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The impact of the climate crisis on gender inequality. Looking to the frontlines in search of priorities for policy

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The climate crisis disproportionately impacts women and girls all over the world. To understand what the priorities in terms of policy are, an examination is conducted on the impacts taking place in South Asia (focusing on the countries of Bangladesh, India, and Pakistan), an area of the globe that is highly vulnerable to climate change and is characterized by having strong patriarchal values. Gender stereotypes and roles in the region heighten women and girls' vulnerability to climate impacts, both in general and in situations of crisis resulting from extreme weather events. Deepening the understanding of the climate crisis' impact on gender in South Asia, a region at the frontline of these effects, can assist in reaching a baseline understanding of the challenge from a global perspective. Methodologically, we reviewed an extensive body of literature, both specialty books and scientific articles, recent institutional reports as well as news or journalistic reports from reliable international press. In this research, the argument is made that today, climate action and urban development cannot be considered separately from women's rights. Extensive scientific data and research support the integration of a gender perspective in urban adaptation standard practices, and priorities in terms of policy to safeguard women and girls are identified accordingly. The allocation of half of climate funds, including those of loss and damage, directly to women or women-led organizations is identified as being particularly relevant. Bold and ambitious policymaking is urgently needed to build capacity to face the multiple crises unfolding.

KEYWORDS

climate crisis, gender equality, urban growth, South Asia, climate adaptation, climate policy, climate finance, loss and damage

1 Introduction

We find ourselves in an exceptionally challenging situation. In 2023, we are witnessing the increasing manifestation of climate change impacts, which are already taking place in all continents of the planet. This impact is closely related to the biodiversity crisis: we are currently in the midst of the planet's 6th mass extinction event with many existing species facing extinction soon (Ceballos et al., 2020). Over six decades have passed since the beginning of the environmental movement, associated with the release of Rachel Carson's book *Silent Spring* in 1962. The warnings from scientists have not resulted in policies that meet the scale of the challenge. In any of the still possible scenarios, regardless of our

collective choices regarding the use of fossil fuels, a profound change in the conditions of life on Earth is inevitable.

There are diverse opinions about the extent of change that awaits us, but all scientific sources point to it being very significant. A recent review of *The Limits to Growth*, published in 1972, concluded that the world is approaching a point of no return regarding social collapse, with a high probability of occurrence before 2040 (Herrington, 2020). Six out of the nine planetary boundaries have already been exceeded (Richardson et al., 2023), and the maximum 1.5°C increase set by the Paris Agreement, relative to pre-industrial temperatures (with a reference date of 1850), considered essential to safeguard by 2100, will be exceeded within the next decade (IPCC, 2023). According to another recent study, a long-term increase of 7°C is already assured (Hansen et al., 2023). This number, incompatible with humans and other forms of life, can only be understood when we realize that, once the planetary boundaries are surpassed, Earth's systems will shift from absorbing to emitting carbon dioxide. The escalation of changes will be beyond human control and unstoppable.

It is in anticipation of this foreseeable new reality that we question the specific impacts it will carry for women and girls around the world. This study focuses on the specific case of the South Asia region, as it is one of the areas of the globe where women face the harshest challenges (Banu, 2016) and where, today, serious effects of climate change are already being felt. As fewer than 1 percent of women and girls live in nations with high levels of women's empowerment and a small gender gap (UN Women, 2023b), this research may provide useful insights into what may take place on a global scale. Methodologically, we reviewed an extensive body of literature—both specialty books and scientific articles as well as recent reports published by official entities (IPCC, UN, UN Women, and World Bank)—on accelerated urban growth, the situation of South Asian women and the causes and consequences of human action on the deterioration of the human and environmental health of the planet. As some relevant information was only found in news or journalistic reports from credible international press, such as BBC, The Guardian, and France24, these sources were also included on occasion. While being aware that analysis, solutions, and proposals must always be situated and therefore localized, this study aims to identify urban policy priorities that can reduce climate-related impacts on women and girls with a global perspective in mind.

2 Origins of the climate crisis: humans, nature, and the Great Acceleration

Our current paradigm, which led us to this crisis, is the inevitability of economic growth, dependent on consumerism and low-cost energy sources (Irwin, 2010). While this paradigm is often considered the central problem underlying climate change, some philosophers view it merely as a symptom of the true issue—the relationship between humans and nature. Western civilization has been built upon the premise that humans are distinct from nature (Fletcher et al., 2021). The dominant culture is based on human/nature dualism, a Western cultural ideology that sees humans and the mind as part of a category of reason and consciousness, separate from a lower category comprising the body, animals, pre-human entities, and, in some conditions, women (Plumwood, 2009). In this context, the physical realm is no more than a resource, existing to serve the higher, spiritual, and conscious human; nature lacks individuality, spirit, consciousness, and agency, which are exclusively attributed to humans/men. This division is referred to as "hyperseparation" by Australian ecofeminist Val Plumwood. Irwin (2010) shares a similar viewpoint, suggesting that the climate crisis results from the illusion of humanity controlling nature. This anthropocentric perspective gives rise to dangerous collective illusions, such as the belief in human immunity from nature's degradation. A collective worldwide delusion is being witnessed today. Apathy toward the climate crisis might indeed stem more from the belief in human invulnerability allied to techno-optimism than from a lack of concern for future generations.

