Project proposal: Enhancing resilience of communities, smallholders, and ecosystems to climate change impacts through adapting and scaling up land/resources used systems in the Marajo archipelago in Brazil

Gender Assessment

Contents

About the project proposal

The consideration, respect and promotion of gender equality, women's empowerment, intergenerational equity and the rights of Indigenous Peoples and local communities are some of the core principles of the 2015 Paris Agreement (PA). The Agreement guides all climate action taken by the signatory countries, including Brazil, in their respective contexts and in relevant international cooperation. This project's goal is to implement culturally sensitive and gender-responsive adaptation measures rooted in traditional knowledge and resilient, native species, especially with highly vulnerable populations in the Amazon archipelago of Marajó, more specifically in Cachoeira do Arari, Salvaterra and Soure, in the state of Pará in Brazil. This goal reflects the concern of directing adaptation measures, including resources, to systemically leverage resilience and autonomy among the most marginalized social groups of Brazilian society in a context where they are realizing heightened risks from climate change impacts.

Following the goals of the Green Climate Fund Gender Policy, especially to achieve gender equality and women's empowerment in its funded projects, this proposal seeks to enhance the resilience of Marajó's smallholder families and traditional communities to adverse climate impacts through diversified agroforestry systems. While pursuing these goals, the project's activities also seek to achieve gender equality and gender balance in its components, which are: to promote the access to information on impacts of climate change in their food systems; to adopt climate resilient practices, such as agroforestry systems (AFS); to enable access to financial services and markets for climate resilient agroforestry-based products; and to create or strengthen regulatory frameworks to sustain the proposed measures.

The AFS, studied as a suitable adaptation measure for the context of Marajó, are related to agroecology, a counterpoint modality to monoculture systems that strengthens climate resilience and socio-biodiversity. "Beyond the agronomic conceptualization, the concepts of agroecology and, consequently, agroforestry systems, incorporate the socio-environmental issue since they are socially inclusive and increase the resilience of the most vulnerable populations. Agroecology provides the basic ecological principles for the study and treatment of ecosystems, both productive and preserving of natural resources, which are also culturally sensitive, socially just and economically viable"[1].

Introduction

Climate change is negatively impacting marginalized people across societies, and areas at the periphery of the globalized economy, especially in the global South, the hardest. Climate justice movements name it Most Affected People and Areas (MAPAS). Different aspects of marginalization, such as gender, sexuality, race, geographical location, (dis)ability, literacy, income, and age, contribute to increasing people's and territories' vulnerability to climate change effects, creating further injustices. Most Affected People are those with greater

[1]H2O Company Climate Feasibility Report, v2, 2022.

intersecting processes of marginalization, such as poor rural women of color in the global South. These people have been increasingly facing the intensified and crosscutting effects of climate change "due to a combination of factors including gendered divisions of paid and/or unpaid labor" (IPCC, 2022)[2].

Most Affected Areas are not only geographical places more prone to climate change related hazards, such as islands and urban informal settlements in the Global South, but also those territories whose economies depend on livelihoods and/or on climate-sensitive production activities, such as agriculture, non-timber forest products' use and fishing. Moreover, places in the Global South, marked by the historical legacies of colonialism to the date, suffer higher risks regarding climate change impacts; and societies with greater socioeconomic inequalities are less resilient to climate change (IPCC, 2022).

Current adaptation measures are not addressing the intersecting marginalization processes linked with racial, gender and ethnicity factors which produce and reproduce poverty and thus vulnerability to climate change (IPCC, 2022). Against this background, systemic adaptation strategies are vital to respond to these structural and interconnected processes shaping people and places' vulnerability and risks to climate change-related impacts, and to support the increase in socioeconomic equality and environmental sustainability in the medium and long run. As a matter of climate justice, MAPAS within the global South need improved adaptation action, with solutions based on traditional knowledge, especially from Indigenous Peoples and local communities (UNFCCC, 2022)[3].

Methodological notes

This assessment was commissioned by Fundación Avina to identify gender-relevant conditions and how these interact with climate change aspects in the municipalities of Cachoeira do Arari, Salvaterra and Soure, in the Marajo Archipelago, in Pará state, Brazil. The assessment seeks to unveil how climate change is differently affecting people, based on aspects such as their gender, race, income or age. Therefore, not only a gender-responsive approach guides this assessment, but also an **intersectional** one, which looks at how other context-relevant social variables, such as race, ethnicity and/or income, mutually contribute to increasing people's vulnerability to the current and projected climate change impacts in the region.

Based on this understanding, recommendations and an action plan are proposed, with gender-responsive activities aimed at improving the adaptive capacities of the targeted population, with gender equality co-benefits. The assessment was conducted from April to July 2022 by a gender and climate change expert through fieldwork, semi-structured interviews, and meetings with relevant stakeholders in the three concerned municipalities and in Belém, Pará's capital. While interviewees were asked for their consent to participate in the interviews, their anonymity is preserved throughout this document.

[2]https://www.ipcc.ch/report/ar6/wg2/
[3]https://lcipp.unfccc.int/homepage

Framework for the project's actions on gender-responsive climate adaptation

As stated in the 2022 IPCC's Report on Impacts, Adaptation, and Vulnerability, "climate justice initiatives that explicitly address multidimensional inequalities as part of a climate change adaptation strategy, can reduce inequities in access to resources, assets, and services as well as participation in decision making and leadership, essential to achieving gender and climate justice". This proposal subscribes to this multidimensional, gender-responsive approach. Moreover, GCF Gender Policy principles, goals, and policy requirements orient this assessment, in which an analysis of the context and recommendations aim at decreasing the gender gap in socioeconomic, territorial, and environmental inequalities and risks exacerbated with climate change.

The Sustainable Development Goals and the 2015 Paris Agreement's (PA) principles of gender equality, human rights, the right to health, the rights of Indigenous Peoples, local communities, people in vulnerable situations, the right to development, and climate justice orient the documents of this project proposal, not only through the gender assessment and action plan, but also in its concept and logical framework. Some of the PA's principles are also included in the 2016 National Adaptation Plan of Brazil[4], such as the consideration of the social, cultural, and economic dimensions to promote adaptation, which need to be addressed in a multisectoral, regional and prioritized manner, including the application of gender, racial and ethnically sensitive approaches, and with particular attention to vulnerable groups and populations, such as Indigenous Peoples, Quilombolas and Riverine populations.

Upon a meaningful consultation with traditional communities addressed in this project proposal, such as Quilombola communities, the aim is to include them and other Most Affected People living in the targeted areas of the project, as beneficiaries to implement agroforestry systems, manage the knowledge and solutions developed throughout the project, apply it in their communities and sustain it after the project's duration.

Above all, this proposal is aligned with and promotes the prescripts of the Universal Declaration of Human Rights, the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), the International Convention on the Elimination of All Forms of Racial Discrimination and relevant International Labor Organization's (ILO) Conventions. At the national level, the proposal follows the Federal Constitution's guarantee that women and men have equal legal rights (article 5) and is in line with the 2007 National Policy for the Sustainable Development of Traditional Communities[5]. This proposal respects the governance of Brazil and the region where it plans to be implemented, including the different scales of competencies (national, state, or municipal level) responsible for the implementation of policies in the project's area. Below is a brief contextualization of Brazil in terms of gender indicators, followed by a presentation of the context in Marajó.

[4] https://unfccc.int/sites/default/files/resource/Brazil-NAP-English.pdf
[5]https://direito.mppr.mp.br/arquivos/File/Decreto_6040_2007(2).pdf.

Relevant gender equality indicators and legal frameworks in Brazil

In Brazil, as in most countries, there is a considerable sexual division of labor within households and in the public sphere (Carrasco, 2012)[6]. Some available indicators collected by the national statistics' office IBGE to follow-up the 17 Sustainable Development Goals (SDG), especially SDG 5 on achieving gender equality and empowering women and girls by 2030, are below.

Proportion of daily hours spent caring for people and/or house chores, by people aged 14 or older, by sex and color or race (SDG Indicator 5.4.1)												
Brazil, Northern Region and state of Pará	Sex X Color or race X Year											
	Men						**Women**					
	Total		**White**		**Black**		**Total**		**White**		**Black**	
	2016	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**	**2017**
Brazil	4,9	5,1	5,0	5,2	4,8	5,0	11,3	11,5	11,0	11,1	11,5	11,8
North	4,6	4,7	4,5	4,6	4,6	4,7	10,4	10,3	10,0	9,8	10,6	10,5
Pará	4,8	5,0	4,9	4,8	4,8	5,0	11,6	11,6	11,5	11,0	11,6	11,8
Source: IBGE. Pesquisa Nacional por Amostra de Domicílios Contínua, 2018[7].												

The data shows that women in general have been spending at least double the time of men in care work and house chores. Important to note that almost always this type of work is unpaid. Black women have been working even more hours than white women in this domain.

Proportion of men/women in management positions, by sex and activity sector (SDG Indicator 5.5.2)								
2017								
Brazil and Regions	Sex X Activity Sector							
	Men				**Women**			
	Total	**Industry**	**Services**	**Agriculture and/or livestock**	**Total**	**Industry**	**Services**	**Agriculture and/or livestock**
Brazil	60,8	31,4	64,5	4,0	39,2	20,8	78,3	0,9
North	60,7	17,3	75,8	6,5	39,3	12,2	86,5	1,3
Northeast	60,4	22,0	75,0	3,0	39,6	15,2	84,3	0,5
Southeast	59,9	33,4	63,0	3,6	40,1	22,5	76,5	0,9
South	62,2	39,1	58,6	2,3	37,8	24,2	75,2	0,6
Centre-West	64,1	24,9	63,0	12,0	35,9	17,1	81,1	1,8
Source: IBGE. Pesquisa Nacional por Amostra de Domicílios Contínua, 2018.								

