

Seen, But Not Heard

Exploring Intersections – Climate Change
Adaptation, Gender and Adolescents



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Seen, But Not Heard: Exploring Intersections – Climate Change Adaptation, Gender, and Adolescents. Mumbai.

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About Dasra

Dasra, meaning 'enlightened giving' in Sanskrit, is a pioneering strategic philanthropic organization aiming to transform India where a billion thrive with dignity and equity. Since its inception in 1999, Dasra has accelerated social change by driving collaborative action through powerful partnerships among a trust-based network of stakeholders (corporates, foundations, families, non-profits, social businesses, government, and media). Over the years, Dasra has deepened social impact in focused fields that include adolescents, urban sanitation, and governance and has built social capital by leading a strategic philanthropy movement in the country.

For more information, visit www.dasra.org.

About the India Climate Collaborative:

The India Climate Collaborative is a collective working to accelerate climate action in India by identifying critical sectors that need investment and driving funding towards climate solutions in India. We work closely with the climate ecosystem, including research organisations, implementers, government stakeholders, businesses, and more, to break silos and enable collaboration; as well as engage with our domestic and international donor base to ensure that funding flows towards filling the needs and gaps in the ecosystem.

For more information, visit www.indiaclimatecollaborative.org.

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Foreword

One day you finally knew
what you had to do, and began,
though the voices around you
kept shouting
their bad advice –
though the whole house
began to tremble
and you felt the old tug
at your ankles.
“Mend my life!”

- Mary Oliver, “The Journey” – *No Voyage and Other Poems*, 1963

As we write this foreword, the Nobel Prize in Physics 2021 has just been awarded to three laureates for indisputably, quantifiably, and reliably predicting global warming. Today, the climate crisis looms stark, unquestionable, and potentially catastrophic. In India it shows its face as torrential rain and cyclones, heat waves and drought – and equally as crops destroyed, unsustainable rural livelihoods, farmer suicides, and the slow march of people from villages into India’s choking cities. While the science of climate change grows ever more established, we still see large gaps in our understanding of how these changes will affect communities on the ground. And often, in the case of disasters, changes don’t play out equally across demographics.

The pandemic has already painted a clear picture of this. With women disproportionately bearing the brunt of household work, girls were more likely to drop out of school during the lockdowns. With reduced spending power, families also tended to deprioritise girls’ education. We witnessed an increase in violence against girls and women, and faltered on our progress towards ending child marriage. Similarly, India’s 120 million

adolescent girls are deeply vulnerable to climate change because of their low stature in households across the country – they are more vulnerable to the disasters when they occur, and more likely to be structurally and chronically left behind.

Despite these vulnerabilities, women and girls are powerful agents of change, often also acting as knowledge banks for their communities and caregivers for their families. The United Nations Secretary General has singled out women’s leadership for their unique ability to act as “drivers of solutions” when they are empowered¹. And as the adage goes, information is power – we believe that governments, philanthropies, non-profits, and other stakeholders invested in the future of girls can do more effective work if they have a clear picture of both the challenges and opportunities climate change places in front of women and girls. As governments and businesses pledge to build back better, we need to craft inclusive solutions that don’t leave women and girls behind.

This report “Seen, But Not Heard: Exploring Intersections – Climate Change Adaptation, Gender, and Adolescents. Mumbai.” is an attempt by Dasra and the India Climate Collaborative to draw attention to the unique space that girls and women occupy in the climate crisis today. Our sincere hope is that the report will serve as a reference point for practitioners, policy makers, and academics alike to go deeper and wider into exploring the interlinkages and deconstructing the unique role that girls and women play in society, to help them be catalysts of change for a new tomorrow.

Shailja Mehta

(10to19: Dasra
Adolescents Collaborative)

Shloka Nath

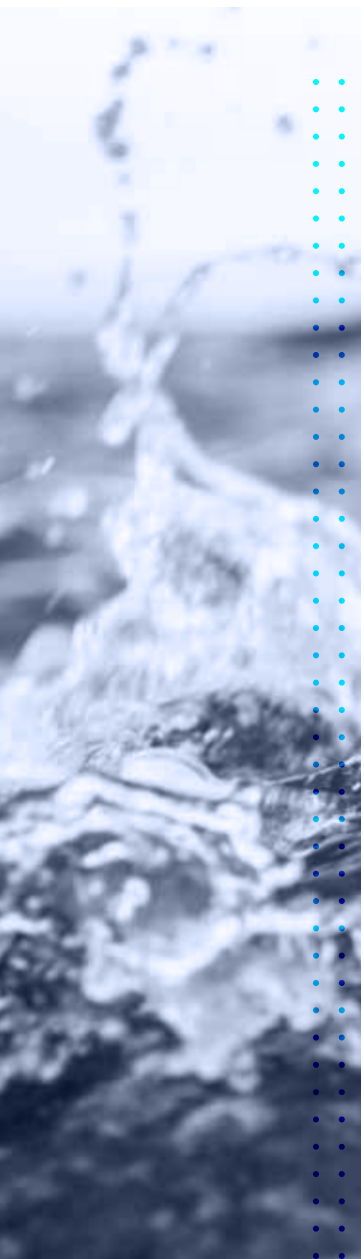
(Acting CEO, The India
Climate Collaborative)



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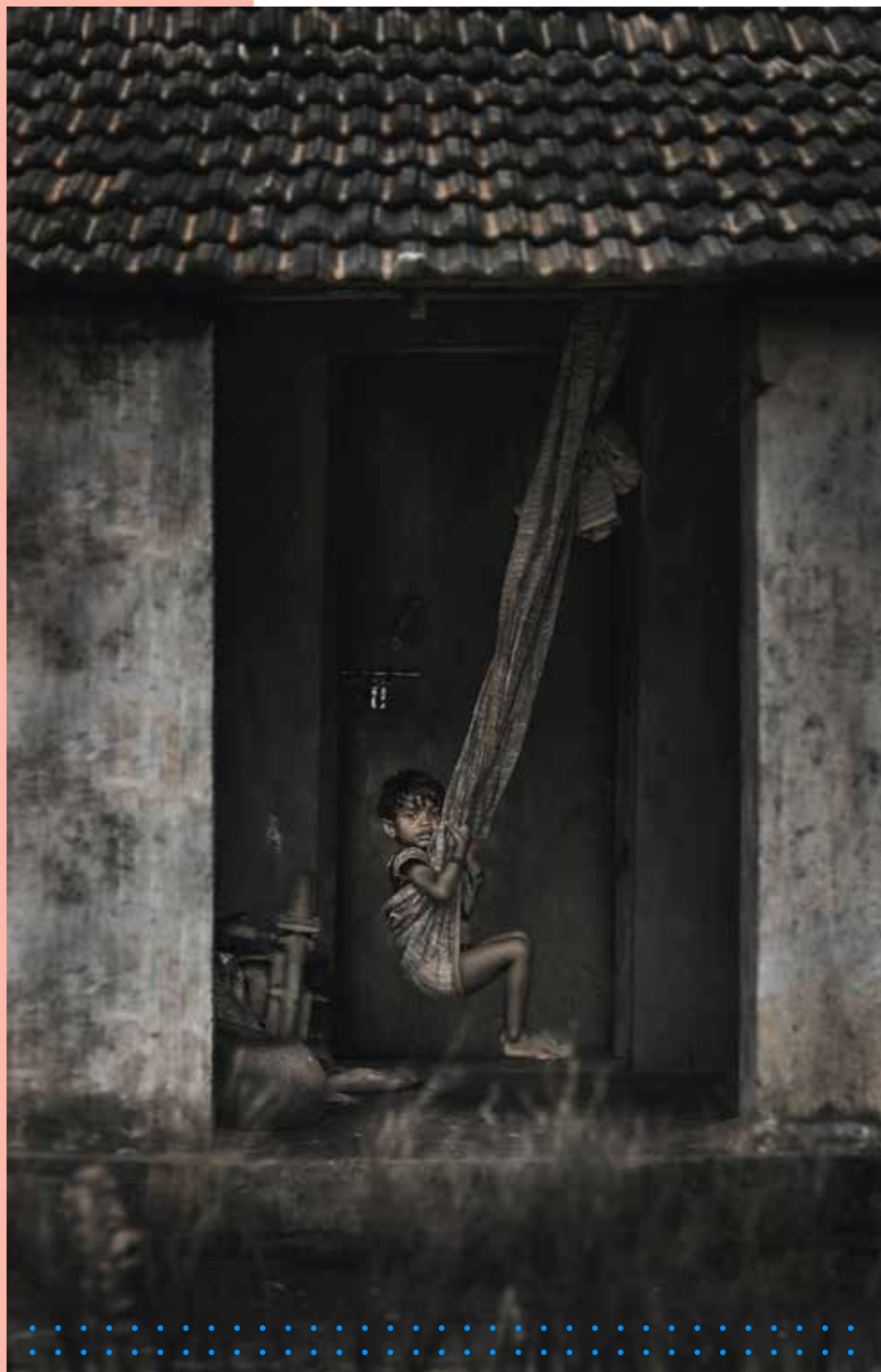
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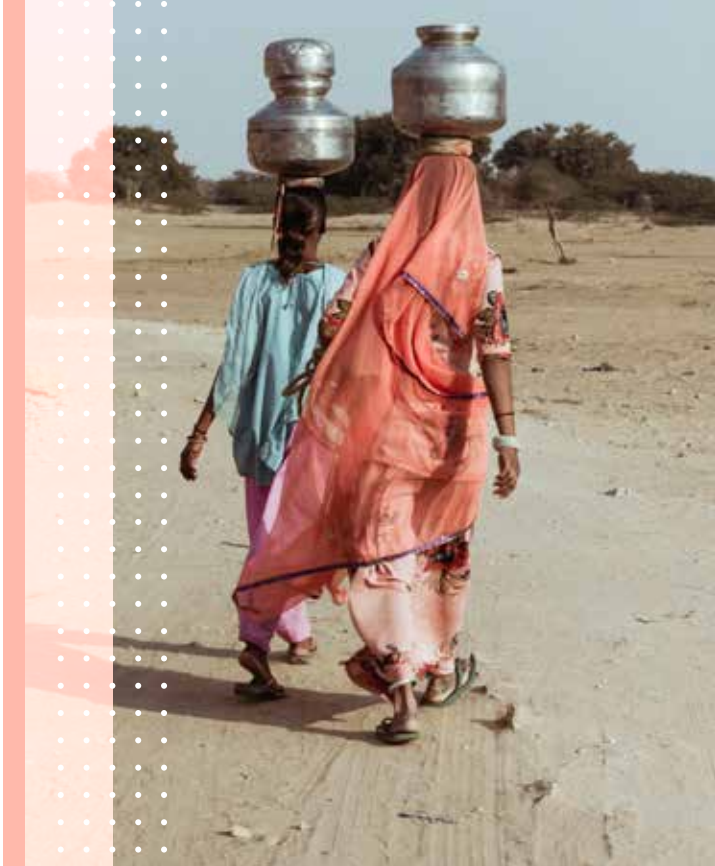
About This Report



Climate change is poised to create a wide array of physical, economic, and social risks over the coming decades – the socio-economic risks, in particular, will be large and often, unpredictable. The harmful impacts of climate change have already become more frequent and intense in many parts of India and is impacting agriculture, food security, biodiversity, water resources, human health and other sectors.

While climate change is a universal problem, its impact will not be uniformly distributed. There is now an increasing body of disparate work on the disproportionate impact of climate change on women across the globe. However, there remains a gap in literature consolidating the various impacts into a single report, and a dearth of studies touching upon the impact of climate change on adolescents. Notably, there are few studies or reports that focus on these intersections within India.





In a country as diverse as India, and one which is highly vulnerable to a plethora of climate impacts, there is a dire need to highlight how differential vulnerabilities define the experience of climate change for different communities and demographics. This is even more the case today, given the impact of the COVID-19 pandemic, which has further exacerbated existing vulnerabilities and pushed the country backward on many key indicators. In this report, we have examined the role of gender in compounding these effects, examining the specific impacts of climate change on women and adolescents using insights from existing literature and interviews with multiple academicians, practitioners, and experts. Through this research, we have sought to identify gaps in the existing research landscape (vis-à-vis the intersection of climate change, gender, and adolescent girls).

It is, thus, prudent to note that this report is not meant to be an exhaustive list of the varied impacts, and even within the specified domains i.e. food systems, human capital, natural capital, and isolated climatic events, it is an exploration of the issue. It seeks to present a list of challenges and opportunities for Indian philanthropies to look into and locate strategic interventions with practitioners and organizations working in the space. It is worth acknowledging that the lack of data and evidence on the issue underscore a need to better research the topic. The purpose of this report is to make the most of available resources, pulling from the useful insights that could inform and strengthen future research on and interventions into gender and climate change.

Ultimately, through this report, we seek to initiate conversations around identified entry points for engagement with, and possible interventions in the sector.

Executive Summary

While climate change is a universal problem, its impacts will not be uniformly distributed; in addition to geographical location, factors such as race, caste, ethnicity, economic well-being, occupation, and religion play a decisive role in how individuals will experience climate change. Across societies, these impacts will also be differentiated between women and men, with a disproportionate burden on women due to systems and structures which marginalize them socially, politically, and economically;

further, there will be differences based on age, entitlements, marital status, etc.

Women are disproportionately impacted during climate-induced crises due to the internalization of patriarchy. Women place themselves and girls at the lowest priority in rescue and relief operations. Their caregiving roles expand dramatically after a disaster and given that their access to resources is constrained, their ability to recover from the shock is hampered.¹

¹ Role of Women in Disaster Management: Vasudha Gokhale; October 2008



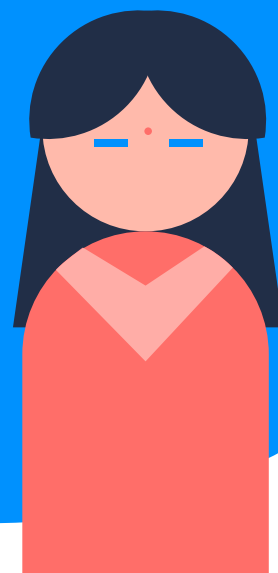
Prevalent structural hierarchies and societal norms, which place women and girls at a disadvantage, will contribute to exacerbating the impacts of climate change felt by them, which will only increase their vulnerabilities. As children, they face discrimination in parental care, nutrition, and health care; growing up, there are restrictions on their mobility, playtime, and school enrolment/attendance, adding to already oppressive conditions. **From ages 10 to 19 years, adolescent girls are confronted with a plethora of**

overwhelming stressors linked with their physical safety, sexual and reproductive health, survival, growth, and future prospects, whether in terms of education, marriage, or occupation.

The vulnerabilities of adolescent girls in India are exacerbated by the impacts of climate change. They are likely to bear the greatest burden of climate change, given their life-stage (transitioning to becoming an adult), status in family and society, their burden of care work and domestic responsibilities, and the fact that all of these, along with impacts of climate change, will impede the realization of their potential. From a young age, girls, especially in rural areas, begin to take on care work and domestic responsibilities that are shared with other women in the household. This has implications on the use of their time, access to and interest in educational and recreational activities, and participation in social or community forums where information and knowledge are enriched.

For 2019, India ranks seventh among 183 countries based on the Global Climate Risk Index 2021, according to Germanwatch, an independent development, and environmental NGO, that documents data on fatalities and economic losses suffered during the year on account of weather-related events. With climate change exacerbating natural disasters and rogue weather events, scenarios such as the heat wave

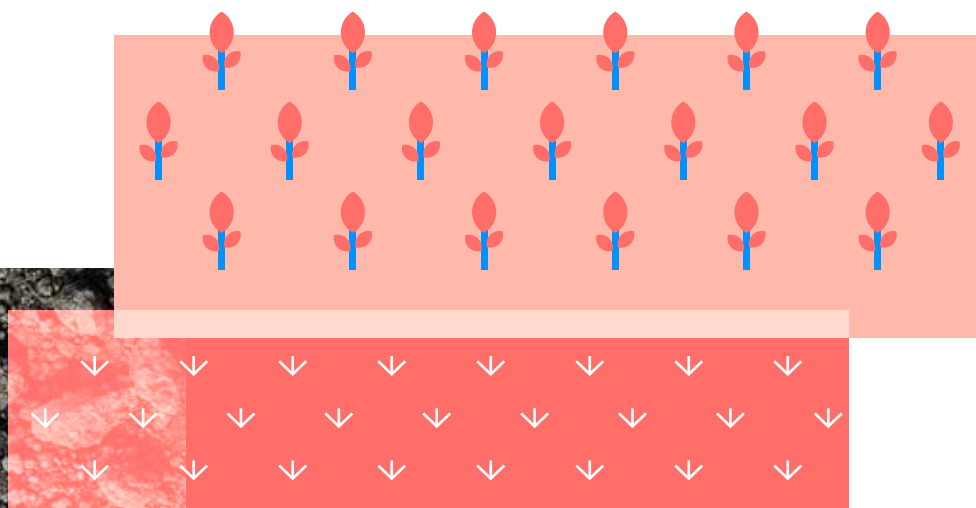
For 2019, India ranks seventh among 183 countries based on the Global Climate Risk Index 2021, according to Germanwatch, an independent development, and environmental NGO, that documents data on fatalities and economic losses suffered during the year on account of weather-related events.



of 2015, which claimed over 2,300 lives, are only expected to rise. In addition to the human cost, the total losses from extreme weather events in India over the last two decades (1998-2017) have been valued at USD 79.5 billion. In post-disaster environments, the challenges for women are compounded by health, sanitation, safety, and economic concerns.

