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Faculty of Business Economics

Master of Management

Master's thesis

Gender and Climate Change in the Aviation Sector: Examining the Challenges and Opportunities in Africa

Amy Meier

Thesis presented in fulfillment of the requirements for the degree of Master of Management, specialization Data Science

SUPERVISOR :

Prof. dr. Robert MALINA

MENTOR :

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Abstract

This study investigated gender equality and climate change in the aviation sector by examining the challenges and opportunities in Africa. Although the aviation industry plays a critical role in global connectivity and economic growth, it still remains male-dominated, particularly in technical and leadership roles. This highlights the need to address the inadequacies of gender-disaggregated data and explore how gender disparities influence climate resilience efforts in the sector.

Using a mixed-methods approach, the study collected survey responses from 68 aviation professionals across 23 African countries. Key findings revealed a significant underrepresentation of women in technical and leadership roles, attributed to societal norms, educational barriers, and limited support. Climate change impacts, such as flight delays and infrastructure vulnerabilities, varied by gender, with men focusing on operational disruptions and women emphasizing infrastructure risks.

The study highlighted the need for gender-inclusive policies, targeted STEM education for girls and women mentorship programs, and equitable climate resilience strategies. Key recommendations included: enforcing equal pay, increasing female participation in decision-making, and improving data collection to monitor progress. Integrating gender considerations into climate adaptation and mitigation plans can help the aviation sector develop a sustainable and inclusive workforce, thereby supporting broader Sustainable Development Goals (SDGs) on gender equality and climate action.

Future research should expand the geographic and demographic scope to focus on generalizability and include non-binary perspectives by validating findings with larger samples. It should also explore successful policy implementations. Additionally, longitudinal studies could assess the long-term implementation of gender inclusive climate initiatives in the aviation sector.

Key terms

Gender equality, climate change, aviation sector, Africa, underrepresentation, inclusive policies

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Chapter 1: INTRODUCTION

1.1 Background of study

The aviation sector plays a crucial role in the global economy through transportation, economic growth, and connectivity as it remains the only way to transport passengers and goods worldwide within a single day. However, it also contributes substantially to greenhouse gas emissions, thereby exacerbating climate change. In Africa, the aviation industry plays a pivotal role in economic development and regional integration. However, it faces unique challenges, including infrastructure deficits, regulatory hurdles, and socio-economic disparities.

Women and girls represent half of the world's population and hold half of its potential to drive social and economic progress. Recognizing this, gender equality and women's rights are anchored in various international agreements, including the *2030 Agenda for Sustainable Development Goals (SDGs)*, in which the commitment to gender equality is prominent, comprehensive, and cross-cutting. Notwithstanding, gender inequalities remain deep-rooted in our societies and within various economic sectors. Within transport, particularly in aviation, less emphasis has been placed on the importance of gender equality and climate change.

Air transport is dominated by a male workforce and from an employment perspective, women continue to be significantly under-represented in many areas of aviation, particularly in technical operations, senior leadership roles, and decision-making processes. Gender disparities in the aviation sector are pronounced, and climate change often exacerbates existing gender inequalities, making it imperative to understand how these dynamics interact within the African context. The sector has, therefore, recognized that 'Business as usual' was not an acceptable approach, and more efforts are needed to change the industry's gender composition. Any attempt to support a shift towards greater gender equality must begin with accurate gender-disaggregated data.

Sex-disaggregated data is key for incorporating a gender perspective into civil aviation planning frameworks. It supports the identification of concrete and targeted action plans to address gender gaps, as well as defining indicators and effective monitoring and evaluation.

Diversity and inclusion should be at the centre of policies aimed at supporting the sustainability of the aviation sector. Data-informed decision-making and evidence-based policies are critical steps toward achieving meaningful change. However, there is currently no comprehensive overview of gender related data and statistics in the aviation industry.

In addition, such data is critical for implementing a gender perspective in investments, budgeting, and allocating, planning, and managing funds to promote gender equality and women's empowerment within respective areas of responsibility. It should be noted that data is a step, and not an end, towards creating more inclusive air transport systems. It is rather one of the main tools that can be leveraged to inform decisions making.

The availability of a comprehensive overview of the status of women in the aviation sector could facilitate the introduction of policies and actions that might also contribute to the much-needed acceleration of achieving Sustainable Development Goals (SDGs) on equity, equality, and women's empowerment.

Gender-disaggregated data plays an essential role in addressing gender disparities and shaping evidence-based policies, strategies, and measures. It ensures that interventions correspond to the sector's priorities, gaps, and needs. Thereby making advancing progress toward gender equality.

This study explored the current status of gender representation in the African aviation sector, identified gender-specific barriers and challenges faced by women, and evaluated the intersection of gender and climate resilience efforts. These insights contribute to the ongoing efforts to create a more equitable and diverse aviation industry.

1.2 Problem statement

The purpose of this study was to explore the intersection of gender equality and climate change in the aviation sector by examining the challenges and opportunities in Africa. The gender-disaggregated data collected from the study provides policymakers with the opportunity to develop concrete and targeted actions to address gender gaps in the sector and help support the implementation of sustainable development goals on climate, gender equality, gender equity, and women's empowerment.

However, there is insufficient gender-disaggregated data available for the aviation sector in Africa, posing a significant challenge for policymakers seeking to make informed decisions and develop inclusive solutions. This data gap hinders efforts to identify and address gender-specific barriers faced by women in the industry, particularly in roles outside cabin crew and cleaning staff. Furthermore, the lack of studies on gender equality limits the integration of gender considerations into climate change and resilience strategies. Without data, evidence-based insights, or comprehensive research, advancing gender equity and building a diverse, inclusive, and climate-resilient workforce remains a considerable change and this research is meant to close that research gap.

1.3 Research objectives

1.3.1 General objective

This research study investigated the intersection of gender equality and climate change within the aviation sector, and identifying key challenges and opportunities for promoting gender equity while advancing sustainable climate solutions in Africa. The result of the study aims to inform the development of inclusive policies that will promote gender equity and integrate gender considerations into climate resilience efforts across the region.

1.3.2 Specific objectives

This study addressed four key objectives. First, it analyzed the gender distribution in the aviation sector by examining the representation and participation of women across technical, operational, and leadership roles within the aviation industry in Africa. Second, it assessed the effects of climate change on the aviation operations, infrastructure, and policy frameworks in Africa. Third, it evaluated gender-specific challenges faced by women in the sector, particularly in relation to climate change, including barriers to career progression, unfavourable working conditions, and broader socio-economic impacts. Finally, the study explored opportunities for gender inclusive climate actions by identifying strategies to promote gender equality through climate resilience actions within the aviation industry.

1.4 Research questions

1.4.1 Main research question

How can gender equality be integrated into climate change mitigation strategies in the aviation sector to enhance the adaptation of inclusive policies and promote climate resilience efforts in Africa?

1.4.2 Sub-research questions

The study addressed the following sub-research questions organized according to the four main objectives. First, regarding the distribution in the aviation sector: (a) What is the current gender distribution of the different workforce in technical, operational, and management roles within the aviation industry across African countries, and how do regional variations influence this distribution? And (b) what key factors contribute to the underrepresentation of women in technical and operational roles in the aviation sector in Africa?

Second, to examine the effects of climate change on the aviation sector: (c) How does climate change affect aviation operations and infrastructure in Africa? And (d) what are the economic implications of climate change for the aviation workforce, and how might these impact gender equity?

Third, to evaluate gender-specific challenges: (e) How does gender equity influence climate change mitigation efforts and career progression for both men and women in the African aviation sector? And (f) what challenges do men and women face in the aviation sector, particularly regarding societal norms, work conditions, and socio-economic outcomes?

Finally, to explore opportunities for gender-inclusive climate actions within the sector: (g) What opportunities exist to enhance gender-inclusive policies and practices for sustainable development in the industry? And (h) how can gender and climate resilience initiatives and policies promote gender equity in the aviation industry?

1.5 Test of hypotheses

To guide this research and provide a structured framework for analysis, a set of hypotheses was developed based on a comprehensive review of existing literature on gender and climate change within the aviation sector. These hypotheses reflect recurring patterns and themes identified in previous studies and were designed to address the core research question without relying solely on primary survey data. Each hypothesis aligns with one of the study's four key objectives, offering a basis for exploring the complex interplay between gender equity, climate impacts, and policy interventions in the African aviation industry. The study hypotheses were as follows:

a) Hypothesis 1: Women are significantly underrepresented in technical, operational, and leadership roles within the African aviation sector compared to men.

b) Hypothesis 2: Women working in the African aviation industry perceive climate change as having a greater impact on aviation operations and economic implications than their male counterparts.

c) Hypothesis 3: Women in the aviation sector experience more career-related challenges and barriers to progression.

d) Hypothesis 4: Climate resilience initiatives and inclusive policy frameworks can positively influence gender equity and promote greater participation of women in the aviation sector.

1.6 Significance of study

This study holds importance as it addresses the significant research gap of gender disaggregated data and deepens our understanding of the relationship between gender equity and climate change in the African aviation sector, an area that has been largely neglected. It enriches both theoretical and practical knowledge by introducing the concept of gender-responsive climate resilience, highlighting the unique challenges faced by different genders, and proposing actionable strategies to foster inclusivity.

It highlighted the importance of integrating gender considerations into climate mitigation strategies, fostering equitable opportunities for women in technical, operational, and management roles, and driving innovation and sustainability in the aviation sector and the necessity of gender-disaggregated data. Additionally, it provided practical solutions for embedding gender equality in climate adaptation efforts, such as customized career development programs and enhanced representation of women in leadership positions.

1.7 Scope and delimitations

This research focused on the intersection between gender equality and climate change by examining the challenges and opportunities in Africa aviation sector. It addressed key gaps such as limited studies on their intersection, inadequate gender-inclusive policies, and limited gender-disaggregated data. It was scoped to the aviation industry in Africa states and provided actionable insights for policymakers. Limitations included data availability, which was addressed through existing secondary sources and primary data collections. This research did not cover other sectors.

Chapter 2: Literature review

2.1 Introduction

The aviation sector plays a crucial role in the global economy as it remains the only way to transport passengers and goods worldwide within a single day. It facilitates globalization by connecting businesses, cultures, and individuals across continents. However, the growing demand for air travel has led to an increase in greenhouse gas emissions. According to Malina et al. (2022), decarbonizing the aviation sector is essential for reducing climate change and achieving climate goals and targets. The aviation sector is not the only contributor to climate change. It is uniquely vulnerable at the same time to the impact of climate change, which adds risks to aviation operations and the infrastructure in the sector.

Tourism is a significant driver of aviation demand and has accounted for 5% to 11% of total emissions of greenhouse gases at the national level in European countries such as Portugal, Spain, Sweden, France, and the Netherlands (Steiger et al., 2003). Between 1991 and 2018, air passenger growth trends highlight a steady increase in demand for air travel, indicating the likelihood of continued growth. Similarly, robust international tourism has significantly contributed to the growth of the aviation industry in Africa (Njoroge et al., 2020). Focused regional support is needed to overcome distinct challenges and foster sustainable entrepreneurship within the continent's aviation and tourism sectors. Policies must focus on regional needs and institutional weaknesses to effectively promote sustainable entrepreneurship across Africa (Njoroge et al., 2020b).

Alongside the growing demand for aviation services, it is essential to examine global and African workforce demographics. Women comprise about 50% of the global population, with a similar distribution in Africa (Table 1). However, despite this demographic balance, women remained significantly underrepresented in the aviation workforce, particularly in technical, operational, and leadership roles, revealing a persistent gender imbalance. This gender imbalance limits diversity and innovation within the industry. Therefore, analysing women's representation and participation in these roles is essential to fostering a more inclusive and equitable aviation sector across Africa.

Table 1. Female % of the population

Year	World	Africa Western and Central	Africa Eastern and Southern
2023	49.747	49.720	50.464
2022	49.735	49.726	50.472
2021	49.723	49.732	50.479
2020	49.706	49.739	50.487
2019	49.692	49.747	50.496
2018	49.685	49.758	50.505
2017	49.680	49.770	50.516
2016	49.676	49.784	50.519
2015	49.676	49.797	50.532
2014	49.679	49.808	50.559
2013	49.681	49.819	50.577
2012	49.685	49.829	50.594
2011	49.688	49.840	50.610
2010	49.691	49.853	50.625
2009	49.692	49.869	50.638
2008	49.695	49.885	50.652
2007	49.700	49.901	50.670
2006	49.706	49.917	50.691
2005	49.710	49.930	50.712
2004	49.713	49.944	50.732
2003	49.716	49.960	50.752
2002	49.719	49.976	50.772
2001	49.722	49.988	50.790
2000	49.729	49.996	50.809

(Source: *Population, Female (% of Total Population)* | *World Bank Gender Data Portal*, n.d.)

Women in the aviation sector face unique challenges. These challenges included limited opportunities for career progression, unequal working conditions compared to their male counterparts, and socioeconomic impacts that negatively affect their roles and opportunities. Understanding and addressing these challenges is vital for ensuring the creation of fair and sustainable systems and policies.

Addressing these challenges presented an opportunity to include gender considerations and build climate resilience within the aviation sector. Developing strategies that foster gender equity, such as inclusive policymaking, mentorship programs, and flexible work options, can promote sustainability and empower women in the aviation sector. This study aimed to answer the question*: How can gender equality be integrated into climate change mitigation strategies in the aviation sector to enhance the adaptation of inclusive policies and promote climate resilience efforts in Africa?*

The study analyzed the gender distribution within the aviation sector in Africa, investigated the impacts of climate change on the industry, assessed gender-specific challenges, and explored opportunities for gender-inclusive climate actions. This analysis was based on the responses from a survey that was conducted among aviation professionals. The results helped create suggestions and solutions shaping inclusive policies and integrating gender considerations into climate resilience initiatives within the sector.

2.2 Theoretical framework

2.2.1 Intersectionality theory

Kimberlé Crenshaw, who first introduced the term intersectionality, described it as "a method and a disposition, a heuristic and analytical tool.". Intersectionality is an important concept that shows how different forms of oppression do not simply add up but are interconnected. It provided a structured way to study and analyze how various forms of oppression interact. This theory shows that individuals can simultaneously experience multiple forms of discrimination ("What Is Intersectionality and Why Is It Important? On JSTOR", n.d.). Researchers, policymakers, and activists are better equipped to examine overlapping systems of power and discrimination, such as racism, sexism, and classism, by applying the concept of intersectionality.

Intersectionality can be illustrated through a few examples. A white woman might face gender discrimination, such as facing a "glass ceiling," limiting her advancement into leadership roles. A black man might face racial discrimination, such as being overlooked for opportunities or promotions due to biases based on his race. A black woman might experience discrimination that combines race and gender in unique ways, such as being perceived as aggressive or angry when asserting herself. Facing stereotypes that black women are more outspoken than white women. This can add an extra demanding layer to her professional career.

2.2.2 Ecofeminism

Ecofeminism is also known as ecological feminism. This is a philosophy that examines the way a society exerts dominance over gender-minoritized people and nature due to associations between the two. This domination is often rooted in patriarchal ideologies that view women and the environment as resources that need to be controlled and exploited (*Ecofeminism*, n.d.). For example, many societies have linked women to nature through roles like caregiving and agriculture. This can also be found further in the literature study, where research showed that women are responsible for their children and the household. However as mentioned in the empirical literature, when men leave or are absent, they are forced to become the head of the household. Despite the shift in responsibility, they still often lack the necessary resources, decision-making power, or access to opportunities that would allow them to improve their circumstances.

Ecofeminism can be seen as a multi-faceted field that combines various ethics, emotional connections, environmental justice activism, philosophies, politics, arts, and spirituality. At the core, ecofeminism utilizes the feminist perspective to examine, challenge, and resist systems of oppression. It looks for ways in which environmental damage and social differences are intertwined, using the concept of intersectionality of gender, race, and class. At the same time, it works to imagine and create new ideas and practical approaches, promoting the well-being of all life. (Taylor, 2024).

2.2.3 Capability approach

The capability approach is a normative framework that defines well-being not just in terms of material wealth or utility but in terms of opportunities individuals must achieve certain functionings. These opportunities are called capabilities and represent the fundamental, substantive ways of living. On the other hand, functionings refer to "doings and beings" that are various states of being and activities a person has achieved. (Robeyns, I. & Byskov, 2021). For example, a function could be a person's ability to pursue a fulfilling career. This approach focuses on enhancing people's capabilities, enabling them to lead lives they value.

The capability approach highlighted the need to address structural barriers such as limited access to education, training, and career opportunities that hinder their ability to participate fully in the sector in the context of women in aviation. As highlighted in the literature, these barriers are often rooted in biases that suggest women are weaker, more emotional, and less intelligent than men. However, gender-based discrimination in aviation was not only fuelled by these stereotypes but also by a workplace environment that has historically been designed around male bodies and needs, for example, cock-pit layout. Efforts are being made to challenge and change this male-centred framework, making the industry more inclusive for women. The capability approach emphasized creating conditions where women have opportunities to pursue careers in aviation, overcoming gaps caused by gender-based discrimination.

2.2.4 Feminist political ecology

Feminist political ecology linked the insights of feminist cultural ecology and political ecology with those of feminist political economy. Creating a comprehensive framework to analyze socio-political and economic dimensions of environmental policies and practices. This approach built on the concern of the political ecologist, who focuses on decision-making processes and the social, political, and economic context that shapes environmental outcomes. Political ecologists have focused mainly on the uneven distribution of access to and control over resources. (Peet and Watts, 1993).

Feminist political ecology considered gender a critical variable in shaping resource access and control. It examined how gender interacts with class, caste, race, culture, and ethnicity to shape processes of ecological change and the struggle of men and women to sustain ecologically viable livelihoods. This perspective also highlighted how these factors affected the prospects of any community for sustainable development. (Rocheleau et al., 2013).

These insights were relevant for understanding how gendered inequalities intersect with climate challenges in the aviation sector. For example, women, particularly in the global south, are more vulnerable to climate-related dangers due to existing inequalities in socioeconomic contexts such as poverty, education, and access to resources (Pearse, 2017).

