

A photograph of a classroom in a developing country. A female teacher stands at the front, facing a chalkboard and several colorful posters on the wall. She is wearing a grey sweater and a patterned skirt. In the foreground, the back of a student's head is visible, with their right hand raised high. Other students in the background also have their hands raised. The room has a simple, functional appearance with a chalkboard and educational posters.

INNOVATIVE APPROACHES TO CLIMATE EDUCATION AMONG ADOLESCENTS AND YOUTHS IN EASTERN AND SOUTHERN AFRICA

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With thanks to the research collaborators

Center for Universal Education
at the Brookings Institution

CARE Zimbabwe

Asante Africa Foundation

Creative Centre for
Community Mobilizing

Education Development Trust

Forum for African Women Educationalists
(Zimbabwe)

One Planet

Right to Play

Teach for Zimbabwe



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The table below shows the collaborative field research team per country:

Country	Research partner	Project leaders
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This toolkit reflects a shared vision: to equip young people with the skills and agency to lead climate solutions and to build education systems that are resilient, inclusive, and responsive to the realities of a changing world.

In preparing this research, I utilized Microsoft CoPilot and Claude AI (developed by Anthropic) as productivity, ideation and supporting tools including for brainstorming and structuring research ideas, summarizing background material, drafting and editing text, and assisting with technical tasks. In accordance with the Brookings Institution's Provisional Principles for the Use of Generative AI, all AI-assisted outputs were reviewed and validated for accuracy, integrity, and alignment with applicable quality and research standards. Full intellectual and ethical responsibility for the findings, conclusions, and integrity of this work remains with the author.

| Table of contents

Acknowledgments	4
Table of contents	5
Tables and figures	8
Abbreviations	10
Overview	11
About this toolkit	12
Centering adolescent and youth voices	13
Key recommendations	15
For adolescents and youths	15
For teachers and educators	15
Section 1: Introduction and background	16
Section 2: Education and climate change in ESA—A literature review	18
Introduction	18
Climate impacts on schooling and learning	19
Gendered impacts: Girls’ education and climate change	19
Teacher challenges in responding to climate effects on teaching and learning	20
Education as a lever for adaptation, resilience, and mitigation	20
Country evidence	21
Kenya	21
Malawi	22
Rwanda	22
South Africa	22
Zimbabwe	22
Promising practices in climate education across Kenya, Malawi, Rwanda, South Africa, and Zimbabwe	23
Section 3: Collaborative research design and methodology	24
Introduction	24
Research design	24

Research objectives	25
Research questions	25
Description of study areas	26
Demographic profile of study participants.....	28
Country-level distribution	28
Geographical location	29
Sex disaggregation.....	30
Marital status.....	30
Education level.....	30
Income sources	31
Access to technology.....	31
Mode of transportation	33
Tool development and training	33
Data collection	34
Ethical considerations	36
Section 4: Findings.....	37
Introduction.....	37
Demographic profile of the study sample	37
Education and climate change diagnostics and learning pathways	40
Awareness of “climate change”	40
Source of first encounter with “climate change”	41
Perceived meaning and causes of climate change.....	42
Perceived broad impact of climate change on adolescents and youths.....	43
Perceived specific impacts of climate change on access to education and skills development for adolescents.....	46
Current and preferred sources of climate change information, knowledge, and skills among adolescents and youths.....	48
Types of climate change content that respondents are interested in accessing	52
Difficulties in accessing climate information, knowledge, and skills.....	55
Enablers for increasing access to climate information, knowledge, and skills.....	58
Education and climate change: Emerging pedagogies	59
Examples of teaching about climate change inside and outside the classroom.....	59
Examples of play-based methods to teach about climate change	61
Difficulties faced by teachers and educators in trying to teach about climate change.....	62

Resources that teachers and educators need to help adolescents and youths learn about climate change.....	65
Other actors helping adolescents and youths to learn about climate change.....	68
Promising practices in climate change.....	68
Roles of adolescents and youths in addressing climate change.....	68
Survey responses: How are adolescents and youths addressing climate change in their communities.....	70
Survey responses: What is one skill that adolescents and youths need to address climate change?.....	71
Section 5: Toolkit—innovative pedagogies for climate education among adolescents and youths.....	74
Introduction.....	74
How to use this toolkit.....	74
Low-tech or no-tech activities.....	74
Medium-tech activities.....	80
Online and high-tech activities.....	84
Teacher professional development, pedagogy, and assessment.....	85
Influencing policy.....	92
Implementation road map (90 days).....	92
Section 6: Recommendations	93
Recommendations	93
Adolescents and Youths	93
Teachers and educators	93
By country	93
Recommendations	94
How adolescents and youths can increase their climate knowledge and skills	94
Policy recommendations	98
Country-specific recommendations for increasing the role of adolescents and youths in addressing climate change.....	99
Recommendations for supporting teachers and educators in helping adolescents and youths learn about climate change	100
Annex A: Glossary of key terms	102

Annex B: Demographic profile of participants	110
Country-level distribution	110
Geographical location	111
Sex disaggregation	111
Marital status	112
Education level	112
Income sources	115
Access to technology	116
Mode of transportation	118
Annex C: Toolkit—annex resource directory (links)	120
References	122

Tables and figures

Table 1 Data collection matrix	29
Table 2 Collaborative research partner organizations by country	29
Table 3 Distribution of study districts per country	30
Table 4 Summary of sex disaggregated data by profile of participant	32
Table 5 Access to technology by profile	33
Table 6 Mode of transport by profile of study participant	34
Table 7 Study respondents' first encounter with climate change	35
Table 8 Preferred sources of climate change information by geographical location	41
Table 9 Concepts that adolescents and youths are interested in accessing	47
Table 10 Summary table: Challenges faced by teachers/educators, by country	50
Table 11 Summary responses to whether adolescents have a role in addressing climate change	51
Table 12 Ranking of the top 10 climate change concepts which adolescents and youths want to learn about across the 5 countries	53
Table 13 Ranking of the variations in interest in the top 10 climate change concepts which adolescents and youths are interested in by country	54
Table 14 Challenges faced by teachers and educators which impede climate education	64

Table 15	Resources needed by teachers and educators for effective implementation of climate education approaches	66
Table 16	Role of adolescents and youths in addressing climate change	70
Table 17	Skills needed by adolescents and youths to address climate change	72
Table 18	Heat map of skills needed by adolescents and youths to address climate change	73
Table 19	How adolescents can increase their climate knowledge and skills	97
Table A.1	Definition of key terms	102
Table B.1	Distribution of study participants by district and country	111
Table B.2	Collaborative research partner organizations by country	111
Table B.3	Summary of sex disaggregated data by profile of participant	112
Table B.4	Access to technology by profile	117
Table B.5	Mode of transport by profile of study participant	118
Figure 1	Distribution of individual interviewees, by country	16
Figure 2	Geographic location per profile	28
Figure 3	Graph showing the education levels of study participants	32
Figure 4	Graphic summarizing the education levels across all profiles	40
Figure 5	Access to technology among respondents	42
Figure 6	Comparative access rates for each technology type across profiles	44
Figure 7	Awareness of climate change	45
Figure 8	Infographic showing climate change impacts on adolescents and youths	46
Figure B.1	Distribution of individual interviewees, by country	110
Figure B.2	Graph showing the education levels of study participants	113
Figure B.3	Education levels across profiles	114
Figure B.4	Access to technology among respondents	116
Figure B.5	Comparative access rates for each technology type across profiles	117

Abbreviations

AAF	Asante Africa Foundation
AU	Africa Union
CCE	climate change education
CRECCOM	Creative Centre for Community Mobilizing
CSESI	Climate-Smart Education Systems Initiative
CUE	Center for Universal Education
ECW	Education Cannot Wait
EDT	Education Development Trust
ESA	Eastern and Southern Africa
ESD	Education for Sustainable Development
FAWEZI	Forum for African Women Educationalists (Zimbabwe)
FGD	focus group discussion
GPE	Global Partnership for Education
ICT	information and communication technology
IPCC	Intergovernmental Panel on Climate Change
NDC	Nationally Determined Contribution
NGO	nongovernmental organization
OP	One Planet
RTP	Right to Play
TFZ	Teach for Zimbabwe
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund

Overview

Education is one of the most powerful levers for shaping a climate-resilient future. Across Eastern and Southern Africa (ESA), climate shocks are no longer distant threats; they are daily realities disrupting learning, deepening inequalities, and eroding opportunities for young people. At the same time, education systems hold immense potential to equip adolescents and youths with the knowledge, skills, and agency to adapt, innovate, and lead solutions for their communities and the planet.

This resource is the product of a two-year collaborative research effort led by CARE Zimbabwe and the Center for Universal Education (CUE) at the Brookings Institution, in close partnership with seven organizations working at the intersection of education and climate change. Together, we sought to answer a pressing question: how can schools and communities transform climate education from abstract concepts into practical, empowering experiences for adolescents and youths? Our approach was grounded in evidence and action—embedding research within active programs in Kenya, Malawi, Rwanda, South Africa, and Zimbabwe and listening to the voices of those most affected: young people, educators, and local stakeholders. The results yielded several clear findings (Box 1).

BOX 1

Key findings

- 1. Schools are the most trusted anchor for climate education.** However, their effectiveness rises sharply with teacher support, simple resources, and community linkages.
- 2. There is a clear, actionable pathway for low-tech and no-tech scaling.** It combines clubs, play-based pedagogy, local media, and climate-smart gardens with periodic drills and policy literacy.
- 3. Young people are ready to learn and lead.** When education is experiential, culturally resonant, and resourced at even a basic level, adolescents and youths across the region are eager to act as agents of climate change.

Adolescents and youths across the region are deeply aware of climate change and are eager to act, but they face barriers such as access, resources, and opportunity. Teachers are committed but constrained by limited training and materials. Ministries and partners are advancing climate education policy frameworks, yet implementation gaps persist. This study explored these realities and thus responds with practical, context-relevant strategies—from low-tech activities like climate clubs, drama, and school gardens to medium- and high-tech options such as WhatsApp microlearning and online Eco-Schools courses of the Foundation for Environmental Education (FEE).¹ It also provides guidance for teacher professional development, policy engagement, and a 90-day road map to build momentum.

¹ Eco-Schools is an international program of the Foundation for Environmental Education (FEE) that aims to “empower students to be the change our sustainable world needs by engaging them in fun, action-orientated, and socially responsible learning.”

Overall, the toolkit posits that adolescents and youths are ready to learn and act when education is experiential, culturally resonant, and resourced at least at a basic level. It must connect knowledge to action, link classrooms to communities, and empower young people as agents of change. This is not only an educational imperative; it is a moral and developmental one. By equipping adolescents and youths with climate literacy and green skills, we invest in resilience, equity, and hope for generations to come.

Schools are the most trusted anchor for climate change education, but their effectiveness rises sharply with simple technologies, teacher support, and community linkages. A practical pathway to scale—especially in low-connectivity settings—combines clubs, play-based pedagogy, local media, and gardens or nurseries with periodic drills and policy literacy while progressively strengthening teacher capacity, infrastructure, and access to curated, offline-first content.

This resource invites educators, policymakers, development partners, and adolescent and youth leaders to use this toolkit as a springboard for collaboration and scale to collectively transform schools into hubs of climate action and ensure that every learner has the opportunity to thrive in a rapidly changing world.

ABOUT THIS TOOLKIT

The toolkit is the product of a two-year collaborative research effort led by CARE Zimbabwe and CUE at Brookings to understand and strengthen climate education for adolescents and youths across five ESA countries: Kenya, Malawi, Rwanda, South Africa, and Zimbabwe.

The partnership convened eight organizations, currently working in places where climate impacts and education intersect, intentionally embedding research within active programs to surface emerging classroom and community practices. Phase 1 focused on establishing a regional advisory group, deepening evidence, and drafting this resource; Phase 2 emphasized evidence dissemination across different contexts. The framing is pragmatic: gather experience where schools and youth already act (e.g., project-based learning and climate-smart school initiatives), make it visible, and translate it into tools that others can reuse.

The toolkit synthesizes literature and field data into a practical suite of low-tech to high-tech pedagogies, professional development guidance, and scale-up recommendations. The toolkit positions schools and educators as central to climate education and action while elevating adolescent and youth agency through clubs, community projects, and creative, play-based learning. It presents findings that climate shocks are increasingly disrupting learning and wellbeing in ESA but also shows that locally relevant, hands-on activities—when backed by teacher training, simple resources, and supportive policy—can build resilience, skills, and hope.

The literature review (Section 2) underscores education's dual role—both as a sector highly exposed to climate hazards and as a crucial instrument for adaptation, resilience, and mitigation through literacy and green skills. Regional strategies and country moves (such as curriculum reforms, Eco-Schools, and teacher professional communities) are gathering momentum, yet implementation gaps persist around financing, teacher preparedness, and system coherence. Across the five countries that were part of this research, recurrent themes include disrupted schooling, gendered impacts (especially for adolescent girls), teacher capacity constraints, and the importance of integrating Indigenous knowledge and locally relevant content into curricula and practice.

More specifically, country spotlights show

- **Kenya** advancing a national learning strategy and interactive digital climate curricula;
- **Malawi** piloting climate-smart education system protocols and calling out large teacher training gaps;
- **Rwanda** integrating a competence-based curriculum with Eco-Schools that demonstrate low-cost gains through Action Learning;²
- **South Africa** deploying climate policy frameworks and geography education opportunities while also contending with constraints on teacher agency and resource inequities; and
- **Zimbabwe** strengthening sustainability within its Heritage-Based Curriculum while grappling with repeated shocks and resource barriers.

Together these snapshots illustrate a region leaning into whole-school and community-linked approaches, with uneven resourcing and training as the main brake on scale.

CENTERING ADOLESCENT AND YOUTH VOICES

The study used a mixed-methods design—a survey, individual interviews, and focus group discussions—across 11 districts in five countries, leveraging the collaborative research partners’ existing footprints. Each site targeted 20 adolescent or youth participants, educator and stakeholder interviews, and three focus groups spanning learners, teachers, and community members, under clear ethical standards for work with minors and responsible data management. Sites ranged from arid pastoralist areas and disaster-prone mountain districts to periurban and rural districts, ensuring variation in climate risks and education system realities.

Across 239 individual interviews, most participants were adolescents (151), with a roughly even gender split, and predominantly from rural areas where walking to school is common and connectivity is limited. Awareness of climate change was very high (about 98 percent), and schools were the dominant first source of information, followed by mass media and community spaces. Adolescents linked climate change mainly to greenhouse gases, deforestation, and fossil fuel use. And they described multidimensional impacts—on health (heat stress, disease); education (absenteeism, damaged infrastructure, reduced concentration); livelihoods (crop losses, migration); and social outcomes (early marriage, protection risks)—with gendered burdens pronounced for adolescent girls.

Access to information is constrained by device, data, and electricity gaps; hence, teachers and stakeholders have far better access than adolescents to the internet and computers. Preferred learning channels differ by geography: rural youth prioritize schools, community and radio, whereas urban youth lean toward social media alongside school. Across profiles, adolescents (ages 10-18) seek foundational concepts plus practical action; youths (ages 19-35) emphasize adaptation, recovery, and livelihoods; teachers want structured content and pedagogy tools; and stakeholders stress policy awareness and campaigns.

² Action Learning is an approach to problem-solving in which groups or teams work on developing solutions to real-life challenges, taking action, and reflecting on the results

Barriers cluster around scarce resources, limited teacher training, cultural beliefs and skepticism, infrastructure damage, and the digital divide. Proposed enablers include community learning hubs with internet access, play-based methods, teacher professional development with simple visual aids, and youth clubs that translate learning into action.

Educators are already integrating climate change education across geography, agriculture, science, and social studies while using local examples, debates, field visits, and performance-based activities. Play-based approaches—drama, songs, role-play, ecobrick building, poster creation, and outdoor observation—boost engagement and retention, although teachers need training, time, and materials to implement them consistently. Reported needs include textbooks, localized visuals, internet and projectors, simple weather instruments, and incentives. The systemic constraints include heavy workloads, limited professional development, uneven curriculum integration, and skepticism in some communities.

The toolkit translates this evidence into ready-to-use activities across low- to no-tech, medium-tech, and online options, plus teacher professional development and assessment ideas:

- *Low-tech examples* include climate clubs, radio minishows and listening circles, climate drama festivals, waste audits paired with ecobricks, and tree nurseries.
- *Medium-tech options* include WhatsApp microlessons, printable Education for Sustainable Development (ESD) packs and posters, school risk mapping and drills, and climate-smart gardens.
- *High-tech modules* extend to Eco-schools e-learning, youth policy literacy, and solutions journalism.

The professional development discussion (within Section 5) centers on a “heads, hearts, hands” model of inquiry and project-based learning, local relevance and justice, and co-assessment, supported by practical webinar outlines, design sprints, and quick classroom assessment tools. An implementation road map sequences the first 90 days to build momentum through visible wins, weekly microlearning, drills, and a public showcase.

The toolkit also provides actionable priorities for adolescents and youths and for teachers and educators, reflecting cross-country commonalities and contextual nuance. For adolescents and youths, the emphasis is on joining or forming clubs, leading hands-on projects like afforestation and waste reduction, using creative and digital platforms for outreach, and adopting practical resilience practices. For teachers, priorities include integrating climate change education across core subjects with interactive, play-based methods; accessing essential resources (textbooks, posters, information and communication technology [ICT], and connectivity); engaging in continuous capacity building; and advocating institutionally for curriculum reform, resourcing, and community partnerships. System-level recommendations call for resilient infrastructure, expanded digital access, curriculum integration linked to career pathways and green skills, community learning hubs, and multistakeholder financing and delivery coalitions.

The toolkit’s recommendations, summarized below, are addressed to those who design, fund, and deliver education systems and programs—including governments, nongovernmental organizations (NGOs), donors, civil society, and community organizations. They are also addressed to adolescents and youths themselves as active agents of change, not merely as recipients of programming. Across all contexts, the most effective responses will involve coordinated action across all of these groups.

| Key recommendations

FOR ADOLESCENTS AND YOUTHS

- **Green clubs.** Join or establish climate or environment clubs that run visible projects each term—such as tree nurseries, cleanup, and waste-sorting stations—and use creative performance and local media to educate peers and communities.
- **Peer outreach.** Leverage accessible channels—radio listening groups, WhatsApp microlessons, and school assemblies—to deepen climate knowledge and translate seasonal information and early warnings into immediate household and school actions.
- **Climate skills.** Build practical resilience and livelihood skills through climate-smart school gardens and adaptation activities, linking learning to nutrition, water conservation, and local enterprise where possible.
- **Youth funds.** Implement activities that generate funds to support localized adolescent- and youth-led initiatives to promote community resilience.