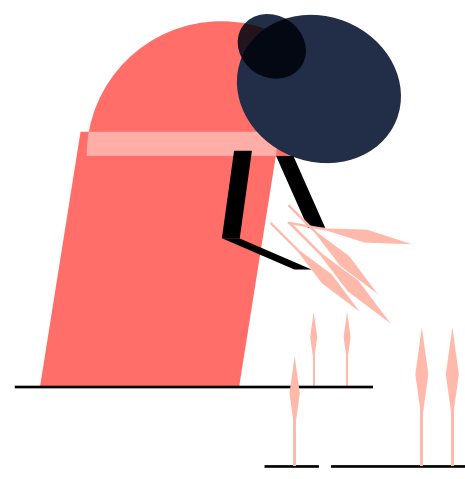
Given the specific, gendered vulnerabilities faced by women and adolescent girls, it becomes essential to ensure the implementation of a gender responsive climate action plan, that includes a thorough gender-sensitive assessment of the varied impacts on these vulnerable groups.

A changing climate will directly affect all sectors with a bearing on human survival and well-being; for the purpose of this report, these have been categorized into four climatic bubbles: food systems, human capital, natural capital, and extreme weather events.



01 | Agriculture and food and nutritional security will be most impacted by climate change in India, due to a drop in productivity caused by rising temperature and changing weather patterns.² This is further compounded by the reduced nutritional quality of foods due to elevated levels of carbon dioxide, affecting the nutritional security of women and girls. With more than 700 million people employed directly or indirectly in the agricultural sector, any negative effects are likely to be far-reaching.

More than 65% of the agricultural workforce is made of women, but nearly 43% of them have no land or tenure rights. While women form a majority of the agricultural workforce, their labor, rights, and entitlements are seldom recognized, with Dalit and Adivasi women being at the lowest rung of the ladder. Women's land and tenure rights are among the biggest threats to gender equity in times of a changing climate. Without secure land rights, their livelihoods remain vulnerable, and they are at risk of being locked in poverty traps and food insecurity.

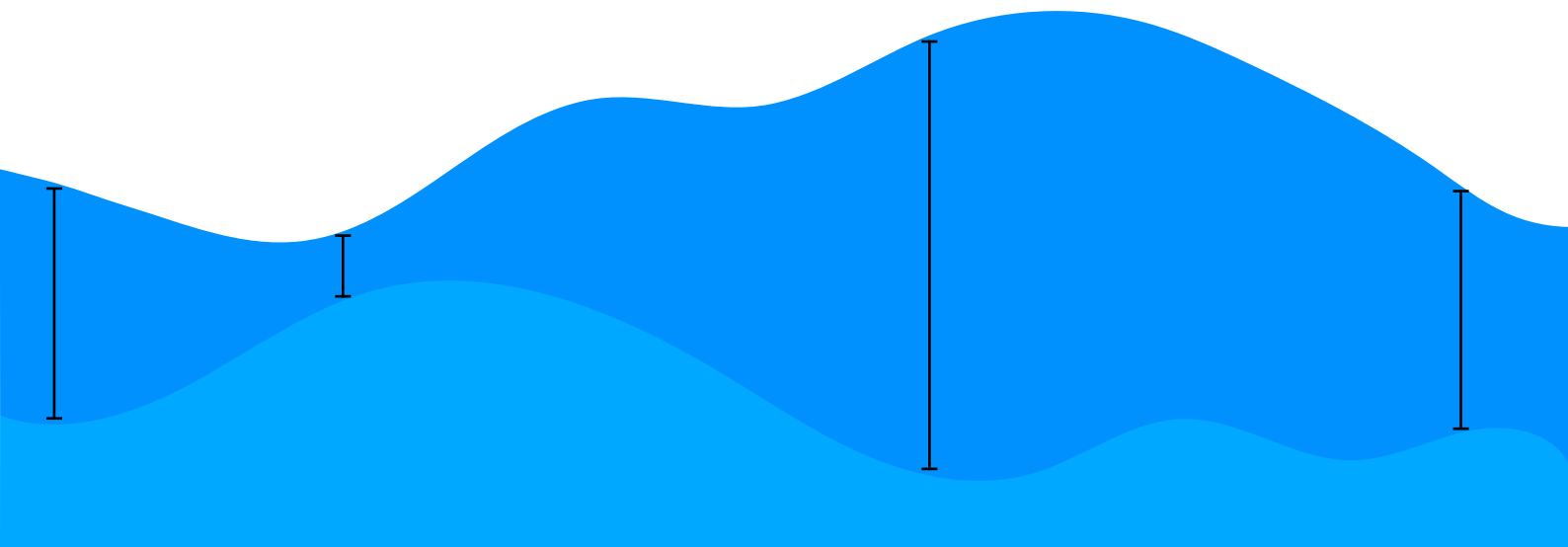


² EPW: Vol. 54, Issue No. 46, 23 Nov, 2019"

02 | Climate change poses a serious threat not only to physical infrastructure but also to human capital. It threatens to widen existing gender-based health and wealth disparities while exacerbating social inequities. **One of the initial impacts of climate emergencies is the loss of access to health services, because of which women can lose access to reproductive health services, making pregnant women most vulnerable. Women and adolescent girls from marginalized groups are particularly at risk of being denied care during emergencies.** Socio-economic shocks can lead to curtailment of education of adolescent girls, particularly if they come from poor or marginalized communities. Human displacement, livelihoods, and sanitation challenges for women also intensify during crises caused by climate change. **When natural resources become scarce due to climate change, girls and women will have to travel farther to secure food and water, which can increase their risk of exposure to sexual and physical abuse.**

03 | The phenomenon of rising seas has been observed all over the world, including India; however, the rise is not uniform. The rise in sea level due to global warming will impact more people in Asian countries, including India than any other region. Parts of India's financial capital, Mumbai, is believed to be at risk of inundation by 2050 according to some climate models.³ Unlike migration in search of employment, which is seasonal and frequently only undertaken by males or able-bodied adults in the household, migration on account of rising sea levels is permanent and entails movement with children, the elderly, and all movable assets. **Migration uproots women and adolescent girls, destroys their support system, and lands them in an alien and unsafe environment with increased physical risks.**

³ Kulp, S.A., Strauss, B.H. New elevation data triple estimates of global vulnerability to sea-level rise and coastal flooding. Nat Commun 10, 4844 (2019)





05 | Rapid changes in India's climate will mean increasing stress on India's natural ecosystems, agricultural output, and freshwater resources, while also causing escalating damage to infrastructure. Women in rural areas are more linked with natural resource use and conservation than men and would be more impacted. Their traditional gender roles bring them in daily contact with natural resources such as land, water, forests, livestock, and wildlife.

To counter the impacts of climate change in India, the government has responded with several plans and targets. Unfortunately, concerns of women and adolescent girls are not adequately accounted for in these initiatives – and their absence is conspicuous at every stage of the decision-making processes.

While women and children remain the most vulnerable to the impacts of the disasters due to skewed power

relations and inequitable cultural and social norms, they are the most important pillar for creating change. Their local knowledge and position on the frontline make them an indispensable part of the solution. Therefore, gender and social analyses become critical and must be extended to all climate actions.

Adaptation programs are critical to manage ongoing impact of climate change. These too must be designed with a strong focus on women and gender equity. With the ability to direct funds and shape programs on the ground philanthropy has an important role to play in this regard. **Robust partnerships between and among governments, philanthropists, civil society organisations (CSOs), and community based organisations (CBOs) are the need of the hour for concerted efforts towards mitigating the adverse impacts of climate change on women.**

Flow of the Report

The report is segmented into different chapters, which will explore the impacts of climate change on women and adolescent girls. The chapters will cover how climate change is panning out within

Food systems

Human capital

Natural capital

Isolated climatic events

The chapters are intended to flow together, however, especially as they have been uniquely positioned, they are also meant to stand independently. Due to the nature of the intersections, the concerns and causes of the disproportionate impacts across chapters are inextricably linked. These overlaps are signals that one issue cannot be seen in isolation.

A special chapter is dedicated to presenting intersectionality associated with caste, ethnicity, descent, and religion to address



diversity, equity, inclusion, and justice, which do not receive the necessary attention in India. This is because the extreme impacts felt by marginalized communities cannot be adequately understood without considering these intersections.

The last two chapters will have critical and justifiable insights on why women and adolescent girls are also the solutions, along with a suggestive roadmap of options and action points are laid out for Indian philanthropies to engage with actors and better understand the domain.

Introduction

1.1. Climate Change: Across the Globe and in India

Climate change is here, it is happening now, and its effects can be observed on all ecosystems and their inhabitants. Predictions made by scientists in the past about the effects and consequences of climate change are now occurring – a rise in frequency and severity of floods, erratic rainfall, melting of glaciers, accelerated rise in sea levels, and longer, more intense heat waves.⁴ The Global Mean Sea Levels (GMSL) have been consistently rising at a worrying pace.⁵

⁴ The Effects of Climate Change: NASA

⁵ Climate Change: Global Sea Level: Rebecca Lindsey for Climate.gov; January 2021

For the purpose of this report, climate change is a change in the global atmosphere attributed directly or indirectly to human activity, leading to extreme weather and climate events.

- Intergovernmental Panel on Climate Change



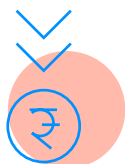
Figure 1: Seven Climatic Physical Risks and their Characteristics

Increasing	The physical climate risks are generally increasing across the globe. The increased physical risk would also increase socioeconomic risk.
Non-stationary	Physical climate risk is ever changing and nonstationary. Replacing a stable environment with one that is constantly changing means that decision making based on experience may prove unreliable.
Systemic	Climate change can have knock-on effects across regions and sectors, through interconnected socioeconomic and financial systems.
Spatial	Climate hazards manifest locally. The direct effects of physical risk must be understood in the context of geographically defined areas.
Non-linear	Physiological, human-made, and ecological systems have evolved or been optimized over time to withstand certain thresholds. Those thresholds are now being threatened. If or when they are breached, the systems may falter, break down or stop working.
Regressive	The poorest communities and populations of the world are the most vulnerable.
Unprepared	Our society hasn't confronted a threat like climate change, and we are unprepared. While communities are already adapting, the pace and scale of adaptation must accelerate. This acceleration may well entail rising costs and tough choices, as well as coordinated action across multiple stakeholders.

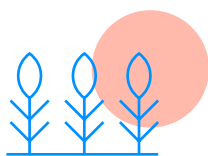
Source: McKinsey & Company,⁶ 2020

⁶ Climate risk and response: Physical hazards and socioeconomic impacts: McKinsey & Company; Jan 2020

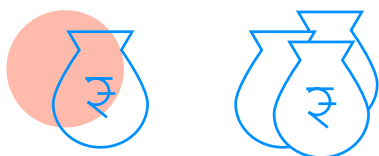
Because of its



low per capita income



heavy reliance on agriculture



and prevailing social inequality,

India is at the forefront in terms of risks posed by climate change; it routinely gets identified as one of the most vulnerable countries to its impacts. Based on the Global Climate Risk Index by Germanwatch, India ranked seventh amongst 183 countries assessed in 2019. In 2018, HSBC identified India as the most vulnerable country to climate change among 67 developed, emerging and frontier markets assessed.⁷ The Council on Energy, Environment, and Water (CEEW) has identified 75% of Indian districts as being vulnerable to extreme weather events,⁸ especially to the effects of intense cyclones and extreme droughts.⁹

⁷ India most vulnerable country to climate change - HSBC report: Reuters; March 2018

⁸ Climate Change Has Made 75% of Indian Districts Vulnerable to Extreme Weather: Study: The Swaddle; December 2020

⁹ India needs a plan for extreme weather caused by climate change: Arunabha Ghosh for Nikkei Asia; June 2020



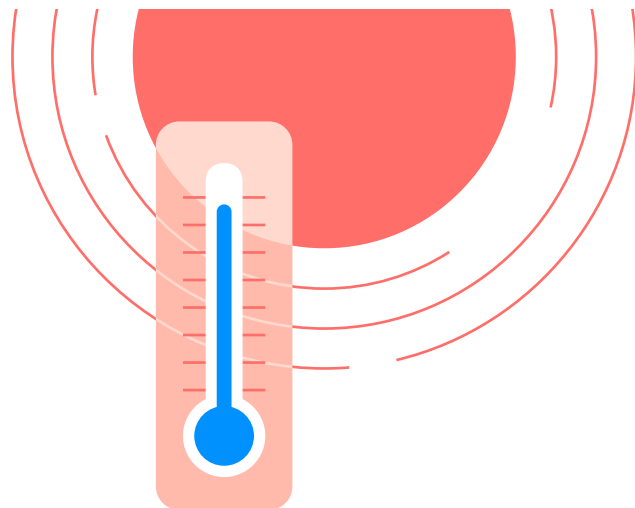


Figure 2: Implications of Climate Change for India

Getting hotter	India could become one of the first places in the world to experience heat waves that cross the survivability limit for a healthy human being sitting in the shade.
Projections for 2030	Without targeted adaptation action, around 160-200 million people in India could annually bear a 5 percent chance of being exposed to a lethal heat, a 40 percent cumulative likelihood over the decade centred on 2030
Economic impacts by 2030	The effective number of outdoor working hours lost will increase approximately 15 percent by 2030, resulting in approximately 2.5-4.5 percent, or \$150-250 billion, risk to GDP
Projections for 2050	By 2050, both the intensity of and exposure to lethal heat waves, as well as the impact on outdoor work, could increase in a nonlinear way.
Long tailed implications	Adaptation will be particularly challenging for the urban poor, who will likely require public support, for example in the form of emergency shelters.

Source: McKinsey & Company,¹⁰ 2020

¹⁰ Will India get too hot to work?: McKinsey & Company; November 2020

In the last two decades, India has been severely impacted by an unprecedented number of climatic disasters, including major droughts, floods, and cyclones.

In the summer of 2015, a series of intense heatwaves swept across much of India.

In 2016, Phalodi in Rajasthan, on the India-Pakistan border, hit 51°C, a new record for the highest day-time temperature in India.¹¹

Parts of Andhra Pradesh and Rajasthan have faced four droughts in the last four years while more than 20 districts in Karnataka reeled under drought for three years during this period.¹²

Amphan, the super cyclone that hit eastern India in 2020, and the floods that affected many parts of the country between June and October 2020 rank among the 10 most “expensive” extreme climate events the world saw last year.¹³ In addition to outright damage, the costs of these events also come in the form of loss of lives and of livelihood for the most vulnerable.

Chennai and Kerala endured once-in-a-century floods in 2015 and 2018, respectively. Experts have attributed the 2013 Uttarakhand floods to glacial melt caused by global warming.¹⁴

The increasing prevalence of climate-induced disasters around the world has led leaders from India and the world to take cognizance of the issues and chalk out a strategy for redressal.

In December 2015, leaders from 195 countries adopted the first universal, legally binding global climate accord at the 21st Conference of the Parties (COP21) held in Paris. Notably, they agreed to a long-term goal of limiting the increase in the global average temperature to well below 2°C above pre-industrial levels; in the longer term, even below 1.5°C above pre-industrial levels.¹⁵ The Paris Agreement is a landmark in the multilateral climate change process because, for the first time, a binding agreement brought all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects. In addition to being a party to this accord, the Indian government responded with the formulation of India’s Climate Change policy, which was initially documented in the National Action Plan on Climate Change (NAPCC) in 2008, and further articulated in - India’s Nationally Determined Contributions (NDCs) submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015.

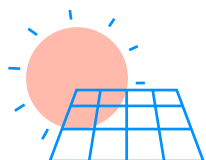
¹¹ Is extreme heat making India unlivable?: Mint; September 2020

¹² Why India struggles to cope with droughts: Hindu Businessline; May 2019

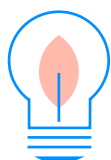
¹³ In 2020, India was hit by two of the world’s 10 most costly climate disasters: Scroll; January 2021

¹⁴ Uttarakhand glacier burst : The Hindu; February 2021

The National Action Plan on Climate Change (NAPCC) incorporates 8 National Missions with the following objectives:



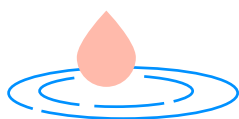
01 | The National Solar Mission (NSM) to hike the renewable energy capacity of the country;



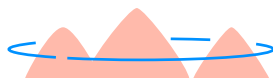
02 | The National Mission on Enhanced Energy Efficiency (NMEEE) to improve energy efficiency and meet the energy demands of the country;



03 | The National Mission on Sustainable Habit (NMSH) to reduce emissions in cities;



04 | The National Water Mission (NWM) to ensure water security and improve access to the resource;



05 | The National Mission for Sustaining Himalayan Ecosystem (NMSHE) to create knowledge and ease coordination between government and non-governmental agencies working on the Himalayan ecology;



06 | The Green India Mission (GIM) to increase forest and tree cover;



07 | The National Mission for Sustainable Agriculture (NMSA) to climate-proof agriculture and reduce emissions from the sector;



08 | The National Mission for Strategic Knowledge on Climate Change (NMSKCC) to generate knowledge, build scientific and technical capacity, and produce new channels of collaboration.

