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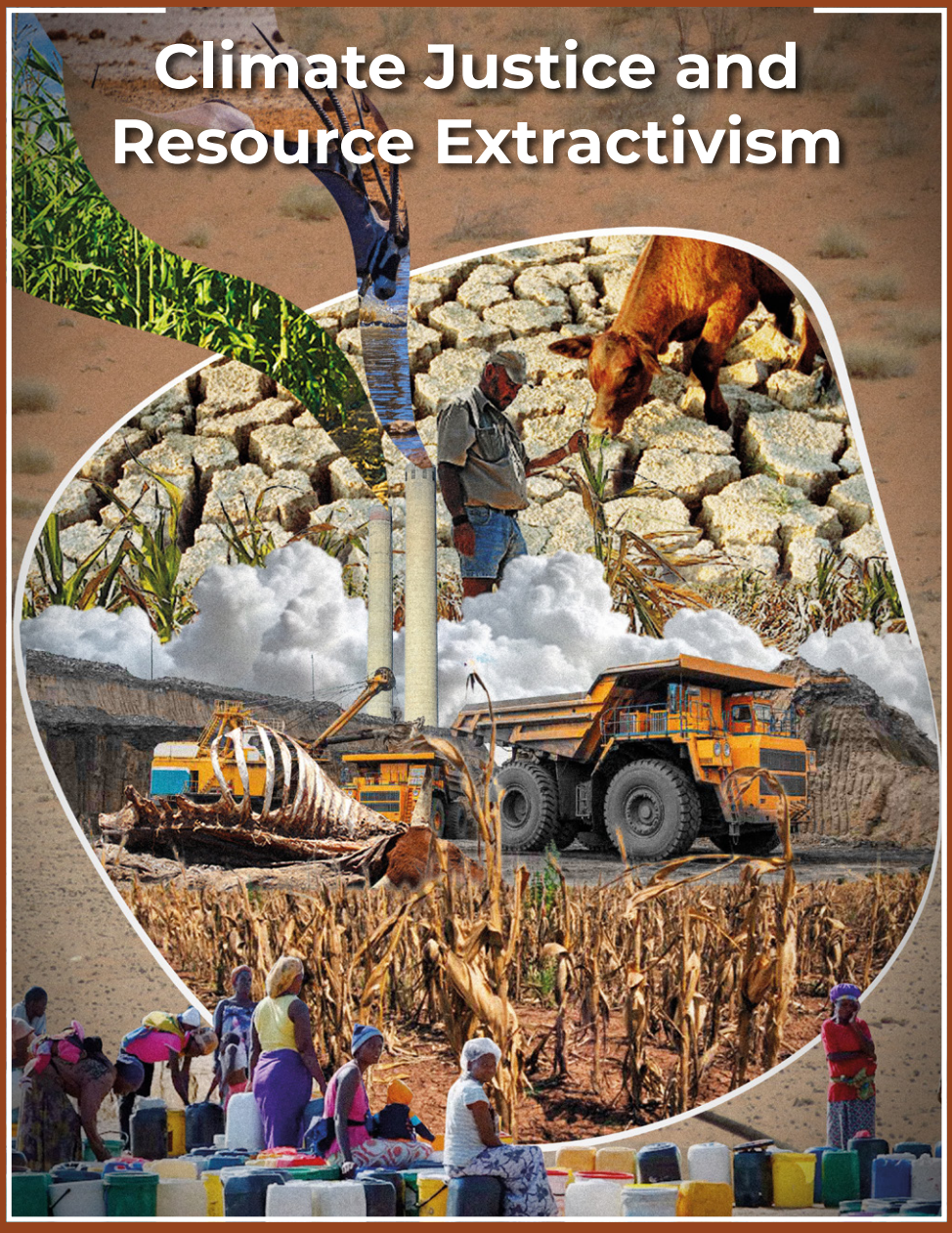

"Rains are no longer there": Examining Namibia's Climate Vulnerability through the Lens of Climate Justice

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Abstract:

This article examines Namibia's climate vulnerability through the lens of climate justice theory to highlight the entanglement of climate impacts with justice concerns. The article specifically focuses on droughts, illustrating Namibia's lived realities and experiences of climate vulnerability. The article is based on a desktop review and synthesis of secondary literature on climate change and climate vulnerability in Namibia, drawing on both global and local literature, including global databases, government reports, academic publications, and grey literature. The data were analysed using thematic analysis, which was instrumental in identifying the key themes on climate vulnerability and justice specific to Namibia. The findings indicate that despite contributing only minimally to global greenhouse gas emissions, Namibia is highly vulnerable to climate change impacts. Namibia's vulnerability results from the country's high exposure to climatic variations, the sensitivity of its populations, the country's socioeconomic and developmental context, and its

Ondjeombaranga, Erongo, Namibia- Droughts destroys grazing.
Source: Royal Mabakeng 2024.

limited adaptive capacity. As Namibia grapples with climate change, some population groups, particularly rural populations, subsistence farmers, marginalised communities, and women, face disproportionate vulnerabilities. At the global level too, the impacts of climate change are differentiated, uneven and disproportionate. The varying degrees of countries' exposure, sensitivity, and adaptive capacity contribute to these disparities. This underscores the need to centralise climate justice in climate change discourse and practice. The rationale is to advocate for a more transformative, just and equitable climate response that is appropriate to the Namibian context.