FOR TEACHERS AND EDUCATORS

- **Cross-curricular integration.** Integrate climate topics across geography, agriculture, science, and social studies using play-based, inquiry, and project-based approaches—such as drama, role-play, debates, field visits, ecobricks, and posters—and co-assess learning with students.
- **Low-cost resources.** Secure and use essential, low-cost teaching resources—such as localized visuals, printed ESD packs, radio prompts, and simple weather tools—as well as, where possible, basic ICT (projector, laptop, connectivity) to enrich lessons and reduce abstractness.
- **Professional development.** Participate in targeted professional development and peer learning (such as webinars, design sprints, and communities of practice) and advocate with school leadership and partners for time, materials, incentives, and curriculum inclusion to sustain climate education.

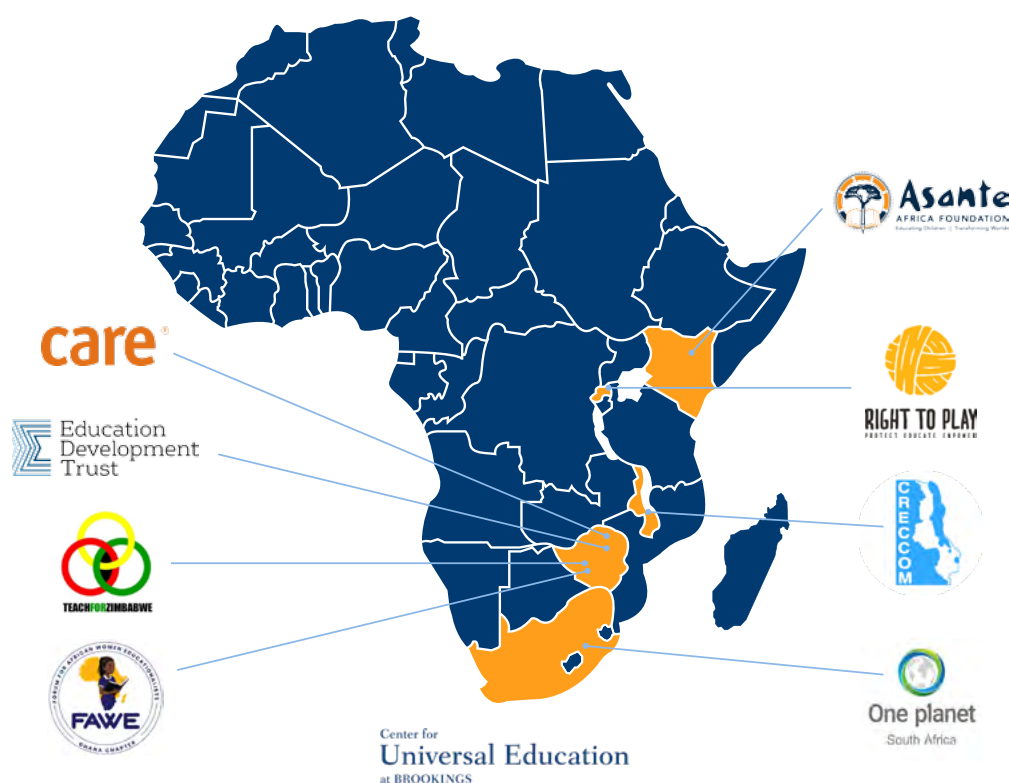
Section 1:

Introduction and background

In June 2024, CARE Zimbabwe and the Centre for Universal Education (CUE) at the Brookings Institution signed a two-year partnership agreement to work together to advance research on the innovative approaches to climate education for adolescents and youths in five countries across the Eastern and Southern Africa (ESA) regions: Kenya, Malawi, Rwanda, South Africa, and Zimbabwe (Figure 1).

FIGURE 1

Map shows the five ESA countries and the organizations that participated in this collaborative research partnership



SOURCE: Author.

NOTE: Countries highlighted in yellow are the five study countries: Kenya, Malawi, Rwanda, South Africa, and Zimbabwe. ESA = Eastern and Southern Africa.

To advance this research, CARE Zimbabwe collaborated with seven other organizations: Education Development Trust (EDT), Forum for African Women Educationalists in Zimbabwe (FAWEZI), Teach for Zimbabwe (TFZ), Right to Play (RTP), Asante Africa Foundation (AAF), One Planet (OP), and Creative Centre for Community Mobilizing (CRECCOM). Leveraging a collective interest in increasing capacity, commitment, and cohesion at the intersection of education and climate change, these organizations conducted research in geographic areas where each of the organizations already had existing active programming designed to complement government efforts in the education and climate sectors.

During Phase 1 of the partnership, the project was launched in ESA to deepen research, develop tools, and map out pathways, which will provide important grounding and insight that will be elevated at the global level. There are a range of shared concerns about the ways in which climate and education intersect in the two regions. The collaborative research was designed to help highlight points of creative, emerging approaches that can provide insight on ways to advance the goal of climate-resilient education systems (Box 2). In Zimbabwe, for example, there is already a great deal of interest in using innovative pedagogical approaches, such as project-based learning, to teach about climate change while simultaneously promoting climate adaptation strategies for the school community. CARE Zimbabwe has developed and piloted this work and hence is well positioned to lead the research and chair the regional advisory group, which consists of representatives from each of the collaborative research partners across the five countries.

There is also demonstrated interest in this research space within other countries, and thus the advisory group also served to provide insights to CARE Zimbabwe to lift up, review, and compile these experiences, which has resulted in the drafting of this toolkit of current emerging good practices across the region.

Phase 2 focused on sharing the findings of collaborative research via the toolkit through online and offline events regionally, across Africa, and at the global level. It is envisaged that the findings of this research and the resultant toolkit will deepen understanding of the nexus between education and climate change at different levels while contributing toward climate-resilient education systems in Eastern and Southern Africa.

BOX 2.

Research methods at a glance

This toolkit draws on four methods (fully described in Section 3):

- **A literature review** of regional and global climate-education evidence
- **A landscape review** of existing toolkits to identify gaps
- **A regional advisory group** and partner consultations
- **Qualitative fieldwork**, comprising a survey (239 individual interviews) and focus group discussions across 11 districts in five countries

Section 2:

Education and climate change in eastern and southern Africa—A literature review

INTRODUCTION

This literature review synthesizes academic and gray literature on the bidirectional links between education and climate change in ESA, including evidence from Kenya, Malawi, Rwanda, South Africa, and Zimbabwe. It examines the impacts of climate change on schooling and learning, education systems as vehicles for adaptation and mitigation, curriculum and teacher capacity reforms, and emerging country initiatives.

Climate change is increasingly disrupting education systems across ESA through extreme weather, heat, droughts, floods, and cyclones. Education simultaneously offers a pathway to build adaptive capacity, increased knowledge of climate change, and green skills—defined as the knowledge and values required to live and work in societies that aim to reduce the impact of human activity on our environment (Gvasalia et al. 2024). Recent assessments emphasize education’s dual role—as both a sector affected by climate hazards and as an instrument for catalyzing behavior change, resilience, and low-carbon development (Sabarwal et al. 2024; UNESCO and MECCE 2024). At the regional level, the United Nations Children’s Fund (UNICEF) 2025 Strategy for Climate-Resilient Education Systems in ESA positions climate action within and through education as central to safeguarding continuity of learning amid escalating climate risks (UNICEF ESARO 2025).

Climate change has evolved into a global crisis that affects regions, countries, and individuals differently depending on age, gender, and geographic vulnerability. Extreme events such as droughts and floods, for example, are increasingly disrupting children’s ability to learn and thrive (Kwauk and Steer 2023). While the risks to education are mounting, education itself is a nonnegotiable part of climate action and adaptation—an instrument to build climate literacy, agency, and resilience as well as to catalyze green skills (GPE 2023; Kwauk and Winthrop 2021).

Global agendas such as Sustainable Development Goals 4, 5, and 13 (Quality Education, Gender Equality, and Climate Action, respectively) underscore the growing coordination between climate change and education, even as gaps persist in financing and evidence on adolescent- and youth-focused climate education and system-level greening (GPE 2023; Kwauk and Winthrop 2021).

CLIMATE IMPACTS ON SCHOOLING AND LEARNING

Evidence increasingly documents significant, adverse effects of climate hazards on educational outcomes. The World Bank estimates that since 2022 (Sabarwal et al. 2024),

- **Over 400 million** students globally experienced climate-related school closures;
- Low-income countries lose, on average, **18 school days annually**; and
- Cost-effective measures averaging around **\$18.51 per student** could reduce learning losses.

African regions face heightened vulnerability, including heat exposure, which reduces learning gains, compounding inequities (IPCC 2022; Sabarwal et al. 2024). In ESA, UNICEF reports disruptions across at least 14 countries between 2022 and 2024 due to floods, droughts, cyclones, and extreme heat, threatening children's right to education (UNICEF ESARO 2025).

Despite escalating hazards, promising evidence shows that innovative, hands-on teaching and school-based adaptation projects can mitigate impacts on learning while strengthening knowledge and responsibility among students (Kwauk and Winthrop 2021). Children's education is disrupted both directly (through damaged infrastructure and unsafe routes) and indirectly via malnutrition, illness, and intensified care burdens. Adolescent girls often face compounded physical and mental health challenges that translate into absenteeism, lateness, and learning losses (Chigwanda et al. 2024; UNICEF 2023).

GENDERED IMPACTS: GIRLS' EDUCATION AND CLIMATE CHANGE

Across ESA, climate hazards amplify preexisting gender inequalities, disproportionately disrupting girls' access to, retention in, and progression through schooling. The Malala Fund estimates that climate change will trigger the abrupt end to schooling for at least 12.5 million girls in 30 climate-vulnerable countries every year, 22 of which are in Africa (GCA 2023). In Benin, Togo, and Uganda, longitudinal qualitative evidence shows that floods, storms, and livelihood shocks interrupt girls' journeys to school, raise household costs, and heighten risks of child marriage and gender-based violence—leading to missed schooling or dropout (Plan International 2024).

Country evidence echoes these dynamics. In Kenya's arid and semiarid lands, protracted droughts and subsequent flooding have widened gender gaps in return to schooling, with girls' dropout linked to caregiving, water collection, and negative coping strategies including early marriage (OCHA 2023; Olingo and Oduor 2024). Similarly, education-in-emergencies monitoring documents the need for school feeding, hygiene services, and resilience-enhancing support to sustain girls' participation during drought (Kenya EiEWG 2023).

In Malawi and Zimbabwe, cyclones displaced families, damaged schools, and intensified poverty—producing overcrowded classrooms and learning interruptions that disproportionately affected girls through increased care burdens, psychosocial stress, heightened protection risks, and early marriage (ECW n.d.-a., n.d.-b; Kahomwe and Muzingili 2025; Munthali 2023). Rwanda's school leader survey associates climate events with attendance and concentration losses, while Action Learning programs have targeted gender barriers alongside climate resilience in schools (Copsey et al. 2024; Fitzpatrick and Muhika 2023).

TEACHER CHALLENGES IN RESPONDING TO CLIMATE EFFECTS ON TEACHING AND LEARNING

Teachers are frontline responders to climate impacts on schooling, yet they face significant constraints in each country.

Kenya. In Kenya, new digital climate curriculum partnerships will require teacher upskilling for effective use of interactive content; the reports of the Kenya Education in Emergencies Working Group highlight the need for educator resilience programs during drought (Kenya EiE WG 2023; UNICEF Kenya 2024).

Malawi. In Malawi, most senior secondary teachers report having received no training in climate change education and rarely use transformative methods such as projects or fieldwork, reflecting gaps in pre- and in-service professional development (Wadson et al. 2023). Cyclone-related displacement and infrastructure damage further strain teacher-pupil ratios and classroom spaces, complicating pedagogy and psychosocial support (Munthali 2023).

Rwanda. Rwanda's policy emphasis on continuous teacher professional development and digital skills is strengthening competencies, though gaps in digital inclusion and capacity persist (UNICEF Rwanda 2024).

South Africa. In South Africa, although climate topics are included in the national geography curriculum, standardized lesson plans and assessment packages can limit teacher agency to adapt instruction to local climate realities, and short professional development courses have shown mixed effects on shifting classroom practices toward learner-centered approaches (Thenga 2025; Thenga et al. 2021).

System-level responses—such as the Department of Basic Education's draft National Strategy for Education for Sustainable Development and the Fundisa for Change professional learning community—aim to consolidate ESD and strengthen teacher capacity, but implementation coherence and resourcing remain ongoing challenges (DBE 2024; Fundisa for Change, n.d.).

Zimbabwe. In Zimbabwe, teachers confront both climate shocks and systemic stressors—low pay, attrition, and infrastructure deficits—that undermine retention and classroom quality during emergencies (Murwira 2024; Musarandega and Masocha 2023).

EDUCATION AS A LEVER FOR ADAPTATION, RESILIENCE, AND MITIGATION

Education builds adaptive capacity by strengthening climate change education, risk awareness, and problem-solving as well as by developing green skills for a just transition (UNESCO and MECCE 2024). Integrating climate change education (CCE) into curricula, teacher education, and school operations can enable behavioral change at scale and prepare youth for green jobs (Sabarwal et al. 2024). The African Union strategies highlight the need to improve climate literacy, early warning systems, and to leverage indigenous knowledge within resilient development (AU 2022).

Regional momentum is growing to embed climate content across curricula and teacher training including the Climate-Smart Education Systems Initiative (CSESI), a project of the Global Partnership for Education (GPE). Scoping reviews underline effective pedagogies including project-based learning, community engagement, and

transformative practices—which support resilience and action (Muccione et al. 2025). However, barriers persist: limited resources, fragmented implementation, and insufficient teacher preparedness (Kemeni Kambiet and Mbah 2025).

COUNTRY EVIDENCE

Across the five countries and the ESA region, recurrent themes include the following (AU 2022; Sabarwal et al. 2024; UNFCCC 2021):

- Climate hazards disrupting schooling and exacerbating inequities
- Promising whole-institution and community-linked approaches
- Persistent teacher capacity and resource gaps
- The importance of integrating Indigenous knowledge and locally relevant content
- Insufficient climate finance directed to education despite cost-effective adaptation options.

Research gaps concern longitudinal evidence on learning and earnings impacts; robust evaluations of climate-adapted school infrastructure; and the scalability and cost-effectiveness of ESD and CCE models in diverse contexts (Muccione et al. 2025).

Priorities for ESA ministries and partners include the following (AU 2022; Sabarwal et al. 2024; UNICEF ESARO 2025):

- Mainstreaming climate resilience in sector plans and education management information systems
- Investing in teacher professional development and leadership for ESD or CCE
- Embedding locally relevant, justice-oriented content and Indigenous knowledge
- Strengthening school feeding; water, sanitation, and hygiene (WASH); and heat-adapted facilities
- Ensuring learning continuity through digital platforms
- Mobilizing climate finance for education, including through adaptation windows and blended mechanisms.

Kenya

Kenya has advanced policy frameworks for climate education and learning, including its National Climate Change Learning Strategy (2021-2031), and made recent moves to integrate digital climate curricula via the Kenya Institute of Curriculum Development and UNICEF (Government of Kenya 2021; UNICEF Kenya 2024). Qualitative research in six counties documents climate impacts on attendance, learning loss, school infrastructure, and intersectional vulnerabilities affecting children with disabilities. Proposed adaptations include school feeding, infrastructure upgrades, contingency funds, and remote learning options (Fitzpatrick and Ameyia 2023). Higher education responses remain uneven, with gaps in curricula and institutional governance (Nyerere et al. 2021).

Malawi

Malawi is piloting climate-smart education through safety drills and standard operating procedures linking national policy to local action under the GPE's CSEI (GPE 2025). Studies show major teacher training gaps: over 90 percent of surveyed teachers had no CCE training, with limited use of transformative strategies (Wadson et al. 2023). Recent evaluations of secondary school initiatives and curriculum reviews emphasize the need to integrate climate hazards (such as cyclones), climate justice, resilience building, and Indigenous knowledge alongside expanded teacher professional development (Chen and Das 2025; UNESCO 2025).

Rwanda

Rwanda's competence-based curriculum integrates cross-cutting issues of climate change and sustainability across levels, supported by ESD policies led by the Rwanda Environment Management Authority (REMA) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) "ESD for 2030" country initiative (UNESCO 2024a). Practice-focused programs such as Eco-Schools demonstrate Action Learning that addresses school feeding and infrastructure challenges while improving teaching relevance. Research indicates that climate action projects can remove barriers to quality education at relatively low cost (ARCOS Network, n.d.; Copsey et al. 2024).

South Africa

South Africa, as one of the most industrialized countries in Africa, faces high climate risk and remains the continent's largest greenhouse emitter; policy frameworks call for integrated adaptation and mitigation within developmental approaches (Chevallier 2010). At system level, initiatives such as Stellenbosch University's School for Climate Studies foster transdisciplinary teaching and research. Evidence from geography education points to opportunities—such as curriculum inclusion and teacher knowledge of climate topics—alongside barriers such as standardized lesson packages that constrain teacher agency (Thenga 2025).

Zimbabwe

Recent climate shocks in Zimbabwe have repeatedly disrupted schooling: the 2016 regional drought contributed to dropouts and irregular attendance due to hunger. In 2017, flooding destroyed schools and critical public infrastructure. And in 2019, Cyclone Idai led to temporary closures, learning disruptions, and loss of life.

Zimbabwe is strengthening sustainability in its Heritage-Based Curriculum (2024-2030) and teacher education, aligned with UNESCO's greening standards (UNESCO 2024b); pilots of new learning materials were planned for 2025 (MoPSE 2024). Research identifies barriers to climate awareness and education—information dissemination, public perceptions, and resource constraints—and underscores the role of media, stakeholder engagement, and technology (Mazuruse and Nyagadza 2025). University systems have capacity gaps, with calls for centers of excellence and better integration of CCE and Indigenous knowledge into secondary and tertiary curricula (Machaya 2025; Makombe 2024).

PROMISING PRACTICES FOCUSING ON CLIMATE EDUCATION ACROSS KENYA, MALAWI, RWANDA, SOUTH AFRICA, AND ZIMBABWE

This section highlights a few promising practices on climate education across the five countries that demonstrate context-relevant, action-oriented approaches.

Kenya. In Kenya, a 2024 partnership between the Kenya Institute of Curriculum Development, UNICEF, and Alef Education integrated an interactive digital climate course into the Kenya Education Cloud, with videos, quizzes, and carbon literacy modules to support teachers and learners (UNICEF Kenya 2024). Complementary school-based projects emphasize hands-on sustainability activities—from waste reduction to organic composting and tree planting—to translate climate literacy into local action (*Daily Nation* 2025).

Malawi. In Malawi, the GPE’s CSEI pilot programs institutionalize school safety standard operating procedures—drills, evacuation routes, and community engagement—linking policy to classroom routines and continuity of learning during floods and cyclones (GPE 2025).

