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Three platforms for girls' education in climate strategies

Christina Kwauk and Amanda Braga





BROOKE SHEARER SERIES

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Contents

| | |
|--|----|
| Abstract | 5 |
| I. Introduction | 6 |
| II. Gender in climate change mitigation and adaption today | 13 |
| III. Three platforms for addressing climate change through girls' education | 17 |
| Platform 1: Promote girls' reproductive rights in order to ensure equitable climate action | 21 |
| Platform 2: Invest in girls' education to foster climate participation and leadership | 27 |
| Platform 3: Develop girls' life skills for a green economy | 32 |
| IV. Conclusion | 39 |
| References | 42 |

List of Figures and Tables

| | |
|---|----|
| Figure 1. Current landscape of approaches to climate action | 8 |
| Figure 2. Integrated approaches to climate action | 9 |
| Table 1. A three-tiered platform for integrating girls' education into climate strategies | 10 |
| Table 2. Girls' education levels and ND-GAIN Index country rankings | 19 |
| Figure 3. The intersection between gender and climate change: A current approach to girls and women in population-based mitigation efforts | 22 |
| Figure 4. The intersection between gender and climate change: A current approach to increasing girls' and women's participation in climate leadership | 28 |
| Figure 5. The intersection between education and climate change: A current approach to integrating girls and women into the green economy | 33 |
| Figure 6. Integrated green skills matrix | 36 |

List of Abbreviations

Cedefop – European Centre for the Development of Vocational Training

COP – Conference of the Parties

DAC – Development Assistance Committee (OECD)

GCF – Green Climate Fund

GEF – Global Environment Facility

GENDERNET – Network on Gender Equality (OECD)

GGCA – Global Gender and Climate Alliance

GHGs – greenhouse gases

ILO – International Labor Organization

INDCs – intended nationally determined contributions

IUCN – International Union for Conservation of Nature

NCFs – national climate funds

NDCs – nationally determined contributions

ND-GAIN – University of Notre Dame Global Adaptation Initiative

ODA – overseas development assistance

OECD – Organization for Economic Cooperation and Development

SDGs – Sustainable Development Goals

STEM – science, technology, engineering, and mathematics

UNDP – United Nations Development Program

UNEP – United Nations Environment Program

UNFCCC – United Nations Framework Convention on Climate Change

UNFPA – United Nations Population Fund

WEDO – Women’s Environment and Development Organization

Three platforms for girls' education in climate strategies

CHRISTINA KWAUK AND AMANDA BRAGA

Abstract

While the damaging effects of climate change tend to hit the most vulnerable and least skilled people in developing countries—largely girls and women—particularly hard, well-educated girls and women can be a powerful part of the solution to the problem. Girls' education may be one of the most overlooked yet formidable mechanisms for mitigating against weather-related catastrophes and adapting to the long-term effects of climate change. For starters, when girls and women are better educated and included in decisionmaking at all levels, their families and communities are more resilient and adaptable to economic and environmental shocks and are better able to plan for, cope with, and rebound from climate crises. Data suggest that there is a strong positive association between the average amount of schooling a girl receives in her country and her country's score on indexes that measure vulnerability to climate-related disasters. Ignoring both the toll of climate change on girls and women as well as the climate-related solutions they can contribute threatens to impede progress on key development goals, including those related to ending poverty, expanding quality education, achieving gender equality, and fostering sustainable cities and agricultural productivity. To bring girls and women to the fore of climate change adaptation and mitigation, we propose that stakeholders in the gender, education, and climate change sectors work together on three platforms: (1) promoting girls' reproductive rights in order to ensure equitable climate action; (2) investing in girls' education in order to foster climate participation and leadership; and (3) spurring actions to develop girls' life skills for a green economy. Making progress on these platforms will require strong support from traditional and non-traditional policy stakeholders, practitioners, and donors.

I. Introduction

The intensifying impacts of climate change and its indiscriminate nature make climate change adaptation and mitigation a high priority for countries around the globe. Disasters caused by droughts, wildfires, tropical cyclones, and floods have wreaked havoc on people's lives everywhere, from Japan to Bangladesh, from the United States to Afghanistan, from Peru to Fiji. From 1850 to 2011 countries in the developing world were responsible for only 21 percent of carbon emitted, yet in 2015 they paid 78 percent of the social cost of climate change through their greater exposure to natural disasters, weaker infrastructure, and less reserve capital on which to fall back. Developing countries' share of the social cost is expected to rise to 87 percent by 2035, and be accompanied by the irretrievable loss of indigenous knowledge systems that could provide key climate change adaptation solutions.¹

The most vulnerable and least skilled members of these populations, largely women and girls, experience most acutely the impact of climate change, particularly extreme weather events. Evidence shows that natu-

ral disasters lower women's life expectancy more than men's,² and in some cases women and girls make up as much as 90 percent of those killed in weather-related disasters.³ Further, women and girls are increasingly vulnerable to human trafficking or to sexual assault in crowded shelters or camps when they survive.⁴ They are also often excluded from participating in decisionmaking within the household and community, or in risk-reduction activities that could expose them to life-saving information, resources, and skills.⁵

In families experiencing climate change's gradual or prolonged effects, such as drought, girls—who already face an array of gender-based challenges⁶—often endure the most consequential long-term impacts of short-term coping responses. For example, girls are at greater risk of early marriage in times of weather-related crises, because their dowries can help ease the burden of scarce household resources; and they are often the first to be withdrawn from school or they attend school less frequently in times of drought so that they can complete house-

1 Busch 2015; UNESCO 2012.

2 Neumayer and Plumper 2007.

3 Plan International 2011.

4 Norlha 2015.

5 Dankelman 2010.

6 King and Winthrop 2015; Sterling, Winthrop, and Kwauk 2016.

hold responsibilities like fetching water.⁷ These coping mechanisms direct resources away from opportunities that would otherwise change the course of girls' futures, and instead force them to stay in existing conditions of poverty, vulnerability, and marginalization that perpetuate low-skill development.

Climate change increases humanity's vulnerability to the shocks of weather-related disasters; it also exacerbates existing gender inequalities that obstruct opportunities for girls' and women's social and economic empowerment. The negative effects of climate change have direct implications for programs and policies that target positive life outcomes for marginalized and vulnerable girls. Ignoring this and how girls and women can be change agents in the push for climate action can backfire. It could halt or reverse some of the progress made toward achieving cross-cutting targets of the Sustainable Development Goals (SDGs). This includes advances related to Goals 1 (no poverty), 4 (quality education), 5 (gender equality), 8 (decent work and economic growth), 10 (reduced inequalities), 11 (sustainable cities and communities), 12 (responsible consumption and production), and 13 (climate action).⁸

The global community knows that the 17 SDGs are intricately intertwined and interdependent, and that innovative partnerships and outside-the-box thinking are prerequisites to achieving Agenda 2030. Women Deliver and the Global Partnership for Education, for example, have illus-

trated how progress in gender equality and education, respectively, lie at the center of each of the global goals.⁹ However, although the gender and education communities have each addressed climate change adaptation and mitigation in their own ways, the identification of problems and solutions has been confined to the gender, education, and climate change sectors from which they have stemmed and, thus, have failed to integrate on the whole (Figure 1).

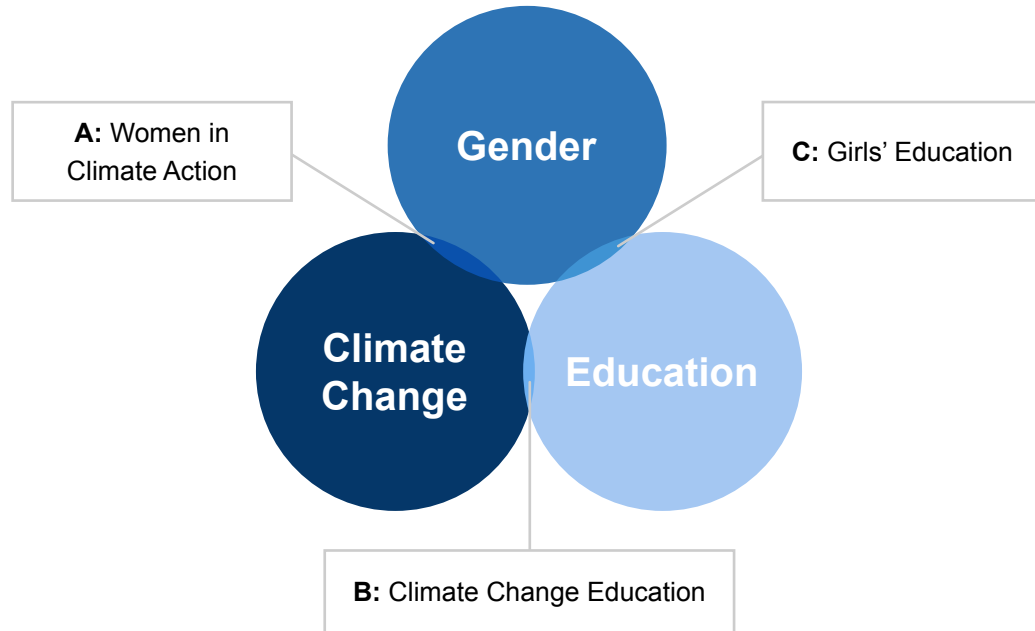
On one side (A in Figure 1), actors from the gender and climate change sectors have engaged in discussions that have highlighted the important role of increasing women's participation in community-led adaptation efforts. While the approaches initiated in this space have included adult education, the actions engendered here have missed the important link to quality education throughout life from early childhood through adolescence to adulthood. Establishing this link is particularly crucial, given the high rates of dropout by girls, due to gender-discriminatory social norms and practices, once they reach secondary school. Consequently, efforts to give voice to women may fall short because interventions fail to take into account the cumulative social and psychological effects of years of being denied access to a quality education. On the other side (B in Figure 1), education and climate change dialogues have done much to engage citizens at a young age, so as to spur important behavior change among children to reduce their vulnerability to the negative impact of climate change. However, these efforts have emerged as gender-blind. As a result, ef-