Keywords: climate change, climate justice, vulnerabilities, climate response, Namibia

Introduction

Namibia is characterised by an arid and semi-arid climate, which is intensified by climate change. Despite its minimal contribution to global greenhouse gas (GHG) emissions, Namibia faces multifaceted climate vulnerabilities. This article examines Namibia's climate vulnerability through the lens of climate justice theory to show how climate impacts are intertwined with issues of justice. The article specifically focuses on droughts, one of the manifestations of climate change to which Namibia is highly susceptible, to illustrate the lived realities and experiences of climate vulnerability on the part of Namibia's people. It addresses the disproportionate vulnerabilities faced by different population groups in Namibia, including rural populations, subsistence farmers and marginalised communities, and highlights gendered and intersectional vulnerabilities.

The key themes covered in the article include Namibia's projected climate risks and the global emission context; Namibia's exposure and sensitivity to climate change; the linkages between climate change and the country's already adverse socioeconomic and development conditions; Namibia's adaptive capacity to climate change; and the institutional and legal framework for climate change. The findings section concludes by threading out the social justice issues focusing on selected dimensions of climate change, namely global inequalities in the distribution of risks; the gendered and intersectional disproportionate vulnerabilities; climate finance; and adaptation, mitigation and the right to development. With the gendered analysis, in particular, the article shows that climate justice is inseparable from gender justice, highlighting the gender-specific barriers that hinder women in particular from coping with and adapting to climate change (Terry, 2009). On the right to development,

specifically, the article critiques the pathways to zero carbon emissions, questioning what this trajectory means for countries like Namibia that are still in the process of pursuing development. With these themes, the article aims to demonstrate that climate change is fundamentally a justice concern.

Theoretical Framework

The article examines Namibia's climate vulnerability through the lens of climate justice. Climate vulnerability refers to the degree to which a system, population, human society or region, in this case, Namibia, is susceptible to climate change and is unable to cope with its adverse impacts (Intergovernmental Panel on Climate Change [IPCC], 2001) as cited in Brooks (2003). The University of Notre Dame Global Adaptation Initiative (ND-GAIN) further defines vulnerability as the propensity or predisposition of human societies to be negatively impacted by climate hazards (Chen et al., 2023). Climate vulnerability encompasses three dimensions: exposure, sensitivity, and adaptive capacity. Exposure represents the extent to which a system, population or human society, or region and its supporting sectors, are exposed to and/or stressed by climatic variations and changing climate conditions (Brooks, 2003; Chen et al., 2023). Sensitivity is the degree to which a system, population, or human society, and a region, are affected by climatic stresses, such as the high dependency on climate-sensitive sectors like agriculture in Namibia. Adaptive capacity, on the other hand, reflects the ability of a system, population, human society or region and its supporting sectors to adjust to or cope with climate change and its consequences, involving the technological, economic, and social resources that enable an effective response to climate impacts and conditions (Brooks, 2003; Chen et al., 2023). Expressed as a formula by Hipondoka and Hamunyela (2024):

Climate Vulnerability = Exposure + Sensitivity – Adaptive Capacity

The article uses the conceptual framework of vulnerability to illustrate Namibia's exposure, sensitivity, and adaptive capacity to climate change. In addition to the conceptual framework of vulnerability, the article adopts climate justice theory, which is a political discourse surrounding climate change policy and practice that provides an understanding of the relationship between climate change and the conceptions of justice and fairness (Schlosberg, 2012). Porter et al. (2020 p. 293) define climate justice as "a framework that brings into view the intersection between climate change and the ways social inequalities are experienced as structural violence". It is widely recognised that climate change impacts countries and populations

unevenly and disproportionately, which underscores the need to address the resultant injustices in fair and equitable ways (Sultana, 2022). Schlosberg (2012) has argued that climate justice takes into its central frame the crucial element of justice theory, namely the identification of social and political misrecognition as the key underlying condition of the maldistribution of climate risks. In critical social theory, recognition is viewed as a remedy to injustice, with the type of recognition required in each context depending on the specific forms of misrecognition that need to be addressed (Fraser, 2003). Fraser's formulation refers to misrecognition resulting from either excessive ascribed or constructed distinctiveness or, in other cases, underacknowledged distinctiveness. The article relates this to the underacknowledged distinctiveness of climate vulnerability for countries like Namibia and its particular vulnerable population groups, and the misrecognition therein. This kind of approach aims to bring the "social and political recognition of specific and local vulnerabilities and the effects of climate change on the basic needs of human beings in various places and under different conditions" (Schlosberg, 2012, p. 446). Climate justice further involves the analysis of who is marginalised by climate change and who is excluded in climate change response processes, including the adaptation and mitigation measures pursued (Sultana, 2022)—again, highlighting the distinctiveness in vulnerability and response. With a focus on adaptation too, this formulation of climate justice departs from approaches that solely focus on discourses around prevention or mitigation, or the distribution of the costs of adaptation to climate change (Schlosberg, 2012). Holistic climate justice also focuses on who benefits, who loses out, and in what ways and why they do so (Sultana, 2022, p. 119). By so doing, a climate justice framework helps to identify and explain the relationships at different scales that co-create and maintain vulnerabilities and injustice.