Rwanda. Rwanda’s Eco-Schools use the IVAC (Investigation–Vision–Action–Change) pedagogy and the seven-step model to cocreate climate action projects with students, parents, and teachers, establishing “Green Learning Zones” and climate adaptation action areas. Evidence shows rapid, low-cost improvements in inclusion, relevance, and teaching quality (ARCOS Network, n.d.; Copsey et al. 2024).

South Africa. In South Africa, Fundisa for Change provides teacher professional development and open resources (such as “Teaching Climate Change” manuals) that support inquiry, place-based projects, and participatory learning. Case studies also highlight participatory girls’ climate education—positioning learners as co-researchers to build agency and climate knowledge (Fundisa for Change, n.d.; Murphy and Fuyani 2025; Thenga 2025).

Zimbabwe. Zimbabwean practice increasingly foregrounds Indigenous knowledge integration within climate education, with studies urging clearer policy guidance, community involvement, and strengthened pre- and in-service teacher preparation. Emergency education programs in numerous countries (for example, Education Cannot Wait and GPE) have supported disaster risk reduction (DRR) messaging, psychosocial support, and temporary learning spaces after cyclones (ECW n.d.-a., n.d.-b.; GPE 2025; Machaya 2025).

Section 3: Collaborative research design and methodology

INTRODUCTION

This collaborative research was conducted by CARE Zimbabwe in collaboration with the seven organizations across five countries: Education Development Trust (EDT), Forum for African Women Educationalists Zimbabwe (FAWEZI), Teach for Zimbabwe (TFZ), Asante Africa Foundation (AAF), Right to Play (RTP), One Planet (OP), and Creative Centre for Community Mobilizing (CRECOMM). Each of these organizations has a history of successfully implementing initiatives to improve access to quality, inclusive, and relevant education for the most marginalized. The research leveraged this existing programming in geographic areas where each of the organizations is already authorized to operate. Each organization selected one data collection site in a climate-affected region to enrich the findings of the research, with the exception of CARE Zimbabwe, which selected two data collection sites.

Through this research, the collaborative research partners are committed to supporting government efforts to build a climate-literate generation that recognizes its role in shaping a greener, more sustainable future for all education stakeholders but, more importantly, for adolescents and youths.

RESEARCH DESIGN

This study employed four complementary methods to generate the evidence base for this toolkit.

First, a literature review synthesized academic and gray literature on the bidirectional links between education and climate change in ESA, drawing on evidence from Kenya, Malawi, Rwanda, South Africa, and Zimbabwe. It examined the impacts of climate change on schooling and learning outcomes; the role of education systems as vehicles for adaptation and mitigation; curriculum and teacher capacity reforms; and emerging country initiatives.

The review documented the dual role of education—as both a sector highly exposed to climate hazards and as a critical instrument for catalyzing behavior change, resilience, and low-carbon development. It also identified recurrent regional themes, including disrupted schooling, gendered impacts on adolescent girls, teacher capacity constraints, and the importance of integrating Indigenous knowledge and locally relevant content into curricula. Country-level evidence across the five partner countries was captured to ground the toolkit in specific national policy and programming contexts.

Second, a toolkit landscape review identified some of the existing climate education resources, tools, and programs already operating across ESA. It surfaced emerging good practices from partner organizations already working at the intersection of climate and education across the five countries, ensuring that the toolkit builds on, rather than duplicates, what already exists in the region.

Third, a regional advisory group—comprising one representative from each of the seven partner organizations listed earlier (EDT, FAWEZI, TFZ, AAF, RTP, OP, and CRECCOM)—met periodically to validate draft tools and ensure relevance across diverse country contexts. Chaired by CARE Zimbabwe, the advisory group served as a cross-country sounding board, providing insights from active programming in Kenya, Malawi, Rwanda, South Africa, and Zimbabwe.

Fourth, qualitative fieldwork employed a mixed-methods design consisting of a survey, 239 individual interviews, and focus group discussions (FGDs) across 11 districts in five countries. Each collaborative research partner selected a data collection site in a climate-affected region within its existing programming area, ensuring purposive sampling grounded in established relationships and local knowledge. At each site, the desire was to conduct 20 individual interviews with adolescents or youths (an equal split of males and females), alongside 3 interviews with teachers or educators and 3 key informant interviews with stakeholders such as district education officials. Three FGDs per site brought together adolescents and youths, teachers, and community members, respectively.

Data from individual interviews were collected using Kobo Collect and entered into Excel for analysis. FGD responses were captured using a structured Excel tool developed by CARE Zimbabwe and reviewed and validated by all collaborative research partners. All data collection followed rigorous ethical standards, including informed consent processes, parental or guardian consent for minors, completion of ethics training by all data collectors, and responsible data management protocols aligned with CARE Zimbabwe's guidelines.

Together, these methods ensured that the toolkit is grounded in both the available evidence and the lived realities of practitioners and learners in the ESA region.

Research objectives

- To explore how and why adolescents and youths in Kenya, Malawi, Rwanda, South Africa, and Zimbabwe are acquiring knowledge on climate change.
- To examine the innovative approaches and pedagogies used by educators in delivering climate education for adolescents and youths in Kenya, Malawi, Rwanda, South Africa, and Zimbabwe.

Research questions

- How are adolescents and youths acquiring climate knowledge in Kenya, Malawi, Rwanda, South Africa, and Zimbabwe?
- How have adolescents and youths applied climate knowledge in Kenya, Malawi, Rwanda, South Africa, and Zimbabwe?
- What innovative approaches and pedagogies are being used to deliver climate education to adolescents and youths in Kenya, Malawi, Rwanda, South Africa, and Zimbabwe?
- What are the key considerations (enablers and barriers) in the use of the innovative approaches for climate education?

DESCRIPTION OF STUDY AREAS

Samburu County, Kenya. Maralal, a marginalized, semiarid community in Samburu County, Kenya, faces harsh climatic conditions with low rainfall and high evaporation, shaping its economy around pastoralism and limited agriculture. Livestock farming dominates, complemented by beadwork and small-scale riverine farming.

Climate change has intensified the area's challenges, causing droughts, livestock losses, poverty, displacement, and insecurity, often escalating into banditry and intercommunal violence over scarce resources (MoALFC 2021). In response, the community—supported by climate education initiatives like those at Mwangaza Muslim Secondary—adopts sustainable practices such as tree planting, rainwater harvesting, drought-resistant crops, diversified farming, and irrigated agriculture (Asante Africa Foundation 2023). These efforts, driven by schoolchildren as change agents, are improving resilience, food security, and environmental health, fostering a more sustainable and climate-resilient future for Maralal.

Mulanje, Malawi. Mulanje District lies in Malawi's Southern Region near the Mozambique border, dominated by the Mount Mulanje massif and an agro-based economy centered on large-scale tea estates alongside smallholder farmers growing maize, groundnuts, and other food crops (GPE 2025). The district is among the country's most climate-exposed areas: it was one of the hardest-hit locations when Cyclone Freddy struck in March 2023, damaging schools, displacing families, and disrupting learning for many children across Malawi's Southern Region, on top of school closures earlier that year from a cholera outbreak (Munthali 2023; UNICEF Malawi 2023).

Recurrent cyclones and flooding have compounded pressures on an education system already constrained by teacher shortages and minimal training in climate change education, with most senior secondary teachers in Malawi reporting no prior instruction in the subject (Wadson et al. 2023). National programs such as the GPE's CSEI are now working to embed climate hazard preparedness, including safety drills, into schools in districts like Mulanje (GPE 2025).

Rubavu District, Rwanda. In Rwanda's Western Province, Rubavu is highly vulnerable to natural disasters because of its location on a fault line, proximity to Lake Kivu, and mountainous terrain (MINEMA 2024). The area has faced severe climate-related emergencies, including catastrophic floods and landslides in May 2023 that killed 131 people, injured 77, and destroyed thousands of homes and schools, disrupting education and displacing children (IFRC 2023). Frequent windstorms (such as those in April 2025) and the 2021 Nyiragongo volcanic eruption with subsequent seismic shocks have compounded these challenges, leading to school closures, infrastructure damage, and social issues like dropout, early marriage, and child labor (UNESCO 2024a, 2024c). These recurring hazards underscore the urgent need for strategies to strengthen education systems and community resilience against climate change and displacement impacts.

Pietermaritzburg, uMgungundlovu, and Western Cape, South Africa. South Africa's education system, despite high government investment comparable to Organisation for Economic Co-operation and Development (OECD) countries, performs poorly globally owing to complex factors such as teacher subject knowledge gaps, socio-economic disparities, and systemic inequalities (OECD 2025).

Climate change education is minimally integrated into the Curriculum Assessment Policy Statements (CAPS), with fragmented and incoherent approaches across subjects and inadequate teacher training (Thenga 2025). Current initiatives like Fundisa for Change (SANBI 2026) and programs led by NGOs (such as Eco-Schools and Sustainable Schools) attempt to bridge the gap through teacher development and holistic learning but operate on a small scale. Achieving meaningful impact requires systemic curriculum reform and embedding climate education in teacher training nationwide to foster ecological and social sustainability.

Buhera District, Zimbabwe. Buhera District in Manicaland Province, Zimbabwe, lies about 170 kilometers southwest of Mutare and is bordered by several districts and provinces, fostering strong interdistrict interactions. It comprises 33 wards grouped into four parliamentary constituencies and features two major growth points (Murambinda and Birchenough Bridge) alongside numerous rural and business centers. The district is entirely communal land.

Livelihoods are mainly subsistence agriculture, focusing on drought-resistant crops, cattle ranching, and small-scale vegetable farming, supplemented by irrigation schemes and cash crops like tobacco. Mining also plays a role, with Dorowa Minerals and Sabi Star as major employers. Education is supported by 143 primary and 73 secondary schools, mission institutions, and a technical vocational center promoting entrepreneurship. Despite economic activity, Buhera faces hazards such as drought, land degradation, and cyclones that challenge development efforts.

Chiredzi District, Zimbabwe. TFZ has been working in Chiredzi District since 2021, placing fellows in marginalized schools that face severe climate change impacts. Rising temperatures, erratic rainfall, and extreme weather events have disrupted education by damaging school infrastructure, reducing water availability, and causing heat stress among students. These conditions have led to hunger, absenteeism, and declining academic performance as families abandon farming and migrate, leaving behind child-headed households. Women and children are disproportionately affected, and urgent research is needed to develop climate-resilient strategies to keep learners in school despite these challenges.

Mutare District, Zimbabwe. Mutare District in Manicaland Province, Zimbabwe, borders Mozambique to the east and neighboring districts such as Makoni, Nyanga, and Buhera. It comprises urban, rural, and peri-urban areas, with 36 wards managed by two municipal authorities and traditional leadership under two chiefs and 12 headmen. The district features diverse landscapes, including mountains, valleys, and tourist attractions like the Vumba Mountains, Christmas Pass, and Mutare Museum. Its economy is driven by agriculture, mining (gold, chrome, diamonds), and cross-border trade with Mozambique.

Mutare hosts 255 primary and secondary schools, higher education institutions such as Mutare Polytechnic and Manicaland State University, and vocational training centers offering practical skills for youth. The population practices a mix of traditional beliefs and Christianity, with a notable concentration of Apostolic sects, which influence cultural norms and youth participation.

Mutoko District, Zimbabwe. Climate change is significantly affecting Makosa High School and the broader Mutoko District in Zimbabwe, where livelihoods depend on agriculture and mining. Rising temperatures, erratic rainfall, and extreme weather events have reduced agricultural productivity, threatening food security and community well-being. Education as a critical tool for climate adaptation and mitigation, advocating for curricula that integrate climate literacy to equip adolescents and communities with knowledge, skills, and resilience. However, climate change disrupts learning environments, damages school infrastructure, and exacerbates educational inequities, particularly in under-resourced areas. Engaging adolescents in climate action and fostering sustainability through education can empower future generations to address environmental challenges and promote social justice.

DEMOGRAPHIC PROFILE OF STUDY PARTICIPANTS

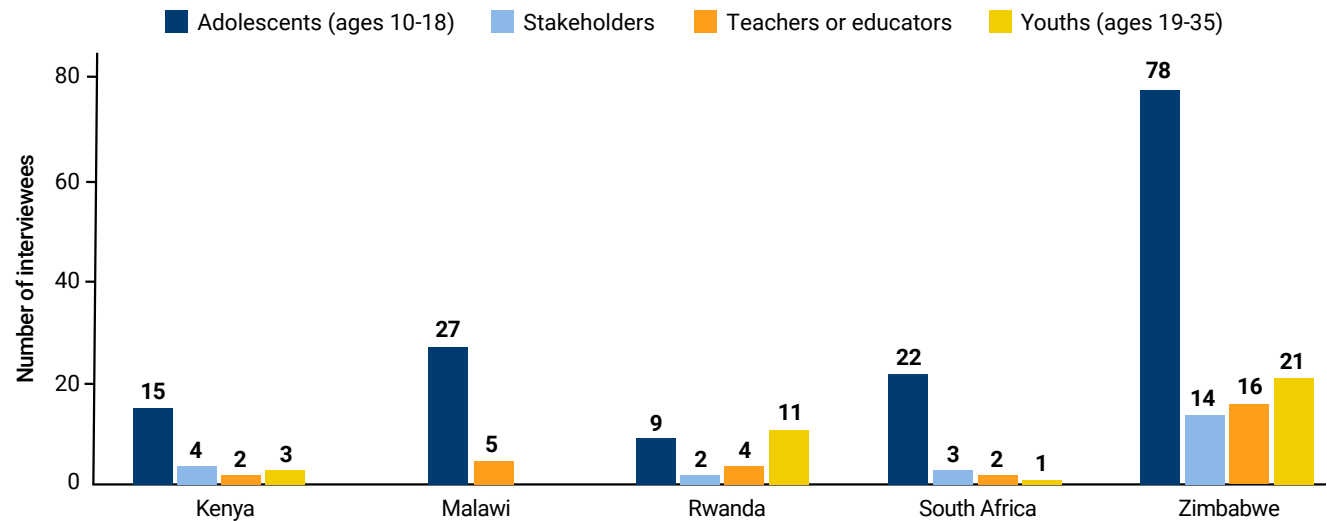
This section outlines the demographic profile of the study participants. For more tables, figures, and synthesis, also see Annex B.

Country-level distribution

The study engaged 239 individual interviewees across 11 districts in five countries (Figure 1 and Table 1): Kenya, Malawi, Rwanda, South Africa, and Zimbabwe. Zimbabwe contributed the largest share of participants (129), followed by Malawi (32), South Africa (28), Rwanda (26), and Kenya (24). The sample comprised adolescents 10-18 years old (n=151), youth 19-35 years old (n=36), teachers or educators (n=29), and stakeholders (n=23). This distribution reflects Zimbabwe's central role in the study design while ensuring comparative perspectives from the other four countries.

FIGURE 2

Individual interviewees comprised four groups, distributed across five countries



SOURCE: Author.

TABLE 1

The study interviewed 239 participants across 11 districts in five countries

Country	Districts (number)	Districts (name)	Interview participants
Kenya	1	Samburu	24
Malawi	1	Mulanje	32
Rwanda	1	Rubavu	26
South Africa	3	Pietermaritzburg, uMgungundlovu, Western Cape	28
Zimbabwe	5	Buhera, Chiredzi, Chitungwiza, Mutare, Mutoko	129
Total	11	n.a.	239

SOURCE: Author.

NOTE: n.a. = not applicable.

Geographical location

Rural areas dominated the study sample, particularly among adolescents (117 of 151 interviewees) and youths (31 of 36 interviewees). Urban areas were more represented among educators and stakeholders, while peri-urban areas showed moderate and relatively even representation across all profiles (Table 2).

This geographical skew toward rural settings has important implications for climate education strategies, which must account for the resource constraints and infrastructure limitations characteristic of rural communities.

TABLE 2

The study sample's geographic distribution varies by profile type

Geographic location type	Adolescent (ages 10-18)	Youth (ages 19-35)	Teacher or educator	Stakeholder
Peri-urban	18	4	2	5
Rural	117	31	19	9
Urban	16	1	8	9

SOURCE: Author.

Sex disaggregation

Gender distribution across the sample was broadly balanced, with females making up 51.88 percent and males 48.12 percent of all participants.

Adolescents were the most female-dominated group (55 percent female), while youth, teachers, and stakeholders showed a slight male majority (approximately 52-56 percent male). Overall, the near-parity in gender representation strengthens the study’s ability to draw conclusions relevant to both sexes, though the adolescent skew toward females warrants attention in designing gender-responsive education approaches.

TABLE 3

The sex-disaggregated data, by profile, shows a balanced sample distribution

Profile	Female	Male
Adolescent (ages 10-18)	83 (55.0%)	68 (45.0%)
Youth (ages 19-35)	16 (44.4%)	20 (55.6%)
Teacher or educator	14 (48.3%)	15 (51.7%)
Stakeholder	11 (47.8%)	12 (52.2%)

SOURCE: Author’s calculations.

Marital status

The overwhelming majority of participants were single (n=182), driven almost entirely by the adolescent cohort, for whom this status is expected. Married participants (n=51) were concentrated among teachers/educators and stakeholders, with limited representation among youths. Divorced, widowed, and separated statuses were rare and confined o adult profiles.

For program design purposes, adolescent interventions can assume a predominantly single demographic, whereas adult-facing strategies should account for greater marital diversity, which may influence scheduling and engagement preferences.

Education level

Education levels varied markedly across profiles. Most adolescents were enrolled in secondary school (54.3 percent), with a substantial proportion still in primary education (45.7 percent), signaling the need for age-differentiated and simplified climate content. Nearly all youth (94.4 pe cent) had attained secondary education, pointing to an opportunity to build on this foundation through vocational and community-based programs.

Teachers were predominantly tertiary or vocationally qualified (82.8 per cent), positioning them well for structured curriculum delivery, though continuous professional development remains essential. All stakeholders held tertiary or vocational qualifications, making them well placed to champion policy advocacy, mentorship, and resource mobilization.

A notable pedagogical gap exists between the advanced qualifications of educators and the basic education levels of adolescents, necessitating innovative, accessible teaching approaches such as play-based learning and visual aids.

Income sources

Climate change is disrupting education and livelihoods in Zimbabwe and other regions, with adolescents (ages 10-18) and youths (ages 19-35) facing distinct vulnerabilities. Income patterns differed sharply by profile: Adolescents were almost entirely dependent on guardians (96 percent), rendering them highly vulnerable to household-level climate shocks such as droughts or floods. Youth showed greater diversification across entrepreneurship, employment, and agriculture but remained exposed to climate-related income disruptions.

Teachers had relatively stable employment-based incomes and technology access, making them well suited as knowledge hubs and focal points for capacity-building efforts. Stakeholders drew on employment, entrepreneurship, and agriculture, and were positioned to fund and support community-level climate programs.

Government social protection was negligible across all groups, underscoring a systemic gap in safety nets for climate-affected households.

