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THE ROLE OF GENDER IN MITIGATION AND ADAPTATION TO CLIMATE CHANGE IN CAPE VERDE

O PAPEL DO GÊNERO NA MITIGAÇÃO E ADAPTAÇÃO ÀS MUDANÇAS CLIMÁTICAS EM CABO VERDE

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Abstract
This paper discusses the role of gender in mitigating and adapting strategies to climate change in Cape Verde. The main research question is: What is the impact of gender equality on the effectiveness of mitigation and adaptation strategies to climate change in Cape Verde? The hypothesis is that promoting gender equality can lead to greater effectiveness of mitigation and adaptation strategies to climate change in Cape Verde. Women and men have distinct roles and responsibilities concerning the environment, and their needs and perspectives must be considered to address climate challenges. The methodology used includes

Resumo
O tema deste trabalho refere-se à contribuição de gênero na mitigação e adaptação às mudanças climáticas em Cabo Verde. Partindo da seguinte questão: de que maneira a igualdade de gênero contribui na eficácia das estratégias de mitigação e adaptação às mudanças climáticas em Cabo Verde? Entende-se que a promoção da igualdade de gênero pode levar a uma maior eficácia das estratégias de mitigação e adaptação às mudanças climáticas em Cabo Verde, uma vez que mulheres e homens têm diferentes papéis e responsabilidades em relação ao meio ambiente e suas necessidades. Perspectivas devem ser consideradas para enfrentar os desafios climáticos. A metodologia

a literature review based on the Theory of Environmental Justice of Gender, as well as national and international documents and legislation on gender and climate change. The paper concludes that gender relations must be included as a cross-cutting issue in the debate on impacts, mitigation, and adaptation to climate change. To this end, the article makes some policy recommendations regarding gender equality and climate in the context of Cape Verde.
Keywords: adaptation; Cape Verde; climate change; gender; mitigation.

utilizada inclui a revisão bibliográfica, a partir da Teoria da Justiça Ambiental de Gênero, além de documentos e legislações nacionais e internacionais sobre gênero e mudanças climáticas. Concluiu-se que as relações de gênero devem ser incluídas como questões transversais no debate dos impactos, mitigação e adaptação às mudanças climáticas. Para tal, o artigo apresenta algumas recomendações políticas em relação à igualdade de gênero e mudanças climáticas no contexto cabo-verdiano.
Palavras-chave: *adaptação; Cabo Verde; gênero; mitigação; mudanças climáticas.*

Introduction

Climate change and gender are intertwined and have distinct impacts on the lives and livelihoods of women and men, as well as girls and boys. Women, in particular, often face greater vulnerability to climate change due to factors such as limited access to resources, education, land, and technology. They are also underrepresented in political and economic decision-making processes. In Cape Verde, the intersection of climate change and gender may not always be immediately apparent. However, a deeper examination of the impact of climate change on key economic sectors, where women play significant roles, especially in the informal economy, can reveal the connection between climate change and gender dynamics within the Cape Verdean context.

This article aims to analyze how promoting gender equality could enhance the effectiveness of climate change mitigation and adaptation strategies in the area. The potential of this question lies in looking at women not only as victims of climate change but also as agents capable of contributing to confronting the climate crisis.

Therefore, it is anticipated that advancing gender equality can lead to increased effectiveness in climate change mitigation and adaptation strategies in the country. This is because men and women have different roles and responsibilities concerning the environment and its requirements. A pluralistic and cross-cutting approach must be considered to address complex climate challenges.

There is a synchronous relationship between climate law and social justice, given that the consequences of climate change disproportionately affect the most vulnerable and marginalized populations in decision-making processes. They are the ones who often face limited opportunities and access to essential resources necessary for protection and response to severe climate events.

Despite not being responsible for climate change, Cape Verde falls into the category of Small Island Developing States (SIDS) and is especially vulnerable to its effects. However, the country faces resource constraints in building and strengthening national capacities regarding climate change, which includes the development of national plans and mitigation strategies that should incorporate the perspectives of women and other vulnerable groups, thereby acknowledging the crucial role they should play in the climate agenda.

The research will employ a qualitative methodological approach, including a literature review on the topic in scientific articles, books, reports, and relevant documents from government and international organizations addressing gender and climate change issues in Cape Verde, as well as international and national legislation on gender and climate change.

The contribution of gender equality will be evaluated through the lens of the Gender Environmental Justice Theory (Robert D. Bullard, Laura Pulido, David Pellow, Fatima Denton), focusing on the two interconnected themes of gender and climate change. This theoretical approach seeks to comprehend the interplay between environmental matters, gender, and social justice, asserting that both environmental and gender issues disproportionately affect various social groups, resulting in an unequal distribution of environmental benefits and burdens.

To assess adaptation efforts, the research will utilize the ND-GAIN Country Index from the Notre Dame Global Adaptation Initiative, which comprises two primary dimensions of adaptation—vulnerability and readiness. Furthermore, political and socioeconomic data on climate change mitigation and adaptation initiatives in Cape Verde will be collected to evaluate the extent to which climate policies consider gender-related issues. An analysis of the data collected will be conducted to identify gender differences concerning the impacts of climate change on these initiatives.