Methodology

This article is based on a synthesis and review of secondary literature on climate change, climate vulnerability, and climate justice. The sources included a mix of national, regional and global scholarly literature, databases and indices; the Namibian government's reports to the United Nations Framework Convention on Climate Change (UNFCCC) and position papers submitted to the UNFCCC Conference of Parties (COP); and other relevant publications. A thematic analysis method was used to identify and analyse the different themes emerging from the literature, employing a structured matrix framework. The matrix framework

consisted of five columns: a 'List of Literature' column, and the themes of 'Exposure', 'Sensitivity', and 'Adaptive Capacity' (displayed horizontally), and 'Climate Justice' analysed across all three themes (displayed vertically).

The first step in the process was to identify and collect literature on climate change, climate vulnerability and climate justice. Each identified source became an entry in the List of Literature column. From each source, the process of identifying passages that speak to Exposure, Sensitivity and Adaptive Capacity followed. After that, the process involved threading out what these themes reveal about justice concerns both within the literature and conceptually, including questions of global inequalities in the distribution of climate vulnerabilities; the gendered and intersectional disproportionate vulnerabilities; climate finance; and adaptation, mitigation and the right to development. The themes identified are Namibia's projected climate risks and the global emission context; Namibia's exposure and sensitivity to climate change; the linkages between climate change and the country's pre-existing adverse socioeconomic and developmental challenges; and Namibia's adaptive capacity to climate change, the institutional and legal framework for climate change, and social justice issues. From the review of various climatic stresses affecting Namibia, drought was referred to consistently and was therefore used in the article to elucidate Namibia's lived realities and experiences of vulnerabilities.

Findings

Namibia's projected climate risks and global emissions context

Namibia experiences high temperatures, with average annual temperatures ranging between 14.3°C and 24.2°C (World Bank, 2021). Temperature trends show that since the 1960s, Namibia has experienced increases in mean, maximum, and minimum temperatures, with overall warming in the country exceeding the global average. Since the Paris Agreement was adopted in 2015 and came into force in 2016, world leaders have emphasised the need to limit global warming to 1.5°C by the end of this century (United Nations, 2015). This legally binding international treaty aims to keep the global average temperature increase below 2°C above pre-industrial levels, with efforts being focused on limiting the rise to 1.5°C (United Nations, 2015). Staying within the 1.5°C threshold is crucial, as exceeding it could lead to much more severe climate change impacts. For countries like Namibia, projections indicate that if global temperatures rise by 1.5°C or 2°C, the country

will experience further increases in maximum temperatures, while annual precipitation will decrease (Thomson, 2021). The current projection trajectory indicates that Namibia will continue to experience high temperatures and increasing aridity. Projections suggest that Namibia will become hotter and drier, with increased variability in rainfall. For example, precipitation rates are expected to decrease by up to 19% by the 2080s (World Bank, 2021). Extreme climate-related events and hazards such as droughts and floods are expected to become more prevalent and intense in the coming years (for example, see Global Facility for Disaster Reduction and Recovery (2020)). These thus characterise the country as a climate risk.

According to the Global Climate Risk Index, which assesses the relative and absolute impacts of extreme weather events based on fatalities and economic losses, Namibia ranks 113 out of 180 countries, with an index score of 98.17 for 2019, placing it among the countries most vulnerable to extreme weather events (Eckstein et al., 2021). Another important measure to assesses countries' vulnerability to climate disruptions and their readiness to leverage private and public investments for adaptation actions is the University of Notre Dame Global Adaptation Initiative (ND-GAIN) (Chen et al., 2023). This index assesses countries' exposure, sensitivity, and ability to adapt to the negative impacts of climate change, focusing on food, water, health, the ecosystem, human habitat, and infrastructure. ND-GAIN also includes the Readiness Index, which measures countries' ability to leverage investments and convert them to adaptation actions using three components, namely economic, governance and social readiness. According to ND-GAIN, Namibia has vulnerability and readiness indices of 0.464 and 0.380, respectively (Chen et al., 2023), suggesting that the country faces significant risks and has a moderate capacity to adapt, while facing considerable challenges in governance, economic capacity, and social systems that hinder its ability to respond effectively to climate change. With climate change impacts on the sectors important for the economy, it is estimated that the country's GDP could decrease by 6.5% (World Bank, 2021).

While Namibia is one of the world's most vulnerable countries, its contribution to global GHG emissions is minimal, standing at only 0.00026% (Ministry of Environment, Forestry and Tourism [MEFT], 2023). This positions the country as one of the world's lowest emitters; in fact, it is a net carbon sink, meaning that the country absorbs more GHGs than it emits (Republic of Namibia, 2020; Sherbourne, 2022).

Namibia is among the bottom 100 countries in the world. The bottom 100 countries only contribute 2.9% of the global GHG emissions. In contrast, the top three emitters globally are China, the United States of America, India, contributing 42.6% of the total emissions (Friedrich et al., 2023). Others in the top ten are European Union, Russia, Japan, Brazil, Indonesia, Iran, and Canada, in that order. Comparing countries' responsibilities for climate change based solely on their respective emissions is just one approach. For a more nuanced understanding, it is also important to consider climate equity, particularly in relation to population differences and their contributions to total emissions. From this perspective, examining emissions relative to population size, or per capita emissions, is considered to provide another useful perspective. In that light, the United States, Russia and South Korea have the highest emissions per capital at 17.6 tonnes of carbon dioxide equivalent (tC02e) per person, 13.3 tC02e per person and 12.6 tC02e per person, respectively (Vigna & Friedrich, 2023). While India ranks among the top three emitters its per capita emissions is only 2.5 tC02e per person. On per capita basis, Namibia emits 5.2 tonnes of CO2 equivalents (tCO2e) per person annually, ranking 82nd out of 191 countries (Boyle, 2024). From the foregoing, it is evident that Namibia is highly vulnerable to climate change, with bleak projections for the future, despite being one of the countries least responsible for global GHG emissions.

