aspect to be highlighted about the reality of the Rio Negro is the difference between those who maintain their swidden in villages/communities, far from the city, and those who have chosen to live permanently in the urban area of one of the three municipalities in the Rio Negro basin. Land use conditions for those living in communities are incomparably more favorable considering the available land area, however, any distribution of production is hampered by the distance from the urban area. In other words, it is not easy to earn money from farming in the community.

In the urban area of São Gabriel da Cachoeira, there are several daily or weekly markets that sell regional products sourced directly from swidden and fisheries: quinhapira, mujeca, beiju, flour, massoca, caxiri. This strategy enables urban indigenous people, who are wage earners and do not maintain swiddens, to also eat traditional foods, while increasing swiddens' sources of income. In the words of Almerinda: "I think this is really cool because the markets motivate us to work harder to sell our surplus, especially those of us who don't have a salary."

However, this is not the case in Santa Isabel do Rio Negro and Barcelos, municipalities downstream from São Gabriel, which face difficulties in promoting and marketing traditional foods. In Santa Isabel, however, there is Casa das Frutas, an initiative promoted by the local indigenous movement (ACIMRN) to buy, process, and market regional fruits. According to Carlos Neri, from the Piratapuaia people, director of the Federation of Indigenous Organizations of Rio Negro (FOIRN), Casa das Frutas currently involves six to eight families who sell bananas and pineapples. Green bananas are turned into flour, used in the preparation of porridge, even in school meals, and their ripe version, alongside pineapple, is transformed into dehydrated bars. The agricultural production potential of the region is much greater than the processing capacity of Casa de Frutas. The goal now is to increase and expand the structure to involve more families in the interior, said Carlos Neri.

A well-known way to generate income through family farming is to participate in institutional food purchasing programs. The National School Feeding Program (PNAE), established by Federal Law No. 11,947 of 2009, stipulates that at least 30% of the total funds transferred by the National Education Development Fund (FNDE) to state and municipal secretariats must be used to purchase regional products to be offered in schools. This proposal seeks to favor family farming through direct purchasing and to provide healthy food options that are regional, fresh, and perhaps organic to the school community. The Food Acquisition Program for institutions in general works in a similar way. Although these programs have been part of public policy for a long time, until recently there was a significant deficit in their implementation in the state



of Amazonas due to a series of “Amazonian factors,” among which we can highlight logistical difficulties and the consequent increase in local production costs.

The situation regarding school meals throughout Amazonas, including Rio Negro, has fortunately been changing since the establishment in 2016 of the Commission for Traditional Foods of the Peoples of Amazonas (CATRAPOA, now CATRAPOVOS) – an interinstitutional commission coordinated by the Federal Public Prosecutor’s Office in Amazonas, which brings together various actors to identify the real difficulties in implementing the PNAE and find solutions together (Semeghini et al., 2020). A technical note was prepared in Amazonas on the 2017 Indigenous PNAE (later used as a reference in the preparation of a national technical note in 2020) in which farmers are exempt from the requirement to present a registration of the brand of the product sold. According to Cipriano Lima, of the Tuyuka people, founder and representative of an indigenous association in the city of São Gabriel (AIETUM), this technical note completely changed the income generation possibilities for farming families. Today, his association participates in public procurement, selling 20 to 30 items, including fresh and some processed foods, to institutions such as the army, hospitals, government departments, and educational institutions through the PAA.

Cipriano Lima also pointed out that families participating in public procurement tend to diversify the products they grow, encouraged by the possibility of selling them. This way, they receive income and diversify their family’s diet. Regarding food consumption, Almerinda noted that currently, even in the most remote villages, children and young people consume many more products from the city, such as chips, cookies, and sweets, and no longer seek out fruits from the forest or riverbanks, such as Uacu (*Monopterix uacu*) and Cunuri (*Micrandra spruceana*), which were part of their childhood[4].

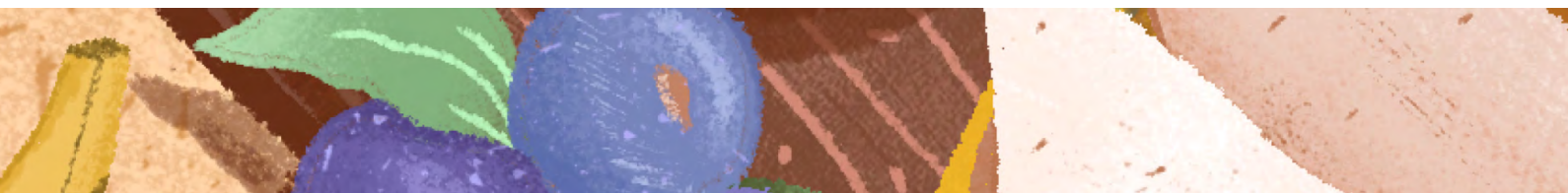
Participation in the two programs and fairs was identified as an excellent option for promoting traditional foods and generating income for indigenous farmers; however, there is still much progress to be made. Families in rural areas are unable to access the PAA, which offers better profitability options, due to the high cost of traveling to the city and lack of technical support. In addition, much has already been done to adapt the rules of the public notices to the local reality, but further progress is still needed in this regard.

[1] The Indigenous Lands included in this total are Alto Rio Negro, Médio Rio Negro I, and Médio Rio Negro II, but there are other Indigenous Lands in the same ethnographic region.

[2] The term refers to the aerial part of the plant’s stem, but also designates the plant as a whole.

[3] On the impacts of drought in the Rio Negro, see: <https://www.bbc.com/portuguese/articles/c6pjn19jw9xo>

[4] Other reports and analyses on the topic of dietary changes in the region can be found in França, 2023, chap. 6.