The first section focuses on defining core concepts and discussing the theoretical importance of gender in climate change mitigation and adaptation, from the perspectives of environmental and gender justice. The second section provides context for climate change in Cape Verde, describing the country's climate and its vulnerability to climate events. The third section covers the primary

legal documents adopted at the national and international levels by the country regarding gender equality and climate change. The fourth section examines the impacts of climate change on the country's major socioeconomic sectors, utilizing the ND-GAIN Matrix from the Notre Dame Global Adaptation Initiative to assess vulnerability and readiness. Finally, the fifth section presents strategies for mitigating and adapting to climate change in Cape Verde, with a focus on the role of gender.

1 The role of gender in climate change mitigation and adaptation

This article concentrates on the role of gender in climate change mitigation and adaptation. This section seeks to define core concepts, namely: climate change, gender, mitigation, and adaptation. We also discuss the role of women in climate change, in the context of the Gender Environmental Justice Theory.

1.1 Definition concepts: climate change, gender, mitigation, and adaptation

Climate change refers to any alteration in the climate over time, whether due to natural variability or resulting from human activity (METZ *et al.*, 2007). While climate change can occur naturally, most scientists agree that human activity, such as the burning of fossil fuels, deforestation, and industrial processes, has accelerated its pace. These activities highlight a gender profile, as women tend to represent a smaller share of the labor force than men. The participation rate in the labor force for women aged 25 to 54 is 63%, compared to 94% for men (UN WOMEN, 2018).

Women are also less protected in the labor market, with an estimated 2.7 billion women legally restricted from having the same job choices as men. Even when they do participate in the workforce, their jobs often do not align with labor legislation, social security regulations, and relevant collective agreements (BANCO MUNDIAL, 2022).

These inequalities limit their ability to respond to and perpetuate the cycle of poverty, particularly for women in precarious economic situations due to a lack of access to social safety nets, adequate health care systems, and stable employment opportunities.

To address climate change comprehensively and effectively, it is crucial to tackle gender inequalities and ensure equal participation of women at all stages of decision-making and in the implementation of adaptation and mitigation measures.

The definition of gender extends beyond the binary concepts of femininity and masculinity or biological sex. Instead, it encompasses the roles, behaviors, activities, and attributes that a given society considers appropriate for individuals based on their biological sex (UN WOMEN, 2023).

Gender systems develop within different sociocultural contexts over time, taking into account societal expectations of how women and men should behave based on their biological sex (UN WOMEN, 2023).

Gender, however, is crossed by social and structural dimensions that distinguish men and women. Therefore, the thematic discussion must consider the context of the socio-ecological system, in which the natural and social environment are connected. It should also be noted that women's material and historical conditions make them more vulnerable to the impacts of climate change. In this context, vulnerability refers to the probability of exposure and sensitivity to the impacts of climate change, which can vary due to the physical, sociopolitical, and cultural resilience of individuals or communities (VINYETA *et al.*, 2015).

A gender-based approach facilitates a holistic analysis of the issue at hand and establishes more robust mechanisms to address the root causes of climate change. Integrating gender into policies, programs, and projects enhances equity and equality, thereby strengthening society's capacity to adapt to climate change (UNDP, 2009).

Equity primarily calls for ensuring gender equality, which presupposes those behavioral differences, aspirations, and needs of men and women are equally respected and supported. This is vital because it does not treat men and women as identical beings but ensures that their rights, responsibilities, and opportunities are not bound to their gender at birth (UNDP, 2009). Therefore, it's crucial to promote equal rights, opportunities, and responsibilities for men and women, free from gender-based discrimination.

This leads to the concept of gender equity, which implies the potential for differentiated treatment to rectify inequalities and create equal benefits, rights, obligations, and opportunities (SILVA; MELO, 2020). Equity and environmental justice revolve around how people, based on factors such as race, gender, ethnicity, income, and others, are affected by environmental impacts (LEAL; VERAS NETO; NABOZNY, 2021).

To effectively address climate change, it's important to ensure the representation and inclusion of women in political decisions concerning mitigation and adaptation in response to climate change.

Mitigation involves reducing environmental impact, such as greenhouse gas emissions established by the Kyoto Protocol in 1997 (UNFCCC, 2020). This has

implications for various sectors, including energy, transportation, industry, civil construction, agriculture, and others.

While mitigation brings a provisional response to the impacts of climate change and secures a sustainable future, adaptation involves planning, defined as a series of adjustments to ecological, social, or economic systems in response to real or anticipated climate-related stimuli and their effects or impacts (MURRAY; EBI, 2012).

Adaptation is a measure to ensure the resilience of communities and ecosystems in the face of the ongoing and anticipated impacts of climate change. Adaptation, however, is not a single solution; it must be complemented by other efforts to reduce emissions and curb global warming.

