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Girls' education in climate strategies

Opportunities for improved policy and enhanced action in Nationally Determined Contributions

Christina Kwauk
Jessica Cooke
Elisa Hara
Joni Pegram

Christina Kwauk is a fellow at the Center for Universal Education at the Brookings Institution| Christina's research focuses on gender equality in education for sustainable development, and 21st century skills and youth empowerment. She has published on girls' life skills education for transformative social change, the inclusion of menstrual hygiene management in national education policies, as well as the intersection of girls' education and climate change. Christina is a co-author (with Gene Sperling and Rebecca Winthrop) of "What Works in Girls' Education: Evidence for the World's Best Investment." She has also published on a wide range of topics in sport, education, and health. At Brookings, Christina manages the Echidna Global Scholars Program and leads the Center's research on girls' education.

Jessica Cooke is the resilience and climate change specialist at Plan International | Jessica provides technical and policy expertise on climate change and resilience. She works at a global level to support strategic thought leadership on climate change and resilience in Plan International's priority thematic areas and delivers expertise and training in these subjects. Her specific focus is on the impact of the climate crisis on girls' rights. She closely follows the UNFCCC climate negotiations, especially those related to girls' rights.

Elisa Hara is a climate change advisor at Plan International Finland | Elisa has supported the federation's understanding of the linkages between climate change and girls' rights, as well as formulating policy stances. Currently she is also coordinating parts of Plan International's climate work globally, including climate change themed research.

Joni Pegram is founder and director of ProjectDryad.org and conducted this analysis on behalf of UNICEF | Joni is an adviser to the UN Committee on the Rights of the Child on climate change, and works closely with key actors such as UNICEF and international NGOs to advance child rights in the UNFCCC climate talks and other key fora. Project Dryad also co-leads the Secretariat of the Global Initiative for Advancing Children's Right to a Healthy Environment.

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Girls' education in climate strategies:

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Overview

Climate change is the most significant intergenerational equity issue of our time. Children and future generations are bearing, and will continue to bear, the brunt of its impact on a polluted, degraded planet. The social and regional impacts of climate change are not distributed equally or evenly, and this inequality increases vulnerability. This paper looks at how the intersecting vulnerabilities of age and gender shape the impact of climate change on girls and young women in particular and asks two questions:

1. Do climate strategies include adequate attention to social protection, and the inclusion and empowerment of vulnerable groups?

2. Do climate strategies include sufficient attention to girls' education, specifically, and to inclusive, quality, gender transformative education, more broadly?

Based on an analysis of 160 Nationally Determined Contributions—country-level climate strategies to reduce emissions and adapt to the effects of climate change—and thirteen National Adaptation Plans, the answer is no. The findings suggest countries have a long way to go.

- Only one country's NDC makes a reference to girls' education and two additional countries refer to girls explicitly, a reflection of a larger omission of children/youth and education in climate strategies.
- Only 67 of 160 NDCs (approximately 42%) include a direct reference to children or youth and only eight to intergenerational injustice or future generations.
- Top 20 carbon emitting countries were least focused on education and children.
- Those countries that do attend to issues of intergenerational equity tend to be "young" countries—countries with a large under-15 population—and climate-vulnerable countries.

Overall, findings from this study suggest that the spirit of the Paris Agreement for climate action to attend to issues of fairness, equity, and justice is not translating into country-level climate strategies.

The alarming speed at which the planet approaches climate catastrophe suggests countries do not have the luxury of time. National climate strategies must step up their ambition in terms of technical solutions and, crucially, pay more attention to the key sociological underpinnings driving climate change in order to uphold human rights, and especially the rights of children and future generation. One route is to incorporate greater attention to girls' education—immediately.

Introduction

In the fight to combat the climate crisis, the years 2020, 2030, and 2050 will be important ones for humanity. Under the Paris Agreement, ratified in 2016, 196 states and the European Union have agreed to keep the rise in global temperatures this century to well below 2°C higher than pre-industrial levels, and to take all measures to limit temperature rise to 1.5°C. Such a goal aims to divert the devastating effects that unchecked global warming will have not only on human society but also on the planet—from the loss of human life and destruction of infrastructure due to rising sea levels, more frequent heat waves, and intensified storms, forest fires and droughts, to widespread extinction of plant and animal species and the collapse of entire ecosystems.

In order to achieve the goals set forward by the Paris Agreement, the United Nations' Intergovernmental Panel on Climate Change (IPCC) has projected that countries must achieve the target of net-zero anthropogenic carbon emissions—those caused by human activity—by the year 2050. To reach this benchmark, global emissions must fall by at least 45% from 2010 levels by the year 2030.[1] In 2015, countries submitted their Nationally Determined Contributions (NDCs),[2] or their national strategies to reduce emissions and adapt to the effects of climate change. However, analysis suggests that the collective efforts behind these NDCs will lead us to fall well short of the Paris goals.[3] Stakeholders committed to the success of the Paris Agreement—and the survival of human civilization—are now focusing on the year 2020, when countries have the opportunity to communicate new or updated NDCs.[4]

Box 1: NDCs and NAPs

Nationally Determined Contributions (NDCs)	NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change
National Adaptation Plans (NAPs)	NAPs identify medium- and long-term adaptation needs and strategies and programs to address those needs.

Source: UN Framework Convention on Climate Change (UNFCCC), n.d.

Importantly, under the Paris Agreement, parties also agreed that climate action should be taken in a manner that "respect[s], promote[s], and consider[s]" countries' obligations to uphold "human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations, and the right to development, as well as gender equality, empowerment of women and intergenerational equity."[5]

It is in this context that the present analysis of NDCs emerges. Because NDCs—in both their aspiration and implementation—are essential for ensuring that global efforts lead to net-zero emissions by 2050. It is imperative that they include the most comprehensive and inclusive mitigation efforts to reduce greenhouse gas emissions as well as adaptation efforts, which

[1] IPCC 2018.
[2] Prior to countries formally ratifying the Paris Agreement, their NDCs were considered *intended* nationally determined contributions (INDCs).
[3] Du Pont and Meinshausen 2018; UNEP 2015.
[4] See for example, Fransen et al. 2017.
[5] Paris Agreement 2015.

attempt to adjust human and natural systems in response to actual or expected climate impacts in an attempt to moderate or avoid harm. This means not only addressing the technical sources of carbon emissions or the development of low-carbon technology and renewable energy, but also the sociological factors like poverty, gender inequality, the denial of human rights, and low quality of education that contribute to the systemic drivers of climate change.[6] It also means ensuring NDCs address the multifold pathways for increasing intergenerational human (and non-human) resilience and adaptive capacity.

Climate crisis and social justice

Research suggests that NDCs and other climate strategies have a long way to go in terms of balancing technical and sociological concerns.[7] For starters, NDCs—and climate finance[8]—continue to overemphasize contributions made by large-scale *mitigation* activities, which tend to be both highly technical and high-tech. This is despite efforts by the Paris Agreement to increase attention to *adaptation* efforts (activities that attempt to help natural or human systems adjust to and/or transform in response to climate change), which tend to be more sociological in nature.

Second, sociological considerations within NDCs tend to stop at the politics of the economic state—i.e., politics between developed and developing economies—leaving little space for challenging social power structures (including gender) that increase the risks and vulnerabilities to climate change more severely for some groups than others.[9] This is despite the spirit of the Paris Agreement to address climate change through the lenses of justice, equity, and fairness.[10] Recognizing, for example, that developing countries did little to contribute to present day emission levels, the Paris Agreement posits that developed countries must bear the responsibility of leading efforts to reduce emissions while supporting the mitigation and adaptation efforts of developing countries.[11] As such, a high proportion of NDCs of developing countries have contributions that are conditional upon receiving international support (e.g., finance, technology transfer, and capacity building).[12]

Such "moral responsibility" by wealthier countries and "solidarity" with poorer countries suggests that other social equity concerns like gender equality, children's rights, and the right to education for the most disadvantaged might also be priorities woven throughout NDCs. After all, it is the Paris Agreement's attention to justice, equity, and fairness that makes it more than a climate treaty, but rather a sustainable development agenda on par with, complementary to, and intertwined with the 2030 Agenda for Sustainable Development.[13] Yet, while the Paris Agreement is the first multilateral environmental treaty to address issues like gender equality, the empowerment of women, intergenerational equity, and the rights of children (among other human rights "obligations"), a plethora of research suggests that a deeper attention to

[6] Kaijser and Kronsell 2014; Roberts 2001; WHO 2011.
[7] UNFCCC 2019.
[8] Climate Policy Initiative 2018.
[9] Carlarne and Colavecchio 2019; Jernnas and Linner 2019.
[10] Indeed, the Paris Agreement is the first instrument of international climate change law that references, albeit conditionally, the concept of climate justice. See Carlarne and Colavecchio 2019 for more elaboration on how the Paris Agreement treats this concept.
[11] For a more comprehensive discussion of how concepts of justice, equity, and fairness are interpreted in the Paris Agreement and by NDCs, see Carlarne and Colavecchio 2019; Caney 2009; Roberts and Parks 2007.
[12] Pauw et al. 2019.
[13] Northrop et al. 2016.

fairness, social equity, and climate justice is not often translated into country-level climate policies.[14]

This paper seeks to unpack this gap further by focusing on policy attention to girls' education and girls' rights in national climate policies—in particular, NDCs and NAPs which, in theory, should be correlated with other national climate policies. Although the immediate need is to cut down emissions in wealthy countries, girls' education—including sexual and reproductive health and rights, education, and information—has been recognized by researchers as a key longer-term solution to drawing down carbon from the Earth's atmosphere as necessary as, for example, solutions like industrial recycling, solar farms, or reducing food waste.[15] With the 2020 NDC renewals around the corner, it is imperative that countries are made aware of the critical gaps in their current NDCs and NAPs, as well as the opportunity to "multisolve" in their next iteration. More specifically, this means solving multiple problems—such as climate, gender, lack of educational opportunities, and development—through a single investment of time and money, in this case girls' education.[16, 17] Indeed, it is the mutual and reinforcing goals of the Paris Agreement and the Sustainable Development Agenda that suggest simultaneously addressing climate and gender equality goals is an easy win for aligning NDC ambition and implementation around justice, equity, and fairness.