The increasing prevalence of climate-induced disasters around the world has led leaders from India and the world to take cognizance of the issues and chalk out a strategy for redressal. In December 2015, leaders from 195 countries adopted the first universal, legally binding global climate accord at the **21st Conference of the Parties (COP21)** held in Paris. Notably, they agreed to a long-term goal of limiting the increase in the global average temperature to well below 2°C above pre-industrial levels; in the longer term, even below 1.5°C above pre-industrial levels.¹⁵ The Paris Agreement is a landmark in the

multilateral climate change process because, for the first time, a binding agreement brought all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects. In addition to being a party to this accord, the Indian government responded with the formulation of India's Climate Change policy, which was initially documented in the National Action Plan on Climate Change (NAPCC) in 2008, and further articulated in India's Nationally Determined Commitments (NDC) submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015.



Source: Moniruzzaman Sazal / Climate Visuals Countdown

¹⁵ The Paris Agreement: United Nations Framework Convention on Climate Change

“Climate change is not gender neutral: climate change was considered gender-neutral, but when we did a gender analysis, gender neutral actually meant gender-ignorant.”

- Naoko Ishii, Chief Executive Officer, Global Environment Facility
(The New York Times, 2017)

1.2. The Impacts of Climate Change

The threats of climate change are not spread evenly. They have varied impacts across geographical regions, and within these, impact people differently based on prevalent socio-economic, cultural, and political systems and structures.

1.2.1. Impact on Women

Women and men are likely to experience climate change differently, with gender inequalities pervading around the world.

Particularly in the Global South, women bear a disproportionate burden of climate change due to existing gender inequalities, discriminatory customs, and unequal access to and control of resources and productive assets that marginalize them socially, politically, and economically.¹⁶

Women are disproportionately impacted during climate-induced crises due to the internalization of patriarchy. Women place themselves and girls at the lowest priority in rescue and relief operations. Their caregiving roles expand dramatically after a disaster and given that their access to resources is constrained, their ability to recover from the shock is hampered.¹⁷

¹⁶ Roots for the Future: International Union for Conservation of Nature Global Gender Office and Global Gender and Climate Alliance; 2015

¹⁷ Role of Women in Disaster Management: Vasudha Gokhale; October 2008

¹⁸ Explaining differential vulnerability to climate change: Wiley Interdisciplinary Reviews Climate Change; December 2018.

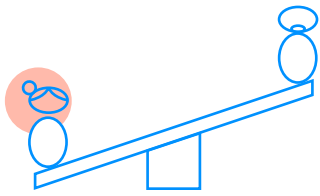


Source: Joydeep Mukherjee / Climate Visuals Countdown

In India, gender disparities because of climate change are more pronounced. Women not only face negative physical and psychological health issues but are also burdened with additional responsibilities during agrarian crises and natural disasters.

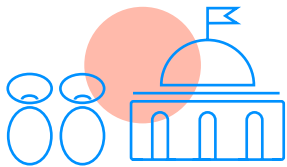
According to the International Union for the Conservation of Nature (IUCN), women are often responsible for food, water, and fuel, meaning the scarcity of these resources has an obvious impact. In rural farming populations, the effect of climate change on crops often means men end up migrating to towns or overseas for other jobs, so women are left with higher workloads and responsibilities.

Although women tend to bear the brunt of climate change, the effects are not the same for all women; factors such as race, caste, ethnicity, age, marital status, economic well-being, and religion impact how they experience the consequences of climate change. Social processes of marginalization and disenfranchisement play important roles in creating and reinforcing patterns of unequal access to resources, including information, skills, and knowledge-sharing forums. The impacts of climate change are expected to exacerbate these differences by aggravating existing vulnerabilities¹⁸ listed on the following page:



01 | Societal Norms: Patriarchy, Sexism, and Oppression

Patriarchy, coupled with sexism and oppression, reinforces gender imbalances while equipping men with more robust adaptive and coping capacities. During natural disasters, more lives of women are lost because resources tend to be diverted towards ensuring the safety and needs of male members of the family.



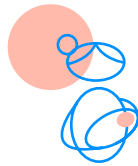
02 | Lack of an Enabling Environment: Low Representation in Political and Governance Spaces

In natural disasters, aid distribution and local governance units are dominated by men, and women have

“Climate change is tied to pregnancy risks, especially for marginalized, underprivileged and minority, women: pregnant women exposed to high temperatures or air pollution are more likely to have children who are premature, underweight or stillborn. Women bear a disproportionate share of the danger from pollution and global warming. Black moms’ matter, it’s time to really be paying attention to the groups that are especially vulnerable.”

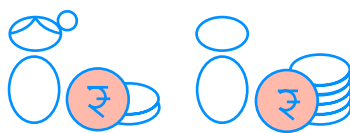
- Dr Bruce Bekkar MD, Southern California Permanente Medical Group, (Climate Action Campaign, San Diego 2020)

to rely on male relatives to represent them in the conversations and discussions pertinent to their future. As such, little attention is given to enabling women as active agents of resilience.



03 | Biological Roles: Child-Bearing and Nurturing

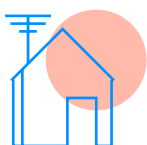
A Lancet Commission has identified that pregnant women, the developing fetus, and young children with nursing mothers are the most sensitive and vulnerable to climate change’s environmental effects. Climate disasters disrupt government programs on sexual and reproductive health and impact the ability of pregnant and postpartum women to access healthcare services and information.



04 | Poverty, Lack of Economic Opportunities and Control

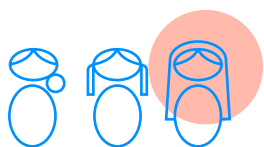
Lack of economic opportunities and control of resources compel women

to operate in a reactive mode focused on basic survival instead of proactively generating options for adaptive and resilient strategies to negate climate risks.



05 | Lack of Rights Over Assets such as House and Land

Women in the developing world are constrained in their ability to own, control, and access land. According to the Food and Agriculture Organization (FAO), in 2011, globally, less than 20% of all landholders were women. This gender disparity impedes their ability to grow wealth that can help tide over periods of difficulty such as climate disasters.



06 | Intersectionality: Caste, Ethnicity, and Descent

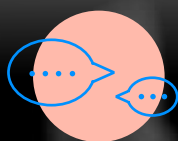
Pre-existing, hierarchical structures and systems of oppression in society are aggravated by climate change. Marginalized communities are already grappling with issues of food and livelihood security, even in the absence of climate change. With climate change creating scarcities, marginalized communities find it harder and more challenging to access basic necessities. Marginalized women who face the twin oppression of caste and gender are the most vulnerable to the climate crisis.

Historical Underrepresentation of Women's Contributions

Women are on the frontlines of experiencing climate impacts and yet, at every level of decision-making – from major international organizations to grassroots activism – their voices, ideas, and capabilities are underrepresented and undervalued. While there is a growing recognition of the role women play as agents and champions of change, women continue to be a minority on every central committee of the United Nation's own top climate change decision-making group, the UN Framework Convention on Climate Change. Women account for just over 20% of the authors on recent reports for the International Panel on Climate Change and less than 30% of the most significant national and global climate change negotiating bodies. While strides have been made towards this internationally with a Gender Action Plan under the Framework Convention on Climate Change, the plan is yet to be operationalized in India. Further, in the Indian context, the NAPCC lacks representation of and role for the Ministry of Women and Child Development. Without their perspectives and representation in these decision-making bodies, climate action plans will continue to be made without adequate focus on their specific issues.

Gender is included in the perambulatory and operative part of the 2015 Paris Agreement that was adopted at the 21st Conference of the Parties (COP21) at the United Nations Framework Convention on Climate Change (UNFCCC). The connection between climate change and gender is also about ensuring that women play crucial roles in setting the international agenda on climate change.

Impediments to Women's Participation in the Climate Change Conversation



Exclusion from Policy and Discussions



Food Insecurity



Economic Poverty


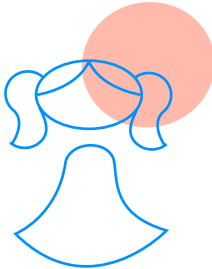
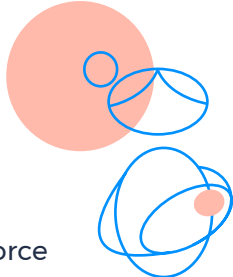


Lack of Access to Education



Limited to Access to Resources

Figure 3: India's Scoring on the Global Vulnerability Index

Birth	<p>Before Birth to Age 6 YYears</p> <ul style="list-style-type: none"> • Female feticide and infanticide • Adverse health events such as absence of or incomplete immunization. • Discrimination in parental care. • Discrimination in access to food and health care 			
Early Childhood				
Primary School	<p>Age : 6 to 11 Years</p> <ul style="list-style-type: none"> • Discrimination in parental care • Discrimination in access to food and healthcare • Low school enrolment and school drop-outs • Restriction on play • Vulnerable to trafficking, child labour, child marriage • Abuse, exploitation and violence 			
Secondary School/ Household Work				
Marriage	<p>Age : 12 to 18 Years</p> <ul style="list-style-type: none"> • Child marriage • Early child bearing • Frequent pregnancy and abortions • Susceptibility to STDs and HIV/AIDS • Maternal morbidity and mortality • Marital and domestic violence • Dowry harassment, desertion, polygamy, divorce • Limited access to information and services • Lack of voice whether in home or society 			
Living with Husband				
Marriage				
<ul style="list-style-type: none"> • Frequent illness due to malnutrition and anemia and micronutrient deficiency. • Restriction on mobility • Unpaid and unrecognized work and drudgery • Domestic chores including heavy domestic work such as commuting long distances to collect firewood or drinking water • Looking after younger siblings 				
Poverty	Protection	Education	Health & Survivability	India
0.490	0.630	0.499	0.526	0.5314

1.2.2. Impact on Adolescents

Adolescents, especially adolescent girls, remain vulnerable to a host of challenges during their early development. At different ages in their development stage, they face different challenges. To understand the same, Plan International highlighted these various effects and called attention to the particular vulnerability of adolescent girls to the effects of climate change. The Global Vulnerability Index (GVI) created by Plan (International) India, which is comprised of over 170 indicators, ranked India across four dimensions of gender vulnerability – Protection, Poverty, Education, and Health.

These impacts are most visible after natural disasters, which create shocks and upend daily living completely. Such natural disasters can have a range of impacts such as disruption to education, reduction of access to healthcare, and increased violence against adolescents.

Following the disruption to life due to COVID-19, a large percentage of adolescents, especially those without

access to their own mobile devices or personalized computers, were unable to continue their education seamlessly¹⁹. A telephonic interview survey conducted by the Population Council found that considerable proportions of young women were unable to access antenatal care, immunization, and contraception because of COVID-19.²⁰

These challenges can be further exacerbated by climate change.

It can disrupt daily living for adolescents and disallow them from realizing their full potential.²¹

It exposes pre-existing psychological vulnerabilities in adolescents. Young individuals with depression, anxiety, and other mental health conditions might be at a disproportionately increased risk for worsening symptoms in the face of changing climate. Natural disasters precipitated by climate change including hurricanes, heatwaves, wildfires, and floods can lead to direct psychological effects, such as increased rates of depression, anxiety, post-traumatic stress, and other mental health disorders.²²

¹⁹ How Does The Pandemic Impact Adolescents?: Feminism in India; May 2020.

²⁰ Access to RCH services during the COVID-19 crisis: Population Council Institute

²¹ Plan International, 2011 Report on Climate and Adolescent Girls

²² The impact of climate change on youth depression and mental health: The Lancet; June 2017



Figure 4: Effect of Climate Change on Girls

Education	In periods of crisis, girls are often the first one to drop out of school to help their families make money. If they are out of school, they are less likely to learn about climate change and how to deal with its effects.
Economic Impacts by 2030s	When families' income and ability to survive are put at risk, child marriage can be seen as an option to reduce the financial burden of taking care of girls.
Violence	After extreme weather events, girls are at increased risk of violence and exploitation, including sexual and physical abuse, and trafficking. These risks are heightened when collecting food, water and firewood, or when staying in temporary shelters.
Sexual and Reproductive Health	Disruption to health services due to disasters increases unplanned pregnancies and sexual and reproductive health problems. A lack of access to education can also limit girls' understanding of these issues.
Health and Nutrition	Girls are more likely to go hungry when food is in short supply. Also, certain diseases may affect girls more than boys if they are already suffering from malnutrition or a lack of water, especially during menstruation or if they are pregnant or young mothers.

Source: McKinsey & Company, 2020

“Following the 2004 tsunami, girls in Indonesia, India and Sri Lanka were forced into marriages with ‘tsunami widowers’ and in many instances did so to receive state subsidies for marrying and starting a family.”

- The Experience of the Adolescent Girls by Plan International Survey, 2011

While the short-term disruptions have some negative consequences, in the long run, some irreparable trends emerge – such as an increase in child marriages.²³ This practice is undertaken not only because parental concerns about their daughters' security increase in difficult times, but also because smaller dowries are demanded for younger girls, and marriage expenses can be minimized by marrying off all the daughters of the family together, in a single ceremony, irrespective of their age.²⁴

As in the case of women, adolescent girls from marginalized communities will feel the greatest impacts, but will not have the knowledge, information, or resources they need to cope.

Their domestic responsibilities, reproductive roles, limited access to education, healthcare, and a virtual absence of agency in decision-making processes all contribute to their greater exposure to climate risks. These are likely to lead to lower chances of survival (vis-à-vis boys and men) and a reduced capacity to pursue resilient livelihoods.²⁵



²³ Adolescent Girls, Human Rights and the Expanding Climate Emergency: Annals of Global Health; May 2015

²⁴ How Does The Pandemic Impact Adolescents?: Feminism in India; May 2020

²⁵ Adolescent Girls, Human Rights and the Expanding Climate Emergency: Annals of Global Health; May 2015

1.3. Integrating a Gender-Lens

Policy measures from the last decade have contributed towards establishing the scientific basis of climate change as a global crisis but have failed to comprehend and/or acknowledge the social and human dimensions of the problem.

The responses have primarily been technocratic and economically oriented, with a glaring absence of a focus on gender, and the asymmetric distribution of power between affected stakeholders.

Climate and development experts have now started exploring pathways for climate action that are centered on women and adolescents. Globally, numerous studies have been conducted to assess the projected impact of climate change on women.

In this report, we have corroborated insights from experts on the differentiated impacts of climate change based on gender, age, caste, and other factors to understand and highlight the role of gender in how people experience climate change, while also drawing out its implications in terms of expected

impacts in the business-as-usual scenario. While applying a gender-sensitive lens approach to the categories mentioned in the chapter above, we have assessed varied impacts of climate change on human development (i.e. factors such as education and health) while being cognizant of the different contexts that people come from.

Through this report, we seek to understand if anchoring climate solutions that are gender-integrated can lead to more robust climate action. Through the creation of this public resource, we strive to :

Compile existing literature and insights for this intersection in the context of India;

Shine a spotlight on unexplored gaps for philanthropists and other actors to fulfill,

Unpack the role of philanthropy and civil society at this intersection, and

Initiate conversations around identified entry points for engagement and possible interventions.

Figure 5: Applying a Gender-sensitive Lens to the Impacts of Climate Change



Source: Chase India, 2021

Climate Change and its Impact on Women across Sectors



Climate change will not only have an ongoing impact on human development but will also upend ecologies, food systems and result in more frequently occurring natural disasters. A changing climate and

increasing number of climatic events will directly affect socioeconomic structures, including: Food Systems, Human Capital, Natural Capital, and Isolated Climatic Events.

Figure 6: Climate Change Impacts on Four Categories Identified

<p>Food System</p>	<ul style="list-style-type: none"> • Climate change will directly affect 52% of India's total land under agriculture, which is directly dependent on seasonal rainfall patterns and rain-fed irrigation. • Agricultural income and allied productivity will fall by up to 20-25% for unirrigated areas. • Small and marginal landholding farmers dependent on rain-fed agriculture will be among the most severely affected by climate change. • Nearly 35 million people will find their nutrition intake impacted because of climate change.
<p>Human Capital</p>	<ul style="list-style-type: none"> • Health: Climate change will result in increased morbidity, spread of disease and mortality due to heat waves, floods, storms, fires and droughts. • Livelihoods: As 40% of India's food demand is met through rainfed agriculture, climate change represents a major threat to food security and rural livelihoods. • Human Displacement: In 2018, nearly 17.2 million people worldwide were displaced from their homes; 94% of these displacements were caused by weather related natural calamities.
<p>Natural Capital</p>	<ul style="list-style-type: none"> • Biodiversity and natural resources: 700 million living in rural areas directly depends on climate-sensitive sectors (agriculture, forests, and fisheries) and natural resources (such as water, biodiversity, mangroves, coastal zones, grasslands) for their subsistence and livelihoods. • Water resources: Climate change will significantly impact the availability of water used for domestic and productive tasks. The consequences of the increased frequency in floods and droughts are far reaching, particularly for vulnerable groups.