This relationship with the world is not innate to humans, however, as it substantially differs from the view held by most indigenous peoples, who see themselves and nature as part of the same ecological family and believe that human survival depends on environmental health (Salmón, 2000). This perspective is well illustrated by the Seventh Generation Principle, a law of the Iroquois Confederation from the American territory, which states that the primary duty of a leader is to ensure that the land is managed in a way that provides sustenance for the seventh generation into the future (Cajete, 2000).

Environmental philosophers have emphasized the need to alter humanity's relationship with nature as a crucial first step in addressing environmental crises. Ecofeminism has highlighted these issues for decades, linking the degradation of the planet with the exploitation of women and connecting patriarchy to the environmental and ecological crisis (Castelo et al., 2023). Neither ecofeminism or environmental philosophy were successful in terms of changing societal norms and beliefs. The emergence of alternative theories, such as Bryan Norton's convergence hypothesis, has further reduced the urgency and focus on the problem. This hypothesis suggests that sufficiently sophisticated anthropocentrism will necessarily converge with non-anthropocentrism, in the sense that both will recommend the same environmentally responsible behaviors and policies (Norton, 1991). Today, we can dismiss this hypothesis as irrelevant; regardless of whether it is true or whether our anthropocentrism is not sufficiently sophisticated, we have not developed the necessary environmental policies to effectively address the problems we face.

Observed accelerations are at the center of the challenge at multiple levels. Since the mid-20th century, a dramatic and persisting surge has been observed in a wide range of human activities, which continues to the present day. This growth of exceptional magnitude has been designated the Great Acceleration and is the driving force behind efforts to formalize the shift to a new Epoch that is characterized by human activity and has been named the Anthropocene (Steffen et al., 2015). We are currently, in the third decade of the 21st century, observing its impacts, which have created different kinds of accelerations, that of climate impacts, natural degradation, and a reduction in biodiversity so severe that has been designated as a mutilation of the tree of life (Ceballos and Ehrlich, 2023). The more ambiguous and uncertain

the environment, the more stable and enduring values are said to matter (Emery and Trist, 1965; Ouchi, 1980; Adler, 2001; Weick, 2006; cited in Gehman et al., 2013), and an uncertain environment is unquestionably ahead, if not already here. Considering that the acceleration of changes in both the natural world and human societies is likely to continue, it is urgent to prepare and protect principles and values that took millennia to evolve and are focused on safeguarding the most vulnerable and exposed groups of society. We must urgently develop policies addressing these concerns. Our main challenge as a global society is to address mitigation and adaptation needs, developing policies and projects matching the pace of the Great Acceleration, and of its current and future consequences as they unfold.

3 Climate change: a gendered crisis

Climate change is, above all, a crisis of inequalities. The 63 million people who make up the top 1% richest on the planet emit more than double the emissions of the bottom half, which consists of 3.1 billion people (Oxfam, 2020). This is true at both global and national levels, as a recent study found that the top 1% of households in the USA are responsible for 40% of the emissions of the country (Starr et al., 2023).

The disproportionate impact of climate change on women is often referred to in the field of climate science (World Meteorological Organization, 2023), and is supported by numerous studies (Schwerhoff and Konte, 2020). This is evident, for example, in the gender breakdown of refugees: women and girls make up approximately half of the non-climate refugees, a number that rises to 80% for climate refugees (Schueman, 2022). In addition to the mentioned impacts, climate change also exacerbates violence against women, which can lead them to seek refuge even in non-disaster scenarios. Women refugees face significant challenges. According to UN reports, 60% of preventable maternal deaths occur in humanitarian settings, and at least one in five refugee or displaced women is estimated to have experienced sexual violence. In fact, any situation that disrupts the social structure seems to lead to negative outcomes for women and girls. Data points to a higher male propensity for violence, such as in the case of homicides, where global data shows that 95% of cases are committed by men (UNODC, 2014). Women, being biologically more vulnerable and often constrained by their gender roles, are often victims of male aggression. A functional legal system acts as a guarantee of security and a barrier to violence.

Significant observed impacts of the climate crisis on women and girls are security, health (both physical and mental), and subsistence/independence. Regarding the primary reasons for their disproportionate vulnerability, the following have been identified:

1. Lack of resources. Generally, women have fewer resources than men, also known as the feminization of poverty (McLanahan and Kelly, 2006), which places them at a disadvantage in terms of adaptive capacity, particularly in what concerns the ability to respond to shocks.
2. Representation in decision-making. There is a limited number of women in climate-related decision-making positions, which reduces the representation of their experiences and the advocacy for their interests in implemented policies (Castelo, 2021).
3. Traditional gender roles. Particularly the roles of caregiver and provider of food/water/fuel can be overwhelming, limiting women's ability to respond and relocate in case of disaster. Usually, women do not move alone (Krishnan, 2022; Tahmina et al., 2022).

There is a significant gap between the extensive literature on gender vulnerability to climate change and the incorporation of measures that integrate this component into implemented projects and urban planning and policy responses to climate mitigation and adaptation. This gap is evident in climate financing data: according to the UN, only 1.5% is dedicated to supporting women (Oxfam, 2023). Another example is gender equality often being mentioned as a guiding principle in the Asia-Pacific region, both in disaster risk reduction (DRR) measures and health policies. However, studies show that this principle has little correspondence in practice, whether DRR policies focus on health or vice versa (SEI, 2022).