2.3 Empirical literature

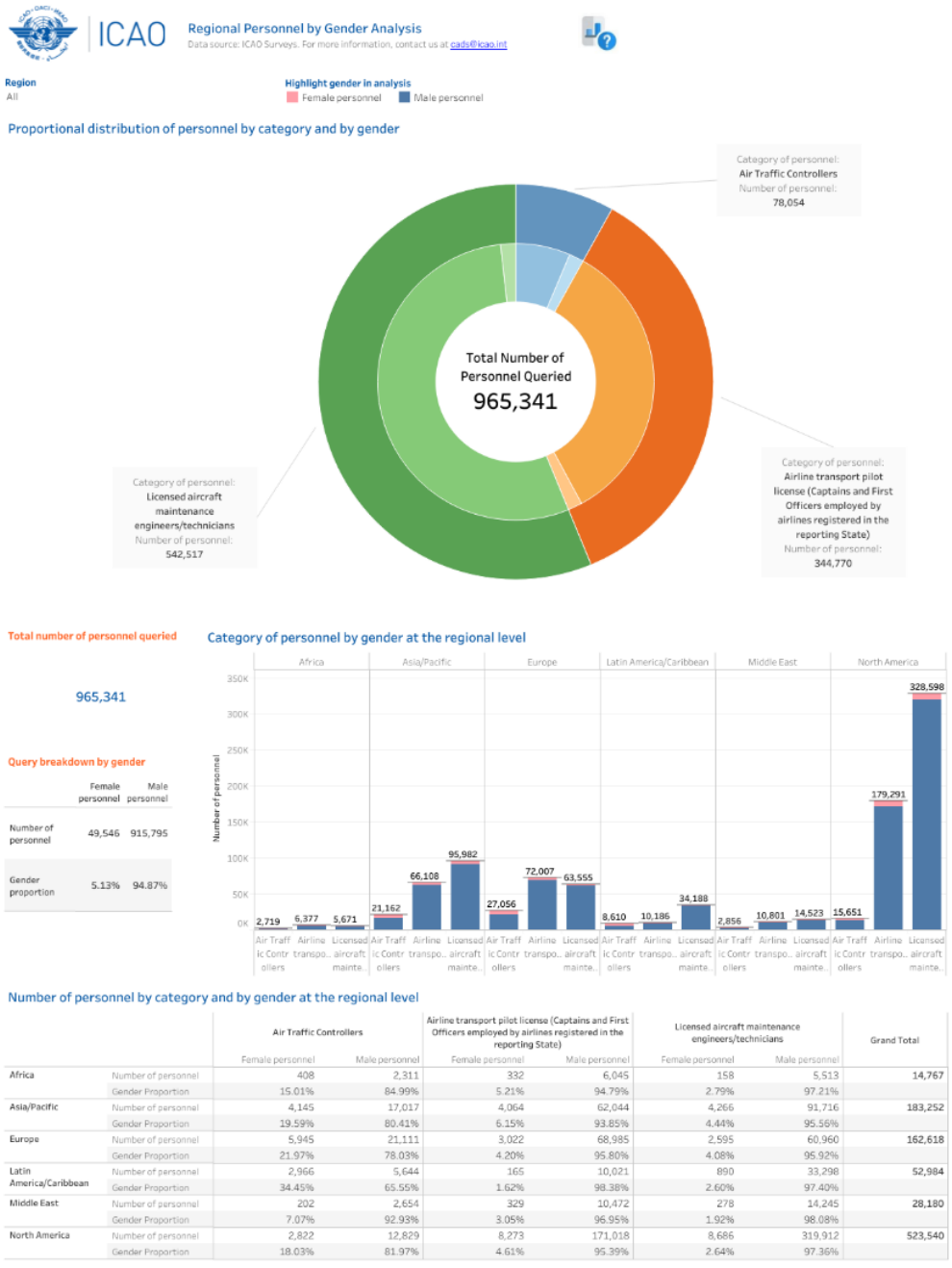
2.3.1 Gender imbalance in aviation

While significant attention has been given to the aviation sector's environmental impact, gender balance within the industry has received less focus. This imbalance has begun as early as education and hindered women's ability to advance in an evolving environment. Research showed that women are significantly underrepresented in STEM degree programs. For instance, women earn only 35.1% of bachelor's degrees, 32.7% of master's degrees, and 34.4% of PhDs in these fields (Halleran, 2019). This disparity can be attributed to a lack of role models and support systems for women in aviation training and careers. (Seligson, 2024).

As of December 2016, only 4.2% of airline transport pilots in the US are women, with an overall percentage of female pilots at 6.7% (Halleran, 2019). According to an ICAO press release, the rate of women pilots in service increased from 3.6% to 4.0% globally, with the highest increases observed in the Asia Pacific and Latin America/Caribbean regions. North America scored highest globally with 4.6% of women pilots, followed by Africa and Europe with 4.1% and 4.0%, respectively (ICAO Releases New Data on Status of Global Aviation Gender Equality, n.d.). However, despite these increases, women still make up only a small fraction of pilots compared to men.

The data presented in the following figure is derived from International Civil Aviation Organization (ICAO) surveys conducted in 2016 and 2021. These survey responses represented 80% of the world's air traffic. The press release mentioned above has been updated to include the survey results and ICAO estimates for the 20% of the non-reporting states. The updated figures are reflected in the referenced ICAO press release, which incorporates both the reported data and the estimations.

Figure 1. Regional Personnel by gender analysis



		Air Traffic Controllers		Airline transport pilot license (Captains and First Officers employed by airlines registered in the reporting State)		Licensed aircraft maintenance engineers/technicians		Grand Total
		Female personnel	Male personnel	Female personnel	Male personnel	Female personnel	Male personnel	
Africa	Number of personnel	408	2,311	332	6,045	158	5,513	14,767
	Gender Proportion	15.01%	84.99%	5.21%	94.79%	2.79%	97.21%	
Asia/Pacific	Number of personnel	4,145	17,017	4,064	62,044	4,266	91,716	183,252
	Gender Proportion	19.59%	80.41%	6.15%	93.85%	4.44%	95.56%	
Europe	Number of personnel	5,945	21,111	3,022	68,985	2,595	60,960	162,618
	Gender Proportion	21.97%	78.03%	4.20%	95.80%	4.08%	95.92%	
Latin America/Caribbean	Number of personnel	2,966	5,644	165	10,021	890	33,298	52,984
	Gender Proportion	34.45%	65.55%	1.62%	98.38%	2.60%	97.40%	
Middle East	Number of personnel	202	2,654	329	10,472	278	14,245	28,180
	Gender Proportion	7.07%	92.93%	3.05%	96.95%	1.92%	98.08%	
North America	Number of personnel	2,822	12,829	8,273	171,018	8,686	319,912	523,540
	Gender Proportion	18.03%	81.97%	4.61%	95.39%	2.64%	97.36%	

(Source: ICAO Aviation Data Analytics, 2024)

Women in aviation face stereotypes suggesting they lack technical skills, are not as strong and intelligent as men, and possess less innate flying ability. These stereotypes could lead to negative experiences, as women are often disrespected and underestimated (Van Wyk, 2021).
In addition, to the underrepresentation of women in STEM, a notable gender pay gap exists. The average women-to-men's earnings ratio for pilots in the US stands at a ratio of 70%, well below the national average (Sobieralski and Hubbard, 2019). This disparity indicated that women have fewer financial opportunities than men in the aviation sector, limiting their economic empowerment and ability to progress in the industry.

Casebolt (2019) highlighted that research participants in aviation related studies expressed concerns about the lack of female representation in aviation, noting its impacts on career choices and aspirations. While some airlines have acknowledged these gender disparities and expressed the need for more diverse, inclusive working environments, only a few have taken the first steps through programs such as Emirates 'Dreams Soar' and Qantas 'Male Champion for Change' (Smith et al., 2021), both in emphasizing collaborative efforts and addressing inequity. Despite these efforts, women in aviation continue to encounter gender-based stressors, such as sexual harassment that is perpetuated by organizational culture. These pressures, compounded by their minority status made it difficult for them to thrive and feel accepted. Many women left the industry. As a result, it perpetuated a culture that contributed to gender segregation and reinforced hegemonic masculine identities that associate piloting with male attributes (Gorlin & Bridges, 2021b).

The nature of aviation work often complicated the work-life balance, particularly for women with family responsibilities (Seligson, 2024). Research, based in Nigeria, indicates that education significantly boosts women's earnings, but disparities in access persist, particularly in resource-poor regions. Furthermore, the study revealed that the income gaps were more significant within groups than between groups, with factors such as geographical location and marital status being significant factors in determining earning outcomes (Adeosun & Owolabi, 2021b).

2.3.2 UN Women

Around the world, different companies, organizations, and governments are working toward achieving gender equality. The United Nations Women is a United Nations entity focused on gender equality and women's empowerment worldwide commonly known as UN Women.

The United Nations has already made significant progress towards gender equality through landmark agreements, such as the Beijing Declaration and Platform for Action (Fourth World Conference on Women, 1995) and the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (CEDAW, 29th Session 30 June to 25 July 2003, n.d.)

Additionally, the UN Women supports the achievement of the Sustainable Development Goals (SDGs) and works across four strategic priorities, as outlined on its website (About UN Women, n.d.). (1) Women lead, participate in, and benefit equally from governance systems. (2) Women have income security, decent work, and economic autonomy. (3) All women and girls live a life away from all forms of violence. (4) Women and girls contribute to and have a more significant influence in building sustainable peace and resilience, and benefit equally from preventing natural disasters, conflicts, and humanitarian action.

In addition to these goals, the United Nations Framework Convention on Climate Change (UNFCCC) recognizes the interaction of gender and climate change. According to the UNFCCC website (Introduction to Gender and Climate Change, n.d.) emphasized: "It is increasingly evident that women are at the centre of the climate change challenge. Women are disproportionately affected by climate change impacts, such as droughts, floods, and other extreme weather events, but they also have a critical role in combating climate change.". This is especially true for women in rural and low-income communities often bear the brunt of climate-related disasters due to their roles as primary caregivers, water gatherers, and food producers. These efforts show how gender equality and climate action are inseparable and that empowering women is essential for achieving sustainable development and reducing the impacts of climate change.

2.3.3 International Civil Aviation Organization (ICAO)

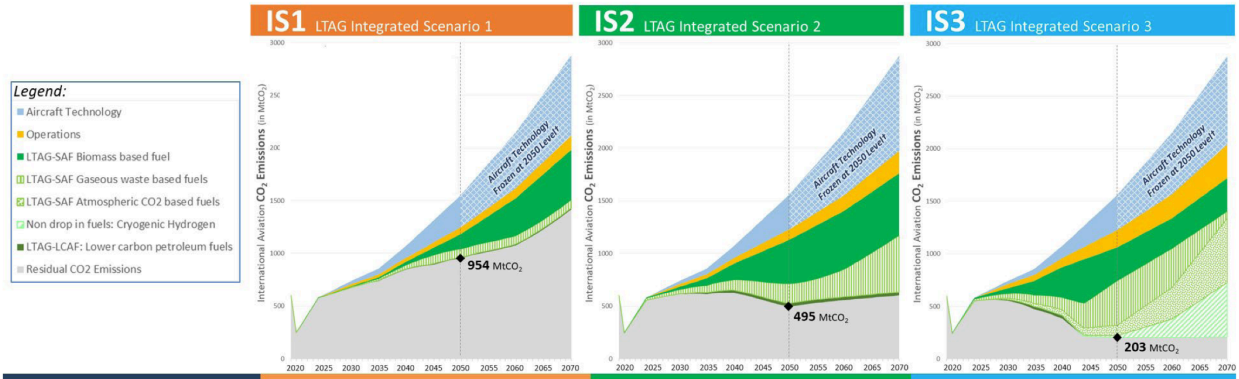
The International Civil Aviation Organization (ICAO) was established in 1944 during the Chicago Convention. ICAO's mission is to serve as the global forum for states in international civil aviation. This UN body develops policies and standards, conducts compliance audits, performs studies and analysis, provides technical assistance, and builds aviation capacity through many other activities and cooperation of its 193 member states and stakeholders.

ICAO operates with five main objectives (Strategic Objectives, n.d.). (1) Safety, supported by the Global Aviation Safety Plan (GASP), which outlines the key activities for the next triennium. (2) Air navigation capacity and efficiency by upgrading air navigation and aerodrome infrastructure. (3) Security and facilitation by strengthening global aviation security and border-related facilitation. (4) Economic development of air transport by promoting the creation of robust, economically viable civil aviation systems through ICAO-led harmonization of economic policies and supporting frameworks. (5) Environmental protection, reducing the negative environmental impact of aviation activities so they align with United Nations (UN) policies.

In addition, ICAO monitors advancements in scientific research on aviation's impacted on global climate change. Through policy formulation, developing and revising Standards and Recommended Practices (SARPs) on aircraft emissions, and various outreach activities, ICAO strived to mitigate the environmental effects of international aviation (ICAO Secretariat, n.d.).

ICAO has implemented a basket of measures which include improvements in aircraft technology, operational efficiency and airport infrastructure improvements, the promotion of Sustainable Aviation Fuels (SAF) and market-based mechanisms such as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) (ICAO Secretariat, n.d.). These measures offer a unified and coordinated approach to reducing CO_2 emissions in international aviation. Figure 2 illustrates how these measures contribute to the reduction of greenhouse gas emissions based on the three scenarios aligned with the long-term global aspirational goals (LTAG).

Figure 2. LTAG feasibility study results: reductions in CO_2 emissions from international aviation with the in-sector measures through 2050 and beyond for various scenarios (IS1-IS3)



Metrics	IS1	IS2	IS3
CO_2 Emissions in 2050 after Reductions	**≈950 MtCO$_2$** in 2050 ***(160% of 2019 CO$_2$ emissions)***	**≈500 MtCO$_2$** in 2050 ***(80% of 2019 CO$_2$ emissions)***	**≈200 MtCO$_2$** in 2050 ***(35% of 2019 CO$_2$ emissions)***
Reduction in 2050 from the Baseline	**39% total** through: Technologies - 20%, Operations - 4%, Fuels - 15%	**68% total** through: Technologies - 21%, Operations - 6%, Fuels - 41%)	**87% total** through: Technologies - 21%, Operations - 11%, Fuels - 55%
Cumulative residual Emissions from 2020 to 2070	23 GtCO$_2$ (2020 to 2050) 23 GtCO$_2$ (2051 to 2070)	17 GtCO$_2$ (2020 to 2050) 11 GtCO$_2$ (2051 to 2070)	12 GtCO$_2$ (2020 to 2050) 4 GtCO$_2$ (2051 to 2070)

(Source: ICAO Environment, 2022).

2.3.3.1 Aircraft technology

Advancements in aviation technology have played a crucial role in reducing greenhouse gas emissions. The aviation industry is already 80% more fuel-efficient today regarding fuel use per passenger per kilometre compared to 1960. This significant improvement was largely due to the adoption of higher bypass ratio (BPR) engines, the use of lighter and high-temperature materials that improves propulsive efficiency and lower fuel consumption, and the reduction of aircraft weight through lightweight materials and innovative structural designs. ICAO actively monitors both current and emerging environmentally driven technologies that have the potential to impact the environment (ICAO Secretariat, n.d.).

To encourage innovation, ICAO has developed standards, policies, and guidance to foster the development and adoption of cleaner technologies. These efforts are reflected in the ICAO Assembly Resolution A41-20 (International Civil Aviation Organization, n.d.). The latest technology related goals

were developed by a panel of independent experts, ensuring transparency and inclusive process involving all relevant stakeholders. The ICAO council adopted the Aeroplane CO_2 Standard in March 2017, which applies to new aircraft type designs from 2020 and those already in production as of 2023.

2.3.3.2 Operational efficiency

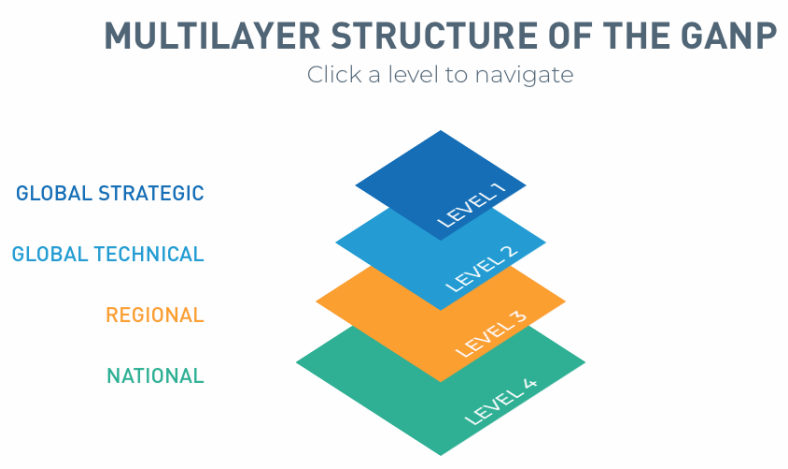
Operational efficiency is a key element in avoiding greenhouse gas emissions. Initiatives such as the Global Air Navigation Plan (GANP) and the Aviation System Block Upgrades (ASBUs) have supported this goal by enhancing air traffic management. (ICAO Secretariat, n.d.).

The Global Air Navigation Plan (GANP, Doc 9750) is ICAO's highest level air navigation strategic document, guiding the evolution of the global air navigation system to meet ever-growing expectations. It is aligned with the Global Air Traffic Management Operational Concept (GATMOC) and the Manual on Air Traffic Management System Requirements, developed in collaboration with and for the benefit of stakeholders. The GANP supports ICAO's strategic objectives and plays a vital role in advancing the United Nations 2030 Agenda for Sustainable Development. (Home - ICAO GANP Portal, n.d.).
The GANP operates in a multilayered approach, with each layer targeting different audiences to enhance communication. It works towards providing a series of operational improvements to increase capacity, efficiency, predictability, and flexibility while ensuring interoperability of systems and procedures. (Home - ICAO GANP Portal, n.d.)

The four levels of the GANP framework are:

- Level 1: High-level strategic directions for decision makers.
- Level 2: Supports technical managers in the planning and implementing basic air navigation services and operational improvements.
- Level 3: Address regional needs aligned with global objectives.
- Level 4: Development by states, NANP template, and CBA checklist.

Figure 3. Multilayer structure of the GANP



(Source: Home - ICAO GANP Portal, n.d.)