The table above presents the percentage of men and women in management positions of different sectors. In Brazil, men have been dominating the management positions overall (60,8%), including in the northern region where Pará is located (60,7%). In that region, within

[6] https://www.sof.org.br/wp-content/uploads/2015/07/Estatisticas.pdf
[7] https://odsbrasil.gov.br/objetivo5/indicador552.

the 39,3% of women in management positions, 12,2% work in the industry sector, 86,5% in the services sector, and only 1,3% in the agricultural and/or livestock sector.

In terms of income, accessing jobs and the formal market, women are also the most left behind in Brazil. On average, women receive about ¾ of what men earn in Brazil as labor income (IBGE, 2018)[8]. This is due to their accrued hours in unpaid domestic work, and a bigger representation in informal sectors and part-time occupations. As seen in the table above, 41,6% of women and 41,4% of men occupied the informal sector in Brazil in 2018. The proportion of Black women in the informal sector in Brazil (47,8%) is also higher than white women (34,7%), Black men (46,9%) and white men (34,4%)[9].

The majority of households in Brazil are headed by women. Of the 75 million Brazilian households, 50.8% were headed by women (PNAD IBGE, 2023). Black women lead this indicator with 21.5 million households (56.5%) and non-black women, 16.6 million. In terms of the family's average work income, the lowest national values are registered among single-parent households with an average female head of R$ 2,833. Still on per capita work income, it is in the single-parent households headed by women with children that the lowest income is found. When we look by color/race, the income of black families was always lower than that of non-black families, independently of the family arrangement. Gender and race/color inequality in productive inclusion intensely affects the quality of life of all family members and often imposes the need for the precarious insertion of children and other relatives to supplement the family income.

Women-led households face other specific barriers, such as lack of formal and informal support networks, such as extended family. This lack of support can make it more challenging to access resources, obtain childcare assistance, or find employment opportunities. On the other hand, women face barriers in accessing credit or financial services, such as loans or bank accounts.

What is the legal status of women in Brazil?

Brazil has ratified the CEDAW, the Action Plan of the International Conference on Population and Development, and the Beijing Platform for Action, all relevant international agendas for the promotion of gender equality. At the national level, discrimination against women is prohibited by the Federal Constitution. There are also specific laws aimed at guaranteeing the rights of women, for example, Law n. 11.340 as of 2006, called “Maria da Penha Law”, creates mechanisms to curb domestic and family violence against women, and Law n. 13.104 from 2015, the “Feminicide Law”, which instituted a new type of qualified homicide based on "reasons of the condition of feminine sex", in cases of domestic and family violence, contempt or discrimination against the condition of women (UN Brazil, 2017)[10].

The amendment to the Constitution no. 72 from 2013, better known as the “Amendment of the Domestic Workers” is an important landmark of gender and racial equality in the country. It redeems historical debt with women by guaranteeing that domestic workers – mostly Black

women enjoy labor rights already guaranteed by the Constitution to other workers. Additionally, government initiatives such as the Programa de Aquisição de Alimentos (or Food Purchase Programme), which establishes a minimum percentage of women's participation in the production of family farming foods purchased by the government, or the Bolsa Família programme, which gives preference to women when granting social protection benefits, contribute to give visibility to women's work and participation in society. However, the existing evidence points to the need to complement them with actions to transform traditional and unequal gender roles altogether (UN Brazil, 2017). The next section presents context-specific data, the cultural and historical background on Marajó in Brazil, with attention to territorial, gender and racial aspects.

Marajó: island of inequalities

Brazil is marked by stark social inequalities within its diverse population, made of different ethnic and racial groups. Historical processes, such as colonization, which started the slavery of native Indigenous Peoples and then Black Africans[11], have left a legacy of racist structures and institutions in present times. Consequently, Indigenous Peoples, people of African descent and local communities, such as fisherfolks and family farmers still face disadvantaged conditions to access policy benefits and other opportunities as they are relatively the most marginalized and discriminated against in society.

In the Marajó Archipelago in the Amazon state of Pará, native people have historically suffered throughout centuries from occupation and exploitation. European settlers have first enslaved Indigenous Peoples, doing later the same with the over 5 million Africans[12] commercialized as slaves to forcibly work in Brazil. During colonial times (1500-1822), a large population of enslaved Black Africans arrived in Marajó with their different ethnic groups, languages, and cultures. They mixed with the equally diverse Indigenous groups in the region, as well as the white settlers, which resulted in a great miscegenation process and in strong cultural identities, reflected in today's Marajó peoples. The region is considered by historians and archeologists as a highly complex society in organizational terms with cultural richness for its Marajoara ceramics, paintings, mythology, music, native healing practices and architecture[13].

Human development in Marajó: the Most Affected People in a Most Affected area of Brazil

The Human Development Index (HDI) measures achievement in key dimensions of life, such as longevity, education, and income. The index expresses if a country has low, medium, high, or very high human development. The greater the index number, the higher the human development. In 2019, Brazil's Human Development[14] was 0.765, considered high. However, the HDI does not account for inequalities, and that is why when the index is adjusted to reflect those, Brazil's index falls to 0.570, considered then a medium development country (UNDP, 2020)[15]. The decrease shows the loss in human development (25,5%) of the country due to inequalities reflected in each HDI indicator.

The Gender Inequality Index (GII) is another HDI adjusted measurement, which accounts for

maternal mortality and adolescent birth rates, share of parliamentary seats, attainment in secondary and higher education, and labor market participation of men and women. Brazil ranked 95 out of 162 countries according to its GII in 2019. The index includes different indicators, which in that year showed that 15% of women occupied the parliamentarian seats, 61,6% percent of adult women and 58,3% of men had reached at least a secondary level of

[11]Formally accounted from 1535 to 1888, during this period, Black Africans were captured in their lands and commercialized by white Europeans as unpaid labor force to work under depriving conditions in the colonial settings of the current Brazilian territory.
[12] The numbers vary depending on historical registry. The percentage of enslaved Africans brought to Brazil are overall around 40-50% of the total amount of enslaved Africans taken to the Americas. See: https://brazillab.princeton.edu/research/racialized_frontiers
[13]Taken and adapted from the previous gender assessment, presented with the Concept Note to the GCF.
[14]The HDI is a multidimensional measure of "a long and healthy life, access to knowledge and a decent standard of living" (UNDP, 2020).
[15]https://hdr.undp.org/sites/default/files/Country-Profiles/BRA.pdf

education, despite women's participation in the labor market was 54,2% compared to 74,1% of men (UNDP, 2020).

In Brazil, the HDI is measured per municipality and regions. Although the inequality-adjusted HDI is not available for the municipalities in Brazil, the HDI already shows where the lowest levels of health, education and income conditions are inside the country. For example, through such data, the greatest inequality gaps are seen between North-South regions, urban-rural areas, white and non-white populations within Brazil. The state of Pará, in the Amazon biome in the North, is in one of the lowest HDI regions in Brazil (IPEA, UNDP, FJP, 2016)[16]. Pará ranked 24th out of 27 states in Brazil in the last HDI measurement from 2010, with a 0,646 score (medium) (IBGE, 2010) [17] . Within Pará state, 8 out of 16 municipalities of the Marajó archipelago have among the 50 lowest municipal HDIs in the whole country[18]. Cachoeira do Arari's municipal HDI score is considered low (0.546), and Salvaterra and Soure present medium human development (0.608 and 0.615 respectively).

The project's aim to work with Most Affected Smallholders to climate change impacts and Areas within Brazil, namely the population in the Marajó municipalities of Cachoeira do Arari, Salvaterra and Soure, come also from the fact that they are contiguous territories sharing similar challenges. They are nevertheless facing diverse climate change impacts such as increase in temperature, rainfall reduction, and sea-level rise, which are already risking their population's livelihoods, economic sustainability, and wellbeing[19].

Population aspects: the prominence of Black and Quilombola people in Marajó

The three municipalities present distinct vegetation, traditional communities, and economic activities, which in turn makes the climate impacts very specific to each of their contexts[20]. 64% of Cachoeira do Arari's population lives in the rural area of the municipality, whereas in Salvaterra and Soure this number is 37% and 9%, respectively. This means most of the population in Cachoeira do Arari lives outside of the urbanised city area, whereas the opposite happens in Salvaterra and Soure.