Namibia's exposure and sensitivity to climate change

Namibia has high levels of exposure and sensitivity to climate change. With 92% of its land classified as very arid, arid, or semi-arid, the country ranks as the second-most-arid country/region in the world, following the Sahara Desert (Mapani et al., 2023; Bailey et al., 2021; World Bank, 2021). Namibia generally experiences a hot and dry climate. The average annual temperatures range from 14.3°C to 24.2°C, with the coastal areas having cooler temperatures, while the northern regions can exceed 22°C (World Bank, 2021). The annual rainfall averages a mere 278 mm, with variations between different areas in the country ranging from 650 mm in the northeast to less than 50 mm in the southwest and along the coast (Spear et al., 2018; World Bank, 2021). The country is exposed to significant climatic variability, where frequent and severe droughts have become a salient characteristic of the new normal and the defining feature projected for the future. Over the past three decades, the country has experienced severe drought events, with three recorded in the 1990s, two in the 2000s, and three in the 2010s (Liu & Zhou, 2021;

Thomson, 2021). The 2018/19 drought was regarded as the worst in 90 years (Nakanyete et al., 2020). The most recent drought was declared in 2024. Its impacts are unprecedented, especially on the country's food security, so much so that the government has decided to cull more than 700 wild animals to support the drought relief programme (Republic of Namibia, 2024).

Every successive drought lays bare Namibia's sensitivity to climate change. The face of drought sensitivity is often represented by the climate-sensitive sectors that a country depends on. For Namibia, the face of drought sensitivity is farming, and it is particularly so for rainfed agriculture. Approximately 70% of Namibia's population rely directly or indirectly on farming and agriculture for their livelihoods (Republic of Namibia, 2023b). These sectors employ about one-third of the Namibian workforce, making them crucial actors for the country's Gross National Product (GDP). Focussing on the 2018/19 drought and the latest 2024 drought elucidates Namibia's sensitivity. During the 2018/19 drought year, the cumulative seasonal rainfall volumes were 60 to 70 percent below average rainfall (Food and Agriculture Organization [FAO], 2019). These extreme rainfall deficits led to agricultural production reaching its lowest point in 2019, resulting in the need for emergency food relief which cost the government about N$ 131 million in addition to N$ 129 million mobilized as donations from development partners ("Govt spends N$131m on drought relief", 2019). In the 2000s, for example, the 2003/2004 drought was estimated to have cost the government N$275 million for the provision of emergency relief (Reid et al., 2007).

Rangeland conditions were severely affected, resulting in significant livestock deaths. It was estimated that over 60 000 livestock perished in the drought year of 2019 (FAO, 2019). Similarly, there were alarmingly low yields of crop production. Namibia's primary staple crops are maize and pearl millet, which saw decreases of 26% and 89%, respectively, during the 2018/19 drought year. For the 2024 drought, the Namibia Meteorological Services reported that rainfall for the entire 2024 season was below normal rainfall. Specifically, certain regions, including //Karas, Hardap, western Erongo, and western Kunene, received less than 25 mm of rain, while other normally wetter regions like Zambezi only saw around 125 mm in January, a period typically expected to be the peak of the rainy season (Namibia Economist, 2024; Xinhua, 2024). The onset of the 2023/2024 rainfall season showed some hopeful prospects. However, as the season progressed, dry spells with high temperatures were experienced,

affecting crop development and thereby causing total crop wilting (Ministry of Agriculture, Water and Land Reform [MAWLR], 2024). As a result, the crop-growing regions experienced poor to no harvests. Nationally, the aggregate cereal production (maize, millet, sorghum, and wheat) was 53% lower than it had been in the previous season (MAWLR, 2024).

One of the key indicators of drought's severe impact on crop failures, and thus livelihoods, is the state of food security in the country. The national Crop Prospects, Food Security and Drought Situation Report (MAWLR, 2024) revealed that household food security has generally weakened in many parts of the country, since agricultural production for 2022/2023 had also been reduced. By the 2023/2024 season, many households had depleted their previous season's food stock, and the majority are now dependent on the market and drought relief. The Integrated Food Security Phase Classification Situation Report (Integrated Food Security Phase Classification, 2024) revealed that in the first half of 2024, 1.2 million people were experiencing acute food insecurity and urgently needed assistance to reduce food shortages and protect their livelihoods. It was projected that this situation would worsen in the second half of 2024, with 1.4 million people, almost 50% of the Namibian population, expected to experience high levels of acute food insecurity. Among those most affected by acute food insecurity are the vulnerable groups, including marginalised communities, children under the age of five, pregnant and breastfeeding women, pensioners, the unemployed, and those without national documents for them to benefit from social safety nets. Acute food insecurity is defined as "any manifestation of food insecurity found in a specified area at a specific point in time of a severity that threatens lives, livelihoods, or both, regardless of the causes, context, or duration" (Integrated Food Security Phase Classification, 2024, p. 9). Acute food insecurity classification indicates a crisis level of food insecurity, where urgent humanitarian assistance is required to address acute malnutrition and prevent further deterioration of food security. The already existing economic decline, poverty, inequalities, unemployment, and price shocks have led to a deterioration in food security, with climate change-induced droughts exacerbating the situation.