The Aviation System Block Upgrade (ASBU) enabled aviation to realize global harmonization, increased capacity, and improved environmental efficiency. The 10th edition of the EUR ASBU Implementation Monitoring Report was based on the 7th edition of GNAP, ensuring alignment with global air navigation objectives (Aviation System Block Upgrade (ASBU) Implementation Monitoring Report, n.d.).

2.3.3.3 Airport improvements

Airports are essential for improving operations on the ground. Airport traffic sequencing is improving with the growing implementation of innovative e-tools (such as Airport Collaborative Decision Making (A-DCM) tools) that enhance overall efficiency, especially turnaround and predeparture sequencing, avoiding unnecessary greenhouse gas emissions (ICAO Secretariat, n.d.).

A green airport is an airport that integrates social, environmental, and economic sustainable initiatives (ICAO et al., 2022). Green airports were developed through smart buildings, renewable energy, green mobility, climate change resilience, resource and biodiversity protection, community engagement, and sustainable reporting.

ICAO has developed the Eco-airport toolkit e-collection (ICAO Secretariat, n.d.) to support this. Implementing renewable energy provided multiple benefits, including fewer life-cycle emissions than fossil fuels, supplemented the purchase of non-renewable energy, reduced operating costs, reduced airport's carbon footprint, reduced uncertainty in power supply, contributed to regulatory compliance, offered potential for revenue compliance, offered potential local air quality benefit and contributed toward climate resilience (ICAO et al., 2022).
ICAO helped by providing comprehensive assistance and capacity building support. The support includes the development of guidance documents, organization of outreach events, implementation of pilot projects, and execution of various capacity building initiatives, for example, the two "solar-at-gate" projects and a feasibility study on the use of solar energy at Piarco International Airport in Trinidad and Tobago (ICAO et al., 2022).

2.3.3.4 Sustainable Aviation Fuels (SAF)

Sustainable Aviation Fuel (SAF) is a type of aviation fuel produced from renewable and sustainable resources, such as waste oils, agricultural residues, municipal solid waste, or non-food crops. This fuel can be used in existing aircrafts and infrastructure with little to no modifications needed. SAF was designed to reduce greenhouse gas (GHG) emissions. SAF is much more environmentally friendly compared to conventional fossil-based jet fuel over its lifecycle, making it a critical tool for decarbonizing the aviation sector. Sustainable Aviation Fuels (SAF) have not yet reached full scale of use at the moment because of challenges related to accelerating production, reducing costs and ensuring production's environmental integrity. However, significant progress has been made in the use of SAF. Since May 2019, more than 180,000 commercial flights have used a blend of SAF fuel, over six airports are regularly distributing blended alternative fuel, and several sustainable aviation fuel initiatives and projects are ongoing or underway worldwide (ICAO Secretariat, n.d.).

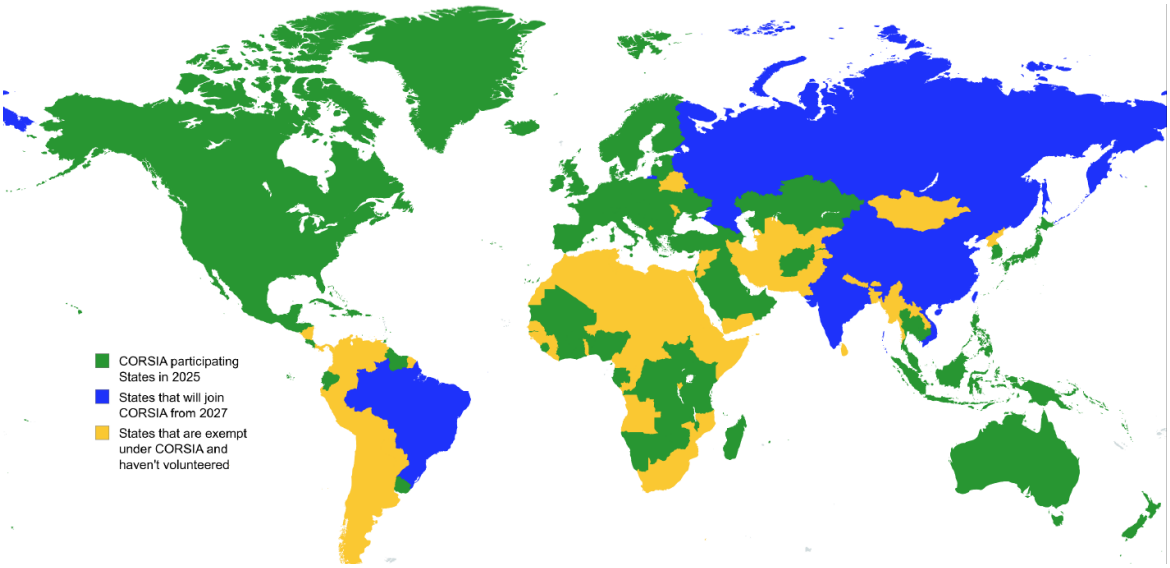
ICAO actively supports Member States and industry stakeholders in efforts to develop SAF through multiple initiatives (ICAO Secretariat, n.d.). These efforts include establishing policies and measures to enhance the uptake of sustainable aviation fuels, development of robust sustainability criteria and life cycle assessment methodologies, and sharing information, knowledge and best practices through the ICAO Global Framework for Aviation Alternative Fuels (GFAAF). ICAO also provides support for the formulation and development of SAF feasibility studies. Additionally, ICAO organises outreach events for to facilitate information exchange.

Despite these efforts, The production of SAF remains limited in scale. Therefore, it is essential to promote and regulate its use through targeted incentives such as policy and regulatory framework, financial support for the SAF production and certification and technical and financial assistance at the state level (ICAO Secretariat, n.d.).

2.3.3.5 CORSIA

The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) was presented at the 39th session of the ICAO assembly as a harmonized global approach to reduce carbon emissions from international aviation (ICAO Secretariat, n.d; International Civil Aviation Organization, n.d.-a) and is the first time a single global industry has collectively agreed to implement a global market-based measure to address climate change (CORSIA, n.d.)

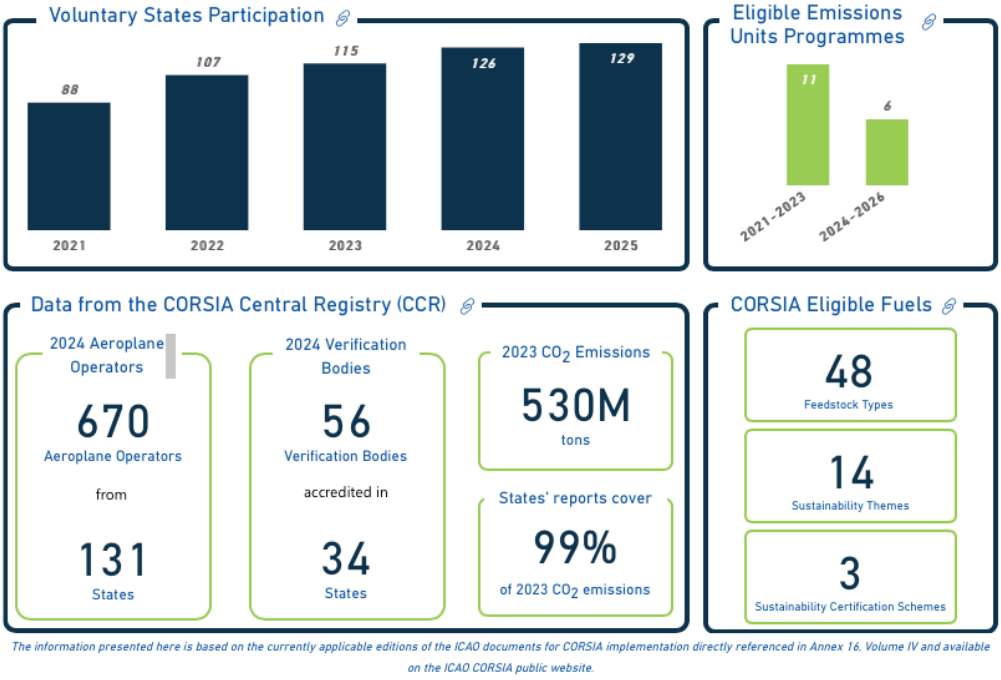
Figure 4. Global participation in CORSIA: countries taking part in the scheme



(Source: IATA, 2025)

A key component of CORSIA is its Monitoring, Reporting, and Verification (MRV) system, which ensures transparency and accuracy in tracking aviation related carbon emissions. (*Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)*, n.d.)

Figure 5. CORSIA implementation overview



(Source: *Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)*, n.d.)

2.3.3.6 Gender inequality

ICAO has committed to promoting gender equality in the aviation sector, setting a target of 50/50 gender parity by 2030. The organization works to ensure women and girls can fully take part in and have access to science and aviation by aligning its efforts and being committed to the UN 2030 agenda and Sustainable Development Goals (SDGs), with a particular focus on SDG5: Achieve gender parity and empower all women and girls. Advancing gender parity is considered one of ICAO's highest strategic priorities.

In 2016, ICAO adopted resolution A39-30, the ICAO's gender equality program promoting the participation of women in the global aviation sector (INTERNATIONAL CIVIL AVIATION ORGANIZATION, 2016). This resolution set the foundation for policy changes in gender equality in the field. ICAO introduced an updated version in 2022 Resolution A41-26, adopted by the 41st Session of the Assembly (INTERNATIONAL CIVIL AVIATION ORGANIZATION, 2022), strengthening its efforts to empower women and girls (Gender Equality and ICAO, n.d.).

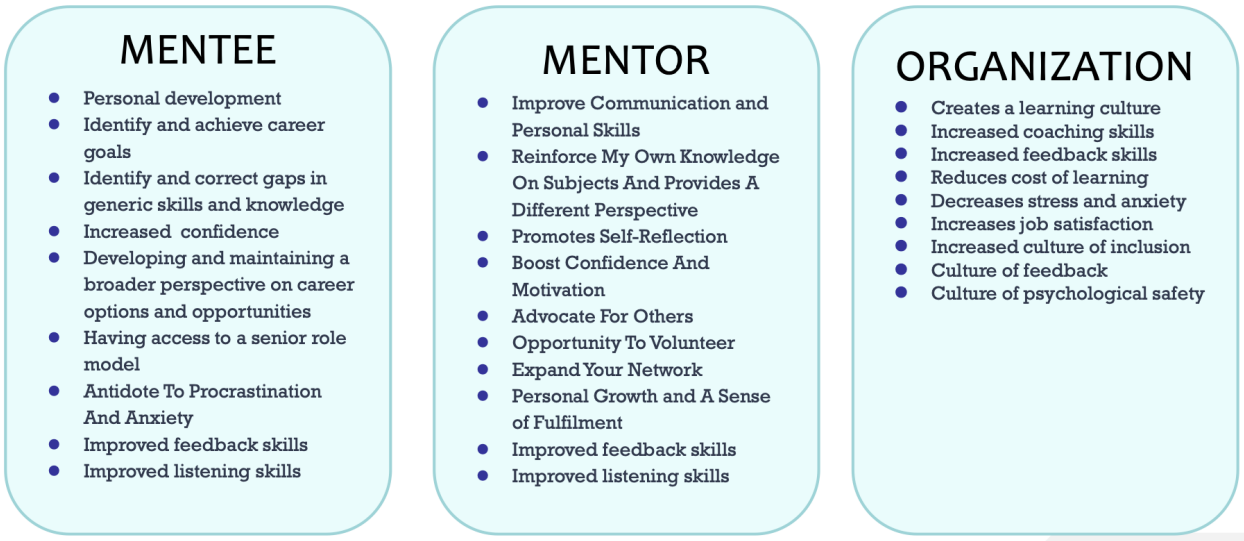
The ICAO Gender Equality Programme covers a broad spectrum of activities, with four main objectives for effective implementation objectives (Gender Equality and ICAO, n.d.): (1) build capacity and enhance awareness for gender equality, (2) enhance gender representation, (3) increase accountability and (4) further engagement with external partners

ICAO's APAC offices played an essential role in facilitating closer support and coordination for APAC member states to remain accountable at the global and regional levels. Ensured gender equality goals are reinforced and promote equal opportunities for women across all areas of the aviation industry (APAC-Gender Equality, n.d.).

Air transport gender equality was a new initiative. Developed in support of resolution A39-30 and commitment to enhance gender equality by 2030. This initiative includes the establishment of air transport gender indicators, through a collection of workforce analytics and collaboration of the International Labor Organization (ILO) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO). Offering guidance for decision makers to create and invest in more opportunities for gender equal employment and training in the global aviation industry (ICAO et al., n.d.).

More recent initiatives took place in 2023, 2024, and 2025. In 2023, ICAO organized a webinar on advancing gender equality in aviation mentoring and building EUROCONTROL 2030, focusing on technology, innovation, international engagement, and people as key drivers of progress. Speakers discussed how to set up a mentoring program during the webinar, following a phased model: Design → Attract → Connect → Guide → Measure success (Bowman & EUROCONTROL, 2023).

Figure 6. Benefits for the mentee, mentor, and or organization



(Source: Bowman & EUROCONTROL, 2023)

In 2024, ICAO organized the ICAO EUR/NAT Webinar on Gender Equality and Empowerment of Women in Aviation, focusing on the accountability for gender equality, gender equality in civil aviation industry from International Transport Workers Federation and gender equality and empowerment for women by EUROCONTROL (ICAO EURNAT Gender Equality Webinar 2024 Slides, 2024)

Additionally, the webinar highlighted the establishment of the Diversity, Equity, and Inclusion (DEI) Toolkit and the Equity, Diversity, and Inclusion Task Force (EDITF) to support DEI in other organizations. The organization CANSO also presented data collected on gender representation in aviation (ICAO EURNAT Gender Equality Webinar 2024 Slides, 2024)

In 2025, ICAO organized the ICAO EUR/NAT Workshop on Gender Equality and Empowerment of Women to bring together stakeholders from the EUR/NAT area and share experiences and best practices on mentoring and other initiatives. During the event, multiple success stories of women leaders and gender equality in aviation, mentoring stories, and efficient techniques and initiatives to attract young women in the aviation field through education were shared (2025 ICAO EUR/NAT Workshop on Gender Equality and Empowerment of Women in Aviation, n.d.).

2.3.4 African Civil Aviation Commission (AFCAC)

The African Civil Aviation Commission (AFCAC) is a specialized agency of the African Union (AU) created in 1969 to promote and coordinate civil aviation in Africa. Its primary objectives are safety, air transport, security, environment, legal, and human capacity development. The AU has 54 African member states representing a unified African voice in global aviation matters.

AFCAC led several initiatives to improve aviation in Africa. Its main initiative is the Single African Air Transport Market (SAATM), aimed at liberalizing air transport markets across the continent to enhance connectivity, reduce airfares, and boost economic integration. AFCAC works closely with the ICAO to ensure African countries follow global safety and security standards in aviation.

The agency also focused on promoting gender equality in aviation by addressing the challenges in areas like training, leadership, opportunities, and technical roles. It supported policies and programs that empowered and recognized their importance in shaping the future of aviation.

2.3.5 Gender-specific impacts of climate change in Africa

While aviation significantly impacts climate change, it is essential to recognize that the effects of climate change are experienced differently across populations due to gender-specific challenges, particularly in Africa. Research showed gender-specific challenges for women, including empowerment, education, access to resources, and societal stereotypes (Vuciterna et al., 2024). Pearse (2017) showed that women in the global south of Africa were more vulnerable to climate-related dangers due to existing socioeconomic inequalities.

Climate change disproportionally affected women across five key areas: agricultural production, food and nutrition security, health, water and energy, migration, and conflict (Awiti, 2022). Female-headed households are particularly vulnerable, experiencing five or more months of hunger more frequently

than male-headed households. Making them more dependent on social support institutions, government, and NGOs (Perez et al., 2015b).

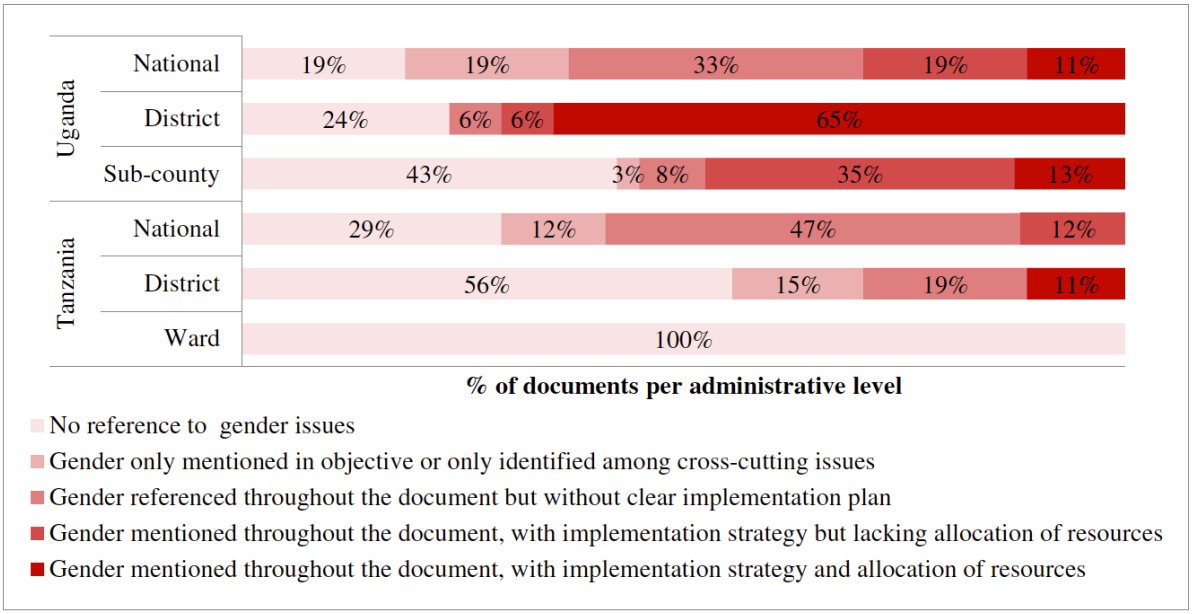
Climate change has also shifted the traditional gender roles of men and women. For example, men traditionally hold more defined agricultural roles, which places a heavier burden on them during climate disruptions due to their responsibility for food production. As climate impacts intensify, more men are migrating for employment opportunities. As a result, women are increasingly taking on agricultural tasks and other economic responsibilities in the absence of men. The health impacts include an increased risk of gender-based violence, with a higher vulnerability in developing countries (Sellers, 2016b). These socio-cultural norms and structural barriers, such as restricted land rights, limited financial resources, and inadequate access to technology and information, further intensify the impact of adapting to climate change (Awiti, 2022). However, a challenge remained for women as they often do not have the opportunity to make decisions based on their changing responsibilities, as decision-making power remained mainly in the hands of men (Ribeiro & Chaúque, 2003).