The Krahô are inhabitants of central Brazil and are part of the Timbira peoples, along with the Apinajé, Canela, Gavião, and Krikati. The Kraolândia Indigenous Land covers 303,000 hectares and is located in the municipalities of Goiatins and Itacajá, in northwestern Tocantins, with a total population of 3,691 people (IBGE, 2022). The cultural tradition of these Timbira peoples is marked by semi-nomadism, which integrates the management of wild fruit forests with the cultivation of sweet potatoes, cassava, corn, and peanuts, mainly.

Culturally, there are several similarities among the Timbira: the villages are round, with central courtyards and well-defined paths for passage, and the houses are made of buriti straw or mud walls. They prepare their bodies daily with jenipapo paintings, haircuts, songs, and traditional log races.

Unlike the Amazon and Atlantic Forest, the Cerrado is a biome characterized by low rainfall, with long periods of drought, and extensive savanna formations, interrupted by riparian forests along rivers. It is the second largest biome in the country, occupying 25% of the national territory. The trees of the Cerrado are very peculiar, with crooked trunks covered by thick bark, whose leaves are generally large and rigid. This biome has one of the highest levels of biodiversity in the world, with more than 6,000 species of trees, of which more than 40% of woody species are endemic, meaning they do not exist anywhere else in the world (ICMBio).



Fig. 1: Image of the Cerrado. Source: the author, 2025.



Fig. 2: Krahô village. Source: Simone Giovine, 2018.

The Krahô fields are cleared during the summer when the weather is hot and dry. First, before clearing the land, the women plant sweet potatoes and yams, a practice also found among the Kayapó Mebêngokre, Xikrin, and Canela. Then the vegetation is cleared and, once it is completely dry, the men burn it. A field must be thoroughly burned, but the fire must be controlled so that it does not spread to the rest of the vegetation. To carry out the burning, the Krahô wait for the first rain and also assess the crescent moon, the flowering of the pequi tree, the intensity of the wind, and the dryness of the wood. The fields of these people are rectangular, unlike the circular fields of other Jê groups, but corn cultivation follows a circular pattern mirroring the social organization of the villages (Morim de Lima, 2016).

Planting takes place during the rainy season. Farmers must follow a series of precautions and physical requirements that directly affect crop growth. "If you eat fox or seriemas, for example, the corn cobs will be thin, like the paws of these animals. When planting sweet potatoes, it is forbidden to eat tatupeba, their main

predator, which digs them up and eats them” (Morim de Lima, 2016, p. 304). According to the author, these rules present a mutual affection that effectively connects indigenous people to the non-human subjects with which they interact.

To feed themselves, the Krahô produce beijus, grolados, flour, and paparuto (a cassava cake with meat, baked in a moquém) from cassava, a ceremonial food exchanged between the families of newlyweds. Cassava offers the advantage of being annual, producing food for the whole year that “gives strength to the body to work, sing, and run” (Morim de Lima, 2016, p. 221), unlike corn and potatoes, whose production is seasonal. However, at specific times in social life, such as postpartum rest, cassava is considered an inappropriate food, as it can cause bloating and stomach pain. Immediately after childbirth, the couple should only eat foods considered light, that is, popcorn, very dry baked potatoes, sweet potato flour, and corn porridge. In the first few days, a very limited amount is eaten, which increases day by day. Gradually, the couple can add ripe fruits from the Cerrado, such as buriti, oiti, and macaúba. Among the palm trees, the bacaba stands out, from which juice, porridge, and oil are made, and its milk is recommended to increase breast milk (Morim de Lima, 2016). According to Creuza Prumkwij, the notion of protection is of paramount importance to the Krahô, which includes dietary restrictions, but also moral conduct and body care at different stages of life.



Fig. 3: Creuza prepares the beiju dough inside a gourd.



Fig. 4: Beiju with fried meat and coffee. Source: Lorena França

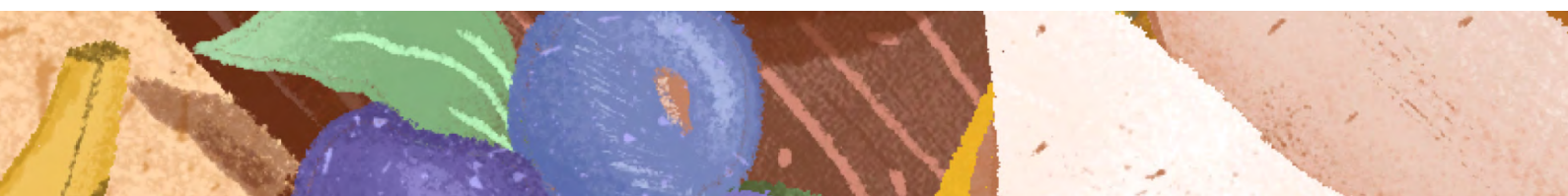
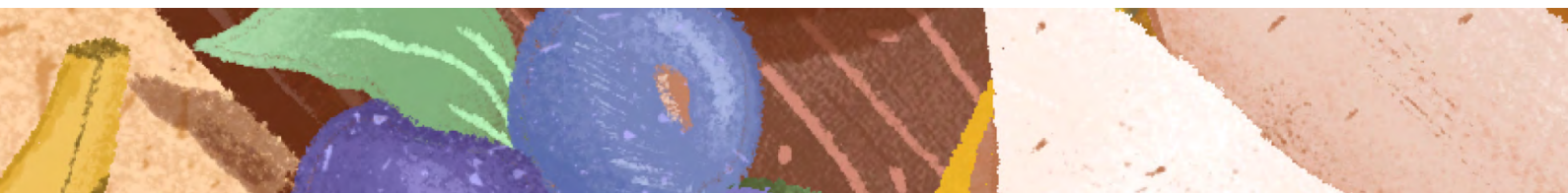