1.2 Theoretical debate in light of the gender environmental justice theory

The specialized literature demonstrates that concerning gender disparities, women, often considered socially disadvantaged groups, are disproportionately affected by climate change compared to men. This arises from a complex interplay of social, economic, and cultural factors, power dynamics, social roles, and inequalities in resource access and decision-making (FREITAS, 2010). Such discrepancy is especially pronounced in developing countries and marginalized communities in terms of decision-making and resource allocation (AGUILAR, 2016; GONÇALVES, 2021; RAWORTH, 2007; TERRY, 2009; SILVA; MELO, 2020). Consequently, the cumulative impact of oppression experienced by women throughout their lives intersects with factors such as class, race, and sexual orientation, placing them in more vulnerable positions (ARIYABANDU, 2009).

These observations align with the Gender Environmental Justice Theory, which centers on how climate change affects men and women differently, necessitating political interventions to address these gaps. Hence, climate justice can be observed in actions aimed at resolving social issues exacerbated by climate change, while social justice presupposes equity and inclusion within societies, emphasizing the fair distribution of resources and the protection of the rights of the most vulnerable.

Numerous scholars have contributed to a deeper understanding of this topic from a gender perspective. Laura Pulido, a Geography professor at the University of Oregon, investigates the intersection of race, gender, and environmental justice in Latin America and the United States. She argues that "historical processes like suburbanization and decentralization reflect instances of white privilege and

have contributed to contemporary patterns of environmental racism" (PULIDO, 2000, p. 12). From this viewpoint, environmental justice "provides a pivotal platform for forging political solidarities that transcend racial, gender, and class boundaries" (PULIDO; LARA, 2018, p. 4).

Robert D. Bullard, often referred to as the "father" of environmental justice, is an activist who delves into the intersection of race, gender, and the environment in the United States. He argues that specific groups and communities, including low-income individuals, working-class people, and black communities, face heightened risks due to environmental threats to their health and pollution in their neighborhoods and workplaces (BULLARD, 1993). This highlights a historical preference for government responses in the last eight decades favoring white populations at the expense of African-American populations in the United States (BULLARD, 2007).

Pellow (2016) emphasizes the perspective of critical environmental justice studies, which advocate for the simultaneous consideration of other categories like race, class, and gender concerning various forms of inequality, the causes and consequences of struggles, and the entrenchment of power (including state power) in society.

There is a notable lack of political commitment to incorporate the interests and needs of women into the government's agenda from an intersectional perspective, which encompasses social, environmental, and economic justice, gender equity, and sustainable development (FREITAS, 2010, p. 891; DENTON; WILBANKS, 2015). This is reflected in the perception that women are often viewed as "incapable" of active participation in decision-making and actions to mitigate and adapt to climate change, contributing to the underrepresentation of women in climate negotiations (ARIYABANDU, 2009).

Innovative approaches are emerging due to the imperative "to collaborate in preventing events influenced by the gradual depletion of natural resources on a global scale" (FREITAS, 2010, p. 893). These approaches, "rooted in gender analysis, underscore the importance of valuing women's knowledge and skills" (FREITAS, 2010, p.893) as agents of change in climate change mitigation and adaptation, from a perspective of gender resilience. Women, especially those in rural areas, play pivotal roles in managing environmental and natural resources and possess knowledge and expertise relevant to biodiversity management and water resources due to their economic dependence on these resources. Their experiences make them well-suited for participation in mitigation and adaptation efforts (VERGES; NUNES, 2018). Regarding mitigation, women are key in

safeguarding forests, managing local resources, and mastering knowledge of agricultural processes and plant types essential for family food security, particularly during periods of drought and food scarcity (FERREIRA, 2017; COELHO; INHAMUSSUA; FRIEDHOFF, 2022).

The Convention on Biological Diversity (1992), established within the framework of the United Nations Conference on Environment and Development, "recognizes the role of women in conservation and sustainability using biological diversity, emphasizing the need for their involvement at all levels of policy implementation" (UN, 1992, p. 2).

This knowledge contributes to enhanced community resilience. UNDP (2009) highlights positive instances in this regard, such as the case of the Honduran community of La Masica in 1998, which received gender-specific training on early warning systems and risk management. Women in the community were responsible for monitoring this system, ultimately saving lives during Hurricane Mitch (UNDP, 2009). During the 2004 floods in Bangladesh, a woman named Sahena from the Gaibandha community organized a local committee to deal with the floods (UNDP, 2009). In the Federated States of Micronesia, ancestral women's knowledge of the islands' hydrology has been crucial for finding safe water sources for the population (UNDP, 2009). In Senegal's Keur Moussa community, erosion has driven youngsters away from their people to seek better opportunities in larger cities. To counter this exodus, women created organizations to combat erosion, constructing canals, reclaiming agricultural land, and improving agricultural production (UNDP, 2009).