Why girls' education?

When it comes to the sociological dimensions of climate change (e.g., geographical location, poverty/class, race, etc.), gender is cross-cutting. Climate vulnerability and its consequences not only reflect existing gender inequality; they also reinforce and exacerbate socially constructed relations of power, norms, and practices that constrain progress toward gender equality in both developed and developing countries.[18] This includes gender roles and responsibilities that confine women's activities and mobility to the home; traditions and laws that limit women's access to natural, financial, and social capital, and thus their ability to cope with climate shocks and to adapt to climate change; and norms that inhibit women's ability to access information, knowledge, skills, and capacity building that could be life-saving during and after a weather-related disaster.[19]

As a result, women and girls experience heightened social, economic, and health impacts of climate change, both in the context of slow-onset disasters like droughts or weather-related emergencies brought on by floods, storms, and heatwaves.[20] Not only does evidence suggest that women's mortality rates are higher than men's during climate-related disasters, women are also more likely to experience human rights abuses including: human trafficking as well as sexual violence in temporary shelters; disruptions in their access to important health services including family planning or maternal and postnatal care; interruptions in their participation in income-generating activities due to their role in post-disaster clean-up and recovery; and

[14] Alston 2014; Holvoet and Inberg 2014; Huyer 2016; IUCN 2016; Jernnas and Linner 2019; Terry 2009.
[15] Hawken 2017.
[16] Sawin 2018.
[17] For additional analytical frameworks that can help to illuminate the intersecting dynamics of climate change with multiple forms of inequity, see Kaijser and Kronsell 2014; Malin and Ryder 2018.
[18]Dankelman 2010; David and Enarson 2012; Easton 2018; Goodrich et al. 2019.
[19] Bhadwal et al. 2019; Cameron et al. 2013; Nelson 2011.
[20] Nelson et al. 2002; Nelson 2011; Swarup et al. 2011.

reductions in their intra-household bargaining power, among many other documented impacts on their well-being.[21]

When age is added to considerations of gender—that is, if the focus is specifically on girls—there is another layer of vulnerability and impact through which climate change intersects.[22] For instance, adolescent girls are at additional risk of being pulled out of school to help alleviate extra domestic burdens, like fetching water, that are shouldered by women in households under climate-related stress.[23] Leaving school also makes girls less likely to be informed about climate change and further increases their vulnerability. Girls are also at risk of being married off early in an attempt by households to manage the financial burdens and/or female safety concerns borne by the environmental hardships and aftermath of weather-related disasters.[24] Such circumstances put into play the early onset of key life transitions, including early pregnancy, that function to direct girls into a vicious cycle of intergenerational poverty, vulnerability, and marginalization.

Research conducted by Plan International in Bangladesh and Ethiopia asked girls what would most help them deal with the causes and impacts of climate change. Girls stated three clear priorities:[25]

- Greater access to quality education to enhance their knowledge, skills, and capacity to adapt to and reduce the risks of climate change.
- Greater protection from gender-based violence in response to the risks exacerbated by disasters and a changing climate, including child labor, child marriage, and sexual violence.
- Greater participation in climate change adaptation decision-making and risk reduction activities.

It is important to note that in most discussions of gender and climate change, attention to girls has been absent. This is in part due to climate policy-makers failing to adequately consider children as important stakeholders, beneficiaries, agents of change, or communicators of good practice—a state of affairs that is then replicated by climate decision-makers in climate policy and action.[26] Because climate change is already impacting children and young people disproportionately and will have an even greater impact on future generations,[27] it is imperative that their needs, vulnerabilities, rights, and agency be taken into account, and that they be consulted on and included in the decisions taken by today's adult generation. As such, in this paper's attention to girls, we attempt to draw greater attention to issues of intergenerational equity in climate policy.[28] This will help to ensure NDCs created or renewed in 2020 recognize the rights of present and future generations of children, who have done little compared to adults in contributing to present and future levels of greenhouse gases, to live out their lives on a healthy planet.

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[21] Cannon 2002; Easton 2018; Gerrard 2018; Neumayer and Plumper 2007.
[22] Back and Cameron 2008; Johnson and Boyland 2018); Swarup et al. 2011; Plan International, Australian Youth Climate Coalition, and Oaktree 2015.
[23] CARE 2016; Chigwanda 2016; Swarup et al. 2011.
[24] Ahmed et al. 2019; Alston et al. 2014; Rashid and Michaud 2000.
[25] Swarup et al. 2011.
[26] Gautam and Oswald 2008; Mitchell and Borchard 2014; Mitchell et al. 2008; Nelson 2011.
[27] UNICEF 2015.
[28] Stone and Lofts 2009.

From the above overview of the intersections between gender and climate change, it is clear how gender inequality and climate change can be mutually reinforcing. Yet, research also demonstrates how gender *equality*, especially through the achievement of universal girls' education and girls' rights, can be a powerful force against further environmental damage and climate change.[29]

Specifically, studies suggest that girls' education can help mitigate against and adapt to climate change in three ways:[30]

1. A quality education functions to enhance girls' "green skills" that not only increases their resilience and adaptive capacity to climate change, but also prepares them to participate in and lead in traditionally male-dominated green sector jobs.[31]
2. An empowering education can increase girls' opportunities for leadership and decision-making, both of which are highly correlated with pro-environmental and sustainable outcomes.[32]
3. A transformative education that includes comprehensive sexuality, reproductive health, and puberty education with attention to issues of gender and power, can increase girls' sexual and reproductive health and rights outcomes.[33] This has the primary benefit of increasing girls' right to control their own reproductive lives, and the secondary benefit of contributing to declines in fertility rates in contexts with the highest rates of unmet need for contraception and where women have the least control over if, when, and how many children they will have.[34]

More generally, and perhaps more importantly, the achievement of universal girls' education and girls' rights would represent a fundamental, and progressive shift in the social fabric and global political economy currently fueling the climate crisis. An emerging body of literature illustrates how the same social systems that have traditionally excluded, marginalized, and discriminated against girls and women while upholding hegemonic masculinity are the same social systems that have viewed the planet as an object to be exploited and profited from through control, domination, and extraction.[35] Thus, a society that has achieved gender equality vis-à-vis girls' education would have also achieved a level of social transformation of the root causes of vulnerability to climate change (e.g., gender norms, attitudes, behaviors, and relations of power) necessary not only to change social relations but also our human relationship with the more-than-human world.[36]

For instance, studies indicate a strong correlation between the enhanced political and social status of women—which is predicated on girls achieving at least minimum levels of education and their human rights being recognized by others—and better outcomes for the planet, in terms of reduced levels of anthropogenic carbon and increased protected land areas.[37] Moreover, in the context of climate crisis, achieving gender equality improves outcomes for families and communities. When girls are better educated and included in decision-making, families and communities are better able to plan for, cope with, and bounce back from

[29] Kwauk and Braga 2017; Lutz et al. 2014; Muttarak and Lutz 2014; Muttarak and Pothisiri 2013.
[30] Kwauk and Braga 2017.
[31] Kwauk and Braga 2017; Muttarak and Striessnig 2014; UNDP 2012.
[32] Lv and Deng 2019; Mavisakalyan and Tarverdi 2018.
[33] Haberland 2015.
[34] Atkinson and Bruce 2015; Potts and Graves 2013; UNFPA 2017.
[35] Johnsson-Latham 2007; Jordan 2019; Nagel 2015; Pease 2016.
[36] Johnsson-Latham 2007; McKinney and Fulkerson 2015; UNDP 2012.
[37] Ergas and York 2012; McKinney and Fulkerson 2015; Norgaard and York 2005; Nugent and Shandra 2009.

economic shocks triggered by environmental events. In addition, mortality and injury due to drought, floods, and other weather-related disasters could be reduced by more than half.[38] However, such an understanding of the interlinkages of gender in/equality, environmental risks and vulnerability, and our resilience and adaptive capacity to climate change should not be taken as reason to instrumentalize girls' education as a means to an end. Girls' education, girls' rights, and women's empowerment are ends in themselves.

Given the evidence above, national policies that address climate change must address sociological issues like gender inequality through greater attention to quality, empowering, and transformative education for girls. Climate strategies that are "gender-blind"—or, that do not take gender into consideration—can inadvertently exacerbate gender inequality.[39] By contrast, climate action that is gender-sensitive, gender-responsive, and gender-transformative can bring about the systems-level change needed, not only to eliminate gender inequality, but also to achieve a sustainable, just, equitable, and fair human society.[40]

This paper attempts to illuminate how countries are doing with regard to such climate strategies—promoting education, protection, and empowerment—by focusing on two key questions:

First, recognizing how gender and age place girls at a double disadvantage when it comes to populations with heightened vulnerability to climate change, do climate strategies include adequate attention to social protection, and the inclusion and empowerment of these vulnerable groups?

Second, recognizing how education, specifically of girls, and the achievement of gender equality more broadly, contribute in powerful ways to humanity's ability to reverse climate catastrophe, do climate strategies include sufficient attention to girls' education, specifically, and to inclusive, quality, gender transformative education, more broadly?