Fig. 5 and 6: Sweet potato harvest.
Source: Lorena França, 2025



Sweet potato flour is considered a unique food technique of the Krahô people. Although it is rarely produced today, it is still a reference point for the food heritage of these people. To produce it, the driest varieties of potatoes are chosen in order to help dry blood and secretions that appear during childbirth or ear piercing rituals. The suitable potatoes are baked in holes dug in the ground, heated with stones and firewood. The potatoes are kept warm there for hours, protected by banana leaves and earth on top. Once removed and cooled, the potatoes are peeled and mashed by hand and placed on a buriti mat to dry in the sun. They remain there for four or five days, protected by tarps at night and drying in the sun during the day. Between tasks, the women crumble the lumps that form to produce a flour-like consistency.



Ethnographic issues from Aldeia Sol

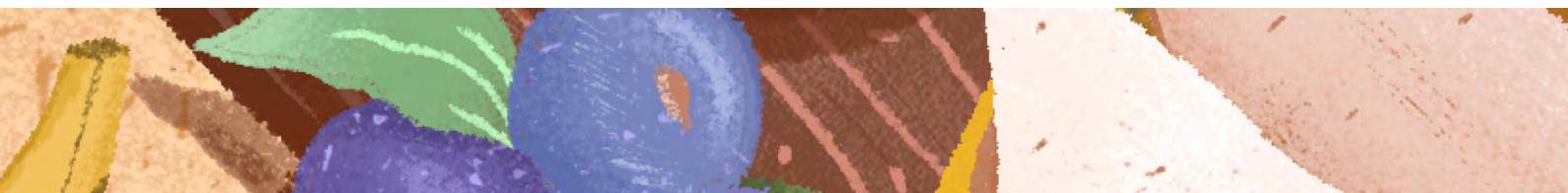
The field research conducted to further explore the data in this report was carried out in Aldeia Sol, located on the edge of the Indigenous Territory in Goiatins, near the border with Maranhão. This village was founded by Creuza Prumkwyj Krahô, who in 2018 chose to live in this location, on the banks of the Riozinho River, attracting some relatives to live near her. Today, the village has 12 houses, including a building for the Pyjaka indigenous school.



7: Aldeia Sol. Source: Lorena França, 2025

Recently, the area surrounding the village suffered intensely from fires during the dry season (August to September), which usually occur during this period, but in 2024 were unusually severe, having been caused by criminal groups in various parts of the country. According to the Krahô people of Aldeia Sol, the fire spread in a way never seen before, coming very close to houses and destroying existing crops. Currently, there is at least one village resident being paid as a firefighter under the Prevfogo firefighting program, conducted by IBAMA in partnership with Funai. According to the firefighter's report, this year's fires are milder than last year's.

Due to this disproportionate burning and also because it is a recent village, few families have mature fields in the village, which does not reflect the reality of the Krahô territory as a whole. In Aldeia Sol, there are cassava plantations (predominantly mansas and some bravas) in the backyards, whose production ensures the occasional production of grolados, beijus, and paparuto. A swidden belonging to a long-time resident was abandoned, becoming a capoeira, where weeds grow and potato branches and some palm trees still remain, which can be accessed by community members. During the field research, the opening of a new, large swidden on dry land, 7 km away from the village, was recorded. Mônica, from another family, keeps her bean seeds for the next swidden to be planted. Everything indicates that in the near future these families will bring traditional foods to the entire village.



On a daily basis, the Krahô consume large quantities of food purchased in the city, especially rice, oil, coffee, sugar, beef (which can also be purchased from neighboring landowners), as well as various treats such as soft drinks, salty chips, sweet and filled cookies, lollipops, and candies. The main meals consist basically of large quantities of rice and a certain portion of meat or fish. Occasionally, they manage to include pumpkin or fava beans. Although adults recognize that city foods, with their excess sugar, salt, and oil, are bad for their health, with a significant increase in the number of people with diabetes, in practice, these items continue to be purchased, unless there are budgetary restrictions. The elders say that the younger generation rarely eats grolado, and beijus are prepared with some regularity, but not daily, with rice being the main source of carbohydrates. In the group discussion held by the consultant in Aldeia Sol on the topic of the report, Creuza shared her thoughts: “In the past, I saw many Krahô go into the forest... without thinking about hunger or eating rice. Any fruit I ate in the forest, such as jatobá and macaúba, was enough for me. I could get through the day like that.”



Fig. 8: Children eating puçá flowers. França, 2025.



Fig. 9: Mônica Krahô displays her seed collection. Source: Lorena

Everything indicates that eating habits are changing rapidly in Krahô villages, with the increase in monetization of relationships. Nowadays, clearing, planting, tending, and harvesting crops is seen as too hard and time-consuming for young people. Letícia Krahô, eldest daughter of Creuza, leader of the Timbira movement, and anthropologist, recalls in her thesis how her diet in childhood and youth differed from that of city dwellers:

I used to eat beiju made from cassava from the swidden. My father had a small vegetable garden he made for me to take care of. I would go to the swidden and pick potatoes, rice, cassava, pumpkin, watermelon, black beans, fava beans, sugarcane, yams, bananas, maxixi, okra, peppers, corn, and beans. I would go with my mother or my aunt to pick these vegetables in the fields, return to the village, prepare them, and store the rest. Not to mention that I would go pick fruit with the girls in the woods. In addition to eating food without pesticides, I walked a lot (Jôkàhkwyj Krahô, 2024, p. 61).