Figure 6: Climate Change Impacts on Four Categories Identified

<p>Isolated Climatic Events</p>	<ul style="list-style-type: none"> • Natural Disasters: India is vulnerable to a range of natural disasters, including floods, droughts, cyclones, landslides and heatwaves. The total losses from disaster events in India from over the past 20 years is approximately USD 79.5 billion. • Climatic Events Risk: India is one of the most risk-prone countries to natural hazards. It will battle with rapid and slow onset weather events on all fronts. • Sea Level Rise: By 2050, nearly 40 million Indians will be at risk of migration or losing their homes to rising sea levels.
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Source: Chase India, 2021

Food Systems

Agriculture and food security will take the hardest hit from climate change in India.²⁶ It has been found that climate change will singlehandedly distort and diminish agricultural incomes and productivity, particularly in unirrigated areas that would be hit hardest by rising temperatures and declines in rainfall.²⁷ Climate change will directly affect 52% of India's total land under agriculture. India is predominantly agrarian, and women play a vital role in the industry – they make up about 33% of cultivators and 47% of agricultural laborers. Two-thirds of India's population, about 850 million people, live in the rural areas, among whom 84 percent of women depend on agriculture

for their livelihood. **Given the high prevalence of women in agriculture and their lack of land rights, the increasing probability and frequency of extreme weather events due to climate change will impact their livelihoods and security.**

Human Capital

Climate change poses a risk, not only to physical infrastructure but also to the ability of billions of people to live healthy and happy lives. Climate change will take a toll on health, livelihoods, cause significant displacement of people and impact access to sanitation and sexual and reproductive health rights (SRHR). One of the first things that happen during climate emergencies is the loss of access to health services. This

²⁶ Changing climate puts, among others, India at risk: The Hindu; April 2018

²⁷ Climate change disrupts the goal of doubling farmers' income: DownToEarth; January 2018

can specifically affect adolescent girls because they rely on these health programs and services and loss of access to these can be detrimental to their wellbeing. Socio-economic shocks directly result in the stalling of the education of adolescent girls, if they come from poor, marginalized, and socially backward communities. Human displacement, livelihoods, and sanitation challenges for women also intensify during crises caused by climate change. Since women are usually in charge of tasks such as collecting water and firewood, they tend to have to travel even longer distances for the same in times of crisis. Therefore, when natural resources become scarce due to climate change, girls and women are exposed to sexual abuse and physical harm, while dealing with a lack of access to essential health services and sanitation.

Natural Capital

Rapid changes in India's climate would mean increasing stress on India's natural ecosystems, agricultural output, and freshwater resources, while also causing escalating damage to infrastructure. Women in rural areas are more linked with natural resource use and conservation than men and would thus, be more impacted. Their traditional gender roles bring them in daily contact with natural resources such as land, water, forest, and wildlife.²⁸

Isolated Climatic Events

With climate change exacerbating natural disasters and rogue weather events, scenarios such as the heatwave of 2015, which claimed over 2,300 lives, are only expected to rise. In addition to the human cost, the total losses from extreme weather events in India over the last two decades (1998-2017) have been valued at USD 79.5 billion. In post-disaster environments, the challenges for women are compounded by health, sanitation, safety, and economic concerns.



Source: Neil Parmar



Source: Nabin Baral/IWMI

²⁸ From interviews with experts.

		Gender-Neutral Impacts of Climate Change	Disproportionate Impacts of Climate Change on Women
Food Systems	Agriculture	<ul style="list-style-type: none"> • Crop failure and lower yield 	<ul style="list-style-type: none"> • Loss of income • Household food provision impacted
	Food Security and Nutrition	<ul style="list-style-type: none"> • Worsening health conditions • Food shortage • Chronic malnutrition 	<ul style="list-style-type: none"> • Anemic conditions
	Land Use Change & Land Rights	<ul style="list-style-type: none"> • Economic drawbacks • Resource scarcity • Lack of land tenure 	<ul style="list-style-type: none"> • Access to resources
Human Capital	Health	<ul style="list-style-type: none"> • Diseases • Lack of healthcare 	<ul style="list-style-type: none"> • Lack of access to healthcare • Increased burden of caring for young, sick, and elderly
	Education	<ul style="list-style-type: none"> • School dropouts • Erosion of formative years • Child labor and exploitation 	<ul style="list-style-type: none"> • Increased school dropouts • Child marriages
	Human Displacement	<ul style="list-style-type: none"> • Internal displacement • Forced migration • Loss of livelihoods • Lack of adequate shelters • Conflicts over natural resources or due to displacement 	<ul style="list-style-type: none"> • Added burden of household and farm responsibilities • Increased risk of physical and sexual violence and abuse

		Gender-Neutral Impacts of Climate Change	Disproportionate Impacts of Climate Change on Women
Human Capital	Livelihoods and Employability	<ul style="list-style-type: none"> • Loss of livelihoods • Economic drawbacks • Extended labor time 	<ul style="list-style-type: none"> • Physical risk from migration • Resource dependent livelihoods
	Sanitation	<ul style="list-style-type: none"> • Health and well being 	<ul style="list-style-type: none"> • Loss of dignity
	Sexual and Reproductive Health Rights	<ul style="list-style-type: none"> • Health and hygiene 	<ul style="list-style-type: none"> • Early marriages • Unplanned pregnancies • Forced abortions • Sexual abuse
Natural Capital	Forest and Biodiversity	<ul style="list-style-type: none"> • Resource scarcity • Food fuel conflicts • Loss of traditional values and knowledge systems 	<ul style="list-style-type: none"> • Loss of livelihoods • Household fuel provisions
	Water	<ul style="list-style-type: none"> • Shortage of safe clear water • Loss of livelihoods • Exposure to contaminated sources 	<ul style="list-style-type: none"> • Household water provisions
Isolated Climatic Events	Extreme Weather Events & Sea-Level Rise	<ul style="list-style-type: none"> • Greater incidence of mortality • Reduction of life expectancy • Forced migration and displacement • Loss of livelihoods and lives 	<ul style="list-style-type: none"> • Increased vulnerability to sexual violence • Greater incidence of mortality

2.1. Impact of Climate Change on Food Systems

Climate change is expected to impact food systems in more ways than one. Changing weather patterns

and an increase in extreme weather events are expected to impact crop production, and eventually, foods and nutrients. This can lower access to nutrients and nutrition in the food that is already available for consumption.²⁹

Figure 7: Impact of Climate Change on Agriculture, Food Security, and Overall Food Systems



Declining Rainfall

Climate change will directly impact **52%** of India's total land under agriculture, which is directly dependent on seasonal rainfall patterns and rain-fed agriculture



Global Hunger Index

India ranked **94th** amongst **107** countries on the Global Hunger Index in 2020



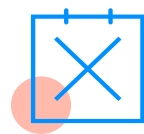
Loss of Income

Climate change could **reduce annual agricultural incomes by between 15% and 20%**



Food Absorption and Nutrient Uptake

Climate change could lead to a **reduction in the nutritional quality of food**; reduced concentration in proteins and minerals like zinc and iron



Farmer's Suicides and Debt

More than **8,000 farmers** and **4,500 agricultural labourers** have committed suicide between 2014 and 2015



Food Security and Yield

For every degree Celsius of temperature rise, it is estimated that wheat yields will drop by 6%, and rice yields will fall by 10%.

Source: Chase India, ²⁰²¹

²⁹ Managing Climate Change Risks in Food Systems: Transforming Food Systems for a Rising India; May 2019

2.1.1. Agriculture

Indian agriculture is highly vulnerable to climate change largely because the sector continues to be highly sensitive to monsoon variability.

Climate change will directly affect 52% (73.2 million hectares area of a total 141.4 million hectares net sown area) of India's total land under agriculture, which is directly dependent on seasonal rainfall patterns and rain-fed irrigation.³⁰ While trends in rainfall are hard to estimate because of confounding factors and changes in the distribution of rainfall across a year, it is clear that some parts of India, such as Chhattisgarh, have shown a significant decline in rainfall.³¹ Others, such as Kerala, have also seen a declining trend in rainfall for the past 50 years. Some climatic models indicate that this is likely due to global warming and climate change.

The changing rainfall patterns have led to the increased migration of men to urban centers in search of jobs, due to falling productivity and uncertainty. Women, who can't migrate as easily, are left behind and become overburdened with agricultural work. Coupled with their existing household responsibilities, this places women in a tenuous position. Adolescent girls, too, are often made to drop out of school to support their mothers in the fields.

As women make up a majority of the agricultural workforce and the proportion is growing, they will be more impacted by the effects of climate change on the sector. 65% of agricultural workers are women,³² and 84% of women are dependent on agriculture for their livelihoods; they will be impacted by shifts in agricultural production.³³ **To top this off, aggravating factors such as unequal access to resources and decision-making process, and constraints on physically relocating themselves place women in rural areas in a precarious position.**³⁴

Dalit and Adivasi women are the most vulnerable during these exigencies, as they do not own land and largely work as agricultural labor.³⁵ After any serious weather event, such as floods, tea estate or agricultural farm owners do not employ labor for some time. Thus, their livelihood security is compromised, and these women become more vulnerable to locked-in poverty and food insecurity.

³⁰ Economic Survey 2017-18: Financial Express; January 2018

³¹ Agriculture is taking the hardest hit of climate change in Chhattisgarh: Mongabay; April 2019

³² Women May Be More Vulnerable to Climate Change but Data Absent: IndiaSpend; July 2019

³³ Making Climate Action Account: ORF Occasional Paper; November 2018

³⁴ Women, Gender Equality and Climate Change: Women Watch

³⁵ From interviews with experts.



2.1.2. Land Use Change and Land Rights

Climate change will have considerable effects on land use due to melting of snow, spatial and temporal rainfall variability, availability of irrigation, frequency and intensity of inter and intra-seasonal droughts and floods, soil organic matter transformations, soil erosion, change in pest profiles, a decline in arable areas due to submergence of coastal lands, and availability of energy. All these can have a tremendous impact on agricultural production and hence, food security of any region.³⁶ A study of 76 drought-prone districts and two sub-basins in Ladakh found that about 30% of the country's total area, is currently undergoing degradation.³⁷

Women's land and tenure rights are among the biggest threats to gender equity in times of a changing climate. Where the legal recognition of farmers usually results from land ownership, only 12.69% of rural women enjoy the same. A low rate of women's land ownership could act as a potential barrier to their access to government schemes, subsidies, and agriculture resources. Equal access for women and men to land and productive resources could increase farm yields by 20-30% and benefit a 'triple dividend' of gender equality, food security, and climate management, thereby offering a cost-effective and transformative approach to the pursuit of the SDGs.³⁸

Statutory and/or customary laws often restrict women's property and land rights and make it difficult for them to access credit and agricultural extension services.³⁹

Women face social, economic, legal, and cultural challenges concerning property rights. In some states of Eastern India, male members of the family have begun to migrate for work due to land degradation, leaving women behind to manage the farms. However, without clear documentation proof of ownership, women find it hard to access resources such as agricultural credit, which are essential to sustaining themselves.

Emerging evidence suggests that when women hold secure rights to land, efforts to tackle climate change are more successful, and responsibilities and benefits associated with climate change response programs are more equitably distributed. Conversely, without effective legal control over the land they farm or the proceeds of their labor, women often lack the incentive, security, opportunity, or authority to make decisions about ways to conserve the land and to ensure its long-term productivity. Women in this situation know that if they work to irrigate their fields or plant border trees, there is a good chance that they will not be the ones to reap the benefits.⁴⁰

³⁶ Impact of Climate Change on Indian Agriculture: Climatic Change; 2006

³⁷ Community Resilience: The Heart of Climate Action - Opportunities For Philanthropy 2020, Rohini Nilekani Philanthropies and India Climate Collaborative

³⁸ Making Climate Action Account: ORF Occasional Paper; November 2018

³⁹ Agriculture, gender and climate change: Gender CC
⁴⁰ Women Gaining Ground: Landesa; December 2015.

2.1.3. Food Security and Nutrition

Climate change affects food security in complex ways. It impacts crops, livestock, forestry, fisheries, and aquaculture, and can cause grave social and economic consequences in the form of reduced incomes, eroded livelihoods, trade disruption, and adverse health impacts.⁴¹

It could lead to a reduction in the nutritional quality of foods.

The connection between climate change and nutrition is complex and multifaceted. Undernutrition can be exacerbated (increased nutrient demands and reduced nutrient absorption) by the effects of climate change at all stages of the food value chain. Suboptimal diet during vulnerable stages, especially pregnancy and lactation, may have adverse repercussions for several generations. There is also evidence that environmental changes reduce yields of starchy staple crops and alter the nutrient composition of fruits, vegetables, and legumes.⁴² It has been projected that by 2050, India will experience a 2.9% increase in zinc-deficient population (with 49.6 million new zinc-deficient people) and a 2.2% rise in protein-deficient population (with 38.2 million new protein deficient people).

Cultural practices that prioritize food to children and adult males

are more pronounced during climate emergencies and can negatively impact nutritional standards for women. Women are inherently sensitive to the effects of food insecurity and resulting increased nutritional needs during menstruation, pregnancy, and nursing. Poor nutritional status with resulting anemia is highly prevalent among women and children in India.⁴³

Nutrition is one of the most overlooked components of climatic impacts, and it has far-reaching consequences for children, adolescent girls, young women, and older women. The girls among them, with continued inadequate food, health, and care, grow up too often as another generation of malnourished mothers who have low birthweight babies of their own.⁴⁴

⁴¹ Climate Change and Food Security in India: Observer Research Foundation; September 2016

⁴² Climate change is exacerbating India's nutrition and health insecurity: Financial Express; March 2019

⁴³ Climate Change and Women's Health: GeoHealth; September 2018

⁴⁴ The Impact of Climate Change and Bioenergy on Nutrition: Food and Agriculture Organization; June 2012



2.2. Impact of Climate Change on Natural Capital

Natural capital provides a range of commodities and services that are essential to human survival and well-being. For a significant number of households in India, particularly women, their livelihoods depend on natural resources, particularly forests and water bodies. Ecosystem services provided by forests and grasslands are critical to the sustenance of life, for maintaining natural equilibrium, and soil fertility. The interconnectedness between and among various life forms, and between animate and inanimate beings, is a delicate balance kept intact on the foundation of natural capital. But climate change is accelerating their depletion and degradation.⁴⁵

Nearly 200 million Indians are directly dependent on forests as a primary livelihood source while around 100 million live on land classified as forest

By 2030, the national water supply is forecast to outstrip demand by 100%, leaving 40% of the population without access to drinking water

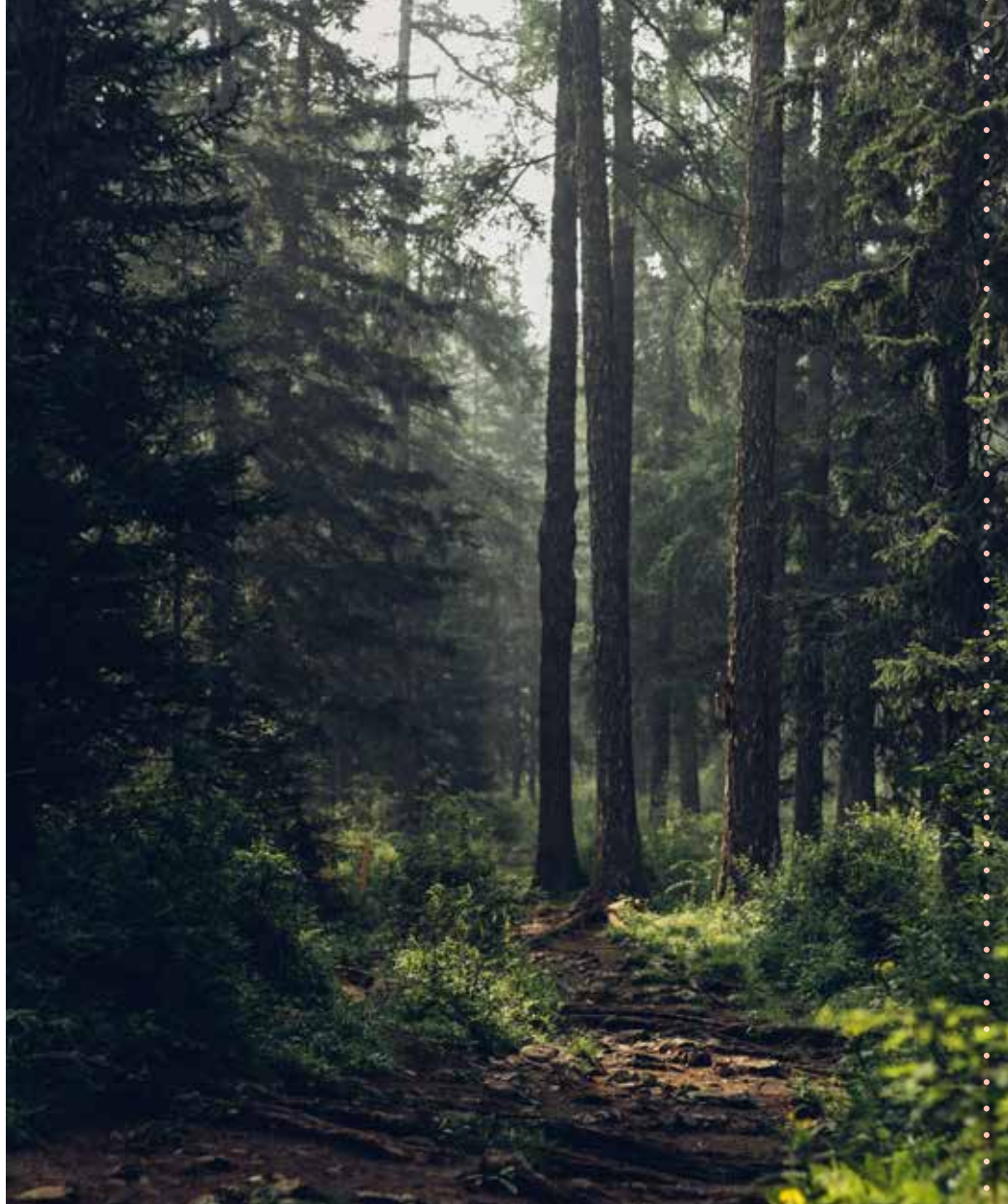
Around 600 million Indians already face high to extreme water stress, and 70% of available water resources are contaminated