Research showed a significant correlation between higher gender inequality and greater vulnerability to climate impacts. This is measurable through the Gender Inequality Index (GII) scores. Countries with lower GII scores tend to have stronger climate policies, suggesting that reducing gender inequality can improve climate action efforts (Andrijevic et al., 2020).

2.3.6 Benefits of gender equality

Regulatory initiatives alone have proven insufficient for enhancing women's financial inclusion, and gender-related and cultural norms significantly influence the implementation and enforcement of policies. This emphasized the need for context-specific diagnostics and the importance of sex-disaggregated data to women's access to finance (Bin-Human et al., 2023).

Figure 7. % of documents per administrative level in Uganda and Tanzania



(Source: Ampaire et al., 2019).

Research indicated that many governments do not fully embrace gender budgeting, allocations remained low, with significant discrepancies between estimated and actual budgets, and did not match gender priorities. For instance, in Uganda, 63% of policy documents mentioned gender throughout, 29% included implementation strategies, but only 11% addressed resource allocation. In Tanzania, the figures were even lower; 59% of policy documents mentioned gender, 12% included implementation strategies, and none addressed resource allocation. This reflects a persistent perception that gender issues are a woman's issue (Ampaire et al., 2019).

Stereotypes that frame women as inherently caring and intrinsically linked to the environment oversimplify complex gender dynamics. These simplistic assumptions hinder the development of effective policies, as they fail to address structural gender inequalities. In addition, the lack of clear definitions of gender equality often results in diluted or misdirected efforts, further complicating the progress toward meaningful change (Lau et al., 2021)

While gender equality is a distinct goal of Sustainable Development Goal 5 (SDG5), it is also closely linked to 86 targets of other SDGs. Gender should, therefore, be treated as a cross-cutting issue in SDG implementation, with more significant inclusion in policymaking, poverty alleviation, and global awareness efforts (Leal Filho et al., 2022).

Addressing gender diversity and inclusion can improve female aviation professionals' satisfaction and retention (Casebolt, 1990) and is associated with higher employee engagement and a more positive workplace culture (Corazza, 2024). Ultimately, benefiting the industry as a whole. Closing the gender

pay gap may lead to increased revenue for airlines, with estimates suggesting a 2% to 5% revenue boost for companies that effectively implement diversity policies (Corazza, 2024). Additionally, research by IFC et al. (2023b) showed that achieving gender equality could boost GDP by 3 to 6%, underlining substantial economic benefits of enhancing gender equality.

2.3.7 Already existing solutions

Some possible solutions to these issues are Policy development aimed at increasing gender diversity, financial assistance and scholarships to ease the burden of training for women in aviation, mentorship initiatives to connect aspiring female pilots with experienced professionals, facilitating networking events to allow women in aviation to connect and support one another, campaigns to challenge and change societal perceptions about women in aviation, creating more flexibility within the job by different work schedules and equipment design reviews and redesigning cockpit equipment to ensure inclusivity to all body types (Nussrat, 2024).

ICAO also introduced a new program, called the Next Generation of Aviation Professionals (NGAP). The program was established to ensure a sufficient supply of qualified and competent professionals to operate, manage, and maintain future international air transport systems. This initiative focuses on a few key areas: (1) Meeting the industry's growing need for skilled professionals to ensure workforce sustainability and mobility; (2) promoting the attraction, recruitment, training, and retention of a diverse and inclusive pool of aviation professionals; (3) fostering innovation through technology adaptation and digital transformation in the aviation sector; (4) enhancing the quality and relevance of aviation education programmes; and (5) encouraging dialogue, collaboration, and partnership between states and key stakeholders within and outside the aviation industry and the relevant (UN) organizations (NGAP Programme, n.d.).

2.4 Conceptual framework

This research's conceptual framework was designed to explore the links between gender and climate change in the aviation industry in Africa. It served as a foundation to understand how gender challenges help create suggestions and solutions to shape inclusive policies and integrate gender consideration into climate resilience initiatives by combining theoretical perspectives with empirical literature.

2.4.1 Key elements of the framework

This study's conceptual framework integrates four components essential for examining gender-climate intersections in African aviation:

1. Gender distribution in the aviation sector
    a. Objective: Analyze the representation and participation of women in various roles within the aviation industry across African countries.
    b. Variables: Proportion of women in technical, operational, and leadership roles.

   c. Relationship: Helps identify areas where targeted interventions can improve diversity and equity.
2. Impacts of climate change on the aviation sector
   a. Objective: Investigate how climate change affects aviation operations, infrastructure, and policymaking in Africa.
   b. Variables: operational disruptions, infrastructure vulnerabilities, and policy gaps intensified by climate change.
   c. Relationship: Aids in developing strategies that consider operational resilience and gender equity
3. Gender-specific challenges
   a. Objective: Identify the challenges women face in the aviation sector concerning climate change, including barriers to career progression such as work conditions and socio-economic impacts
   b. Variables: Barriers to career progression, work conditions, socio-economic challenges, and resource access.
   c. Relationship: Encourages a more inclusive environment that supports women's contributions.
4. Opportunities for gender-inclusive climate actions
   a. Objective: Investigate potential strategies and initiatives for fostering gender equity through climate resilience actions within the aviation industry.
   b. Variables: Inclusive policies, mentorship programs, flexible work options, and climate-resilient planning.
   c. Relationship: Promotes equity and creates a more sustainable aviation workforce.

This framework provided a structured approach to analyzing the study's objectives. It established a clear pathway to understanding the interactions between gender equity and climate resilience. It offered actionable insights for policymakers and industry stakeholders to create a more inclusive and sustainable aviation sector.

2.5 Synthesis of literature and research gap

The literature review highlighted critical insights into the overlap of gender and climate change in the aviation industry. While significant progress has been made in understanding the broader impacts of climate change and the need for gender equity, several gaps remained, especially in the African context.

2.5.1 Critical analysis of literature review

The literature identified four key findings regarding gender and climate change in aviation. First, research consistently demonstrates women's underrepresentation in technical and leadership roles within the aviation industry. This imbalance stems from structural barriers, cultural norms, and limited access to education and training opportunities.

Second, research showed that climate change disrupts aviation operations and infrastructure. However, most studies do not examine how these disruptions affect women in the workforce, particularly in regions where women already face systematic disadvantages.

Third, women in aviation often encountered barriers such as limited career progression, unequal working conditions, and socio-economic pressures. These issues are well-documented but rarely linked to climate resilience strategies.

Finally, opportunities for gender-inclusive climate actions. While there were examples of successful gender equity initiatives in other industries, the aviation sector lacks documented case studies demonstrating practical strategies for integrating gender equity into climate resilience efforts.

2.5.1.1 Research gaps

The literature review identified critical research gaps. First, Limited research on gender equity and climate resilience in the aviation sector within Africa. This gap obstructs the development of context-specific strategies. Second, a lack of studies addressing the connection between gender imbalances and climate durability in aviation, especially concerning structural and socio-economic barriers faced by women. Third, Insufficient evidence-based recommendations for creating gender-inclusive policies that address climate change in the aviation industry. Finally, there is a notable absence of gender-disaggregated data within African aviation. This data is critical for identifying gaps, shaping interventions, and monitoring progress.

2.5.2 Proposed research

This research aimed to address the identified gaps by focusing on the African aviation sector, where gender equity and climate resilience are both underexplored. By including gender considerations in climate policies, this study sought to provide actionable insights for policymakers and stakeholders.

Key contributions included expanded context-specific knowledge, developed practical solutions and informed policy frameworks.

Chapter 3: Research methodology

3.1 Introduction

The study focused on Africa's aviation sector, exploring the intersection of gender and climate change across various regions and socio-economic contexts. The data was collected through a structured survey with mostly closed-ended questions to analyze trends and eight additional open-ended questions for deeper insights.

Responses from men and women enabled deeper analysis of gender dynamics and their relationship with climate change. The study only focused on binary genders (male and female) for generalization and easier comparisons, which may not fully capture gender dynamics in aviation. All respondents were targeted through convenience sampling via professional networks, focusing on aviation professionals in technical, operational and leadership roles. Ethical compliance was ensured through informed consent and confidentiality.

3.2 Research design

This research primarily took a quantitative approach, using a structured survey with mostly closed-ended questions to collect measurable data for identifying trends and patterns through statistical analysis across key areas. The areas included personal information, family responsibilities, work, gender challenges, policies, and other related topics. The survey included eight open-ended questions to add extra depth and understanding of participants' perspectives. This combination enhanced the study by providing a more comprehensive view of the topic.

3.3 Study area

The study covered various countries, regions, and cultural contexts across Africa. This provided a unique setting to explore the intersection of gender and climate change in aviation because of the varying socio-economic conditions and significant gender-related challenges in the different areas.

The primary focus lay on women, who are underrepresented in the aviation sector and face distinct barriers. These barriers include limited job opportunities, unequal access to resources such as training, pay gaps, and social norms that hinder career progression. Centred on women, the study aimed to shed light on their experiences and challenges in relation to climate change. It explored how gender imbalances affect job opportunities, resource access, and inclusion in decision-making processes. This highlighted the need for equitable policies and practices addressing gender inequity and climate challenges.

3.4 Target population and sampling

3.4.1 Target population

The target population consisted of professionals working in the aviation sector in Africa. This included individuals in technical, operational, and leadership roles. A particular emphasis was placed on women, who are underrepresented in the industry. The study sought to capture a diverse sample that spans multiple countries and regions within the continent. Additionally, the study collected responses from both men and women in the sector to facilitate meaningful gender comparisons. This allowed analysis of gender dynamics within the industry and their intersection with climate change issues.

3.4.2 Sampling technique

The sampling technique was convenience sampling, which employed the professional network of the supervisor to distribute the survey in the aviation industry. This method was deemed appropriate given the specialized nature of the research, which required direct contact with professionals in the sector. Convenience sampling also allowed for more manageable and efficient data gathering from this specific group. The sample size was estimated to be between 50 and 100 participants.
This range ensured enough responses for meaningful quantitative analysis while allowing diverse perspectives.

3.4.3 Selection criteria

The study established three key eligibility criteria for survey respondents. First, participants were required to demonstrate willingness to engage with the survey by providing honest and insightful responses. Second, all respondents needed to have current or previous employment experience in the aviation industry in Africa. Third, participants were required to have experience or awareness of either gender-related challenges or climate change issues in the industry. These criteria ensured respondents could offer informed perspectives on the study's core themes.

3.5 Data collection methods

3.5.1 Tools and instruments

The primary tool for data collection was an online survey through Qualtrics, available through the University of Hasselt (UHasselt). Qualtrics is a widely used platform for creating and distributing surveys, offering a user-friendly interface that provides easy access for respondents. The platform also provided reliable tools for collecting and analyzing data.

3.5.2 Survey

Before distributing the survey to the target population, a pre-test (or pilot test) was conducted. The pre-test involved a small group to identify and address issues with the survey wording, structure, or design to ensure that the questions were clear, concise, and effectively captured the intended data. Feedback from the pre-test was used to refine the survey and improve its clarity and reliability.
The survey was distributed to the target participants in March 2025. Respondents were provided a link to the online survey via email or other professional channels through the research supervisor, Francis Mwangi. Participants were given ample time to complete the survey within the month at their convenience. The data collection was done entirely online to ensure accessibility and reach for aviation professionals across various regions in Africa.

3.5.3 Validity and reliability

The questions were carefully developed based on a review of existing literature on gender, climate change, and aviation and input from subject experts to ensure the validity of the survey instrument.
The survey was evaluated for consistency during the pre-test phase to ensure reliability. The aim was to ensure that responses to the same or similar questions were consistent between participants and that the instrument produced stable results when administered multiple times under identical conditions. Qualtrics provided access to institutional support and ensured the reliability of data collection, as it included built-in validation checks (e.g., for missing answers or invalid responses) to minimize data entry errors and ensured that the collected data was accurate and complete.

3.6 Data analysis techniques

3.6.1 Data cleaning

A thorough data cleaning process was conducted before analyzing the survey data to ensure validity and consistency. The following techniques were used: all responses with less than 70% completion were labelled as incomplete responses and deleted. Additionally, duplicate responses were excluded based on IP address and timestamps. Initially, 118 responses were collected, after data cleaning, 68 valid responses remained for analysis.

3.6.2 Data analysis

The study used a dual-software approach for comprehensive data analysis. Qualtrics was used for basic descriptive statistics (e.g., averages and percentages) and visualizations (e.g., bar charts). SPSS was used to conduct more advanced analysis including independent samples t-tests and chi-square tests, to compare responses across different demographic groups.
Thematic analysis was used to identify key themes and patterns in the qualitative data from the open-ended responses this allowed for in-depth understanding about the different themes.

Data analysis compared responses between men and women using the different methods. Hypothesis 1 was tested through a cross-tabulation followed by a chi-square test to see if the distribution differs significantly by gender. Hypothesis 2 and 3 compared mean scores for men and women using independent t-tests. Hypothesis 4 analyzed the overall agreement with statements, including a more in-depth analysis of the survey output on policy impact. All hypotheses were tested using a significance level of $p < 0.05$.

3.7 Ethical considerations

The following measures were implemented to ensure ethical compliance. Informed consent, all participants were informed about the purpose of the research, the voluntary nature of their participation, and their right to withdraw at any time. Confidentiality and anonymity, the survey asked for the company's name where the respondents work. However, the research analysis did not include specific names and information to protect the respondents' anonymity. Personal identifiers were kept separate from the survey data, and any other information shared was treated confidentially. Approval process, the research was submitted for ethical review and approval by the UHasselt.

3.8 Limitations of the study

This study acknowledges the existence of diverse gender identities. However, it focuses solely on the two primary genders, male and female, to generalize the findings and facilitate easier comparisons. This approach may limit the study's ability to fully reflect the complexity of gender dynamics within the aviation sector.

Additionally, using convenience sampling through the supervisor's network may result in a sample that is not fully representative of the industry. Efforts were made to include participants from diverse regions, roles, and backgrounds to enhance the range of perspectives, though some bias may remain.
These limitations were transparently addressed in the analysis, and recommendations for future analysis will be made to explore broader gender dynamics and adopt more representative sampling methods.

Chapter 4: Results

4.1 Gender distribution in the aviation sector

4.1.1 Demographics

Figure 8. Gender of respondents

Q1:...der?		Count	Percent	Cumu...tive
Male		28	41.2%	41.2%
Female		40	58.8%	100.0%
Total	0.0% 20.0% 40.0% 60.0%	68	100.0%	

Group A	Group B	Difference (A - B)
Female	Male	17.6%
Male	Female	-17.6%

The final sample comprised 68 responses after the data cleaning. Among these, 28 identified as men (41%) and 40 identified as women (59%), indicating a good gender representation with a slight majority of female respondents. Geographically, participants were distributed across 23 different countries, with the largest representation from Kenya (n=25, 37%) and Angola (n=9, 13%).

Figure 9. Age of respondents

Q2:...age?		Count	Percent	Cumu...tive
26-35		13	19.1%	19.1%
36-45		31	45.6%	64.7%
46-55		19	27.9%	92.6%
Above 55		5	7.4%	100.0%
Total	0.0% 20.0% 40.0% 60.0%	68	100.0%	

Participants ages ranged from 26 to over 55 years, distributed over following categories: 26 and 35 years (n=13, 19%), 36 and 45 (n=31,46%), 46 and 55 years (n=19, 28%) and above 55 (n=5, 7%).

The education levels of the respondents were mainly bachelor's degree (n=25, 37%) and master's degree (n=36, 53%). Other degrees represented a smaller proportion of the sample (with 1% post-secondary education, 4% PhD, and 2% who preferred not to disclose). In terms of professional seniority, 32 respondents held a senior level in their department, while 22 held mid-level roles. Smaller proportions reported top-level (n=6), entry-level (n=4) and 4 respondent preferred not to disclose their level. Most of the respondents work for the Civil Aviation Authority (CAA) of their country, while other companies included in the survey were from various lines of work such as airlines, airports, universities, air service

providers, government bodies and law firms. The respondent pool covered all departments ranging from Human Resources (HR) to the planning department to policy and legislation, with even lecturers being included. These results demonstrate a very diverse respondent base that reflects a mature workforce with meaningful work experience.

The survey revealed that most participants were married (n=46, 68%), while others reported being single (26%), divorced (4%), and widowed (1%). Regarding parental status, 76% of the respondents indicated that they have children, 22% reported they do not have children (n=15), and 1 participant preferred not to answer. These family structures appear to be linked to climate change perspectives, as 38 respondents (56%) reported that parenthood influenced, or would influence, their views and/or concerns about climate change. Notably, 59 respondents (87% of the sample) reported that they discuss climate change issues within their household. This connection between family status and environmental awareness extended to mobility patterns, with 34 respondents (50%) explicitly noted that having a family affected their travel behaviour. These findings suggest meaningful differences between those with and without dependents.

4.1.2 Gender representation in technical roles

Chi-squared goodness-of-fit tests were conducted to assess whether the observed distribution of gender composition in technical roles differed from the expected equal distribution, across five categories (Mostly men (80%+), more men (60-79%), balanced (50-60%), more women (60-79%), and mostly women (80%+)). The analyses were performed separately for male and female respondents to assess potential differences between genders.