7 CARE 2016; Chigwanda 2016; Plan International 2011.

8 Mearns and Norton 2010.

9 GPE 2015; Women Deliver, n.d.

Figure 1: Current landscape of approaches to climate action

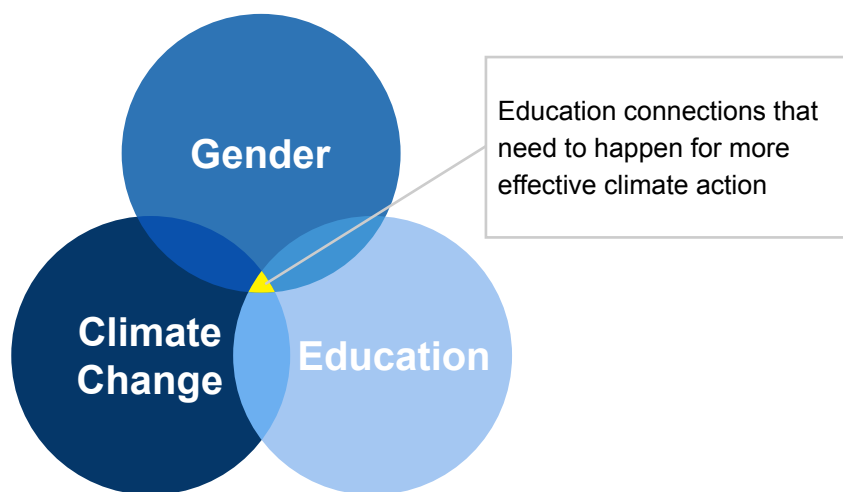


forts to improve the adaptive capacity of the next generation may fall short because climate change education fails to recognize the disproportionate vulnerability shouldered by girls stemming from structural inequalities and constraining gender norms. Finally, although gender and education actors have done much to advance issues in girls' education (C in Figure 1), these discussions remain largely disconnected from issues of climate change. The extent to which educators could team up with climate activists and gender specialists to contribute to climate adaptation and mitigation efforts remains largely unexplored.

To improve the efficiency and effectiveness of climate change interventions—and to avoid pitfalls such as those mentioned

above—this paper proposes that actors approaching climate action through the gender, education, and climate change sectors come together through multisectoral partnerships and collaboration, as illustrated in Figure 2, rather than in separate, isolated occasions, as in Figure 1. To demonstrate how, this paper draws on research in girls' education specifically and on gender and education more broadly to highlight three platforms around which these three sectors could link up knowledge and action to lift up girls and women as agents of change in the pursuit of sustainable development and more equitable climate action:

1. **Promote girls' reproductive rights in order to ensure equitable climate action.** The first platform is centered on enhancing girls' and women's reproductive health and rights, an argument that pushes current discussions on

Figure 2: Integrated approaches to climate action

“female education,”¹⁰ women’s fertility, and population growth to consider how the underlying lever of change is education’s impact on girls’ and women’s control over their reproductive lives. Making the connection to female rights and agency has important implications not only for providing girls and women the opportunities to develop their own human, social, and political capital, but also for ensuring more equitable climate action.

2. Invest in girls’ education in order to foster climate participation and leadership. The second platform

draws attention to the role that women in leadership and decisionmaking have in increasing the diversity of experiences and perspectives shaping climate change problem identification and policy solutions. This case points to the critical importance of education, both in formal and informal spaces, in setting girls up to take on leadership roles later in life.

3. Develop girls’ life skills for a green economy. The third platform focuses on increasing girls’ and women’s skills for a green economy, and how an investment in girls’ quality education—one

¹⁰ Here, “female education” is used to describe what gender and climate actors conceptualize as a non-political, demographic variable captured in objective years of schooling. We distinguish this from “girls’ education,” which is a more politicized term concerned with both the quality and quantity of education that girls receive during their school-going years. It is an opportunity that is very often determined by household dynamics and other gendered social and cultural factors present in the environment.

Table 1: A three-tiered platform for integrating girls' education into climate strategies

| WHO | |
|--|---|
| <p>Platform 1: Promote girls' reproductive rights in order to ensure equitable climate action</p> <p>The existing emphasis on girls' and women's fertility places the onus of sustainable population growth on the shoulders of marginalized women and does not give due consideration to a rights-based approach to girls' and women's reproductive health</p> | <ul style="list-style-type: none"> » Girls' health and education actors » Population-health-environment (PHE) actors » Climate financing and accountability institutions |
| <p>Platform 2: Invest in girls' education in order to foster climate participation and leadership</p> <p>Current approaches to fostering female leadership in the climate arena neglect the importance of early leadership opportunities and experience</p> | <ul style="list-style-type: none"> » Women and leadership organizations and networks » Girls' education organizations and networks |
| <p>Platform 3: Develop girls' life skills for a green economy</p> <p>Policy actors focused on "greening" the economy fail to consider innovative female engagement in the green economy and the necessary skill building and educational experiences needed earlier in life</p> | <ul style="list-style-type: none"> » Labor-oriented policy and workforce development actors » Girls-in-STEM actors » Girls' life skills education actors » Climate change education actors » Climate financing and accountability institutions |

| HOW | EXPECTED OUTCOME |
|--|--|
| <ul style="list-style-type: none"> » Broker partnerships between girls' education and family planning efforts to address girls' educational and reproductive needs and vulnerabilities » Promote girls' access and completion of quality education, including sexuality, puberty, and reproductive health education with attention to issues of gender and power » Include girls' education and reproductive health in climate aid accountability mechanisms | <p>Climate action that works toward climate justice and gender equality</p> |
| <ul style="list-style-type: none"> » Broker partnerships between organizations and networks focusing on women in climate leadership, women in organizational and political leadership, and girls' leadership development to maximize progress in breaking down barriers for female leaders » Invest in girls' life skills education to foster the knowledge, skills, and attitudes of future women leaders | <p>Creation of a pipeline of female climate champions</p> |
| <ul style="list-style-type: none"> » Broker partnerships between green economy and climate change education actors and girls' education and girls-in-STEM actors to bring a gender lens to the former and a climate agenda to the latter » Identify key crossover points between girls' life skills and green skills » Create quality educational learning environments and pathways for girls to build competencies and experiences to participate in green-sector jobs » Extend green-sector training and skills development opportunities to female youth through tailored girls' education programming | <p>A gender-responsive green economy with educational pathways for girls</p> |

that builds the breadth of skills needed not only for a changing world but also for *transforming* a girl's world—can be the key to ensuring that girls and women fully participate in sustainable development and have equal opportunity to drive and benefit from greener innovations in the 21st century.

While girls' education is one of many promising and cost-effective solutions to climate change,¹¹ investing in girls' education comes down to increasing humanity's capacity to develop diverse technical *and* sociological solutions for adapting to and mitigating against climate change. Indeed, investment in girls' education is a foundational strategy for addressing the underlying gender inequalities driving much of the unequal impacts of climate change experienced by girls and women, as well as those threatening the achievement of the SDGs.

¹¹ Hawken 2017.

II. Gender in climate change mitigation and adaption today

In general, climate change is addressed in two ways: mitigation—human intervention to reduce greenhouse gas (GHG) emissions into the atmosphere—and adaptation—the development of the knowledge, skills, and attitudes necessary to reduce risk and vulnerabilities while building resilience to climate change.¹² Because there are extraordinary amounts of GHG in the atmosphere, mitigation alone will not suffice. Adaptation is thus an important and complementary way of adjusting current behavior to anticipate, counteract, and cope with both the long-term effects of climate change and the immediate aftermath of weather-related disasters. So, what has the international community done to address both climate mitigation and adaption? And how have gender and education actors shaped these actions?

Since the 1992 adoption of the United Nations Framework Convention on Climate Change (UNFCCC), progress in global and country-level mitigation and adaptation efforts has largely been dealt with by the now 197 parties to the convention. At the annual Conference of the Parties (COP) meeting, parties negotiate decisions and commitments for countries to reduce GHG emissions. Major milestones of the UNFCCC have included the Kyoto Protocol, which

was adopted in 1997, entered into force in 2005, and amended in 2012, and the Paris Agreement, which was adopted in 2015 and entered into force in 2016. The Kyoto Protocol committed parties to reduce GHG emissions, placing the onus on developed countries because of their historical role in establishing current levels of GHG in the atmosphere. The Paris Agreement established a set of binding procedural commitments for holding parties accountable to and strengthening their efforts at keeping global temperature rise below 2 degrees Celsius above pre-industrial levels during this century and aiming to further limit temperature increase to 1.5 degrees Celsius. The Paris Agreement also for the first time placed greater stress on the implementation of adaptation efforts.

Gender equality was first recognized in UNFCCC policy mandates in 2001, but it wasn't until 2010 at COP16 in Cancún that parties to the UNFCCC acknowledged gender equality and women's participation as necessary prerequisites for effective, sustainable, and socially inclusive climate action, including climate financing. To meet the ambitious goals of international climate accords and nationally determined contributions (NDCs), countries across the globe began to recognize the need to address climate

¹² UNESCO/UNEP 2011 in Mochizuki and Bryan 2015.

change in their national budgets and to develop national climate funds (NCFs). While many of those same governments recognized that there are gendered dimensions to climate change and understand the UNFCCC COP decisions and mandates for enhancing gender-responsive action, most have not allocated resources for integrating gender into their national mitigation and adaptation policies, planning, and measures. Efforts by organizations like the International Union for Conservation of Nature (IUCN), the UN Development Program (UNDP), and UN Women have attempted to build government capacity to address inequality and discrimination in fiscal policy through gender-responsive budgeting and gender audits, but government budgets in general, and public financing for climate action specifically, have remained in large part gender-blind.