Not only what they eat, but how they eat is a central aspect for the Krahô. Meals are shared by many people at the same time, especially in this village where the leader is a woman. Creuza does the cooking and her

kitchen is full of grandchildren, daughters, nephews, neighbors, and relatives almost every day. In Creuza's kitchen, there is a particularity because she is the social and political leader, and so she takes care of and feeds her relatives more, but in any case, the sharing of food among relatives in the village is part of a principle of reciprocity that constitutes and guides indigenous social life. In other words, gifts are always in circulation, in the form of giving-receiving-returning. This is easily observable in everyday eating habits and is especially prevalent with the arrival of game, as described by Creuza below.

Someone kills a tapir. When there are a lot of people, they put the meat there, and that's it. When there are few people, the meat lasts two or three days. While there is meat, they don't eat anything else. They don't stop. It's morning, it's noon, any time. There was no refrigerator, no such thing as saving it for another day. I learned that. If you eat today, tomorrow you have to hunt another one. Why save it? My daughters are learning to store meat and fish in the refrigerator... I can't handle storing it. I learned from my great-great-grandfather: we shared the hunt with everyone. It's not like Cupen, who buys things just for himself. That's why I say: I don't like to save anything. What for? Money is for buying things, it runs out, I eat it right away and that's it. Maybe I'm alive today and tomorrow I'm dead. Who's going to enjoy my money? So, I'm going to enjoy my money, enjoy my happiness. Our inheritance is just this land here. Everything is here: fruit. Look up there on the mountain: there are puçá flowers, they eat the fruit, they eat the flowers. When you have diarrhea, you make tea from the bark. So the inheritance we have is this nature of the Cerrado! (Personal communication, 2025)



Fig. 10 and 11: Preparation of paparuto: cassava cake with meat. Source: Lorena França, 2025.



Fig. 12 and 13: Paparuto ready and being distributed to relatives in the village. Source: Lorena França, 2025.

The social principle of gift-giving among relatives can also be clearly understood in the consumption of paparuto, which involves several relatives in its production and everyone in its distribution. Creuza reflects on her moral ethics of sharing in contrast to the Western way of life of the Cupen (white people), based on individualism and greedy planning, from an indigenous point of view. As she rightly points out, in the end, it is the Cerrado that is the fundamental source of all the riches accessible to the Krahô.

Despite the demarcation of a large Indigenous Territory, the Krahô suffer from the impacts of pesticides sprayed on their land. They are surrounded by large-scale farmers who plant soybeans, corn, beans, and rice in the surrounding area and use planes to spray poison on their crops. These substances have affected the health of Krahô families, especially those on the edge of the Indigenous Territory, as is the case with Aldeia Sol. Creuza said about this: “At first, we didn’t know why we were sick: we had fever, diarrhea, headaches. When we looked into it, we realized it was because of the plane that was spraying poison. I thought that little thing wouldn’t harm our skin. Then I understood that it was poison. The plane flew over us every Thursday while the crops were growing.”

For this reason, the people of Aldeia Sol have limited access to the river that runs alongside their homes and is so beloved by children: they can only bathe in it during the summer. During the rainy season, pesticides fall on the ground and run off into the river, causing skin damage. Fortunately, today they have artesian well water and solar panels that generate the energy needed to supply water. Even so, it is impossible to ignore the impact of this productive activity that spreads poison in the air, causing the death of birds and bees, and drastically reducing wild honey—a food much desired by the Krahô.



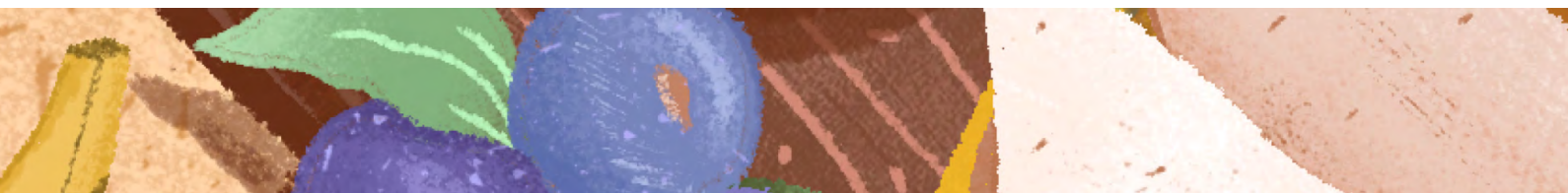
Fig. 14: Krahô women in the Cerrado

Fig. 15: Harvesting wild honey



3) Guarani Mbyá of the Atlantic Forest

The Guarani Mbyá are a people with a wide territorial distribution in Brazil, present in six states in the South and Southeast regions. In this document, I present an overview of the Guarani Mbyá who live in São Paulo, mainly in the Tenondé Porã Indigenous Territory.



The Guarani are well known for their culture associated with agriculture, as historical sources from the 16th century show, and are equally known for their constant movements in search of the “Land Without Evil.” Despite the remarkable nomadism that characterizes Guarani groups, and the territorial and social oppression they have suffered, sacred crops—notably corn varieties—have been stored and reproduced over time. Corn and cassava have been the basis of the traditional Guarani diet for centuries, cultivated alongside varieties of sweet potato, yam, peanuts, and beans.