Our analysis will provide a baseline from which we can track progress in national policies to combat climate change on the crucial issues of gender equality, girls' education, and the empowerment of marginalized groups.

Methodology

To answer these questions, we mapped a set of key terms in 160 Nationally Determined Contributions in English, French, and Spanish to garner how much attention countries are giving to girls and education (see Table 1).[41]

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[38] Blankenspoor et al. 2010; Striessnig et al. 2013.
[39] Ahmed 2019; Women Deliver 2017:3.
[40] GPE and UNGEI 2017; Plan International 2019; An approach that is gender-sensitive is one that recognizes the important effects of gender norms, roles, and relations. A gender-responsive approach not only considers gender norms, roles, and relations, but also takes measures to actively reduce their harmful effects. Finally, a gender-transformative approach tackles the root causes of gender inequality by reshaping unequal power relations; For a theory of change linking gender-sensitive adaptation to broader goals of gender equality, see also Pearl-Martinez 2014. See also Opiyo et al. 2016:187; Solís et al. 2019.
[41] Data were provided by Plan International and UNICEF, with some additional data collected by Brookings to fill any gaps. Marisa Muma and Elisa Hara from Plan International conducted keyword searches for and text analysis of girl-, education-, and child-related terms in 152 NDCs and 9 English-language NAPs. For the purposes of their analysis, they excluded countries whose NDCs were not uploaded on the UNFCCC NDC registry. Joni Pegram from UNICEF conducted keyword searches for and

The NDCs analyzed for this paper were submitted in 2015 by countries as Intended Nationally Determined Contributions (INDCs) ahead of COP21, or the 21st session of the Conference of the Parties (COP) to the UN Framework Convention on Climate Change held in Paris. Most INDCs subsequently became binding nationally determined contributions (NDCs) upon the respective country's ratification of the Paris Agreement. All NDCs are up for revision in 2020, and countries must submit their new or updated NDCs 9 to 12 months prior to the relevant COP.[42]

To get a broader sense of attention to girls and education in other national climate policies, we also mapped key terms across 13 National Adaptation Plans (NAPs). The Cancun Adaptation Framework (COP16, Cancun) laid the foundation for the promotion of adaptation measures in developing countries that are most vulnerable to the impacts of climate change through international cooperation and support mechanisms. National Adaptation Plans were intended to help reduce the vulnerability of least developed countries to the impacts of climate change by building adaptive capacity and resilience. As such, NAPs foreground a country's key climate vulnerabilities, especially in its enabling environment—a view that lends itself toward a more sociological approach—and should be kept constantly in review. To date, only 13 NAPs have been submitted to the UNFCCC's NAP portal.[43] As the number of NAPs increases they will provide crucial information for researchers in determining progress and priorities in national adaptation.

text analysis of education- and child-related terms in 160 NDCs—6 of which were found outside of the UNFCCC NDC registry—and 13 NAPs. Brookings cross-checked the data from Plan International and UNICEF on education- and child-related terms for internal rater reliability, as well as any discrepancies in conclusions from the qualitative analysis of the contextual usage of the terms. Where there was disagreement in the two analyses by Plan International and UNICEF, Brookings conducted an independent analysis to resolve the conflicting conclusion.

[42] For the NDC registry, see UNFCCC n.d. "Interim NDC Registry." At the time of writing, only one country (Marshall Islands) had submitted their second NDC to the NDC registry. We reviewed Marshall Islands' first NDC submission.

[43] For the NAP portal, see UNFCCC n.d. "National Adaption Plans."

Table 1. Key term search[44]

Language	Search term	Key term	Number of NDCs searched	Numbers of NAPs searched
EN FR SP	girl* fill* nin*, chic*	girl fille niña, chica	160	13
EN FR SP	gende*, genre*, sex* genero*, sexo	gender genre, sexe género, sexo	152	13
EN FR SP	wom* femm* mujer*	woman/women femme mujer	152[44]	13
EN FR SP	child*, you*, adolescent, infant, baby, boy enfan*, jeun*, juve*, adolescent*, bebe, garcon nin*, chic*, jov*, juv*, adolescente, hij*, bebe, infancia	children, youth/young, adolescent, infant, baby, boy enfant/enfance, jeune/jeunesse, juvenile, adolescent/adolescente, bébé, garçon niño/niños, chico, joven/jóvenes, juventud, adolescente, hijo/hija, bebé, infancia	160	13
EN FR SP	intergen*, future/next gene* intergénérat*, generat* intergenerac*, generac*	intergenerational equity/justice, future generations, next generation équité/égalité/solidarité intergénérationelle, génération future equidad intergeneracional, generación futuro	160	13
EN FR SP	educa*, school educat*, ecole educac*, escuela*	education, school éducation, école educación, escuela	160	13
EN FR SP	skill* capacit*, compet*, habilité habilidad	skills capacité**, compétence**, habilité habilidad	152	9
EN FR SP	health* sante* salud*	health santé salud	152	9

**Extracted only when relevant to children/youth

[44] For some key terms (e.g. girl), the authors searched all 160 NDCs and 13 NAPs; the final data set is a result of combining, reconciling, and/or supplementing original analyses by Plan and UNICEF. For other key terms (e.g. skill), the authors searched 152 NDCs and 9 NAPs, drawing on original analyses conducted by Plan.

Upon counting word frequencies of key terms in each NDC and NAP (e.g., the number of times a term appears in any given document), a text analysis was conducted on the nature of and context in which the term was used. For example, additional analysis of the context in which the term "education" was used allowed for further analysis of the child-sensitiveness of NDCs. Those NDCs that are categorized as having a "substantive" reference included the term in a manner that is explicitly linked to children/youth or to child/youth-related topics (e.g., primary school infrastructure). Those that were categorized as "passive" implicitly referred to education without directly acknowledging children (e.g., public education).

As mentioned above, NDCs (as well as NAPs) are particularly important vehicles on the road to reversing the climate crisis as they set national ambition in five-year increments. Key stakeholders in the creation and revision of NDCs and NAPs from the climate community include the Ad Hoc Working Group on the Paris Agreement, the Least Developed Countries Expert Group, the NDC Partnership,[45] the World Resources Institute, and many agencies within the UN, including the UNFCCC, UNDP, UNEP, UNESCO, and UNICEF. In addition, other key NDC stakeholders include National Action for Climate Empowerment (ACE) Focal Points, the YOUNGO ACE Working Group, as well as specific members of the education community such as the Global Partnership for Education and the Education Commission, which must be made aware of the gaps and opportunities for more ambitious climate policy and action through greater attention to education in climate strategies. In particular, gaps must be filled in climate policy in terms of its attention to social protection and the inclusion and empowerment of marginalized groups as agents of change, including girls in developing countries, in order to ensure countries achieve net-zero emissions by 2050.

Findings

In this section we present the findings of our analysis of NDCs under three key headings:

1. The use and prevalence of the terms "gender" and "women."
2. References to "children" and "youth" with a particular focus on "girls."
3. The positioning of the role of education.

We also discuss how countries overall are attending to these terms based on their population demographics, carbon emissions, and climate vulnerability.

1. While gender is present, climate strategies portray women primarily as victims

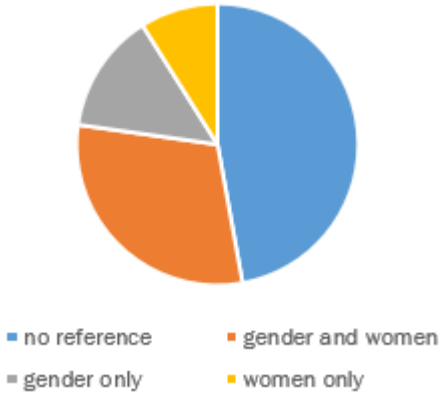
Even in countries where women's agency in other areas is acknowledged, the narrative of climate change primarily places women as passive recipients of support rather than active providers of solutions.

Our analysis reveals that **43% of countries' NDCs (65 of 152), reference the term gender or women** (see Figure 1). Countries ranking in the top third of the 2019 Equal Measures 2030 Sustainable Development Goal (SDG) Gender Index (e.g., countries characterized with higher gender equality along 14 of the 17 SDGs) are the least likely to include references to gender (only three NDCs: Uruguay, Mauritius, and Georgia). However, as countries move lower in

[45] Notably, the NDC Partnership's new Gender Strategy does not give explicit attention to ensuring NDC strategies include considerations at the intersection of gender and age (e.g. girls). See NDC Partnership 2019.

rankings on the SDG Gender Index (i.e., countries doing worse on issues of gender equality across the SDGs), references to gender in NDCs increase: 16 of the middle third, and 25 of the bottom third ranked countries include references to gender.[46] This is perhaps indicative of the impact of stakeholders invested in improving gender equality in these respective countries through gender mainstreaming in relevant policy structures.

Figure 1: References to gender in NDCs



While 36 NDCs position gender as a cross-cutting issue, **women are portrayed in the majority as a vulnerable group** (18 NDCs), often in the context of the country's broader sustainable development strategy rather than in relation to climate specific policies.[47] The next major positioning of women is as beneficiaries of support (six NDCs), or, more positively, as agents of change (six NDCs). In the minority are discursive constructions of women as stakeholders (two NDCs) (See Table 2).[48]

Table 2. Country NDC positioning of women in the context of climate change

Vulnerable Group (19)	Beneficiary (6)	Agent of Change (6)	Stakeholder (2)
Barbados, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Côte D'Ivoire, Dominica, Republic of The Gambia, Ghana, Guatemala, Indonesia, Jordan, Kiribati, Mali, Mexico, Sri Lanka, Uruguay, and Zimbabwe	Côte D'Ivoire, Eritrea, Republic of The Gambia, Mali, Niger, Papua New Guinea	Cameroon, Comoros, Côte D'Ivoire, Costa Rica, Sri Lanka, and Uzbekistan	Mali, Panama

In Uzbekistan's NDC, for instance, a table summarizing its measures to help ensure the adaptation of the social sector to climate change includes a reference to women positioned as agents of change:

[46] See Equal Measures 2030 2019.
[47] WEDO n.d. "Gender and Nationally Determined Contributors: Quick Analysis."
[48] WEDO 2016.