In addition to agriculture and the state of food security, a country's sensitivity to climate change or drought is also reflected in its water supply. As a result of the 2024 drought, many areas in Namibia are facing serious water shortages due to insufficient water inflow into dams and reservoirs. In addition, underground

water aquifers have not been sufficiently recharged (Petersen, 2024). For example, in the central regions of the country, water levels in dams and boreholes are in a precarious state. It is documented elsewhere that even without significant climate change, Namibia is predicted to face water scarcity – generally, the country is water-deficient (Republic of Namibia, 2011, 2021), with climate change expected to exacerbate the situation.

The high exposure and sensitivity of Namibia to climate events, particularly droughts, are evident in the frequency with which the President has declared a state of emergency, as he or she is empowered to do by Article 26 of the Namibian Constitution when a situation threatens the lives of the nation (Namibian Constitution, 1990). The President has declared a state of emergency four times over the last decade in response to severe drought conditions (2013, 2016, 2019 and 2024) (Matthys, 2024).

Linkages between climate change and adverse socioeconomic conditions

Namibia's sensitivity to climate change is caused not only by its reliance on climate-sensitive sectors, but also by the broader socioeconomic and developmental context of the country, which faces high levels of unemployment (33.40%) (Namibia Statistics Agency, 2019), poverty (17.2%), and inequality (GINI index: 57.2) (Namibia Statistics Agency, 2018). Additionally, 43% of the population is multidimensionally poor, and many livelihoods are vulnerable. There are also significant numbers of female-headed households (46%) and child-headed households, both of which are more likely to experience multidimensional poverty (Namibia Statistics Agency, 2021). Female- and child-headed households, the unemployed, and the poor are more likely to bear the brunt of the impacts of climate change due to several factors, including high dependency on climate-sensitive sectors, and limited economic resources and general adaptive capacity to cope with climate change. As Porter et al. (2020) argue, the distribution of effects and impacts of climate change are burdening those who are already disadvantaged. On a more macro level, frequent and severe droughts force the country to divert resources originally intended to address the developmental challenges the country is facing towards emergency drought relief. It is reported that Namibia needs about 1.3 billion to fully implement the 2024 drought relief programme ("Drought to cost Govt over N$1 billion", 2024a). In contrast, in 2019, the government spent 131 million on the drought relief programme ("Govt spends N$131m on drought relief", 2019)). This significant increase can be

attributed to the population's inability to recover from previous droughts, thus highlighting the compounding effects of consecutive climate events and the escalating costs of emergency relief. Generally, the consecutive droughts over the past decade have prevented Namibia's population from recovering and rebuilding, thereby leading to a cycle of dependency on drought relief. We argue that this is a chronic vulnerability, and that it is evident in the continued supply of drought relief over the years. It is as if the country is on a "life drip", in a state of perpetual emergency, which is indicative of the reality of climate exposure and sensitivity in Namibia. The resource demands and diversion towards drought relief programmes impede focus on long-term development goals. Thus, frequent and severe droughts not only raise immediate humanitarian needs (an additional strain) but also strain the Namibian economy and disrupt planned development initiatives. The country thus faces a triple challenge: managing immediate climate impacts; addressing economic consequences; and striving for long-term development. This is the multifaceted nature of Namibia's sensitivity to climate change.

Namibia's adaptive capacity

Climate stresses, in Namibia's case droughts, increase dependency on international aid. During drought events, the government appeals to development partners and international development organisations for assistance to mitigate the drought impacts and support the affected communities. With the latest declaration of a state of emergency, of the N$1.3 billion needed for drought relief to mitigate hunger and food scarcity across all fourteen regions of the country, the government has only made N$820 million available through the National Emergency Disaster Fund. This leaves a deficit of N$482 million, for which the country has requested development partners for support ("Drought to cost Govt over N$1 billion", 2024). Dependency on international aid to mitigate the impacts of droughts and climate change broadly speaks to the third element of vulnerability (the other two being exposure and sensitivity) – namely adaptive capacity: how effectively Namibia can adapt to and cope with climate change.

According to the IPCC, adaptation to climate change occurs within a dynamic context of social, economic, financial, technological, biophysical, and political factors that vary over time, location, and sector, thus influencing countries' capacity to adapt to the respective changes they experience. Existing literature identifies the primary determinants of countries' adaptive capacity as economic wealth, technological advancement,

availability of information, knowledge and skills, infrastructure, institutional frameworks, and equity (IPCC, 2001). The economic condition of countries and social/population groups within countries plays a crucial role in determining adaptive capacity. Compared to poorer nations, wealthy nations are better equipped to respond to and manage the risks of climate change and to bear the costs of adaptation. For example, when a flood or any climate hazard occurs in any of the wealthy nations, they do not rely on international aid to respond to and cope with the disaster. However, the situation is different for developing nations. This serves as a rough indicator of the differentiated abilities to cope with climate-related events. It is therefore crucial not only to highlight the inequalities in the distribution of risks arising from climate change (that is, highlighting vulnerabilities), but also to emphasise the social positioning of these risks, including the different levels of capacities and abilities to respond to such risks.