3.1 Regional vulnerability: South Asia

The IPCC has identified that the regions of the planet that will suffer the most from climate change are Sub-Saharan Africa, India, and Southeast Asia (IPCC, 2018). Bangladesh has been identified as one of the most vulnerable countries in the world as well (Ali, 1999). Climate injustice becomes particularly evident in times of disaster. In the case of the floods in Pakistan, considered one of the costliest disasters in the planet's history (World Bank, 2022), the affected country is responsible for only 0.5% of global carbon emissions. Whenever a disaster occurs, those working in the field of climate adaptation investigate the impacts that have occurred, with the aim of adjusting projects to address them. These impacts include gender-specific ones. Disaster situations exacerbates gender vulnerability. An example of this is the 1991 disaster in Bangladesh resulting from cyclones: out of the 140,000 people who died, 90% were female (Ikeda, 1995). This highly disproportionate number does not seem to be justified by biological differences between women and men (such as lower muscular strength), which result in greater vulnerability for women, even when combined with the additional exposure to risk associated with gender roles, as will be discussed in the next section.

Sociocultural norms in the region further exacerbate women's vulnerability, perpetuating gender disparities from early childhood. Gender-related factors like veiling, child marriage, labor division, resource access, female-headed households, and violence against women are crucial in understanding rural settings in both disaster-free and post-disaster contexts (Juran and Trivedi, 2015; Nasreen, 2022). Women continue to bear a disproportionate burden during disasters, being responsible for childcare, resource collection, and household protection. While disasters impact both genders, women are left with the heavier load of coping. In rural areas, men often migrate in search of work, leaving women to manage family, property, and resources alone, intensifying gender-based labor divisions (Haque and Jahan, 2015). Women and girls also face heightened insecurity, reproductive health challenges, and violence

due to societal discrimination that devalues them (Hoque et al., 2018).

Despite adversity, women exhibit resilience and resourcefulness during crises. They play a crucial but often unnoticed role in household resilience during disasters, employing various mitigation and adaptation strategies. They intensify gender-assigned activities, adapt consumption patterns, and creatively manage resources. Nevertheless, patriarchal norms undervalue their contributions, relegating marginalized women to casual labor roles. Decision-making remains skewed in favor of men, limiting women's agency and recognition in both household and community contexts (Kumbetoglu and User, 2010; Ayeb-Karlsson et al., 2016).

Floods are a recurring and severe disaster in Bangladesh, typically happening in July and August. Early research on floods, including Khondker (1996), scarcely acknowledged women's contributions or responses. Later studies delved into women's challenges during floods from a social perspective, though still lacking detailed insights into their responses (Kumbetoglu and User, 2010; Nasreen, 2022). Research reveals a stark gender division of labor during floods, with women assuming increased responsibilities in activities like cooking, cleaning, and childcare, even amid difficult circumstances. Women often must wade through chest-high water to fetch essential resources like drinking water and fuelwood, leading to difficulties in cooking. Poorer women face food and supply shortages, diminishing their purchasing power (Azad et al., 2013). Tragically, violence and harassment against women increase during disasters. Research indicates that women's rights, including access to information, food, clean water, healthcare, education, housing, livelihood, and protection, are often violated during and after floods (Nasreen, 2009). Floods disrupt agricultural production, compelling women to seek alternative work that exposes them to various forms of gender discrimination, such as lower pay and longer working hours than men.

More gender-specific data is needed. Studies have highlighted the scarcity of gender-specific information and efforts in disaster management by government and non-governmental organizations, although some projects address gender in disaster contexts (Nasreen, 2011). Coordination and knowledge-sharing among stakeholders are lacking, hindering the mainstreaming of gender in disaster management. During disasters, women resist relocating to shelters due to concerns about asset loss, overcrowding, privacy violations, inadequate toilet facilities, and the risk of violence (Nasreen, 2022). While provisions for separate toilet facilities and gender-specific needs have been outlined in disaster management plans, their implementation remains insufficient. Additionally, the existing early warning systems are not inclusive, particularly for women and individuals with disabilities (Nasreen, 2011). Gender norms further limit women's ability to adapt to climate hazards. Differences in experiences, perspectives, and social capital between men and women lead to distinct coping strategies. Unequal access to resources and opportunities also influences adaptive capacity. Gendered cultural and economic structures result in women disproportionately experiencing poverty, hunger, malnutrition, economic crises, health problems, insecurity, and violence stemming from environmental degradation, disasters, and climate change (Juran and Trivedi, 2015). Women's income globally averages only 77% of men's income (UN Women, 2023a). Interestingly, as wealth increases, the gender gap widens. Among the billionaires listed in the year 2021, only 12.9% were women (Statista Research Department, 2023). It is not extreme wealth that raises concerns, however. The unresolved issue of unpaid family work, which underpins the global economy and largely falls on women, is once again brought to attention.