⁴⁵ Reduced dividends on natural capital?: McKinsey Global Institute; June 2020

⁴⁶ Integrating Biodiversity Conservation and Human Well-being in India: Economic and Political Weekly; December 2020

⁴⁷ India faces worst water crisis: NITI Aayog; The Hindu; June, 2018

⁴⁸ Half the World to Face Severe Water Stress by 2030 unless Water Use is "Decoupled" from Economic Growth, Says International Resource Panel: United Nations Environment Programme; March 2016



2.2.1. Forest and Biodiversity

Climate change is expected to be the leading cause of the loss of biodiversity by the end of the century.⁴⁹ In its flagship Living Planet Report 2020, the World Wide Fund For Nature (WWF) has warned that global biodiversity is in steep decline.⁵⁰

Climate change is imposing severe threats to, and having dramatic effects on, a wide range of India's biodiversity. India is a mega-diverse country with four out of thirty-four global biodiversity hotspots hosting tens of thousands of faunal and floral species distributed

over the varied forest, wetland, shrubland, grassland, desert, coastal, and marine ecosystems. Variation in precipitation and temperature are the two important aspects of climate variability that are likely to have a direct and significant effect on India's biodiversity. The Ministry of Earth Sciences, Government of India, warns that the rapid changes in India's climate would mean increasing stress on India's natural ecosystems, agricultural output, and freshwater resources, which will escalate damage to infrastructure⁵².

⁴⁹ Ecosystems and their services: Millennium Assessment

⁵⁰ Living Planet Report 2020: World Wildlife Foundation; 2020

⁵¹ Exploring the 4-Cs Framework: Economic and Political Weekly; December 2020

⁵² Assessment of Climate Change over the Indian Region: Ministry of Earth Sciences, Government of India; 2020



Advances in technology and infrastructure development notwithstanding, traditional fuels, including firewood, continue to be the main cooking fuel for many households in rural areas. Women and girls spend several hours every week, as the primary responsibility-holders, for the collection of fuelwood. Girls are sometimes kept home from school to help gather fuel/fodder/water, thus perpetuating the cycle of deprivation and disempowerment.⁵³ Environmental degradation will make this task even more arduous, forcing girls to search farther afield for resources, and making them more vulnerable to injuries from carrying heavy loads over long distances, while also magnifying associated risks from sexual harassment and assault.⁵⁴

The North-East of India in particular is more vulnerable to the effects of climate change. Forming a part of the Indo-Burma Ecological hotspot, this

region is characterized by communal ownership of forests and the practice of shifting cultivation, which has become unsustainable and detrimental due to the shortening of fallow cycles (the intermittent period between two crops being planted). This change has had huge implications on the biodiversity of the region, affecting the water recharge, soil binding capacity, landslides, etc.

Women are both the biggest knowledge banks related to forests, agriculture, water resources, kitchen gardens, or livestock, and are also likely to be the most affected by climate degradation of biodiversity. Forest fringe communities are dependent on womenfolk to collect firewood and non-timber forest produce in terms of plants and roots used for diet and cultural and religious purposes. Many of these are replaced by a change in vegetation so women have to work harder as well as walk farther.

⁵³ From interviews with experts.

⁵⁴ Factsheet: UN Women Watch

2.2.2. Water

Water resources in India are already under stress with groundwater levels depleting at an alarming rate.

According to NITI Aayog, the source of 40% of India's water needs is depleting at an unsustainable rate. The impact of climate change on the availability of freshwater is an area of concern for India and the growing propensity for droughts and floods because of changing rainfall patterns caused by climate change would be detrimental to surface and groundwater recharge, posing threats to the country's water security.⁵⁵

Water scarcity and stress are going to further magnify because of climate change. More than 44% of the country experiences drought of various degrees (abnormally dry to exceptionally dry). About 100 districts of the country have witnessed drought-like conditions in 9 of the past 15 years, triggered by a failure of the Southwest monsoon. Wells and ponds have dried up, rivers have shrunk, and water scarcity has become a way of life.

The consequences of increased frequency of floods and droughts are far-reaching, particularly for

vulnerable groups, including women who are responsible for water management at the household level. Climate change impacts both the availability and quality of water for domestic and agricultural uses; thus, it has implications for women on both fronts – in collection, as well as judicious utilization.⁵⁶

Water scarcity, drought, and climate change deepen gender disparities and injustice, particularly in arid and semi-arid regions of the country. In India, women and girls bear the burden of fetching water for their families and spend significant amounts of time hauling water from distant sources. In desert regions like Thar, the population around villages is scattered with a central source of water in the villages. As a result, women and girls often have to walk 10-15 kilometers a day to reach this central source; this can result in a time loss of 5-6 hours a day.

The UN Sustainable Development Goals have three dedicated goals for Gender Equality (SDG 5), Clean Water and Sanitation (SDG 6), and Climate Action (SDG 13). Identifying interlinkages between these goals will facilitate more effective implementation of the goals. Gender equality and gender responsive activities are also recognized elements in the Paris Agreement. There is global consensus that women are integral to climate change dialogue, not just because of their role and dependence on natural resources, but also because of their disproportionate vulnerability to climate change threats.

⁵⁵ Assessment of Climate Change over the Indian Region: Ministry of Earth Sciences; 2020

⁵⁶ Climate change might be a greater threat to women, but data absent: Business Standard; July 2019

India recorded extreme weather events triggered by climate change every month of 2019

By 2050, the probability of at least one heatwave occurring during the decade centered around 2050 will be ~80%

82% of India's population is exposed to different kinds of natural hazards and 75% of all its districts are considered extreme climate event hotspots

By 2050, the number of people living in at-risk regions will increase, and the average annual probability of a natural disaster will be 14%

Around 12% are exposed to floods; 68% to droughts, landslides and avalanches; 59% landmass is earthquake-prone; and tsunamis & cyclones are regular phenomena along 5,700 km of the 7,516 km-long coastlines

Over the last two decades (1998-2017), total losses from extreme weather events in India have been valued at USD 79.5 billion

Source: Multiple Sources^{57 58 59 60}

⁵⁷ Will India get too hot to work?: McKinsey Global Institute; November, 2020

⁵⁸ India is not prepared for natural disasters: Hindu BusinessLine; January, 2020

⁵⁹ Preparing India for Extreme Climate Events: Council on Energy, Environment and Water; December, 2020

⁶⁰ India lost USD 79.5 billion from climate-related disasters in 20 years: UN report: Hindu BusinessLine; October, 2018

Evidence shows that there's a direct correlation between the number of girls going to school and the number of water harvesting structures close to homes. In water-crisis-ridden districts such as Betul in Madhya Pradesh, it was found that adolescent girls had to start early at 4 a.m., to fetch water for the family, resulting in higher drop-out rates.⁶¹

As with other forms of biodiversity, women can play a key role in natural resources management as they have the knowledge and experience gained from working closely with their environment, and their analytical skills in their community can play a vital role in sustainably developing water and forest resources.⁶² Women in rural areas are more linked with natural resource use and conservation than men. Their traditional gender roles bring them in daily contact with natural resources such as land, water, forest, and wildlife.⁶³ They also tend to look at water management from a different perspective than men. While men generally look at it from the perspective of the technicalities, its use, its application; women look at it from domestic uses, but also how it can be shared and how it can take care of the ecosystems.

⁶¹ Girls in this MP district are missing school to fetch water: India Today; June 2019

⁶² The importance of women in natural resources management: India Water Portal; December 2015

⁶³ Women and their role in natural resources: International Journal of Research Granthaalayah; October 2015

⁶⁴ Extreme Weather and Climate Change: Center for Climate and Energy Solutions

⁶⁵ Preparing India for Extreme Climate Events: Council on Energy, Environment and Water; December 2020

⁶⁶ Preparing India for Extreme Climate Events: Mapping Hotspots and Response Mechanisms. New Delhi: Council on Energy, Environment and Water; December 2020

2.3. Impact of Climate Change on Isolated Climatic Events

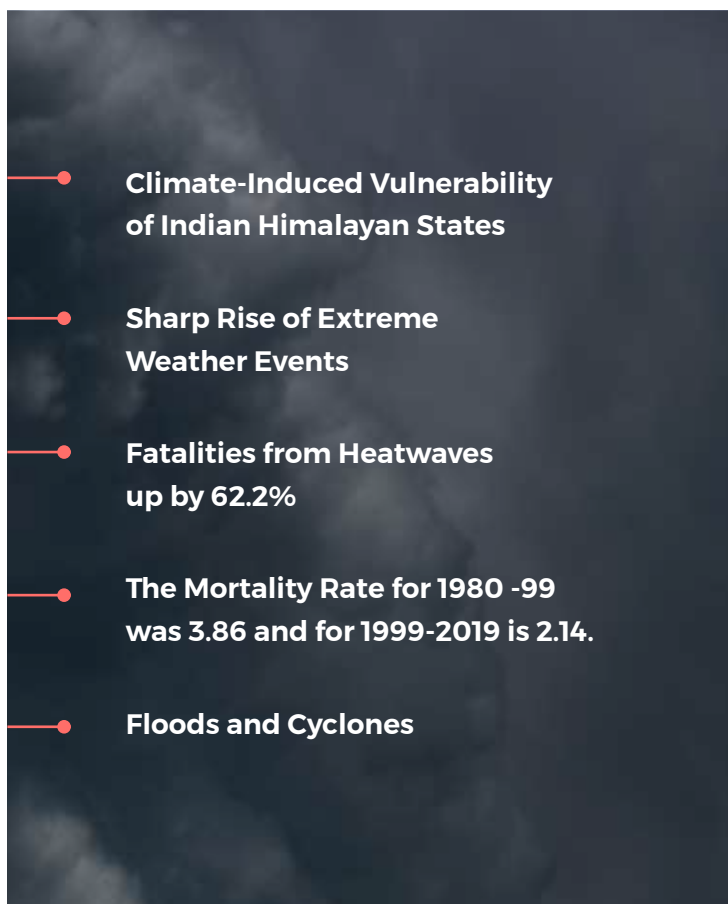
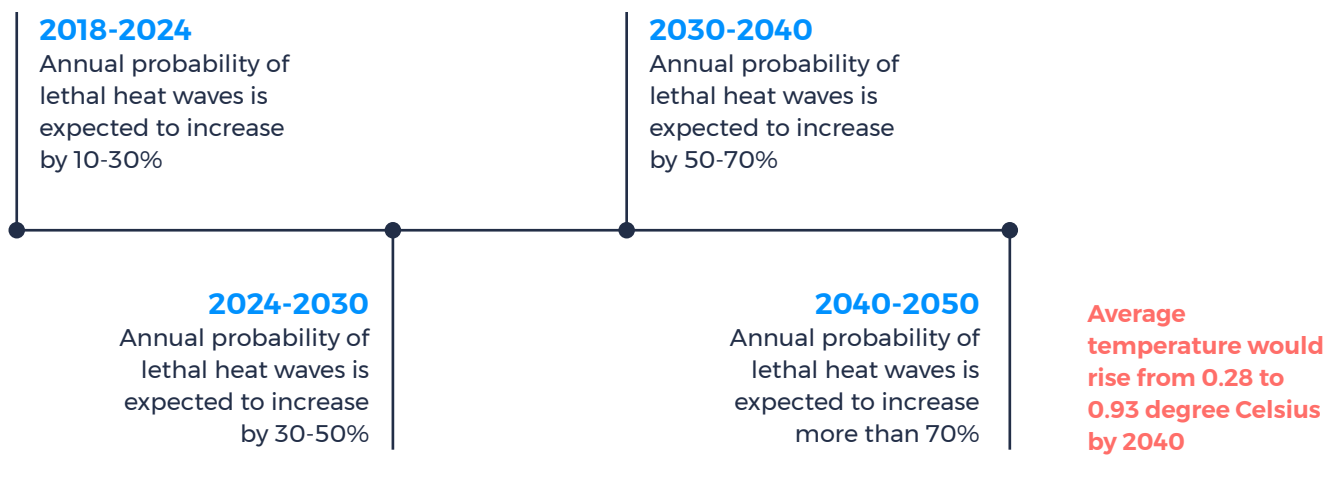
Climate change is expected to worsen the frequency, intensity, and impact of extreme weather events.⁶⁴

Against the backdrop of changing climate, the frequency, intensity, extent, and duration of weather events are also changing, leading to unprecedented extremes with catastrophic consequences; these include acute hazards such as cyclones, droughts, and floods, and chronic hazards, such as rise in sea level.⁶⁵

2.3.1. Extreme Weather Events and Natural Disasters

India has a diverse topography spanning the entire sub-continent, which gives rise to a multitude of ecological and climatic conditions. According to the Council on Energy, Environment and Water (2020), “more than 75 per cent of Indian districts, which are home to over 638 million people, are extreme climate event hotspots.”⁶⁶ The National Disaster Management Authority has estimated that around 40 million hectares (MH) (12%) of the country's area is exposed to floods; 247 MH (68%) is susceptible to droughts, landslides and/or avalanches; 213 MH (59%) landmass is classified as earthquake-prone, and tsunamis and cyclones are regular phenomena along 5,700 km of the 7,516 km-long coastlines. These vulnerabilities have resulted in India being amongst the top disaster-prone countries.

Figure 8: Climate Change-induced Vulnerabilities



Assam, Mizoram, and J&K are the **most vulnerable states** followed by Sikkim, Nagaland, Himachal Pradesh, Uttarakhand, Meghalaya, West Bengal and parts of Bihar

Compared extreme weather events across two twenty years periods 1980-1999 and 2000-2019 saw an **increase of 138% in heatwaves, 193% in lightning strikes, 25% in cold waves and 28% in floods.**

Over 50 years, 7063 extreme weather events occurred in India causing **141,308 deaths** with an average of **20 deaths per event.**

Floods were responsible for maximum mortality (**46.1% of total deaths followed by tropical cyclones 28.6%**)

Source: Multiple Sources ^{67 68}

⁶⁷ Will India get too hot to work?: McKinsey; November 2020

⁶⁸ Climate Vulnerability Assessment for the Indian Himalayan Region Using a Common Framework: IIT Guwahati and IIT Mandi; 2018-19

Natural disasters due to rapidly changing climatic conditions will gnaw away the country's economy, causing loss of life and denting its gross domestic product.⁶⁹ With climate change exacerbating natural disasters and rogue weather events, scenarios such as the heatwave of 2015, which claimed over 2,300 lives, are expected to rise. **Over the last two decades (1998-2017), total losses from extreme weather events in India have been valued at USD 79.5 billion.**⁷⁰

Women and girls are disproportionately impacted by natural disasters because of their marginalization in society.

Several studies have established that boys are likely to get preferential treatment over girls in rescue efforts in the aftermath of natural disasters. Girls are additionally disadvantaged because of their social indoctrination, physical inhibitions, and lack of survival skills, such as running, climbing, or swimming. Women are reluctant to evacuate hazardous sites without explicit instructions either from the men in their household, or the village elders.