It has been well documented that while there are differentiations, many communities in Namibia have limited adaptive capacity due to factors such as marginalisation, underdevelopment, poverty, inequality, ineffective policies, and rapid population growth (Republic of Namibia, 2020). The Fourth National Communication to the United Nations Framework Convention on Climate Change measured adaptive capacity at the constituency level using an adaptive capacity index. This index was conceptualised using multiple deprivations, defined as "a measure of the level of unmet needs in terms of material, education, employment, health, housing, and services in each constituency" (Republic of Namibia, 2020, p. 8). A higher adaptive capacity index value indicates greater deprivation, which implies lower adaptive capacity. Conversely, a lower adaptive capacity index value indicates less deprivation, thus signifying higher adaptive capacity (ibid.). The assessment identified health deprivation, material deprivation, and service deprivation as the key drivers of diminished adaptive capacity in Namibia. Areas in northern Namibia were found to have very low adaptive capacity due to higher levels of these deprivations. This is a reflection that vulnerability is differentiated and is determined by the prevailing context.

In its position paper to COP 28, Namibia highlighted that countries' adaptive capacities to climate change "vary in terms of recovery from the losses and damages associated with the impacts of climate change" (Republic of Namibia, 2023a, p. 2). Wealthy nations' adaptive capacities are conditioned by strong economies, advanced technologies, and well-

developed infrastructure, which enable them to manage such crises internally, thereby minimising the need for external assistance (also see above). Additionally, adaptive strategies for managing climate change directly or indirectly involve technology such as early warning systems, that most developing countries grapple with.

As an arid country with low economic growth and a high dependence on natural resource-based industries, Namibia has limited capacity to adapt to climate change impacts (Republic of Namibia, 2011). Economically, Namibia faces limitations and developmental challenges, and despite its ranking as an upper-middle-income country, there are high levels of inequalities. As presented above, the pre-existing development challenges of high levels of poverty, unemployment and multiple deprivations constrain the country's ability to independently finance adaptation measures, with the result that adaptive capacity in the form of climate financing is an issue. In Namibia's First Adaptation Communication to the UNFCCC, it was indicated that Namibia needed about USD 1.72 billion over the period 2021–2023 for its adaptation actions (Republic of Namibia, 2021). As indicated in the Nationally Determined Contributions (NDCs), Namibia's adaptation policies and strategies cannot be efficiently enforced without external assistance (MEFT, 2023). Namibia requires significant investment to enhance its technological resilience, as the country still grapples, for example, with early warning systems, which are key for preparedness and better, timely responses. This is linked to the dissemination of information, knowledge, and skills, which while growing, remains differentiated. A recent study on the gendered impacts of drought on women in Omusati and Kunene regions found that early warning system communications do not come straight to the regions, and that the sharing of information is not coordinated with the stakeholders on the ground (Olwage & Nghitevelekwa, 2023). Infrastructure development, especially in rural areas, remains inadequate, thereby impacting climate response capabilities. Namibia's position paper at COP 28 highlights the challenges the country faces in coping with climate change impacts, thus emphasising that developing nations, including Namibia, face significant difficulties due to their having limited financial resources, technological advancement, and human capacity (Republic of Namibia, 2023a).

Institutional and legal framework for climate change

On a very positive note, Namibia has established legal and institutional frameworks for climate change, and the

country actively participates in international climate change negotiations of the UNFCCC COPs. The institutional frameworks include the multi-sectoral climate change committee, now referred to as the National Committee on Rio Conventions, and a Climate Change Unit within the Department of Environmental Affairs in the MEFT. The country has also developed responsive national policies and strategies, including the National Climate Change Policy and its ambitious NDCs. Namibia has also developed capacities over the years for climate change action programming. Nevertheless, equity issues do persist, as vulnerable communities and social/population groups, particularly those reliant on subsistence farming, face disproportionate impacts from climate change. From the above, it is clear that adaptive capacity to climate change in Namibia, and/or positioning Namibia in relation to other countries, is differentiated—definitely low in comparison to other countries, low in some sectors and better in others, and lower for some social/population groups than for others (see also Angula & Kaundjua (2016)).

Social justice issues

Global inequalities: Distributional effects of climate change

The justice concerns that are entangled with climate change vulnerability revolve around the disparities between countries such as Namibia and other developing nations which contribute the least to global GHG emissions, yet suffer the most from its impacts, underscoring the inequality in the distribution of climate risks and vulnerabilities. As presented above in the section on Namibia's climate risks and global emission context, the country's contribution to GHG emissions is minimal. However, the country faces the daily challenges of climate change, evident in its vulnerability to consecutive droughts that threaten food and water security, amongst others. This highlights the injustice in terms of the country's responsibility for climate change vis-à-vis its vulnerability. Climate change itself stems from a "Western" mode of production that is based on extractivism, characterised by high levels of resource extractions and significant GHG emissions, and is associated with the prioritisation of economic growth over environmental sustainability. Additionally, high consumption levels in the Global North (and generally, in other industrialised nations) are the other driving force behind extractivism. Collectively, these have led to global environmental degradation. As captured early in the 1990s by Ulrich Beck, modernity has produced so much wealth, but that wealth is accompanied by risks (Beck, 1992). The injustice here is

reflected in capability (or lack thereof) to respond, which speaks directly to adaptive capacity. Despite being highly vulnerable, yet one of the countries least responsible for causing climate change, Namibia has less ability to address its impacts. The injustice here lies in the mismatch between responsibility/capability and vulnerability. All these raise significant issues of fairness and equity in the global response to climate change.