When discussing climate change, the focus is usually placed on rising temperatures, floods, extreme weather events, and sea-level rise. It is possible, however, that the tipping point of our functioning societies is the collapse of productive agricultural systems. Food shortages are already starting to be experienced in developed parts of the world; there have been supply chain disruptions, such as the tomato supply shortage in the UK since the summer of 2022, partly due to droughts in Spain and North Africa (BBC, 2023). There is, however, no comparison in terms of the potential impact it can have in developing countries. Considering the specific crop of rice: its production decrease in 2023 is expected to be the highest in 20 years, leading to price increases, particularly felt in the Asia-Pacific region, which consumes 90% of the world's rice (CNBC, 2023), and especially among the most vulnerable communities. This trend will intensify in the future: the estimated reduction in rice production for the next 100 years is 51% (Hussain et al., 2020). This number takes on even greater significance when we factor in that this region is among the areas of the planet experiencing the highest population growth. Additionally, and contrary to gender stereotypes, data shows that 43%−70% of agricultural work in developing countries is carried out by women (FAO, 2011), who represent 60%−80% of small-scale farmers in non-industrialized countries (Grain, 2014). The impact of the climate crisis on food production in these circumstances affects them at multiple levels. Food security is an urgent issue that needs to be addressed in international negotiations, including the role played by women in this sector in the most vulnerable countries, including South Asia.

3.2 Bangladesh, India, and Pakistan: urban growth and gender inequality

We are currently witnessing the Global South being subject to two simultaneous pressures: the exploitation of natural resources (mainly for the construction and technological industries), and accelerated urbanization, which is a prominent factor in carbon emissions (Khan and Majeed, 2023). Bangladesh, India, and Pakistan, three highly vulnerable nations to climate impacts, are suffering the effects of the very high rates of population growth and fast-paced and unregulated urbanization. The combination of these factors further exposes these countries to climate impacts. India and Bangladesh have, today, three of the 10 megacities in the world—respectively, Delhi, Mumbai, and Dhaka—with further growth expected until 2030 (WUP, 2018).

An extensive body of literature has identified the massive urbanization and the dramatic Land Use Land Cover, LULC, changes in recent years as one of the most significant human changes to the Earth's climate, associated with urban sprawl

progressively taking over the countryside and its significant consequences (Baqa et al., 2022; Nasir et al., 2022; Tariq et al., 2022). India's current (mostly unplanned) urbanization rate of 0.25% will predictably double by 2050 (WUP, 2018). Pakistan faces also an extensive urban sprawl in a pace of urbanization rate increased steadily over the previous four decades, and larger urban areas make up about a third of Pakistan's population (Tariq et al., 2022). Some of them, such as Karachi, have the particularity of being tropical megacities (Baqa et al., 2022). Some of the direct consequences of rapid urbanization are land insufficiency, the growth of slums in many cities, the expansion of many cities into riverbeds and other high-risk areas, the drastic decrease of green areas, the loss of biodiversity, the proliferation of urban heat islands and high air pollution levels and, consequently, the quality of life of residents (Patel et al., 2018; Ramaiah and Avtar, 2019).

In Bangladesh, for instance, besides the increasingly urban and populational growth, the development of dense road networks was identified as the major cause of urban green and blue space loss and consequent reduction of ecosystems; also, the country faces the scarcity of land and a complex pattern of land use change (Abdullah et al., 2022). Also, during the winter dry period, high urban heat island intensity in the major Bangladeshi districts is related to dense population, urban expansion, and unplanned urbanization (Rahman et al., 2022). A recent scientific study analyzed the growth and land use of Jashore city and predicted the increase of almost ¼ of the urban area (the fastest period during 2020–2030) with simultaneous reduction of cropland, vegetation, unused land, and water, by 2050 (Morshed et al., 2023, p. 425). A recent study published by the World Weather Attribution academic group found that human-induced climate change makes heat waves in South Asia 30 times more likely (WWA, 2023). And because those effects are already felt intensely, mostly along its southwestern coast, many people from these regions' worst-affected neighborhoods have already been forced to relocate themselves to informal settlements without basic infrastructures—they become, in fact, climate migrants (Khan, 2022).

Women and children are disproportionally affected by climate migration, which puts them at greater risk of exploitation, gender-based violence, and child labor (Sawas and Bose, 2021). Also, the pace of empowerment and achievement of women's and girls' rights varies between these countries due to different social and economic national contexts and cultural values. India's heterogeneous society, for example, mirrored a country with multiple communities and religions and each followed its own customary practices and laws, some of which still contain gender inequitable provisions (Braunmiller et al., 2023a). Generally, the implementation of national formal actions in gender equality has been delayed because of the deeply entrenched patriarchal mindsets, and women in Bangladesh, India, and Pakistan still face a huge number of challenges.

Although South Asian women secured suffrage earlier than some European countries—Bengali women have held the right to vote since 1946, in Pakistan since 1947, and, in India, all women were allowed to vote since the first general elections in 1951—there still are, today, enormous challenges in terms of political representation, decision-making participation, and economic opportunities (Sirivunnabood and Liao, 2021). South Asian countries show poorer performance both in female participation labor force, in which the average is 39.9% compared to 78.9% of male intervention, in the gendered segmentation of jobs for those in formal employment, and in gender pay gaps (curiously, while Bangladesh presented no gender pay gaps, Pakistan witnessed more than 30% of disparity between gender) (Sirivunnabood and Liao, 2021, p. 4–5).