Among male respondents (n=28), the chi-square test revealed significant deviation from the expected distribution $X^2(3) = 21.714$, $p = <.001$ (Table 2), indicating these results were unlikely to occur by chance. Post hoc analysis of residuals demonstrated an overrepresentation of the category More men (60-79%) (observed n=17, expected n=7 with a residual=10.0) along with an underrepresentation of the category Balanced (50-60%) (observed n=, expected n=7, residual=-4.0) and with a more pronounced underrepresentation of the category Mostly women (80%+) (observed n=1, expected n=7, residual=-6.0) The category Mostly men (80%+) matched the expectation (observed n=7, expected n=7). These results strongly indicated that male respondents perceive technical roles as male-dominated, with significantly fewer reports of gender-balance or female representation in jobs than would be expected by chance.

The patterns among female respondents (n=40) similarly revealed significant deviation from the expected distribution, X^2 (3) = 11.692, p = .003 (Table 3). Further analysis of residuals showed a significant overrepresentation of the category Mostly men (80%+) (observed n=19, expected n=13, residual= 6.0) and a secondary overrepresentation of the category More men (60-79%) (observed n=17, expected n=13, residual=4.0). There was a corresponding underrepresentation of the category Balanced

(50-60%) (observed n=3, expected n=13, residual=-10.0). These results indicated that female respondents share the perception of technical roles being overwhelmingly male-dominated, with significantly fewer reporting gender balance or female representation in jobs than expected by chance.

4.1.3 Gender representation in management roles

Chi-squared goodness-of-fit tests were conducted to determine if the observed distribution of gender composition in management roles differed from an expected equal distribution. The predicted distribution assumed equal representation across categories (Mostly men (80%+), more men (60-79%), balanced (50-60%), more women (60-79%), and mostly women (80%+)). The analyses were performed separately for male and female respondents to assess potential differences between genders.

Among male respondents (n=28), the test revealed significant deviation from the expected distribution, $X^2(3) = 8.00$, $p = .046$ (Table 4). Post hoc analysis of residuals showed an overrepresentation of the category More men (60-79%) (observed n=11, expected n=7, residual=4.0). An underrepresentation of the category More women (60-79%) (observed n=1, expected n=7, residual=-6.0). The category Balanced (50-60%) showed a moderate overrepresentation (observed n=9, expected n=7, residual = 2). The category Mostly men (80%+) matched the expectation (observed n=7 and expected n=7). These findings indicated that male respondents perceive management roles as predominantly male-dominated, with significantly fewer reports of gender-balance or female representation in jobs than expected by chance.

Similarly, among female respondents (n=40) test revealed significant deviation from the expected distribution, X^2 (3) = 13.946, $p = .007$ (Table 5). Further analysis of residuals showed an overrepresentation of the category Mostly men (80%+) (observed n=14, expected n=7.4, residual=6.6). An underrepresentation of the category More women (60-79%) (observed n=4, expected n=7.4, residual=-3.4) and with a more significant underrepresentation of the category Mostly women (80%+) (observed n=1, expected n=7.4, residual=-6.4). The category Balanced (50-60%) showed a moderate overrepresentation (observed n=10, expected n=7.4, residual=2.6). These results indicated that female respondents also perceived management roles as overwhelmingly male-dominated, with significantly fewer reports of gender-balance or female representation in jobs than expected by chance.

4.1.4 Key factors to underrepresentation of women in technical and leadership roles

Respondents indicated whether they have experienced barriers to entering or advancing in technical or leadership roles. (1=yes, 2=not sure and 3=no). Men had a mean of 2.43, which means they leaned closer to no than women, with a mean of 1.97.

Table 6. Experienced barriers to entering or advancing in technical or leadership roles

What is your gender?	Mean	N	Std. Deviation
Male	2.43	28	.836
Female	1.97	40	.920
Total	2.16	68	.908

Post hoc analysis per gender of residuals showed an overrepresentation of the category Yes in both men (n=14, expected n=8.7 and residual=5.3) and women (n=16, expected n=12.7 and residual=3.3) The answer Not sure was underrepresented for both men (n=8, expected n=8.7 and residual=-0.7) and women (n=9, expected n=12.7 and residual=-3.7). The answer No was different for men (n=4, expected n=8.7 and residual=-4.7) and women (n=13, expected n=12.7 and residual=0.3) (Table 7 and 8). These quantitative patterns align with respondents reporting that flexible work options are not widely available at their organisation (n=38), a barrier that affects advancement opportunities as higher-level jobs require more work and greater availability.
In a separate assessment of support systems, respondents showed mixed access to mentor or roles models that inspire to pursue leadership and technical roles in aviation (Yes: n=30, Not sure: n=17 and No: n=17)

These results supported hypothesis 1 demonstrating, quantitative underrepresentation of women in technical and leadership roles and systemic barriers affecting women. This data may not mirror actual employment statistics and future studies should incorporate regional diversity, as they may limit generalizability to other African countries.

4.2 Effects of climate change on the aviation sector

4.2.1 Aviation operations

Survey respondents rated the climate change on aviation operations and infrastructure of men and women based on their perceptions on a 5-point scale as shown in Table 9, flight delays were perceived as the most probable climate-related disruption, with M=3.72 and SD=1.17, followed by tarmac degradation (M=3.31, SD=1.15). All categories averaged above the scale midpoint (3.0), indicating that climate risks to aviation are considered substantial in different categories.

Table 9. Climate change effects on aviation operations and infrastructure

	Minimum	Maximum	Mean	Std. Deviation
Flight delays	1.00	5.00	3.7206	1.16984
Increased flight diversions	1.00	5.00	3.3382	1.15397
Flight cancellations	1.00	5.00	3.1912	1.30735

Increased frequency of droughts reducing fuel and water availability	1.00	5.00	3.1912	1.30735
More frequent sandstorms and dust storms reducing visibility	1.00	5.00	3.0441	1.21476
Damage to airport power grids and air traffic control systems due to extreme heat and storms	1.00	5.00	3.1471	1.33007
Heat stress weakening airport tarmac and runways	1.00	5.00	3.3088	1.14940

Closer analysis showed variations in perceptions of climate-related aviation risks by gender. Male respondents reported higher across operational risks, mainly flight delays (men: M=3.89 and SD=1.10014, women: M=3.6 and SD=1.21529), increased flight diversions (men: M=3.5 and SD=1.17063, women: M=3.225 and SD=1.14326), and drought-related impacts (men: M=3.5357 and SD=1.10494, women: M=2.95 and SD=1.39505) (Table 10). Female respondents reported higher across infrastructure risks, namely Tarmac/runway weakening (women: M=3.375 and SD=1.14774, men: M=3.2143 and SD=1.16610) and power grid/system damage (women: M=3.1750 and SD=1.3939, men: M=3.1071 and SD=1.25725).

An independent samples t-test (Table 11) revealed that while men rated operational risks higher and women rated infrastructure risks higher, only drought perceptions approached statistical significance. Suggesting that while gender differences may exist, they only reflect small effect sizes rather than stark contrasts.

4.2.2 Economic implications

Survey respondents rated the climate change, and the economic implications of men and women based on their perceptions on a 5-point scale as shown in Table 12, increased costs of operations were rated as the most probable economic implication with M=3.5588 and SD=1.01308, followed by higher maintenance costs (M=3.5147, SD=1.20314). All categories averaged around the scale midpoint (3.0), indicating that climate risks to aviation are considered substantial in different categories.

Table 12. The economic implications of climate change

	Minimum	Maximum	Mean	Std. Deviation
Job instability	1.00	5.00	2.9412	1.10470
Increased costs of operations	1.00	5.00	3.5588	1.01308
Change in the working hours	1.00	5.00	2.9412	1.20796

Potential job losses for pilots and ground staff	1.00	5.00	2.7206	1.24404
Higher maintenance costs	1.00	5.00	3.5147	1.20314
Less focus on training	1.00	5.00	2.7500	1.37542

Closer analysis showed variations in perceptions of climate-related aviation risks by gender (Table 13). Male respondents reported higher for the category job instability (men: M=3.0357 and SD=1.10494, women: M=2.875 and SD=1.11373). The results were balanced for the categories increased costs of operations (men: M=3.5714 and SD=0.92009, women: M=3.55 and SD=1.08486) and less focus on training (men: M=2.7143 and SD=1.11744, women: M=2.775 and SD=1.54401). Female respondents reported higher for the categories change in the working hours (women: M=3.025 and SD=1.38652, men: M=2.8214 and SD=0.90487), potential losses for pilots and ground staff (women: M= 2.825 and SD=1.43021, men: M=2.5714 and SD=0.92009) and higher maintenance costs (women: M=3.575 and SD=1.29867, men: M=3.4286 and SD=1.06904).

While the descriptive statistics showed gender-based trends, there were no differences with statistical significance (Table 14), implying the need for sample variability or a qualitative follow-up of these results. The abovementioned results supported hypothesis 2.

4.3 Gender-specific challenges

4.3.1 Climate change mitigation efforts and career progression

Survey respondents rated their perception of gender-specific challenges about climate change mitigation efforts and career progression as shown in Table 15. Respondents rated gender-balanced skill development as the most significant influence with M=3.7353 and SD=1.22922, followed by equal career opportunities encourage innovation in climate reduction solutions (M=3.4559, SD=1.26295). All categories averaged above the scale midpoint (3.0), indicating that climate change mitigation efforts and career progression are considered substantial in different categories.

Table 15. Gender specific challenges about climate mitigation efforts and career progression

	Minimum	Maximum	Mean	Std. Deviation
Gender-diverse leadership improves climate policy decisions	1.00	5.00	3.1618	1.19214
Gender-inclusive policies enhance workforce engagement in climate initiatives	1.00	5.00	3.3088	1.23696

Equal career opportunities encourage innovation in climate reduction solutions	1.00	5.00	3.4559	1.26295
More women in operational and management roles contribute to sustainable aviation practices	1.00	5.00	3.2941	1.25851
Gender-balanced skill development programs enhance workforce readiness	1.00	5.00	3.7353	1.22922

Female respondents reported higher than men on all categories except the balanced category, where gender-diverse leadership improves climate policy decisions (men: M=3.1786 and SD=1.24881, women: M=3.15 and SD=1.16685) (Table 16). Although female respondents descriptively rated gender-inclusive policies higher in 4 of 5 categories, independent samples t-tests revealed no statistically significant gender differences (all $p > .05$) (Table 17).

4.3.2 Challenges men and women face in the aviation sector, regarding societal norms, work conditions and socio-economic outcomes

Majority of the respondents (n=46) mentioned that there are societal pressures that discourage certain genders from pursuing careers. These pressures include cultural and religious norms, gender stereotypes, family responsibilities, irregular or difficult working hours, the male-dominated nature of the profession, education barriers, lack of support, financial constraints and limited trainings opportunities. These perceptions align with survey responses rating gender challenges faced in the aviation sector on a 5-point Likert scale, regarding societal norms, work conditions and socio-economic outcomes as shown in Table 18. Respondents identified unequal pay between men and women as the most significant challenge (M=3.7794 and SD=1.50468), followed by economic barriers (M=3.6763, SD=1.33205). All categories averaged around or above the scale midpoint (3.0), indicating that challenges for men and women persist across multiple dimensions of the aviation industry.

Table 18. Gender challenges faced in the aviation sector

	Minimum	Maximum	Mean	Std. Deviation
Gender stereotypes limit career opportunities	1.00	5.00	3.5441	1.26295
Workplace discrimination and bias affect promotions and leadership roles	1.00	5.00	3.5147	1.25178

Unequal pay between men and women	1.00	5.00	2.7794	1.50468
Work-life balance struggles due to demanding schedules and travel requirements	1.00	5.00	3.6029	1.30601
Lack of mentorship and networking opportunities	1.00	5.00	3.4118	1.31847
Economic barriers	1.00	5.00	3.6765	1.33205

Although female respondents reported higher than men on all categories except the balanced category Work-life balance struggles due to demanding schedules and travel requirements (men: M=3.6071 and SD=1.3968, women: M=3.6 and SD=1.25678) (Table 19). Independent samples t-tests revealed only one marginally significant gender difference, females reported stronger concern about unequal pay (p* = .076, two-tailed), though this did not reach the conventional .05 threshold (Table 20).

Survey respondents answered if they have been treated as if they are not competent due to their gender. (1=yes, 2=not sure and 3=no). Men had a mean of 2.52, which means they leaned closer to no than women, with a mean of 1.92.

Table 21. Incompetence due to gender

What is your gender?	Mean	N	Std. Deviation
Male	2.54	28	.793
Female	1.92	40	.944
Total	2.18	68	.929

Survey respondents answered whether they have ever been denied a promotion in favour of the opposite sex. (1=yes, 2=not sure and 3=no). Both men and women leaned closer to no, men (M=2.64) even more significantly than women (M=2.25).

Table 22. Experience with denial of promotion in favour of opposite sex

What is your gender?	Mean	N	Std. Deviation
Male	2.64	28	.731
Female	2.25	40	.840
Total	2.41	68	.815

The abovementioned results support hypothesis 3.

4.4 Opportunities for gender-inclusive climate actions within the aviation sector

4.4.1 Challenges of the implementation of gender and climate change

Survey respondents shared their familiarity with the decarbonisation targets towards net zero for the aviation sector (1=Not familiar, 2=Somewhat familiar and 3=Very familiar). The target SAF/LCAF (M=2.43 and SD=0.654) was the most well-known target. All targets averaged around or above the midpoint (2.0), indicating that the targets were well known in the sample.

Table 23. Knowledge of decarbonisation targets

	Minimum	Maximum	Mean	Std. Deviation
Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)	1	3	2.40	.715
Sustainable Aviation Fuels (SAF)/LCAF	1	3	2.43	.654
Aircraft Technologies	1	3	2.26	.745
Operational Efficiency	1	3	2.35	.686
Airport improvements	1	3	2.49	.658
CDO/CCO	1	3	1.88	.856

Male respondents rated higher than women on all categories. The highest difference was noticed in the category CORSIA, with men M=2.64 and women M=2.223 (Table 24). Groups differed significantly in perceptions of CORSIA (t=2.60, p=.012) and CDO/CCO (t=2.11, p=.039), with narrower confidence intervals excluding zero (Table 25).

The respondents rated challenges of implementation of gender and climate change in the aviation sector in Africa. Respondents rated lack of training in environmental and climate change matters (M=3.7794 and SD=1.35873) as the most significant challenge, followed by inadequate institutional capacity (M=3.75, SD=1.09783). All categories averaged above the scale midpoint (3.0), indicating significant challenges. However, most survey respondents noted that this training gap could not be attributed to climate change as they believe there is no link between them causing a reduction in opportunities.

Table 26. Challenges of implementation of gender and climate change in the aviation sector in Africa

	Minimum	Maximum	Mean	Std. Deviation
Financial constraints	1.00	5.00	3.6029	1.28295
Limited technological capacity	1.00	5.00	3.6912	1.12313
Inadequate institutional capacity	1.00	5.00	3.7500	1.09783
Policy coordination issues	1.00	5.00	3.3971	1.16080
Public awareness and engagement	1.00	5.00	3.7353	1.21701
Lack of training in environmental and climate change matters	1.00	5.00	3.7794	1.35873

The category financial constraints was balanced between men (M=3.6071 and SD=1.31485) and women (M=3.6 and SD=1.27702). Women rated the category limited technical capacity higher than men (women: M=3.725 and SD=1.08575, men: M=3.6429 and SD=1.19301). Men rated higher on the other categories, with the most significant difference for the category inadequate institutional capacity (men: M=3.8929 and SD=1.13331, women: M=3.65 and SD=1.07537) (Table 27).

4.4.2 Gender and climate change policies

The study revealed striking patterns in the perception of gender equality across Africa's aviation sector. A chi-square test across all respondents (n=68) revealed significant deviation from the expected distribution ($X^2(3) = 22.794$, $p = <0.001$), with 41 respondents (residual=18.3) confirming the existence of gender equality frameworks. To further illustrate these findings Table 28 compares the availability of legal frameworks for gender equality based on gender. The visual representation underscores the significant overrepresentation of Yes and the underrepresentation of No and Not sure, reinforcing the statistical analysis.

Table 28. Availability of legal frameworks to enforce and monitor equality and non-discrimination based on gender

	Observed N	Expected N	Residual
Yes	41	22.7	18.3
Not sure	16	22.7	-6.7
No	11	22.7	-11.7
Total	68		

Deeper analysis per gender also showed distinct perspectives. The analysis per gender of the residuals showed an overrepresentation of the category Yes in both men (n=18, expected n=9.3 and residual=8.7) and women (n=23, expected n=13.3 and residual=9.7) The other answers were underrepresented, No was the most significant for both men (n=3, expected n=9.3 and residual=-6.3) and women (n=8, expected n=13.3 and residual=-5.3) (Table 29).

Beyond policy enforcement, employee involvement in these policies also showed broad support. The majority of men (n=16, expected n=9.3 and residual=6.7) and women (n=17, expected n=13.3 and residual=3.7) mentioning they help. The underrepresentation of the answer No might hint at a gap in potential, indicating that many already are included, some are still unheard (Table 32).

Figure 10. Comparison of presence of legal frameworks (Q28) and effective enforcement (Q29)

Q29: Are g...fectively?	Q28: Are there...ased on gender? Yes	Not sure	No	Total
Yes	45.6%	5.9%	4.4%	55.9%
Not sure	7.4%	14.7%	4.4%	26.5%
No	7.4%	2.9%	7.4%	17.6%
Total	60.3%	23.5%	16.2%	100.0%

The results revealed a strong consensus among both men and women that gender inclusive policies are effectively enforced in their workplace. Shown by and overrepresentation of the answer Yes in both men (n=19, expected n=9.3 and residual=9.7) and women (n=19, expected n=13.3 and residual=5.7) (Table 30). This algins with the respondents' beliefs that gender inclusive policies improve the effectiveness of climate resilience efforts in aviation (Table 31). Table 10 also illustrates that most respondents believe that legal frameworks are effectively enforced in their organisations.

Figure 11. Comparison of presence of a department that focuses on gender equality (Q33) and the existence of a budget for gender equity initiatives in an organisation (Q34)

Q33: Does...r balance)	Q34: Does your...ate resilience? Yes	Not sure	No	Total
Yes	20.9%	11.9%	7.5%	40.3%
Not sure	0.0%	6.0%	3.0%	9.0%
No	3.0%	11.9%	35.8%	50.7%
Total	23.9%	29.9%	46.3%	100.0%

It is important to have people working on gender equality to make real change in a company. The most effective way can be by implementing a department that deals with these matters. Most respondents were split about if their company has this, shown in the results of Yes and No (See table 33). The financial commitments show another layer of inconsistency. While men slightly overrepresented the answer Yes (n=11, expected n=9.3 and residual=1.7), women strongly disagreed (n=21, expected n=13 and residual=8). Suggesting a gap between policy intent and investment (Table 34) this uncertainty was also visible based on the comparison shown in figure 11.