Gender and intersectional inequalities

The disparities in climate change impacts exist not only between countries, but also within countries—and not only geographically, but also between different social groups. Specific social and population groups within countries, such as women, the elderly, and children, are more vulnerable to climate change (Angula & Menjono, 2014). A key element of this vulnerability is the sensitivity to climate change and its impacts, which, as shown above, is complex and multifaceted. For example, female- and child-headed households are particularly sensitive to climate change due to their economic marginalisation, limited access to resources and multiple deprivations across a broad spectrum. Other structural challenges that increase women's vulnerability include their overdependence on climate-sensitive sectors, limited voice in decision-making processes, unequal access to information and knowledge, and social exclusion, as well as pervasive gender inequalities (also see Angula & Menjono (2014)). These signal a significant need for fairness and equity in climate action and the inclusion representation, and participation of women in climate-related decision making at local, national and international level. At the international level, as evidenced by the recently concluded COP29, delegates registration data showed that 40% of parties' delegations were women. However, women's representation in top executive positions remains notably limited—for instance, only 10% of the 78 government leaders who spoke during the opening of COP29 were women (UN Women, 2024a). In addition to participation and representation, questions of what has been said about gender during the COP were asked, with organisations advocating for gender equality arguing that gender equality has been pushed to the backburner, despite the COP's outcomes being crucial for women and girls. By the end of the COP, some progress has been recorded for example recognizing women as an important beneficiary group of climate finance and the renewal of parties' commitments to gender-responsive climate policy and action (UN Women, 2024b). The argument here is that there

is need to move beyond mere numbers (participation and representation) and focus on ensuring that the decisions made at COPs are gender-sensitive and responsive. Gender mainstreaming in climate action should be the norm, as should improved access to climate information and knowledge, increased awareness of and sensitivity to existing social exclusion and gender inequalities, and deeper understanding of how these intersect with climate change impacts.

Climate financing

Climate financing is one of the key points included in Namibia's position to the UNFCCC COPs (for example, see Republic of Namibia (2023a)). According to the Paris Agreement, developed countries are required to provide financial resources to assist developing countries in implementing mitigation and adaptation measures (United Nations, 2015). In line with this, developed countries committed to mobilising USD 100 billion per year by 2020 to address the needs of developing countries. This commitment was not honoured, as by 2020 only USD 20 billion had been mobilised through the Green Climate Fund (Republic of Namibia, 2023a). It has been argued that the climate finance architecture is highly fragmented, thus creating challenges in coordinating and monitoring aid flows, and that developed countries have consistently fallen short of their commitments (Salazar, 2019). A 2014 report revealed that Namibia was among the countries that received very small volumes of climate finance, with funding totalling less than USD 5 million (Nakhooda & Norman, 2014). In Namibia's NDCs, it is indicated that the country needs over USD 18 billion for implementation, including of its mitigation and adaptation actions, from 2015 to 2030 (The Commonwealth, 2023). The challenges that exist in this regard are not only about access to climate finance but also capacity to develop proposals for mobilising climate financing (ibid.). Through climate change negotiations, developing countries also emphasise the need to separate climate finance from developmental finance and uphold the UNFCCC polluter-pays principle. This principle asserts that countries responsible for more emissions should bear the costs of climate mitigation and adaptation efforts to support vulnerable nations. The current state of climate finance challenges the financing of adaptation to climate change and hinders the ability of developing countries to meet their NDC targets, including those for mitigation, set for 2030.

Many developing countries are already living with climate change, and people who are directly affected by its very real and increasing effects have

begun to face the urgent new reality of adaptation (Schlosberg, 2012, p. 445), and climate finance is seen as key to this. In this regard, Namibia's call for climate finance is not only about increasing the scalability and ensuring the long-term commitment of climate finance targets, but also about reassessing the allocation between adaptation and mitigation. Specifically, Namibia advocates for increased grant-based support for adaptation (Republic of Namibia, 2023a). While the country is committed to contributing to the global efforts to mitigate GHG emissions (under the principle of common but differentiated responsibilities) and remains a net carbon sink, its primary climate challenge and needs lie in adaptation. This situation highlights a significant justice issue of (mis)recognition of the fact that adaptation is beyond being merely important; it has become a "life-support" for the survival and well-being of the population where the underlying condition of the maldistribution of climate finance may fail to adequately address the distinctive needs of countries like Namibia. Maldistribution as a result of misrecognition deprives vulnerable nations of the resources needed to survive the impacts of climate change. The inadequacy of climate financing, the fragmentation of its flows, its non-separation from general development finance, and the increasing preference for the financing of mitigation over adaptation (in other words, misrecognition and maldistribution) present serious justice challenges for developing countries like Namibia. In adopting a new climate finance goal during COP29 for example, it is described as the 'insurance policy for humanity' but the caveat to that is as expressed in the discussions, like any insurance policy – it only works – if the premiums are paid in full, and on time (UNFCCC, 2024). This speaks to countries contributions towards climate financing. Therefore, just and fair practices in terms of climate financing are those that consider these elements and ensure that finance benefits the most vulnerable nations and populations most vulnerable to climate change. Notwithstanding the need for adaptation financing, especially for countries like Namibia, a critical justice perspective on climate finance—often overlooked—raises the question of whether climate finance is perpetuating Western economic models and, in so doing, contributing to ongoing climate change. Without structural changes to address the root causes of climate change, including strong enforcement of emission reductions and transformative shifts in wealthier nations, climate finance risks being only a temporary solution. To be truly effective, climate finance must be in parallel with systemic reforms (in particular, in terms of mitigation reforms discussed below) that tackle the very root causes of climate change.