While some progress on women's rights has been globally achieved and women are enlarging their voice in decision-making, according to UN Women's most recent data, the percentage of legal frameworks that promote, enforce, and monitor gender equality under the SDG indicator, with a focus on violence against women, places India in the best place among these three South Asian countries: 83.3% in India and 75% both in Bangladesh and Pakistan (UN Women, n.d.a,b,c). But India still needs additional reforms to overcome gender discriminatory legal provisions and social norms that perpetuate the exclusion of women from accessing and owning property, to increase the rate of female labor force participation (23% in 2021 compared to 72.7% for males) and to guarantee women's freedom from domestic violence and sexual harassment (Braunmiller et al., 2023a,b).

The 27% global average of violence against women and girls in 2018 worsens in South and East Asia Region: about 34% of women aged 15–49 have been subjected to physical and/or sexual violence, by an intimate partner or non-partner, or both (World Health Organization, 2021, p. 1). Prevalence estimates of intimate partner violence are 50% in Bangladesh and 35% in India (World Health Organization, 2021, p. 2), and, as the COVID-19 pandemic has exacerbated existing inequities, during lockdowns, women and children were globally and severely exposed to violence. And it is assumed that the reality is more serious than the reported cases. The UN called it "The Shadow Pandemic" (UN Women, 2021). During the COVID-19 pandemic, the rise of violence against women and girls in Bangladesh exposed them to greater risk (Barkat et al., 2020) and had significant negative impacts on their experiences in both public and private spaces (UN Women, 2022).

Even when reforms or new legislation exist, it takes time to be fully implemented and even more to change social and cultural values (Braunmiller et al., 2023a). India was among the first signatories of the Convention on the Elimination of all Forms of Discrimination against Women, CEDAW, an international treaty approved in 1979 by the United Nations General Assembly. Bangladesh acceded it in 1984 and it was ratified by Pakistan in 1996. Although India has had remarkable reforms in the areas of domestic violence and sexual harassment (such as the Enactment of Protection of Women from Domestic Violence Act of 2005), the country still faces several gaps in the existing legal framework and in terms of implementation of the laws (Braunmiller et al., 2023b). However, the climate crisis will worsen those realities. Another set of studies explains how extreme heat is increasing domestic violence against women in India, Nepal, and Pakistan: one of the reasons is that frequent heat waves tend to decrease working hours for daily wage workers, reducing income and forcing family members to spend more time at home and creating more tension and confrontations among men who find themselves unable to provide (Zhu et al., 2023). Then, the absence of air conditioning in South Asian houses potentiates stress caused by heat.

In Asia and Africa, women work harder and longer hours than men (Lau et al., 2021), and we are already witnessing a cumulative effect of vulnerabilities. Traditional gender roles lead to them spending more time at home and less in the formal labor market, reducing their access to economic resources and independence. In India, we are witnessing a reversal of progress with a reduction in women's participation in the labor market (SCMP, 2022), which will make them less autonomous and, consequently, even more vulnerable. A HomeNet South Asia report, a regional network of groups representing home-based workers, explained that women home workers across the region make up nearly a quarter of total female employment (against only 6% for men) and more than 40% of women surveyed had reported a loss in income and growing hours of unpaid care-work, because of extreme heat (HomeNet South Asia, 2022). The report also concluded that most of these invisible and unrecognized women workers—significant contributors to their families, communities, and national economies—are using negative coping strategies, including moving home or giving up their livelihoods.

Moreover, women face other difficulties, particularly when inhabiting slums or similar precarious settlements. In addition to the physical poverty of the houses, they spend a disproportionate amount of time on unpaid domestic and care work (e.g., cooking, cleaning, traveling to a toilet, childcare, and elderly care) (Patel et al., 2018, p. 2). For women, having access to clean water is a question of time, health, and safety. A countless number of studies and programs interconnected gender and water, sanitation, and hygiene (WASH) in South Asia (Coles and Wallace, 2020; MacArthur et al., 2020), worsening past and future water wastages and disputes in the region (Mukhopadhyay, 2015). With the primary responsibility of collecting and managing household water supplies, women and girls are the group most impacted by the lack of access to clean water. Besides often having to walk very long distances daily, clean water scarcity impacts their participation in educational, social, and livelihood activities, and menstrual health and hygiene management. As they are not properly consulted to map their specific needs and challenges, both at the community level and at higher levels of policy planning, women are disproportionately neglected by decision-making. Although they are traditionally and historically the household members responsible for collecting water, feeding, and cleaning, they are often excluded from decision-making processes concerning water needs (Price et al., 2014, p. 16).

Women are also highly impacted by the lack of basic daily facilities. For instance, women and female teenagers in five slums of Bangladeshi Khulna City, "sometimes neglected their hygienic needs, as there was often no separate toilet for women, the number of toilets was relatively low as compared to the total number of households in a settlement, and the construction and quality of the toilets were not women friendly. Therefore, women faced problems in terms of menstrual hygiene management" (Khan, 2022, p. 6). According to this investigation, the majority of women among climate migrants were unemployed and they must be supported with "skill development for diverse livelihood opportunities as well as income-generating capacity development for women" (Khan, 2022, p. 8). In coastal regions, women bear the brunt of the related challenges, including adverse effects on reproductive health due to factors like chemical pollutants, salinity, and inadequate water and sanitation facilities. Climate-induced hazards and disasters further contribute to higher mortality rates among women and girls, often leading to increased school dropout rates and child marriages (Ahsan et al., 2016). Additionally, they must contend with unhygienic menstrual management, reproductive health issues, disabilities, and physical and sexual violence during and after disasters (Ayeb-Karlsson et al., 2016). The country faces gender-based violence also in the public sphere, such as those occurring in crowded public transportation (Mowri and Bailey, 2022).