Great part of Cachoeira do Arari's territory are flooded fields dominated by the Quartiero family[21] who yields rice monocrops with indiscriminate use of pesticides (Amazonia Real, 2020)[22]. There are other large-scale landowners, whereas the small-scale family farms are

[16]https://www.ipea.gov.br/portal/images/stories/PDFs/livros/livros/20160331_livro-idhm.pdf
[17]https://cidades.ibge.gov.br/brasil/pa/pesquisa/37/30255?tipo=ranking
[18] H2O Company, Climate Feasibility Report, v2, 2022.
[19] H2O Company, Climate Feasibility Report, v2, 2022.
[20] H2O Company, Agroforestry Report, 2022.
[21]The Quartiero family arrived in 2011 in Cachoeira do Arari, introducing rice plantations. The family is infamous for their reiterated use of violence against Indigenous groups in the northern state of Roraima, where they were previously settled and later expelled from, once the ratification of their latifundia as Indigenous territory was done by the federal government. The family moved their business to Marajó then (see Environmental Justice Atlas, 2022).
[22]https://amazoniareal.com.br/a-natureza-esta-secando-quilombo-no-marajo-vive-impactos-do-arrozal-e-clima-de-violencia/

concentrated in the Quilombola community of Gurupá, the settlement projects of Xipaiá and Urubuquara, and on the banks of the Arari River by Riverine communities.

It is worth noting the meaning of Quilombola communities in Brazil, and their centrality in the Marajoara territory. Quilombola communities are based on traditional territories to where reminiscent from enslaved Black people fled and withstood together during the slave trade period (1535-1888). Quilombola territories still exist, are recognized under special national regulations and constitute an important landmark in the cultivation of Afro-Brazilian culture, resistance, and knowledge (Fundação Palmares, 2003)[23].

In Salvaterra, there are 16 Quilombola communities recognized by the State's authority Fundação Palmares[24]. Salvaterra is one of Pará's municipality with the highest number of Quilombola communities (MALUNGU, 2013)[25], and Pará is the 4th state in Brazil with the largest Quilombola population (Agência Brasil, 2021)[26]. Even though there is no Quilombola community officially recognized in Soure, the latest administrative records registered 27 people as self-declared Quilombola there. In these three municipalities, there are no acknowledged Indigenous communities, but there are other traditional communities, such as artisanal fisherfolks, Riverine and forest peoples, many of which sustain themselves through agriculture and the sustainable use of non-timber forest products (IBGE, 2020)[27].

In Brazil, it is estimated that 1,13 million people live in Quilombola traditional territories. The Quilombola population in Cachoeira do Arari is 803, while in Salvaterra it is 6.357 (IBGE, 2020). This represented 26% of Salvaterra's total population in 2021, and 3,3% of Cachoeira do Arari's[28]. Despite being a considerable part of the population overall in Marajó, Quilombola people are relatively more excluded from opportunities and face multidimensional insecurities shaped by racist and colonial legacies still present in cultural norms, institutions, laws, and public policies. They thus endure significant disadvantages in accessing rights, recognition, and representation, and heightened violence against their traditions, including the territories. Because most of Quilombola territories are held through customary tenure, these communities are vulnerable to land grabs and expropriation, risks which rise with climate change. This reality applies across Brazil. These aspects contribute to the fact that around 48% of Quilombolas in Brazil live in severely food-insecure households, the Northern region presenting one of the most critical situations (UNDP, 2022)[29].

Despite the lack of visibility based on the country's colonial history, Black and Quilombola people in Brazil have been outspokenly recognizing themselves as Black, especially since the

[23]https://www.palmares.gov.br/?page_id=52126
[24]The communities are: Campina, Bacabal, Santa Luzia, Rosario, Vila União/Campina, Boa Vista, Deus Ajude, Bairro Alto, Caldeirão, Pau Furado, São Benedito da Ponta, Siricarí, Providência, Mangueira, Salvá, Paixão (https://www.palmares.gov.br/wp-content/uploads/2015/07/tabela-crq-completa-certificadas-20-01-2022.pdf).
[25]https://malungupara.wordpress.com/quilombolas/comunidades/
[26]https://agenciabrasil.ebc.com.br/geral/noticia/2021-10/populacao-residente-em-area-indigena-e-quilombola-supera-22-milhoes
[27]https://biblioteca.ibge.gov.br/visualizacao/livros/liv101859.pdf
[28] https://www.ibge.gov.br/cidades-e-estados/pa/salvaterra.html
[29]https://hdr.undp.org/system/files/documents//srhs2022pdf.pdf

last two decades. This is reflected in the most recent official data, which shows that, among the projected total population of 213.317.639 people in 2021, 56,2% of Brazilians are self-declared Black, 42,7% are white, and 1,1% are yellow or Indigenous (IBGE, 2019)[30]. The growing self-recognition of people as Black is in part attributed to the organization and strength of the Black movement in Brazil. Among their achievements within the last two decades is the advocacy for the creation of affirmative and reparational public policies, such as racial quotas in public universities in 2012[31], and the establishment of the Racial Equality Statute in 2010[32].

Populational indicators show that Cachoeira do Arari has 51% of men and 88,9% of Black people, with high birth rates and low infant mortality rates. In Salvaterra, the numbers are similar: 50,99% are men, 86,74% are Black, and birth rates are high, with a significant growing population of children and young people. Last, Soure's population is 50,13% of women, and 83,24% of Black people. There, the number of individuals of both sexes between 15 and 19 years old is reduced, probably due to the migration of youngsters to bigger cities where more opportunities exist [33] . The data shows that the largest population group in the three municipalities is composed of young and adult Black people.

Socioeconomic and territorial indicators under climate change projections

Cachoeira do Arari

In terms of income and occupation, Cachoeira do Arari's ratio of formally employed people to the total population was only 4,2% in 2020, ranking 5418 among the 5570 Brazilian municipalities, and 133 among the 144 municipalities in Pará[34]. The average monthly wage among formal workers was 1,8 minimum wages in the year 2020. As of 2022, the minimum wage is BLR 1212,00, around USD 220. From the projected 24.355 people living in Cachoeira do Arari in 2021[35]. 6.656 families were registered in the national social protection registry "Cadastro Único"[36] in April 2022, among which 6.049 are families with income up to 0,5 minimum wage. The federal government uses data from this registry to provide social benefits and services to the economic poor, people with disabilities, among other marginalized groups. The registry's data is also used for mapping local vulnerabilities, planning actions, and selecting beneficiaries of municipal and state level policies (Ministério da Cidadania, 2022)[37].

These numbers show that most of the municipality's population is economically poor and relies on social protection benefits. This also applies to the municipalities of Salvaterra and Soure, as shown by the numbers in the respective below sections. In Cachoeira do Arari, it was reported

[30]https://educa.ibge.gov.br/jovens/conheca-o-brasil/populacao/18319-cor-ou-raca.html
[31] http://portal.mec.gov.br/cotas/perguntas-frequentes.html
[32] https://direito.mppr.mp.br/arquivos/File/Lei122882010EstatutoIgualdadeRacial.pdf
[33]http://www.atlasbrasil.org.br/perfil/municipio/150200 & H2O Company, Climate Feasibility Report, v2, 2022.
[34] https://cidades.ibge.gov.br/brasil/pa/cachoeira-do-arari/panorama
[35] https://cidades.ibge.gov.br/brasil/pa/cachoeira-do-arari/panorama
[36]Cadastro Unico is the Federal Government's database where the socioeconomic information of low-income families domiciled in Brazil is registered. It includes those with monthly incomes of up to 0,5 minimum wage per person or total family income of up to 3 minimum wages.
[37]https://aplicacoes.cidadania.gov.br/ri/pabcad/relatorio-completo.html

that about 80% of its territory is associated with large farms with livestock activity. This indicates a context of high concentration of land by a minority. Artisanal fishing and subsistence farming are strong among family farmers and the most marginalized population of the municipality, like Quilombolas and Riverine people[38].

The two climate scenarios projected by H20 Company in the climate prefeasibility report elaborated for the three municipalities show an increase in consecutive number of days without rain, a reduction of annual precipitation volumes and increase in temperature overall[39]. In the RCP 4.5 scenario, annual precipitation volumes shall decrease by 23% by the end of the century. In the RCP 8.5 scenario, this reduction should be of 43% for the same period. Under the most drastic scenario, RCP 8.5, the southern portion of Cachoeira do Arari, where the Gurupá Quilombola community lies, shall most harshly be affected by longer periods of water scarcity because of the mentioned climate effects, and thus have their agricultural production at risk. As for sea level rise, the traditional settlements of Urubuquara and Xipaiá might be affected, possibly reaching Lake Arari too, a place of importance for the subsistence and production of traditional peoples.

Cachoeira do Arari has 816 registered farms, among which 693 (85%) are family farms. 59% of the registered producers of family farms are men, among which the largest share is between 35 and 65 years old (IBGE Censo Agropecuário, 2017). Family farming entails that the management of a property is shared by the family, and the agricultural and/or animal production is the main source of their income. Besides, family farms are small scale, with a maximum of 4 fiscal modules, which is a measure that varies depending on the context (Decree n. 9.064, from May 31st, 2017)[40].

Salvaterra

Income indicators show that the monthly wage of formal workers was also 1,8 minimum wages in 2020, ranking 94 out of 144 municipalities in Pará. The ratio of employed people to the total population was 4,8%, again a very low percentage. From the projected 24.392 people living in Salvaterra in 2021[41], 7.521 families were registered in "Cadastro Único" in April 2022, from which 6.856 were families with income up to 0,5 minimum wage[42]. Salvaterra's economy relies on agriculture production, following the Amazon region's tendency of having at least half of agricultural establishments as family farms (Souza, 2020 as cited in Vieira & Freitas, 2021)[43]. Salvaterra has 344 registered farms, among which 277 (80,5%) are family farms. 80,5% of the registered producers of family farms are men, among which the largest share is also between 35 and 65 years old (IBGE Censo Agropecuário, 2017).