Access to technology

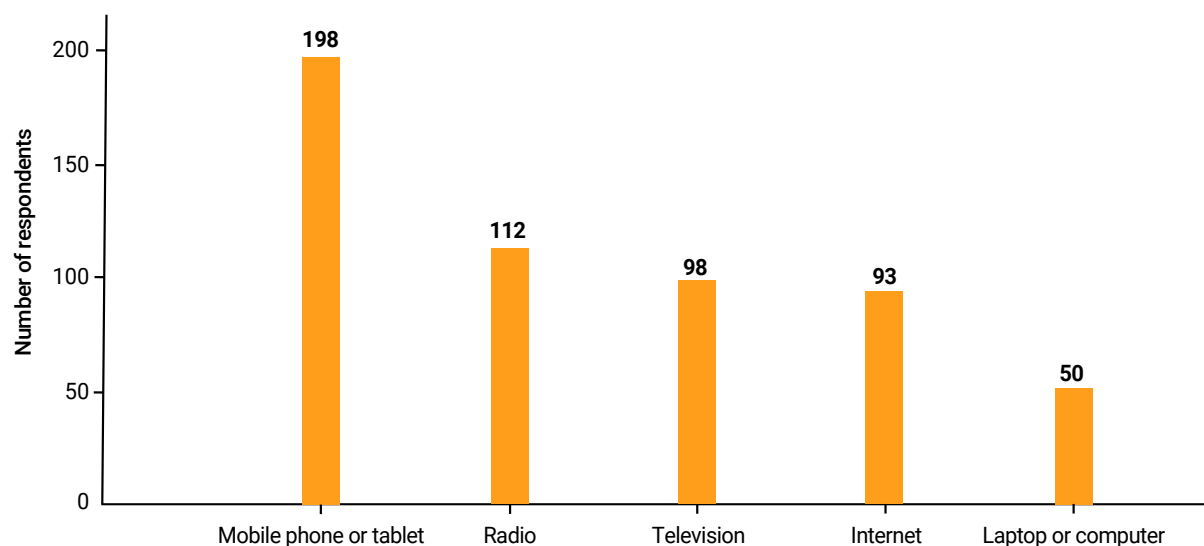
Mobile phones were the dominant technology across all profiles (76-100 per cent), making them the most viable channel for climate education outreach (Table 4). However, access to the internet was highly unequal: stakeholders (87 percent) and teachers (72 percent) had substantially greater connectivity than adolescents (25 percent) and youths (39 percent). Given the higher numbers of adolescent and youth interviewees, overall internet access is relatively low (n=93), as shown in Figure 3.

Laptop and computer access was similarly concentrated among stakeholders (78 percent) and teachers (41 percent), with very low rates among adolescents (10 percent) and youth (14 percent). Radio remained a critical medium in rural areas, accessed by nearly half of adolescents (48 percent).

These disparities, consistent with regional evidence on the digital divide in sub-Saharan Africa, mean that climate education strategies must be multiplatform, prioritizing mobile and radio channels for rural and younger audiences while leveraging digital tools where infrastructure permits.

FIGURE 3

Mobile phones were the dominant technology used among respondents across all profiles



SOURCE: Author.

TABLE 4

Disparities in access to technology, by profile, indicate a need for multiplatform climate education strategies

Profile	Mobile phone (%)	Internet (%)	Television (%)	Radio (%)	Laptop or computer (%)
Adolescent (ages 10-18)	76	25	37	48	10
Youth (ages 19-35)	92	39	8	33	14
Teacher or educator	100	72	72	48	41
Stakeholder	96	87	83	61	78

SOURCE: Author's calculations.

Mode of transportation

Walking was the predominant mode of transportation for adolescents (67 percent) and youths (58 percent), reflecting limited financial resources and poor public transportation availability in rural and peri-urban areas. Stakeholders relied primarily on private transportation (50 percent), consistent with their higher income levels, whereas teachers showed a mixed pattern of public transportation and walking. Cycling and motorcycle use was minimal across all groups.

These mobility constraints have direct implications for climate education access: extreme weather events such as floods, cyclones, and heat waves can make walking routes impassable or unsafe, increasing absenteeism and reducing program reach, particularly for the most vulnerable adolescents in rural areas.

TABLE 5

Predominance of walking as a mode of transportation among adolescents and youths may be a constraint on access to climate education

Profile	Public (%)	Private (%)	Cycling or motorcycle (%)	Walking (%)
Adolescent (ages 10-18)	22.99	2.87	7.47	66.67
Youth (ages 19-35)	38.18	1.82	1.82	58.18
Teacher or educator	36.11	19.44	11.11	33.33
Stakeholder	29.41	50.00	2.94	17.65

SOURCE: Author’s calculations.

TOOL DEVELOPMENT AND TRAINING

CARE Zimbabwe, with input from all collaborative partners, developed the following data collection tools:

- *Individual Interview Guide*, customized to each profile—adolescents and youths, teachers and educators, and key stakeholders
- *Focus Group Discussion Guide*, customized to each profile—adolescents and youths; teachers and educators; and parents, community representatives, and stakeholders
- *Informed consent forms*, used to ensure that adult research participants as well as the parent, guardian, or responsible authority (e.g., the headmaster in the case of schools) have granted their consent for the research.

Data from the individual interviews were collected using Kobo Collect and downloaded into an Excel spreadsheet for analysis. Data from the FGDs entered into an Excel spreadsheet. CARE Zimbabwe organized an online training session on March 21, 2025, targeting the data collection and entry teams from all the participating organizations. The training provided an opportunity for teams to engage with the tools and to review the tools for coherence, logic, and flow.

DATA COLLECTION

Each collaborative research partner organization was responsible for data collection at the chosen site based on its programming parameters, and thus sampling was largely purposive. However, at each data collection site, a clear effort to sample an equal proportion of males and females was demonstrated and any exceptions clearly justified.

Table 6 outlines the data collection process.

Each of the organizations participated in this collaborative research leveraging existing programming being implemented in geographic areas where they are already authorized to operate, and thus they each took the responsibility of engaging the relevant authorities in the districts from which they collected data (Table 7).

TABLE 6

Data were collected in a standardized manner by each collaborative research partner organization

Data collection	Quantity	Study participants	Data collection method
Individual interviews	20 per site	Adolescents and youths (10 male, 10 female)	Kobo Collect-administered
	3 per site	Teachers	Kobo Collect-administered
	3 per site	Key stakeholders	Kobo Collect-administered
Focus group discussions (FGDs)	1 per site	8-12 adolescents and youths per FGD	Excel tool In-person
	1 per site	8-12 teachers per FGD	Excel tool In-person
	1 per site	8-10 community members per FGD	Excel tool In-person

SOURCE: Author.

TABLE 7

Each collaborative research partner organization collected data in the country and districts where they have existing programming

Organization	Country	District(s)
CARE Zimbabwe	Zimbabwe	Buhera and Mutare
Education Development Trust (EDT)	Zimbabwe	Mutoko
Forum for African Women Educationalists Zimbabwe (FAWEZI)	Zimbabwe	Chitungwiza
Teach for Zimbabwe (TFZ)	Zimbabwe	Chiredzi
Right to Play	Rwanda	Rubavu
Creative Centre for Community Mobilizing (CRECCOM)	Malawi	Phalombe
Asante Africa Foundation	Kenya	Samburu
One Planet	South Africa	Pietermaritzburg, uMgungundlovu, and Western Cape

SOURCE: Author.

The key deliverables for each data collection site were organized as follows:

- **Twenty individual interviews with adolescents or youths.** Each organization chose either adolescents or youths (half male, half female) depending on their current targeting. These interviews (maximum of 45 minutes to 1 hour each) were conducted using a tool available via a link on the Kobo Collect platform administered by CARE Zimbabwe.
- **Three individual interviews with teachers and educators.** These interviews (maximum 45 minutes to 1 hour each) were conducted using a tool available via a link on the Kobo Collect platform administered by CARE Zimbabwe.
- **Three key informant interviews with key stakeholders** (including government, donor, private sector). These interviews (maximum of 45 minutes each) were conducted using a tool available via a link on the Kobo Collect platform administered by CARE Zimbabwe.
- **Three focus group discussions** (maximum of 1 hour each) with
 - Adolescents and youths;
 - Teachers and educators; and
 - Parents and other community stakeholders.

The FGD responses were captured using an Excel Tool developed by CARE Zimbabwe. Three tabs were created in the tool for each of the three FGDs.

- **A 1- to 2-page summary** (with a few references) of the situation of the country, education, and climate change in the chosen study area or data collection site to provide background for the data.

ETHICAL CONSIDERATIONS

The data collection team ensured that an informed consent process was completed for each research participant. For minors, informed consent was sought from their parents or guardians—or, in the case of schools, the responsible authority (such as the headmaster) in advance of data collection.

In addition, given that the research involved working with minors, members of the data collection teams were expected to take [UNICEF's Ethics in Evidence Generation](#) free online training (a 75-minute course that issued a certificate upon successful completion)³ These certificates were lodged or filed with CARE Zimbabwe. Alternatively, other similar, reputable courses were also accepted as certification.

CARE Zimbabwe also observes responsible data management (RDM) guidelines—referring to the ethical and secure handling of data throughout its life cycle, from collection to disposal. It involves ensuring that data are used in a manner that respects privacy, confidentiality, consent, and other relevant ethical principles. RDM helps everyone involved to understand how the research process might put participants at risk and what to do about it. These guidelines were applicable to all the other collaborating teams as well.

For Zimbabwe, permission for conducting the research was sought from the Ministry of Primary and Secondary Education in Zimbabwe. The collaborative research partners in the other four countries were responsible for ensuring that the required permissions were sought from the relevant authorities in advance of data collection.

³ This particular course has been archived and is no longer maintained. A newer version of this course, available in English, is [Ethical Principles and Standards for Evidence Activities Involving People – Basic Course](https://agora.unicef.org/course/info.php?id=53539) (see <https://agora.unicef.org/course/info.php?id=53539>).

Section 4: Findings

INTRODUCTION

Based on the findings of collaborative research, this section is organized as follows:

- **Demographic profile of study participants:** What is the socio-economic profile and contextual setting of the study participants?
- **Diagnostics and learning pathways:** How do adolescents and youths learn about climate change?
- **Pedagogical effectiveness:** Which teaching methods (e.g., project-based learning, play-based methods, digital tools) are most engaging and impactful for adolescents and youths?
- **Adolescent and youth perspectives:** What role do young people believe they should play in climate action?
- **Barriers and opportunities:** What challenges exist in climate education, and how can they be addressed?
- **Recommendations:** What recommendations do adolescents and youths, educators, and stakeholders propose to support climate education?

DEMOGRAPHIC PROFILE OF THE STUDY SAMPLE

Understanding who participated in this study is essential context for interpreting what follows. The demographic characteristics of the 239 individuals interviewed—their geographic locations, education levels, income sources, technology access, and modes of transportation—are not merely background details; they are the lived conditions within which climate education must operate if it is to be relevant, accessible, and effective. The profile that emerges across the six dimensions below reveals a sample that is predominantly rural, largely young, and navigating significant structural constraints, and it is against this reality that all findings and recommendations in this report should be read.

Study reach and geographic spread. The study engaged 239 participants across 11 districts in five countries: Kenya, Malawi, Rwanda, South Africa, and Zimbabwe—spanning four profile groups: adolescents ages 10–18 (n=151), youths ages 19–35 (n=36), teachers and educators (n=29), and stakeholders (n=23). Zimbabwe contributed the largest share of participants (129), reflecting its central role in the study design.

Geographically, rural communities dominated the sample, particularly among adolescents and youths, most of whom live and study outside urban centers. Urban areas were more represented among educators and stakeholders, while peri-urban settings showed moderate participation across all groups. This geographic diversity is significant for the report's findings because it ensures that the evidence base reflects the varied conditions—ecological, infrastructural, and socio-economic—across which climate education must be delivered. The strong rural weighting in particular grounds the recommendations in the realities faced by the majority of young people in the study region rather than in the comparatively better-resourced urban contexts that can skew research of this kind.

Gender and marital characteristics. Gender distribution across the sample was broadly balanced, with females making up 52 percent and males 48 percent of all participants. Adolescents were the most female-skewed group (55 percent female), while youths, teachers, and stakeholders showed a slight male majority (52-56 percent).

In terms of marital status, the vast majority of participants were single (n=182), a figure driven almost entirely by the adolescent cohort for whom this is expected. Married participants (n=51) were concentrated among teachers and stakeholders, with limited representation among youths. Divorced, widowed, and separated statuses were rare, appearing only in adult profiles. This profile matters for the report because gender shapes both climate vulnerability and the conditions under which young people engage with education.

The relative balance between sexes strengthens the credibility of the findings. The female majority among adolescents is particularly relevant given well-documented evidence that girls in sub-Saharan Africa face compounded barriers to schooling during climate shocks—including increased domestic burdens and safety risks along walking routes—making gender-responsive design a nonnegotiable feature of any climate education strategy emerging from this study.

Education levels. Education levels varied considerably across the four profiles, with important implications for how climate content should be designed and delivered:

- *Among adolescents*, 54 percent were in secondary school and 46 percent in primary school, indicating that a substantial portion may not yet have the foundational knowledge needed to engage with complex climate concepts—necessitating simplified, age-appropriate materials.
- *Youths* were almost universally at the secondary level (94 percent), suggesting the need for a platform from which to build practical skills through vocational and community-based channels.
- *Teachers* were predominantly tertiary or vocationally qualified (83 percent), well positioned to deliver structured climate curricula, although continuous professional development remains essential given the pace of climate knowledge evolution.
- *All participating stakeholders* held tertiary or vocational qualifications, situating them as capable advocates for policy, resource mobilization, and institutional partnership.

These education gradients are directly relevant to the report's recommendations: they confirm that a single, uniform approach to climate education cannot serve all groups equally and that content, pedagogy, and delivery mechanisms must be differentiated by both age and educational attainment. The gap between highly qualified teachers and primarily school-level learners also highlights the importance of translating educator knowledge into forms that are genuinely accessible to younger audiences.

Livelihoods and income sources. Income patterns differed sharply across profiles and carry significant implications for climate vulnerability:

- *Adolescents* were almost entirely dependent on guardians (96 percent), making their educational participation highly sensitive to household-level economic shocks such as droughts or floods
- *Youths* demonstrated greater income diversification through entrepreneurship, employment, and agriculture but remained exposed to climate-related instability across all three sources.

- *Teachers* reported relatively stable employment-based incomes and better access to technology, positioning them as reliable anchors for capacity-building initiatives.
- *Stakeholders* drew on employment and entrepreneurship and were the group most capable of directing financial resources toward community climate programs.

Across all groups, government support and social safety nets were negligible, pointing to a structural gap that climate education strategies must navigate rather than assume away. Understanding these livelihood dynamics is essential to the report because climate change does not affect all participants equally: those most dependent on climate-sensitive income sources, particularly adolescents relying on agricultural households, are simultaneously the most educationally vulnerable and the most in need of climate knowledge. The findings signal that climate education cannot be treated in isolation from the broader socio-economic conditions in which young people live and that effective programs must account for the economic pressures that can pull adolescents and youth away from learning environments altogether.

Technology access and the digital divide. Mobile phones were the near-universal technology across all profiles—ranging from 76 percent among adolescents to 100 percent among teachers—making mobile-based communication the most viable and inclusive channel for climate education outreach. Beyond mobile access, however, stark disparities emerged:

- *Internet connectivity* was available to 87 percent of stakeholders and 72 percent of teachers but only 25 percent of adolescents and 39 percent of youths.
- *Laptop and computer access* was similarly concentrated among stakeholders (78 percent) and teachers (41 percent), with adolescents (10 percent) and youths (14 percent) largely excluded.
- *Radio*, by contrast, remained a critical touchpoint in rural areas, accessed by nearly half of all adolescents (48 percent).

These findings are consistent with broader regional evidence: the GSMA Mobile Gender Gap Report (GSMA 2023) documents a 36 percent gender gap in mobile internet use across sub-Saharan Africa, with women and girls disproportionately excluded, while the International Telecommunication Union estimates that only 22 percent of individuals in least-developed countries accessed the internet in 2023, compared with an average of 68 percent among middle- and high-income countries⁴—with rural youths and lower-income households most affected (ITU 2023).

Taken together, these patterns are critical to the report because they set firm boundaries on what digitally delivered climate education can realistically achieve at scale. The assumption that online or app-based tools can serve as primary delivery mechanisms for adolescent climate learning is not supported by this evidence base; instead, the findings point toward a layered approach that prioritizes mobile phones and radio as the foundations of outreach, with digital tools reserved for settings where teachers and stakeholders can serve as intermediaries.

⁴ In the ITU (2023) report, least developed countries (LDCs) are defined according to criteria of the United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (OHRLLS) (<https://www.un.org/ohrrls/content/ldc-category>), which also lists the LDCs (<https://www.un.org/ohrrls/content/list-ldcs>).

Mobility and transportation. Walking was the dominant mode of transportation for adolescents (67 percent) and youths (58 percent), reflecting both limited financial resources and the scarcity of affordable public transportation in rural and peri-urban areas. Stakeholders relied primarily on private vehicles (50 percent), consistent with their higher income levels, while teachers showed a mixed pattern of public transportation and walking. Cycling and motorcycle use was negligible across all groups.

These mobility realities have direct consequences for climate education access. Extreme weather events—floods, cyclones, and heat waves—routinely make walking routes impassable or unsafe, increasing absenteeism and disrupting program continuity at precisely the moments when climate awareness is most salient. This finding is particularly important for the report because it reveals a cruel irony at the heart of climate education delivery: the populations most exposed to climate-related disruptions to their daily movement are the same populations the report seeks to reach. Any education model that depends on consistent physical attendance, without accounting for climate-induced mobility barriers, risks systematic exclusion of the most vulnerable adolescents in rural communities. The transportation profile therefore reinforces the case for flexible, distributed, and where possible, community-embedded delivery approaches that do not assume reliable or safe access to centralized learning venues.

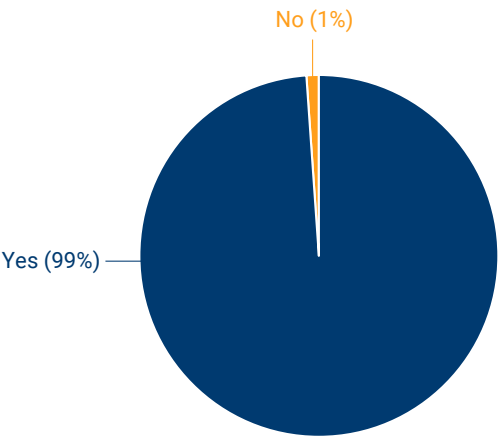
EDUCATION AND CLIMATE CHANGE DIAGNOSTICS AND LEARNING PATHWAYS

Awareness of “climate change”

The study sought to understand awareness levels about climate change among study participants. By far, most respondents (235 respondents, or 98 percent) responded “yes” to the question, “Have you ever heard of climate change?” Only 2 respondents (adolescents from the rural areas) responded “no” despite having access to mobile phones and the radio.