Women can make significant contributions to combating climate change through various means. By ensuring effective participation in the formulation and implementation of public policies related to climate change, including adaptation and mitigation initiatives. Innovation and technology, by fostering the inclusion of women in technology production spaces, allows for their participation in the development of ideas and innovations, particularly through green startups. In the realm of education, women play a crucial role in community environmental education by spearheading projects that involve renewable energy, natural resource preservation, and the adoption of resilient agricultural techniques. They can contribute through strategies like composting and maximizing food utilization to reduce food waste.

Hence, gender integration not only enhances the efficiency of climate change efforts through resilient measures but also exclusion poses a threat to progress in achieving gender equity by silencing the voices of half of the global population,

denying women their rights, and depriving society of their unique contributions, experiences, and skills essential for poverty reduction and sustainable development (HEMMATI; RÖHR, 2009; UNDP, 2009).

In Cape Verde, the debate around climate change is recent, even though the country has a dry climate, which affects vital sectors of society. Key institutions in the country are beginning to address specific threat factors and the impacts of climate change, primarily concerning agricultural production, water resource availability, environmental quality in municipalities, and other related effects (BARROS, 2020; LARSEN, 2020; MCOMBER, 2020).

To assess the impact of climate change on gender dynamics in the African context, it is imperative to identify sectors where women are most active, including water management, agriculture, fishing, and forestry (DANKELMAN, 2008). It is evident that women are affected by climate change as the primary areas impacted by climate change are the ones they are predominantly engaged in.

In the Cape Verdean context, women are the primary participants in informal economic activities and agriculture, which make substantial contributions to the country's economy. The agricultural sector alone constitutes 8% of the Gross Domestic Product (FAO, 2019). Nevertheless, there are still no mechanisms in place to accurately gauge the actual contribution of informal activities to the formal economy, given the transactions and exchanges that go unrecorded by formal means.

The causes of informality are related to socioeconomic opportunities, especially training and education, highlighting that 58.5% of women in the informal economy have only a basic level of education (INE, 2017).

Women tend to be employed in fields related to personal services, protection, security, and sales (64.1%), as well as those associated with intellectual and scientific activities (56%). Conversely, men usually make their living as operators in installations, dealing with machinery and assembly (92.8%), as well as skilled workers in agriculture, fishing, forestry (84.3%), and other qualified roles in industry, construction, and craftsmanship (INE, 2017).

In fact, the literacy rate is higher among men (93.1%) compared to women (83.9%). Despite this, women are more likely to pursue higher education, averaging 8 years of studies compared to the 7.7 years of men, also presenting a higher rate of secondary education completion compared to men. Literacy rates are higher in urban than rural areas, with gender disparities being more pronounced in urban environments, reaching 14.1% (INE, 2019a).

The female population constitutes the largest inactive segment of the coun-

try's population, and their unemployment rates (17.4%) surpass those of men (12.9%), with a notable prevalence among young women (INE, 2017). Regarding social roles, households are predominantly represented by men (50.7%); nevertheless, there has been an increase in households represented by women, rising from 40% in 2000 to 46.7% in 2016 (INE, 2019b).

2 Contextualization of climate change in Cape Verde

Cape Verde is a small archipelagic country situated in the heart of the Atlantic Ocean, off the coasts of Senegal and Mauritania, approximately 282 miles from the western coast of Africa. It consists of ten islands—nine of which are inhabited, along with eight islets.

Its volcanic origin, coupled with an arid/semi-arid climate, presents challenges for agricultural practices. In the 1990s, only 10% of the country's land was considered suitable for agricultural practice (MENEGATTO, 2014). Over time, the proportion of land area covered by forests increased from 9.9% in 2000 to 11.3% in 2020 (UN, 2023).

Cape Verde experiences a mild tropical climate, significantly influenced by the cold winds arriving from the Canary Islands and the anticyclone system of the Azores. The variability of the subtropical Azores acts as a regulator of rainfall anomalies (NEVES *et al.*, 2017). Generally, the country experiences a hot climate, with average temperatures of 77 °F in coastal regions and 66 °F in high-altitude areas above a thousand meters (MAA; INMG, 2017). These conditions result in two distinct seasons: the dry season, referred to as the "time of the winds", lasting from December to June, and the rainy season, occurring exclusively from August to October, with the transition months spanning from July to November (NEVES, 2012).

Cape Verde grapples with interconnected climate challenges, including water scarcity, recurrent droughts, and low agricultural productivity, which in turn lead to rural migration and food insecurity (SEMEDO, 2020). Climate change has significantly impacted the nation's agriculture sector, resulting in soil erosion, infrastructure damage, and ecosystem degradation (NAÇÕES UNIDAS CABO VERDE, 2018).

The scarcity and value of water resources are evident in Cape Verde, with climate change cited as a key factor exacerbating this issue (SHAHIDIAN, 2015; MARTINS; LIMA; LIMA, 2019). In 2019, the usage of freshwater accounted for 8.4% of available water resources (UN, 2023).