The Guarani distinguish true corn (avaxi etei), in its various varieties and colors, from yellow corn (tupi) sold by white people (juruá), and consider true corn to have been left by Nhanderu as a legacy of life on earth. This species is used in an important Nimongaraí ritual in which boys and girls are prepared to receive their names. Corn is essential for the naming ceremony and is therefore fundamental for a child to be considered a person and to enter the circle of social relations. “The name is the very condition of the person, indicating the origin of their soul and the role they are expected to play in the family and community” (Ladeira, 2001, p. 207). This ritual coincides with the corn harvest season, and various corn-based dishes are prepared, such as kaguyjy, mbojapé, and mbyta, for collective consumption. Girls are even represented by a mbojapé, without which they do not receive their name or the revelation of their soul. The connection between shamanism, the construction of the person, and cultivation appears not only at the time of harvest, during this naming ritual, but also at the planting stage, when the seeds are baptized in the prayer houses (opy) before being planted (Felipim, 2001).

In culinary terms, corn is used as a raw material for various types of pamonha (pamonha), bread, beijus (beijus), cornmeal for pasta, corn bran, starch, and porridge. Fresh corn is eaten boiled or roasted; it can be used to produce mbaipy, a type of polenta made with ground corn and water, wrapped in sororoca leaves, and also corn starch (avaxi kuipó). When dry, it is pounded to become corn flour, widely used in dishes such as mbeju (a type of flatbread); mbojapé (made with flour and water, baked in ashes); and reviro (flour, water, and animal fat). Corn can be combined with other crops: kângui (corn and sweet potato porridge), while avaxi kui (corn and peanut flour).



Fig 1: Creole corn varieties (avaxi ete'i)



Fig 2: Sweet potato varieties. Source: Jera Guarani.

Among the many possible preparations that demonstrate the richness of culinary techniques closely associated with corn, we highlight kaguyjy (or ka'aguijy), a fermented drink made from partially chewed green corn mixed with water (Maymone, 2017). According to tradition, only girls who have not yet menstruated can prepare this drink, which cleanses and heals the Guarani body (Felipim, p. 43). Despite the centrality of corn cultivation in Guarani culture, these people face severe difficulties in maintaining the

production and constant consumption of their true food due to the limited demarcation of demarcated and secured lands.

For a long time, families in Tenondé Porã had been unable to see avaxi ete'i, the true Guarani corn, with its various colors and sizes. With the reopening of the land, it was possible to plant it again, as well as many traditional crop varieties that we brought from different territories through exchange activities, where we continued exchanging seeds and strengthening ties¹.

This is the testimony of Jera Poty Mirim, a Guarani leader from the Tenondé Porã Indigenous Territory, located in the southern part of the municipality of São Paulo, with 16,000 demarcated hectares and home to 16 villages². One of the important results of the Indigenous Territory's demarcation was the possibility of reviving traditional crops that had always been part of the local culture but were disappearing. Jera Poty Guarani says that it was only at the age of 22 that she discovered the truly Guarani colored corn; until then, she had only known the yellow Tupi corn, brought by white people³. Upon arriving in the new village, they found land dominated by eucalyptus monoculture. The transition to traditional crops—corn, cassava, sweet potatoes, and bananas—was not easy.

The Guarani people are very agricultural. So, when we arrived here, to live here, one of the first things we wanted to do was plant. We started planting juçara palm hearts, corn, beans... but without properly preparing the land because it was very dry from the eucalyptus. And then, in the early stages, things went really badly. I have a photo of an area we filled with corn and it produced 2 little corn. We understood that it can't be like this; this land needs to be cared for, tended, prayed for, healed because it is sick. So we started partnerships... [...] we started agroforestry, a system of partnerships between the plants, of consortiums, of who can provide shade for whom, who can strengthen whom... treating the plants like actual people⁴.

Jera's testimony points to two solutions to the crop problem: the need to bring in shamanic prayers to heal the soil and to build partnerships with agroforestry technicians who work on intercropping plants, favoring the traditional polyculture farming method. Indigenous leaders sought support to strengthen productive activities through various projects⁵. Among them, one supported by the São Paulo Municipal Department of Culture demonstrated that, especially from a Guarani perspective, social culture is closely linked to soil cultivation. Thus, within the framework of these partnerships, the villages received support to implement agroforestry systems combining innovative techniques with traditional farming methods. The result of the engagement of several families from six villages in the Tenondé Porã Indigenous Territory generated a significant increase in biodiversity in the territory⁶.

In the 81 farms participating in the study carried out by the City Hall and the Indigenous Work Center (Keese & Oliveira, 2020), 190 species were identified, including vegetables, annual and perennial crops, shrubs, and trees. Among the perennial species present in the Indigenous Territory, banana is the most common, being an important source of Guarani food, but blackberries are also abundant, as well as orange, pitanga, sugar cane, juçara, tangerine, guava, lemon and many others. Among the short-cycle species, the most common are corn, cassava, sweet potato, beans, rice and pumpkin.

¹ Jera Guarani and Lucas Keese. 2025.

² Until 2012, 1,500 people lived on 26 hectares of land, living under intense territorial and social pressure and with no space to cultivate. In 2012 and 2013, the Guarani movement pressured FUNAI (National Foundation for Indigenous Peoples) and the Ministry of Justice, through the streets of São Paulo, to obtain land recognition in an area compatible with the population, which has been growing considerably in recent years. The land was demarcated in 2016.

³ Source: <https://brasil.mongabay.com/2022/06/como-os-guarani-de-sao-paulo-estao-voltando-a-plantar-seus-cultivos-ancestrais/>

⁴ Jera Guarani, 2024, in an open lecture entitled "Guarani Agriculture and the Tekoa Porã." Link in the references.

⁵ Institutional support came from the Aldeias Project, funded by the São Paulo Municipal Department of Culture, the Basic Environmental Plan (PBA) for the expansion of the São Paulo railway network, and the FUNAI Environmental and Territorial Management Program.

⁶ Of the 1,390 people living in the six villages, approximately 35% have active farms in the territory (Keese & Oliveira, 2020).