> Widening the participation of the public, scientific institutions, women and local communities in planning and management, taking into account approaches and methods of gender equity.[49]

This contrasts with the positioning of women as a vulnerable group in the NDC of Kiribati:

> The effects of climate change are felt first and most acutely by vulnerable and marginalised populations, including women, children, youth, people with disabilities, minorities, the elderly and the urban poor. Violence against women and children is a widespread issue within Kiribati society, which can be exacerbated in times of disasters when normal social protection may be missing.[50]

Of course, women's experiences with climate change are quite diverse, and women simultaneously occupy both positions of vulnerability and agency. Jordan's NDC provides a good example of this nuance, where women are portrayed as key economic agents while also positioned as a vulnerable group in the context of climate change:

> Though gender issues are still under-investigated in Jordan, the role of women in economy of rural areas is known to be substantial. Women in these areas are traditionally responsible for the household economy and are active in field work as well. Any negative impact of climate change will be most sensed by women. Women make crucial contributions in agriculture and rural enterprises in drylands as farmers, animal husbandry, workers and entrepreneurs through their indigenous knowledge. Thus, Jordan is committed to the following climate change strategic objectives and actions as related to sustainable development-oriented socio-economic adaptation with emphasis on vulnerable groups and gender mainstreaming.[51]

To make Jordan's statement even stronger, the NDC could have been more explicit in linking its positioning of women as economic agents to women's capacity to also contribute to mitigating against or helping society adapt to the impacts of climate change.

Like other studies, we also found that women are most often referenced in discussions around adaptation (16 NDCs) rather than mitigation activities (four NDCs), indicating a level of gender bias in strategies to achieve a net-zero, climate resilient future (see Figure 2). This bias could be a byproduct of climate strategies focusing more on hardware, technology, or infrastructure advancements and innovation that do not systematically consider gender in their production or impact. Even adaptation responses, which lend themselves to more social responses, often tend to emphasize such technical adaptation activities (e.g., building dikes) over social aspects of building human adaptive capacity. Sri Lanka's NAP section on Coastal Marine management, for example, concentrates on physical protection measures, research, and mapping and makes little mention of the population living there and the role people might play.[52]

[49] Uzbekistan 2018:6.
[50] Kiribati 2016:15.
[51] Jordan 2016:17.
[52] Ministry of Mahaweli Development and Environment 2016.

Figure 2: Gender in NDCs in reference to mitigation vs. adaptation

2. Climate strategies are ignoring girls and overlooking the role of children and youth

As we shift our analysis to the younger generation, it is clear that if gender issues and women are overlooked, children, youth, and especially girls are even more invisible in NDCs. Out of 160 NDCs analyzed, only three countries' NDCs included an explicit reference to girls (Malawi, Venezuela, and Zambia).[53, 54]

Malawi's reference to girls positions them as a vulnerable group under the context of adaptation to climate change:

> It is worth noting that gender is a cross-cutting issue. Hence, it needs to be mainstreamed in all the sectors. Vulnerable and disadvantaged groups carry the burden of the impacts of climate change. Women and girls are particularly impacted, as they have to walk further in search of basic commodities for the family such as firewood and water. Yet, women may not have the authority to decide on alternative and climate-resilient solutions for the household. The adaptation interventions proposed in this INDC are meant to enhance gender inclusiveness in the adaptation programmes and projects.[55]

Venezuela did not give special emphasis to girls in its reference, but rather referenced boys and girls as beneficiaries of educational efforts to increase environmentally sustainable behaviors:

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[53] It is important to note that the NDC from the Solomon Islands includes a reference to "female education": "Females still have less access than males to secondary and tertiary education while women have poor access to health and family planning services in the rural areas" (p. 4). As such, Solomon Islands was not counted in the key term search for "girl." However, later in this paper, we include Solomon Islands in our discussion of NDCs that make a reference to girls' education. See Solomon Islands 2016:4.

[54] Also of note, Lesotho's INDC calls attention to the negative impact of climate change on boys' education, reminding readers of the importance of attending to all genders and their unique experiences of a changing climate in climate policy: "In Lesotho the formative years of the boy child are occupied by herding of livestock to the detriment of their education. Climate change will particularly affect them negatively as good grazing land is gradually pushed further away from the village by its compounding negative effects on natural resources. In addition, extreme weather events like heavy snow will increase their risk of life in the remote cattle posts more than any other group in society." This focus on the vulnerability of boys and the negative impact of climate change on boys' education gets dropped by Lesotho's revised NDC, finalized in 2017, which was included in this analysis. See Ministry of Energy and Meteorology 2015:11.

[55] Malawi 2017: 11.

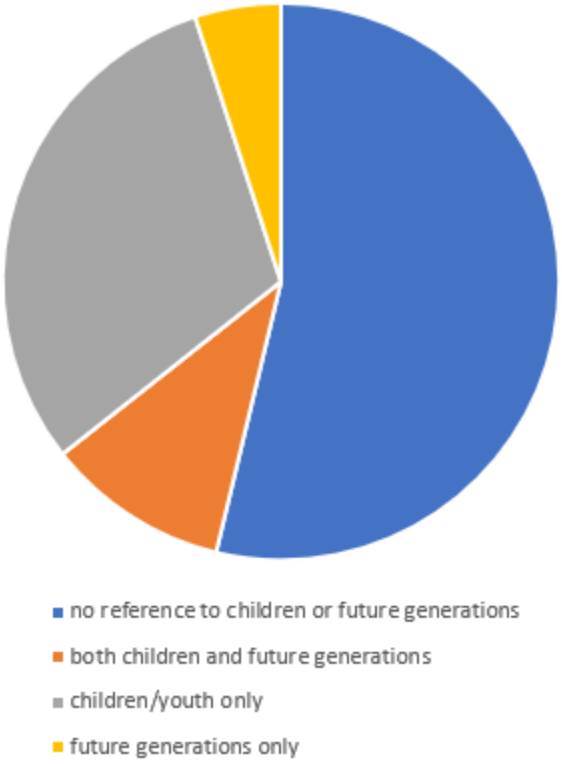
> Encuentros escolares estadales y nacionales con niños y niñas de educación primaria sobre uso racional y eficiente de la energía.[56]

And, in Zambia, the reference made to girls positions them as beneficiaries under the context of its mitigation strategies. Specifically, girls' education—the one reference to girls' education in all of the NDCs reviewed—is referenced as a co-benefit of the Renewable Energy and Energy Efficiency program, an example of a program contributing to Zambia's mitigation goal:

> Improved education impacts due to longer hours of study and advanced teaching methods, safety, creation of opportunity for girl child and women's education.[57]

The absence of attention to girls, however, is a reflection of a larger, more general omission of children and youth in NDCs. **Only 67 of 160 NDCs (approximately 42%) include a direct reference to children or youth.**[58] To be even more comprehensive, we found eight additional NDCs that made reference to future generations and/or intergenerational equity issues without referencing children or youth specifically. Together, 75 NDCs made some reference to the next generation of human society (see Figure 3).

Figure 3: References to the next generation in NDCs



We found that the **discursive treatment of children (and youth), like the treatment of women, leaned more heavily toward children as vulnerable** (32 NDCs). Second, were children as beneficiaries (23 NDCs), followed by children as agents of change (12 NDCs). In only seven

[56] Venezuela 2017: 12.
[57] Zambia 2016:4.
[58] Analysis by UNICEF 2019, forthcoming.

NDCs were children positioned as stakeholders to be included in decision making and climate action (see Table 3). Children and youth were also referenced more heavily in relation to adaptation (33 NDCs) than to mitigation (nine NDCs) activities (see Figure 4).

Figure 4: Children in NDCs in reference to mitigation vs. adaptation

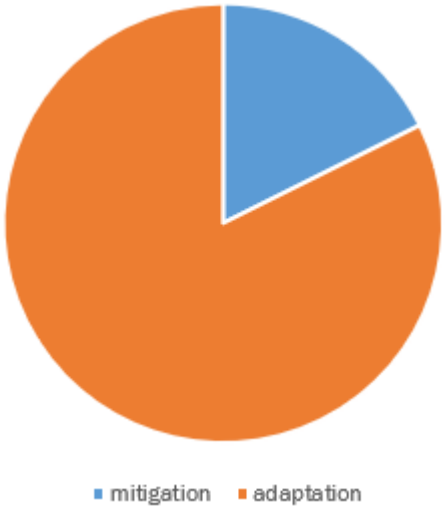


Table 3. Country NDC positioning of children and youth

Vulnerable Group (32)	Beneficiary (23)	Agent of Change (12)	Stakeholder (7)
Barbados, Belize, Benin, Burundi, Cameroon, Central African Republic, Chad, Costa Rica, Democratic Republic of the Congo, Dominica, Ecuador, Eritrea, Republic of The Gambia, Guatemala, Guinea, Iran, Jordan, Kenya, Kiribati, Lesotho, Liberia, Mauritania, Morocco, Nigeria, Sri Lanka, Tajikistan, Uruguay, Peru, Vanuatu, Viet Nam, Yemen, Zimbabwe	Bahamas, Belize, Burkina Faso, Cameroon, Congo, Côte D'Ivoire, Dominican Republic, Egypt, Eritrea, Ethiopia, Republic of The Gambia, Iran, Nicaragua, Papua New Guinea, Qatar, St. Vincent and the Grenadines, Senegal, Seychelles, Somalia, Sri Lanka, Sudan, Tajikistan, Zambia	Democratic People's Republic of Korea, Cuba, Dominican Republic, Côte D'Ivoire, Nicaragua, Pakistan, Paraguay, Qatar, Seychelles, Sri Lanka, Sudan, Venezuela	Algeria, Canada, Mali, Mexico, Panama, Paraguay, Republic of Moldova