Water scarcity is particularly pronounced on Santiago Island, which is also home to the highest percentage of the population, at 60% (ANAS, 2020). Other islands also struggle with reduced water availability for human consumption, agriculture, and livestock, all of which are essential economic sectors (NAÇÕES UNIDAS CABO VERDE, 2020). This decline in agricultural contribution to GDP is evident, dropping from 13.5% in 2001 to 4.9% in 2020 (UN, 2023).

Cape Verde belongs to the Small Island Developing States (SIDS) category, as designated by the United Nations due to their significant challenges in terms of economic, social, and environmental development[1]. Given their small size, fragile economies, and susceptibility to external shocks, such nations are especially at risk from the consequences of climate change, including rising sea levels, ocean acidification, heightened intensity of extreme weather events, and water scarcity (THOMAS *et al.*, 2020).

These tropical countries struggle against rising sea levels, powerful storms, and unpredictable rainfall patterns, resulting in floods, coastal erosion, displacement of communities, damage to vital infrastructure, economic setbacks, and reduced livelihoods for coastal-dependent industries like fishing and tourism (UNDP, 2007).

Their limited economic resources hinder their ability to strengthen resilience, particularly regarding the formulation of national plans and strategies for both mitigation and adaptation to climate change. Nevertheless, the sea and coastline offer avenues for economic advancement, with potential for activities such as fishing, tourism, oil exploration, and harnessing hydroelectric power. Safeguarding the sea and coastline, alongside government and corporate efforts to prevent harm, becomes crucial for fostering balanced economic growth (THOMAS *et al.*, 2020).

From a sociodemographic perspective, SIDS face high population density, inadequate infrastructure across multiple sectors, and limited institutional and technical capacity to counteract climate change impacts. These deficiencies shed light upon the need for international cooperation and external partnerships to effectively address the climate change challenges faced by SIDS (THOMAS *et al.*, 2020).

1 As active United Nations members, these countries number 38 in total: 9 situated in the Atlantic, Indian Ocean, and South China Sea; 16 in the Caribbean; and 13 in the Pacific.

3 Legal frameworks for gender equality and climate change in Cape Verde

Cape Verde perceives gender equality as a universal principle, established in various international human rights instruments that have been domestically ratified (CABO VERDE, 2019). Notably, these include the Convention on the Elimination of All Forms of Discrimination against Women and the Protocol to the African Charter on Human and Peoples' Rights Relating to the Rights of Women in Africa.

On July 23, 2007, the National Plan to Combat Gender-Based Violence (GBV) was approved under Resolution No. 27/2007. This plan aligns with the policy of gender equity and equality, alongside the promotion of respect for human rights (CABO VERDE, 2007).

Similarly, on March 23, 2016, the Council of Ministers, following No. 2 of Article 265 of the Constitution, approved the National Gender Equality Plan 2015-2018, aiming to empower the State in formulating and implementing policies to promote equal rights (ANJOS, 2015).

In 2019, Cape Verde adopted the Parity Law, which is grounded in "preventing and combating discriminatory conduct based on sex" and fostering active equality policies between men and women, to effectively uphold the principles of human dignity, justice, and equality (CABO VERDE, 2019).

This law covers public policies at both the central and local levels, encompassing public institutions and private companies, with a special focus on critical sectors where the representation of women in elective and decision-making roles has historically been insufficient compared to the gender composition of Cape Verdean society (CABO VERDE, 2019).

This law played a significant role in increasing the proportion of seats held by women in parliament from 11.1% in 2000 to 38.9% in 2022. Similarly, the proportion of seats held by women in government deliberative bodies increased from 28.4% in 2017 to 41.8% in 2021 (UN, 2023).

The government considered gender equality one of the central issues for inclusive and sustainable development in the 2017-2021 Strategic Plan for Sustainable Development (SPSD). The Plan recognizes several obstacles to economic empowerment, including the lower participation of women in economic sectors, constraints on access to markets and credit, and persisting gender stereotypes (NAÇÕES UNIDAS CABO VERDE, 2018).

In November 2021, the government approved the National Gender Equality Plan (2021-2025 NGEP), aligning with key international agendas promoting

gender equality and sustainable development, such as the Beijing Declaration and Platform for Action, Agenda 2030, and Agenda 2063 (NAÇÕES UNIDAS CABO VERDE, 2021a).

The degree to which legal frameworks promote, reinforce, and monitor gender equality in public life was 60 points on a scale of 0 to 100, and in relation to violence against women it was 83.3 points, considering the same scale as the 2020 data (UN, 2023).

In terms of decision-making, the current government includes five ministers in its structure, and the National Assembly comprises 24 deputies in Parliament, being 2 from UCID, 7 from PAICV, and 15 from MPD. However, political parties (MPD, PAICV, and UCID), particularly at the local level, have not consistently adhered to the aforementioned law. In the 2020 local elections, several municipalities, including São Miguel, Tarrafal de Santiago, São Domingos, Santa Cruz, Santa Catarina-Santiago, Paúl, Tarrafal de São Nicolau, and São Filipe, failed to comply with the law regarding the composition of candidacies for the City Council and Municipal Assembly (UN, 2023).