In post-disaster situations, the challenges for women are compounded by health, sanitation, safety, economic, and cultural concerns. Relief shelters often lack adequate sanitation facilities and are seldom equipped to meet the specific sanitation needs of women and girls, which frequently manifests as urinogenital infections. A rise in incidents of female trafficking have been documented in the wake of natural disasters.⁷¹

Among the first casualties following disasters are the lifestyle and aspirations of adolescent girls; their education and freedom of movement get restricted, even as they are expected to take on a greater share of household and care responsibilities. The second-order impact is visible in the form of an increase in child marriages. This was most observable in Tamil Nadu in the aftermath of the 2004 tsunami, when many girls younger than 18, were forced to drop out of high school and get married.⁷²

2.3.2. Sea Level Rise

Sea level rise (SLR) is one of the more serious and irreversible impacts of climate change, with rising waters threatening to inundate small-island nations and coastal regions by the end of the century. In India especially, this is cause for concern – the country has seen the rate of increase in the mean sea level in the northern Indian Ocean, almost triple to ~3.3 mm per year between 1993 and 2017.⁷³ Additionally, it is estimated that the rise in sea level due to global warming will impact more people in Asian countries, including India, than any other region worldwide⁷⁴ Sea level rise, along with erratic rainfall patterns and high tides can lead to disastrous consequences for India's 7,516-kilometer coastline which runs across nine states; it is estimated that by 2050, nearly 40 million Indians will be at risk from rising sea levels. **Parts of India's financial capital, Mumbai, is believed to be at risk of submergence by 2050 according to some models.**⁷⁵

⁶⁹ Natural disasters cost \$232 billion in 2019 : Down To Earth; January 2019

⁷⁰ India lost \$79.5 billion due to climate-related disasters in last 20 years: Mint; October 2018

⁷¹ Women and Girls in Disasters: Center for Disaster Philanthropy

⁷² The Role of Media in Science and Technology Education, Development and Rehabilitation of Women Affected by the 2004 Tsunami in the State of Tamil Nadu : Journal of Tsunami Society International; 2011

⁷³ The Surprisingly Difficult Task of Measuring Sea-Level Rise Around India: The Wire; August 2020

⁷⁴ Sea level rise to impact more population in Asia, including India: The Hindu; January 2020

⁷⁵ Mumbai, Kolkata, Chennai May Be Submerged By 2050: India Spend; October 2019

Submergence of commercially important cities and port areas will drive inland migration as local infrastructure and livelihood options get obliterated. Sea-level rise forces people to migrate inland, and erratic monsoons and droughts will force people to consider livelihood options other than agriculture, which will have further adverse impacts on agricultural production and food security. Women and girls often bear the brunt this instability, as they are often prioritized last in comparison to men and boys in the family. In low-lying areas such as the Indian Sundarbans, the impact of sea-level rise is already evident. Satellite

pictures show that the sea level has risen by an average of 3 centimeters (1.2 inches) a year over the past two decades in the Sundarbans, well above the global average. During that period, four islands have completely disappeared, and 6,000 families have become climate refugees).⁷⁶

2.4. Impact of Climate Change on Human Capital

Climate change poses a serious threat, not only to the infrastructure that is visible around us but also to the human capital of billions of people.

⁷⁶ On the front line of climate change in India's Sundarbans: Mongabay; October 2019

⁷⁷ Human capital and climate action: World Bank Blogs; May 2020

Figure 9: Impact of Climate Change on Human Development

Climate change poses a serious threat, not only to the infrastructure that is visible around us but also to the human capital of billions of people.⁷⁷

Health

Climate change can impact physical health and exacerbate existing mental health conditions such as anxiety and depression

Education

Natural disasters disrupt education, sometimes resulting in adolescent girls not being able to return to education

Human Displacement

Displacement due to climate change can increase the vulnerability of women, whose roles and responsibilities expand

Sanitation

With water scarcity increasing, sanitation and availability of uncontaminated water sources reduces

Livelihoods & Employability

Physical labor will get increasingly different because of climate change

Sexual and Reproductive Health Rights

Access to SRHR gets impacted during natural disasters

Source: Chase India, 2021

2.4.1. Health

Climate change affects the social and environmental determinants of health - (clean air, safe drinking water, adequate and nutritious food, and secure shelter for instance) - changing the severity and frequency of health problems already existing in that area. Between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths per year, from malnutrition, malaria, diarrhea, and heat stress.⁷⁸

India is especially vulnerable due to its diverse array of agro-ecological / agro-climatic zones. From the

Himalayas in the far north to coastal megacities to deserts, the nation is consistently ranked as one of the most vulnerable to the effects of climate change.⁸⁰ For example, on May 16, 2016, regions around Phalodi (Rajasthan) saw temperatures reach 51°C resulting in heat strokes, exhaustion, kidney failures, and severe dehydration, especially among the very young and elderly.

Given that the impacts of climate change are projected to increase over the next century, some existing health threats will intensify, and new threats may emerge.⁸¹

⁷⁸ Climate Change and Health: World Health Organization; February 2018

⁷⁹ Global Climate Risk Index: Germanwatch⁸⁰ 1.4 bn people face severe risks in South Asia, as region struggles to build resilience: Verisk Maplecroft; March 2016

⁸¹ Climate Effects on Health: Centers for Disease Control and Prevention

Figure 10: Health Threats Expected to Intensify

<p>Increasing ground-level ozone and/or particulate matter air pollution</p>	<p>Due to India's heavy reliance on coal, millions suffer respiratory problems from smoke inhalation, meaning deaths due to increased temperatures are also likely to increase. Many Indian cities find themselves in the midst of an air pollution crisis. Delhi is afflicted by toxic smoke clouds containing over six times the acceptable pollutant level, leading to serious respiratory issues.</p>
<p>Lengthening of the transmission seasons of important vector-borne diseases and to alter their geographic range</p>	<p>Concerns over the spread of vector-borne diseases such as malaria, dengue, etc. in India are well-founded, with 96% of the population exposed to malaria and over 2 million annual cases. Many infectious agents, vector organisms, and the rate of pathogen replication are sensitive to climate conditions.</p>
<p>Water-borne diseases are sensitive to climate and show seasonal variation</p>	<p>A report from the Ministry of Health and Family Welfare estimates that nearly 40 million people are affected by water-borne diseases every year. Both floods and drought are risk factors for water-borne diseases (cholera and various diarrheal diseases). When floodwaters become contaminated with animal waste, outbreaks of leptospirosis may occur. Outbreaks of rotavirus, cholera are also reported in past after floods.</p>



Women and men suffer different adverse health consequences of climate change. Food intake and nutritional profile of women and men are influenced not only by their life-stage and biology but are also socio-culturally mediated. In the household food hierarchy, although women and young girls are responsible for preparing meals and feeding the family, they are the last ones to consume food, often ending up with insufficient quantities. In food scarce scenarios, gendered food disparities will be reinforced.

Additionally, women are differentially exposed to health hazards as a result of domestic choices such as the choice of cooking fuel, a decision that

is likely to be impacted by climate change. For example, rural and tribal women in India bear the responsibility of collecting biomass for cooking through highly-polluting solid fuels. On an average, in single day, women spend about 94 minutes each day cooking, adding up to roughly 23 days a year, in contrast to just 25 mins per day or 7 days annually by men, impacting their health significantly.⁸² Despite efforts being made to move towards liquified petroleum gas (LPG) challenges in implementation⁸³ have meant that households in rural India are shifting towards traditional fuels like firewood, cow dung, and kerosene with significant negative health impacts for women.⁸⁴

⁸² (WHO, 2016)

⁸³ (Kumar et al., 2020; Sharma, 2020).

⁸⁴ (Jairaj and Kumar, 2019)

Pregnant and postpartum women and their infants are uniquely vulnerable to the health impacts of climate change, due to the many physiological and social changes that occur as a result of pregnancy.

Climate change can worsen environmental hazards that threaten the health of pregnant women and increase health risks for the baby, such as low weight at birth and/or pre-term birth. Pregnant and postpartum women are also at an increased risk for severe stress and other negative mental health outcomes due to weather-related disasters associated with climate change.⁸⁵ Drought endangers pregnant women's access to safe and reliable water sources for drinking and sanitation, increasing their vulnerability to dehydration and infectious agents. Floods place pregnant women at increased risk of exposure to environmental toxins and mold, reduced access to safe food and water, psychological stress, and disrupted healthcare. Other flood-related health outcomes for mothers and babies include maternal risk of anemia, eclampsia, and spontaneous abortion. Extreme heat exposure can lead to dehydration and renal failure in pregnant women. Pregnant women in India, who are exposed to poor air quality, may be at higher risk of stillbirths and miscarriages, as per The Lancet. The Lancet study also indicates that air pollution accounted for 7% of annual pregnancy loss in South Asia from 2000-2016.

In India, where rapid environmental changes are taking place, climate change threatens to widen existing gender-based health disparities. There is severe gender injustice caused by

droughts and climate change because women have to travel long distances to fetch water for domestic use which causes health problems such as arthritis, uterus collapse, malnutrition, anemia but also in mental health issues. In instances of climate crises, the disparities will widen in men's and women's access to care, simply because women are much more likely to need domiciliary services than men – meaning that someone will have to come to them – which is unlikely to occur in a crisis.

Similarly, adolescent girls often rely on government health programs, such as Rashtriya Kishor Swasthya Karyakram (RKSK), or civil society interventions for access to weekly iron and folic acid supplementation (WIFS) to prevent anemia, and lose access to them during climate crises and emergencies⁸⁶.

Caste is likely to further worsen the impacts of these situations. Many Dalit women reside in disaster-prone areas and due to climate change, their livelihoods are threatened.⁸⁷ Dalit women are often refused admission to hospitals or denied access to healthcare and treatment.

⁸⁵ The Impacts of Climate Change on Human Health in the United States: U S Global Change Research Program; 2016

⁸⁶ Adolescent Health (RKSK): National Health Mission

⁸⁷ The Situation of Dalit Rural Women: Navsarjan Trust (India), FEDO (Nepal), and International Dalit Solidarity Network; September 2013.



2.4.2. Education

Climate change can impact education in different ways. Most directly, climate-related disasters can interrupt children's and adolescents' education by damaging or even destroying schools and relevant infrastructure. As a result of the floods that ravaged Kerala in 2018, over 650 schools were damaged in the state⁸⁸. Further, the Kerala floods of 2017 damaged over 7000 schools across the country⁸⁹.

Climate disasters can also cause injury to parents, students, and teachers, resulting in absenteeism. Evidence suggests that relocation due to migration and the resulting change of school generally translates into dropouts or lower academic performance.⁹¹ A study found that exposure to extreme heat and precipitation in prenatal and early childhood years in countries of the global tropics could make it harder

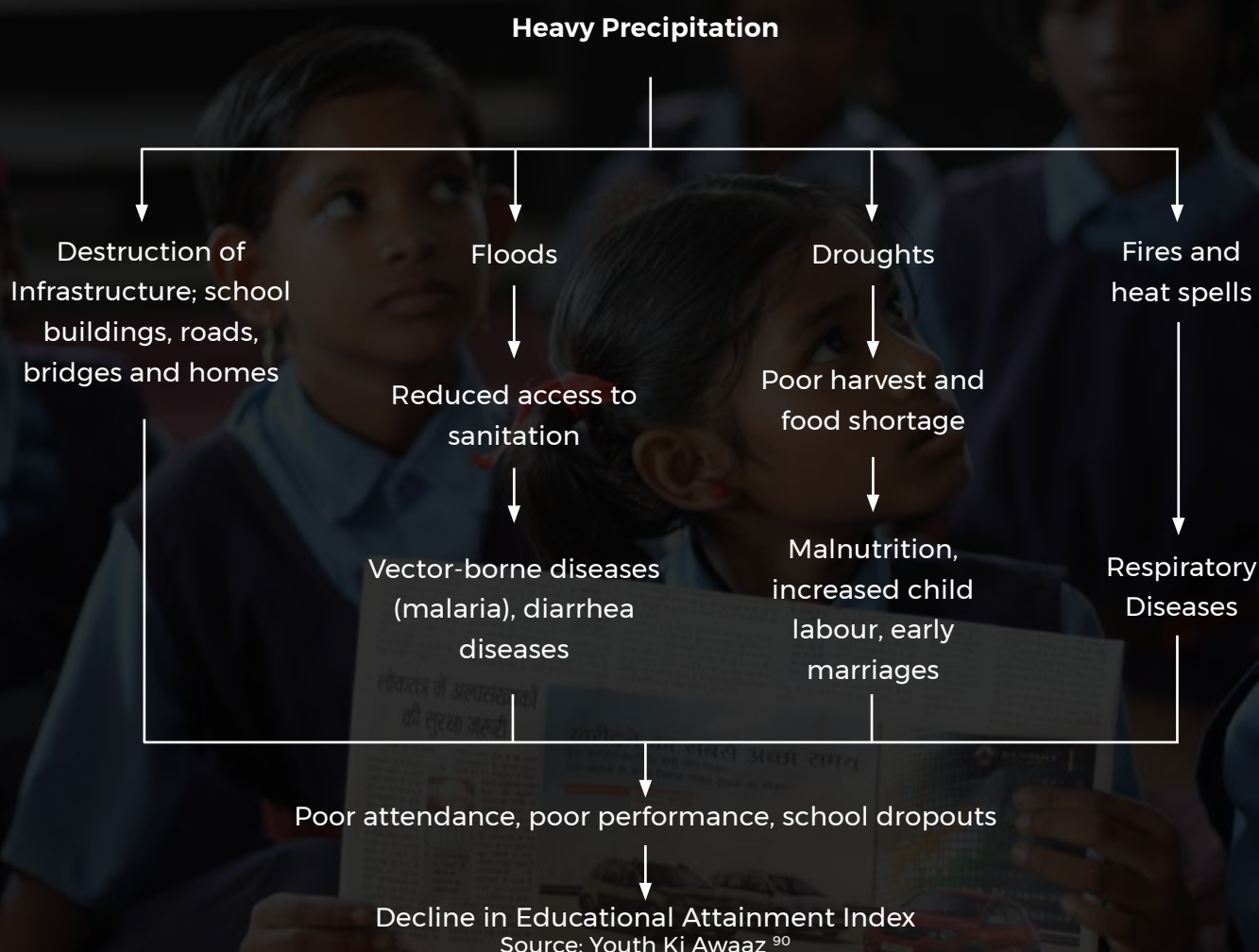
⁸⁸ Hundreds of schools reopen after devastating floods in India: Relief Web; August 2018

⁸⁹ Thousands of schools destroyed, damaged or disrupted by South Asia's deadly floods: Their World; August 2017

⁹⁰ Domino-Effect of Climate Change Will Hamper Access To Education: Youth Ki Aawaz; October 2019

⁹¹ It Is Getting Hot: United Nations Children's Emergency Fund; 2019

Figure 11: Impact of Climate Change on Education



for children to attain secondary school education, even for better-off households. The impact of climate change in the form of health and income shocks leads to poor health and nutrition in the early years that affects children's cognitive and physical development.⁹²

In periods of crisis, girls are often the first to drop out of school to augment household income, perform domestic chores, or look after their younger siblings. In North-Eastern states such as Nagaland, school attendance of adolescent girls and young girls gets drastically reduced because of a lack of support systems for them.⁹³ Girls in their late teens have to sacrifice education for their younger siblings and go back to the fields. Climate change is speeding up

this phenomenon. Data also indicates that termination of schooling for adolescent girls can have extreme second-order consequences such as an increase in child marriages.

Disruptions in education have consequences that can last a lifetime; they act as an impediment to future livelihood and active participation in future climate discourse. Lack of education reduces the opportunities for livelihood available to women and causes them to slip back into (unskilled) wage work or less remunerative traditional occupations. It also disrupts an adolescent girl's future ability to increase their agency and exercise their sexual rights, get married later in life, have multiple options before them, and delay the process of childbirth, which could be dangerous at a younger age.

⁹² Climate change and educational attainment in the global tropics: PNAS; April 2019

⁹³ From interviews with experts.





2.4.3. Human Displacement

More than 62 million South Asian people will have to relocate from their homes due to slow-onset climate disasters such as sea-level rise, water stress, crop yield declines, habitat loss, and drought by 2050. Some

geographic hotspots will experience inevitable displacement due to uninhabitable rising temperatures, eroding rivers, and rising seas. Highly climate-vulnerable regions, such as the Sundarbans or the Mahanadi delta in India, are subject to a greater threat from sea-level rise and salinification. It is estimated that 1.5 million of the five million inhabitants of Sundarbans will have to be relocated as sea levels rise.

In addition to its internal displacement due to natural disasters, India is seeing migration from neighboring countries. India accounted for as many as 2.8 million newly-displaced persons; nearly 2.7 million of whom were displaced as a result of four major extreme weather events: the Kerala floods, Cyclone Titli, Cyclone Phethai, and Cyclone Gaja. To add to this, more recent studies that have reviewed trends and empirical

data suggest that Indian cities might not only be the preferred option for Bangladeshi migrants but also often the only option⁹⁴.

Displacement due to climate change often forces women to assume traditional male responsibilities without having access to the knowledge, technical, financial, and social resources required to adequately fulfill them. The majority of migration is expected to be male, with women staying behind in the source areas to take care of the family, land, and livestock. Consequently, women shoulder greater responsibility without a corresponding enhancement of their rights and capabilities.