[38] H2O Company, Climate Feasibility Report, v2, 2022.
[39] H20 Company, Report Climate Scenarios, 2022.
[40] http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2017/decreto/d9064.htm
[41] https://cidades.ibge.gov.br/brasil/pa/salvaterra/panorama
[42] https://aplicacoes.cidadania.gov.br/ri/pabcad/relatorio-completo.html
[43] http://bdta.ufra.edu.br/jspui/handle/123456789/2022

Through fieldwork and interviews with actors from the three municipalities, Salvaterra was often reported as the municipality with the most viable and most experienced population working with agriculture among the three. However, about 75% of the territory (38.271 ha) is in the hands of large landowners, which indicates again a context of high concentration of land. Excluding latifundia, smallholding and Quilombola territories in Salvaterra are key in keeping traditional agricultural practices, biodiversity, and maintaining not only their livelihoods but the local market too. In Brazil, despite family farmers sustain 70% of the domestic food market, they are still in disadvantage in terms of access to investments and credit (Lima, Silva & Iwata, 2019 as cited in Vieira & Freitas, 2021).

Climate change might hamper land use, increase water scarcity, and aggravate territorial disputes, as the projections show that longer periods without rain and reductions in precipitation will mostly affect this municipality, where the majority of Quilombola communities are. Under RCP 8.5 scenario, sea level rise here will have a greater impact on the urban area close to the border with Soure, including some Quilombola communities, such as Caldeirão[44].

Soure

Soure is considered Marajó's capital, for it is the most touristic place in the archipelago, being also one of the most visited federal conservation units in Brazil, with over 150.000 visitors per year (ICMBio, 2018)[45]. There, the average monthly wage was 1,9 minimum wages in 2020 for formal employees. The ratio of employed people to the total population was 5,8%, ranking 104 out of the 144 Pará's municipalities and 4980 among the 5570 Brazilian municipalities (IBGE Cidades, 2022)[46]. From the projected 2021 population of 25.752 people, 6.867 families were registered in "Cadastro Único" in April 2022, from which 5.814 were families with income up to 0,5 minimum wage.

Soure's territory diverges from the previous ones as it includes a Marine Reserve (RESEXMAR), a conservation unit with sustainable use of resources. Within the Reserve, land is public and managed by a deliberative council including the federal government and the local traditional communities. These communities can reside in the Reserve and use its resources in a sustainable manner (ICMBio, 2018) [47] . Despite the absence of data, the municipality's economy and local market are largely based on tourism, and the productive activities of the RESEXMAR, including fishing and sustainable use of non-timber forest products. The climate scenarios' projections by H2O Company show that Soure shall be the municipality, among the three in the project, to suffer the most adverse impacts from climate change, especially sea level rise, which shall take over half (under RCP 4.5) and up to 60% of Soure's land by 2050

[44] H20 Company, Report Climate Scenarios, 2022.
[45]H2O Company, Climate Feasibility Report, v2, 2022.
[46] https://cidades.ibge.gov.br/brasil/pa/soure/panorama
[47]https://www.icmbio.gov.br/portal/images/stories/plano-de-manejo/plano_de_manejo_resex_marinha_de_soure_v19.pdf

(under RCP 8.5)[48]. This will also affect the RESEXMAR area where traditional and fisherfolks' communities live by the coast.

While small properties, which have up to 4 fiscal modules, cover only 1% of the territory (3.958 ha), the large ones cover 95% of the municipality (255.881 ha). Soure has 120 registered farms, among which 52 (43%) are family farms. 84,6% of the registered producers of family farms are men, among which the largest share is between 55 and 75 years old (IBGE Censo Agropecuário, 2017).

The available data on family farms in the three municipalities might not include the small holdings of the most vulnerable parts of the population in the three municipalities, as they are usually much smaller than a fiscal module. For reference, in the three municipalities, one fiscal module equals 65 hectares. Hence, the account of the the rural properties considered small (with up to 4 fiscal modules) might mask the very small holdings targeted in this proposal. Because of the inexistence of gender-sensitive data on the municipalities' small-scale agricultural and agroforestry activities and considering the relevance of family farming for food production in Brazil, the presentation of such data from the 2017 Census shows the disparity in land concentration in the region, and the gender inequalities within family farms.

However, the data should not be interpreted as if women and younger people participate considerably less in family farming. They might indeed benefit less from agricultural policies, including credit and technical assistance, but the interviews and fieldwork conducted indicate a more gender-balanced and nuanced reality in terms of youth workforce in family farming overall (see more on section 5). According to FAO (2015), women account for 43% of the total workforce in rural areas of developing countries, and they spend an average of 372 hours/year on rural activities versus 368 hours by men[49]. Below, a tailored gender analysis is drawn based on the fieldwork in the three municipalities targeted in this project, including semi-structured interviews with relevant stakeholders.

Gender assessment of the context

Marajó archipelago is a highly specific and complex cultural site in Brazil which encompasses over three thousand islands. 1616 marked the year of the foundation of Belém, Pará's capital, and since then the Amazon and its native peoples were incorporated into Portuguese territory and thus exploited by them. From 1616, the first Black enslaved people from Africa were brought to the Amazon to forcibly work in agriculture and fields, forming significant part of the ethnic, racial, and cultural composition of the region (Salles, 1971 as cited in Guimarães et al, 2021)[50].

However, historic accounts have up until recently only acknowledged the presence of Indigenous Peoples in the Amazon. This invisibility of Black people in the Amazon region,

[48] H20 Company, Report Climate Scenarios, 2022.
[49]https://www.fao.org/3/i5120e/i5120e.pdf
[50]https://www.revistas.ufg.br/revistaufg/article/view/69173

especially in Pará, is perceived to the date, as there is low self (and also hetero) recognition of Blackness among people [51] . Black and Indigenous women have also been suffering from invisibility, as well as hyper sexualization and gender-based violence based on overlapping racist and patriarchal structures (Guimarães et al, 2021)[52]. In Marajó, the deprivations are several and interrelated, which makes any intended intervention more complex.

> *Old problems still affect Marajó today. Women's empowerment is still an issue here. I wish we could be already fighting homophobia, racism, but basic issues are more urgent, such as hunger and teenage pregnancy*[53].

The population of the three municipalities of Marajó is largely composed of young and middle-aged Black people. In Soure, representatives of one of its residents' associations indicated that the State's lack of support to local community initiatives is one big hindrance to Soure's population to benefit from accessing public policy benefits and enjoying a good life quality. Similarly, one Carimbó association in Cachoeira do Arari reported having no State's support to carry out a traditional cultural education and dance project with vulnerable children and youth, leaving this population even more susceptible in a context of rampant inequality and climate change[54]. These are examples of the challenges facing the targeted population.

An analysis of how climate change is affecting a given area needs to be systemic, sensitive to cultural and historical dynamics, and gender-responsive, if it aims to enhance climate resilience while addressing inequalities. A gender assessment of the three contexts was carried out to observe where the biggest inequality and vulnerability gaps are, as well as opportunities to implement and potentialize the expected results of this project proposal. The gender assessment analyzed not only gender dynamics during the fieldwork and interviews, but also other interconnected vulnerability aspects, such as ethnicity, race, use of time and age. The assessment is organized as per the components of the proposal through the subsections below.

Challenges and opportunities to build climate resilience through information and capacities

Soure

Given the lack of State's support in ensuring the resilience of the most marginalized parts of the population in the three cities, a significative role is played by community associations and cooperatives working for the empowerment of people and sustainability. Grassroots associations are key stakeholders in Soure's context, given that its special condition of Marine Reserve was formalized in 2003 thanks to historical struggles of the local fisherfolks and community leaders concerned with the predatory use of the forest and predatory fishing[55]. Because of the federal jurisdiction of the RESEXMAR and its deliberative council, mostly

[51]For example, in Pará, it is common to refer to brown and Black people who do not identify as Black nor Indigenous as "moreno/a" (Guimarães et al, 2021).
[52]https://www.revistas.ufg.br/revistaufg/article/view/69173
[53]Interview with member of a Residents' Association, Soure, 11.05.2022.
[54]Interview with members of a Carimbó Association, 25.05.2022.
[55]Interview with Secretaria de Producao, Soure, 12.05.2022.

composed of civil society representatives, Soure's associations and local communities are sound, organized, engaged in municipal political spaces, and committed to cultural and sustainable practices within and for the benefit of their own communities.

A strong leadership and participation of women is observed in two of the most popularly recognized associations in Soure: Pacoval Residents' Association (AMPAC) and the Association of Users of the Marine Reserve of Soure (ASSUREMAS). The latter was registered in 2001 and has today more than 1500 members. The Association has a women's group, where 75 women participate in diverse activities, such as collective savings. One representative of the association described that being a part of the group improved her self-esteem and income.

Plus, two small-scale agroecological projects also deserve attention, as they were not only tackling similar challenges to this project proposal, but also were mostly run by women. First, the "Mulheres que Plantam" project targets women in a poor peri-urban neighborhood, rescuing traditional knowledge on plants, so that women can benefit from using and selling them; and the "Fazenda Lunar" works with regenerative farming towards food sovereignty, incentivizing exchanges of produces within the community. Both projects do not receive any public nor external support. Despite this scenario of low public support to community initiatives, the civil society and its associations in Soure, many of which with women as protagonists, points to the gender equality conditions fostered through collective work.