Cape Verde ranks 37th in the global gender disparity ranking, with a score of 0.761 on a scale of 0 to 1, where 1 signifies the ideal situation or "parity". Disparities are less pronounced in the areas of education (0.981) and health (0.980), while challenges persist in terms of political empowerment (0.334) and economic participation and opportunity (0.747) (WORLD ECONOMIC FORUM, 2023).

Concerning climate change, the country ratified the United Nations Framework Convention on Climate Change in 1994. In 2005, a *White Paper on the state of the environment* was prepared, containing data and measures related to natural resources, environmental sectors, and the legal and institutional aspects of environmental management (CABO VERDE, 2005).

In the same year, the second National Action Plan for the Environment (NAPE II), covering the period from 2004 to 2014, was approved, along with the country's accession to the Kyoto Protocol to the United Nations Framework Convention on Climate Change.

Since Resolution No. 16/2009, the country established the Interministerial Committee for Climate Change, tasked with various functions, including issuing opinions and providing support to the government within the scope of the United Nations Framework Convention on Climate Change and the Kyoto Protocol (CABO VERDE, 2009).

Furthermore, the National Assembly ratified the Paris Agreement on Climate

Change, adopted on December 12, 2015, in Paris, France, following Article 180, *g*, of the Constitution, through Resolution No. 35/IX/2017.

4 Impacts of climate change on socioeconomic sectors

Cape Verde is a country that originated in a context of drought, and it has faced these challenges head-on, compelling policymakers to create strategies for mitigating and adapting to climate change in key sectors of the economy, including food, water, health, energy, ecosystem services, housing, and infrastructure.

The ND-GAIN Matrix, developed by the Notre Dame Global Adaptation Initiative, was used to aid in the analysis of the impact on these sectors. It provides a visual representation of countries' comparative resilience along two axes—the vertical, which represents vulnerability scores, and the horizontal, which indicates readiness scores. Under these axes, the matrix is split into quadrants. Cape Verde falls within the lower right quadrant, signifying that it remains susceptible to climate change but is actively developing its capacity to respond, despite facing specific challenges.

Vulnerability, in this context, gauges a country's exposure, sensitivity, and adaptability to the adverse effects of climate change across various sectors, including food, water, health, ecosystem services, housing, and infrastructure (DAME, 2023). Meanwhile, readiness assesses a country's ability to mobilize investments and translate them into effective adaptation measures. It encompasses indicators within the economic sphere, governance, and social readiness. The index ranges from 0 to 1, with higher values indicating a more favorable country classification in terms of readiness and lower values indicating a better classification regarding vulnerability (DAME, 2023).

In light of the vulnerability and readiness dimensions across critical sectors, it is imperative to acknowledge that over the past two decades, the percentage of the country's workforce and their families living on less than $1.90 per person per day has decreased significantly, dropping from 13.5% in 2000 to a mere 0.4% in 2021 (UN, 2023). Additionally, the proportion of the population covered by at least one social protection benefit has seen an upward trend, rising from 36.2% in 2017 to 39.2% in 2020 (UN, 2023).

Nevertheless, there has been a concerning increase in the proportion of the population experiencing hunger, surging from 14.5% in 2001 to 17.7% in 2020, with severe food insecurity impacting approximately 100,000 people (UN, 2023). This unfortunate situation has been exacerbated by the adverse

effects of successive droughts, particularly affecting rural families, primarily led by women. This scenario is further aggravated by external factors, such as the economic repercussions of the COVID-19 pandemic, particularly affecting the tourism sector and the spike in food prices due to the conflict between Russia and Ukraine. Regrettably, it is essential to acknowledge the inadequacy of effective public policies in addressing these issues. This is exemplified by the diminishing allocation of government expenditure to agriculture, a strategic sector, which declined from 9.1% in 2001 to a mere 2% in 2020 (UN, 2023).

Agriculture is an economic area affected by the country's climatic and geographical conditions. Approximately 20% of precipitation is lost to the sea, 67% evaporates, and only 13% infiltrates the arid soil, where it is rapidly absorbed. Consequently, agriculture is critically reliant on rainfall to recharge groundwater, support rainfed production, and sustain irrigation systems (FAO, 2019).

In the realm of healthcare, the country has achieved notable progress, marked by reductions in maternal and child mortality rates and the successful battle against communicable diseases such as HIV, malaria, and hepatitis (RODRIGUES, 2010). According to data from the United Nations, the maternal mortality rate decreased from 118 per 100,000 live births in 2000 to 58 per 100,000 live births in 2017. Likewise, the mortality rate for children under 5 years of age dropped from 38.1 per 1,000 live births in 2000 to 14.2 per 1,000 live births in 2020, with the infant mortality rate decreasing from 31.1 deaths per 1,000 live births in 2000 to 12.2 deaths per 1,000 live births in 2020 (UN, 2023).