At the same time, however, coordinated and targeted advocacy efforts by multistakeholder networks and partnerships such as the Global Gender and Climate Alliance (GGCA) and by civil society organizations like the Women's Environment and Development Organization (WEDO) and the Heinrich Böll Foundation North America have been instrumental in supporting multilateral climate finance mechanisms to engender climate investments across levels and sectors.¹³ And in 2015, with the decisions from COP21 in Paris, the parties made it a requirement under the Paris Agreement to promote gender equality and the empowerment of women, thus catalyzing action more broadly.¹⁴

Between 2001 and 2015, the combination of advocacy and policy development saw three of the UNFCCC's primary financial mechanisms—the Adaptation Fund, the Global Environment Facility (GEF), and the Green Climate Fund (GCF)—retroactively or from their inception (in the case of the GCF) take gender into account in their operations and governance in the form of Gender Policies and Gender Action Plans. In addition, the GCF made it a goal to achieve gender balance in participation in its board, secretariat, and staff. This move was likely influenced by Decision 23/CP.18 at COP18 in Doha, which focused on enhancing the gender balance and women's participation in UNFCCC delegations, boards, and bodies, and also established a standing item on gender and climate change in the COP agenda.

While it is clear there has been much progress toward creating more gender-responsive and gender-sensitive global climate policy and financing environments, turning ambition into reality on the ground for women has proven to be more difficult. To illustrate, such structural changes should have made it theoretically easier for women to access and benefit from fund activities, giving them equal opportunity to increase their resilience and adaptive capacity, to enhance their lives and livelihoods, and to decrease their vulnerabilities to the impact of climate change. But while the number of gender-responsive projects financed by these institutions has increased, progress toward gender equality on other fronts has been slow and uneven.¹⁵ Climate funds have also continued to emphasize large-scale mitigation activi-

¹³ Glemarec, Qayum, and Olshanskaya 2016; Schalatek, Aguilar, and Granat 2015.

¹⁴ Glemarec, Qayum, and Olshanskaya 2016.

¹⁵ Schalatek, Aguilar, and Granat 2015; GGCA and UNDP 2016.

ties using high-tech solutions that traditionally exclude women,¹⁶ and their governing boards continue to be underrepresented by women.¹⁷ In addition, the percentage of women in UNFCCC national delegations at COP meetings has hovered around 30-35 percent since 2012, in spite of Decision 23/C.18, “the Doha Miracle.”¹⁸

The emergence of aid accountability and transparency mechanisms has been helpful in spurring greater attention to gender equality in climate financing specifically and in climate action more generally. For example, the Organization for Economic Cooperation and Development (OECD) Development Assistance Committee (DAC) Network on Gender Equality (GENDERNET)¹⁹ began recently to use the OECD DAC gender equality marker to track overseas development assistance (ODA) targeting gender and climate change. While bilateral ODA for gender and climate change nearly doubled between 2010 and 2014, from \$4.4 billion to \$8 billion (or 31 percent of total climate change ODA), the majority of this aid has gone into the agriculture and water sectors, reflecting a heavy emphasis on adult women and their traditional roles in the domestic and agricultural spheres, where the bulk of climate adaptation work is targeted. Indeed, the OECD GENDERNET found that in 2014, approximately 41 percent of bilateral

aid targeted at adaptation also targeted gender equality, compared to only 18 percent of bilateral aid targeted at mitigation that also targeted gender equality.²⁰ In contrast, approximately 92 percent of climate financing (or approximately \$361 billion in 2014) goes into mitigation activities like renewable energy generation.²¹ Findings from the IUCN confirm this uneven attention to gender equality in climate adaptation over climate mitigation. Of the 189 intended nationally determined contributions (INDCs) submitted by parties as part of the UNFCCC COP21 meeting in Paris, 13 mentioned “women” or “gender” exclusively in their adaptation actions; a dismal three mentioned “women” or “gender” exclusively in their mitigation actions.²² Although the ultimate goal remains to have gender cut across sectors and mainstreamed throughout climate action, the fact that only 22 countries’ nationally determined contributions²³ do so points to the long road ahead.²⁴

Gender actors have focused on improving the inclusion and participation of adult women in climate negotiations and in gender-responsive climate policy and processes. Conversely, education actors, specifically those in the science education and global education communities, have focused on enhancing the role of children in climate change adaptation on the grounds that chil-

16 GGCA and UNDP 2016.

17 IUCN 2015b.

18 WEDO 2013, 2017a.

19 Formerly known as the Women in Development Expert Group.

20 OECD DAC GENDERNET 2016.

21 UN Women 2016.

22 IUCN 2016.

23 INDCs become binding NDCs upon the country’s ratification of the Paris Agreement.

24 WEDO 2016a.

dren will be future leaders and environmental stewards. Environmental education emerged in the 1960s in the United States in response to rapid urbanization and calls for conservation.²⁵ But with new evidence of climate change and intensified concerns for the environment in the 1990s, what began as a scientific discipline focused on teaching youth *about* the environment became a more political, global, and forward-looking endeavor to engage youth *with* sustainable development.²⁶ Alongside this shift, key agenda-setters in the global climate change policy space began acknowledging the significance of the role of children in successful development projects. For instance, in 1992 the Rio Declaration on Environment and Development prioritized children as integral to achieving a sustainable future, and by 2002 the United Nations General Assembly declared 2005-2014 the Decade of Education for Sustainable Development.²⁷ These efforts, led by organizations like UNESCO, UNICEF, and Plan International, have been critical in mobilizing new generations of force multipliers for environmentally friendly behavior change and in some cases life-saving disaster-response.²⁸

The environmental education, education for sustainable development, and climate change education movements have, in large part, been about teaching children and youth to understand the causes and impacts of climate change, develop knowledge of cli-

mate science, learn to cope with existing and unknown consequences of climate change, change lifestyle and consumption, and prepare for a more sustainable future.²⁹ Yet, adaptation requires both imparting knowledge of what is certain, such as preparation and response mechanisms to expected natural disasters, and teaching transferable skills that can cultivate individuals' and communities' adaptive capacity to face the uncertain futures that climate change brings.³⁰ While climate change education has begun to broaden its focus by incorporating efforts to build capabilities like managing personal emotions, challenging existing attitudes and values, and considering new possibilities for one's future,³¹ it still has quite a way to go. More must be done to promote an understanding of how the histories and power dynamics that have created the current geopolitical and social landscapes influence the emotional realities of climate change. Issues such as power, structures, and agency remain muted in the realm of climate change education. Yet these issues are particularly key as they intersect with the gender dynamics and social relations that have systematically limited girls to being victims of climate change and from being solution-makers.

25 Stapp et al. 1969.

26 Tilbury 1995.

27 UNICEF, n.d.; Læssøe and Mochizuki 2015.

28 Anderson 2010.

29 Anderson 2011; Mochizuki and Bryan 2015.

30 Anderson 2010.

31 Mochizuki and Bryan 2015.

III. Three platforms for addressing climate change through girls' education

The recommendations made by gender and climate change actors to make climate action work for women have focused on (1) prioritizing gender equality across all climate-related sectors, especially transportation, agriculture, and energy; (2) ensuring women's meaningful participation in decisionmaking in the design and delivery of climate change solutions; and (3) improving women's access to renewable energies and thus their participation in the green economy. The recommendations of climate change education actors have focused on engaging youth early on and equipping all children with the competencies necessary to change their behaviors and cope with new and unknown realities. These efforts might take the form of interdisciplinary approaches that weave environmental topics into existing curricula, or programming that engages children as community participants and leaders. But just as gender actors have missed the importance of early childhood, childhood, and adolescent education in their efforts to improve the status of women in climate discussions, education actors have missed the importance of gender in their efforts to better equip children and youth to face the immediate and

future challenges of climate change.

Girls' education actors, however, may be able to bridge the critical missing link. Research on girls' education has consistently demonstrated a wealth of positive returns from investing in girls' access to and completion of quality education.³² For example, studies show that the returns to education for girls are higher than for boys at all levels of education: the average increase in wages for children with a primary level of education is 10.9 percent for girls, 10.0 percent for boys; at the secondary level it is 8.7 percent for girls and 7.1 percent for boys; and at the tertiary level it is 16.8 percent for girls and 15.2 percent for boys.³³ Globally, 47,700 girls 17 years of age and under are married every day.³⁴ In countries with high rates of child marriage, studies show that keeping girls in school beyond primary is one of the best ways to avoid early marriage. In Bangladesh, for example, each additional year of secondary school reduces a girl's risk of marrying before the age of 18 by 4 percentage points and reduces her risk of having her first child before the age of 18 by 6 percentage points. In Mali, with each additional year of secondary school the risk of early marriage is

³² OECD 2012; Barro and Lee 2013; King and Winthrop 2015; Sperling, Winthrop, and Kwauk 2016; Unterhalter et al. 2014.

³³ Patrinos and Montenegro 2014.

³⁴ UNFPA 2016.

reduced nearly 13 percent and early child-bearing by nearly 8 percent.³⁵ Higher levels of education are also associated with strong measures of agency—or “the ability to make decisions about one’s life and act on them to achieve a desired outcome, free of violence, retribution, or fear.”³⁶ For instance, 17 percent of women with a higher education report having no say in decisions about visiting friends and family, whereas 43 percent of women without an education report having no say. Beyond freedom of movement, fewer than 20 percent of women with higher education lack sexual autonomy, compared to 61-80 percent of women with no education.³⁷ The cumulative effect of investing in girls’ education points to greater gains made in the social, economic, and political conditions necessary for achieving gender equality.

Studies have also shown that girls’ increased education and empowerment can mean the difference between life and death in the face of climate-related crises. Indeed, when girls and women are better educated and when they are included in decisionmaking at all levels, their families and communities are more resilient and adaptable to econom-

ic and environmental shocks, and they are better able to plan for, cope with, and rebound from weather-related disasters. For example, a study of weather disasters in developing countries estimated that if countries had invested more in girls’ education between 1960 and 2003, 465 million people could have been saved from injury and 667 million from drought, and the death toll from floods could have been reduced by 60,000.³⁸ Another study projected that if at least 70 percent of women between ages 20 and 39 achieved at least a lower-secondary education, disaster-related deaths in 130 countries could be reduced by 60 percent by 2050.³⁹

While the link between girls’ education and climate vulnerability should be investigated more rigorously, back-of-the-envelope calculations suggest a compelling association. Using the ND-GAIN Country Index⁴⁰ developed by the University of Notre Dame Global Adaptation Initiative and UNDP data on the mean years of schooling for girls in 162 countries, there is a strong positive association ($r = 0.85$, $p < .001$) between the average amount of schooling a girl receives in her country and her country’s ND-GAIN index. That is, girls with high levels of schooling are more likely to live in countries less vulnerable to climate disasters, and girls with very little schooling are more likely to live in countries that are more vulnerable (see Table 2).