Salvaterra

In Salvaterra, the prominence of women leadership and gender equality benefits was also remarkable among the cooperatives and associations. For example, the Rural and Artisan Education Association of the Village of Joanes (AERAJ) currently engages 20 people, mostly middle to old-aged women. Although they do not take part in agricultural activities, they use native seeds and forest tree substrates in their products and are a role model cooperative in northeast Marajó. AERAJ's members declared that working in the association was important for their mental health and chores' alleviation, as they are now able to work outside of the house[56]**. It is noteworthy how cooperative work with financial return can function to relieve the unpaid domestic work women usually do, while also strengthening their capacities through the sharing of knowledge and skills.**

The second example is the Cooperative of Family Farmers of Salvaterra (CAFAS). The cooperative supplies processed regional fruit pulps to public schools through public purchasing policies and is growing since 2012. It is run by women and includes young people. They divide the work in mixed teams, except the delivery unit, who are only men. CAFAS counted with an incubator and technical support by federal universities in their setting up process, which seemingly helped them access credit, training, and other opportunities.

[56] Interview with AERAJ, Salvaterra, 04.05.2022.

They also reported several indirect actions and benefits realized by their members: participation in city councils (health, school feeding, social work, children, and youth's rights), access to opportunities (capacity building and access to biddings). CAFAS is thus an enhancer of political participation, income generation, and further specialization of their members. Its members acknowledged climate change has been impacting some fruit varieties they grow, like cupuaçú. To solve that, they already envision adaptive structures, including irrigation, agroforestry systems and a greenhouse, but lack capacity and resources. According to them, young people are interested to engage in the cooperative by seeing their parents thrive.

As the young population in the three municipalities is the biggest among the age groups, any medium to long-term intervention needs to integrate this generational group as a priority, especially through climate-sensitive education. Young people, especially the poor, suffer compound discriminations and risks in Marajó as a whole, given the lack of opportunities they face. Sexual exploitation of children and youngsters is endemic among the rural poor areas of the archipelago (Dip, 2019)[57]. In Salvaterra, there were around 40 complaints of rape against minors from 2019 to 2020, most of the victims being girls (90%). Most perpetrators were men linked to the family, and the whistleblowers were usually someone close to the family, but hardly ever the mothers[58]. **This scenario suggests that poverty, the lack of autonomy of women and misogynistic norms perpetrate gender-based violence in marginalized areas.**

Cachoeira do Arari

An interview with several adult members of a Carimbó[59] Association, whose work targets vulnerable children and youth, revealed a deep shared sense of urgency to increase children and youth's wellbeing. They also demonstrated having a clear understanding of the direct and indirect socioenvironmental hazards perpetrated by the large rice farm, appointed by them as the "biggest problem affecting the municipality". **Information on climate change and its specific impacts to their context is not available, although strong perceptions are shared regarding some changing climate conditions in the region.**

This strong perception, despite the lack of data on climate change, was also observed in interview with a Quilombola representative. She recounted how family farming in her community, where around 800 people live, diminished through the last decades. The reasons to it were not only harsher weather conditions, but above all the monocultures of açaí, an Amazon fruit which became largely produced in Pará to be commercialized to the whole of Brazil and for export. The interviewee reported that the takeover of açaí in the region led many Quilombola families to stop farming to only produce açaí. On the one hand, this might have increased the income of açaí producers. On the other, it impoverished food diversity and subsistence of their families. Despite this, traditional practices and food varieties are still

[57]https://apublica.org/2019/09/investigamos-a-violencia-sexual-no-marajo-e-nao-e-nada-do-que-a-ministra-damares-diz/
[58]Interview with Conselho Tutelar, Salvaterra, 04.05.2022.
[59] Carimbó is a Brazilian traditional cultural manifestation of Afro-Indigenous origin, which includes a musical rhythm and round dance genre, created in the 17th century in Pará (Wikipedia, 2022).

cultivated in the Quilombola community of Gurupá, including manioc, farinha (manioc flour), sesame, pumpkin, beans, rice, maxixe, and watermelon.

The previous examples demonstrate an overall lack of support of the State to the economic empowerment and social inclusion of the most marginalized strata of the population across the three municipalities, the exception being the social protection benefits mentioned in the previous section serving to alleviate poverty among families. However, there is local expertise from people working on small-scale initiatives on agroforestry, most of the successful ones observed *in situ* led by women. The women-led agricultural initiatives in Salvaterra and Soure are stakeholders this project can learn from, and potential accelerators within the project proposal. **Cooperative and associations present the potential not only to attract women to work together and alleviate unpaid domestic work, but they also increase public participation, self-esteem and intergenerational knowledge sharing, all of which are resilience co-benefits to be strengthened in a context of intensified climate change**.

Lastly, the lack of information on how climate change is affecting and will affect these three municipalities, especially the most vulnerable groups, needs to be urgently addressed. Cooperation with universities, the government, and non-governmental organizations with networks in Marajó should be forged to tackle this gap. Moreover, a strategy should be carefully drawn in terms of how to communicate the adverse impacts, sometimes irreversible, the three municipalities will realize. **This should be done in a way to empower community members and incentivize them to further adopt climate resilient practices. Regarding the government, the information on climate change should open the opportunity to strengthen participatory decision-making spaces on climate responses, focused on the community welfare and sustainability.** Next, an analysis on the local climate policy landscape is drawn.

Adaptation in action: supporting the creation of local climate policies

The main overarching public policy in Brazilian municipalities, the Master Plans, guide action at the subnational level of the country in alignment with state and national level's regulations. In the three municipalities, none of the Master Plans include mentions to climate change. No other local legal frameworks consider climate change in their texts[60]. This points again to the lack of available information on climate change impacts that the Marajó archipelago and its population already faces and will keep enduring. As shown by the interviews, there is available capacity and interest of community members to work with adaptation strategies such as agroforestry systems. This interest was also seen among the interviewed public authorities, such as EMATER[61] technicians in the three municipalities, the Production Secretary in Soure, the Environmental Secretary in Salvaterra, and the Mayor's Office in Cachoeira do Arari.

[60]Local Climate Policy Instruments Assessment for Marajo Archipelago in Brazil (Thomas, 2022).
[61]EMATER-PARÁ is an Indirect Administration Public Company of the State of Pará, linked to the Secretariat of State for Agricultural and Fishery Development (SEDAP). It has been active in the state agricultural sector since 1965 with the creation of the Association of Credit and Rural Assistance of the State of Pará (ACAR-PARÁ).

Through the interviews, it was nevertheless evident the **limited capacities of local public entities, in terms of available personnel, infrastructure and logistics**. Also, there is a **lack of gender-disaggregated data on environmental, agricultural, or social policies implemented at the local level**. Therefore, it is recommended that the project not only works with the designated local authorities to draw specific adaptation plans and integrate climate change in each city's Master Plans, but also helps create and strengthen personnel's capacity on climate change, and the socioeconomic aspects related to it, including gender.

On the other hand, it is strategic to align any new subnational policies with existing ones at the state level (Pará) that already address climate change. For example, Pará's Policy for Integrated Action for Sustainable Territories seeks to design measures for sustainable development and climate justice, considering impacts on human rights, women, peasants, and children[62]. Also, Pará's state Policy on Climate Change has the objective of supporting adaptation measures in the state, by means of education, public participation, economic and financial inclusion. Both policies present guidelines and entry points for the creation of climate change action in the three municipalities of Marajó. Most importantly, the principles reflected in these state's plans, as well as in the Paris Agreement, such as women's empowerment, human rights, public participation, and climate justice, must orient the set up and implementation of any climate action in the three municipalities.

Finally, precipitation reduction, water scarcity and intensity of rainfall are projected to escalate in the three municipalities by the end of the century. Longer periods of scarcity will be mostly felt in Salvaterra, where most potential for implementing agroforestry systems lies, and the majority of Quilombola people live[63]. These projected impacts show the risks marginalized populations, including traditional communities, will face with climate change. As their territories, especially the Quilombola ones, are already targeted by large landowners claiming possession, land disputes and consequently violence must rise in case no measures are taken in the present. Hence, **the incentive of public participation, especially including traditional communities, women, the youth, and the elderly, are key in the elaboration and decision-making on climate action that could alleviate such risks**.

Challenges and opportunities in the implementation of agroforestry systems in small farms

Knowing about how men and women use their time in the domestic sphere is important to unveil how work is distributed. While bringing such information to light, unpaid work is made visible. As this type of work is largely performed by women and girls, including caring for children, the elderly, the sick, commuting, cooking, and cleaning (Carrasco, 2012)[64], data on time use contribute to shaping interventions with gender equity benefits. This means that such data help interventions build solutions which take account of unpaid work as work which should be either alleviated or compensated through specific actions. Interviews with

[62]https://cpisp.org.br/decreto-no-344-de-10-de-outubro-de-2019/.
[63]H20 Report Climate Scenarios, 2022.
[64] https://www.sof.org.br/wp-content/uploads/2015/07/Estatisticas.pdf

stakeholders included questions on how work is distributed in family farms and, despite the absence of data on the use of time within the households in the municipalities, the responses point to a gendered time use in family farming settings.