A study revealed that 87% of respondents identified women, children, the elderly, and disabled individuals as the most vulnerable to the impacts of climate-shifting patterns (Ashrafuzzaman et al., 2022a). Respondents also emphasized that gender inequality and differentiation exacerbated vulnerability, with women particularly affected due to factors like poverty, social and cultural norms, and religious restrictions. Religious and cultural values significantly shape women's roles in society in many developing countries (Mosedale, 2005). Another study highlighted gender disparities in the impacts of severe climatic events, particularly cyclones, with women experiencing uneven effects (Ashrafuzzaman et al., 2022b). In Bangladesh, gender biases exacerbate women's vulnerability to climate extremes, notably concerning land ownership and livelihood assets. These disparities expose women to risks like violence, early marriage, and reproductive health issues during and after disasters (ibid). Climate justice and gender equity are interconnected, revealing marginalized groups' reliance on natural resources for survival.

Two specific cases further illustrate specific vulnerabilities, the 1991 cyclone in Bangladesh and the 2022 floods in Pakistan. A significant gender gap was observed in mortality rates in the cyclone of Bangladesh, with women being nearly five times more susceptible to death than men (Begum, 1993). This discrepancy was exacerbated by cultural and religious customs that restricted women from acquiring essential survival skills like swimming, significantly hampering their ability to survive natural disasters (Chowdhury et al., 1993). This gender-based vulnerability underscores the intersection of cultural norms and climate-induced risks (ibid). To enhance resilience in vulnerable communities, there is a pressing need for disaster preparedness and climate adaptation strategies that are sensitive to gender disparities. In 2022, the largest floods in the history of Pakistan inundated one-third of the country. Six months later, 1,800,000 people were still at risk due to their proximity to stagnant and/or contaminated waters (OCHA, 2023). In this emergency scenario, in some villages, only men were allowed to move to refugee camps, with "honor" being cited as one of the reasons for this decision (France24, 2022), which was exclusively made by men (the council of elders). Many of the women who were prevented from escaping the floods likely faced an additional challenge, not knowing how to swim, as swimming lessons for women and girls are considered inappropriate in many societies (Gallup, 2021). Women are initially hindered from fleeing and unprepared to survive. These circumstances help us understand what kind of variables could explain the 90% death rate in Bangladesh. Data indicates that, according to all analytical metrics, women and girls were disproportionately affected in the Pakistan floods as well (Water Aid, 2022). Nearly 700,000 pregnant

women were left without maternal medical care during the floods; they were also without support for themselves and their newborns, lacking food, security, or basic medical care. Rates of spontaneous abortions increased drastically. In 2018, the U.N. reported that only 48.6% of Pakistani women had their reproductive health care needs satisfied by the resources available to them (UN Women, 2022). Women and girls were without proper menstrual care, and an estimated 70% of women in flood-affected areas suffered urinary infections due to a lack of access to toilets and hygiene facilities (Water Aid, 2022).

Research shows that no social group in South Asiais more impacted by climate change than women. A 2018 policy brief by GrOW, Growth and Economic Opportunities for Women, summed up that, in India, Bangladesh, and Pakistan, women control fewer resources than men, women from slum communities are disproportionately impacted by environmental conditions and climate shocks compared to their male counterparts, and, finally, they bear a disproportionate burden of environmental degradation and climate change events in both direct and indirect ways (Patel et al., 2018, p. 1). As World Bank specialists concluded, "with less access to education, employment, financial services, and land resources, and with highly constrained roles in decision-making at all levels, women across South Asia bear the brunt of the climate crisis" (Kuriakose and Kerr, 2023).

4 Gender and leadership

During the COVID-19 pandemic, there were frequent mentions of the fact that female leadership, such as that of Jacinda Ardern, Prime Minister of New Zealand, produced better outcomes (Coscieme et al., 2020; Johnson and Williams, 2020; Martínez-Córdoba et al., 2021). This is attributed to a greater inclination of women toward collaboration, human needs and acceptance of recommendations from the scientific community (Garikipati and Kambhampati, 2021). The characteristic of female leadership being more team-oriented and consensus-building had been identified earlier (Appelbaum et al., 2003). Female leaders also tend, on average, to take environmental issues more seriously and safeguard the interests of the most vulnerable populations, including women and girls. There is clear evidence of a correlation between female leadership and the adoption of environmental policies (Alam et al., 2015; Singh et al., 2022). A close but non-existencialist relationship between women and nature is advocated by ecofeminism, and many prominent figures in the field, such as the aforementioned Rachel Carson, Gro Brundtland, Jane Goodall, or activist Greta Thunberg, convey this idea to the general public. This perception raises other issues, such as men refusing to recycle because they associate this activity with feminine behavior (Somerville, 2018), but that is a topic for another discussion. Studies show that women's public participation and leadership benefit everyone's interests, not just those of women and girls (UNDRR et al., 2023). It is for these reasons that female leadership is particularly important in this time of crisis, not only from the perspective of women and girls but also from a global interest standpoint.