Having a transparent system to track gender equality and public report allocation is essential for any

country committed to gender equality and to transform promises into real results. While both men and women showed that their country uses these kind of systems (Table 35) results showed that their perceptions of accessibility and reliability of these systems differ as shown in figure 12.

Figure 12. Comparison of the national collection of gender-disaggregated data (Q37) and the accessibility (Q36)

Q37: Do na...ated data?	Q36: Is there a...and accessible? Yes	Not sure	No	Total
Yes	23.9%	7.5%	4.5%	35.8%
Not sure	9.0%	37.3%	0.0%	46.3%
No	1.5%	0.0%	16.4%	17.9%
Total	34.3%	44.8%	20.9%	100.0%

When asked whether there are centralized systems available to hold and give access to gender-sensitive information at national and sub-national levels, men were more likely to say yes (n=12, expected n=9.3 and residual=2.7). However, many women responded not sure (n=20, expected n=13 and residual=7) suggesting less access to or awareness of these systems compared to men. (Table 36) A similar trend emerged from data collection practices. Though both men (n=10, expected n=9.3 and residual=0.7) and women (n=14, expected n=13 and residual=1) generally agreed that institutions do collect this kind of information, they are not sure how regularly this happens. (Table 37 and 38)

Gender climate change policies can take various forms with different focus points. The most popular approaches identified in the survey were supporting women in leadership roles (n=52) and implementing flexible working arrangements available to all employees (n=45). Respondents believe that these strategies would be effective when implemented through top-down gender diversity initiatives (n=43) and by being accountable in the organisation (n=39).

4.4.3 Opportunities in the implementation of gender and climate change in aviation sector

Survey respondents rated opportunities in implementation of gender and climate change in the aviation sector, analyzed per gender. Male respondents rated higher for the category technology transfer (men: M=3.44 and SD=1.19304, women: M=3.2222 and SD=1.45624), innovation and market development (men: M=3.28 and SD=1.33815, women: M=3.2222 and SD=1.43649). Both gender showed nearly identical ratings for capacity building (men: M=3.56 and SD=1.22746, women: M=3.5278 and SD=1.40379), and achievement of net zero by 2050 (men: M=2.96 and SD=1.30639, women: M= and

SD=1.47358). Female respondents rated higher on the other categories, with a largest difference for the category job creation (women: M=3.5278 and SD=1.3832, men: M=3.24 and SD=1.26754).

Table 39. Opportunities in implementation of gender and climate change in the aviation sector, analyzed per gender

What is your gender?		Job creation	Technology transfer	Innovation and market development	Capacity building	International collaboration	Achievement of net zero by 2050
Male	Mean	3.2400	3.4400	3.2800	3.5600	3.3600	2.9600
	N	25	25	25	25	25	25
	Std. Deviation	1.26754	1.19304	1.33915	1.22746	1.18603	1.30639
Female	Mean	3.5278	3.2222	3.2222	3.5278	3.4722	3.0000
	N	36	36	36	36	36	36
	Std. Deviation	1.38329	1.45624	1.43649	1.40379	1.42400	1.47358
Total	Mean	3.4098	3.3115	3.2459	3.5410	3.4262	2.9836
	N	61	61	61	61	61	61
	Std. Deviation	1.33388	1.34834	1.38631	1.32380	1.32236	1.39633

Levene's tests confirmed equal variances ($p > .12$ for all), validating the use of standard t-tests. While minor mean differences existed (e.g., job creation: -0.29; innovation: +0.06), none reached statistical significance (Table 40).

These results could not fully support hypothesis 4.

Chapter 5: Discussion and conclusion

5.1 Discussion

The African aviation industry stands at the crossroads, where gender disparities and climate problems come together in ways that require urgent attention. This study investigated gender equality and climate change in the aviation sector by examining the challenges and opportunities in Africa. The statistics offered a compelling vision of an industry struggling with deeply seated disparities while facing accelerating impacts of climate change, two issues more deeply intertwined than they first appear. The study engaged professionals from 23 African countries, nearly half of all nations on the continent, with 59% female and 41% male respondents. This distribution enabled gender-disaggregated analysis, though it should be noted that Kenya was overrepresented in the sample, which might have influenced some findings related to cultural norms and institutional structures.

5.1.1 Gender distribution in the aviation sector

The results showed a stark division of gender distribution in technical and management roles. Both genders viewed technical roles as male-dominated, though male respondents described these roles as "male-dominated" and female respondents selected "overwhelmingly male-dominated". Suggesting that women experience greater exclusion from technical fields. Similar patterns emerged in leadership positions, painting a picture of an industry where women face barriers at every level of career progression. These findings directly addressed the first (a) research question.

These perception gaps are revealing and can be linked to women's greater awareness of structural barriers to advancements (Van Wyk, 2021) and the "glass ceiling" effect women face (Sellers, 2016b) particularly in STEM advancement fields (Halleran, 2019), while men's relatively moderate assessment could indicate that they are less likely to notice these challenges, a privilege of invisibility that itself perpetuates inequality. Male respondents leaned more toward never having experienced barriers to entering or advancing in technical or leadership roles, whereas women's answers leaned more toward yes or not sure.

This can be linked to the access of mentors or role models who inspire employees to pursue leadership roles or technical roles in the aviation industry. Men answered mostly yes, while more than half of the women said they are not sure or don't have role models at their company. These findings align with the African-specific studies, noting that women face compounded barriers in a male-dominated society (Awiti, 2022).

The survey uncovered a web of three intertangled barriers that contribute to the underrepresentation of women in technical and operational roles, namely, societal barriers, education, and guidance answering the second (b) research question. First, the societal barriers were mentioned by 34 respondents. At the bottom lie deep-rooted societal barriers including the focus on boys' education, and

the belief that girls are not interested in more science-related topics, and their capabilities are often misunderstood. These results showed that the gap between men and women already exists at a young age and only grows later in life. Besides these challenges, cultural expectations that women are homemakers and are expected to nurture their families make it more difficult for them to try and change their priorities outside their private lives.

The educational system, mentioned by 30 respondents, emerged as the second critical bottleneck. The data showed that STEM fields are male dominated, making it more difficult for women to enter. Besides this, respondents believed that women are encouraged to take easier courses because of the misconception that they are not smart enough. Additionally, the limited access to good education, and especially training for more technical roles in aviation is expensive and limited making it difficult to participate in.

The last factor was guidance, mentioned by 19 respondents. Women remain unaware of potential STEM fields when they are not given enough information, making it more difficult to enter or know about its existence. If there was enough information respondents mentioned that there are not enough role models to look up to and show that it is possible to enter and succeed in these roles. This creates a vicious circle, the fewer women in technical aviation roles, the fewer examples to inspire the next generation.

These three factors are linked to the disparity of women in STEM that can be linked to the lack of role models and support systems for women in the industry (Seligson, 2024). Literature also mentioned the cultural barriers, and the results showed that there are 2 additional categories that influence the underrepresentation, namely the education and guidance of girls.

The data strongly supports hypothesis 1 revealing that women are not equally represented in the technical and leadership roles of a company. Their male counterparts expressed that they feel the same way about the distribution, but less drastically. This showed that there is a gap between their perceptions that makes it more difficult to change, as the industry is male-dominated.

Beyond validating the hypothesis, respondents proposed some possible solutions, such as promoting the STEM field more at schools, offering scholarships to make access to specific education easier, mentor programs, and role models for girls and women, and enforcing inclusive workplace policies that encourage gender diversity commitments.

5.1.2 Effects of climate change on the aviation sector

The survey revealed striking insights about climate change as a substantial risk factor for the operations and infrastructure of the aviation industry answering research question three (c). Flight delays was rated as the most disruptive effect and tarmac degradation in second place. A gendered analysis of these risks uncovered important patterns in threat perception. Male respondents reported higher results across operational risks, and female respondents reported higher results across infrastructure risks. But statistical analysis showed that drought perceptions only had statistically significant effects. This showed

the need for further research on the perceptions of men and women on the effects of climate on aviation operations and infrastructure.

Addressing the fourth (d) research question about economic implication of climate change, the study revealed significant economic impact of climate change on Africa's aviation workforce. Respondents rated all categories as significant, but the increased costs of operations and higher maintenance costs were the most probable climate-related impacts. Striking gender differences emerged in other economic consequences, but male respondents reported higher for job instability and less focus on training. Whereas female respondents reported higher working hours, potential losses for pilots and ground staff, and higher maintenance costs. There is further sampling needed to really prove and understand the main point

The results showed that men and women both perceived climate change as having a substantial influence on the aviation industry, but the main focus was different for both groups. There was a significant correlation between higher gender inequality and greater vulnerability to climate impacts. This can be linked to the literature that mentioned that climate change is experienced differently across different groups of the population (Vuciterna et al., 2024). Men were more likely to perceive operational risks as important, whereas women believed that the infrastructure risks were more severe. Showing that men had a more personal view on the effects of climate change which aligned with immediate job-related concerns. Women focused more on the bigger picture and end results. The literature mentioned that climate change disproportionately affects women (Perez et al., 2015b), showing why women are more likely to perceive the bigger results and not only their personal outcomes.

While hypothesis 2 proposed women would perceive climate change as more substantial than men, results instead revealed qualitatively different prioritizations of risks. This suggests that climate adaptation policies must address both immediate operational risks (male-dominated perspectives) and long-term infrastructure investments (female-voiced concerns) to ensure equitable resilience.

5.1.3 Gender-specific challenges

The survey results provided important insights into how gender equity influences climate change mitigation efforts, answering research question five (e). Respondents rated gender-balanced skill development as the most important influence, followed by equal career opportunities, encouraging innovation in climate change reduction solutions. All categories were above the midpoint, showing the importance of all. While female respondents showed stronger engagement with all categories than men. The T-test revealed no statistical significance between the genders, suggesting the need for a bigger sample to validate these preliminary findings and detect potential subtler effects.

The survey revealed that both men and women perceived significant challenges in the sector, answering research question six (f). Respondents rated unequal pay as the most significant challenge, followed by

economic barriers. All results varied around the midpoint, implying a recognition of the importance of all categories. Female respondents consistently assigned higher ratings to the categories than men, suggesting women are more affected by or attuned to these inequities. The only marked statistical difference appeared in perception for higher pay, but did not reach the conventional 0.05 threshold.

Gender influenced experiences of workplace treatment. When asked whether they had been treated differently because of their gender, men more frequently denied such experiences (leaning towards "no"), while women often answered Yes or expressed uncertainty ("not sure"). In contrast, both groups largely agreed that outright denial of promotion because of gender was uncommon.

These findings showed a paradox, women perceived system inequalities more vividly than men, even when concrete outcomes registered less gendered variations. Such a disconnect can be accounted for by implicit bias, wherein women perceived subtle discrimination or structural barriers that particularly affect them. The non-statistical significance of some measures could be a result of sample constraints or genuinely common problems in this masculine field, and therefore, additional mixed-methods research would be required to understand these nuances.

The survey results provided evidence supporting hypothesis 3, that women in the aviation sector reported higher on all challenges and barriers to progression due to climate change mitigation efforts than men, but there was no significant difference in the statistics. This trend aligned with existing literature documenting gender specific challenges for women, including empowerment (Vuciterna et al., 2024). A shift in traditional gender roles (Sellers, 2016b) and socio-cultural norms and structural barriers further intensified the impact of adapting to climate change (Awiti, 2022) but it remains a challenge as women do not have the opportunity to make decisions (Ribeiro & Chaúque, 2003).
Future research should combine quantitative data with interviews to uncover latent disparities.

5.1.4 Opportunities for gender-inclusive climate actions within the sector

The survey results answer the research question seven (g) by revealing both challenges and opportunities for gender inclusive policies in African aviation. Gender inclusive policies have certain challenges for implementation. Lack of training was the most significant challenge based on survey results, followed by inadequate institutional capacity. Men rated most categories higher than women.

Most companies have a legal framework in place to enforce and monitor equality and non-discrimination. Some companies are doing well with gender inclusive policies, but there is still some room for improvement. Only a few respondents mentioned that they know that employees are involved in gender inclusive policies and climate resilience, which showed some margin to grow and include them. More than half of the respondents mentioned that their company does not have a department that deals with

matters related to gender equality, showing that most companies want to implement these kinds of policies, but do not put in the practical effort or these efforts are not visible enough for their employees to use.

The survey revealed critical gaps in institutional capacity to address gender-climate challenges in African aviation. Most respondents answered that they did not know or knew that there is no centralised system where national and subnational data, including gender-sensitive data, are stored and accessible. And if they even collect gender-disaggregated data, which is needed to answer these issues and questions. Despite these systemic shortcomings, respondents identified actionable opportunities to advance gender-inclusive climate resilience, agreeing that gender and climate change implementation opportunities exist in all categories. Men mostly believed that technology transfers of information are the avenue for progress, while women mostly focused more on job creation initiatives. Notably both genders believed that these can be implemented to support women in leadership roles.

The survey showed that most climate target initiatives were known to very well known. While men rated higher for knowing all these targets, the biggest difference was for the target CORSIA. This awareness gap suggested a need for targeted training and knowledge-sharing programs to ensure women in aviation have equal access to climate-related information and decision-making opportunities. Showing that gender-inclusive policies improve the effectiveness of climate resilience efforts in aviation as asked in research question eight (h). Organizations can develop more comprehensive and equitable climate strategies by actively involving women in sustainability planning and leadership roles.

More than half of the respondents mentioned that their country has systems to track and make public allocations for gender equality, but not by much, showing there is still margin to grow on this aspect. However, tracking alone is insufficient, companies must also ensure these allocations directly support initiatives like mentorship programs, women's leadership in green aviation projects, and equitable access to emerging jobs. Most respondents were not sure or knew that their company does not adopt international standards or frameworks for gender-inclusive climate policies. More than half of the respondents answered that their company does not, or they did not know if they allocated a budget for gender equity initiatives in the context of climate resilience. This highlighted a critical gap between national gender policies and companies that take ownership by embedding gender equity into their climate strategies. To truly advance gender equity in aviation's climate resilience effort, the industry must move beyond policy compliance and actively empower women.

Respondents mentioned that these initiatives and policies can promote gender equality, but it is not supported enough at the moment to really have an impact. Some initiatives come from the national level but are not implemented in the company, and if they are implemented in the company, they were not supported by a department or the correct resources, making them miss their main goals of the issue. This implementation gap revealed a critical disconnect between policy design and practical execution,

where well-intended initiatives fail to translate into meaningful change. This also proved the literature standpoint that mentioned that regional support is needed to overcome the challenges and institutional weaknesses (Njoroge et al., 2020b), but that many governments do not fully embrace gender budgeting (Ampaire et al.,2019). The lack of proper funding and institutional commitments creates a cycle where gender equity goals are not yet achievable, despite the recognized importance.

Existing frameworks (e.g., the Beijing Declaration and the Platform for Action, CEDAW) offer a strong normative basis for climate action and gender equality, yet their potential remained largely untapped within the air transport sector due to the limitations highlighted above. Addressing gender diversity and inclusion can improve female aviation professionals' satisfaction and retention (Casebolt, 1990) and is associated with higher employee engagement and a more positive workplace culture (Corazza, 2024). These benefits demonstrated that gender-sensitive policies are not just concerned with organisational performance and resilience, but also with social justice, ultimately serving the industry as a whole. But these potential benefits are theoretical rather than real without mechanisms for implementation, a paradox in which the aviation industry recognises the value of gender equality but is not yet able to achieve it in practice.

While hypothesis 4 is theoretically supported by respondents' beliefs and the literature, empirical validation remains incomplete due to implementation gaps. Thus, the hypothesis is plausible but not yet fully proven in practice. Future research should examine cases where climate-gender initiatives have been successfully implemented, identifying the specific enabling factors that allowed these policies to overcome the typical implementation barriers.

5.2 Conclusion

This study provided important insights on gender disparities in the African Aviation industry as well as the relationship between gender equality and climate change resistance. The results showed that social standards, educational obstacles, and a lack of guidance are the main causes of women’s continued underrepresentation in technical and leadership positions. Although both men and women recognize gender inequality, women are more sensitive to these differences, drawing attention to systemic obstacles like the “glass ceiling” and unconscious prejudices in professional advancements.

The aviation sector faces serious operational and infrastructure hazards as a result of climate change, and risk perception varies by gender. Men tended to focus on immediate operational disruption, whereas women emphasized long-term infrastructure vulnerabilities, aligning with broader literature on how climate impacts disproportionately affect women. Although women expressed more worries about employment instability and workplace injustices, both genders acknowledge the economic effects of climate change.

Implementation of gender-inclusive policies and climate resilience measures is still uneven. They have the potential to advance fairness, although there is knowledge of gender and climate targets, progress is impeded by institutional deficiencies, including a lack of money, data tracking, and dedicated departments. Stronger accountability systems and focused interventions, such as mentorship programs, STEM advocacy, and gender-sensitive budgeting are required in light of the gap between legislative frameworks and actual implementation.

In conclusion, resolving structural obstacles and including gender viewpoint into climate adaption plans are necessary to achieve gender equality in African aviation. To confirm these early results, future studies should examine effective case studies of policy implementation and increase sample sizes. The aviation industry can improve social justice and organizational performance by promoting inclusive workplaces and equitable climate resilience strategies, which will ultimately support sustainable development throughout the continent.

5.3 Recommendations

The following recommendations were proposed based on the study's findings to promote gender equality and climate resilience in the African aviation sector.