Across several interviews in the three municipalities, men were largely reported as responsible for the "harder" work of cutting vegetation and trees to make room for new crops. Men and women seem to equally reap the harvest. Women came more prominently in the "cleaning" of the terrain. The use of fire[65] to burn old vegetation and allow for new ones was reported in some interviews as men's task, but as it is a tradition in many communities, some women also expressed using fire themselves. Women were also mostly assigned to the processing of fruits, vegetables, and nuts, adding value to them, be it for the family's own consumption or commercialization**. This points out that women and men, in family settings, have different roles in farming, some of which might be more performed by one gender. However, as the numbers on family farm heads previously presented show, men are still largely the ones managing the family production.**

In Soure, the population is more prone to fishing and using non-timber forest products for their livelihoods and income. According to a member of ASSUREMAS, it is men who fish in the community, while women do the "rest" of the work, such as processing the fish, crabs, and shrimps, taking out oil and nuts from forest trees, cooking for tourists, doing arts and crafts with local seeds and materials[66]. Again, this shows that a major part of the processing part of the productive activities are concentrated in women. Interviewees also mentioned that young people and children worked in the family farms and family businesses. In rural areas of Marajó, children suffer particularly from lack of leisure. Often, children and youngsters are tasked to work with their family during free time.

This gendered division of labor can be seen as balanced but still binding to traditional roles. **Despite this gendered work division, public policies and services dedicated to family farmers are, when available, mostly given to men** [67] . Plus, women were more often mentioned as working not only in the farm at different stages, but also as the responsible ones for household chores. It is noteworthy that in Brazil, although women in general and Black women in particular spend more hours in unpaid work than men, Black women have higher unemployment rates (20,1%) than white women and Black men (both of 12,9%) and the national average (13,7%) (UNDP, 2022)[68].

The higher time use women deploy in unpaid family-related activities, including farming, in conjunction with their limited access to agricultural policies and benefits, such as credit and rural extension, pose women family farmers greater vulnerability to climate change

[65]The use of fire is a traditional widespread technique across the three municipalities, and more broadly, in Marajó. However, the technique can pose increasing risks to the region as it becomes drier and with less and less native vegetation due to deforestation and climate change.
[66] Interview with ASSUREMAS member, Soure, 12.05.2022.
[67]Interviews with technicians from EMATER in Cachoeira do Arari, Salvaterra and Soure indicated the large majority of their beneficiaries are men, with numbers in a sliding scale from 60 to 85%, according to their perceptions.
[68]https://hdr.undp.org/sites/default/files/srhs2022.pdf

impacts. The introduction of agroforestry systems (AFS) in the three municipalities must take into account labor and time use divisions within the family context. Any type of technical support or capacity building on AFS should include women, at least in equal numbers to men, as beneficiaries.

In conversation with Quilombola people in Salvaterra and Cachoeira do Arari, it was reported that the time use in farming activities is also gender differentiated there. Moreover, **the way the community works with the land has changed throughout the last decades, due to hotter climate and tougher economic conditions**. They narrated that, in the past, groups of people from different families used to gather and work with each other in different stages of family farming in what is called *mutirão*, or community task force. This communal work was compensated to the involved workers by non-monetary means, including the sharing of what was produced. Nowadays, most of the Quilombola family farmers pay a daily fee for people to work in their farm instead of doing *mutirão*.

With this monetization of relations within Quilombola territories, community ties were weakened. Also, working times in the farm were reported as longer in the past, including mornings and afternoons. With the "hotter sun", people are now almost only able to work in the mornings[69]. Considering that family plots in the Quilombola communities are small, the viability of introducing AFS seems to be greater in shared areas of their territories. **The reported changes in time and work relations in the traditional communities must be considered in the introduction of AFS, including Agroforestry Home Gardens. AFS demands dedication of time and people, and in regard to Quilombola communities, the area where AFS will be implemented must be discussed and decided with the community to avoid the further disruption of communal ties that climate change is already driving**.

Notwithstanding, Quilombola community members still work on the preservation of their traditional knowledge, including languages, cultivation techniques, religion, and arts, as observed in various interviews. There are two Quilombola initiatives worth noting in Salvaterra: "Semente de Quilombo" and "Abayomi". The first is a women's support and artistic group. Members also exchange traditional seedlings among them. Abayomi is a youth's initiative with members from different Quilombos in Salvaterra. They engage in educational, artistic, and socioenvironmental initiatives. **One key to the empowerment of marginalized people, such as young Black folks and Black women living in rural areas of the three municipalities, seems to come from collective work and the value of ancestral knowledge.** Different Quilombola leaders in Salvaterra and Cachoeira do Arari, all women, reinforced the central role their territories and traditions play to their process of self-esteem, collective empowerment, and resistance.

It is worth noting that some interviewees from Bacabal Quilombola community in Salvaterra seem to be implementing agroforestry systems without naming it AFS, as they grow diverse trees, such as ipes, tucuman, pequi, in conjunction with cassava, maxixe and açaí together. The interviewees expressed they feel a cooler temperature once they leave the rural fields and enter

[69] Interview with Quilombola representative, Cachoeira do Arari, 25.05.2022.

their territory, because of the height and diversity of trees in there. This points to an environmental benefit AFS brings, such as microclimate regulation. They also stressed their resistance to work with pineapple, a variety largely cultivated in Salvaterra as a monoculture for the supplying of internal and external markets in Brazil. Other interviewees from Salvaterra who plant pineapple reported the difficulty to sell all produces in the market, since the high competition makes the criteria for sellers high.

Similarly, in Cachoeira do Arari, the rice monoculture produced by large landowners was repeatedly appointed as one of the biggest problems affecting the most vulnerable people in the city, alongside açaí[70]. W**hen drawing agroforestry models for Marajó, this project proposal must prioritize the AFS method in itself, following a gender-balanced division of work at all stages, and considering the higher time dedicated to unpaid work women perform in the household. The need to focus on the AFS as a system is because some species cultivated in the region, such as pineapple and açaí, are not only culturally associated and economically viable as monocultures, but are also mostly managed by men. Moreover, AFS seem to be bring more diverse productive outputs when compared to monocultures, according to several interviews.** This does not mean that varieties such as açaí, pineapple and rice cannot be included in AFS models, but rather that the project must reinforce agroforestry systems in themselves, as they also present the potential to increase women's participation in paid agricultural work in opposition to monoculture systems.

Despite interviews pointed to a lack of formalized AFS initiatives in the project's area, a few initiatives exist, as shown earlier. The main opportunities to further implement AFS were reported by EMATER interviewees to be in the Tucumanduba and Pedral communities in Soure; in the communities of Camará, Umarizal, Santa Rosa, Xipaiá, Retiro Grande, Bacuri, Santo Antonio, Cará Cará, Gurupá, Janacá, Japuíra, Bom Jesus and Guajará in Cachoeira do Arari; and in Salvaterra, the potential lies overall in the family farms across the rural communities, including the 16 Quilombola ones. These opportunities were identified by the interviewees based on various aspects, such as availability of land and agricultural vocation.

Other gender-sensitive criteria which must be included in the design and implementation of agroforestry systems are the resilience of the selected crops under the estimated climate change scenarios and their local acceptance. Above all, the project must strengthen the use of traditional knowledge, such as Quilombola ancestral expertise on growing and preparing local varieties of food, such as manioc flour and maniçoba, as well as traditional seeds in the implementation of AFS across the three municipalities, as it aims to boost gender-responsive, sustainable, and local practices in small farms. Finally, the projected climate change impacts in the region might accentuate pressure for productive land and heighten land conflicts in the three municipalities, as shown in section 4. Water scarcity, the estimated territorial losses due to sea level rise, and temperature rise must be considered in the planning of the areas where to implement the AFS, not to further exclude the already Most Affected People from the opportunity to access and benefit from this project proposal's activities.

[70]Interview with Quilombola member, Cachoeira do Arari, 25.05.2022, who reported there is currently an "açaização" of the Amazon Rainforest.

Accessing finance and markets as an adaptive strategy for small-scale farmers

Given the scenario of low-income, high unemployment rates and unequal land and resources concentration, especially affecting marginalized parts of the population in the three municipalities, one catalytic response to alleviate socioeconomic deprivations and climate impacts is to **involve young women, especially the poor and Black, in productive agroforestry activities. The strengthening of AFS in Quilombola communities present a particular potential to leverage socio-biodiversity and promote women and Black empowerment as co-benefits.** However, channeling agroforestry production to the market remains a challenge, that if redressed could increase families' financial sustainability and resilience in all three municipalities.

The younger generations and youth-led collectives could enhance the AFS practices and their family businesses by disseminating the system and its products in social media and other relevant digital spheres. Nevertheless, **it is notable the need for support to connect agroforestry production by smallholders, especially women, into the market.** Interviewed women informal agroforestry workers from Salvaterra and Soure[71] stated their necessity of basic issues, such as transport to the city, connection with sellers, among other structural assets whose lack hindered the flow of their production to the market. Data from 2017 displays a very low access to technical assistance services by men family farmers in Pará state (5,1%), which is even lower for women family farmers (4,1%) (Censo Agropecuario, 2017).

For the project to systemically address barriers that small producers face, it must provide materials and logistics considerable of the time use of producers, especially women in the context of family farms, as they not only work in the farm but also perform unpaid care work and household chores more than men. **The materials and logistics should be compatible with the contextual needs and projected climate impacts and could include the support to transportation of the production into the local market; elevated structures to grow some cultures to prevent from production loss in case of floods and the movement of cattle/buffalo. Also, support to the acquisition of machinery and technological means to improve the processing of produces could enhance women's participation in paid work within family farming**. This is because women are largely responsible for working in the processing stages, where value is most added to the products, although they still lack material means to do such work in a sustainable income-generating manner.