Examining current female leadership, strong evidence is found of their initiative in promoting gender equality. Such is the case with Theresa Kachindamoto, the first female chief of her tribe in Malawi. In collaboration with UN Women and the government, she contributed to raising the minimum marriage age in the country from 15 to 18 in 2017. Since being appointed to her position in 2003, she has annulled around 3,500 marriages of underage girls and helped them return to school, often subsidizing their education (UN Women, 2021). A similar case is that of Peace Mutuuzo, the Minister of Gender and Culture in Uganda. While underage marriage has been illegal in the country since 1995, underage girls, and sometimes even children, continue to be forced into marriage. Mutuuzo occasionally intervenes personally, accompanied by the police, to prevent these marriages, which are often reported anonymously at the time (Monitor, 2022). In Brazil, Sonia Guajajara, the current Minister of Indigenous Peoples of the country, is one of the female leaders of the project *Voz das Mulheres Indígenas* [Voice of Indigenous Women]. With the support of UN Women, they prepared the National Agenda for Indigenous Women and contributed to strengthening their political participation, their ability to advocate for policies, and their knowledge of global human rights standards (Voz das Mulheres Indígenas and UN Women, 2018).

While the United Nations emphasizes the importance of gender-sensitive approaches to address the consequences of climate change, the representation of women in national and global climate negotiation bodies remains very low, averaging 33% (UNFCCC, 2019). The relevance of the issue led to some feminists pointing to climate action being the greatest feminist fight of our time (Bhutto, 2023). More female leadership should be encouraged at this moment to step up in developing gender-conscious policy.

5 Priorities for policy safeguarding urban women and girls

Gender disparities impact negatively not only women's wellbeing and advancement but also human progress (UN Women, 2023b). Addressing the issue, in July 2023 the UN introduced two new indices, the Women's Empowerment Index (WEI) and the Global Gender Parity Index (GGPI) (UN Women, 2023b). Data is crucial to support the identification of strategies, policies, and projects to implement worldwide. Research indicates that the effectiveness of measures aimed at safeguarding individuals from climate variability and change can be heightened by integrating a women-centric analysis and data documentation (Yadav and Lal, 2018).

The priorities presented below were identified with the support of previous research and as a subject for further discussion. Research has previously identified gender as the primary climate change agenda for South Asia (Patel et al., 2020). Policies addressing women's vulnerability to climate change have already been developed in South Asia (Orlando et al., 2022). In India, a collaborative effort spanning a decade involving national and state governments, along with the World Bank, has successfully mobilized over 50 million women into self-help groups and federations. This initiative has sparked significant transformations in the lives of rural communities, particularly those experiencing poverty (World Bank, 2019). Economic empowerment is recognized as particularly important: in 2011, the World Bank facilitated the establishment of a South Asian

platform dedicated to women's economic empowerment. Known as the Business Enterprise and Employment Support (BEES) Network, this platform comprises over 25 facilitating organizations and women-led enterprises. Notable participants include World Bank-supported livelihood programs like Nuton Jubon in Bangladesh, the Poverty Alleviation Fund in Nepal and Pakistan, and the Women Economic Empowerment Rural Development Program (WEERDP) in Afghanistan.

Another example, the South Asia Consortium for Interdisciplinary Water Resources Studies (SaciWATERs) developed, between 2017 and 2021, the South Asian Water (SAWA) Leadership Program on Climate Change with the aim of increasing the number of women occupying leadership roles in the water sector. The program is awarding fellowships to 36 women enrolled in master's level Interdisciplinary Water Resources Management across four universities in South Asia and providing opportunities to access decision-making environments through internships.[1]

In 2021, UN Women and UN Environment Programme (UNEP) reviewed the progress of Bangladesh's Climate Change Gender Action Plan (ccGAP) of 2013, a document that defined guides to ministerial promotion of gender equality and women empowerment internally as well as with partners while tackling climate change issues. Although the report concluded that the implementation of the ccGAP has been extremely limited due to a variety of barriers, it presented some examples of public policies that already consider women's specificities in terms of food security, disaster management, social protection and infrastructure development (UN Women and UNEP, 2021).

Ensuring inclusive and gender-responsive resilience is crucial so that the most vulnerable women and girls can face the future impacts of the climate crisis. Priorities in policy to address women's climate-related vulnerability must address not only the safeguarding of women and girls but also the regulation of urban planning in terms of adaptation. As the main vulnerabilities identified were the lack of economic resources, representation in decision-making, and traditional gender roles, the priorities proposed address these vulnerabilities, as well as urban planning adaptation from a gender-responsive perspective.

I. Strengthening women's economic capacity
   - 50% of climate finance to be disbursed directly to women-centric projects and/or women-led projects;
   - Increase women's access to finance in general;
   - Equal pay to be mandatory;
   - Facilitate women's access to land ownership, adjudication, and registration;
   - Invest in the care economy and activities to relieve women's burden on unpaid daily work;
   - Creation of skills development programs for women and girls to enhance their labor ability in a wider range of industries.