Girls with very little schooling are more likely to live in countries that are more vulnerable to climate disasters.

35 Wodon, Male, Nayihouba, et al. 2017.

36 Klugman et al. 2014, 1.

37 Klugman et al. 2014.

38 Blankenspoor et al. 2010.

39 Streissnig, Lutz, and Patt 2013.

40 The ND-GAIN Country Index measures a country’s vulnerability to climate change in relation to its readiness to improve resilience. In this case, higher scores are better, representing lower vulnerability to climate disasters.

Table 2. Girls' education levels and ND-GAIN Index country rankings

| Top Five Countries | Average years of schooling for girls | ND-GAIN Index score* |
|------------------------------|--------------------------------------|----------------------|
| Denmark | 12.6 | 81.3 |
| New Zealand | 12.6 | 80.6 |
| Norway | 12.8 | 80.6 |
| Singapore | 11.1 | 78.8 |
| United Kingdom | 13.2 | 78.5 |
| Bottom Five Countries | | |
| Sudan | 3.0 | 30.6 |
| Burundi | 2.6 | 30.1 |
| Eritrea | no data | 25.5 |
| Chad | 1.2 | 25.3 |
| Central African Republic | 2.8 | 24.8 |

*Note: A higher ND-GAIN score represents a lower vulnerability to climate disasters; thus, higher scores are better.

Source: Notre Dame Global Adaptation Initiative 2017; UNDP 2016 (girls' mean years of schooling).

Yet, for every additional year of schooling for girls on average, a country's ND-GAIN score could be expected to increase by 3.2 points ($p < .001$), notwithstanding other potential control variables unaccounted for in this analysis. Such variables might include whether or not a country is a recipient of climate aid targeted at increasing its resilience to the impacts of weather-related disasters, what quality of education girls are receiving in formal school or in informal learning environments, or whether efforts to increase gender equality interact with the effect of girls' education.

Cutting the analysis more closely, further calculations suggest that there may be a threshold upon which girls' education levels have a stronger association with the country's level of vulnerability. Girls in countries ranked in the top 50 percent of the ND-

GAIN Index receive on average 10.7 years of schooling, whereas girls in countries ranked in the bottom 50 percent of the index receive on average 5.8 years of schooling. But, again without controlling for other variables, for each additional year of schooling girls receive in countries ranked in the top 50 percent, a country can expect on average a 3.2-point increase on the ND-GAIN Index. For girls in countries ranked in the bottom 50 percent, however, a country can expect only about a 1.6-point increase. This difference may provide one reason why countries and the global community should ensure that girls transition to and complete an upper-secondary level of education.

Despite the benefits of investing in girls' education, climate action and financing have paid little attention to girls' education as a cost-effective strategy for tackling long-term

carbon reduction and for building individual and community resilience and adaptive capacity. One explanation is that climate dialogues, with the exception of those in the education for sustainable development community, have largely framed children and youth only as victims of climate disasters or as inheritors of the future state of the earth. And climate action has largely ignored children and youth as legitimate and capable actors in mitigation and adaptation efforts.⁴¹ Yet, without the simple consideration that today's girls and boys become tomorrow's women and men, climate action will continue to fall short. Tackling society's biggest global challenge is going to take more than environmental knowledge and technological solutions like clean energy. It will also require sociological solutions like gender equality and women's empowerment. Indeed, demographers looking at the relationship between climate change and population have begun to see human capital, namely education, as a key factor in determining how well societies will cope with climate change in terms of fertility, mortality, and migration.⁴² As such, it is going to take more than equipping adult women with the capacities to adapt to the impacts of climate change; it will require a whole-of-society approach to transform the structures, processes, and networks that have held women back. A whole-of-life approach (e.g., improving a woman's status by improving the opportunities she has as a girl) will also help to ensure that women (and men) of tomorrow have the necessary knowledge, skills, and attitudes to participate in climate action

and sustainable development *ex ante* rather than *ex post facto*.

The remainder of this paper summarizes evidence regarding the contributions of girls' education to three promising platforms for effective and efficient climate mitigation and adaptation—namely, population, leadership, and skills. We then propose three ways new and existing actors can champion girls' education as a solution to enhancing global climate action. Each platform identifies *why* such multisectoral partnerships are necessary, *who* should be brought into the discussion, *how* they can take action, and *what* evidence gaps need to be filled. Each section begins by illuminating what specific actors are currently doing as portrayed in Figure 1, and then proposes what should happen when actors from all three sectors are brought together as configured in Figure 2. Each section summarizes current efforts and the actors involved, identifies gaps and/or shortcomings in these approaches, offers recommendations for new partnerships and actions, and touches on remaining questions and further inquiries to be explored. All together, these three platforms should convince bilateral, multilateral, and private donors to consider investments in girls' education as part of their gender-responsive climate aid. It should also persuade countries to invest in girls' quality education as part of their nationally determined contributions, nationally appropriate mitigation actions, and low-emission development strategies.

41 Mitchell et al. 2008.

42 Lutz, Butz, and KC 2014.

Platform 1: Promote girls' reproductive rights in order to ensure equitable climate action

It is no surprise that insofar as mitigation remains in a technical and scientific realm, girls and women are perpetually excluded. Around the globe, girls and women continue to be grossly underrepresented in the science, technology, engineering, and mathematics (STEM) fields compared to boys and men, making up a mere 28 percent of scientific researchers around the globe.⁴³ But for several decades, the one woman-centered mitigation strategy that has captivated climate specialists and demographers is that of fertility. According to the United Nations Population Fund (UNFPA),⁴⁴ there are 1.8 billion youth between the ages of 10 and 24, 600 million of whom are adolescent girls. This youth bulge presents both opportunities and challenges for climate change. If countries invest in youth-friendly policies that aim to decrease mortality and fertility rates, they can successfully navigate a demographic dividend—a key opportunity for economic growth due to a larger workforce with fewer dependents.⁴⁵ (Platform 3 discusses further what this economic growth could look like for a greener future.) Howev-

er, if current fertility rates persist, estimates suggest that the majority of the world's population growth in the next 40 years will take place in the Global South—where gender disparities in educational attainment are highest, where women have the least control over their reproductive lives, where vulnerability to climate risks is highest, and where carbon emissions are projected to increase the most in the next few decades.⁴⁶

Research has demonstrated a clear link between higher levels of female education and lower rates of fertility; a woman who has completed secondary school is likely to have one fewer child over a lifetime than a woman who has only completed primary school.⁴⁷ This can be explained by increased age at first birth, increased spacing between births, decreased infant and child mortality, and increased access to employment opportunities in the formal sector.⁴⁸ If universal education for girls were achieved tomorrow, the population in 2050 could be smaller by 1.5 billion people than if girls' access to education remained the same as today; by

43 UNESCO 2016.

44 UNFPA 2014.

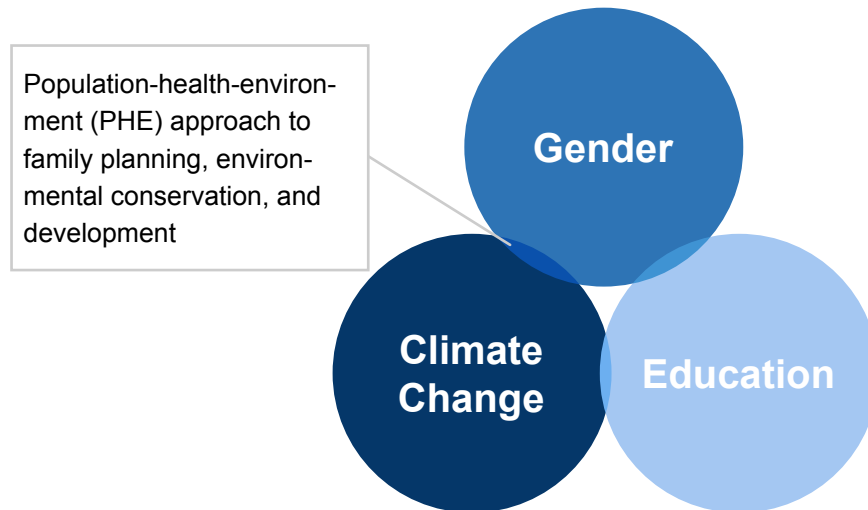
45 UNFPA 2014.

46 Cohen 2010; Das Gupta 2013; UNFPA 2017a; Wheeler and Hammer 2010.

47 Cohen 2010; Lutz, Butz, and KC 2014; Mocan and Cannonier 2012; Osili and Long 2008.

48 Sterling, Winthrop, and Kwauk 2016.

Figure 3: The intersection between gender and climate change: A current approach to girls and women in population-based mitigation efforts



2100 that number could amount to 5.7 billion fewer people.⁴⁹ To put these population reductions into context, note that studies estimate that the amount of carbon emissions reduced by lowering the U.S. population by a single person is 20 times the reductions that could be expected if a single person in the United States became more conscious of his or her carbon footprint, adapting behaviors like switching to electric cars and using LED light bulbs.⁵⁰ It is no wonder that action to curb population growth has been one of the frontrunners to a discussion incorporating women in climate mitigation.