There is a range in the ways in which NDCs position children as agents of change. In the case of Pakistan, children and youth are brought up in discussing Pakistan's broader context of development, and are positioned as valuable for their potential contributions to economic growth rather than attributing a specific role for them in mitigating against further environmental degradation or increasing the adaptive capacity of Pakistani society:

> The sizeable youth bulge offers an opportunity for accelerated economic growth and for reaping developmental dividend if required investments flow into social and development sectors.[59]

In contrast, Cuba's and Sudan's references to children as agents of change are in the context of educating or empowering them to adapt more environmentally friendly behaviors and attitudes:

> Campañas de divulgación para la promoción de las políticas de ahorro en la población y con los niños en las escuelas sobre el uso eficiente de la energía.[60]

> Enhancing the participation of women and youth in activities related to adaptation and environmental conservation in order to empower them and enhance their adaptive capacity including through establishment [sic] rural women development programme.[61]

In Moldova, children and youth are positioned as stakeholders who could be affected by the country's plans for adapting to climate change:

> To implement climate change adaptation policies, the whole society together with public authorities, companies and NGOs, will assure an appropriate level of knowledge about climate change and its expected effects. … At the same time, inclusion of climate change adaptation issues in the curricula at all levels and in the professional training process plays a very important role in the development of appropriate attitudes, so that young people and children have access to information on disaster and climate risk, appropriate emergency response and long-term adaptation options.[62]

Such active positioning of children and youth can be contrasted with their more passive representation in NDCs that position them as beneficiaries of programs and efforts that their countries intend to implement toward mitigation and adaptation efforts. For example, beyond mentioning children as a vulnerable group, the NDCs of Belize and Ethiopia do not ascribe any further role for children in climate action:

> Public communication is an integral element of the GSDS [Growth and Sustainable Development Strategy]. The program of action component of the GSDS contains provisions for education, awareness and training. To support economic growth, sustainable development and resilience, the GSDS recognizes the need to develop adequate skills and capacities via the implementation of the Education Sector Strategy 2011-2016, at all education levels and institutions. […] Furthermore, the GSDS will develop programs to educate and provide employment opportunities to at-risk youth.[63]

> Because climate change will affect all geographic areas of the country, its solution requires the participation of the entire population, especially farmers and pastoralists. Parallel to this, Ethiopia's response to climate change aims to integrate actions that improve the status of women and the welfare of children. Furthermore, measures to

[59] Pakistan 2016:6.
[60] "Outreach campaigns for the promotion of savings policies in the population and with children in schools on the efficient use of energy." See Cuba 2015:15.
[61] Sudan 2017:13.
[62] Moldova 2017:15.
[63] Belize 2016:13.

> address climate change will be planned and implemented in a manner that addresses the wellbeing of the elderly, persons with disabilities and environmental refugees.[64]

In the case of Ethiopia, above, although its NDC calls on the participation of the entire population, it makes no explicit reference to the *contributions* that children can make. Further plans and strategies that trickle down from this national policy may overlook action for, by, and with girls, children, and youth. Ethiopia's national adaptation plan does not reference girls, and where it references children they are positioned as one of several vulnerable groups who must be made beneficiaries of social protection mechanisms, such as "putting in place safety net schemes."[65] For example, the NAP references children when discussing households under climate stress employing coping mechanisms that can negatively impact the welfare of children, including sending children away to engage in income generating activities, limiting portion sizes at meals, and relying on less preferred and cheap foods.[66]

Given the small number of NAPs submitted to the UNFCCC after the Paris Agreement, it is difficult to determine if there is a relationship between a country's NDC's attention to girls, children, and youth and its NAP's attention to these same groups. Nonetheless, there were relatively more references made to our key terms in the NAPs than in the NDCs. For example, all 13 NAPs included references to gender (12 of which were gender-sensitive in their inclusion). Two NAPs (Burkina Faso and Fiji) include references specifically to girls, both of which were relatively progressive in terms of the context of their inclusion, as well as nuanced in terms of their positioning as vulnerable group of stakeholders and agents of change:

> The level of school attendance of girls is low compared to boys in Burkina Faso, as in many other Sahelian countries. With no access to education, women are at an even greater disadvantage, as they are excluded from debates on the exploitation and sustainable protection of natural resources.[67]

> The integration of gender considerations receives particular attention, especially the need to enhance the welfare of women and girls—such as ensuring their full, equal, and meaningful participation and access to opportunities and resources—to maximise their potential as active agents of change and drivers of climate-resilient development.[68]

In addition, 12 out of 13 NAPs analyzed include some reference to children, youth, future generations, or intergenerational equity. Chile's NAP does not make any references to children or to future generations—although it does make child-sensitive references to education. And, while Sri Lanka's NAP includes a single reference to future generations—although, no references to children or youth—this reference is made in the Introduction and in the context of summarizing the key message of the IPCC report, rather than in consideration of future generations in Sri Lanka.[69] The majority of NAPs, however, make substantive references to children. One of Kenya's references to youth, for example, calls out special attention to their role in innovating in climate resiliency efforts:

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[64] Ethiopia 2017:4.
[65] Ethiopia 2019:58.
[66] Ethiopia 2019: 42-43.
[67] Ministry of Environment and Fishery Resources 2015:55.
[68] Fiji 2018:38.
[69] Of note: Sri Lanka's NAP does include reference to school curricula.

> Rising to the challenges of climate change requires innovative application of technology and science matched to local needs and risks. Kenyan universities and research institutes already possess a strong scientific foundation necessary to promote further research and development into local risks and adaptation options. […] In addition small and medium sized enterprises in Kenya operated by the youth are at the forefront of innovation in technology and require adequate support to upscale and increase uptake of these innovations in order to enhance resilience.[70]

While a text analysis of the NAPs suggests climate policies are doing a good job, the lack of attention to girls, children, and youth in NDCs tells a different story. All too often children and youth are included in population lists among those to be informed and considered, rather than as groups with a contribution to make and a real stake in combatting climate crisis.[71]

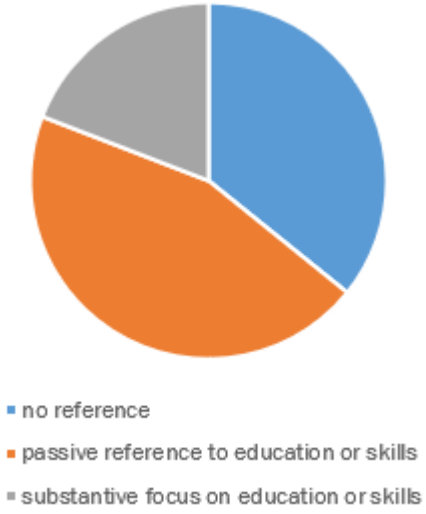
Even though girls, because of their gender and age, bear greater risks and vulnerability to climate change, country policies are not adequately addressing their needs in climate adaptation efforts, nor are they doing enough to set the foundations for their inclusion and empowerment in and through climate policy and practice. Interestingly, many of the positive, and more active references to girls, children, and youth in both NDCs and NAPs are in relation to their roles as students in school. However, as we discuss below, when it comes to *how* education is referenced, NDCs still have a long way to go.

3. Climate strategies position education in a largely passive role, not an empowering one

Out of 160 NDCs, 108 (68%) include education-related references in the broadest sense (e.g., education, schools, skills, capacity building).[72] At first glance, this number suggests education has been well-integrated into national climate strategies. However, a deeper analysis shows that this is not the case. Of all the NDCs that reference education (or school**), the majority (66 of 108, or 61%) position education passively without explicitly describing children's role in mitigation or adaptation efforts** (see Figure 5).

[70] Ministry of Environment and Natural Resources 2016:24.
[71] See for example "Ensure capacity building and participation of the society, local communities, indigenous peoples, women, men, youth, civil organizations and private sector in national and subnational climate change planning." See México 2015:7.
[72] These findings and the analysis behind it are slightly different than the analysis conducted by YOUNGO (the Youth Constituency to the UNFCCC), which looked specifically at the incorporation of Action for Climate Empowerment (ACE) concepts (e.g., education, public access, public participation, and scientific training), as captured in Article 6 of the Convention and then reiterated in Article 12 of the Paris Agreement, in the NDCs. The YOUNGO also scored each country's inclusion, creating a ranking of country performance on integrating ACE in NDCs. See YOUNGO Ace Working Group 2016.

Figure 5: References to education or skills in NDCs



We observe such passive representation in NDCs manifest in four primary ways:

First, education-as-climate action is positioned as a general activity (e.g., public education, awareness raising), almost token in nature, intended to contribute to the success of efforts made by other sectors. In some instances, like that of Kenya's NDC below, the reference appears to be a literal placeholder to Article 6 of the UNFCCC/Article 12 of the Paris Agreement. The NDCs of Cabo Verde, Bhutan, Morocco, and Kenya all reference education in this manner:

> Seek to provide proper waste management coverage … for at least 50% of the more vulnerable municipalities by 2030, including: implementing educational programs for the separation of basic waste types by households and waste producers ….[73]

> Enhancing awareness and capacity through education, research on areas of concern in Bhutan and institutional strengthening will also be essential for successful implementation of the intended actions. Other indirect success may also be achieved through advocacy and behavioural changes to promote sustainable consumption, energy efficiency and other climate friendly actions.[74]

> The protection of the cultural heritage of the kingdom through education and awareness actions, and efforts to preserve ancestral good practices in highly vulnerable sectors, such as water and agriculture.[75]

> Enhance education, training, public awareness, public participation, public access to information on climate change adaptation across public and private sectors.[76]

[73] Cabo Verde 2017:5.
[74] Interestingly, Bhutan's NDC does not link education as a pathway for achieving behavioral change toward climate friendly action. See Bhutan 2017:8.
[75] Morocco 2016:20.
[76] Ministry of Environment and Natural Resources 2015:5.