In 2019, women were only 20,14% of the country-wide beneficiaries of the National Program for Strengthening Family Farming - PRONAF. Within this figure, 73,56% of the credit went to livestock production and 26,44% to investments in the agriculture (Rodrigues et al, 2021)[72]. This significant gendered inequality in the access to agricultural policies, including credit, relates to several factors: the difficulty to access information on banking services and market inclusion that small-scale rural workers face overall, women being left the most behind; the

[71]Interview with community member in Salvaterra, 06.05.2022 and community member in Soure, 13.05.2022.
[72] https://revistas.ufpr.br/guaju/article/view/80645

restrictions on the access to land and production tools; the low registry of women as rural producers; and the traditional gender roles, some of which still normalize the household/farm heads as being the men. Hence, as men are more acknowledged by cultural norms, official statistics and public institutions as family farm heads, they eventually benefit more from accessing agricultural policies, including technical assistance, rural extension, and credit, even in a context where the access to such policies is overall scarce, like in Pará (Rodrigues et al, 2021).

Financial education oriented to the inclusion of AFS smallholders in the local markets and to access financial services should be promoted in the project. Plus, credit and assistance for agroforestry-based products should encourage the participation of women as at least half of the total beneficiaries, given the existing gap mentioned above. Interest rates should consider the relative disadvantage family farmers in general, and women in particular, face in accessing agricultural benefits, in order not to create nor increase debt among already marginalized parts of the population.

To achieve better and systemic outcomes, the AFS implementation in the municipalities must consider the production and supply chains and the gender-specific roles attached to each part of these chains. As an example, one member of a fisherfolks' community in RESEXMAR Soure, part of a social gardening project run by a Brazilian Foundation, indicated that the project gives her varied skills on planting and harvesting. However, it falls short on providing to her community their needed resources, such as fertilizers and local seeds. Plus, the project includes seedlings which have low local acceptance. It has also not yet incorporated any support nor logistics to introduce the produces into the market. All this hinders the selling process, bringing hardly any income to the producers in the end. Although the dedication of a few community members, especially the women, in keeping the project going, it seems to fail in engaging the community and bring them benefits. This example shows that agricultural initiatives should tackle entangled barriers in productive activities, which are accrued with climate change.

In Salvaterra, similar challenges to this example were noted. Despite the population has a stronger agricultural vocation than Soure's, there are governance hindrances which frustrate the potential of smallholders to get better livelihoods and income from their production. In conversation with informal market vendors – all of which were women – they reported having no governmental support to sell their products, including transport, which is one of the biggest material barriers in the region, especially for residents from rural areas. Interviewed vendors[73] expressed their reliance on social protection benefits such as Seguro Defeso and Bolsa Familia (currently called Auxílio Brasil), combined with the surplus sales of their family farms.

It is notable the overrepresentation of women in the sales front in informal food markets. Fieldwork and interviews indicated a greater participation of women in informal economic

[73]Their products sold included maxixe, cassava, pumpkin, pupunha, urucum, pepper, corn, fruit pulp (mangaba, tapereba, muruci, tucuman, cupuaçu), cassava flour, tucupi, açaí, pre-cooked manioc, turu (mangrove mollusk) and shrimp.

activities that are geared towards the subsistence and income of rural families. This overrepresentation can be attributed to women's lower access to formal markets when compared to men, as shown by the previous data and interviews with EMATER technicians from all three municipalities. The gender disparity persists in formal economic sectors too, where women face wage gaps, precarious working condition and have less access to decision-making positions, for example[74].

The lack of access to technical assistance, including knowledge and technologies, as well as to the formal market, are obstacles in the economic welfare of women family farmers. All interviews attested that women are a fundamental part of family farming, especially on processing, selling and relationship with consumers. But again, it was also reported that men were the ones mostly accessing agricultural credits and technical support. According to a staff of EMATER in Salvaterra, most of their beneficiaries are men, estimated in 85%. This and the previous data show the dimension of the gap which needs to be bridged so to support gender-responsive AFS systems for the climate resilience of family farmers in Marajó.

Recommendations towards gender-responsive climate adaptation action in Cachoeira do Arari, Salvaterra and Soure

As set in the 2022 IPCC Sixth Assessment Report "Impacts, Adaptation and Vulnerability", "present adaptation strategies do not sufficiently include poverty reduction and the underlying social determinants of human vulnerability such as gender, ethnicity and governance" (p. 20)[75]. Promoting gender-responsive climate change funding is "an opportunity to improve the effectiveness and efficiency as well as the sustainability of investments" (Heinrich Boell Stiftung, 2022)[76], both for mitigation and adaptation. As a project proposal committed to integrating gender not only through an action plan, but in all its activities, a few recommendations are pointed below, taken from the assessed above. The recommendations seek to catalyze the project's activities while promoting gender equality, climate resilience and economic empowerment among the beneficiaries.

Building and strengthening of capacities in the communities

Associations and cooperatives are key community stakeholders in the three observed municipalities. According to the United Nations Development Programme (2016), organized social institutions, such as cooperatives and associations, promote higher rates of human development by expanding individual freedoms, especially among the most marginalized people, with the effect of enhancing collective capacities[77].

[74]https://cop25.mma.gob.cl/wp-content/uploads/2021/10/Mensajes-claves-sesion-4.pdf.
[75]https://report.ipcc.ch/ar6wg2/pdf/IPCC_AR6_WGII_FinalDraft_TechnicalSummary.pdf
[76]https://us.boell.org/sites/default/files/2022-03/CFF10%20-%20Gender%20and%20CF_ENG%202021.pdf [77] https://sustainabledevelopment.un.org/content/documents/25212016_human_development_report.pdf

Working towards the resilience of the most vulnerable population to the previewed climate change impacts should take a bottom-up approach, meaning creating the means for the participation of these stakeholders along the project. Workers, farmers, fisherfolks and neighborhood's associations and cooperatives feature as references in the three contexts, since they have capillarity in the municipalities, high acceptance within the population, and work for the wellbeing, inclusion and sustainability of their community and territories. They represent the potential to enhance the outreach of climate-relevant information and strengthening of capacities in their territories. Along these lines, it is recommended that the project:

- Supports the inclusion of relevant grassroots associations and cooperatives in the project activities, particularly family farmers' cooperatives, women's groups, traditional communities' groups, farmers' unions, neighborhood associations and collectives.

- Includes the existing grassroots associations and cooperatives as mobilisers and trainers of the project's beneficiaries on climate change drivers, impacts and solutions, including AFS;

- Engages the existing cooperatives as incubators and/or accelerators of new cooperatives and family businesses to work with AFS, respecting gender balance;

- Supports the establishment of new associations or cooperatives focused on AFS through women and youth's leadership, as women-led cases of associations in Soure and Salvaterra seem to have good chances to thrive.

The social organization of women in cooperatives and other systems of civic participation are essential for the formation of communities with greater gender, economic, social, and environmental equality. These social entities are essential to reinforce civic community norms and values and strengthen habits of cooperation, solidarity, and public spirit, and they favor the formation of more democratic societies. In a more participatory and organized society, as an effect, there should be greater outreach of policies and assistance by governments. Ultimately, it is also an important instrument in reducing the barriers suffered by women in rural areas (Rodrigues et al, 2021).

Information and education on climate change

Another key element of the project should be education, especially relevant for the underprivileged youth, who are going to realize stronger impacts of climate change in the region and consequently live in further marginalized conditions in the future in case urgent adaptive measures are not taken. In conversation with Quilombola leaders in Salvaterra, they showed that the youngest generations are interested in preserving ancestral knowledge and traditions from their older relatives. However, according to the interviews[78], the youth seem

[78]Interviews with Quilombola representatives, Salvaterra, 05.05.2022, 17.05.2022 and 26.05.2022.

also committed to breaking traditional norms such as sexism, which still prevail in their communities. **They are hence important catalyzers in advancing sustainable practices based on gender equality and traditional knowledge**.

The youth were also mentioned as a more dynamic group which works well in the digital world. This points to the potential of engaging them in agroecological and climate-sensitive education initiatives throughout the project, as main beneficiaries, organizers or input givers, by using information and communications technologies (ICTs). Potential stakeholders with whom to implement education activities on climate change, and who dispose of grassroots networks in the three municipalities are:

- Acauã Cultural Association (Cachoeira do Arari);
- Association of Quilombo Remnants of Rio Gurupá – ARQUIG (Cachoeira do Arari);
- Abayomi youth collective (Salvaterra);
- Semente de Quilombo women's group (Salvaterra);
- Mulheres que Plantam project (Soure);
- Fazenda Lunar project (Soure);
- Pacoval Residents' Association – AMPAC (Soure);
- Association of Users of the Marine Reserve of Soure – ASSUREMAS (Soure);
- Coordination of Associations of Remnant Quilombola Communities of Pará state – MALUNGU (Pará);
- NGO Observatório do Marajó (Marajó).