Actors focused on addressing the link between population change and climate change have come primarily from the population-health-environment (PHE) community (see Figure 3). Organizations like

Blue Ventures and Pathfinder International, alongside their conservation and development work, have been helping women gain access to family planning in areas such as coastal communities in Madagascar and Tanzania's Great Rift Valley and the Lake Victoria Basin, where increased population pressures have led to the unsustainable use of natural resources and increased vulnerability to weather-related shocks.⁵¹ Studies in PHE have shown that increasing access to family planning and comprehensive reproductive health care—specifically, empowering women with the information, services, and decisionmaking to control their reproductive lives and the number and spacing of their children—builds resilience and improves the adaptive capacity of individuals and households.⁵²

49 Lutz, Butz, and KC 2014.

50 Winthrop and Kharas 2016.

51 De Souza 2014.

52 De Souza 2014; Kidanu, Rovin, and Hardee 2009; Vogel and Engelman 1999.

In addition, environmental economists and other researchers have demonstrated that family planning is a more cost-effective investment in reducing harmful greenhouse gases than other more technical strategies, including adopting wind power technology, shifting from carbon power to solar power, or driving hybrid vehicles.⁵³ Estimates suggest that the cost of reducing carbon emissions would be \$4.50 per ton if directed to family planning efforts, compared to \$5/ton for forestry/agriculture strategies and \$20/ton for low-carbon-energy strategies.⁵⁴ At a larger scale, one study suggests that reducing 34 gigatons of carbon in the atmosphere would cost \$220 billion if spent on family planning, compared to \$1 trillion if spent on low-carbon technologies.⁵⁵

Importantly, family planning interventions work best in communities with higher levels of female education. This points to the complementarity of the two agendas, on the one hand, and the stark absence of girls' education actors in existing population-focused

mitigation initiatives, on the other. Indeed, research suggests that, when funding is scarce, investments would be more productive in terms of reductions in carbon emissions if divided between girls' education and family planning rather than if they were allocated to one activity over the other. This is especially true where overall levels of female education are low due to low transition rates and high rates of school dropout by girls.⁵⁶ To make family planning dollars go further, efforts must be made early to ensure that girls have access to and are completing a quality education—including sexuality, puberty, and reproductive health education with explicit attention to issues of gender and power—in both formal (e.g., school) and informal (e.g., extracurricular) learning environments.⁵⁷ After all, studies consistently show that girls who stay in school longer are more likely to use contraception and other family planning resources available to them.⁵⁸ Despite this knowledge, few actors are focused on promoting girls' education alongside their reproduc-

To make family planning dollars go further, efforts must be made early to ensure that girls have access to and are completing a quality education—including sexuality, puberty, and reproductive health education with explicit attention to issues of gender and power—in both formal and informal learning environments.

53 Hawken 2017; Population Action International 2013; Wheeler and Hammer 2010; Wire 2009; Skeer 2002.

54 Wheeler and Hammer 2010.

55 Wire 2009.

56 Wheeler and Hammer 2010.

57 Haberland 2015.

58 Mekonnen and Worku 2011; Mocan and Cannonier 2012.

tive rights as smart investments with positive contributions to population-dependent mitigation goals.

While the economic case can be made for investing in women's reproductive health, focusing solely on reducing fertility rates and stabilizing population growth is fraught with moral and ethical issues. For one, it places the cost of reproductive decisions on girls and women in the Global South while ignoring other anthropogenic factors that contribute to climate change, like consumption and technology—factors historically driven by the Global North.⁵⁹ It also ignores other population dynamics like urbanization, aging, and household composition and size, which affect how demographic trends influence carbon emissions.⁶⁰

If, instead, women's reproductive health is approached from a gender justice and rights-based perspective delivered through quality girls' education programming, it can avoid population-focused agendas from being misappropriated by coercive state policies that further infringe on the reproductive rights of marginalized women in the Global South.⁶¹ This revised focus has the potential to create more equitable climate action, because girls' and women's empowerment and gender equality, rather than the reproductive decisions of marginalized women, become the ultimate goal of fertility- and population-based mitigation efforts.

Thus, efforts need to be made to connect ac-

tors like CARE and Plan International—organizations that focus on the rights and empowerment of women and girls through education and health—with PHE actors also working on climate change mitigation (see Figure 2). Other gender actors that should be brought to the discussion are organizations such as Girls Not Brides that focus on addressing early marriage, forced marriage, and child marriage. Given the relationship between early marriage, school dropout, and early childbearing—not to mention the loss in agency and decisionmaking by the child bride herself—these actors are critical to curbing the rise in child marriage and other gender injustices that are household-coping responses to climate crises.⁶² In addition, climate financing mechanisms like the Adaptation Fund should expand their gender policies and action plans to include consideration of efforts to build women's resilience and adaptive capacity by addressing the girl child's unique needs and vulnerabilities as they pertain to her education and reproductive rights. And, finally, ODA accountability mechanisms like the OECD DAC gender marker should include girls' education and reproductive health as a climate aid sector alongside energy, transportation, environment, water, and agriculture.

These actions would not only help address an issue that 214 million women—the majority of whom live in the poorest 69 countries in the world—are struggling with due to a lack of access to reproductive health resources and information,⁶³ but would also

59 Heyward 2012.

60 Jiang and Hardee 2009; O'Neill et al. 2010.

61 Heyward 2012.

62 Alston, Whittenbury, Haynes, and Godden 2014; Atkinson and Bruce 2015; Wodon, Male, Nayihouba, et al. 2017.

63 UNFPA 2017b.

cost-effectively integrate two crucial issues—girls' education and family planning—underpinning the success of climate change and sustainable development efforts. Girls do not only need health centers to go to; they also need quality learning opportunities early in life to build the knowledge, skills, and attitudes about sexual and reproductive health and rights to reap the benefits that access to such family planning resources would bring later in life. Furthermore, delaying her first child and having fewer children farther apart also means that a woman has more time to invest in activities like education, leisure, networking, and participation in the workforce that build necessary human, social, political, and financial capital for both her own development and that of her family and community.

A big unanswered question regarding this case for investing in girls' education as a long-term climate change intervention is whether there is a significant association between girls' increased levels of education and subsequent carbon emissions. Research estimates that the combined investment in universal girls' education (13 years of school for all girls) and family planning would reduce atmospheric carbon by 119.2 gigatons by 2050. That's significantly more than the 89.74 gigaton reduction projected to come from the better management of harmful chemical refrigerants like chlorofluorocarbons, the step ranked as the top solution to draw down carbon levels by 2050.⁶⁴ But would the effect of girls' education and fami-

ly planning on carbon reductions be negated if consumption levels increased as a result of girls' increased levels of education? That is, if improvements in girls' education are associated with increased income⁶⁵ and if increased income is associated with increased levels of consumption, would the net effect be increased levels of carbon emissions, offsetting any benefits?

While more evidence is needed to answer this question, emerging research suggests that the domino effect of decreased population growth to increased economic growth to increased consumption will not lead inevitably to increased levels of carbon emissions.⁶⁶ This is primarily because reductions in carbon emissions depend on so many factors at once, such as urbanization and aging. In fact, research suggests that education actually improves the "quality" of the population; in other words, better-educated people tend to consume more eco-friendly energy and transportation options regardless of income and are more conscious of their environmental footprint.⁶⁷ Our research suggests that the wide-ranging benefits from investing in girls' education produce an overall effect that could be stronger than the rise in consumption because the contributions of girls' education to long-term climate change adaptation and mitigation go far beyond curbing population growth.

As discussed in this section, girls' education enhances girls' and women's reproductive health in ways that are critical to ensuring

64 Hawken 2017.

65 Patrinos and Montenegro 2014. Research estimates the average rate of return on one additional year of schooling for girls is an 11.7 percent increase in wages.

66 Lutz and Striessnig 2015.

67 Lutz and Striessnig 2015.

equitable climate action that promotes gender equality and women's empowerment—key factors not only to reducing girls' and women's disproportionate vulnerability to climate change and weather-related disasters, but also to building the capital to break the cycle of intergenerational poverty.

Platform 2: Invest in girls' education to foster climate participation and leadership

In 2015, women made up only 24 percent of the 173 focal points (delegates from various interest groups) to the UN Forum on Forests, 12 percent of the heads of 881 national environmental sector ministries from 193 UN member states, and 4 percent of 92 national member committee chairs on the World Energy Council.⁶⁸ And, despite a goal of gender balance on the boards of key climate-financing mechanisms, only 15 percent of the GCF's board positions were held by women in 2015. The Adaptation Fund had the highest representation of women, at just 35 percent.⁶⁹ And yet, studies show that female leaders are incredibly effective in conservation and protection efforts and are more likely to pursue more sustainable futures for their communities.⁷⁰ A scan of 130 countries demonstrated that women were more prone to ratify international environmental treaties, and another review of 90 countries showed that those with higher female participation at the parlamenta-

ry level tended to protect land areas at higher rates.⁷¹

Using the ND-GAIN Country Index and data from WEDO's Gender Climate Tracker on women's participation in climate diplomacy,⁷² analyses suggest that, in addition to years of schooling for girls, having women in climate leadership makes a difference to countries' vulnerability to climate disasters. For example, there is a moderate correlation ($r = 0.48$, $p < .001$) between the number of female delegates representing a country and that country's ND-GAIN Index. Furthermore, for every additional female delegate, a country can expect a 0.03 point gain in its index score, compared to a 0.008 point gain for any additional delegate not taking into account gender.⁷³ When looking at the percentage of female delegates a country has had since 2008, the point gain in the ND-GAIN Index is even larger: every 1 percent increase in the percentage of female delegates in official government delegations is

68 IUCN 2015a.

69 IUCN 2015b.

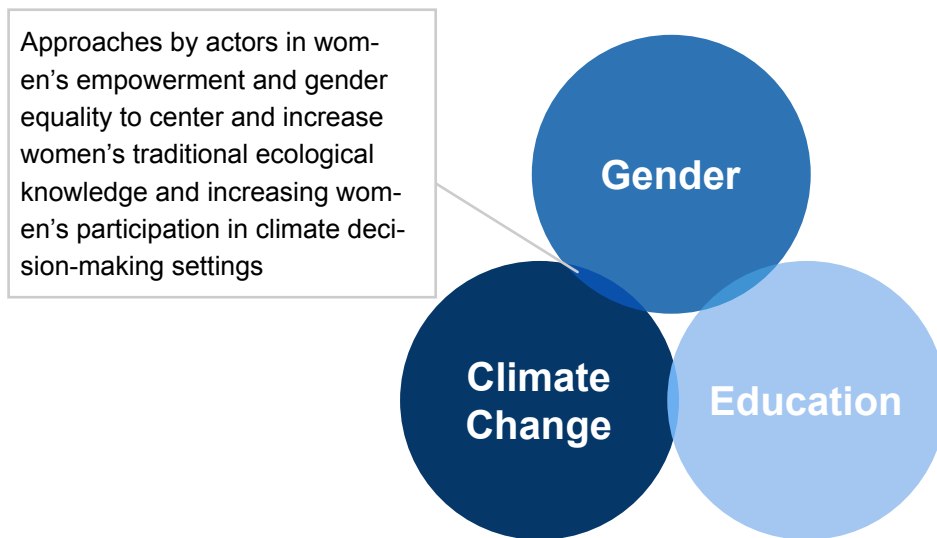
70 Norgaard and York 2005; O'Neil, Plank, and Domingo 2015.