Second, NDCs reference education as an outcome that is indirectly or directly impacted by climate change and/or by another sector's contribution to mitigation or adaptation. Take Jamaica's and Lesotho's for example:

> Hurricane Sandy (2012) accounted for J$9.7 billion or 0.8% of 2011 GDP in direct and indirect damage, as well as increased expenditures by private and Government entities. The health, housing, and education sectors experienced the greatest impact accounting for 48% of the total costs in damaged.[77]

> The rural electrification programme will reduce GHG emissions, promote rural development local entrepreneurship, reduce poverty, reduce rural exodus through job creation, strengthen social cohesion, improve education and health, improve access to new information and communication technologies and energy equipment and alleviation of women's domestic duties.[78]

Third, NDCs may be specific about the type of education needed, but the reference lacks any targeted audience. Notably absent in these instances is attention to the education of school-aged children and youth—again, further evidence that the majority of NDCs do not take an intergenerational approach to education in climate action. In addition to overlooking children and youth, all but two NDCs (Zambia and Solomon Islands) ignore the education of girls; **no NDC formally recognizes the contributions that investment in girls' education could make toward their climate strategy**. If NDCs were to fulfill the Paris Agreement's aspirations to promote fair, equitable, and just climate action, positioning education as a vehicle for the empowerment not only of society, but of society's most vulnerable and marginalized populations, would have been low hanging fruit. However, given the political change that more explicit attention to girl's rights, children's rights, and human rights might engender, it is no surprise that NDCs approach education in a more politically palatable and normative way. For example, St. Lucia's NDC discusses education on the impacts of climate change for the general public; Vanuatu references education that increases *all* stakeholders' awareness about ecosystem-based adaptation efforts; while Mozambique references climate change education for an unnamed audience:

> Government and the local NGO community have also undertaken sector-based and wider public education and awareness programmes to inform various publics of the anticipated and emerging consequences of climate change and to seek to build resilience to these impacts.[79]

> Support ecosystem function and services through action and planning by … Developing advocacy and educational programs for all stakeholders at all levels around the value of ecosystem-based adaptation.[80]

> To implement the INDC it is necessary to: … Elaborate and implement a strategy for climate change education, awareness raising, communication and public participation.[81]

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[77] Jamaica 2017:6.
[78] Lesotho Meteorological Services 2017:8.
[79] Saint Lucia 2015:1.
[80] Vanuatu 2016:11.
[81] Mozambique 2018:8.

Finally, NDCs reference education as a sector in need of financial or material support to help the country achieve its sustainable development goals—not necessarily to enhance the country's climate action.[82] For example, the NDCs of Antigua and Barbuda, Guatemala, and Ghana make apparent the struggles that all countries, regardless of income level, face when it comes to supporting education:

> Additional activities requiring support for implementation include … support for education, training, public awareness, public participation, public access to information, and international cooperation throughout implementation of the INDC targets.[83]

> Ningún acontecimiento nacional relevante, perjudica la asignación de recursos financieros a nivel nacional e internacional y no es necesario reorientar actividades y políticas públicas, restando financiamiento a temas priorizados para el país como educación, salud y seguridad.[84]

> In this regard, Ghana considers its INDC to be fair and ambitious for 4 main reasons: […] As a developing country, the lack of fiscal space to finance priority issues including poverty reduction policies including investments in education, health and basic infrastructure constrains the country's effort to finance and implement climate mitigation and adaptation policies.[85]

Such passive positioning of education leaves little room for the empowerment, inclusion, and participation of actors who could provide instrumental support in planning and budgeting, design, delivery, and implementation (in formal, non-formal, and informal learning spaces), or monitoring and evaluation. Such framing also contributes to the construction of unnecessary silos that position climate change as a problem for environment-relevant sectors to handle, rather than all sectors. For example, Solomon Islands' brief discussion of "female education" is in reference to the context of gender inequality and the overall human and economic development in the island nation rather than in the context of climate change, per se:

> Females still have less access than males to secondary and tertiary education while women have poor access to health and family planning services in the rural areas …[86]

The vague positioning of education as "awareness raising" and "training" leaves ample room for countries to simply talk the talk without following up with coordinated action or investment, including with respect to the targeted interventions needed for children, without which they are more likely to be overlooked. Moreover, an approach that does not positively incorporate children and young people as stakeholders in their own futures, empowering them to act now in their communities, is not only failing to tackle climate crisis today but is building in even

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[82] Although, with the exception of Costa Rica, whose NDC takes a more empowering approach to describe both its own investment in public education and how it plans to leverage this investment for climate action—albeit not in a child-sensitive manner: "Costa Rica has a century old tradition of investment in public education, and it's one of the few countries in Latin America to invest 8% of GDP in public education. This becomes a unique opportunity to use that installed capacity to educate Cost Rican citizens of today and strengthen university research to develop science and technology needed to support the mitigation and adaptation goals proposed in the National Contribution. See Ministry of Environment and Energy 2015:5.
[83] Antigua and Barbuda 2015:11.
[84] "No relevant national event prohibits the allocation of financial resources at national and international and level and it's not necessary to reorient activities and public policies, except for funding of prioritized issues for the country such as education, health and safety." See Guatemala 2017:7.
[85] Ghana 2015:9.
[86] Solomon Islands 2016:4.

greater challenges for tomorrow. And finally, passive positioning of education means a missed opportunity for countries to link their sustainable development and climate agendas by creating space for coordinated investments in education across sectors.

Although 68% of NDCs refer to education, **only 26% (42 of 160) actually make child-sensitive references to education** (see Figure 5, above)—of which 35 are in reference to education specifically, three to skills (Dominican Republic, Egypt, and Mali), and four to both education and skills (Belize, Cameroon, Eritrea, and Nigeria) (see Box 2).

Box 2: Countries whose NDCs make child-sensitive references to education (42)

Algeria, Bahamas, Bahrain, Belize, Cameroon, Chile, China, Congo, Cuba, Dominica, Dominican Republic, Ecuador, Egypt, Eritrea, Republic of The Gambia, Ghana, Haiti, India, Jordan, Kiribati, Madagascar, Mali, Myanmar, Nicaragua, Nigeria, Palau, Panama, Qatar, Senegal, Seychelles, Solomon Islands, Somalia, South Africa, St. Vincent and the Grenadines, Sudan, Togo, United Arab Emirates, Uganda, Uruguay, Venezuela, Yemen, Zambia

These references range in quality from merely referencing schools as the context in which mitigation and adaptation efforts would take place (see Palau's and China's NDCs, below), to building intergenerational knowledge and awareness of climate risks (see Eritrea's NDC, below), to leveraging schools as sites through which to build adaptive capacity through the development of knowledge, skills, and attitudes (see Qatar's and Seychelles's NDCs, below). For example:

> Palau is investigating a project to convert waste cooking oil to biofuel for diesel vehicles, beginning with public school buses and a potential public bus route.[87]
>
> To enhance related education and training and to fully utilize the function of schools, communities and civil organizations.[88]
>
> It is also very important to mainstreaming climate related topics to be included in the curricula at all levels. Inclusion in the adult education would augment awareness not only among school children but also impart knowledge on adults concerning the risks involved in climate change.[89]
>
> Qatar is investing heavily in education. Great steps have been taken to create a world-class education system that aims to build an environmentally aware society. … Qatar's emphasis on education is expected to produce graduates who are specialized in knowledge-based services, healthcare and green technologies. On the same grounds, young Qataris are always motivated to take advantage of the various opportunities for post-secondary education and training … [to] strengthen the new generation's capabilities and improve their analytical thinking, innovation and entrepreneurship to contribute to climate change efforts and sustainable development.[90]
>
> There is a need to accelerate efforts to integrate climate change education into the school curriculum at all levels, including primary, secondary and professional centres and ensure that adequate attention is given to adaptation measures. On a more

[87] Palau 2015:5.
[88] National Development and Reform Commission 2015:15.
[89] Eritrea 2018:24.
[90] Qatar 2015:3-4.

> fundamental level, there is a need for Seychelles to reinforce and enhance the quality of STEM (science, technology, engineering and mathematics) education at all levels to develop a new generation more capable of climate change adaptation leadership.[91]

Qatar's and Seychelles' NDCs, above, are a few of the notable examples of NDCs taking a more ambitious, strategic, and transformative child-sensitive approach to education. Nigeria's NDC goes a step further to specify strategies for the education sector that could amplify the impact of its activities for greater climate action:

> 1. Provide evidence-based information to raise awareness and trigger climate change adaptation actions that will protect present and future generations in Nigeria. 2. Develop skills-based curriculum in subjects like science, geography, social studies, language arts, environmental education and technology that will empower children to better respond to the threats of climate change. 3. Train teachers on climate change adaptation teaching strategies and techniques at pre-primary, primary, secondary and tertiary levels of education in Nigeria.[92]

The Gambia's NDC provides an excellent example of how a country can move toward integrating attention to issues of equity in climate action by addressing educational inequality within and across countries. Although, The Gambia's NDC oftentimes misses the mark when it comes to the transformative potential of education for children and youth—and misses the inclusion of women and girls entirely—in the links it makes, it is a model that other countries could learn from while building in greater attention to the education of children and girls:

> While the legal basis for education service delivery responds to upholding the right of everybody to quality basic education … there is empirical evidence to suggest that the provision of such education to any population lays a strong foundation for the sustainable development of any country. … *As the National Education curricula are currently being reviewed, financial and technical support would be required to integrate climate change and other environmental issues into the curricula. This will be the starting point for the mainstreaming climate change into basic and higher education curricular and the development and institutionalization of specialized training programmes in higher education* as is proposed in the PAGE (1012-2015).
>
> The Government plans to embark on research and provision of higher education on climate change-related disciplines, such as adapted land use, and integrate climate change into the *primary, secondary, tertiary and higher education curricula as the education sectors contribution to the proposed national climate change strategy of The Gambia.*[93] *(emphasis added)*

Education in National Adaptation Plans

NAPs are again more targeted than NDCs and have, both quantitatively and qualitatively, better inclusion of education topics that are both child- and gender-sensitive, as well as rights-based.