- Addressing gender inequalities in aviation careers
    - Promote STEM education for girls by giving more information in schools to encourage girls to go into STEM fields, and governments and institutions should offer scholarships, mentorships, and awareness campaigns.
    - Increase female representation in technical and leadership roles by using targeted recruitment.
    - Mentorship and role model programs that pair young female professionals with experienced leaders for guidance and support.
- Improve workplace inclusion
    - Enforce equal pay and anti-discrimination policies by doing regular gender pay audits and changing policies based on the results.
    - Increase female participation in decision-making by including women in leadership and climate resilience planning committees.
- Strengthening climate resilience with a focus on gender
    - Integrate a gender perspective in climate adaptation plans.
    - Invest in infrastructure and training for climate resilience, ensuring women have equal access to training programs.
    - Improve data collection on gender-disaggregated impacts by establishing a centralized database tracking climate risks and workforce trends.
- Strengthen policies and institutions
    - Adopt and enforce international gender climate standards in the company policies.

- Create dedicated gender and sustainability departments/units focusing on gender equality and climate resilience.
- Enhance public-private partnerships for funding to secure funding for gender-inclusive climate initiatives

In conclusion, the African industry can promote a fairer workforce and increase climate change resilience by putting these suggestions into practice. Sustainable growth and equal opportunity for women in the sector will be ensured by a proactive strategy that combines institutional responsibility, regulatory reforms, and focused initiatives.

Future studies should track how well these policies are working and find the best way to expand efforts that work throughout the continent.

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Chapter 6: Appendices

6.1 Research questionnaire

6.1.1 Gender equality and climate change in the aviation industry

6.1.1.1 Introduction

Dear respondent,

My name is Amy Meier. I am a student in the Master of Management program specializing in Data Science at the University of Hasselt, Belgium.

As part of my master's degree requirement, I am conducting a survey to investigate the key challenges and opportunities related to gender equality and climate change in the aviation sector in Africa. Your valuable insights will contribute to a deeper understanding and will help inform strategies and policies in the sector that will promote gender equity and integrate gender considerations into climate resilience efforts.

Aviation continues to remain a male-dominated industry, particularly in technical and management areas. The purpose of this questionnaire is to examine the challenges and opportunities in Africa on how gender equality and climate change in the aviation industry can be achieved. The gender-disaggregated data collected from this questionnaire will guide policymakers in developing concrete and targeted actions/policies that will help address gender gaps and promote the participation of women in the aviation sector. The study will promote the achievement of sustainable development goals on climate change, gender equality (equal rights and support for all), equity (fair support based on individual needs), and women's empowerment.

Therefore, I need your kind support by filling this online questionnaire. Please note that your participation is voluntary, but your contribution will enrich my study. The information collected in this questionnaire will be kept anonymous and confidential and is meant for academic purposes only. The final study results will be available for sharing with the interested respondents.

I would appreciate receiving your feedback by 31st March 2025.

Thank You.

Kind regards.

Amy Meier

Email: amy.meier@student.uhasselt.be

6.1.1.2 Personal information

Q1 What is your gender?

- Male (1)
- Female (2)
- Prefer not to say (3)

Q2 What is your age?

- 18-25 (1)
- 26-35 (2)
- 36-45 (3)
- 46-55 (4)
- Above 55 (5)
- Prefer not to say (6)

Q3 Where are you from?

▼ Algeria (1) ... Zimbabwe (54)

Q4 What is your level of education?

- ○ Post-secondary education (1)
- ○ Bachelor's degree (2)
- ○ Master's degree (3)
- ○ Doctorate/PhD (4)
- ○ Prefer not to say (5)

Q5 What is your marital status?

- ○ Single (1)
- ○ Married (2)
- ○ Divorced (3)
- ○ Widowed (4)
- ○ Prefer not to say (5)

6.1.1.3 Family responsibility

Q6 Do you have children/dependents?

- ○ Yes (3)
- ○ No (4)
- ○ Prefer not to say (5)

Q7 Does having a family affect your travel behaviour and mobility patterns? If so, how?

_____

_____

_____

_____

_____

Q8 Do you think having children has influenced/would influence your views or concerns about climate change?

- Yes (1)
- Not sure (2)
- No (3)

Q9 Do you discuss climate change issues within your household?

- Yes (1)
- Not sure (2)
- No (3)

6.1.1.4 Work-related questions

Q10 What organisation do you work for?

_____

_____

_____

_____

_____

Q11 Which department or section do you work in? (e.g., Flight operations, maintenance, cabin crew, etc)

_____

_____

_____

_____

_____

Q12 Are flexible work options widely available at your organisation?

- Yes (1)
- No (2)

Q13 What is your job position in your department/organisation?

- ○ Entry level (1)
- ○ Mid-level (2)
- ○ Senior-level (3)
- ○ Top-level (4)
- ○ Prefer not to say (5)

Q14 Which best describes the gender composition in your workplace for the following roles? (Select the option that fits your observations)

	Mostly men (80%+) (1)	More men (60-79%) (2)	Balanced (50-60%) (3)	More women (60-79%) (4)	Mostly women (80%+) (5)
Technical (1)	○	○	○	○	○
Operational (2)	○	○	○	○	○
Management (3)	○	○	○	○	○
Support staff (4)	○	○	○	○	○

Q15 What key factors contribute to the underrepresentation of women in technical and operational roles in the aviation sector in Africa? (Please describe any barriers, challenges, or societal factors that you believe contribute to this issue)

_____

_____

_____

_____

_____

6.1.1.5 Gender and climate change in the aviation sector

Q16 How do you think climate change affects aviation operations and infrastructure in Africa? (Rate the level of influence on a scale of 1 to 5, where 1 = No influence and 5 = Strong influence)

	1 2 3 4 5
Flight delays	
Increased flight diversions	
Flight cancellations	
Increased frequency of droughts reducing fuel and water availability	
More frequent sandstorms and dust storms reducing visibility	
Damage to airport power grids and air traffic control systems due to extreme heat and storms	
Heat stress weakening airport tarmac and runways	

Q17 What are the economic implications of climate change for the aviation workforce, and how might these impact gender equity? (Rate the level of influence on a scale of 1 to 5, where 1 = No influence and 5 = Strong influence)

	1	2	3	4	5
Job instability					
Increased costs of operations					
Change in the working hours					
Potential job losses for pilots and ground staff					
Higher maintenance costs					
Less focus on training					

Q18 Are there societal pressures that discourage certain genders from pursuing careers in aviation?

- ○ Yes (1)
- ○ Not sure (2)
- ○ No (3)

Q19 Can you give any example(s) of these pressures? Please feel free to share one or more examples.

_____

_____

_____

_____

_____

Q20 Has climate change led to a reduction in training opportunities within your organisation?

- ○ Yes (1)
- ○ Not sure (2)
- ○ No (3)

Q21 Kindly rate how familiar you are with the following decarbonisation target towards net zero for the aviation sector:

	Not familiar (1)	Somewhat familiar (2)	Very familiar (3)
Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) (1)	○	○	○
Sustainable Aviation Fuels (SAF)/LCAF (2)	○	○	○
Aircraft Technologies (3)	○	○	○
Operational Efficiency (4)	○	○	○
Airport improvements (5)	○	○	○
CDO/CCO (6)	○	○	○

6.1.1.6 Gender-specific challenges in the aviation sector

Q22 How does gender equity influence climate change mitigation efforts and career progression for both men and women in the African aviation sector? (Rate the level of influence on a scale of 1 to 5, where 1 = No influence and 5 = Strong influence)

	1	2	3	4	5
Gender-diverse leadership improves climate policy decisions					
Gender-inclusive policies enhance workforce engagement in climate initiatives					
Equal career opportunities encourage innovation in climate reduction solutions					
More women in operational and management roles contribute to sustainable aviation practices					
Gender-balanced skill development programs enhance workforce readiness					

Q23 What challenges do men and women face in the aviation sector, particularly regarding societal norms, work conditions, and socio-economic outcomes? (Rate the level of influence on a scale of 1 to 5, where 1 = No influence and 5 = Strong influence)

	1	2	3	4	5
Gender stereotypes limit career opportunities					
Workplace discrimination and bias affect promotions and leadership roles					
Unequal pay between men and women					
Work-life balance struggles due to demanding schedules and travel requirements					
Lack of mentorship and networking opportunities					
Economic barriers					

Q24 Have you ever experienced barriers to entering or advancing in technical or leadership roles due to your gender?

- ○ Yes (1)
- ○ Not sure (2)
- ○ No (3)

Q25 Have you ever been treated as if you are not competent due to your gender?

- ○ Yes (1)
- ○ Not sure (2)
- ○ No (3)

Q26 Have you even been denied a promotion in favour of the opposite sex?

- ○ Yes (1)
- ○ Not sure (2)
- ○ No (3)

Q27 Please rate the following challenges on a scale from 1 to 5, where 1 = Not a challenge and 5 = Significant challenges:

	Challenges of implementation of gender and climate change in aviation sector in Africa				
	1	2	3	4	5

Financial constraints	
Limited technological capacity	
Inadequate institutional capacity	
Policy coordination issues	
Public awareness and engagement	
Lack of training in environmental and climate change matters	

6.1.1.7 Gender and climate change policies

Q28 Are there legal frameworks in place to enforce and monitor equality and non-discrimination based on gender?

- ○ Yes (1)
- ○ Not sure (2)
- ○ No (3)

Q29 Are gender-inclusive policies enforced in your workplace effectively?

- ○ Yes (1)
- ○ Not sure (2)
- ○ No (3)

Q30 Do you believe that gender-inclusive policies improve the effectiveness of climate resilience efforts in aviation?

- ○ Yes (1)
- ○ Not sure (2)
- ○ No (3)

Q31 Are employees involved in shaping gender-inclusive policies and climate resilience in your workplace?

- ○ Yes (1)
- ○ Not sure (2)
- ○ No (3)

Q32 Does your country/organisation have systems to track and make public allocations for gender equality and women empowerment?

- ○ Yes (1)
- ○ Not sure (2)
- ○ No (3)

Q33 Does your organisation have a department that deals with matters related to gender equality? (enforcing gender balance)

- ○ Yes (1)
- ○ Not sure (2)
- ○ No (3)

Q34 Does your organisation allocate a budget for gender equity initiatives in the context of climate resilience?

- Yes (1)
- Not sure (2)
- No (3)

Q35 Does your organisation adopt international standards or frameworks for gender-inclusive climate policies?

- Yes (1)
- Not sure (2)
- No (3)

Q36 Is there a centralised system where national and sub-national data, including gender-sensitive data, are stored and accessible?

- Yes (1)
- Not sure (2)
- No (3)

Q37 Do national and sub-national institutions regularly collect gender-disaggregated data?

- Yes (1)
- Not sure (2)
- No (3)

Q38 What strategies can organisations do to build a more inclusive culture for women?

- ☐ Drive gender diversity from the top (1)
- ☐ Support women in leadership roles (2)
- ☐ Make flexible working available to everyone (3)
- ☐ Be accountable (4)
- ☐ Other: (5) _____

Q39 Does your organisation provide access to mentors or role models who inspire you to pursue leadership or technical roles in aviation?

- ○ Yes (1)
- ○ Not sure (2)
- ○ No (3)

6.1.1.8 Opportunities for gender-inclusive climate actions within the sector

Q40 What opportunities exists to enhance gender-inclusive policies and practices for sustainable development in the industry?

_____

_____

_____

_____

_____

Q41 Please rate the following opportunities on a scale from 1 to 5, where 1 = Not an opportunity and 5 = significant opportunity:

	Opportunities in the implementation of gender and climate change in the aviation sector in Africa 1 2 3 4 5
Job creation	
Technology transfer	
Innovation and market development	
Capacity building	
International collaboration	
Achievement of net zero by 2050	

Q42 How can gender and climate resilience initiatives and policies promote gender equity in the aviation industry?

_____

_____

_____

_____

_____

6.1.1.9 Policy recommendations

Q43 Kindly state three policy recommendations to address the gender and climate in the aviation sector and rank them from 1 to 3 based on importance, with 1 being the most important:

_____

_____

_____

_____

_____

6.2 Tables

Table 2. Gender representation in technical roles, male respondents

	Observed N	Expected N	Residual
Mostly men (80%+)	7	7.0	.0
More men (60-79%)	17	7.0	10.0
Balanced (50-60%)	3	7.0	-4.0
Mostly women (80%+)	1	7.0	-6.0
Total	28		

Table 3. Gender representation in technical roles, female respondents

	Observed N	Expected N	Residual
Mostly men (80%+)	19	13.0	6.0
More men (60-79%)	17	13.0	4.0
Balanced (50-60%)	3	13.0	-10.0
Total	39		

Table 4. Gender representation in management roles, male respondents

	Observed N	Expected N	Residual
Mostly men (80%+)	7	7.0	.0
More men (60-79%)	11	7.0	4.0
Balanced (50-60%)	9	7.0	2.0
More women (60-79%)	1	7.0	-6.0
Total	28		

Table 5. Gender representation in management roles, female respondents

	Observed N	Expected N	Residual
Mostly men (80%+)	14	7.4	6.6
More men (60-79%)	8	7.4	.6
Balanced (50-60%)	10	7.4	2.6
More women (60-79%)	4	7.4	-3.4
Mostly women (80%+)	1	7.4	-6.4
Total	37		

Table 7. Strategies to build more inclusive culture for women

What is your gender?			Drive gender diversity from the top	Support women in leadership roles	Make flexible working available to everyone	Selected Choice Other:	Be accountable
Male	N	Valid	19	22	21	5	14
		Missing	9	6	7	23	14
Female	N	Valid	24	30	24	4	25
		Missing	16	10	16	36	15

Female respondents (n=24–30 valid responses) engaged more frequently with gender diversity initiatives than males (n=14–22).

Table 8. Provided access in organisation to mentors and role model that inspire for leadership or technical roles

What is your gender?		Observed N	Expected N	Residual
Male	Yes	14	8.7	5.3
	Not sure	8	8.7	-.7
	No	4	8.7	-4.7
	Total	26		
Female	Yes	16	12.7	3.3
	Not sure	9	12.7	-3.7
	No	13	12.7	.3
	Total	38		

What is your gender?		Does your organisation provide access to mentors or role models who inspire you to pursue leadership or technical roles in aviation?
Male	Chi-Square	5.846[b]
	df	2
	Asymp. Sig.	.054
Female	Chi-Square	1.947[d]
	df	2
	Asymp. Sig.	.378

Table 10. Gender comparison of perceived climate change effects on aviation operations and infrastructure

	What is your gender?	N	Mean	Std. Deviation	Std. Error Mean
Flight delays	Male	28	3.8929	1.10014	.20791
	Female	40	3.6000	1.21529	.19215
Increased flight diversions	Male	28	3.5000	1.17063	.22123
	Female	40	3.2250	1.14326	.18077
Flight cancellations	Male	28	3.1786	1.12393	.21240
	Female	40	3.2000	1.43581	.22702
Increased frequency of droughts reducing fuel and water availability	Male	28	3.5357	1.10494	.20881
	Female	40	2.9500	1.39505	.22058
More frequent sandstorms and dust storms reducing visibility	Male	28	3.1429	1.11270	.21028
	Female	40	2.9750	1.29075	.20408
Damage to airport power grids and air traffic control systems due to extreme heat and storms	Male	28	3.1071	1.25725	.23760
	Female	40	3.1750	1.39390	.22039
Heat stress weakening airport tarmac and runways	Male	28	3.2143	1.16610	.22037
	Female	40	3.3750	1.14774	.18147

Table 11. Independent t-test of the gender comparison of perceived climate change effects on aviation operations and infrastructure

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Increased flight diversions	Equal variances assumed	.604	.440	.967	66	.169	.337	.27500	.28448	-.29298	.84298
	Equal variances not assumed			.963	57.381	.170	.340	.27500	.28569	-.29700	.84700
Flight cancellations	Equal variances assumed	5.738	.019	-.066	66	.474	.948	-.02143	.32456	-.66943	.62657
	Equal variances not assumed			-.069	65.104	.473	.945	-.02143	.31089	-.64230	.59945
Increased frequency of droughts reducing fuel and water availability	Equal variances assumed	2.042	.158	1.851	66	.034	.069	.58571	.31646	-.04611	1.21754
	Equal variances not assumed			1.928	64.916	.029	.058	.58571	.30374	-.02091	1.19234
More frequent sandstorms and dust storms reducing visibility	Equal variances assumed	.240	.626	.558	66	.289	.579	.16786	.30087	-.43285	.76856
	Equal variances not assumed			.573	63.076	.284	.569	.16786	.29303	-.41771	.75342
Damage to airport power grids and air traffic control systems due to extreme heat and storms	Equal variances assumed	.187	.667	-.206	66	.419	.838	-.06786	.33010	-.72693	.59121
	Equal variances not assumed			-.209	61.785	.417	.835	-.06786	.32408	-.71573	.58001
Heat stress weakening airport tarmac and runways	Equal variances assumed	.000	.998	-.565	66	.287	.574	-.16071	.28467	-.72907	.40764
	Equal variances not assumed			-.563	57.674	.288	.576	-.16071	.28548	-.73223	.41080

Table 13. Gender comparison of perceived economic implications of climate change

	What is your gender?	N	Mean	Std. Deviation	Std. Error Mean
Job instability	Male	28	3.0357	1.10494	.20881
	Female	40	2.8750	1.11373	.17610
Increased costs of operations	Male	28	3.5714	.92009	.17388
	Female	40	3.5500	1.08486	.17153
Change in the working hours	Male	28	2.8214	.90487	.17100
	Female	40	3.0250	1.38652	.21923
Potential job losses for pilots and ground staff	Male	28	2.5714	.92009	.17388
	Female	40	2.8250	1.43021	.22614
Higher maintenance costs	Male	28	3.4286	1.06904	.20203
	Female	40	3.5750	1.29867	.20534
Less focus on training	Male	28	2.7143	1.11744	.21118
	Female	40	2.7750	1.54401	.24413

Table 14. Independent t-test of the gender comparison of perceived economic implications of climate change

										95% Confidence Interval of the Difference	
		F	Sig.	t	df	Significance One-Sided p	Significance Two-Sided p	Mean nce	Std. Error Difference	Lower	Upper
Job instability	Equal variances assumed	.056	.813	.588	66	.279	.559	.16071	.27354	-.38543	.70686
	Equal variances not assumed			.588	58.5	.279	.559	.16071	.27315	-.38595	.70738
Increased costs of operations	Equal variances assumed	1.201	.277	.085	66	.466	.932	.02143	.25150	-.48070	.52356
	Equal variances not assumed			.088	63.4	.465	.930	.02143	.24425	-.46659	.50945