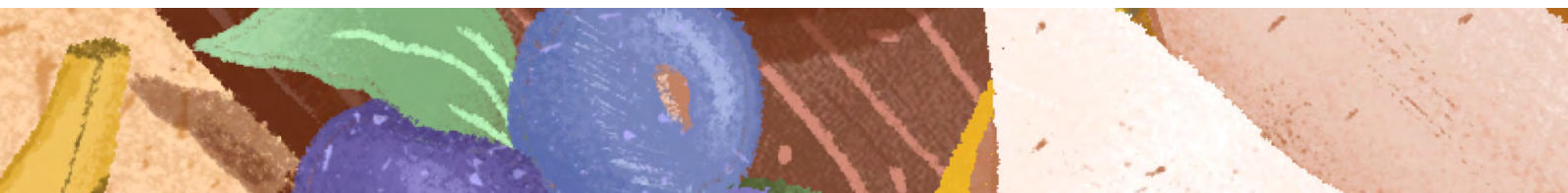




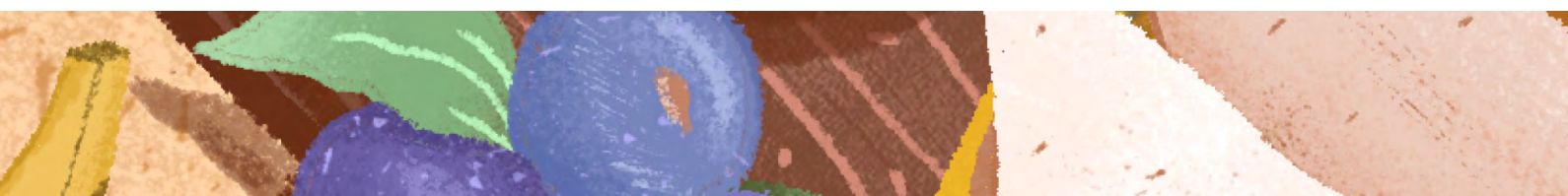
Fig 3: Banana plantation



Fig 4: Corn crop intercropped with beans and pumpkin. Source: Keese & Oliveira, 2020.

In the Kalipety village, where Jera Guarani is the leader, more than 80 cultivated species were recorded, while in the other villages the average is around 60 species. Among the agrobiodiversity produced there, the sweet potato (jety) varieties stand out, the result of a long process of rescuing and exchanging seeds. According to Jera herself, they cultivated 50 varieties, three or four of which originated in Peru, and the remainder came from Guarani family networks (2024).

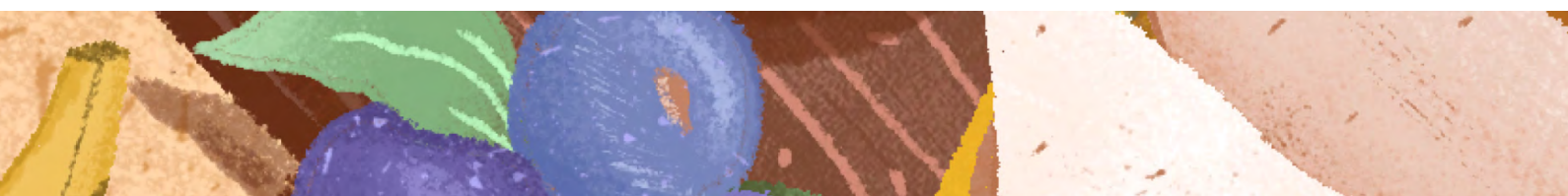
The quantitative survey of food produced in the production units showed at least 12 kg of cassava per person per year, and in the villages with the highest productivity—Tekoa Porã and Tenondé Porã—these figures are 23 kg and 55 kg, respectively. Despite the significant increase in plantings, the vast majority of Guarani



people (96.6%) believe that the food they produce themselves is not sufficient for food security in the production unit. Even so, the authors of the publication point out that the agricultural results achieved are promising and encourage people to continue, expanding their farms (Keese & Oliveira, 2020, p. 66).

In the state of São Paulo, there is also the Jaraguá Indigenous Territory, northwest of the city, which was recently expanded from 1.7 hectares (1987 demarcation) to 532 hectares (2025), still awaiting presidential approval and subsequent registry registration. The history of territorial oppression prevented villages from being established following the traditional way of life. This Indigenous Territory currently has seven villages, of which only three (Itakupé, Itaendy, and Pindó Miri) are suitable for farming. "The Ytu village has a lot of rocks, making farming impossible. And the lava river is very polluted. The bandeirantes (bandeirantes) worked there mining for gold and used mercury. The river is still polluted today; it hasn't died, but no one goes in to swim or drink the water," says Sônia Ara Mirim, a leader active in the demarcation of the Jaraguá Indigenous Territory. In Pyau village, "the land was used for eucalyptus plantations, and then it dried out. There's no way to cultivate this land for our crops," he adds.

It was precisely in the area of territorial expansion, with the reclaiming of land, that the Guarani of Jaraguá were able to witness the growth of food produced by their own hands. Sônia explains that in "Itaendy, we have traditional corn, pumpkin, peanuts, purple, orange, black, and white sweet potatoes, sugarcane, and juçara palm hearts. In this village, we have the conditions to plant larger plots. And we are beginning to bring this food to the communities, but since land is still very limited, it's not possible to feed all the villages." Gradually, the farming families of Itaendy are establishing a distribution center for small-scale food supplies, as well as seeds and seedlings for relatives who can replicate the program in their villages.