Due to their limited ability to seek paid employment because of caregiving responsibilities, even when women do migrate, they are particularly vulnerable to economic and physical risks. The situation of female migrants in destination countries has often been described as hazardous in terms of human and labor rights, adequate pay, and sexual violence.⁹⁵

⁹⁴ Taking India's Climate Migrants Seriously: The Diplomat; August 2018

⁹⁵ Migration, gender and climate change: Gender CC

2.4.4. Livelihoods and Employability

Existing threats to livelihoods will be exacerbated by climate change due to a combination of factors that

include the increasing frequency and intensity of climate hazards; diminishing agricultural yields and reduced production; rising health risks; increasing water scarcity; and intensifying conflicts over scarce resources, etc. For example, in drought conditions, the livelihood options of landless laborers are impacted. They face economic losses and have to migrate to far-off places where they face many socio-economic problems.

India could become one of the first places in the world to experience heat waves that cross the survivability limit for a healthy human being sitting in the shade. This rising temperature could lower labor productivity and affect employability. This will create

unfavorable conditions for work that has a high reliance on physical labor input such as work at construction sites, factories, agro-industries, etc. The increasing frequency and intensity of environment-related hazards caused or exacerbated by human activity have already reduced labor productivity. Between 2000 and 2015, 23 million

working-life years were lost annually at the global level as a result of such hazards.⁹⁶

Limited mobility

Restricted access to resources

Denial of rights

Higher dependence on natural resources

make women's livelihoods more vulnerable to the impacts of climate change. Where women do not or cannot migrate for work, their opportunities are limited by social circumstances. In certain richly forested tribal pockets as in the Western Ghats, where dependence on non-timber forest produce (NTFP) is high, the impacts of climate change have already been felt by a lot of women who are not able to reap the benefits in recent years, as climate change has altered the seasonal patterns of NTFP availability and made them doubt their traditional knowledge. Amongst those affected are some landless communities that rely solely on forest resources for their livelihoods, and therefore are the worst affected.

⁹⁶ The Employment Impact of Climate Change Adaptation: International Labour Organization; August 2018



2.4.5. Sanitation

Lack of access to sanitation is a major obstacle to human development.

It can lead to a range of potentially deadly health problems. It can also force women and girls to drop out of school, miss work, stay away from public places, and restrict their ability to live a life with dignity. Climate change might worsen this situation if the gendered impacts of water and sanitation inadequacy are not factored into climate action, including adaptation measures.⁹⁷

The importance of sanitation has been recognized in the United Nations Sustainable Development Goals (UNSDG) under SDG 6.2, which calls for achieving access to adequate and equitable sanitation and hygiene for all and an end to open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.⁹⁸ SDG 6 on clean water and sanitation and SDG 13 on climate action are intractably linked as arresting/ halting climate change is important to achieve SDG 6.

Climate change exacerbates the risks that the current climate poses for sanitation. It further creates new risks, heightens uncertainties, and can increase inequality in sanitation access.⁹⁹ Sanitation concerns include damage and loss of services from floods, and reduced carrying capacity of waters receiving wastewater. Fecal contamination due to flooding of sewage systems and limited or no access to handwashing facilities **near toilets**



⁹⁷ Climate Change and the Human Rights to Water and Sanitation: United Nations

⁹⁸ Climate Change and resilient WASH in South Asia: Water Aid India; February 2019

⁹⁹ Climate, Sanitation and Health: World Health Organization; July 2019



in drought-prone/struck geographies further add to the health burden.

This is felt even more by women from marginalized groups, especially during climatic crises. In over 100 villages affected by drought in India, Dalit women are denied access to water sources in 48.4% of villages because of segregation and untouchability practices. More than 20% of Dalits do not have access to safe drinking water.

In the mountainous regions of India, rising temperatures and diminished snowfall, followed by rapidly receding glaciers have already depleted water reservoirs. Reduction of flow in rivers has dire implications for access to safe drinking water; sewerage and flushing of latrines; and overall hygiene and health.

Sanitation for women and adolescent girls is deeply and structurally affected in water-stressed and arid areas. Sanitation only works if there's water available, so it is directly

linked to access to water. Women are differentially affected by water scarcity as they often have to use water of poorer quality or even walk further to collect water. The impact is worsened when girls start menstruation, as they may even be pulled out of school when access to sanitation facilities is scarce. Access to water and sanitation is further impacted by social standing, through factors such as caste.¹⁰⁰

The challenges for women intensify during crises and temporary relocation caused by cyclones or floods. It is especially difficult for women and adolescent girls to take care of sanitation in these circumstances because of a lack of available toilets/ inadequate number of toilets, which are promptly taken over by males. In the wake of floods, people living on the streets because of a lack of rehabilitation centers causes health and sanitation issues for women and adolescent girls as well as heightened anxiety and stress due to lack of privacy.

¹⁰⁰ Water: "Women and Men have differential roles, rights and responsibilities"; Ideas 4 Development; March 2018



2.4.6. Sexual and Reproductive Health Rights (SRHR)

Gender equality, SRHR, and climate change issues are inextricably linked. There is strong evidence linking climate change to negative maternal health outcomes, increased incidence of gender-based violence, and, generally, a lack of access to SRH services, which in turn negatively impact family planning, abortion, and sexually transmitted infection (STI) outcomes. Climate crises can disrupt the functioning of primary health programs, and adolescents may no longer have access to SRH services. General hygiene and sanitation resources may also become scarce during crisis.

When natural resources become scarce due to climate change, girls and women travel farther distances to secure food and water, which can increase their risk of exposure to sexual abuse, physical abuse, and harm.¹⁰¹ With increasing stress on water, the menstrual hygiene of young women and adolescent girls will also be increasingly affected.

Disruption to health services due to disasters increases unplanned pregnancies and sexual and reproductive health problems. When health facilities and supply chains are compromised, there is a direct and immediate negative impact on access to and quality of SRH services, such as post-exposure prophylaxis for HIV, HIV treatment, emergency contraception, and safe abortion services.

Adolescent girls and young women face some of the greatest barriers to SRH services and information due to issues with privacy, confidentiality, stigma, discriminatory laws and practices, and access to financial resources.¹⁰² One of the major challenges with creating access to SRHR for adolescents is that there is no freedom or space to talk about sexual health with adults; an overreliance on information from peers can lead to misconceptions getting solidified. Such misconceptions can grow into sexual violence over time. Awareness building on MHM (Menstrual Health Management) is needed to dispel beliefs and taboos amongst communities.

¹⁰¹ The Link Between Climate Change and Sexual and Reproductive Health and Rights: Women Deliver; January 2021

¹⁰² The Link Between Climate Change and Sexual and Reproductive Health and Rights: Women Deliver; January 2021

Climate Justice and Intersectionality: Addressing Diversity, Equity, Inclusion, and Justice



A person's caste, ethnicity, race, religion, and sex are all crucial factors in how they experience climate change. The intersectionality of people's identities can exacerbate

their experiences. Power structures play a major role in determining who has access to resources and who can build resilience to the impacts.

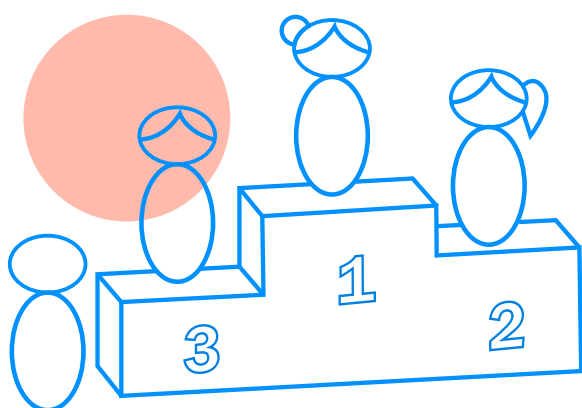
3.1. Dalit Women

Dalit women constitute a majority of victims facing structural discrimination, which leads to marginalization, social and economic exclusion, and limited access to basic services, including water and sanitation. Discriminatory practices include physical and social segregation, restrictions on occupation or enforcement of certain types of menial jobs as well as widespread caste-based violence. Dalit women are often discouraged from accessing water, food, and accommodation due to ingrained, discriminatory societal norms that lead to a separation of common water sources, common dining, and common shelter areas according to their caste status. In places such as Bundelkhand and Lucknow, there have been ‘water riots’ in the recent past where the dominant upper-caste women have

disallowed Dalit women to use the government hand pumps and wells amid of water crisis ¹⁰³.

Dalit women are more exposed to climatic natural disasters than other groups, and are less likely to receive humanitarian aid, while simultaneously being least responsible for actions driving the climate change crisis. . Even prior to any extreme weather events like drought, floods, typhoons, or cyclones, they are more vulnerable and exposed to disasters. Their social exclusion means they often live outside of main villages, with less access to the amenities and information of administrative centers. In some contexts, this less desirable land will be more exposed to floods or hazards and have less developed infrastructure like drains, drinking water, or flood barriers.

¹⁰³ The Link Between Climate Change and Sexual and Reproductive Health and Rights: Women Deliver; January 2021



A woman's caste in India can increase her exposure to mortality as a result of factors such as poor sanitation and inadequate water supply and health care. The average age of death for Dalit women is 14.6 years younger than for higher caste women.

Examples of Caste-Based Discriminations faced by Dalit Women and Girls during Climatic Disasters and Humanitarian Aid¹⁰⁴

<ul style="list-style-type: none"> • Prevented from accessing aid due to perceived ‘untouchability’. • Made to remove corpses and debris from the area. • Exclusion from compensation lists by officials. 	<ul style="list-style-type: none"> • Face problems with registering relief camps. • Precluded from formal data-gathering responses and decision-making by government officials and humanitarian agencies. 	<ul style="list-style-type: none"> • Often receive poor quality relief material. • Losses are less recognized; systemic exclusion from formal development (such as land titles for homes etc.) undermines the ability to access opportunities for rehabilitation.
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Such risk factors, their social exclusion, dependence on wage labor, and dominant upper caste groups, make them particularly vulnerable to shocks and stresses of extreme weather events.

3.2. Adivasi Women

Adivasi women are considered ‘the custodians of biodiversity’ for their ability to preserve and conserve biodiversity and ensure sustainable management of natural resources.¹⁰⁵

They have historically played an essential role in the forest-based production of goods. They often enjoy high social status based on their knowledge of flora and fauna and their role in religious rituals with strong ties to the forest.¹⁰⁶ Due to deforestation and degradation of the environment, Adivasi women are losing control over natural resources, and thus their power and value in the community are reducing. Adivasi women cannot transfer their life skills of sustainable forest and biodiversity management to other livelihood options linked with mainstream agriculture

systems and face exclusion. Adivasi women are also facing threats from outsized interventions like privatizations of natural resources – which have by and large been extractive and exploitive.

Climate change is directly threatening their relationship with nature. Their dependence on natural resources is well documented, and the corresponding vulnerabilities are well-established. The Human Development Index rating for Adivasi women in India is more than 30% below the national average. Poverty, ethnic discrimination, forced displacement from their natural habitats, and structural inequalities of larger social, political, and economic institutions that determine, among other things, legal rights and ownership for Adivasi women, enhance their overall vulnerability to climate shocks.

¹⁰⁴ As per International Dalit Solidarity Network findings under the European Commission Assessment, 2013

¹⁰⁵ Adivasi Women: Engaging with Climate Change: UNIFEM; IFAD; The Christensen Fund; June 2009

¹⁰⁶ Adivasi Women: Engaging with Climate Change: UNIFEM; IFAD; The Christensen Fund; June 2009

Women and Adolescent Girls as Change Agents in Climate Action

While women and children remain the most vulnerable to the impacts of the disasters due to skewed power relations and inequitable cultural and social norms, they are the most important pillar for creating change. Climate action cannot be successful or sustainable if it does not involve women and adolescent girls. The United Nations Secretary-General has also singled out women's leadership for their unique ability



as “drivers of solutions” when they are empowered.¹⁰⁷ Women can play a critical role due to their local knowledge of natural resources, which positions them well to contribute to livelihood strategies adapted to changing environmental realities.

Women are the biggest knowledge banks of what works on the ground and what doesn't. The high stakes that women hold in this arena are best illustrated by the prominent leadership they have displayed in

several environmental movements within the nation. The Chipko Movement (1973) in Uttar Pradesh, the Appiko Movement (1983) of Karnataka, the Silent Valley Movement (1976), and the Narmada Bachao Andolan are but a few of the instances where women have stepped up to voice concerns regarding environmental issues.¹⁰⁸ When faced with such issues, women tend to effectively organize into grassroots-level groups and take action.¹⁰⁹

¹⁰⁷ Women as Agents of Change: United Nations

¹⁰⁸ Role of Women in Environment Conservation: SSRN; April 2019

¹⁰⁹ From interviews with experts



“Listening to the voices of women and increasing their awareness of gender perspectives in the climate change debate matters because they are fundamental to fulfil two pressing tasks. First, there is an urgency to produce credible scientific knowledge based on social science and humanities that contextualizes and gives meaning to both the risks and the opportunities posed by climate change. Second, it is of fundamental importance that policy decisions at any scale (from local to national, regional or global) are designed in such a way as to be considered credible and relevant by the people for whom such policies are addressed.”

‘Women at the frontline of climate science and policy’ by Dr. Asuncion Lera St. Clair, Lead Author, Intergovernmental Panel on Climate Change Fifth Assessment Report, Working Group II.

Internationally, the role of adolescents and women in the climate movement has now become more prominent with many of them being frontrunners in the fight against climate change. In 2018, teenagers across the world coordinated marches across the world to protest climate change. This teenager-led movement used the power of social media and advocacy to raise awareness and call for immediate action towards climate change. In November 2016, a group of 21 young people between the ages of 9 and 20 sued the US government for failing to take adequate and appropriate action towards climate change and protecting public resources. India has seen similar actions by young climate activists at the national level too. In March 2017, Ridhima Pandey, a 9-year-old girl from Uttarakhand, filed a court case against the Indian government, arguing that India, the third-largest emitter in the world, has failed to

take ambitious action to fight climate change¹¹⁰. Sneha Shahi, a 24-year-old PhD scholar studying floods and droughts, headed an initiative to clear plastic waste from the Bhuki stream in Vadodara, thus revitalizing the stream’s wildlife.¹¹¹.

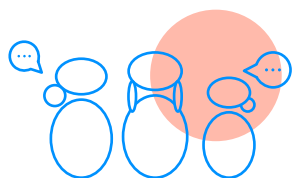
However, despite the successes at the international level, the role of women and adolescents at the grassroots in India remains muted. Vernacular TV channels and newspapers do not talk about how young girls are leading the fight against the Climate Crisis. At the grassroots, these adolescent girls are mostly focused on survival and cannot act at the local or national level. Several dynamics make adaptation more difficult for some women. These dynamics put women at a distinct disadvantage, and few programs include or focus on them for adaptation. In some contexts, women are often subject to gender-based violence, and harassment.

¹¹⁰ Youth need to occupy the future on climate change: Down To Earth; August 2018

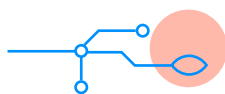
¹¹¹ India’s young activists call for tech-driven climate action backed by civic participation. The Indian Express. Nov 2021

4.1. Enabling Conditions: Women and Girls as Agents of Change

To ensure that women and children are empowered to take the lead in climate action, it is essential to simultaneously remove the impediments to their participation and equip them with the tools needed to lead the discussions. Some of the actions that could help in this regard include:

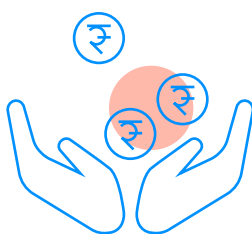


Ensure an enabling environment for the increased participation of women in decision-making and policymaking at the local, national, and international levels. The Panchayati Raj Institution provides a huge systemic framework to empower women formally at the grassroots level and increase their participation in decision-making. The government has already begun the transition that would empower women through reservations at the panchayat level. By building programs that help educate new women leaders in public policy and leadership, philanthropies can enable the transition of women in these institutions to local leaders.



Invest in culturally appropriate green technologies that empower women

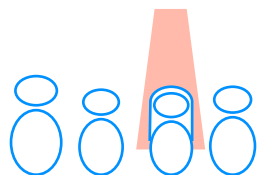
such as water harvesting, storage, irrigation systems, and substitutes for fuelwood and use (including mechanisms for maintenance). As a result of the water harvesting technologies implemented by Gramin Vikas Vigyan Samiti (GRAVIS), there was a reduction in the workload and drudgery of women in the collection of water. WOTR invested in the knowledge and capacity building of women to provide more options in terms of different crops, management practices, and agronomic practices. These interventions helped influence the decision-making of their families and communities through expert knowledge.



Improve women's livelihoods and strengthen adaptation by ensuring women's access, control, and ownership of resources, and access to development resources such as credit, information, training and outreach, and culturally appropriate and labor-saving technology. This can be done through measures such as MNREGA for urban women and women-owned community-run orchards to create income opportunities.



Ensure that **education, training, awareness-raising, and information programs** address the vulnerability and risk of gender-based violence, sexual abuse, and trafficking, especially in high-risk flood, drought, and disaster-prone areas. The **Barefoot Ecology Program** of Keystone foundation builds awareness in schools about climate change and equips women and girls with the tools they would need to take note of the changes in their environment. Educated young girls have greater sexual awareness and can exercise their sexual rights, get married later in life, have other options and so the process of childbirth may be delayed, or they may choose to not have as many children. This has a direct impact on consumption and carbon emission.