The education and information components should be gender-sensitive, and respect traditional knowledge. Plus, the education modules should be designed and carried out respecting gender and age balance, with the prevalence of women and the youth from these associations as the trainers and/or facilitators of activities. The inclusion of the elderly is also important in local-led capacity-building and knowledge sharing, especially as they hold more traditional knowledge on sustainable agricultural practices, and memory which is more sensitive of climate change across time.

Adaptation policies

Considering the gap on available information on climate change drivers, impacts, and responses specific to the Marajó region, the project's preparatory and further studies can support decision-makers and citizens access cutting-edge scientific information on the matter. This is strategic to plan climate action in the three cities, considering Marajó is a Most Affected

Area, home to Most Affected People by climate change. The planning of climate action should aim to boost the population and areas' resilience to climate impacts, while promoting equality at all levels. To do so, the project needs to:

- Support public participation in the three municipalities, including traditional communities, social movements, and subscribing to gender balance, in the preparation, implementation, monitoring and review of any climate action.

- Support the **creation of participatory spaces to discuss and decide about climate action** at each city or at another most appropriate level, with gender balance and balanced representation from civil society actors.

- Support the elaboration of climate action plans, including adaptation, aligned with relevant state, national and international policy frameworks, and with participation of civil society for consultation and deliberation.

- Support the government to draw **climate-sensitive Master Plans**, including budgets which are attentive to a fair distribution of benefits among the citizens in terms of gender. Specifically, municipalities can year mark their budget for climate action, e.g., describing activities with gender balance.

Implementation of agroforestry systems

Technical knowledge and means to implement AFS are a fundamental part of this project proposal. This is not because the community do not have knowledge on such systems, but **there is need to strengthen, scale up and add value to the local practices concerning AFS**. The example of CAFAS showed that technical assistance and support through medium-term were fundamental aspects in their maintenance and prosperity as a group. Therefore, to have enhanced outcomes when strengthening AFS in the three municipalities, the project needs to:

- Integrate traditional knowledge and practices, including the use of Creole seeds, especially relevant when working with Quilombola communities, in the establishment of AFS in their territories.

- Use climate-resilient species that have high local acceptability.

- Encourage women's lead on monitoring the AFS in the first years alongside the project's agroforestry team, and involve women in all implementing phases of AFS, according to their availability.

Important to note an observation by a member of the project Mulheres que Plantam in Soure. When asked about the demanded time to implement AFS until reaping the harvests, they said that time availability can be a limiting issue in the life of poor women, especially those who are mothers and/or caregivers of older people in the households. However, they also mentioned

that **AFS is ultimately simpler and less time-consuming than monocultures. It is only more difficult at the beginning, and it might take more time to see the results**. Eventually, AFS presents, in the medium to long-run, environmental benefits of soil and water improvement, habitat restoration, microclimate regulation as well as socioeconomic benefits, such as food security, better income and diversified time use. These three last aspects can bring greater advantages to women and thus increase gender equality, given that they are overrepresented in unpaid domestic work, earn thus less income compared to men, and take more care of the food security situation of their families[79].

Access to finance and markets

The strategy to implement the project's activities through the strengthening of associations and cooperatives comes from the observation that these collectives are enhancers of co-benefits for their members, such as higher political participation in relevant decision-making spaces and women's empowerment. They also seem to bring more access to opportunities, resources and financial sustainability to their members if compared to individual family farmers. **In the case of the poorer and more marginalized population strata, cooperatives and associations seem to facilitate the access to credit lines to their members with greater gender equality. This is because the majority of individual family farming cases observed with access to credit, land and technical assistance were destined to middle-aged men, while women were still fundamental parts of the family businesses,** especially in the stages which added value to the produces (cleaning, processing and commercialization).

Schalatek (2022) recommends that beneficiary and people-centered adaptation initiatives should pay "particular attention to some of the small-scale and community-based actions in which women are over-represented (including in the informal sector […]) and ensuring that the concessionality of public funding is passed to women as beneficiaries" (p. 3). Besides that, the project needs to:

- Strengthen women-led cooperatives, associations or collectives working with products from small farms and AFS.
- Support the inclusion of small farmers into local and regional markets, especially women, as they are overrepresented in unpaid work in the farm and in the informal sectors.
- Provide means and structures to connect the surplus production of farmers into the markets, including recycled and sustainable materials, technologies, and safe transportations.

[79]Interview with UFPA staff, Soure, 12.05.2022.

- Support the acquisition of necessary processing and maintenance technologies of AFS products, so to improve family's income overall and women's participation in paid work in specific, as they are overrepresented in these parts of the family farm work.

- Provide agroforestry technical assistance, including flexible credit, with gender balance.

This should be sought so that highly vulnerable smallholders do not increase their debt while participating in the project's activities. Moreover, women should get at least half of any assistance promoted through the project, as their contribution to farming activities are overall invisibilized and not compensated.

Conclusion

To enhance the resilience of Marajó in light of current climate change projections, a systemic and gender-responsive assessment was carried out, with attention to not only gender relationships relevant to the context, but also ethnic, racial, socioeconomic, environmental and historical conditions. The three municipalities targeted in the project were framed as a Most Affected Area, with Most Affected People by climate change, in relation to the Brazilian reality, and more broadly, to the Global North. The Marajó Archipelago presents a rich variety of species, territories, cultures and peoples, and this socio-biodiversity is threatened with increased climate change in the region. Its impacts will more harshly affect the population which already endure economic exclusion, land tenure rights' threats, racism, sexism, unpaid work, and lack of access to information and education.

The proposal to introduce and strengthen diversified agroforestry systems in Cachoeira do Arari, Salvaterra and Soure got the interest of the consulted and interviewed actors. The next steps should be taken along with the beneficiaries to ensure a participatory project with more chances to thrive. While addressing a climate problem through the diversification of species and the restoration of habitat in small farms, the project's indirect potentials are many, among which we cited: the empowerment of women and Quilombola people, the fair distribution of resources among the most marginalized people in the region, the regulation of microclimates, the strengthening of public participation in decision-making, the strengthening of community ties, the appreciation of traditional knowledge, and youth's leadership, which are all key aspects to achieve climate just and resilient outcomes.

Finally, an in line with GCF's Gender Policy, to combat climate change in the proposed region, considered a Most Affected Area in Brazil, this project will promote mechanisms for raising capacity for effective climate action, primarily including those most left behind in Brazilian society, namely women, Black people, traditional communities, and the economic poor. As also stated in the Policy, the proposed project is engaged to make women and men have equal opportunity to participate in consultations, benefit-sharing and decision-making during its preparation, implementation, and evaluation.

ANNEX 1: GENDER CHALLENGES AND ACTIONS FROM THE PROJECT

Taking into account Johan Galtung's approach to structural violence and its forms, a division is made by categories according to Marajó's gender diagnosis. It is worth pointing out that many of the causes and forms of violence are intrinsically connected and this categorization exercise is to order the measures and expected results.

We are aware of the interdependence of the causes of violence and gender inequality and therefore consider that only comprehensive and interconnected measures will serve to transform the reality of structural violence experienced by women in society.

Causes of structural or visible violence	Measures and actions from the project
Gender and age division of labor Women are more focused on product transformation but are invisible in the whole process of land management and production. The data collected shows that many women equally manage the technologies of clearing, fire management and sowing until harvesting. Women work in the family farm but also are in charge of household chores.	-Strengthen women in the areas of awareness and capacity building, associativity and political participation so that they become empowered from technical roles to decision-making roles. -Promote, in alliance with other organizations, awareness campaigns on the impact of men's participation in family care activities in order to position the concept of shared responsibility.
Unequal opportunities Women benefit less from agricultural policies, including credit and technical assistance.	-The project will seek to ensure gender equality in access to knowledge, technical assistance and credit for the implementation of DAS, through the generation of affirmative actions in favor of the most vulnerable women.
Feminization of poverty	-In each component of the program, we seek to include as a decision criterion the generation of affirmative actions in favor of the most vulnerable women in order to identify measures for strengthening, accompanying and developing capacities to support women with difficulties in accessing knowledge, resources and participation.
Women's unemployment and the wage gap	- Special care will be taken in all plans and documents to mainstream the gender equality approach and the differentiated impact of Climate Change for gender reasons, with special care in policies and actions

	to improve the condition of women's livelihoods and to contemplate gender-sensitive budgets. -Associations led by women will be strengthened, not only as an organizational measure, but also as a measure of care and the creation of protected spaces and trust so that women begin to trust each other, to lose their fear of speaking, listening, thinking and living free of violence. -The associations will have the purpose of not only deciding technical aspects such as what to produce, where to produce it, the value chain, but will also have a measure of healing space, strengthening self-esteem, building their own voice and generating a network of containment of violence that will be essential for the productive process to move forward. -Training in financial education and product transformation techniques will be promoted, with a special focus on women. -Special access to credit will be offered to women for their economic empowerment.
Discrimination against women due to cultural, religious, ideological aspects that justify this action. Some issues such as access to land, inputs, etc., may be a barrier for many women and their associations are discriminated against by culture and power	-Strategies will be used to generate enabling conditions so that more women can participate in the project, for example, support will be given to women who will be accompanied to meetings and capacity building sessions so that they do not feel vulnerable and shy, childcare services will also be provided when mothers participate in meetings or capacity building sessions, etc. -The project defines criteria for a target of explicit support to the most vulnerable groups, especially women who want and need to participate in the project. -A gender situation room in the Local Advisory Committee will monitor gender issues during project implementation