Current reflections

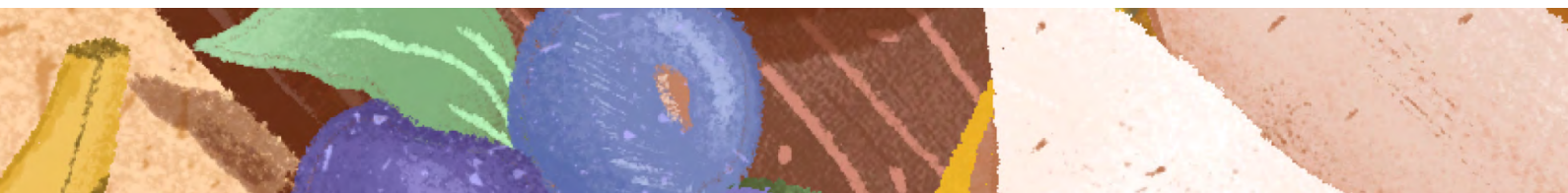
The Guarani express that they face several challenges in increasing agricultural production and, thus, further strengthening their traditional diet. Specifically, for those who work in the fields, it would be important to receive more support with inputs, fertilizers, and tools that facilitate the work. While many Guarani recognize that planting is a significant source of future livelihood, on the other hand, there are several threats from the non-Indigenous world that can reduce engagement in the reproduction of traditional life, such as intense access to television, video games, and cell phones (Keesy & Oliveira, 2020, p. 52). Sônia Ara Mirim, in an interview with the consultant, reflects that the consumption of ultra-processed and industrialized foods is very high, and that this causes many illnesses such as skin problems, diarrhea, and stomach pain. On the other hand, this habit is long-standing, as many Guarani in São Paulo have lived on food donations for decades. It is not easy to break the habit of this consumption. Encouraging food autonomy through access to land is fundamental to ensuring health.

Reflecting on the significance of the revival of Guarani crops, Jera Guarani, a leader, and Lucas Keesse, an anthropologist, state:

Combating monoculture as a policy of power concentration and destruction of life and its diversity is a fundamental priority. Therefore, the resumption of planting and the expansion of crop varieties has been and continues to be one of the most important processes in our territory in recent years. We can summarize by saying that we fight for the land so we can plant again, and we plant as a way to fight for and protect the land. (...) Contrary to monoculture, we want to be able to cultivate a diversity capable of sustaining healthy life in the territory—both our own and that of the other beings with whom we share it. The fight is still long, but we are on the right path.” Jera Guarani and Lucas Keesse, 2025.

The positive results presented here regarding the resumption of farming and the increase in food sovereignty—which favors the consumption of traditional foods—were only possible after the demarcation of the Tenondé Porã Indigenous Land and the expansion of the Jaraguá Indigenous Territory. The paths and solutions outlined by the Guarani reinforce the need for continued demarcation of more Indigenous Lands so that they can have a living space and the reproduction of their social customs. Furthermore, it is necessary to expand projects and policies that facilitate and encourage agricultural production, such as adequate technical assistance and inputs.

Fig 5: Guarani youth harvesting vegetables.
Photo: Jera Guarani



Final recommendations

Social, territorial, economic, and climate issues affect the food security of Indigenous peoples in an integrated manner, so planned actions must also be developed cross-sectorally. The following recommendations are organized into three areas, based on the most relevant issues emerging from the three case studies in Brazil:

1) Program to combat ultra-processed foods in indigenous territories.

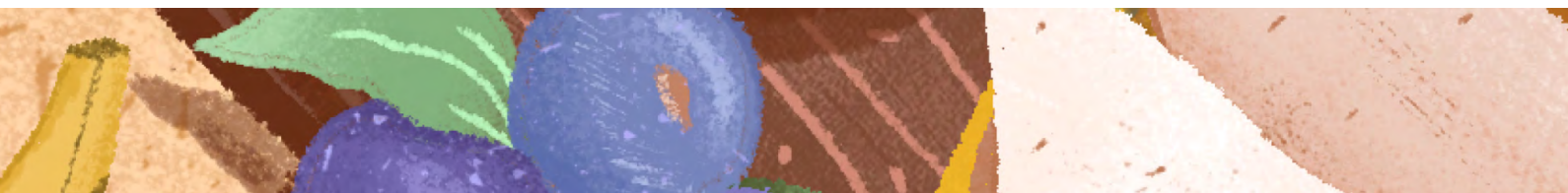
The data recorded during the consultation indicate frequent consumption of ultra-processed foods in all regions, with a particular emphasis on small territories surrounded by agribusiness or large cities. The people's narratives reinforce data published in nutrition research: changes in eating patterns, with the adoption of a Western diet, are significantly altering the health status of Indigenous peoples. There is a wealth of national and international data pointing to a correlation between the consumption of ultra-processed foods and the increase in chronic non-communicable diseases (Askari et al., 2020; Lane et al., 2024; Pagliai et al., 2021; Monteiro et al., 2019). Specifically, in the case of Indigenous populations, the research conducted is smaller-scale, but the limited data indicate the same trend of a considerable increase in hidden malnutrition, overweight, diabetes, cardiovascular disease, and high blood pressure (Basta, Orellana, Arantes, 2012; Leite, 2012).

During interviews with Indigenous interlocutors from the three regions, we attempted to assess these people's level of understanding of the impact on people's health of consuming ultra-processed foods. Although responses often revolve around "yes, we know it's bad," they usually don't distinguish between simple industrialized products (sugar, salt, oil) and ultra-processed foods that contain a range of stabilizers, colorings, and preservatives, nor are they aware of the different degrees of impact these items have on health. An elderly Krahô woman emphasized that, initially, sugar was brought to the village by white men as a synonym for something positive, finding the discourse about the harmful effects of consuming sugary foods strange. The challenge faced today, however, goes beyond the sugar added to coffee or meat fried in soybean oil. Harmful and unhealthy foods arrive everywhere, in various formats, seductive and crunchy, promising convenience and immediate pleasure at a low cost.