Design adaptation programs with a strong focus on women and gender equity to ensure successful implementation and that adequate resources are allocated to translate this vision into tangible action. GRAVIS's project called **Enhancing Women and Girls Leadership (EWGL)** in climate change adaptation looks at creating rainwater harvesting structures, promoting rain-fed farming practices, and supporting other measures of drought mitigation. The project is entirely led by women and girls.



A Possible Roadmap: Galvanizing Philanthropic Action for an Inclusive and Equitable Green Recovery

“Reporting standards for the philanthropic ecosystem are non-uniform with no single regulator overseeing the movement of funds into the sector. While CSR is regulated by the MCA, non-profit organizations are registered under various Registration Acts – both at the central and State levels. Public trusts are regulated by the States through Trusts Acts; however, in the absence of a Trust Act in a particular State, the principles of the Indian Trusts Act 1882 apply.”

While multi-lateral and inter-governmental action has been galvanized in the last two decades, philanthropic action towards solving what may be the defining challenge of our species remains muted. Less than 2 percent of global philanthropic funding is dedicated to climate change mitigation through reduction of emissions or planet warming gases. Of \$730 billion in philanthropic funding last year, only an estimated amount of \$5-9 billion was designated for efforts to address climate change. Annual global grantmaking for climate change mitigation between 2015 and 2019 averaged \$1.1 billion, including \$360 million for U.S.-based efforts and \$310 million in support of global initiatives¹¹².

In the Indian context, philanthropy has tended to focus on its many social-economic and developmental challenges. Climate change comes much lower in the list of priorities. Corporate Social Responsibility (CSR), while offering a lot of promise by way of resources and corporate engagement has been more focused on tangible, short-term objectives.

Investing in climate action is a long haul, which requires persistence and patience.¹¹³ Billionaire wealth increased by approximately Rs 20,91,300 crore in 2017 in India, a staggering sum, but only about 39 people donated more than Rs 10 crore (of which Azim Premji was the outlying single largest donor by far) according to the Hurun Indian Philanthropy List 2018. Of this, climate-focused philanthropy accounts for just about 7% of the total.

There are other challenges in terms of tracking funding data related to climate. Data on individual, voluntary philanthropy remains disparate, and the source, destination, and sectors of these donations remain difficult to track. Further, the categories under which CSR funding is bracketed do not give a clear distinction of funds focused on climate change (mitigation or adaptation).

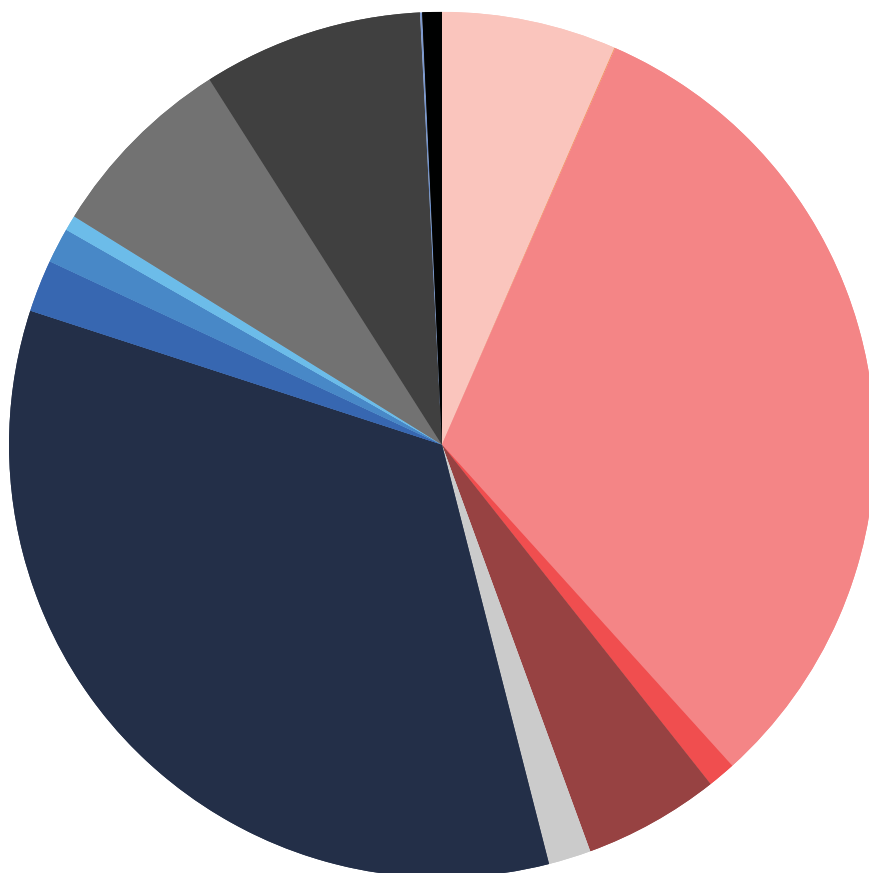
Given these constraints, tracking funding to projects focused on climate change or adolescent empowerment (or those using a climate, gender, or adolescent lens) remains a challenge. However, using related sectors, one can estimate the amount of funding towards similar causes such as environmental issues and gender empowerment.

¹¹² Report highlights insufficient funding for climate change mitigation: Philanthropy News Digest; September 2020

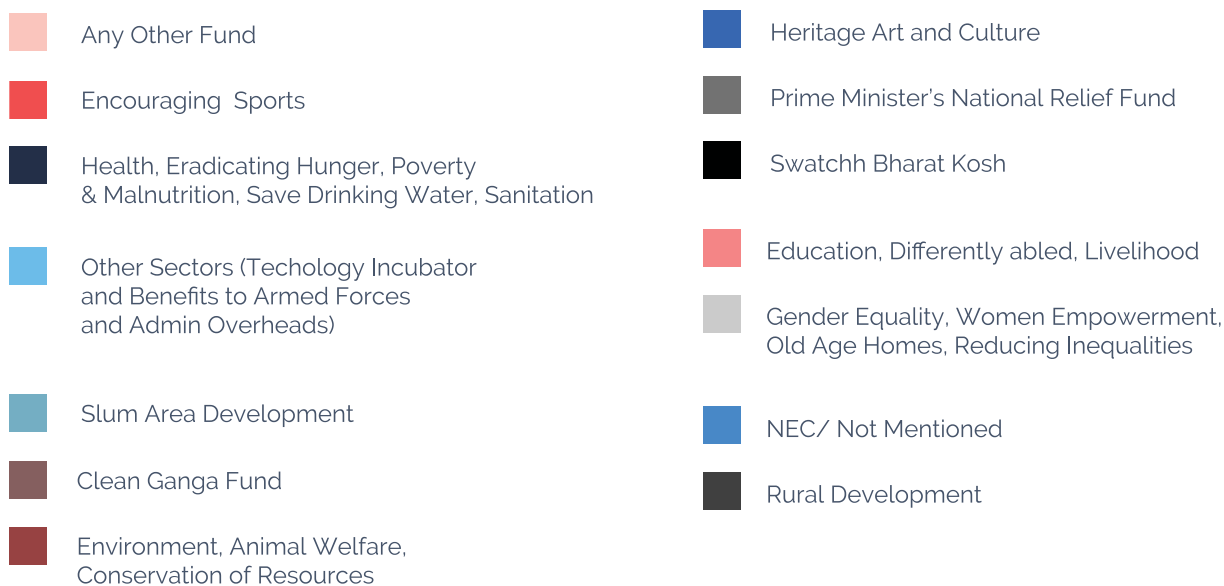
¹¹³ What Philanthropy Can Do For Climate Change: Shakti Foundation; November 2018

¹¹⁴ Putting climate change on the philanthropic radar: Observer Research Foundation; March 2020

Figure 11: CSR Spending by Sector - FY 2020-21 (INR CR)



Grand Total: 20,360.25 (Cr)



Source: National CSR Data portal by the Ministry of Corporate Affairs



5.1. Recommendations for Climate Philanthropy

There is a need to take a closer look at the physical and socio-cultural structures in response to climate change to identify and address long-standing gender inequalities. To ensure that philanthropies and foundations are targeting climate action, response and sustainable recovery are not susceptible to gender agnosticism and discrimination, they should implement the following recommendations:

5.1.1. Data and Knowledge Creation

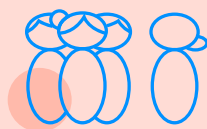


Disclose projects being funded, to allow for stakeholders in the ecosystem to better understand sources and destinations of funding.

Such a move would allow players in the space to identify and bridge the gaps in funding.



Create a repository of organizations working in climate change, specifically at the intersections with gender and adolescents. Such a database would enable actors to identify each other and create opportunities for collaboration.

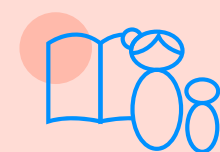


Conduct a scoping study about the needs of marginalized communities

impacted by climate change across regions and ecosystems, and create customized programs to build adaptation and resilience to its impacts.



Fund the creation of Information, Education, and Communication (IEC) material specifically customized for the local context and in regional languages. To ensure participation from stakeholders at the grassroots level, it would be essential for them to understand the threat that is climate change, through examples of how it has and will continue to impact their lives.



Commission long-term studies to track the impact of climate emergencies on women and children.

For example, while it is known that climate emergencies disrupt education, there aren't enough studies to determine the long-term impacts such as health issues that may come about a decade or so later.

5.1.2. Capacity Building

- **Integrate the use of social-equity audits into monitoring, evaluation, and learning (MEL) frameworks as well as into existing climate change-focused and other programs, and MEL frameworks.** Where the appropriate tools do not yet exist, philanthropies and humanitarian actors should come together to build such tools.
- **Work with marginalized communities to understand their existing status and build customized capacity-building programs based on them.** These should be made with proper representations from different vulnerable and socially marginalized groups including Dalit and Adivasi women.
- **Build programs focused on creating climate-resilient livelihood opportunities.** This can be done by building upskilling programs that move the youth away from vulnerable sectors while looking at the skills necessary to succeed in the coming decades.
- **Focus on building capacities of local stakeholders.** Local stakeholders already have the trust of the communities, and come with their repository of knowledge, which can be enhanced through capacity-building programs.
- **Design programs that can help communities respond to climate disasters.** Such capacities can help mitigate the impacts of climate change, as plans to overcome the negative impacts will already be in place.



5.1.3. Policy, Advocacy, and Legislation

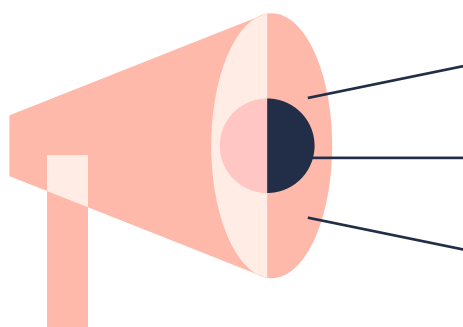
- **Support and advocate for the development and implementation of inclusive and appropriate disaster management laws and policies at local, national, and international levels** that enable the effective targeting of women and adolescent girls from the marginalized and excluded groups for climate action, with a specific focus on caste-based discrimination.
- **Champion for increased social security nets for women, and specific schemes focused on marginalized women.**
- **Build forums and dialogues** to bring together civil society, the private sector, and government stakeholders **to effectively collaborate and coordinate efforts towards climate change action.**
- **Provide technical advisory services to governments, especially at the state and municipal levels.**
- **Conduct campaigns to publicly recognize the problem of gender agnosticism in climate action and rework strategies in their organizational missions, work plans, and public engagements.**

Philanthropies can explicitly declare their adherence to gender-sensitive and responsive principles, while simultaneously working towards understanding the societal processes of gender exclusion (including caste) at work in communities.

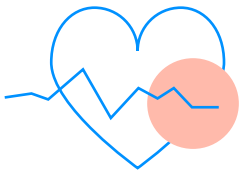
- Engage with the government to create incentives for the public to shift towards greener alternatives. Such measures by the government are already being seen (though not gender-sensitive) in upcoming EV policies.

5.1.4. Structural Recommendations

- **Build long-term projects and remain engaged with the communities after they're completed.** There is a tendency for communities to slip in indicators after a project is completed if support is not extended after the completion of a project.
- **Focus on underserved areas.** From a geographic perspective, the North-East is extremely vulnerable to the impacts of climate change (it lies with the Burma ecological hotpot). Yet, it receives little focus in philanthropic funding.

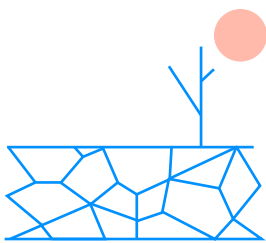


5.1.5. Sector-Specific Recommendations



Health

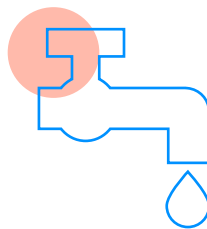
- Simple transitions such as funding or incentivizing people to move away from chulhas (traditional woodstoves) to low-carbon, fuel-efficient cooking stoves should be accelerated. Such a move can help reduce indoor air pollution and vastly improve the health of families.
- Support the development and implementation of community driven heat wave action plans, including transitions to technologies that respond to heat stress (e.g. cool roof technologies).



Climate Induced Extreme Events

- Larger focus on droughts, which receive less attention because of the lower shock value – more and closer attention should be focused on mitigation and adaptation strategies to prevent/build resilience to the same.

- Create climate adaptation funds for communities and build community resilience by developing community driven landscape-based and place-based disaster risk reduction plans and adaptation plans.
- Support risk reduction strategies through using Risk assessments tools
- Support decentralized renewable energy systems, which are far less impacted by natural disasters unlike conventional grid systems.



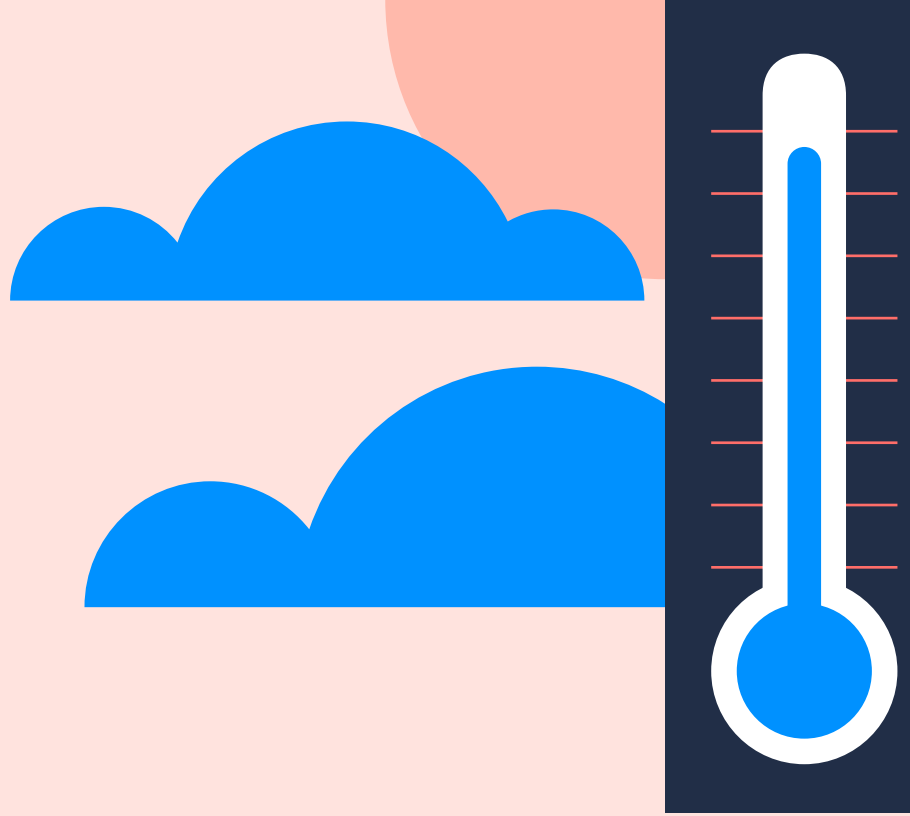
Water and Sanitation

- Creating resilient infrastructure such as toilets and sanitation facilities in flood-prone areas, and support communities to develop efficient water management systems and local water governance systems,



Agriculture

- Use community-driven Nature Based Solutions (NbS) as an overarching framework to guide philanthropic investments
- Promotion of low carbon, low energy intensive, agro-ecologically aligned practices such as regenerative agriculture and climate adaptive permaculture should be encouraged in existing agriculture programs.
- Create an enabling environment by providing access to technology, access to skilling and entrepreneurship training and increasing access to markets to increase the scale and spread of organic farming.
- Support the development and implementation of region specific, socially appropriate Agroforestry models.
- Support creation of water sources for drinking water through low cost low carbon technologies (e.g. biosand water filters) to save hours of physical labor – often borne by women.
- Support creation of critical irrigation systems through low cost, low carbon place-based technologies like hydrams, gravity flow, drip irrigation etc aiding better farm productivity, especially for women farmers.



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