FIGURE 4

Almost all respondents have “heard of” climate change



SOURCE: Author’s calculations.
NOTE: Respondents were asked, “Have you ever heard of climate change?”

First encounters with “climate change” occur mainly in formal education

The study also explored where study respondents first heard of or learned about climate change. The data show that *most respondents first encountered information about climate change in formal education settings*. Their responses were as follows (with respondents allowed to choose more than one source):

- *Schools* were by far the dominant source, with 190 individuals reporting that they learned about climate change there.
- *Media platforms* such as television, radio, social media, and newspapers were the second most common source, cited by 56 respondents, indicating the growing role of mass communication in shaping climate awareness.
- *Community spaces* also played a notable role, with 34 respondents mentioning local gatherings or meetings as their initial point of exposure.
- *Home environments* accounted for 17 responses, suggesting that family discussions contribute modestly to climate knowledge.
- *Workplaces* were mentioned by 13 respondents, reflecting some level of climate-related learning in professional contexts.
- *Friends* were a relatively minor source, cited by only 6 respondents.
- Other channels were reported by 10 respondents, who attributed their first learning to environments such as universities, NGOs, churches, books, and training programs—highlighting the diversity of informal and institutional pathways through which climate education occurs.

TABLE 8

School was the predominant place where study respondents first learned about climate change

Place of first encounter with “climate change”	Number of responses
School	190
Home	17
Work	13
Community	34
Friends	6
Media (television, radio, social media, newspaper)	56
Other	10

SOURCE: Author.

NOTE: “Other” includes university (Midlands State University); nongovernmental organizations (CARE Takunda Project, Umgeni Resilience Project); and personal discussions, churches, books, and training programs. The total number of responses exceeds the number of respondents (239) because each one could choose more than one option.

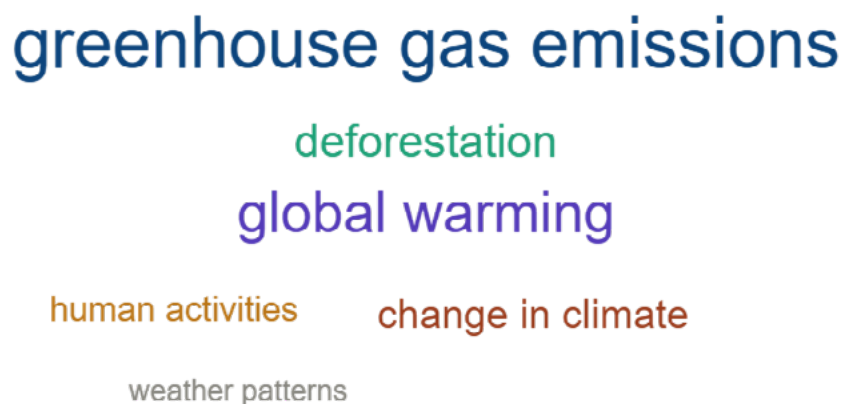
Perceived meanings and causes of climate change

Most respondents described climate change as a gradual or systematic shift in weather conditions over an extended period, often mentioning decades or years. Many answers linked climate change directly to global warming, emphasizing rising temperatures as the core phenomenon. Several responses highlighted human activities—such as burning fossil fuels, greenhouse gas emissions, and deforestation—as primary drivers. Some participants noted that climate change results from both natural processes (e.g., solar radiation) and human actions. A recurring theme was the idea that climate change disrupts ecosystems, agriculture, and water availability, often framed as “changes in atmospheric conditions.”

The most frequent terms identified in the dataset in relation to meaning of climate change include *weather patterns*, *global warming*, *change in climate*, *human activities*, *deforestation*, and *greenhouse gas emissions* (Figure 5).

FIGURE 5

A word cloud highlights the most frequent descriptions of climate change



SOURCE: Author.

The study participants highlighted a wide range of perceived causes of climate change:

- **Energy-related causes.** Most participants strongly associated climate change with the burning of fossil fuels and the release of greenhouse gas emissions, showing strong awareness of human-driven emissions.
- **Land-use changes.** Deforestation and agricultural practices are frequently mentioned, reflecting concern about environmental degradation.
- **Development impacts.** Urbanization and industrial processes appear moderately in responses, indicating awareness of modernization effects as a contributing factor.
- **Natural factors and uncertainty.** A minority attribute climate change to natural causes or express uncertainty, showing that while human activity is widely acknowledged as the primary driver, some ambiguity remains among a minority of respondents.

Interestingly, a qualitative analysis of the biggest perceived causes of climate change, by profile, revealed that adolescents often cite visible environmental issues like tree cutting and pollution, showing awareness of tangible causes including *fossil fuels, greenhouse gas emissions, deforestation, and waste disposal*. Youths' responses, on the other hand, lean toward systemic factors such as industrialization and demographic pressure, reflecting broader socio-economic awareness. Educators emphasize scientific and structural causes, aligning with curriculum-based knowledge, while stakeholders often balance human-induced and natural factors, possibly because of policy or technical perspectives.

Perceived broad impact of climate change on adolescents and youths

In response to whether study participants think that climate change affects adolescents and youths, of the 236 responses (with no response from 3 respondents), an overwhelming 217 agreed that climate change affects adolescents and youths in their communities, whereas only 19 said that climate change does *not* affect adolescents and youths.

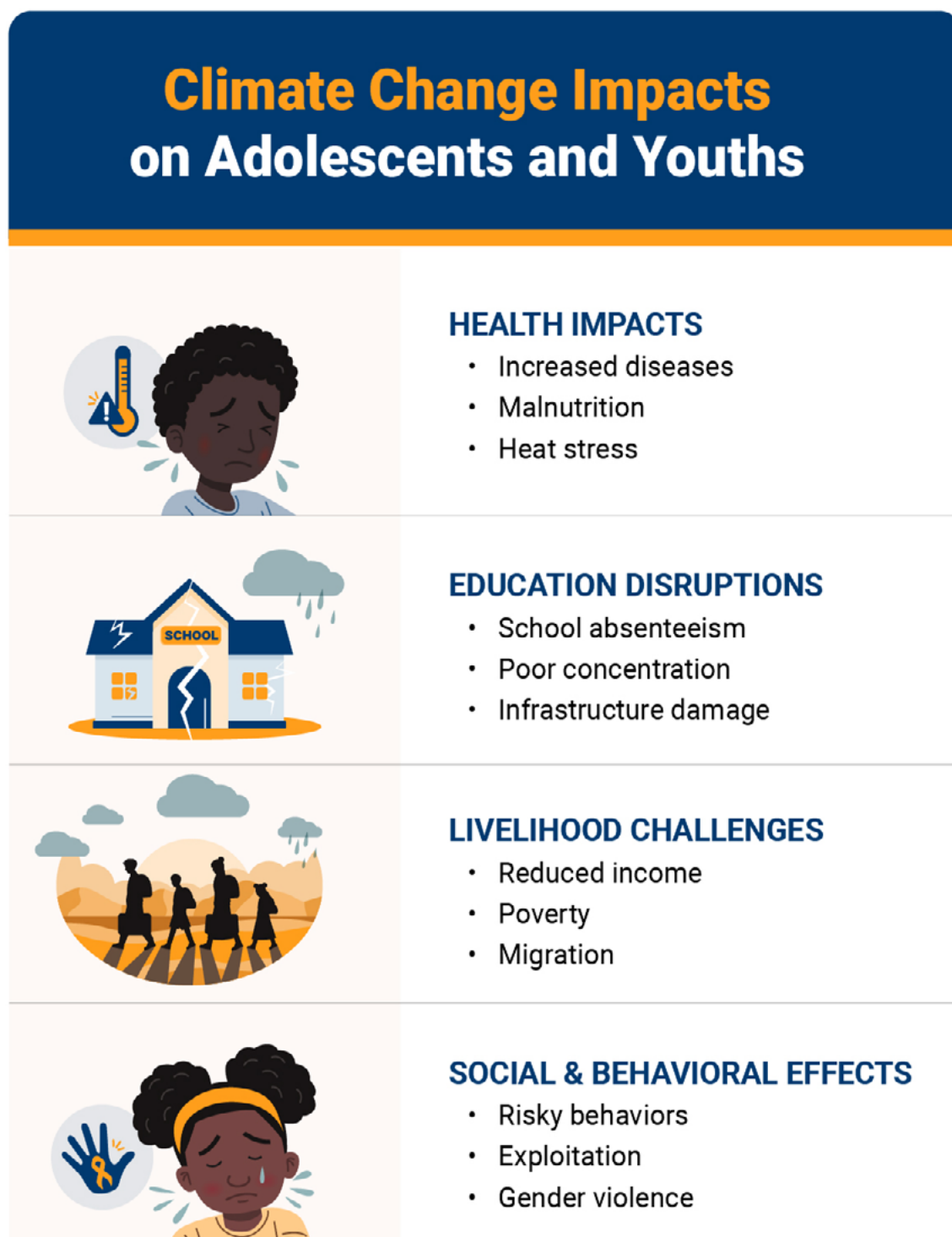
Although most answers were brief (yes or no), deeper analysis of extended answers in related columns of the dataset shows that climate change influences young people in multiple ways:

- *Health risks* are prominent, including heat stress, dehydration, malnutrition (from food shortages), and increased vulnerability to diseases (such as malaria, cholera, and skin diseases), alongside mental health challenges like anxiety and depression triggered by climate-related disasters.
- *Education* is also disrupted through absenteeism and school dropouts caused by floods, drought, and hunger, compounded by poor concentration in class (due to hunger and extreme temperatures) and damage to school infrastructure during floods and storms.
- *Livelihood challenges* emerge as families lose income from agriculture and casual labor because of extreme weather (including droughts and floods), forcing migration to urban areas in search of jobs and destabilizing family and social structures.
- *Social and behavioral consequences* include rising drug abuse, crime, and risky coping mechanisms among youths, while gendered impacts expose girls to early marriages and heightened vulnerability to sexual exploitation and gender-based violence during displacement.
- *Environmental constraints* such as flooded roads and damaged bridges hinder access to schools and markets, and water scarcity forces adolescents to spend long hours fetching water, reducing study time.

Collectively, these insights confirm that climate change exerts a profound, multidimensional impact on adolescents and youths, spanning health, education, economic stability, and social well-being as summarized in the Figure 6.

FIGURE 6

Climate change affects adolescents and youths across several dimensions



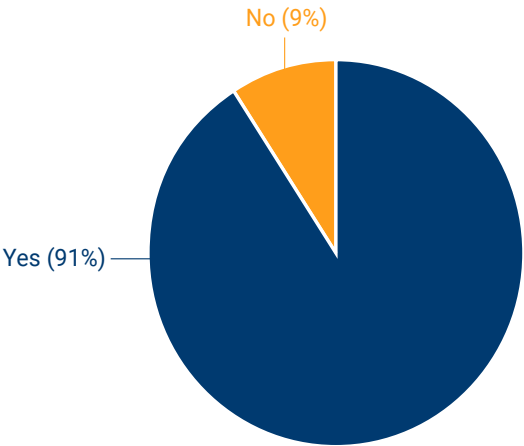
SOURCE: Author.

PERCEIVED SPECIFIC IMPACTS OF CLIMATE CHANGE ON ACCESS TO EDUCATION AND SKILLS DEVELOPMENT FOR ADOLESCENTS

The study found that 91 percent believe climate change affects education and skills development for adolescents and youths. Only 9 percent—mostly adolescents in rural secondary schools (also including one youth and one teacher/educator)—believe that climate change does *not* affect education. A balance of both males and females gave the negative answer, as shown in Figure 8.

FIGURE 8

Most respondents perceive impacts of climate change on education



SOURCE: Author.

NOTE: Respondents were asked whether they believe climate change affects education and skills for adolescents and youths.

The study found that climate change significantly disrupts access to education and skills development for adolescents and youths in multiple ways (Table 9):

- *Damage to bridges and school buildings* often result from heavy rains and flooding, making it impossible for learners to attend classes.
- *School closures and absenteeism* increase in response to extreme heat and storms, particularly in rural and peri-urban areas.
- *Economic hardships* caused by climate-induced poverty force families to prioritize survival over education, resulting in child labor and school dropouts, while food insecurity from drought reduces enrollment and affects concentration in class.
- *Gendered impacts* are evident as girls frequently miss school to fetch water during droughts or take on household responsibilities, and some drop out entirely, leading to early marriages.
- *Learning environments* also suffer, as excessive heat reduces classroom comfort and makes outdoor lessons and practical subjects like agriculture and building studies difficult, limiting skill development.
- *Resource gaps* such as lack of phones, internet access, and textbooks, combined with insufficient teacher training and inadequate teaching materials, further hinder climate education, especially in rural areas.

A married female youth from Buhera, Zimbabwe, highlighted economic conditions as a constraint: “Adolescents and youths do not have time for climate education; they devote time for job seeking and

income-generating activities.” An adolescent female secondary student in Chitungwiza, Zimbabwe, added, “Unavailability of water due to the heat [is] making us bathe half body, so it makes us less confident in school”

TABLE 9

Adolescents’ views on the impact of climate change on their access to education and skills development spanned several thematic categories

Theme	Frequency	Representative quote
Infrastructure damage	48	“School infrastructure may be destroyed by floods or storms.” —M, Zimbabwe
Economic constraints	62	“Parents may not be able to send children to school due to reduced income from drought.” —F, Zimbabwe
Food insecurity	55	“Going to school without food, may faint because of hunger.” —F, Zimbabwe
Gendered impacts	33	“Girls spend time fetching water, reducing time for schoolwork.” —F, Zimbabwe
Reduced concentration	41	“If it is extremely hot there is lower concentration levels.” —M, Malawi
Psychological stress	18	“Climate change causes stress and anxiety among adolescents.” —M, South Africa

SOURCE: Author’s compilation.

NOTE: Table represents responses from 151 adolescents (ages 10-18), a group comprising 83 females (F) and 68 males (M). The total responses (frequency) exceeds 151 because the participants could choose more than one theme.

The FGDs pointed to climate change as severely disrupting education and daily life for adolescents and youths, explaining that drought leads to poverty, forcing learners to drop out of school, while flooded rivers and heavy rains make roads impassable, preventing attendance. Extreme heat causes illnesses and poor classroom performance, and prolonged sunny periods reduce agricultural activity, leaving many young people without food. The FGD participants also noted the lack of equipment to forecast weather, which limits preparedness, although schools do teach about climate change and students often help parents by interpreting alerts from their countries’ ministries of emergency management.

Despite these efforts, practical learning is hindered because outdoor conditions are unsafe, and thunderstorms even stop students from opening books because of fears of lightning. FGD participants highlighted cascading effects such as damaged infrastructure, destruction of school property, water shortages, and electricity blackouts that interrupt learning for weeks. Sporting activities and physical education suffer under extreme temperatures, while poor road networks and high heat make commuting difficult, sometimes causing learners to escape school or arrive late.

Collectively, these experiences show that climate change not only disrupts academic performance but also undermines skill development, health, and safety, leaving adolescents and youths highly vulnerable to its impacts.

Suggested coping strategies for addressing the impact of climate change on education and skills development for adolescents and youths include

- *Establishing community libraries and learning hubs* with internet access;
- *Using play-based methods* like drama, songs, and field trips to teach climate concepts;
- *Providing ICT gadgets, textbooks, and climate education resources & training* for teachers and learners; and
- *Promoting afforestation and water harvesting projects* as practical learning activities.

In summary, the research found that economic constraints and food insecurity are the most significant challenges affecting education access during climate shocks. Families struggling with poverty often cannot afford school fees or basic learning materials, which forces children out of school. Infrastructure damage caused by floods compounds these difficulties, as destroyed bridges and school buildings make physical access to education nearly impossible in rural areas.

Gendered impacts are also evident, with girls disproportionately affected because they spend more time on household chores and fetching water, reducing their study time and increasing the risk of early marriage. Although psychological stress is mentioned less frequently, it remains an important concern because anxiety and mental health issues linked to climate-related hardships further undermine adolescents' ability to learn and thrive.

Current and preferred sources of climate change information, knowledge, and skills among adolescents and youths

The study sought to find out whether adolescents and youths are interested in getting more information, knowledge, and skills on climate change. Most study participants (n=208) said that they are. However, 30 respondents indicated that adolescents and youths are *not* interested in getting more information on climate change. They included 18 male and female adolescents; 4 male stakeholders in Kenya, Rwanda, and Zimbabwe; 5 male teachers or educators in Rwanda, South Africa, and Zimbabwe; and 3 youths from Rwanda and Zimbabwe.

Current sources of information, knowledge, and skills

FGD participants provided rich narratives of how adolescents and youths currently access climate change information. These narratives show that schools remain the most trusted and structured source, where teachers play a central role in explaining concepts and encouraging learners to apply knowledge at home.

Community observation also contributes knowledge, as students notice changes in weather patterns and crop failures, linking these experiences to climate change. Media platforms, including radio, television, and social media, are widely used, while smartphones with weather applications offer real-time updates. Family discussions and Indigenous knowledge systems, such as predicting weather by observing the moon or wind patterns, continue to influence understanding in some communities.

Additionally, government departments and environmental organizations support awareness through campaigns, booklets, and workshops, and projects. Those by the Duzi Umngeni Conservation Trust (DUCT) and South African National Biodiversity Institute (SANBI) have extended outreach by conducting door-to-door sensitization.

Overall, the FGDs portray a blend of formal education, digital tools, traditional practices, and community initiatives as key pathways through which climate knowledge is shared and reinforced.

Preferred sources of information, knowledge, and skills

As noted, schools are regarded as the most trusted and structured source of climate education, making them the primary choice for most respondents. Media platforms also play a significant role, with social media such as WhatsApp, Facebook, and TikTok favored for quick and engaging content, while traditional media like radio, television, and newspapers remain important, especially in rural areas.

Communities contribute through meetings, local leadership programs, and NGO initiatives, which are valued for providing practical and localized knowledge. Respondents suggest that workshops, awareness campaigns, and resource centers equipped with internet access would further strengthen community-based learning. Homes, through parents and guardians, offer some support, albeit less frequently than schools and media. Peer-to-peer learning and youth clubs are emerging as informal yet influential sources, reflecting a growing trend toward collaborative and interactive approaches to climate education.

Overall, the study respondents preferred the following sources of climate information (with multiple choices allowed):

- **School:** 175 respondents
- **Media:** 169 respondents
- **Community:** 71 respondents
- **Home:** 30 respondents

The study findings show clear contrasts between rural and urban preferences for accessing climate change information. In rural areas, schools are the most trusted and dominant source, with formal education regarded as highly reliable. Community engagement also plays a strong role, as local leadership, NGOs, and government programs provide practical knowledge where technological access is limited. Radio is the most cited medium, while television and newspapers appear occasionally. Homes contribute moderately through parents and guardians, and peer learning is mentioned but far less than school or community channels. Resource centers and workshops are suggested as ideal additional sources.