It is true that this problem is common to the global population, affecting the social classes with lower economic power more intensely. However, this same problem takes on a perverse dimension in indigenous cultures, which have been progressively altering their dietary patterns. These peoples are holders of a food heritage, within which there is a diversity of techniques, flavors, and associated species that may no longer be reproduced or managed, depending on the impact of such changes. The challenge faced in this field is, therefore, not against land invaders, but rather against a new face of colonialism: the market-driven approach, which arrives through various avenues, enticing the consumption of ultra-processed foods. The recommendation to change this situation consists of developing a program, with a multidisciplinary team, that can operate in indigenous schools and with family health centers, providing relevant content through a participatory methodology on an ongoing basis. Informative actions such as isolated lectures will not have a consolidated effect for this purpose. Even so, raising awareness among indigenous peoples themselves about the problem they experience is the first step toward achieving change.

2) Support for the expansion of the demarcation of Indigenous Lands and territorial monitoring

The situation of the Guarani in São Paulo clearly demonstrates how the demarcation of Indigenous Lands is crucial to ensuring the continuation of traditional land use, including forest management and local food practices. According to the 2022 MapBiomass survey, demarcated Indigenous Lands are largely responsible for environmental conservation and biodiversity, maintaining 19% of the country's vegetation cover. Therefore, financial and political support for the expansion of fragmented lands, as well as for territorial protection to prevent land invasion by various actors (mining, agribusiness), must be agreed upon by both governmental and non-governmental groups. In the same context, it is important to develop—with the indigenous peoples—climate



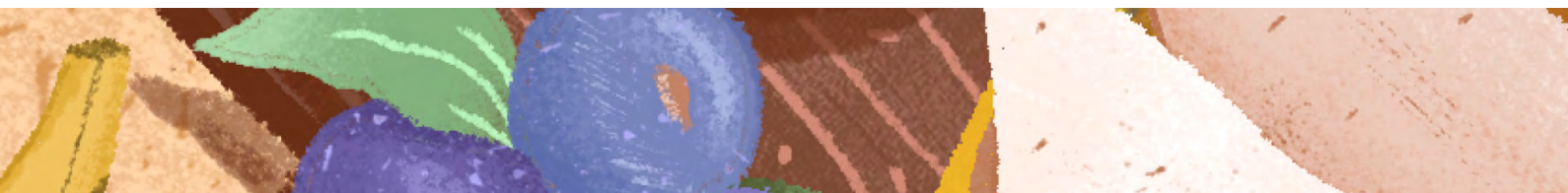
resilience and seed protection strategies, since climate change directly impacts agricultural production and food security.

3) Adding value to traditional food through income generation

Resource acquisition opportunities have been a major bottleneck for Indigenous peoples and directly impact their quality of life and the preservation of traditional culture. Direct purchases through public tenders in Brazil, through the PAA and PNAE programs, have been a good option for generating income for Indigenous farmers. The PNAE also guarantees the regionalization of school meals, strengthening the right to adequate food for Indigenous peoples. The inter-institutional collaboration carried out in Amazonas through CATRAPOVOS-MPF, strengthened by the Rio Negro Indigenous movement, since 2017, has demonstrated how it is possible to achieve a satisfactory level of income generation, positively impacting the maintenance of the food system. Technical Information No. 63/2024 of FUNAI on the regionalization of school meals resumes the history of advances initiated in different locations in Amazonas, and already expanded in 2023 to Tocantins in the form of a pilot project, with the Krahô and Xerente/Akwê peoples, in the villages of Pedra Branca and Paraíso respectively [1].

Reinforcing the content of the aforementioned FUNAI document, this consultancy recommends supporting the expansion of these programs to other territories, taking into account the need to listen to local demands through participatory methodologies. Progress in adapting procurement notices, prepared by city halls and local agencies (hospitals, departments), is crucial to address Indigenous needs and realities, which are so different from the operating logic of conventional agriculture.

Finally, it highlights the need to support the expansion of municipal or regional fairs focused on local products, connecting producers and consumers, and promoting traditional Indigenous food for Indigenous people themselves. Numerous commercial initiatives seek to bring sociobioeconomy products to national and international markets, inserting them into haute cuisine circuits. Such initiatives undoubtedly generate financial resources and visibility, but the consultant emphasizes the need for smaller value chain circuits so that Indigenous food products are truly accessible to Indigenous people living in urban centers.



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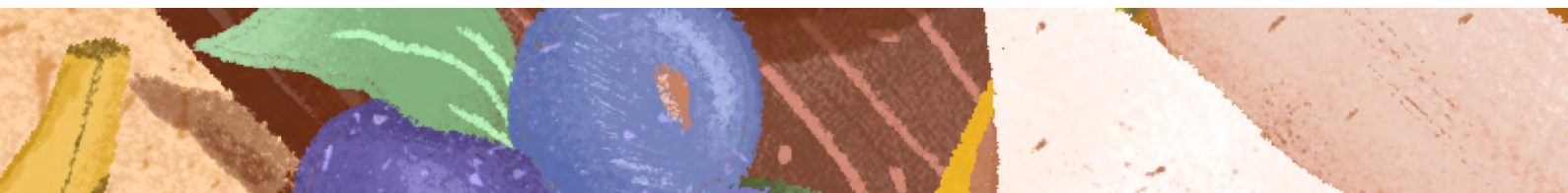
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