All 13 of the NAPs reviewed for this analysis contain references to education (or schools or skills), and many of these references function to link the country's national climate strategies

[91] Seychelles 2015:6.
[92] Nigeria 2017:22.
[93] Ministry of Environment, Climate Change, Forestry, Water and Wildlife 2016:19.

(in these cases, focused on adaptation) with their strategies for achieving the SDGs, including Goal 5 on gender equality and Goal 4 on quality education. Fiji's NAP, for example, dedicates an entire section to drawing connections between its strategies for climate change adaptation and the SDGs, as well as discussing the gender and human rights-based approach of its adaptation strategies:

> The NAP will generally support efforts to achieve Goal 4 which is to ensure inclusive and equitable quality education and promote lifelong learning opportunities. It achieves this predominantly through the section on climate change awareness and knowledge which will be expected to have some benefits for enhancing access to affordable and quality technical, vocational, and tertiary education. It is also expected to have some benefit for promoting relevant skills and to support efforts to ensure equitable access to all levels of education and vocational training. Most pertinently, it is expected that this section of the NAP will have significant benefits for ensuring that all learners acquire the knowledge and skills needed to promote sustainable development. Particular focus will be given to contextually relevant ecosystem-based as well as gender and human rights-based approaches to adaptation.[94]

Similarly, Kenya's NAP integrates the country's desire to achieve economic growth and development in a way that is climate compatible. It sees education and training as a mechanism for aligning these agendas and achieving a vision of the future that is climate resilient:

> Kenya's need to increase the number of beneficial, fair-paying jobs available is closely aligned with the need for effective responses to climate risks that are organised and led by Kenyan stakeholders. Reducing the vulnerability of Kenyans through economic growth and increasing employment opportunities and improving wages is an integral part of climate-compatible development. Training young Kenyans in relevant careers and imparting new skills to those already in the workforce or unemployed will build national resilience to climate change while aiding the country's economic development.[95]

It is through an analysis of the sociological dimensions of NDCs and NAPs that we get a greater understanding of how climate strategies are (or are not) more than just climate strategies. By looking at how countries treat education (and children within these references), we begin to see how responsibility for climate action gets spread unevenly across actors within countries and among countries. Such spread has real political and social ramifications when looked at from a summative perspective—a point we turn to next.

4. "Moral responsibility" and "solidarity" are largely ignored in national climate strategies

While there are a few positive examples of national climate strategies paying attention to issues of equity, justice, and fairness vis-à-vis attention to girls, children, and education, climate strategies are on the whole not doing justice to the aspirations of both the UNFCCC and the Paris Agreement. Perhaps some of the most interesting findings occurred when we began to look at the key terms' results across different groupings of countries, particularly by age, levels of carbon emissions, and climate vulnerability.

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[94] Fiji 2018:14.
[95] Ministry of Environment and Natural Resources 2016:26.

For example, "young" countries—those countries whose total population under the age of 15 comprises between one-third to one-half of its total population[96]—are more likely to make references to children, youth, future generations, and/or intergenerational equity concerns in their climate strategies.

Specifically, 59% (37 countries' NDCs) of 63 young countries whose NDCs were analyzed incorporate attention to current and future generations of children (see Appendix A for a list of countries), compared to 38% (38 NDCs) of 100 "older" countries. This suggests that countries with a youth bulge are more likely to be attentive to the intergenerational dimensions of climate change and climate action.

In contrast, **those countries responsible for emitting the highest levels of carbon emissions today are less likely to make references to children in their NDCs.** Only five (25%)—India, Iran, Canada, Mexico, and Indonesia—of the top 20 carbon emitting countries (including the European Union) include attention to children and future generations, compared to 70 (49%) in the rest of the world[97] and 12 of the top 20 most climate-vulnerable countries (see Appendix B and C for a list of countries).[98]

When it comes to NDC references to education and skills, only seven of the top 20 carbon emitting countries have done so (three of which are child-sensitive: China, India, and South Africa), compared to 101 (71%) of the rest of the world, and 15 (75%) of the top 20 most climate-vulnerable countries (see Table 4).

Clearly, the rest of the world, and especially the most climate-vulnerable countries, are shouldering the policy burden of ensuring their countries, and especially their young people, receive the necessary education and skills to face the oncoming challenges of a hot planet. Whether these countries actually achieve this in practice is a matter for another study.

Table 4: Number of NDCs that make references to children and education

	Children and future generations	Education and skills
Top 20 CO_2 emitting countries	5 (25%)	7 (35%)
The rest of the world (142 countries)	70 (49%)	101 (71%)
The top 20 most climate-vulnerable countries	12 (60%)	15 (75%)

Interestingly, among the top 20 carbon emitters, wealthy, industrialized countries like the United States, Japan, Canada, and Australia, as well as countries in the European Union, are not among the countries tending to children *and* child-sensitive education. Rather, it is countries that are already experiencing the impact of rising sea levels, decreased air quality, and intensifying heat alongside ongoing challenges of economic development, poverty and inequality. Specifically, Qatar, Eritrea, Bahrain, Sudan, Myanmar, and India—countries whose NDCs include both references to children (or future generations) and child-sensitive

[96] For data source, see Population Reference Bureau 2019.
[97] For data source, see Global Carbon Atlas n.d.
[98] For data source, see ND-GAIN n.d.

education—are leading the way in terms of addressing the spirit of the Paris Agreement. Other countries like China, for example, may include the ambitious goal of leveraging education to transform the patterns of consumption driving climate change[99], but direct little of this attention to children and youth.

> To enhance education for all citizens on low-carbon way of life and consumption, to advocate green, low-carbon, healthy and civilized way of life and consumption patterns and to promote low-carbon consumption throughout society.[100]

Finally it is worth noting that, out of the 118 NDCs discussing health and climate change, only 12 actually discuss these issues in relation to children, despite the fact that children are one of the most vulnerable populations to decreased air quality, shifting disease patterns of climate-sensitive infections, increased heat stress, increased food and water insecurity, and other adverse effects of a changing climate and weather-related disasters.[101]

When it comes to the ideas of "moral responsibility" and "solidarity" in climate action, there is little evidence of either in the attitudes of wealthier countries toward poorer countries. Nor did we see overwhelming attention paid to these concepts within individual countries, vis-à-vis their national climate strategies, toward their own populations, whether present or future generations.

Conclusions: Opportunities for enhanced policy and action

Given the important role that NDCs play on the road to 2030 and 2050, it is critical to understand where the gaps and opportunities lie. Research has shown us that there is no single solution to reversing the climate crisis. Rather, countries need to deploy every evidence-informed strategy at their disposal.[102] Currently, NDCs are not doing this. While the Paris Agreement, as we noted earlier, references the importance of issues like gender equality, the empowerment of women, intergenerational equity, and the rights of children, such attention has not translated into country-level climate policies. This will only impede progress toward realizing a just, equitable, and fair transition to a net-zero, climate-resilient future that leaves no child behind.

Research on girls' education has demonstrated powerful linkages between the achievement of quality, empowering, and transformative education for girls, the fulfillment of girls' rights, and the types of outcomes and social change needed to reverse global warming trends. Yet, climate strategies ignore the evidence and do not recognize or prioritize the important contribution that girls' education could make to combating climate crisis.

From a gender and age perspective, it is clear that girls are not being addressed at all in adaptation and mitigation at a national policy level. National climate strategies are inadequately responding to those most vulnerable to climate change, barely recognizing the

[99] Notably, few other NDCs have laid out such an ambitious climate-related agenda for the education sector.
[100] National Development and Reform Commission 2015:11.
[101] Ahdoot et al. 2015.
[102] Hawken 2017.

social implications of the climate crisis. In the process, national strategies are also reinforcing gender inequality rather than seeing it as an opportunity for change, not just for girls and women but also for society and the planet as a whole. Consistent with the research, more attention is needed on girls, children, and youth—not only as vulnerable populations and prospective beneficiaries in need of social protection, but also as rights holders, stakeholders and agents of change in their own right.

In addition, research continues to highlight education and access to information as a key response in strengthening resilience and adaptive capacity. However, education and the sectors that can advance girls' rights are almost non-existent in national responses to climate change. When education is referenced more broadly, it is referred to more in terms of a sector that needs to be mobilized, or a set of abstract activities that needs to be enacted (e.g., "education, awareness, and training"). Rarely is the substance or the quality of education called out as an important factor in determining how education might contribute to the kind of systems-level transformation needed to increase humanity's ability to reverse climate catastrophe. Such transformation would seed efforts toward achieving gender equality through a more inclusive, quality, and gender transformative education. Yet, countries have missed this opportunity in their NDCs as well.