Change in the working hours	Equal variances assumed	3.313	.073	-.681	66	.249	.498	-.2035	.29884	-.80023	.39309
	Equal variances not assumed			-.732	65.7	.233	.467	-.2035	.27803	-.75873	.35158
Potential job losses for pilots and ground staff	Equal variances assumed	6.103	.016	-.825	66	.206	.412	-.2535	.30727	-.86705	.35991
	Equal variances not assumed			-.889	65.6	.189	.377	-.2535	.28526	-.82317	.31603
Higher maintenance costs	Equal variances assumed	1.973	.165	-.491	66	.312	.625	-.1464	.29815	-.74170	.44885
	Equal variances not assumed			-.508	64.1	.306	.613	-.1464	.28806	-.72187	.42901
Less focus on training	Equal variances assumed	6.388	.014	-.178	66	.430	.859	-.0607	.34138	-.74231	.62088
	Equal variances not assumed			-.188	65.9	.426	.851	-.0607	.32279	-.70521	.58378

Table 16. Gender comparison of perceived gender specific challenges about climate change mitigation efforts and career progression

	What is your gender?	N	Mean	Std. Deviation	Std. Error Mean
Gender-diverse leadership improves climate policy decisions	Male	28	3.1786	1.24881	.23600
	Female	40	3.1500	1.16685	.18450
Gender-inclusive policies enhance workforce engagement in climate initiatives	Male	28	3.2143	1.31535	.24858
	Female	40	3.3750	1.19158	.18841
Equal career opportunities encourage innovation in climate reduction solutions	Male	28	3.3571	1.28277	.24242
	Female	40	3.5250	1.26060	.19932
More women in operational and management roles contribute to sustainable aviation practices	Male	28	3.1786	1.24881	.23600
	Female	40	3.3750	1.27475	.20156
Gender-balanced skill development programs enhance workforce readiness	Male	28	3.6429	1.31133	.24782
	Female	40	3.8000	1.18105	.18674

Table 17. Independent t-test of the gender comparison of perceived gender specific challenges about climate change mitigation efforts and career progression

		Levene's Test for Equality of Variances		t-test for Equality of Means					
						Significance		Mean Difference	Std. Error Difference
		F	Sig.	t	df	One-Sided p	Two-Sided p		
Gender-diverse leadership improves climate policy decisions	Equal variances assumed	.004	.948	.097	66	.462	.923	.02857	.29594
	Equal variances not assumed			.095	55.687	.462	.924	.02857	.29956
Gender-inclusive policies enhance workforce engagement in climate initiatives	Equal variances assumed	.322	.572	-.524	66	.301	.602	-.16071	.30645
	Equal variances not assumed			-.515	54.483	.304	.608	-.16071	.31191
Equal career opportunities encourage innovation in climate reduction solutions	Equal variances assumed	.031	.860	-.537	66	.297	.593	-.16786	.31286
	Equal variances not assumed			-.535	57.615	.297	.595	-.16786	.31384
More women in operational and management roles contribute to sustainable aviation practices	Equal variances assumed	.248	.620	-.631	66	.265	.530	-.19643	.31150
	Equal variances not assumed			-.633	59.015	.265	.529	-.19643	.31036
Gender-balanced skill development programs enhance workforce readiness	Equal variances assumed	.252	.617	-.516	66	.304	.608	-.15714	.30455
	Equal variances not assumed			-.506	54.257	.307	.615	-.15714	.31030

Table 19. Gender comparison of gender challenges faced in the aviation sector

	What is your gender?	N	Mean	Std. Deviation	Std. Error Mean
Gender stereotypes limit career opportunities	Male	28	3.3571	1.31133	.24782
	Female	40	3.6750	1.22762	.19410
Workplace discrimination and bias affect promotions and leadership roles	Male	28	3.3929	1.37003	.25891
	Female	40	3.6000	1.17233	.18536
Unequal pay between men and women	Male	28	2.3929	1.42307	.26894
	Female	40	3.0500	1.51826	.24006
Work-life balance struggles due to demanding schedules and travel requirements	Male	28	3.6071	1.39680	.26397
	Female	40	3.6000	1.25678	.19871
Lack of mentorship and networking opportunities	Male	28	3.3214	1.38921	.26254
	Female	40	3.4750	1.28078	.20251
Economic barriers	Male	28	3.6071	1.31485	.24848
	Female	40	3.7250	1.35850	.21480

Table 20. Independent t-test of gender comparison of gender challenges faced in the aviation sector

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Gender stereotypes limit career opportunities	Equal variances assumed	.241	.625	-1.02	66	.155	.311	-.3179	.31109	-.93897	.30326
	Equal variances not assumed			-1.01	55.76	.158	.317	-.3179	.31479	-.94851	.31279
Workplace discrimination and bias affect promotions and leadership roles	Equal variances assumed	1.000	.321	-.669	66	.253	.506	-.2071	.30972	-.82552	.41124
	Equal variances not assumed			-.651	52.27	.259	.518	-.2071	.31842	-.84603	.43175
Unequal pay between men and women	Equal variances assumed	.031	.861	-1.80	66	.038	.076	-.6571	.36469	-1.38527	.07099
	Equal variances not assumed			-1.82	60.55	.037	.073	-.6571	.36049	-1.37810	.06381
Work-life balance struggles due to demanding schedules and travel requirements	Equal variances assumed	.557	.458	.022	66	.491	.982	.00714	.32423	-.64021	.65449
	Equal variances not assumed			.022	54.22	.491	.983	.00714	.33041	-.65522	.66951
Lack of mentorship and networking opportunities	Equal variances assumed	.117	.733	-.470	66	.320	.640	-.1536	.32678	-.80601	.49887
	Equal variances not assumed			-.463	55.17	.323	.645	-.1536	.33156	-.81799	.51085
Economic barriers	Equal variances assumed	.145	.705	-.357	66	.361	.722	-.1179	.33038	-.77748	.54177
	Equal variances not assumed			-.359	59.45	.360	.721	-.1179	.32845	-.77499	.53927

Table 24. Gender comparison of knowledge of decarbonisation targets

	What is your gender?	N	Mean	Std. Deviation	Std. Error Mean
Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)	Male	28	2.64	.559	.106
	Female	40	2.23	.768	.121
Sustainable Aviation Fuels (SAF)/LCAF	Male	28	2.61	.567	.107
	Female	40	2.30	.687	.109
Aircraft Technologies	Male	28	2.43	.742	.140
	Female	40	2.15	.736	.116
Operational Efficiency	Male	28	2.43	.634	.120
	Female	40	2.30	.723	.114
Airport improvements	Male	28	2.57	.634	.120
	Female	40	2.43	.675	.107
CDO/CCO	Male	28	2.14	.891	.168
	Female	40	1.70	.791	.125

Table 25. Independent t-test of gender comparison of knowledge of carbonisation targets

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)	Equal variances assumed	4.410	.040	2.458	66	.008	.017	.418	.170	.079	.757
	Equal variances not assumed			2.598	65.871	.006	.012	.418	.161	.097	.739
Sustainable Aviation Fuels (SAF)/LCAF	Equal variances assumed	1.522	.222	1.946	66	.028	.056	.307	.158	-.008	.622
	Equal variances not assumed			2.013	64.122	.024	.048	.307	.153	.002	.612
Aircraft Technologies	Equal variances assumed	.372	.544	1.532	66	.065	.130	.279	.182	-.085	.642
	Equal variances not assumed			1.529	57.951	.066	.132	.279	.182	-.086	.643
Operational Efficiency	Equal variances assumed	.598	.442	.758	66	.226	.451	.129	.170	-.210	.467
	Equal variances not assumed			.776	62.615	.220	.441	.129	.166	-.202	.460
Airport improvements	Equal variances assumed	.545	.463	.902	66	.185	.370	.146	.162	-.178	.470
	Equal variances not assumed			.912	60.482	.183	.365	.146	.160	-.175	.467
CDO/CCO	Equal variances assumed	1.178	.282	2.157	66	.017	.035	.443	.205	.033	.853
	Equal variances not assumed			2.112	53.699	.020	.039	.443	.210	.022	.863

Table 27. Gender comparison of perception on challenges of gender and climate change in the aviation sector in Africa

	What is your gender?	N	Mean	Std. Deviation	Std. Error Mean
Financial constraints	Male	28	3.6071	1.31485	.24848
	Female	40	3.6000	1.27702	.20191
Limited technological capacity	Male	28	3.6429	1.19301	.22546
	Female	40	3.7250	1.08575	.17167
Inadequate institutional capacity	Male	28	3.8929	1.13331	.21418
	Female	40	3.6500	1.07537	.17003
Policy coordination issues	Male	28	3.5000	1.17063	.22123
	Female	40	3.3250	1.16327	.18393
Public awareness and engagement	Male	28	3.7857	1.16610	.22037
	Female	40	3.7000	1.26491	.20000
Lack of training in environmental and climate change matters	Male	28	3.8571	1.23871	.23409
	Female	40	3.7250	1.44980	.22923

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Financial constraints	Equal variances assumed	.043	.837	.022	66	.491	.982	.00714	.31851	-.62878	.64306
	Equal variances not assumed			.022	57.171	.491	.982	.00714	.32018	-.63396	.64824
Limited technological capacity	Equal variances assumed	.039	.845	-.295	66	.385	.769	-.08214	.27865	-.63848	.47419
	Equal variances not assumed			-.290	54.663	.387	.773	-.08214	.28338	-.65012	.48584
Inadequate institutional capacity	Equal variances assumed	.529	.469	.896	66	.187	.373	.24286	.27090	-.29802	.78374
	Equal variances not assumed			.888	56.281	.189	.378	.24286	.27346	-.30489	.79061
Policy coordination issues	Equal variances assumed	.088	.768	.609	66	.272	.545	.17500	.28738	-.39877	.74877
	Equal variances not assumed			.608	58.031	.273	.545	.17500	.28770	-.40089	.75089
Public awareness and engagement	Equal variances assumed	2.203	.143	.284	66	.389	.777	.08571	.30195	-.51716	.68859
	Equal variances not assumed			.288	61.099	.387	.774	.08571	.29760	-.50935	.68078
Lack of training in environmental and climate change matters	Equal variances assumed	2.889	.094	.392	66	.348	.696	.13214	.33693	-.54056	.80484
	Equal variances not assumed			.403	63.307	.344	.688	.13214	.32764	-.52253	.78682

Table 29. Availability of legal frameworks in place to enforce and monitor equality and non-discrimination based on gender

What is your gender?		Observed N	Expected N	Residual
Male	Yes	18	9.3	8.7
	Not sure	7	9.3	-2.3
	No	3	9.3	-6.3
	Total	28		
Female	Yes	23	13.3	9.7
	Not sure	9	13.3	-4.3
	No	8	13.3	-5.3
	Total	40		

Table 30. Effective enforcement of gender-inclusive policies in workplace

What is your gender?		Observed N	Expected N	Residual
Male	Yes	19	9.3	9.7
	Not sure	6	9.3	-3.3
	No	3	9.3	-6.3
	Total	28		
Female	Yes	19	13.3	5.7
	Not sure	12	13.3	-1.3
	No	9	13.3	-4.3
	Total	40		

What is your gender?		Are gender-inclusive policies enforced in your workplace effectively?
Male	Chi-Square	15.500[a]
	df	2
	Asymp. Sig.	<.001
Female	Chi-Square	3.950[b]
	df	2
	Asymp. Sig.	.139

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 9.3.

b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 13.3.

Table 31. Impact of gender-inclusive policies on climate resilienve efforts

What is your gender?		Observed N	Expected N	Residual
Male	Yes	20	9.3	10.7
	Not sure	5	9.3	-4.3
	No	3	9.3	-6.3
	Total	28		
Female	Yes	25	13.3	11.7
	Not sure	12	13.3	-1.3
	No	3	13.3	-10.3
	Total	40		

What is your gender?		Do you believe that gender-inclusive policies improve the effectiveness of climate resilience efforts in aviation?
Male	Chi-Square	18.500[a]
	df	2
	Asymp. Sig.	<.001
Female	Chi-Square	18.350[b]
	df	2
	Asymp. Sig.	<.001

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 9.3.

b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 13.3.

Table 32. Employee involvement in shaping gender-inclusive policies and climate resilience in workplace

What is your gender?		Observed N	Expected N	Residual
Male	Yes	16	9.3	6.7
	Not sure	7	9.3	-2.3
	No	5	9.3	-4.3
	Total	28		
Female	Yes	17	13.3	3.7
	Not sure	13	13.3	-.3
	No	10	13.3	-3.3
	Total	40		

What is your gender?		Are employees involved in shaping gender-inclusive policies and climate resilience in your workplace?
Male	Chi-Square	7.357[a]
	df	2
	Asymp. Sig.	.025
Female	Chi-Square	1.850[b]
	df	2
	Asymp. Sig.	.397

Table 33. Existence of systems to track and make public allocations for gender equality and women empowerment

What is your gender?		Observed N	Expected N	Residual
Male	Yes	14	9.3	4.7
	Not sure	9	9.3	-.3
	No	5	9.3	-4.3
	Total	28		
Female	Yes	22	13.3	8.7
	Not sure	11	13.3	-2.3
	No	7	13.3	-6.3
	Total	40		

What is your gender?		Does your country/organisation have systems to track and make public allocations for gender equality and women empowerment?
Male	Chi-Square	4.357[a]
	df	2
	Asymp. Sig.	.113
Female	Chi-Square	9.050[b]
	df	2
	Asymp. Sig.	.011

Table 34. Presence of department in the company that deals with gender equality matters

What is your gender?		Observed N	Expected N	Residual
Male	Yes	12	9.3	2.7
	Not sure	4	9.3	-5.3
	No	12	9.3	2.7
	Total	28		
Female	Yes	15	13.0	2.0
	Not sure	2	13.0	-11.0
	No	22	13.0	9.0
	Total	39		

What is your gender?		Does your organisation have a department that deals with matters related to gender equality? (enforcing gender balance)
Male	Chi-Square	4.571[a]
	df	2
	Asymp. Sig.	.102
Female	Chi-Square	15.846[c]
	df	2
	Asymp. Sig.	<.001

Table 35. Organisation allocates a budget for gender equity initiatives in the context of climate resilience

What is your gender?		Observed N	Expected N	Residual
Male	Yes	11	9.3	1.7
	Not sure	7	9.3	-2.3
	No	10	9.3	.7
	Total	28		
Female	Yes	5	13.0	-8.0
	Not sure	13	13.0	.0
	No	21	13.0	8.0
	Total	39		

What is your gender?		Does your organisation allocate a budget for gender equity initiatives in the context of climate resilience?
Male	Chi-Square	.929[a]
	df	2
	Asymp. Sig.	.629
Female	Chi-Square	9.846[c]
	df	2
	Asymp. Sig.	.007

Table 36. Organisation adopts international standards or frameworks for gender-inclusive climate policies

What is your gender?		Observed N	Expected N	Residual
Male	Yes	13	9.3	3.7
	Not sure	11	9.3	1.7
	No	4	9.3	-5.3
	Total	28		
Female	Yes	12	13.0	-1.0
	Not sure	19	13.0	6.0
	No	8	13.0	-5.0
	Total	39		

What is your gender?		Does your organisation adopt international standards or frameworks for gender-inclusive climate policies?
Male	Chi-Square	4.786[a]
	df	2
	Asymp. Sig.	.091
Female	Chi-Square	4.769[c]
	df	2
	Asymp. Sig.	.092

Table 37. Presence of centralised systems where national and sub-national data, including gender-sensitive data, is stored and accessible

What is your gender?		Observed N	Expected N	Residual
Male	Yes	12	9.3	2.7
	Not sure	10	9.3	.7
	No	6	9.3	-3.3
	Total	28		
Female	Yes	11	13.0	-2.0
	Not sure	20	13.0	7.0
	No	8	13.0	-5.0
	Total	39		

What is your gender?		Is there a centralised system where national and sub-national data, including gender-sensitive data, are stored and accessible?
Male	Chi-Square	2.000[a]
	df	2
	Asymp. Sig.	.368
Female	Chi-Square	6.000[c]
	df	2
	Asymp. Sig.	.050

Table 38. Collection of gender-disaggregated data by national and sub-national institutions

What is your gender?		Observed N	Expected N	Residual
Male	Yes	10	9.3	.7
	Not sure	13	9.3	3.7
	No	5	9.3	-4.3
	Total	28		
Female	Yes	14	13.0	1.0
	Not sure	18	13.0	5.0
	No	7	13.0	-6.0
	Total	39		

What is your gender?		Do national and sub-national institutions regularly collect gender-disaggregated data?
Male	Chi-Square	3.500[a]
	df	2
	Asymp. Sig.	.174
Female	Chi-Square	4.769[c]
	df	2
	Asymp. Sig.	.092

Table 40. Independent t-test of opportunities in implementation of gender and climate change in the aviation sector, analyzed per gender

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Job creation	Equal variances assumed	1.379	.245	-.827	59	.206	.412	-.28778	.34819	-.98449	.40894
	Equal variances not assumed			-.840	54.536	.202	.405	-.28778	.34266	-.97462	.39907
Technology transfer	Equal variances assumed	2.456	.122	.617	59	.270	.539	.21778	.35286	-.48828	.92384
	Equal variances not assumed			.640	57.296	.262	.525	.21778	.34035	-.46369	.89925
Innovation and market development	Equal variances assumed	.680	.413	.159	59	.437	.874	.05778	.36388	-.67035	.78590
	Equal variances not assumed			.161	54.025	.436	.873	.05778	.35924	-.66245	.77800
Capacity building	Equal variances assumed	1.509	.224	.093	59	.463	.926	.03222	.34752	-.66317	.72762
	Equal variances not assumed			.095	55.820	.462	.925	.03222	.33913	-.64718	.71162
International collaboration	Equal variances assumed	3.724	.058	-.324	59	.374	.747	-.11222	.34686	-.80629	.58185
	Equal variances not assumed			-.334	56.961	.370	.739	-.11222	.33555	-.78416	.55972
Achievement of net zero by 2050	Equal variances assumed	1.896	.174	-.109	59	.457	.913	-.04000	.36655	-.77347	.69347
	Equal variances not assumed			-.112	55.459	.456	.912	-.04000	.35859	-.75849	.67849