Urban respondents, on the other hand, lean toward digital and media-driven channels. Although schools remain important, they are slightly less dominant than in rural areas. Social media platforms such as WhatsApp, Facebook, and TikTok, along with television, are highly preferred for quick and engaging content—supported by urban adolescents’ and youths’ greater access to technology than their rural peers. Peer groups and youth clubs are more common in urban settings, reflecting a trend toward collaborative learning. Internet-based platforms and digital hubs are frequently suggested as valuable sources, while community involvement receives lower emphasis than in rural areas. Homes play only a minimal role in urban contexts.

Overall, rural preferences cluster around school, community, and radio, whereas urban preferences favor school combined with social media and television, underscoring a clear digital divide between the two settings (Table 10).

TABLE 10

Adolescents and youths prefer different sources of climate change information depending on geographical setting

Source	Rural (frequency)	Urban (frequency)
School	Very high	High
Media	Moderate (radio > TV)	Very high (social media > TV)
Community	High	Low
Home	Moderate	Low
Friends	Low	Moderate
Other	Resource centers, NGOs	Digital hubs, online platforms

SOURCE: Author.

NOTE: NGO = nongovernmental organization.

A detailed qualitative comparative analysis also highlights differences in preferred sources of climate change information, knowledge, and skills across all five countries (as summarized in Table 11).

Kenya. There's a strong reliance on schools and formal education in Kenya, alongside significant use of television and social media platforms such as WhatsApp and Facebook, with radio also mentioned. Community actors, including NGOs, churches, and local leadership, contribute through campaigns and environmental clubs. Youths prefer interactive formats like debates, symposiums, and creative arts (songs and drama), though barriers such as poor internet connectivity, lack of smartphones, and low educator capacity persist.

Malawi. Schools remain the central source of climate education in Malawi as well, supported by active community engagement through influential local leaders and NGOs, commonly through community drama and sensitization meetings. Radio dominates as the primary medium because of limited access to television and social media (due to poverty and poor connectivity). Youth clubs and drama performances are also used for awareness, but cultural beliefs and resource scarcity hinder engagement.

Rwanda. Schools are the leading source in Rwanda. Their structured programs and environmental clubs are supported by strong community involvement in tree planting and awareness campaigns. Media use is more traditional, with radio and television common, while social media is emerging but less dominant. Youth engagement includes mobilization activities, capacity-building events, and agroforestry projects, though challenges such as insufficient teaching materials and limited teacher knowledge remain.

South Africa. Schools remain important sources in South Africa but are less dominant in urban areas than in rural contexts. Media preferences shift toward digital platforms, with social media such as TikTok, Facebook, and Instagram, along with television, being highly favored for engaging content. Community involvement is moderate, with NGO and government programs available but less prioritized than digital platforms. Learners also often participate in ecobrick projects, environmental clubs, and competitions. Teachers face challenges like resource shortages and skepticism about climate change.

Zimbabwe. Schools are the most trusted and structured source in Zimbabwe, complemented by strong community involvement through NGOs, local leadership, and government programs. Media plays an important role, with radio and television widely used, while social media is growing but limited by connectivity. Peer learning and clubs exist but remain secondary, and resource centers and workshops are suggested as ideal additions.

Cross-country themes. Overall, schools are universally the most trusted source across all countries, while media preferences vary: social media dominates in urban areas of Kenya and South Africa, whereas radio remains key in rural contexts like Malawi, Rwanda, and Zimbabwe. Community engagement is vital in Malawi, Rwanda, and Zimbabwe but less emphasized in South Africa, and barriers such as digital divides, resource gaps, and low educator capacity persist across all settings.

TABLE 11

The preferred sources of climate change information for adolescents and youths vary by country

Source	Kenya	Malawi	Rwanda	South Africa	Zimbabwe
School	High	High	High	High	Very high
Media	High (TV, social media)	Moderate (radio > TV)	Moderate (TV, radio)	High (social media > TV)	High (radio, TV, social media)
Community	Moderate	High	High	Moderate	High
Home	Low	Moderate	Low	Low	Moderate
Friends	Low	Low	Low	Moderate	Moderate
Other	Government programs, WhatsApp	Clubs, drama groups	Local leadership, peer groups	Digital hubs	Resource centers, NGOs

SOURCE: Author’s compilation.
NOTE: NGO = nongovernmental organization.

In summary, the FGDs reflect the diverse ways in which adolescents and youths prefer to access climate change information. They show that schools remain the most trusted and structured source of learning, with formal education regarded as highly reliable. Respondents also value media platforms, including social media such as WhatsApp, Facebook, and TikTok, alongside traditional channels like radio, television, and newspapers, for quick and engaging content. Community spaces play an important role through meetings, local leadership programs, and NGO initiatives, which provide practical and localized knowledge, while homes contribute modestly through parents and guardians.

Peer-to-peer learning and youth clubs are emerging as influential sources, signaling a growing trend toward collaborative and interactive approaches. Additionally, respondents suggest that workshops, awareness campaigns, and resource centers equipped with internet access would further strengthen community-based learning and bridge gaps in access to climate education.

TYPES OF CLIMATE CHANGE CONTENT THAT RESPONDENTS WANT TO ACCESS

Content preferred by adolescents

Adolescents expressed a strong interest in understanding the causes and effects of climate change, such as deforestation, fossil fuel use, floods, and droughts. They also emphasized practical mitigation strategies like afforestation, waste management, and renewable energy, alongside adaptation skills to cope with extreme weather and water scarcity.

Many adolescents prefer a combination of basic conceptual knowledge and hands-on activities, including recycling, cleanup campaigns, and tree planting. Rural adolescents often focus on agriculture-related content such as irrigation and drought-resistant crops, whereas urban adolescents lean toward technology-driven solutions and awareness campaigns.

Content preferred by youths

Youth respondents demonstrated a solution-oriented approach, prioritizing climate adaptation and recovery, disaster preparedness, and resilience. They showed significant interest in economic linkages—particularly climate-smart agriculture and income-generating activities during disasters—as well as policy and advocacy to understand climate-related rights. Their responses highlight a desire for livelihood security, community engagement, and entrepreneurship opportunities tied to climate resilience.

Content preferred by teachers and educators

Teachers and educators seek comprehensive knowledge on climate change, including causes, effects, and mitigation strategies, and require structured pedagogical tools such as posters and videos. They advocate for integrating climate education into core subjects and favor up-to-date, practical content as well as interactive teaching methods like drama and role-play to make lessons engaging and practical.

Content preferred by stakeholders

Stakeholders focus on community awareness campaigns and local action, emphasizing policy and governance aspects such as climate laws and enforcement. They also recognize the role of technology and media, particularly social platforms, in driving advocacy and behavioral change efforts as well as community mobilization.

Cross-profile themes

Across all profiles, interest in causes, effects, and mitigation strategies dominates, with notable differences in emphasis: Adolescents prefer foundational knowledge and practical activities, whereas youths prioritize adaptation and economic resilience (Table 12). Teachers seek structured teaching resources. Stakeholders concentrate on policy and community mobilization.

Common themes include climate education and awareness, mitigation strategies, adaptation techniques, disaster preparedness, renewable energy, waste management, and climate-smart agriculture. Education and awareness emerge as cross-cutting priorities, complemented by practical solutions and youth agency through clubs, campaigns, and peer learning. Health and economic impacts are also increasingly recognized, especially in regions affected by droughts and floods.

TABLE 12

Across the five countries, adolescents and youths want to access climate change information, knowledge, and skills covering 10 concepts

Rank	Concept	Description and examples
1	Causes and effects of climate change	Greenhouse gases, deforestation, global warming, extreme weather, droughts, flood
2	Mitigation strategies	Afforestation, reforestation, reducing emissions, cleanup campaigns
3	Adaptation techniques	Drought-resistant crops, water harvesting, irrigation, climate-smart agriculture
4	Waste management and recycling	Sorting waste, recycling into crafts, proper disposal, cleanup drives
5	Climate change education and awareness	General knowledge, school clubs, posters, campaigns, peer education
6	Renewable energy	Solar energy, biogas, alternatives to firewood and charcoal
7	Disaster preparedness	Early warning systems, cyclone alerts, flood safety, community resilience
8	Impact on health and nutrition	Malnutrition, disease outbreaks, heat stress, waterborne illnesses
9	Impact on livelihoods and economy	Loss of income, food insecurity, migration, unemployment
10	Role of youth in climate action	Advocacy, leadership, community mobilization, environmental clubs

SOURCE: Author's compilation.

NOTE: Concepts are ranked in order of interest as expressed in the focus group discussions with adolescents (ages 10-18) and youths (ages 19-35).

Education and awareness emerge as cross-cutting priorities, with youths expressing a strong desire to understand climate change deeply and share knowledge within their communities. Practical solutions such as waste management and adaptation strategies are highly valued, particularly in rural areas where climate impacts are more severe. Youth agency is consistently emphasized because many adolescents and young people want to be part of the solution through participation in clubs, campaigns, and peer learning initiatives. Additionally, the health and economic impacts of climate change are increasingly recognized, especially in regions affected by droughts and floods

Differences in content preferences, by country

Across the five countries—Kenya, Malawi, Rwanda, South Africa, and Zimbabwe—there are notable variations in the thematic interests of adolescents and youths (Table 13):

- **Kenya** exhibits a balanced interest across most themes, with a strong focus on education, causes and effects, and youth roles in climate action.
- **Malawi** demonstrates high interest in adaptation techniques, health impacts, and economic consequences, reflecting concerns about practical survival strategies such as drought-resistant crops and food security.
- **Rwanda** mirrors Kenya's pattern, prioritizing education, causes and effects, and renewable energy while maintaining moderate interest in other areas.
- **South Africa** places greater emphasis on renewable energy, disaster preparedness, and youth empowerment, alongside a preference for technology and media-driven climate education.
- **Zimbabwe** shows strong interest in understanding causes and effects of climate change, mitigation strategies, and youth-led action, with climate education ranked as a top priority and less emphasis on renewable energy.

TABLE 13

Countries show notable variations in the top 10 themes that interest adolescents and youths

Rank	Theme	Kenya	Malawi	Rwanda	South Africa	Zimbabwe
1	Causes and effects	High	High	High	Moderate	High
2	Mitigation strategies	Moderate	Moderate	Moderate	Moderate	High
3	Adaptation techniques	Moderate	High	Moderate	Moderate	Moderate
4	Waste management	Low	Moderate	Low	Moderate	Moderate
5	Climate education and awareness	High	High	High	High	Very High
6	Renewable energy	Moderate	Low	Moderate	High	Low
7	Disaster preparedness	Moderate	Moderate	Moderate	High	Moderate
8	Health and nutrition impacts	Moderate	High	Moderate	Moderate	Moderate
9	Livelihood and economic impacts	Moderate	High	Moderate	Moderate	Moderate
10	Youth role in climate action	High	Moderate	High	High	High

SOURCE: Author's compilation.

NOTE: Concepts are ranked in order of interest, by country, as expressed in the focus group discussions with adolescents (ages 10-18) and youths (ages 19-35).

Overall, the data highlight that although education and awareness are universally prioritized, country-specific differences shape the focus on mitigation, adaptation, and technology-driven solutions. These insights underscore the need for tailored climate education strategies that combine conceptual knowledge with practical, action-oriented approaches to empower adolescents and youths as active agents of change.

DIFFICULTIES IN ACCESSING CLIMATE INFORMATION, KNOWLEDGE, AND SKILLS

Across the five countries adolescents and youths face multiple barriers to accessing climate education.

Kenya. Kenyan adolescents and youths face displacement and migration caused by climate-induced shocks, which disrupt education and access to information. Resource gaps such as lack of teaching materials, trained educators, and infrastructure persist, while youths remain vulnerable to early marriages, substance abuse, and poverty linked to climate stress.

Few community programs target youth directly. Respondents suggest climate-smart agriculture and water harvesting as solutions, and teachers call for integrating climate topics into life skills and agriculture subjects. Stakeholders emphasize peer-to-peer learning and storytelling as effective engagement strategies.

Malawi. Technological limitations are significant in Malawi because many homes lack radios, phones, or internet, and high data costs remain prohibitive. Climate change is not consistently integrated into the curriculum, and teaching aids are scarce. Limited civic engagement and traditional beliefs hinder climate education, while language and literacy barriers affect comprehension among adolescents.

Notably, adolescents and youths cited flooded rivers as a barrier to school attendance, and teachers emphasized the need for visual materials such as pictures and videos. Drama and community radio are preferred methods for disseminating climate information.

Rwanda. Poor internet connectivity and lack of devices in Rwanda limit access to climate information. Cultural resistance and traditional beliefs reduce urgency for climate action, and teachers require more training and resources to teach effectively.

Adolescents are often excluded from community decisionmaking and climate programs. Youths participate in Umuganda (traditional, required community work)⁵ but need structured climate education. Preferred formats include local language radio, posters, and interactive forums, and stakeholders recommend establishing ICT hubs and youth centers for climate learning.

South Africa. Infrastructure and mobility challenges affect South Africa, particularly in rural areas where poor roads and long commutes are common. Educators lack resources like projectors and digital tools, and some remain skeptical about climate change. Despite better urban access, many learners still lack consistent internet or devices. Curriculum gaps persist, as climate change is only briefly covered in natural sciences without practical engagement.

⁵ Umuganda—also known as community work with the purpose to contribute to the overall national development—was reintroduced to Rwandan life in 1998 as part of efforts to rebuild the country after the Rwandan Civil War. Today it takes place on the last Saturday of every month for mandatory nationwide community service from 8 a.m. to 11 a.m. Participation in Umuganda is required by law for Rwandans between 18 and 65; failure to participate can result in a fine

Learners suggest ecobricks and tippy-taps as practical climate actions⁶; while stakeholders advocate for integrating climate topics across subjects and using interactive learning methods. Youths propose leveraging social media campaigns and drama clubs to raise awareness.

Zimbabwe. Challenges identified in Zimbabwe include resource scarcity such as lack of textbooks, internet access, projectors, and ICT tools, alongside educator limitations caused by high workloads and insufficient training. Poor school infrastructure, particularly in rural areas, disrupts learning during extreme weather events, while limited access to phones, radios, and data restricts exposure to climate content.

Adolescent and youth disengagement and exclusion from decisionmaking processes further compound these issues, with reports of school absenteeism due to hunger and floods and teachers struggling to explain climate scenarios without visual aids. Adolescents and youths have suggested creating community centers with internet access to improve climate learning.

Cross-cutting themes

Common themes across all countries include limited digital access, which remains a major barrier as phones, data, and internet are essential but often unavailable. Educator training is critical because teachers need support, materials, and incentives to deliver climate education effectively. Youth engagement must be intentional through clubs, campaigns, and peer education, while community involvement by local leaders, NGOs, and media plays a vital role.

Practical learning approaches such as tree planting, drama, and cleanup campaigns resonate more strongly than theoretical instruction, highlighting the need for interactive and context-specific strategies to strengthen climate education for adolescents and youths.

In their own words: Personal insights from adolescent and youth focus groups

The FGDs capture the barriers adolescents and youths face in accessing climate education, drawing on participants' own words and experiences. They reveal that schools often lack essential materials and strong internet connectivity, making research and interactive learning difficult. As one participant explains, "At school we don't have all the materials we need, [and there's a] lack of strong internet to do research here at school. Some teachers don't have academic background in climate change; they experience some difficulties when trying to do practical things."

This lack of resources is compounded by environmental challenges, as a learner notes: "We cannot go outside and play vital educational games if it is raining. Some cannot go to school if it is raining or when we have storms, especially when there are floods"

⁶ Tippy-taps are handwashing stations made from locally available materials which double up as water-saving technologies as well as hygiene facilities.

Access to information is further limited by poverty and infrastructure breakdowns. As one respondent laments, “Some do not have TVs and cannot access or know about weather and climate change. Some places will be affected by floods, and that will make it difficult for learners to go to school because the pathway might be muddy or flooded”

Long distances to school, hunger, and extreme heat exacerbate these difficulties, as an adolescent shares: “Long distance to and from home affects children’s performance. Hunger affects their performance. High sunshine makes adolescents drop out and go by the lake to swim and work for money.”

Teachers also struggle to make lessons relevant when students lack basic resources at home. A seventh grade natural sciences teacher explains:

If you tell children that do not have water in their homes to not wash clothes in the river, how do you expect them to wash and do daily things? Another thing is that in our community there’s no garbage truck, so community members found a way of making a ditch whereby they bury their garbage and that’s also affecting our planet, and some others are burning their litter—plastic releases carcinogenic fumes—so that’s why in our communities now we have African people getting things like cancer more and more often because of all the things that we exposed ourselves to.

Cultural beliefs and skepticism further complicate climate education. As one respondent notes, “[There are] myths and belief systems. ... If someone was struck by lightning, we won’t think that was a direct or indirect effect of climate change; we will think the neighbor bewitched them. Most people think climate change doesn’t exist. That makes it difficult to have an open mind.”

Others demand visible proof, saying, “People want tangible facts. ... How do you know that because now it is raining so much, it’s climate change? It could be just rain. Prove it to me.” They compare this to anti-smoking campaigns, arguing that without visible experiments, climate education remains unconvincing: “So people would be like ‘life goes on.’ Even in 1987 it was cold, and there were also floods, ... so it is very hard to educate people.”

Finally, technological barriers persist, as one respondent summarizes: “No access to technological gadgets, the digital divide, lack of resources in schools, poor network reception, lack of awareness”

Infrastructure damage and soil erosion also prevent children from attending school, leaving them disconnected from climate knowledge. Collectively, these narratives paint a vivid picture of how resource scarcity, socio-economic hardships, cultural norms, and environmental disruptions converge to make climate education inaccessible for many adolescents and youths.

ENABLERS OF ACCESS TO CLIMATE INFORMATION, KNOWLEDGE, AND SKILLS

Across the five countries, adolescents and youths face significant barriers to accessing climate education, and each country presents unique challenges and solutions.

Kenya. Kenya’s challenges are linked to drought-induced migration and poor access to media and education. Solutions emphasize national tree planting campaigns, leveraging media such as radio and social platforms for climate messaging, promoting youth involvement in afforestation and awareness drives, and improving access to climate data and practical learning tools.

Malawi. Barriers in Malawi stem from poor access to radios, phones, the internet, and educational materials, alongside low literacy and limited community awareness. Suggested interventions include increasing access to radios and community announcements; using drama, songs, and storytelling for climate education; and forming youth clubs and sensitization programs. Additional measures involve providing books, posters, and visual aids as well as training teachers while equipping schools with climate-related materials.