71 Norgaard and York 2005; Nugent and Shandra 2009.

72 WEDO 2017b. According to WEDO, data on women in climate diplomacy were drawn from official UNFCCC participant lists for each UNFCCC meeting—including all intersessional and COP meetings—between the years 2008 and 2017. Participant lists include official government delegations and members of UNFCCC boards and bodies; female participation in stakeholder nongovernmental organizations were not included.

73 Standardized regression coefficient for any additional delegate not taking into account gender is 0.33. The total number of delegates ranged from 42 individuals from Turkmenistan to 3,245 individuals from Brazil between 2008 and 2017.

Figure 4: The intersection between gender and climate change: A current approach to increasing girls' and women's participation in climate leadership



associated with a 0.43 point gain on the ND-GAIN Index.⁷⁴

While the evidence above makes the case for increasing the number of women in climate change leadership, the rates at which particularly poor women and girls are killed by disasters is further evidence that there are systemic factors at play regarding female vulnerability to climate change that go unaddressed when women are missing from the climate decisionmaking tables. Women and girls are not only at greater risk as disaster strikes, but also afterwards. Heads of households, who in many societies are men, are the focal points of rescue and relief efforts and are thus given greater access to resources, including food.⁷⁵ If women do

not make up the infrastructure that informs planning and responses to climate-related challenges, so-called gender-neutral protocols will continue to be gender-unequal.⁷⁶ And the consequences can be a matter of life and death.

To challenge these inequities, two complementary approaches dominating gender and climate change action have focused on (1) bringing to the table the knowledge, experiences, and rights of the adult woman, and (2) increasing women's participation and women's leadership in key climate decision-making bodies and governance institutions. These approaches, driven by a wide range of actors deeply invested in women's empowerment and gender equality (see

⁷⁴ Standardized regression coefficient is 0.47.

⁷⁵ Neumayer and Plumper 2007.

⁷⁶ Paxton and Hughes 2016.

Figure 4), are centered on climate justice for women and engender policy solutions aimed at reducing women's vulnerabilities to death, exploitation, and undue burden during and after climate crises. These solutions are often centered on strengthening a woman's voice and agency; ensuring her inclusion and equal participation and decisionmaking in her community; increasing her access to economic opportunities, savings/capital, and safety nets and services; enforcing her rights to land and inheritance; increasing her access to and use of clean energy and technologies, like clean cook stoves or solar lamps; and increasing her access to family planning and health care services and facilities. At the core of these solutions is the attempt to increase her participation in disaster risk reduction, disaster response, and adaptation with two primary aims: to ensure that her local environmental knowledge and experiences are included in decisionmaking and implementation, and to ensure that her social, economic, and health vulnerabilities, needs, and rights are considered and designed for.

Efforts to increase women's participation in climate action typically aim to build women's sector-specific technical knowledge about, for example, climate-smart agriculture; the causes, consequences, and warning signs of a specific weather-related disaster, like cyclones or floods; existing mitigation or adaptation programs and ways in which women can be involved; and women's rights and how to claim them, as well as laws, policies, and institutions that govern women's lives.⁷⁷ While important for positioning

women to take action in new and empowering ways, these efforts ignore the role that women have played in many societies as keepers of indigenous and traditional ecological knowledge systems that have been instrumental in helping their communities adapt to and build resilience in the face of the impacts of climate change. Another critical byproduct of maintaining such reactive mechanisms for engaging women in gender and climate solutions is that, by doing so, climate action keeps women where they are. That is, efforts thus far have focused on building women's resilience and adaptive capacity in agricultural and domestic spheres—spaces that they currently occupy—without a view to increasing their reach and the reach of successive generations of women beyond those spheres. Indeed, climate action must also consider lifelong approaches to setting up girls and women to enter spaces outside of the home, such as those driving innovation in the green economy or leading the institutions that currently place women at critical disadvantages.

For example, organizations like Solar Sister have focused on reversing the energy poverty of women in rural Tanzania, Uganda, and Nigeria by developing women-centered direct sales networks and women-run solar enterprises. In Tanzania alone, these efforts have helped nearly 2,000 female entrepreneurs break out into community-level leadership roles in non-traditional spaces, including accounting and public speaking.⁷⁸ At the policy level, initiatives like WE-DO's Women Delegates Fund have worked to fill the void in female climate leadership

77 Bährge 2010; Brody Demetriades, and Esplen 2008; UNISDR 2015.

78 Soria, Farley, and Glinski 2016.

by supporting capacity building, skills development, and meaningful technical participation by women in climate negotiations and policymaking. In just seven years of the fund's efforts, and in conjunction with other gender equality advocacy efforts within the climate sector, the number of women delegates representing their countries at UNFCCC meetings increased from 31 percent to 35 percent, and the number of women heads

approach that focuses on early learning and building a pipeline of girls' to women's leadership for widespread long-term change. That is, there need to be strategic efforts for organizations concerned with increasing female participation and leadership in climate action to partner with girls' education and girls' leadership development networks, like the Campaign for Female Education's CAMA Network or Rise Up's network of

What is missing is a critical systemic approach that focuses on early learning and building a pipeline of girls' to women's leadership for widespread long-term change.

of delegations increased from 16 percent to 26 percent.⁷⁹ Yet, beyond those working specifically on channeling women leaders into climate action, more cross-sector partnerships are needed between organizations like WEDO and networks like the International Gender Champions Network and the Women Political Leaders Global Forum that are focused on promoting gender equality and increasing the number of women in organizational and political leadership more broadly. In this way, efforts by actors focused on women in climate leadership specifically and women in leadership generally can be leveraged for maximum progress in breaking down barriers to women's participation in climate action and climate diplomacy.

While efforts to increase women's participation and leadership ultimately aim for women's empowerment, what is missing in this focus on adult women is a critical systemic

youth champions, to ensure that girls have clear pathways to grow from youth leaders in their communities into adult leaders in key climate-financing institutions. Indeed, analysis suggests that every additional year of schooling for girls is positively associated with higher numbers of ($r = 0.30, p < .001$) and higher percentages of ($r = 0.53, p < .001$) women participants in official government delegations to UNFCCC meetings and on UNFCCC boards and bodies. Such an association points to a critical opportunity to link girls' education actors with actors focused on increasing women in climate leadership. This is particularly crucial for ensuring continuity in leadership between those who are knowledgeable, for example, about sexual and reproductive health or girls' empowerment and their connections to mitigating against and adapting to climate change.

Although current gender and climate change efforts do acknowledge and attempt

⁷⁹ WEDO 2016b.

to address the often low educational levels of adult women, these efforts often ignore the skills and education levels necessary for girls to reach *new* levels of engagement as women. Among the kinds of enabling factors for women's participation in public life and decisionmaking identified by researchers at the University of Sussex, one in particular stands out: "confidence, self-esteem and the skills to challenge and confront existing power structures."⁸⁰ Yet much of the knowledge, skills, and attitudes that this enabling factor entails falls directly under the umbrella of life skills education that is at the core of many girls' education initiatives. What research in girls' education is making increasingly clear is that key to the ambition of equipping girls with empowering and transformative skills is developing these skills as early as possible.⁸¹ Confidence and self-esteem, like negotiation, communication, critical thinking, problem identification, and problem solving, are skills that are developed in progressions over time.⁸² And to be able to put these skills to use to "challenge and confront existing power structures" requires the right mix of opportunity structures and increased levels of agency—as well as the recognition of a woman's agency by others—that does not happen overnight.⁸³ So, while women-centered efforts are significant in the short term, the cycle of low female participation and low levels of female leadership in climate action will continue if the global community doesn't engage and support girls today for long-term goals.

Training programs and quotas aimed at increasing women's participation and leadership in climate change are essential to creating gender-responsive climate policy and financing, but they aren't enough. Research demonstrates that early, quality intervention in girls' lives is key to fostering women leaders, and it's time that climate action begins to bridge the gap.⁸⁴ In the meantime, more studies are needed to understand why and how women take on leadership positions so that climate action can better support girls and women through their leadership journeys. And, while increased levels of education lead to greater concern about the environment, and while women are more likely to express concern for the environment than men,⁸⁵ more rigorous investigation is needed to demonstrate the impact of female leadership on outcomes, not only for women and girls in weather-related disasters and sustained climate change, but also on overall efforts at climate mitigation, adaptation, and sustainable development.