Finally, examining attention to girls, children, and education across these different groupings of countries helps to illuminate trends that are defined by power—trends that are political, economic, and social in nature. For instance, it is no coincidence that among the top 20 carbon emitters, those countries that are historically responsible for our current levels of anthropogenic greenhouse gases in the atmosphere are the same countries that are not attending to the sociological dimensions of the impacts of climate change: the role of women and girls in strategies to mitigate against further environmental damage, or approaches to increasing the adaptive capacity of children and youth through new approaches to education. Such delineation sheds light on how concepts like fairness, equity, and climate justice are being sidelined by those with power, while countries most vulnerable to the impacts of climate change are shouldering the burden of social change.[103] In this way, frequency counts become illustrative of deeper sociopolitical trends preventing themes of gender equality, children's rights, and the right to education for the most disadvantaged from being etched throughout the climate policy landscape.

While this analysis pays special attention to Nationally Determined Contributions (NDCs), National Adaption Plans (NAPs) may be a country-level climate strategy needing equal public scrutiny and research. On all key terms searched, NAPs performed considerably better in terms of their inclusion of attention to girls, children and youth, and education. Further analysis is also needed on inclusion of girls and education in Nationally Appropriate Mitigation Actions.

This study highlights how the inclusion of girls' rights in national climate strategies can have mutual benefits for both climate action and gender equality. Indeed, it is through girls' education that interdependency between the Paris Agreement and the Sustainable Development Agenda becomes clear. However, national governments currently have missed the opportunity to advance these two vital agendas. It is important that any activities to reduce climate change also contribute to gender equality and that activities to achieve gender equality do not contribute to further environmental degradation. Climate policy that addresses girls'

[103] See for example, Roberts and Parks 2017; Parks and Roberts 2008.

education and prioritizes their access to information is climate policy aimed at dismantling the roots of inequality that sustain the present patriarchal system of exploitation, oppression, and domination underlying the current climate crisis. By investing in girls' education, countries are simultaneously investing in the social change needed to engender a just transition to an alternative world system grounded in social, gender, and ecological justice.

Appendix A: Young countries and their inclusion of children and youth in NDCs

Country	Includes reference to children/youth	% population <15 years
Niger		0.5
Angola	No data	0.48
Chad	X	0.48
Mali	X	0.48
Somalia	X	0.47
Uganda	X	0.47
Zambia	X	0.46
Burkina Faso	X	0.45
Burundi	X	0.45
Central African Republic	X	0.45
Guinea	X	0.45
Malawi		0.45
Mozambique		0.45
Afghanistan		0.44
Republic of The Gambia	X	0.44
Guinea Bissau		0.44
Nigeria	X	0.44
Tanzania		0.44
Benin	X	0.43
Cameroon	X	0.43
Senegal	X	0.43
Congo	X	0.42
Côte D'Ivoire	X	0.42
Eritrea	X	0.42
Ethiopia	X	0.42
Liberia	X	0.42
Togo		0.42
Kenya	X	0.41
Madagascar		0.41
Sierra Leone		0.41
Sudan	X	0.41
Mauritania	X	0.4

Nauru		0.4
Rwanda		0.4
Solomon Islands	X	0.4
Yemen	X	0.4
Zimbabwe	X	0.4
Comoros		0.39
Iraq	No data	0.39
Marshall Islands		0.39
State of Palestine	X	0.39
Timor-Leste	No data	0.39
Vanuatu	X	0.39
Gabon		0.38
Ghana		0.38
Samoa		0.38
Equatorial Guinea		0.37
Namibia		0.37
Belize	X	0.36
Pakistan	X	0.36
Papua New Guinea	X	0.36
Tonga	X	0.36
Guatemala	X	0.35
Kiribati	X	0.35
Swaziland		0.35
Egypt	X	0.34
Haiti		0.34
Jordan	X	0.34
Tajikistan	X	0.34
Honduras		0.33
Kyrgyzstan		0.33
Lao		0.33
Lesotho	X	0.33

Appendix B: "The rest of the world" countries and their inclusion of children/youth, education/skills

Rank (by CO2 emissions, highest to lowest)	Country	Inclusion of children/youth	Inclusion of education/skills
22	Kazakhstan		
25	Malaysia		X
26	United Arab Emirates		X

27	Egypt	X	X
28	Ukraine		
29	Argentina		X
30	Viet Nam	X	X
31	Pakistan	X	X
32	Iraq	No data	No data
34	Venezuela	X	X
35	Algeria	X	X
36	Qatar	X	X
37	Philippines	X	X
39	Nigeria	X	X
40	Kuwait	X	
42	Uzbekistan		X
43	Bangladesh		
44	Chile	X	X
45	Colombia		X
48	Turkmenistan		
50	Israel		
51	Oman	No data	No data
52	Peru	X	X
53	Singapore		
54	Morocco	X	X
55	Belarus		X
56	Democratic People's Republic of Korea	X	X
58	Libya	No data	No data
62	Serbia		
63	Norway		
66	Trinidad and Tobago		
67	Switzerland		
69	Ecuador	X	X
70	Azerbaijan		
71	Cuba	X	X
72	New Zealand		
73	Angola	No data	No data
76	Bahrain	X	X
77	Mongolia		
78	Tunisia		
79	Syrian Arab Republic		X
80	Bosnia and Herzegovina		
81	Myanmar	X	X

82	Sri Lanka	X	X
83	Jordan	X	X
84	Dominican Republic	X	X
85	Bolivia		X
86	Guatemala	X	X
88	Lebanon		X
89	Yemen	X	X
91	Sudan	X	X
92	Ghana		X
93	Kenya	X	X
95	Tanzania		X
96	Ethiopia	X	
98	Afghanistan		X
99	Côte D'Ivoire	X	X
100	Georgia		
101	Honduras		X
102	Kyrgyzstan		
103	Zimbabwe	X	X
104	Mozambique		X
105	Brunei Darussalam	No data	No data
106	Panama	X	X
107	Senegal	X	X
109	Nepal		X
110	Costa Rica	X	X
111	Cambodia		
112	Botswana		X
113	Jamaica		X
114	Cameroon	X	X
116	Benin	X	X
117	Papua New Guinea	X	
120	El Salvador		X
121	Uruguay	X	X
122	Equatorial Guinea		X
123	Albania		
125	Paraguay	X	
126	Uganda	X	X
127	Tajikistan	X	
128	Armenia	X	X
130	Gabon		
131	Nicaragua	X	X
132	Republic of Moldova	X	X

133	Democratic Republic of the Congo	X	
134	Zambia	X	X
135	Mauritius		X
136	Namibia		X
137	Iceland		
138	Congo	X	X
139	Burkina Faso	X	X
140	Madagascar		X
141	Haiti		X
142	Togo		X
143	Guinea	X	X
144	Mauritania	X	X
145	Lesotho	X	X
146	Montenegro		
147	Bahamas	X	X
148	Niger		X
149	State of Palestine	X	X
150	Guyana		X
151	Suriname		X
152	Lao		X
154	Mali	X	X
155	Maldives		X
158	Sierra Leone		X
159	Malawi	X	
160	Fiji		
161	Swaziland		X
162	Barbados	X	
163	Bhutan		X
164	Liberia	X	
165	Rwanda		X
168	Djibouti		
169	Eritrea	X	X
170	Somalia	X	X
171	Chad	X	
173	Republic of The Gambia	X	X
175	Seychelles	X	X
176	Cabo Verde		X
178	Antigua and Barbuda	X	X
179	Belize	X	X
180	Timor-Leste	No data	No data
181	Burundi	X	X

182	Andorra		
183	St. Lucia		X
185	Guinea Bissau		X
186	Central African Republic	X	X
187	Palau		X
188	Grenada		
189	St. Kitts and Nevis		
190	Solomon Islands	X	X
191	Samoa		
192	St. Vincent and the Grenadines	X	X
193	Turks and Caicos Islands	No data	No data
194	British Virgin Islands	No data	No data
195	Comoros		X
196	Vanuatu	X	X
197	Micronesia		
198	Liechtenstein		
199	Anguilla	No data	No data
200	Dominica	X	X
201	Tonga	X	X
202	Marshall Islands		X
203	São Tomé and Principe		X
204	Cook Islands		
205	St. Pierre and Miquelon	No data	No data
206	Kiribati	X	X
207	Nauru		X
209	Wallis and Futuna Islands	No data	No data
210	Niue	X	X
211	Tuvalu	X	X
212	St. Helena	No data	No data

Appendix C: Climate-vulnerable countries and their inclusion of children/youth, education/skills

Rank (most vulnerable to least)	Most climate-vulnerable country	Inclusion of children/youth	Inclusion of education/skills	NDC-Gain Index*
178	Qatar	X	X	-45.33
177	Kuwait	X		-22.75
174	Chad	X		-16.01
173	Equatorial Guinea		X	-15.51

172	Eritrea	X	X	-15.25
171	United Arab Emirates		X	-15.05
170	Central African Republic	X	X	-13.66
169	Singapore			-13.61
168	Bahrain	X	X	-13.45
167	Sudan	X	X	-12.62
166	Democratic Republic of the Congo	X		-11.63
162	Niger		X	-10.34
162	Afghanistan		X	-10.29
162	Haiti		X	-10.26
160	Guinea Bissau		X	-9.46
159	Liberia	X		-9.04
155	Myanmar	X	X	-8.84
155	Zimbabwe	X	X	-8.84
155	Burundi	X	X	-8.82
151	Madagascar		X	-8.64

*Adjusted for GDP, Source: https://gain.nd.edu/our-work/country-index/rankings/
**Saudi Arabia was removed from this list, as it is also ranks in the top 20 carbon emitting countries.

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