Rwanda. Barriers in Rwanda include limited teaching resources, poor internet connectivity, and traditional beliefs that resist climate science. Recommended strategies focus on capacity building for educators; using drama, role-play, and storytelling as teaching tools; forming climate clubs and assigning focal teachers; providing incentives and organizing competitions; and ensuring that messaging is culturally relevant and delivered in local languages.

South Africa. Challenges in South Africa include limited internet access, lack of projectors and digital tools, and low youth engagement. Proposed solutions include adopting play-based learning methods like ecobricks and games; providing internet connectivity and digital devices in schools; organizing workshops and awareness campaigns; encouraging youth participation in environmental clubs and community projects; and integrating climate education into natural sciences and other subjects.

Zimbabwe. The main obstacles in Zimbabwe include a lack of textbooks, internet access, ICT tools, and trained educators, compounded by low community awareness. Proposed solutions emphasize establishing community centers equipped with internet and learning resources; providing ICT tools such as phones, laptops, and projectors; and training educators to integrate climate education into the curriculum. Outreach through media platforms like WhatsApp, Facebook, and TikTok—as well as promoting youth-led clubs and campaigns with support from NGOs, churches, and government departments—is also recommended.

Overall, these findings highlight the need for context-specific approaches that combine resource provision, educator training, community engagement, and innovative teaching methods to strengthen climate education for adolescents and youths across diverse settings.

The FGDs recommended enablers for strengthening climate education and engagement among adolescents and youths that reflect both practical actions and strategic priorities. They emphasized the importance of leveraging social media platforms for knowledge sharing, encouraging young people to join climate change clubs, and actively participating in community programs. Respondents suggested that access to adequate materials and resources is critical, alongside initiatives such as tree planting to prevent soil erosion and expanding climate-related infrastructure like internet connectivity. They also called for awareness-raising campaigns and sensitization events to preserve the environment, complemented by competitions and awards to motivate participation.

Findings from the FGDs further highlight the need to involve stakeholders and experts, including news broadcasters and government departments, to provide accurate information and explain why climate patterns are changing. As one recommendation noted, “They must invite people who know more about weather and climate change to tell us why it is suddenly changing like this nowadays. Sometimes it is extremely hot; at times heavy rain lasts the whole week. They must tell us why it is happening like that, and what are the causes of this ever-changing climate.”

Practical interventions such as workshops, disaster management programs, road shows, and projects that sustain communities during droughts are also proposed, alongside using local radio to disseminate information widely. Capacity building emerges as a recurring theme, with calls to strengthen knowledge on recycling, encourage innovation among youths, and make adolescents focal persons for climate action through the formation of dedicated clubs. Respondents advocate for partnerships with organizations that specialize in climate change, as well as government-led educational programs. They stress the value of interactive activities to make learning engaging—such as games, debates, and themed events—while also promoting tree planting and expanding orchards as tangible climate solutions. Finally, the findings underscore the need for adequate materials such as laptops, improved school infrastructure, and greater government investment to ensure that climate education is accessible and impactful.

Education and climate change: Emerging pedagogies

TEACHING ABOUT CLIMATE CHANGE INSIDE AND OUTSIDE THE CLASSROOM

According to the data, teachers and educators are playing a pivotal role in helping adolescents and youths learn about climate change by embedding climate education into existing subjects such as agriculture, science and technology, social and development studies, geography, and expressive arts. This integration ensures that climate change is treated as a cross-cutting issue connected to students’ everyday lives rather than as an isolated topic.

To make lessons engaging and relevant, educators employ diverse pedagogical approaches. They use real-life examples drawn from local experiences like droughts and floods to contextualize concepts, and project-based learning encourages students to research climate issues within their communities. Field trips provide firsthand observation of environmental impacts, while debates and discussions stimulate critical thinking and dialogue. Creative methods such as drama and role-play are widely used to communicate climate messages in

memorable ways, and even sports activities, such as football competitions, serve as platforms for sharing climate information.

Beyond classroom instruction, teachers are facilitating hands-on environmental action in schools. Activities include tree planting initiatives, where some schools have planted dozens of trees, and waste management programs that teach proper disposal and recycling practices. Youth-led eco-clubs further reinforce these lessons by promoting environmental stewardship through peer education and awareness campaigns. These combined efforts not only build knowledge but also foster practical skills and leadership among adolescents and youths, positioning them as active participants in climate resilience strategies.

By country, the approaches vary while sharing a common hands-on ethos:

- **In Kenya**, teachers integrate climate topics into formal subjects while supporting environmental clubs, rewarding climate champions, and promoting creative learning (debates, symposiums, public speaking, and exhibitions) alongside project-based activities such as tree nurseries and recycling.
- **In Malawi**, climate content is embedded in social and development studies, agriculture, and science and technology. Educators ground lessons in local experiences (such as cyclones and droughts), organize field based learning, and run youth clubs that use drama, songs, and debates.
- **In Rwanda**, cross-curricular teaching spans geography, science, and environmental studies, complemented by experiments, wind-direction tools, field visits, and strong community engagement through Umuganda service, tree planting, and awareness campaigns.
- **South Africa** foregrounds ecobrick projects and creative arts, with climate change taught in natural sciences and life orientation and strengthened by student-led initiatives via social media and school clubs.
- **In Zimbabwe**, climate topics are integrated through geography, agriculture, and science; reinforced by interactive methods like drama, poetry, and role-play; and supported by practical action such as tree planting, waste management, and cleanup campaigns.

Across contexts, educators identify recurring support needs: access to textbooks and updated materials; internet connectivity, ICT devices, and projectors for multimedia learning; localized visual aids (charts and posters); and regular training and incentives. Institutional and community backing—curriculum integration, clubs, competitions, and partnerships with NGOs and local leadership—helps sustain youth engagement and translate classroom learning into practical climate action.

The FGDs also revealed how teachers actively engage adolescents and youths in learning about climate change through both classroom instruction and practical activities. Inside the classroom, teachers integrate climate education into formal lessons, ensuring that students understand key concepts such as weather patterns and seasonal changes. They also encourage learners to stay informed by listening to or watching radios and televisions for current weather events, reinforcing the importance of real-time awareness. Beyond theoretical teaching, educators provide relevant books and sometimes use internet resources accessed through laptops to deepen understanding. They complement these efforts with interactive methods, making students “play games about climate change” to enhance engagement.

Outside the classroom, the FGD participants added, teachers initiate practices that promote environmental stewardship, such as tree planting and cleanup campaigns. They also introduce learners to gardening and farming activities, linking climate education to practical skills. Creative approaches feature prominently, with

teachers using poems, public speaking, and drama to communicate climate messages in memorable ways. Some educators collaborate with facilitators who have “vast knowledge on climate change” and involve NGOs in programs that support awareness and action. Teachers also emphasize safety during adverse weather, advising students “not to use electronic devices during storms and heavy rain,” and they encourage parents to reinforce climate education at home by discussing related topics and promoting media engagement.

Collectively, these strategies reflect a holistic approach that combines curriculum-based learning with experiential activities, community involvement, and creative expression to build climate literacy and resilience among adolescents and youths.

PLAY-BASED METHODS TO TEACH ABOUT CLIMATE CHANGE

Play is an important part of adolescent and youth development. Across several communities, particularly in rural and peri-urban areas, educators are creatively integrating play-based learning into climate education in several ways to foster deeper understanding and active participation among adolescents and youths:

- **Outdoor exploration and observation.** Teachers often take learners outside the classroom to observe natural phenomena. For example, students are encouraged to look at cloud formations and guess weather conditions, helping them connect theoretical knowledge with real-world experiences. Field trips to local environments affected by climate change—such as degraded riverbanks or deforested areas—are used to stimulate discussion and reflection.
- **Games and simulations.** Interactive games are used to demonstrate climate concepts. One example includes games that simulate wind direction or waste sorting, allowing students to learn through movement and competition. These activities help reinforce environmental behaviors like proper waste disposal and understanding the impact of pollution.
- **Drama, role-play, and songs.** Creative arts are a powerful tool in climate education. Teachers facilitate role-plays, dramas, and songs that convey messages about climate change causes, effects, and mitigation strategies. These performances are often staged during school assemblies or community events, making them accessible and memorable.
- **Poster creation and visual learning.** Students are engaged in creating posters and visual aids that depict climate change impacts and solutions. This not only enhances their understanding but also empowers them to become advocates within their communities. Teachers support this by providing examples and guiding discussions around the visuals.
- **Ecobrick projects and environmental clubs.** In some schools, learners participate in making ecobricks from plastic waste, which are then used in school infrastructure or as goalposts in sports. This hands-on activity teaches recycling and environmental stewardship. Environmental clubs further reinforce these lessons through peer-led initiatives and community cleanup campaigns.
- **Integration with curriculum and technology.** Educators incorporate climate change topics into subjects like geography, science, and social studies. Where resources allow, they use projectors, videos, and internet-based research to enrich lessons. However, many teachers report challenges such as lack of materials, poor internet connectivity, and limited access to updated climate content.

The FGDs revealed that teachers are using a variety of creative and interactive methods to help adolescents and youths learn about climate change. Participants described how educators incorporate drama, dances, and poems into lessons to make climate concepts more engaging and memorable. In some cases, teachers invite students

to bring tree seedlings to class and demonstrate proper planting techniques, linking theory to practical action. Other approaches include organizing theater performances or short films that dramatize climate issues, as well as using simple tools like candy whistles and ropes to teach wind direction in a playful way. These activities are complemented by role-plays and games that simulate seasonal changes, such as identifying leaf colors across different seasons and discussing their significance.

Teachers also encourage students to compose songs about climate change and participate in soccer or netball tournaments themed around environmental awareness, blending recreation with education. In Kenya, one young woman holds the Guinness World Record for hugging a tree—for 72 hours on December 8-11, 2025—to raise awareness about the environment (GWR 2025).

Despite these innovative efforts, the discussions highlighted notable gaps in teacher capacity and resources. Secondary school teachers often lack sufficient knowledge and skills to implement play-based methods effectively, and many admitted they have not received training in this approach. Participants emphasized the need for structured guidance and professional development to help educators design and deliver interactive lessons that resonate with young learners.

Although some teachers have successfully introduced games, traditional dances, debates, quizzes, public speeches, and poetry to convey climate messages, others struggle to integrate these techniques consistently because of limited exposure and confidence. Overall, the focus groups underscored that play-based learning holds significant potential for climate education, but scaling its impact will require targeted support, training, and resource provision to ensure teachers can fully harness these creative strategies.

DIFFICULTIES THAT TEACHERS AND EDUCATORS FACE IN TEACHING ABOUT CLIMATE CHANGE

A deep dive into the data provides a comprehensive overview of the systemic and resource-based challenges that educators face in delivering climate change education to adolescents and youths. Across the five countries, these challenges significantly hinder the integration of climate education into both formal and informal learning environments:

- **Kenya** faces a situation compounded by climate-induced disruptions, and schools are frequently used as rescue camps during disasters. Floods and migration interrupt education, while high illiteracy rates and limited access to media restrict climate knowledge.
- **Malawi** presents similar resource constraints, with poor access to teaching materials and technology compounded by cultural beliefs that conflict with scientific explanations of climate change. Community engagement is minimal, and the shortage of trained educators and inadequate infrastructure make it difficult to sustain climate education initiatives.
- **Rwanda** lacks sufficient teaching materials and trained educators, which combine with poor infrastructure and connectivity to create significant barriers. Cultural resistance and low youth engagement further complicate efforts, and teachers lack practical tools for demonstrations, making lessons abstract and less engaging.
- **South Africa** faces particular challenges in rural schools, where resources such as projectors and internet access are scarce. Teachers often lack motivation or even question the reality of climate change, which reduces the effectiveness of instruction. Climate topics are largely confined to geography—missing opportunities for cross-curricular integration—and poor access to digital tools limits interactive learning.

- **Zimbabwe** struggles with a lack of textbooks, internet connectivity, projectors, and ICT tools, which limits teachers' ability to use multimedia resources and interactive methods. They also face limited training opportunities and poor curriculum integration, leaving many educators reliant on outdated content. High workloads and burnout exacerbate these issues, while student disinterest and resistance further undermine efforts to teach climate topics effectively.

The findings emphasize five overarching categories of challenges: resource limitations, knowledge and training gaps, pedagogical difficulties, community and cultural barriers, and communication and engagement issues. Teachers often lack textbooks, visual aids, and updated content as well as access to technology such as smart boards and projectors. Poor school infrastructure makes practical learning difficult, while limited training opportunities leave educators without specialized knowledge or strategies for integrating climate topics across subjects. Pedagogical challenges include difficulty contextualizing global climate issues to local realities and overcoming student resistance. Community support is often absent, and cultural beliefs perpetuate misconceptions about climate change.

Finally, limited access to media and communication tools, combined with a lack of interactive or play-based methods, restricts student engagement. These challenges underscore the urgent need for investment in education resources and infrastructure; teacher training programs focused on climate literacy; community engagement strategies; and the development of inclusive, localized, and interactive pedagogies.

Table 14 synthesizes the country-specific barriers in a clear comparative view, highlighting the systemic resource gaps, cultural constraints, and pedagogical challenges that impede effective climate education across the ESA region.

TABLE 14

Teachers and educators in each country face distinct challenges that impede effective climate education

Country	Key challenges to climate education
Kenya	• Schools used as rescue camps during disasters • Disrupted education due to floods and migration • Lack of resources to support the climate-specific curriculum • High illiteracy • Limited access to media
Malawi	• Poor access to teaching materials and technology • Limited community engagement • Cultural beliefs that hinder climate education • Few trained educators • Inadequate infrastructure
Rwanda	• Insufficient teaching materials and trained educators • Poor infrastructure and connectivity • Cultural resistance • Low youth engagement • Lack of practical tools for demonstrations
South Africa	• Lack of resources in rural schools (e.g., projectors, internet) • Cultural myths that influence teachers or induce disbelief in climate change • Limited integration beyond geography • Poor access to digital tools and climate-specific content
Zimbabwe	• Lack of textbooks, internet, projectors, and ICT tools • Limited teacher training and curriculum integration • Student disinterest • High teacher workload and burnout

SOURCE: Author's compilation.

NOTE: ICT = information and communication technology.

The FGD data further reveal a series of interconnected challenges that teachers and educators face in delivering climate change education. FGD participants noted that educators suffer from a lack of resources and limited knowledge, which severely restricts their ability to teach effectively. This scarcity includes the absence of essential teaching materials and practical skills, leaving teachers ill equipped to provide comprehensive lessons. The absence of workshops and training sessions leaves teachers without updated knowledge or innovative pedagogical strategies, reinforcing the problem of “less knowledge on climate change.”

Some educators also lack internet access, which prevents them from showing videos or using online resources to explain climate concepts. In fact, many teachers resort to using their personal data to search for climate-

related content—an unsustainable practice that underscores systemic gaps in institutional support. Health-related issues also emerged as a barrier, as some teachers reportedly fall ill as a result of climate change impacts, which disrupts their teaching schedules and continuity of learning.

Schools themselves lack basic infrastructure such as projectors, making it difficult for students to visualize complex climate processes compared with those in better-equipped institutions. This technological gap further widens the inequality in learning outcomes. Connectivity problems compound these challenges because poor network access limits digital engagement and interactive learning opportunities.

In addition, the FGDs highlighted gaps in content delivery, noting that students do not receive enough information about climate issues, and recycling remains a challenge because of inadequate instruction on waste management. Broader social and cultural factors exacerbate these difficulties. Ignorance among parents, lack of support and cooperation from youths, and resistance from families toward climate education create an environment where learning is undervalued. Limited access to information and insufficient funding for lessons further restrict progress, while learners themselves struggle with concentration and commitment, often because of competing priorities or lack of motivation.

Collectively, these issues illustrate a complex web of resource shortages, infrastructural deficits, cultural resistance, and systemic neglect that undermines efforts to build climate literacy among adolescents and youths.

RESOURCES THAT TEACHERS AND EDUCATORS NEED TO HELP ADOLESCENTS AND YOUTHS LEARN ABOUT CLIMATE CHANGE

Across the five countries, teachers and educators need essential resources for climate education (summarized in Table 15), but their priorities are also country- and context-specific

Kenya. The priorities in Kenya focus on leveraging media and interactive methods. Teachers need access to television and social media platforms for climate content, internet connectivity, and peer teaching platforms to encourage collaborative learning. Drama and storytelling methods are emphasized as effective pedagogical tools alongside adequate teaching resources and curriculum integration of climate change topics.

Malawi. The resource needs in Malawi reflect a strong emphasis on communication and community engagement. Teachers require radios and mobile phones to disseminate information, books with climate-related content and illustrations, and community drama clubs and awareness campaigns to make learning interactive. Memory cards preloaded with climate content and teaching aids like charts and videos are also critical. Internet access in schools, training for teachers on climate change, youth clubs for climate education, and public-address systems for community sensitization complete the list of priorities.

Rwanda. The resource requirements in Rwanda are more comprehensive—combining educational materials, technology, and capacity building. Teachers need books and booklets specifically focused on climate change, charts and posters for visual learning, and regular updates to ensure that content reflects current climate trends. Digital tools such as smartphones and laptops, internet access, projectors, monitors, and smart boards are essential for interactive learning. Capacity building through teacher training workshops and the designation of focal teachers to lead climate education efforts is also critical. Finally, curriculum integration through cross-cutting units and practical exposure via field visits is recommended to make climate education relevant and actionable for students.

South Africa. South Africa's needs highlight the importance of technology and practical learning. Teachers require computers and projectors, internet access, and textbooks or printed materials. Ecobrick materials are essential for hands-on sustainability projects, while drama and role-play activities help make lessons engaging. Support from NGOs and local leadership is needed to reinforce school-based initiatives, along with integration of climate topics into the natural sciences curriculum and community awareness campaigns.

Zimbabwe. Educators in Zimbabwe require textbooks on climate change; reliable internet access and connectivity; computers and laptops; and projectors and visual aids as well as posters and flyers to make lessons engaging. They also need training workshops to strengthen their knowledge and skills, climate change modules integrated into the curriculum, access to media such as radio and television, and support from NGOs and government departments to sustain these efforts.

TABLE 15

Teachers and educators need essential resources for climate education in each of the five countries

Country	Key resources teachers and educators need
Kenya	• Television and social media platforms for climate content • Internet connectivity • Peer-teaching platforms • Drama and storytelling methods • Adequate teaching resources • Curriculum integration of climate-change topics
Malawi	• Radios and mobile phones • Books with climate-related illustrations • Community drama clubs and awareness campaigns • Memory cards preloaded with climate content • Teaching aids such as charts and videos • Internet access in schools • Training for teachers on climate change • Youth clubs for climate education • Public-address systems for community sensitization
Rwanda	• Books and booklets on climate change • Charts and posters • Regularly updated materials • Smartphones and laptops • Internet access • Projectors, monitors, and smart boards • Capacity-building and teacher-training workshops • Designated focal teachers • Cross-cutting curriculum units and field visits

Country	Key resources teachers and educators need
South Africa	• Computers and projectors • Internet access • Textbooks and printed materials • Ecobrick materials for practical learning • Drama and role-play activities • Support from NGOs and local leadership • Integration of climate topics into the natural sciences curriculum • Community awareness campaigns
Zimbabwe	• Textbooks on climate change • Internet access and connectivity • Computers and laptops • Projectors and visual aids • Posters and flyers • Training workshops • Climate change modules integrated into the curriculum • Radio and TV access • Support from NGOs and government departments

SOURCE: Author's compilation.