80 Brody, Demetriades, and Esplen 2008, 17.

81 Kwauk and Braga, forthcoming.

82 Kim and Scoular 2017.

83 Kwauk and Braga, forthcoming.

84 O'Neil, Plank, and Domingo 2015.

85 Clery and Rhead 2013; McCright 2010.

Platform 3: Develop girls' life skills for a green economy

A key paradox of economic development is that while the world economy has quadrupled, lifting millions of people out of poverty, 60 percent of the world's goods and services have been produced with resources that cannot be replaced.⁸⁶ By 2030, climate change is predicted to reverse the trend on poverty by sending 122 million people back into it.⁸⁷ But if the global community steps up to the challenge now, this tragedy can be averted. The vision to transition to a green economy⁸⁸ has become a catch-all adaptation solution attracting multilaterals, corporations, governments, and civil society alike due to its promise of reconciling the paradox of development and environmental degradation.⁸⁹ The appeal of the green economy, as imagined in global policy spaces, is that, contrary to recommendations that require scaling back 21st century lifestyles, it focuses on moving forward while embracing the

ambition of continued economic growth.⁹⁰ Within this framework, if the global community were to adopt environmental reforms and legislation, a whopping \$3.7 trillion could be saved each year⁹¹ and 15 to 60 million additional jobs could be created.⁹²

In this sense, rather than sequestering development, a green economy presents opportunities for investing in new technologies and innovative practices that lead presumably to continued and sustainable development. According to the Global Education Monitoring Report,⁹³ green industries already employ 3.5 million people in Bangladesh and 1.4 million in Brazil. And if the green economy becomes a global ambition, developing countries could receive more than \$6.4 trillion in green-sector investment between 2015 and 2025. Sectors with potential for such opportunities include agriculture, for-

86 Anderson and Strecker 2012.

87 Global Education Monitoring Report (GEMR) 2016.

88 The UNEP defines the green economy as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive. [...] It is one whose growth in income and employment is driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services." (<http://www.unep.org/greeneconomy/what-inclusive-green-economy>)

89 Kenis and Lievens 2015.

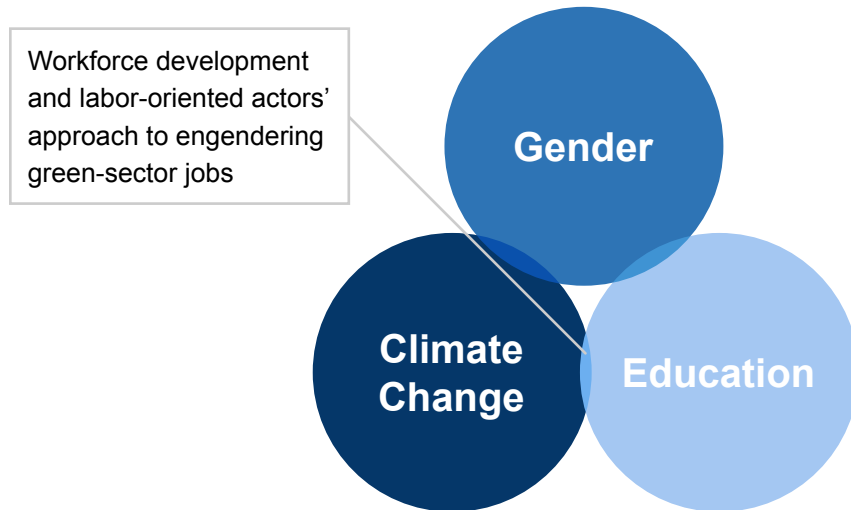
90 UNEP 2011; UN DESA 2012.

91 MGI 2011.

92 ILO 2012; GEMR 2016.

93 GEMR 2016.

Figure 5: The intersection between education and climate change: A current approach to integrating girls and women into the green economy



estry, fishery, and water management, all of which are already key industries to the world's poor.⁹⁴ Yet, with all of the promises of the green economy, most actors leading green growth discussions fail to take into account what these visions mean for girls and women at the margins of the existing world economic order. Can “green growth” really lead to positive life outcomes for everyone?

Thus far, a range of diverse actors has led initiatives to balance out the goals of economic growth with those of sustainable development and the improved well-being of women in society. Among these actors are those whose efforts are located at the intersections between climate change and education (see Figure 5), although educa-

tion is viewed here from the perspective of labor-oriented, workforce development. While a discussion on the labor sector's efforts at addressing climate change as its own circle of influence is beyond the scope of this paper, a closer examination into the specific efforts of workforce development actors to address gender in the green economy is necessary for identifying entry points for better linking gender, education, and climate action. For example, policy actors like the United Nations Environment Program (UNEP), the International Labor Organization (ILO), and the OECD working to make the green economy a reality do a good job pointing out where women and girls may be vulnerable to climate change. But their analyses fall short when it comes to envisioning

94 GEMR 2016.

how to create the conditions necessary to make green growth work for girls and women, especially in terms of transforming the realm of possibilities for girls' and women's economic empowerment in the face of the added challenges created by climate change.

For instance, in a policy recommendation to “green” the tourism sector, UNEP points out that women make up the majority of the tourism labor force, and that sustainable tourism can create more jobs within that sector.⁹⁵ But it fails to include how women and girls may be positioned for jobs in emerging green industries, and not just the hospitality sectors that women have long been limited to. The OECD GENDERNET points out that currently women hold only 20-24 percent of jobs in the renewable energy sector compared to 49.5 percent⁹⁶ of jobs in the formal sector globally.⁹⁷ While green jobs are projected to lead to millions of new job opportunities, the current underinvestment in gender equality in these sectors means that women will not have the opportunity to contribute to the design, use, and dissemination of, for instance, clean technology and renewable energy, nor will they have equal opportunity to benefit from such development. The OECD GENDERNET recommends remedying this glass door to the green economy through the introduction of gender quotas, gender analysis, and gender audits in green jobs, as well as through building women's skills in the fields driving such jobs.⁹⁸

However, such efforts to make provisions to add women to the green economy come too late in a woman's life, especially in areas with low levels of female education. Rather, at a minimum, more investments need to be made by non-education actors in the education sector that link gender and climate change efforts earlier—to when women are girls—ensuring that girls go to school and complete a quality education that builds the knowledge, skills, and attitudes necessary to participate as adults in the green economy. Outside of actors in girls' education, little attention is paid to the girl whose life opportunities are constrained by gender norms and economic status in early childhood, childhood, and adolescence. These experiences go on to cement the pillars of inequality, vulnerability, and disempowerment that often encompass her adulthood. Indeed, across many communities vulnerable to climate change, the immediate impacts of weather-related disasters and the long-term effects of climate change upend progress made in girls' education⁹⁹ by multiplying the obstacles in childhood and adolescence that preclude a woman's participation in green jobs later in life. To address this, workforce development and labor-oriented policy actors working at the intersection of education and climate change—actors such as the European Centre for the Development of Vocational Training (Cedefop), the ILO, and the OECD that are focused on building and monitoring green skills for inclusive growth—must shed a gender-blind approach. Instead, they must extend green-sector training opportunities

95 UNEP 2011.

96 This percentage includes females age 15 and older.

97 OECD DAC GENDERNET 2016; World Bank 2017.

98 OECD DAC GENDERNET 2016.

99 Chigwanda 2016.

and green skills development specifically to girls and female youth through tailored girls' education programming. In doing so, they must also be willing to take on a greater stake in broader gender and education issues, especially in places where girls are lagging behind, by, for example, investing in efforts to reverse the low transition rates of girls from primary to secondary school and the high rates of secondary school dropout by girls.

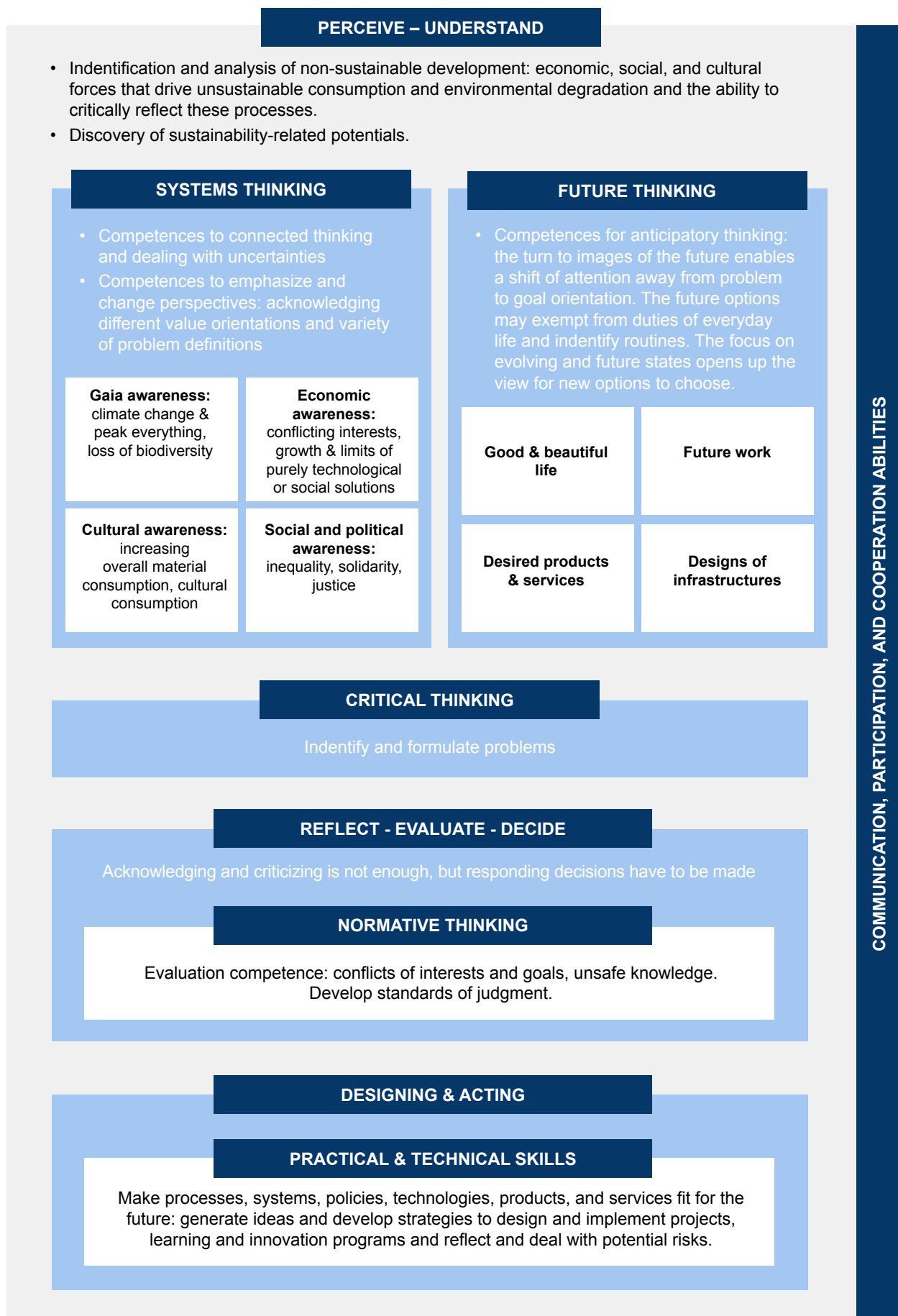
Workforce development actors don't have to go far for ideas. Today, the girls' education community leads a plethora of initiatives, including Code to Inspire in Afghanistan and the United Nations Girls' Education Initiative's UN Ivy STEM Connect Program, to bring more girls into STEM fields. But these "girls in STEM" initiatives tend to focus on STEM more broadly, overlooking climate change and green-sector career pathways as a specific agenda with which to connect. Similarly, when girls' education actors develop skills-building programs, they tend to focus on developing girls' life skills, or the mix of interpersonal, personal, and cognitive skills (e.g., communication, negotiation, self-efficacy, and self-esteem) that enable them to better function, thrive, and adapt in their lived realities. While the programs' targeted life outcomes (e.g., improved sexual and reproductive health outcomes, reduced child marriage rates, increased meaningful formal employment, etc.) tend to vary depending on the organization, rarely do girls' education programs attempt to link life skills or STEM education to the kinds of green skills that the green economy will demand—not to mention the kind of green skills needed to

mitigate against and adapt to the increasing frequency and intensity of climate-related crises in the 21st century.