II. Promoting increased representation in decision-making
   - A quota of a minimum of 40% representation of women should be established for decision-making bodies at local, regional, and national levels of government, as well as at the intergovernmental level;
   - Women's councils to be created at local, regional, and national levels of government;
   - Campaigns focused on encouraging women to take on leadership roles to be launched, sponsored by the national states;
   - Violence against women, including online abuse, to be heavily penalized in law;
   - Actions focused on women to be designed and led by women.

III. Mitigating exposure due to traditional gender roles
   - Integration of caretaking responsibilities into the economy with minimum wage compensation;
   - Gender-specific data collection to be mandatory in the government's research, data, and documentation;
   - Campaigns promoting women's rights in general, as well as specifically to mobility, to be launched, sponsored by the states;
   - Women support groups to be created and sponsored by governments.
   - Women-only shelters to be provided in case of extreme weather events or disasters;
   - Disaster response camps to have segregated women's areas;
   - Menstrual products to be provided at no cost to low-income women and girls;
   - Regional and National Gender Action Plans to be created, implemented, monitored, assessed in post-project reviews (PPRs), and updated accordingly.

IV. Gender-responsive urban planning adaptation
   - Regular low-income community stakeholder engagements to take place focused on assessing their needs and registering inputs in urban planning and management. Dedicated women's sessions are to be included;
   - Subsidized air conditioning to be provided for vulnerable communities in previously identified heat-stressed urban areas;
   - Urban expansion projects to include climate risk mitigation projects;
   - Urban expansion projects to include universal accessibility plans;
   - Nature-based solutions, a social equalizer, to be promoted with a minimum of 9% permeable and vegetated surfaces per habitant to be provided in all urban expansion projects, focusing on minimizing exposure to flooding and heat stress and promoting wellbeing;
   - Urban farming is to be provided near low-income communities.

Some of the priorities proposed may seem ambitious in terms of financing. The Paris Agreement includes a transfer of US$100 billion a year from developed to developing nations from 2020 onwards (Weikmans and Roberts, 2019). It is key that half of

1 More information about SAWA Leadership Programme on Climate Change available online at: http://saciwaters.org/sawa.php (accessed January 15, 2024). Pakistan has it own Climate Change Gender Action Plan (ccGAP) since 2022, aiming to support policy measures and strengthen institutional processes that enhance women's participation in climate decision making and implementation (available online at: https://genderandenvironment.org/climate-change-gender-action-plan-of-the-government-and-people-of-pakistan/).

the budget allocated for adaptation be specifically disbursed to women-related projects, which can include some of the proposals identified above. Studies focused on micro-credit have shown that an investment in women is substantially more beneficial for all than an investment in men. A study focused on Bangladesh has concluded that female credit results in increased women empowerment while male credit is, at best, neutral, and often negative for a variety of women's needs, including physical mobility (Pitt et al., 2003). Considering this, the case can be made that the disbursement of climate funds in general, including of loss and damage, which are mostly managed by men, can therefore result in a negative result for women's empowerment, a maladaptation in terms of gender. From this standpoint, some of the proposals presented above become imperative.

6 Discussion

Addressing the challenge of the climate crisis has demanded, for decades, a profound transformation in the way human societies and the natural world are managed which has not materialized. It has seemed impossible to envision a different way of inhabiting the Earth, as contemporary social and cultural identities and experiences are so deeply rooted in consumerism and resource exploitation that a change in the system seems unattainable. If humans fail to initiate this change, however, planetary systems will compel it upon them. As human and natural systems are already experiencing an unfolding crisis, courageous and ambitious policy prioritizing the protection of the most vulnerable communities must be drafted to help steer communities through the turbulent phase that lies ahead.

Considering that all of humanity will be profoundly impacted, it is legitimate to question the importance of studying the specific impact on women and girls. In this crisis of global inequalities, there is a constant: in any part of the world, Global North or Global South, women and girls will be much more affected than their male counterparts. A significant portion of this disproportionate impact stems not from their biological condition, but from gender norms and power balance. It is therefore crucial, as the UN has recently begun to promote, to address gender vulnerabilities in general to overcome climate vulnerabilities. South Asia, as one of the regions most affected by climate change, has provided in this study a baseline for understanding the vulnerability of women globally and for the importance of gender-responsive policies and urban planning.

Multiple scientific studies and data on the climate crisis and gender inequalities support the priorities for policy identified in this study. What is urgently needed is implementation. To overcome this crisis, research must be focused on action. Action focused on creating robust institutions able to lead and finance the implementation of strategies, policies, and projects focused on climate mitigation, adaptation, and disaster risk reduction. A deep understanding of regional and local complexities is needed for adaptation strategies to be translated into localized implementable policies and projects. Although many such responses are gender-neutral, governments are increasingly open to gender-sensitive approaches. Policymakers must prioritize the political economy of climate change, ensuring gender-sensitive financing and the active involvement of women in governance, promoting gender equality and empowerment. Climate funds must be equitably disbursed to women and women-led organizations, as is the case with loss and damage funds. Civil society can play a crucial role by joining forces in pressuring global, national, and local governments to adopt ambitious policies with an effective transformative potential.

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