It is crucial to recognize that climate change has far-reaching consequences on health, including increased risks of mortality, the proliferation of infectious diseases, and related issues. Delays in addressing climate change are likely to amplify health risks and undermine decades of progress in global health. The most severe impacts are observed in Small Island Developing States, where floods, droughts, and storms have proven to be 15 times deadlier in highly vulnerable regions compared to regions with lower vulnerability levels in recent decades (WHO, 2023).

Regarding healthcare infrastructure, the country boasts two central hospitals, one situated in the capital city, Praia, and the other in São Vicente, specifically in Mindelo, along with four regional hospitals (INE, 2017). Noteworthy efforts by successive governments have been made to augment the ratio of doctors and nurses per capita, recognizing that the country currently has a total of 8 doctors and 13 nurses per 10 thousand inhabitants (ROSA, 2019).

Climate change exerts a substantial influence on infrastructure, particularly given the country's heightened vulnerability. The rising sea levels, attributed to

glacier melt and the thermal expansion of seawater due to global warming, pose a significant threat to coastal areas and infrastructure close to the coasts. Consequently, the escalating frequency and intensity of extreme weather events such as storms, hurricanes, floods, and droughts put infrastructures at risk. In September 2013, the country experienced the impact of Tropical Storm Cyclone Humberto, which escalated into a hurricane, resulting in torrential rainfall, powerful winds, and substantial damage to property and infrastructure (PEREIRA *et al.*, 2018).

Cape Verde's energy matrix is predominantly reliant on non-renewable thermoelectric sources fueled by imported fossil fuels. Approximately 81.6% of the energy produced in 2019 was of thermal origin. Although the country possesses substantial renewable energy potential, wind energy accounted for 16.2% of the energy production mix in 2019, with solar energy contributing 2.2% (INE, 2021). The proportion of renewable energy in total final energy consumption has declined from 27.9% in 2000 to 22.2% in 2019 (UN, 2023).

Concerns regarding greenhouse gas emissions have propelled the shift towards low-carbon energy sources such as solar and wind, aimed at diminishing the energy sector's contribution to global warming. Moreover, the escalating average temperatures result in an increased energy demand, both for cooling in hot climates and heating in colder climates. This heightened demand could lead to an uptick in electricity and fossil fuel consumption to meet the burgeoning needs.

Internally, the impacts of climate change within the country exhibit disparities contingent on social class, financial resources, and gender (ALVES, 2019; ANDRADE, 2017; HOLANDA, 2020; MOREIRA, 2018). Cape Verde finds itself situated on a continent highly affected by climate change compared to other global regions, attributable to structural challenges such as poverty, institutional fragility, technological inadequacies, low levels of education, and health issues (BOKO *et al.*, 2007; CHRISTENSEN *et al.*, 2007; IPCC, 2021).

5 Measures and actions for climate change mitigation and adaptation strategies in Cape Verde

Cape Verde presents unique characteristics, being a Sahelian country grappling with water scarcity. These distinctive features have given rise to a set of challenges for the nation, including the imperative to establish sustainable water management systems, enhance access to potable water, and mitigate the effects of climate change.

Within the scope of adaptation, and considering historical data, the country

has made strides in improving the distribution of potable water. Since 2000, there has been no exacerbation of climate change's impact on malnutrition and associated diseases (DAME, 2023). Nonetheless, critical indicators of vulnerability persist in certain sectors. In agriculture, specifically agricultural capacity, there remains a deficiency, particularly in the ability to acquire and utilize agricultural technology. In the healthcare sector, there is a shortage of medical professionals and healthcare infrastructure to cater to the population's needs.

In the realm of ecosystem services, the nation's engagement in international environmental conventions remains limited. This suggests a lack of active participation in international forums dedicated to environmental themes and inadequate efforts toward engaging in multilateral negotiations to establish a robust internal agreement on environmental protection. Regarding preparedness, two areas present formidable challenges. Firstly, education faces issues, particularly the low enrollment ratio in higher education concerning the population within the eligible age group. Secondly, innovation encounters barriers, especially the scant number of patent registrations, indicating limited investment in science and technology (DAME, 2023).

Raworth (2007) delineates several essential prerequisites for achieving success in the adaptation process and narrowing disparities among various groups, including (1) embracing locally-focused approaches that prioritize community involvement in decision-making; (2) incorporating sector-specific plans and strategies at both the national and local levels into broader development plans; (3) enhancing and restructuring partnerships between government institutions and civil society organizations to address the effects of climate change; (4) bolstering the readiness of communities and decision-makers through the dissemination of reliable information about potential climate change impacts, enabling them to respond promptly to arising challenges; (5) advocating for accessible and cost-effective green and blue technologies, such as resilient grain varieties and renewable energy solutions.

The Constitution ensures that every individual is entitled to a healthy and ecologically balanced environment (Article 72). To uphold this right, public authorities are obligated to "formulate and implement suitable policies for territorial planning, the protection and conservation of the environment, and the promotion of the prudent utilization of all natural resources, ensuring their ability to regenerate and maintain ecological stability" (CABO VERDE, 2010). In alignment with this objective, the Ministry of Agriculture and Environment, in conjunction with other competent entities, has devised various plans aimed at curbing the

nation's susceptibility. Notable among these are: the National Action Plan for the Environment (1994-2004 and 2004-2014); First National Inventory Report on Greenhouse Gases (1995), 20 years after national independence; National Communication on Climate Change, the first being carried out in 2000, the second in 2010 and the third in 2017; and First National Climate Change Adaptation Action Program (NAPA) 2008-2012.