Yet, upon comparison, with the exception of the specific practical and technical skills needed by green-sector jobs, green skills (as identified and categorized by Cedefop and the OECD; see Figure 6) overlap seamlessly across the kinds of transferable or transversal skills (e.g., systems thinking, future thinking, and critical thinking) that are essential for linking life skills programming to social change.¹⁰⁰ That is, such skills are foundational to girls' ability to translate life skills into empowered action, equipping them with the capacity to read their contexts, identify solutions, and respond and/or adapt more effectively. It seems that these skills are also important for paving a pathway into green-sector careers. Indeed, considerable benefits are derived from connecting the efforts of actors in the girls' education community, especially those working on STEM and life skills education, with efforts by actors in the workforce development communities who are focused on preparing youth for a greener, more sustainable economy. The latter group could also benefit from bringing to the table climate change education actors who have not yet fully ventured into bridging their work with youth to the purposeful development of the green knowledge, skills, and attitudes required by green-sector jobs. In this way, climate change education actors could also become a more strategic force in girls' education by helping to identify key crossover points between girls' life skills and girls' green skills.

100 Kwauk and Braga, forthcoming.

Figure 6: Integrated green skills matrix



Source: Cedefop and OECD 2015.

But climate action shouldn't stop at bringing girls' education actors together with green economy workforce development and climate change education actors. Simply creating a pipeline linking girls' educational opportunities to green jobs would be akin to an "add women and stir" approach that does little to address the nuances of an equitable alternative economy. Instead, the global community needs to start with a vision of the green economy that includes a clear role for women's participation, innovation, and leadership, and then create the educational pathways necessary for girls to build the competencies and experiences to become agents of change in sectors of which they have traditionally been left out. Indeed, the process of improving girls' educational opportunities must also include transformative structural change to the social, economic, political, and learning environments in which girls and women are embedded.

This means, for starters, improving the girl-friendliness of STEM classes and the gender sensitivity behaviors of STEM teachers;¹⁰¹ adopting a gender lens (e.g., including topics like gender and power, structure and agency) to current climate change education discussions; ensuring that girls are exposed to green economy careers and role models early in life; and focusing on developing transformative and empowering life skills so that girls can more effectively navigate what will likely be a gender-exclusive rather than gender-inclusive pathway into green economy jobs. This also means going back to the basics and ensuring that girls have access to water, sanitation, and safe passage to

school in times of stability as well as when weather-related crises hit. It also means working with green-sector industries to ensure that gender equity and gender equality are at the forefront of their hiring practices and human resources policies in order to prevent gender wage gaps and gender-segregated jobs.¹⁰² And it means that climate governance, financing, and accountability institutions like the UNFCCC, the Adaptation Fund, and the OECD DAC must view as a critical component of climate action efforts aimed at eliminating discriminatory gender norms, expectations, and practices that underlie the barriers girls face in going to school, staying in school, and completing a quality education.

In recommending this platform of investing in girls' education to develop girls' skills for a green economy, it is important to also be skeptical of the green economy's promise to improve the well-being of all economic players, especially girls and women. That is, green economy models, like current economic models, assume that green growth guarantees a better—and even more just—life for all. But as is evident by the mass inequality that has prevailed and the failure of green economy discussions to address gender and other intersections of marginalization, including indigeneity, this assumption is not necessarily true.¹⁰³ Further, the green economy invites new industry and corporate actors like Shell, Procter & Gamble, and Unilever to join the conversation, fundamentally altering the set of interests represented in the environmental agenda. Critics have grounds to wonder if the green econ-

101 Ekine 2017.

102 Stevens 2009.

103 Becher 2012.

Simply creating a pipeline linking girls' educational opportunities to green jobs would be akin to an "add women and stir" approach that does little to address the nuances of an equitable alternative economy... The process of improving girls' educational opportunities must also include transformative structural change to the social, economic, political, and learning environments in which girls and women are embedded.

omy is merely a marketing opportunity for the greatest perpetrators of carbon emissions to reposition themselves as sustainability conscious (think BP rebranding itself as "Beyond Petroleum").¹⁰⁴

This set of critiques begs the question, what would a gender-responsive green economy actually look like? Who needs to be involved now to begin that transition? And how can this vision assure that both irretrievable and retrievable loss and damage from climate change are minimized, especially the loss of traditional ecological knowledge systems that indigenous women have passed from generation to generation? Research by feminist ecologists and economists (actors typically outside of policy circles determining climate action) suggests that a truly sustainable alternative economy must consider gender inclusion *and* power as part of the human component in the larger ecological system. Such visions must also question power imbalances that lead to the exploitation of women, marginalized groups, and the environment itself through unregulated economic policies, no matter how "green" the policies may be.¹⁰⁵

104 Kenis and Lievens 2015; Beder 2002.

105 Gaard 1993; Warren 2015.

IV. Conclusion

In a race to address a most pressing global challenge, climate action has been short-sighted. Actors driving these efforts have pursued fundamental conservation efforts under the crucial premise that humanity must protect the earth today in order to care for it in the future. Their priorities have sought to address urgent matters like drought, coastal erosion, and air quality, without a comprehensive approach that considers both the damage already done and the fact that the global community is not harnessing resources and action quickly enough. The ripple effects of these very issues—like migration and displacement, stress on food production systems, and threats to education, especially for girls—are of a long-term nature and need long-term solutions.

Women and girls suffer the most in the long run from the short-term and gender-blind responses that have become commonplace in climate action. They are disproportionately affected by climate change, but they are also an integral part of climate change solutions. Actors focused on gender equality have made great progress in making UNFCCC processes and structures more gender-sensitive and gender-responsive. Some organizations, like Save the Children, have begun to think about bringing this work to-

gether.¹⁰⁶ But more long-term thinking and cross-sectoral partnerships are needed to ensure that future generations of girls are able to step into adulthood with the education and confidence needed to participate and lead in climate action and sustainable development.

Indeed, the long-term challenge of climate change makes it akin to other changing landscapes, like the changing nature of 21st century jobs due to automation, technology, and globalization. Those groups with more social, economic, education, and political advantage—groups that are more likely to have driven this change—have more access to training and opportunity to keep up, adapt, and innovate. Disadvantaged people-groups that likely played no part in driving change but feel disproportionately the negative impact of automated jobs (or, weather-related disasters, in this case)—have less opportunity to adapt successfully to the challenges of the changing nature of work (or climate). Long-term solutions aimed at transforming the playing field are needed to counteract the unequal burden of change, mitigate against being further marooned from advantaged groups, and better prepare disadvantaged groups with the skills and capabilities to adapt to these changing landscapes. These include solutions such as education

106 De Souza 2008; World Watch 2004.

reform to address skills gaps or business incentives to address opportunity gaps.

Similarly, a long view of transformative social change is needed to combat the disproportionate impacts of climate change on women and girls, especially in areas with the highest gender disparities and discrimination. Increased investments in quality learning opportunities for girls must be made one of the highest priorities in climate action, because these investments set the long-term trajectory for achieving the necessary conditions for equal and effective participation, leadership, and innovation in climate change mitigation and adaptation at all levels. Ignoring the contributions of girls' education and educated women to climate adaptation and mitigation—not to mention the associated gains in gender equality from a more educated female population—could be the Achilles' heel in humanity's ability to tackle climate change and to realize a more sustainable future.

As such, this paper outlined three promising ways actors beyond the usual suspects in the agriculture, energy, environment, oil and gas, and transportation sectors can advance climate action through girls' education: (1) by promoting girls' reproductive health and rights, (2) by fostering girls' leadership, and (3) by building girls' skills for a green economy (see Table 1). These recommendations place at the center of climate strategies a whole-of-society and a whole-of-life approach to transform the power structures that have prevented girls and women from participating in climate action and sustainable development and have perpetuated an intergenerational cycle of marginalization, exploitation, and vulnerability. Most importantly, these recommendations are centered

in three critical approaches to climate action: gender, education, and climate change (see Figure 2 from page 9).

This paper argues for new partnerships and opportunities for dialogue among a wider range of actors working on issues of gender equality in climate change and climate change education. These efforts include building strategic collaborations between girls' education actors; climate actors; and the host of governments, like Sweden, Canada, Finland, Norway, and Luxembourg, and philanthropies, like the Bill and Melinda Gates Foundation and the Children's Investment Fund Foundation, that have committed to filling the financing void left by the United States in its recent decision to reinstate and expand a global ban on funding and aid to organizations providing services and information about abortion and family planning. Pursuing these three platforms means initiating discussions about the contributions of and pathways for investing in girls' education in order to nurture a new generation of climate scientists and green-sector innovators with new global actors, like President of France Emmanuel Macron, who have made a public commitment to support climate research and action. It also means bringing to the table actors typically outside of climate policy discussions to ensure that climate action is focused on and supportive of long-term strategies that address the intersections of marginalization, oppression, and vulnerability that threaten the success of any technical solution for climate change. These groups include education actors focused on youth skills development (green skills, life skills, or a breadth of skills) and climate change education, as well as indigenous, feminist, and minority groups that have strong critiques against narrow eco-

conomic pathways to a narrow vision of sustainable development. While there are still gaps in the evidence that need to be filled and questions that need to be explored, achieving gender equality and women's empowerment is key to tackling climate change. And investing in girls' quality education is the foundation that must be strengthened today.

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