Mitigation and emission reductions

Mitigation is another climate justice concern. Under the Paris Agreement, countries have committed to keeping the global temperature increase well below 1.5 degrees Celsius above pre-industrial levels by mid-century (United Nation Climate Change, n.d.). However, assessments have revealed that unless more robust and rapid reductions in GHG emissions occur now, the Paris Agreement targets will not be achievable (IPCC, 2001). The global temperature is likely to surpass the 1.5-degree threshold by 2030, much sooner than initially anticipated. Much sooner than predicted, the world has already been recorded to have breached the 1.5 degrees Celsius target in 2024 (Poynting, 2024). For countries like Namibia, it has been documented that "even a 1.5°C increase in global temperature will have severe local impacts, ushering in intensified and longer droughts and many more heatwaves" (New & Bosworth, 2018). Without robust action and commitment to urgently reduce the emissions, the critical question arises: Where is the fairness for countries like Namibia and others that will face the brunt of further global temperature increase as the earth exceeds the critical temperature threshold? To ensure justice, countries, especially developed ones, need to be more ambitious in their NDCs and adopt stringent deadlines for achieving net-zero emissions (Republic of Namibia, 2023a). Developed countries, in particular, must take the lead in mitigating GHG emissions in line with their historical responsibilities.

Adaptation, mitigation and the right to development

Adaptation is a primary justice concern. The Paris Agreement recognises adaptation as an important pillar of the long-term global response to climate change. In relation to this, Namibia emphasises the need for countries to establish a global goal for adaptation that enhances adaptive capacity, strengthens resilience, and reduces vulnerability to climate change. Additionally, Namibia advocates for climate finance to be evenly distributed between adaptation and mitigation efforts (see above). For a just transition, it is acknowledged that climate action may have both positive and negative economic impacts on different economies. To address these impacts, affected economies should pursue economic diversification. Namibia calls for support for developing countries to conduct comprehensive studies to fully understand the consequences, both positive and negative, of global climate response measures (Republic of Namibia, 2023a). Furthermore, Namibia urges the eradication of unilateral measures implemented by developed countries that negatively

affect imports from developing countries, particularly African nations with limited means of implementation. The call for economic diversification is closely tied to the right to development for nations like Namibia. Under the principle of common but differentiated responsibilities, developing countries argue that it is only fair for them to explore their natural resources to further their development. For Namibia, this specifically refers to the discourse and plans of oil and gas exploration, especially since the country is a net carbon sink. While pursuing resource exploration, Namibia is also committed to advancing green industrialisation. Although these may be viewed as contradictory trajectories, the former is pursued from a climate justice angle.

Conclusions

Based on the preceding discussion, it can be concluded that Namibia's vulnerability to climate change is a multifaceted issue that is intertwined with justice concerns. Characterised by a semi-arid climate, Namibia is among the most affected by climate change, despite contributing only minimally to global GHG emissions. This disparity underscores significant issues of fairness and equity in the global climate response. The country's high exposure to climatic variations, the sensitivity of its ecosystems and economy, and limited adaptive capacity highlight the urgent need for targeted support and justice-oriented climate policies. The conceptual framework of climate vulnerability, comprising exposure, sensitivity, and adaptive capacity, reveals that Namibia is particularly susceptible to climate impacts, with frequent droughts posing severe threats to agriculture, water supply, and food security. Rural populations, marginalised groups, and women are those most disproportionately affected. Namibia's position in global climate negotiations, as articulated in its position to COP 28, calls for increased and more equitably distributed climate finance, which is critical for adaptation. The country advocates for a balanced allocation of climate finance, with a strong emphasis on grant-based support for adaptation to enhance resilience and reduce vulnerability. However, climate finance alone will not solve the bigger problem as there is a need for structural changes to address the root causes of climate change—structural changes that are embedded in enforcement of emissions reductions and wider economic transformation. More so, mitigation efforts must be ambitious, with developed countries leading the charge in line with their historical responsibilities. The global commitment to keeping temperature increases well below 1.5 degrees Celsius requires rapid and substantial reductions in GHG emissions. For this to happen, the mode of production must change. Unless this happens,

all adaptive measures may not really make a big difference. For Namibia and similar countries, even a small increase in global temperatures can lead to drastic local impacts, including intensified droughts and heat waves. Adaptation is crucial for Namibia's survival and well-being, and it requires a global goal that strengthens adaptive capacity and resilience. In conclusion, therefore, Namibia's climate vulnerability highlights the critical need for a transformative, just, and equitable global climate response.

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