These actions and measures are categorized into mitigation and adaptation, with the following characteristics of the former: reducing energy intensity and strengthening energy efficiency; increasing renewable energy capacity; reducing the carbon intensity of mobility; encouraging responsible tourism and a circular economy; and strengthening the natural fabric of ecosystems. As for adaptation measures, Cape Verde has outlined the following objectives: (1) enhancing water security and facilitating natural restoration; (2) strengthening the management of solid and aquatic waste; (3) expanding and securing food supplies through regenerative agriculture; (4) extending the coverage of maritime protected areas; (5) safeguarding marine and coastal resources; (6) employing spatial planning as a tool for climate change mitigation and adaptation; (7) alleviating climate-related risks, address disasters and vulnerabilities, and confronting health risks posed by climate change (CABO VERDE, 2021a).

In 2021, the Cape Verdean government outlined a set of commitments in the Ambition Plan 2030. These commitments encompass a wide range of initiatives, including decarbonizing the economy, promoting low-carbon public transportation, utilizing renewable energy for water supply, and fostering responsible tourism. However, the attainment of these objectives necessitates international support, particularly in the form of technology transfer, capacity building, and financial assistance.

Regarding the inclusion of discussions on gender inequality issues within the country, it is noteworthy that Cape Verde had voted on the terms of paragraph *f* of No. 3 of Article 191 of the Constitution of the Republic on October 20, 1994, which approved Resolution No. 74/IV/94, endorsing the United Nations Framework Convention on Climate Change. However, it was only in 2022, during the preparation of the Fourth National Communication and First Biennial Update (4CN&1BUR) for the Republic of Cape Verde under the United Nations Framework Convention on Climate Change (UNFCCC), that a comprehensive analysis of the gender dimension was integrated. This inclusion has allowed for critical and empirical thinking to contribute to challenging the "roles" and behaviors assigned to women, which, as previously mentioned, are social

constructs (FREITAS, 2010). Furthermore, they facilitate the dissemination of methodologies that prioritize participation and equity in the development of Climate Change Impact Mitigation Plans. This includes actively seeking the perspectives of women and other vulnerable groups, thereby highlighting the pivotal roles they should play in the climate agenda.

Conclusion

This study examined the impact of gender on climate change mitigation and adaptation in Cape Verde. To this end, we sought to understand how women are impacted by climate change in sectors such as food security, as they play a key role in food production and natural resource management. In the realm of healthcare, it is essential to emphasize that women often bear a greater burden of climate-related illnesses, including those transmitted by vectors and respiratory ailments resulting from air, water, and sanitation pollution. Considering that women typically shoulder the responsibility for water collection and sanitation, these tasks may become more challenging with water shortages stemming from climate change. Furthermore, in the arena of political participation, women often have reduced agency and representation in decision-making processes related to climate change, limiting their ability to influence climate change policies and actions.

This study acknowledges that African economic and social contexts differ from those of other regions worldwide, impacting the capacity to respond to climate change and posing unique challenges in understanding each actor's role in this process. This distinction is particularly crucial when addressing the repercussions of climate change on Small Island Developing States, such as Cape Verde.

Adaptation strategies are imperative for Small States to mitigate climate change impacts, including the development of more resilient communities and ecosystems, fortifying coastal defenses, and enhancing the capacity to manage climate change risks. In this context, gender relations should be integrated as overarching concerns in discussions about climate change impacts, mitigation, and adaptation. When examining natural resources and the surrounding environment, the goal is to comprehend the integrated social processes that occur in the relationship between nature and humanity.

The study puts forth several gender-related recommendations for mitigating and adapting to climate change in Cape Verde. These recommendations primarily include bolstering women's participation in decision-making processes to ensure that their needs and perspectives are considered. It also involves recognizing

and valuing the knowledge and practices of women, who possess vital traditional knowledge about the environment, including sustainable agriculture and natural resource management. Furthermore, strengthening women's capacity through training in skills related to climate change mitigation and adaptation, especially in the technology and innovation sector, is essential. Finally, ensuring equal access to resources for effective climate change adaptation is imperative, as women often face limitations in accessing resources like land, water, and energy, which can hinder their ability to adapt to climate change.

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Authors' participation
Pedro Andrade Matos was in charge of crafting the conceptual model and conducting the literature review. Gisseila Andrea Ferreira Garcia took the lead in contextualizing climate change within the Cape Verde context. Mirtes Aparecida dos Santos played a pivotal role in formulating the legal framework regarding gender and climate change in Cape Verde. The sections dealing with the impacts of climate change and outlining measures for mitigating and adapting to climate change were collaboratively authored by all the contributors.

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