NOTE: NGO = nongovernmental organization.

Collectively, the FGD data revealed that teachers need comprehensive support to effectively deliver climate education to adolescents and youths. This begins with capacity-building initiatives such as training workshops and the creation of communities of practice where educators can share experiences and strategies. Alongside training, teachers require adequate teaching and learning materials, including books that specifically address climate change, as well as visual aids and interactive resources.

Access to technology is critical. Educators should be equipped with ICT tools such as laptops, projectors, and reliable internet connectivity to enhance lesson delivery and research. In resource-constrained settings, innovative approaches like using locally available materials—such as cartons for visual demonstrations—can help make lessons engaging for younger learners in primary schools.

Teachers also need opportunities to connect with climate experts who can deepen their understanding of weather patterns, causes of climate change, and contributing factors, ensuring that classroom content remains accurate and relevant. To motivate and sustain teacher engagement, incentives and recognition—such as branded materials like T-shirts and caps—can be introduced. Finally, practical exposure through field trips and easy-to-access information that does not rely on strong network connectivity will enrich teaching experiences and make climate education more impactful.

OTHERS HELPING ADOLESCENTS AND YOUTHS TO LEARN ABOUT CLIMATE CHANGE

This research found that, beyond teachers and educators, several other actors are actively helping adolescents and youths learn about climate change within their communities.

A significant majority of respondents—190 individuals—affirmed that such support exists, while 49 indicated otherwise. Among the most influential contributors are media outlets (cited by 105 respondents) and NGOs (mentioned by 103 participants). Government entities also play a major role (with 100 mentions), reflecting their involvement in awareness campaigns and educational programs. Religious institutions, such as churches, were noted by 28 respondents, indicating their participation in spreading climate-related messages. Local businesspeople contribute modestly, often through community initiatives or sponsorships.

Social media platforms are emerging as additional channels for climate education, though their reach remains limited compared with traditional actors. WhatsApp was the most frequently cited platform, followed by Facebook, TikTok and Instagram, and LinkedIn. These platforms provide opportunities for interactive engagement and peer-to-peer learning, complementing formal and community-based efforts. Interestingly, two respondents admitted they did not know of any actors involved, suggesting gaps in awareness or outreach in certain areas. Collectively, these findings underscore the multistakeholder nature of climate education, whereby media, NGOs, government agencies, religious institutions, local businesses, and digital platforms converge to support adolescents and youths in building climate knowledge and skills.

Education and climate change promising practices

ROLES OF ADOLESCENTS AND YOUTHS IN ADDRESSING CLIMATE CHANGE

A majority of respondents affirmed that adolescents and youths have a meaningful role in addressing climate change, with only a small minority expressing uncertainty or disagreement; these dissenting views were concentrated mostly among adolescents, slightly more males, and primarily in South Africa.⁷

Malawi. The general response in Malawi was affirmative, especially in rural areas. Youth roles frequently involve tree planting, soil conservation, community drama, and participation in school clubs and awareness campaigns, supported by subjects such as social studies and expressive arts. Barriers include poverty, limited access to media (radios and phones), cultural beliefs that hinder climate education, and a need for community sensitization and teacher training.

⁷ This section (as throughout the report) includes specifics only on the countries for which data were available. Hence, this section does not include a specific discussion of Kenya

Rwanda. The response in Rwanda was a strong yes. Youths contribute through community work, tree planting, soil erosion control, and learning activities in geography and field trips, often using role-play and radio programs. However, limited internet access and insufficient books, alongside needs for government support and school infrastructure, remain pressing challenges.

South Africa. Respondents in South Africa mostly agreed on the importance of youth roles, though pockets of uncertainty remain. Engagement often takes the form of ecobrick creation, tree planting, community cleanups, and leveraging social media and school projects to raise awareness through natural sciences and environmental education. Key challenges include shortages of books, projectors, and internet access; low interest or understanding among some learners; high learner-to-teacher ratios; and broader resource constraints.

Zimbabwe. Youth participation in Zimbabwe is characterized by school clubs, cleanup campaigns; afforestation; peer education and community awareness; and the use of drama, poetry, and role-play to communicate climate issues. Persistent barriers include limited resources (textbooks, internet access, and ICT tools), restricted avenues for learning outside school, and the need for greater teacher support and training.

Across countries, common forms of youth engagement include environmental clubs; tree planting and afforestation initiatives; waste management and recycling (including ecobricks and creative crafts); creative arts for advocacy (drama, music, poems, storytelling); community cleanup campaigns; and innovations such as solar cookers and Indigenous-knowledge-based solutions (Table 16). The skills most frequently identified are critical thinking, problem-solving, leadership and advocacy, creativity in using local materials, and communication for disseminating climate information.

TABLE 16

Adolescents and youths have a role in addressing climate change

Country	General response	Roles and engagement	Key challenges
Malawi	Generally yes, especially in rural areas	Tree planting; soil conservation; community drama; school clubs and awareness campaigns; social studies and expressive arts	Poverty; limited access to media (radios, phones); cultural beliefs hindering education; need for community sensitization and teacher training
Rwanda	Strong yes	Community work; tree planting; soil erosion control; geography and field trips; role-play and radio programs	Limited internet access; lack of books; need for government support and school infrastructure
South Africa	Mostly yes, with some uncertainty or lack of awareness	Ecobricks; tree planting; community cleanups; social media and school projects; natural sciences and environmental education	Limited resources (books, internet, projectors); low learner interest or understanding; high learner-to-teacher ratios; resource constraints
Zimbabwe	Overwhelmingly yes, with adolescents and youths seen as key actors in climate action	School clubs; cleanup campaigns; afforestation; peer education and community awareness; drama, poetry, role-play	Lack of resources (textbooks, internet, ICT tools); limited learning outside school; need for teacher support and training

SOURCE: Author's compilation.

NOTE: Data were not available for Kenya, which is hence excluded from the table.

ICT = information and communication technology.

SURVEY RESPONSES: HOW ARE ADOLESCENTS AND YOUTHS ADDRESSING CLIMATE CHANGE IN THEIR COMMUNITIES?

Adolescents and youths across the surveyed communities are actively addressing climate change through a variety of initiatives that combine environmental stewardship, education, and advocacy. Tree planting and afforestation are among the most common activities, with youth-led efforts focused on restoring ecosystems in schools, homes, and community spaces. Waste management and recycling also feature prominently, as adolescents organize cleanup campaigns, sort waste, and create ecobricks to promote sustainability and reduce pollution. Community awareness and education are integral to these efforts, with young people using posters, school assemblies, peer education, and social media platforms to share information about climate change and its impacts.

In rural areas, climate-smart agriculture is a key strategy, where youths adopt sustainable farming practices such as planting drought-resistant crops and implementing water conservation techniques to enhance resilience against climate shocks. Schools play a central role in fostering climate literacy through environmental clubs that engage students in debates, quizzes, field trips, and practical projects. Creative arts (including drama, poetry,

music, and role-plays) are widely used to communicate climate messages in culturally relevant and engaging ways. Furthermore, adolescents are taking leadership roles by mentoring peers, engaging local authorities, and initiating community-based climate action projects—demonstrating their commitment to advocacy and long-term climate resilience.

SURVEY RESPONSES: WHAT IS ONE SKILL THAT ADOLESCENTS AND YOUTHS NEED TO ADDRESS CLIMATE CHANGE?

Across the dataset, adolescents and youths consistently demonstrate a core cluster of climate-related skills—leadership, advocacy, critical thinking, and environmental stewardship—while country contexts shape distinctive expressions of those skills (Tables 17 and 18). South Africa stands out for eco-innovation and digital advocacy, Rwanda for Umuganda-driven community resilience, and Kenya for survival and adaptation in pastoralist and climate-stressed communities. Common barriers recur across settings: resource scarcity, limited teacher training and curriculum integration, and the exclusion of young people from formal decisionmaking processes.

Kenya. Responses in Kenya stressed survival and adaptation to droughts and floods; advocacy and peer education; climate-smart farming; and creative expression through drama, poetry, and music. Learning is often situated in community meetings and school clubs, but migration, resource scarcity, and youth exclusion from decisionmaking pose ongoing challenges.

Malawi. Youths in Malawi emphasize public speaking and drama, environmental stewardship, problem solving, and creativity via expressive arts, often anchored in social studies and community drama. Yet poverty, limited access to radios and phones, and culturally rooted beliefs necessitate stronger community sensitization and teacher training.

Rwanda. Youth skills in Rwanda cluster around community mobilization; conservation and erosion control; peer education; and resilience and adaptation, reinforced through geography, science, field visits, storytelling, and radio. Key gaps remain in internet access and books, and schools call for greater infrastructure and government support.

South Africa. Respondents in South Africa point to ecobrick making and other eco-innovations; growing digital literacy; teamwork and leadership; and observation and investigation skills supported by natural sciences. Persistent constraints include shortages of books, internet access, and projectors; uneven learner interest; and high learner-to-teacher ratios.

Zimbabwe. Respondents in Zimbabwe highlighted leadership and advocacy alongside critical thinking and creative communication through drama and poetry. Practical skills—tree planting, recycling, and climate-smart agriculture—are prevalent, but progress is constrained by shortages of textbooks, internet connectivity, and ICT tools as well as gaps in out-of-school learning opportunities and teacher support.

TABLE 17

Study participants across countries specified the skills necessary for adolescents and youths to address climate change

Country	Skills identified	Learning methods	Challenges
Kenya	• Survival and adaptation • Advocacy • Agricultural skills • Creative expression	• Community meetings • School clubs • Expressive arts	• Migration due to climate stress • Resource scarcity • Youth exclusion
Malawi	• Public speaking • Environmental stewardship • Problem solving • Creativity (arts, drama)	• Social studies • Expressive arts • Community drama	• Poor access to media • Cultural beliefs • Limited teaching materials
Rwanda	• Community mobilization • Conservation • Peer education • Resilience and adaptation	• Geography and science • Field visits • Umuganda (community work)	• Poor infrastructure • Limited digital tools • Curriculum integration
South Africa	• Eco-innovation (ecobricks) • Digital literacy • Teamwork • Observation and investigation	• Natural sciences • Drama, role-play • Indigenous games	• Lack of projectors • Curriculum gaps • Community-school disconnect
Zimbabwe	• Leadership • Advocacy • Critical thinking • Communication (drama, poetry) • Practical skills (tree planting, recycling)	• Geography and agriculture • Drama, posters, quizzes • Assemblies	• Lack of textbooks, internet, ICT tools • Limited teacher training

SOURCE: Author's compilation.

NOTE: ICT = information and communication technology.

TABLE 18

Heatmap structure of skills necessary for adolescents and youths to address climate change, by country

Skill	Kenya	Malawi	Rwanda	South Africa	Zimbabwe
Leadership	✓	✓	✓	✓	✓
Advocacy	✓	✓	✓	✓	✓
Critical thinking	✓	✓	✓	✓	✓
Communication (drama, etc.)	✓	✓	✓	✓	✓
Environmental stewardship	✓	✓	✓	✓	✓
Digital literacy	✓	✗	✗	✓	✗
Eco-innovation	✗	✗	✗	✓	✗
Resilience and adaptation	✓	✓	✓	✓	✓
Agricultural skills	✓	✓	✓	✓	✓
Creative expression	✓	✓	✓	✓	✓

✓ = Skill mentioned or emphasized in responses

✗ = Not explicitly mentioned or emphasized

SOURCE: Author's compilation.

Section 5:

Toolkit—innovative pedagogies for climate education among adolescents and youths

INTRODUCTION

This toolkit translates evidence from the collaborative research, “Innovative Pedagogies for Climate Education among Adolescents and Youths,” into ready-to-use tools, lesson ideas, and youth-led activities suited to resource-constrained contexts in ESA. It emphasizes play-based learning (drama, songs, role-play), climate-smart agriculture, waste management, afforestation, radio and WhatsApp-based learning, and school/community club—while also addressing common barriers such as limited textbooks, ICT devices, connectivity, and trained personnel. The toolkit has been prepared for adolescent- and youth-focused climate education initiatives across schools and communities.

HOW TO USE THIS TOOLKIT

The subsections below (grouping low-tech, medium-tech, and online options) each presents a short rationale, a step-by-step activity, a materials checklist, adaptation tips, and links to practical resources.

LOW-TECH OR NO-TECH ACTIVITIES

Climate clubs and peer education

Adolescents and youths who participated in the research frequently cited clubs, peer education, and school and community involvement as effective entry points for climate education. Clubs sustain action through small climate projects and mentorship.

A climate club thrives when young people see themselves not only as learners but also as organizers of meaningful change on campus and in their neighborhood. Begin by inviting a diverse group of adolescents and youths to co-design a simple club charter that sets meeting rhythms, roles, and a shared code of respect. The first weeks should build identity and trust through small, visible wins—such as a classroom talk on local hazards or a cleanup hour—while older youths mentor younger members in public speaking and facilitation.

Each term, the club selects one thematic focus—such as waste, water, trees, or clean energy—and plans a project that makes the theme tangible, from installing labeled sorting stations to establishing a seedling nursery. This whole-school, student-led approach mirrors the Eco-Schools and has repeatedly proven to strengthen environmental learning when paired with teacher patronage and simple monitoring of participation and impact.

STEPS:

1. **Form a club** with 15–30 members and a teacher patron.
Set a simple charter (meeting rhythm, roles, code of conduct).
2. **Pick quarterly themes** (e.g., waste, water, trees, or clean energy).
Run peer-led microlessons and schoolwide “campaign weeks.”
3. **Plan one visible project per term** (e.g., a waste sorting station, nursery bed, or water harvesting barrel).
4. **Pair older youth with adolescents** for mentorship, and rotate leadership to build confidence and public speaking

Materials: flipchart and markers, locally sourced seedlings, hand tools, and a simple record book.

Resources: [Eco-Schools \(global program and handbooks\)](#) | [Eco-Schools South Africa \(teacher support\)](#).⁸

⁸ See the Foundation for Environmental Education’s Eco-Schools website (<https://www.ecoschools.global/>) and the Wildlife and Environment Society of South Africa’s (WESSA) Eco-Schools program (<https://www.wessa.org.za/eco-schools/>).

Radio minishows and community listening groups

Radio was widely identified as an accessible and trusted source of climate information. The data show that adolescents rely on radio or TV for climate information; thus radio segments in local languages can share practical tips and links to school action.

Radio becomes a classroom without walls when you pair concise, locally produced segments with moderated listening circles. Work with a nearby station to cocreate 5- to 7-minute minishows in the local language that follow a clear arc: an early warning or seasonal update, a practical action tip that households can adopt, and a youth voice reflecting on what worked at school or in the community.

Back at school or the community hall, a teacher or youth facilitator hosts listening sessions using a short discussion guide that translates broadcast information into immediate steps—for instance, setting family evacuation routes or starting a kitchen garden before the rains.

STEPS:

1. **Cocreate 5- to 7-minute segments** with the support of a local radio station, consisting of content such as weather or early warning + action tip + youth voice.
2. **Schedule weekly listening groups** at school or community hall using a simple discussion guide containing questions that adolescents and youths may have on the selected climate theme.
3. **Invite stakeholders** such as extension officers (agriculture or health) for Q&A once per month. Collect questions from youth to feed future programs.

Resources: [BBC Media Action: Policy Note on media & climate](#) | [BBC Media Action iLearn: Climate courses](#).⁹

⁹ See the BBC (2021) policy note (<https://downloads.bbc.co.uk/mediaaction/pdf/climate-policy-note-2021.pdf>) and BBC Media Action's Climate Change Courses (<https://www.bbcmmediaactionilearn.org/learn/public/catalog/view/27>).

Climate drama, songs, and poetry festival

Play-based methods (drama, music, and role-play) appear frequently in the dataset and are effective for engagement and retention.

Play-based learning transforms passive awareness into embodied understanding. Invite classes or clubs to create 10- to 15-minute pieces (skits, choral pieces, spoken word) that dramatize a familiar risk (heat stress, floods, waste) and model a specific solution (mulching, safe crossing protocols, ecobricks). Coach groups to use local idiom, humor, and call-and-response to draw in their peers and families, then curate a festival each term that elevates youth performance as a civic act.

STEPS:

1. **Run classroom or club workshops** to script 10- to 15-minute skits on local hazards (heat, floods, waste) and solutions (tree planting, water harvesting).
2. **Hold climate change and environmental conservation festival** once each term, where different groups perform.
3. **Invite judges** such as community leaders, parents, and youth.
4. **Record skits with smartphones** (be sure to get consent first), and share via WhatsApp or noticeboards. Integrate skit or drama messages into school assemblies.

Resources: [Creative climate drama examples \(UEA\)](https://www.uea.ac.uk/creative/exploring-climate-change-through-creativity).¹⁰

¹⁰ See “Song of the Reeds,” an ongoing project of the University of East Anglia that explores drama’s dialogue with urgent conservation issues (<https://www.uea.ac.uk/creative/exploring-climate-change-through-creativity>).

Waste audit and ecobricks

Waste management is a common interest among adolescents and youths in the dataset. Ecobricks and sorting stations turn learning into visible change and materials for school projects.

A schoolwide waste audit is an entry point to systems thinking and resource stewardship. For one week, classes tally waste by type and location, then analyze patterns in where, when, and why materials accumulate. Use these insights to position clearly labeled bins and to launch demonstrations of ecobrick making—stuffing clean, dry plastics tightly into bottles to create building units for benches, planters, or even goal posts.

STEPS:

1. **Conduct a one-week waste audit** (by type and source).
2. **Install labeled bins**, and run peer demonstrations on sorting and ecobrick making (plastic into bottles).
3. **Build** simple benches, planters, or goal posts with ecobricks.
4. **Take pictures** to showcase the before-and-after scenarios.

Resources: [Eco-Schools Handbook \(2024\)](https://www.wwf.org/publications/eco-schools-handbook-2024).¹¹

¹¹ See the World Wildlife Fund’s “Eco-Schools Handbook” (WWF 2024) at <https://www.wwf.org/publications/eco-schools-handbook-2024>.

Tree planting and school nursery

Afforestation and reforestation are top actions cited by adolescents and youths across the dataset. A nursery provides seedlings for campus and community, with livelihood and nutrition co-benefits

Establishing a small nursery cultivates patience, care, and ecological literacy while providing seedlings for campus and neighborhood planting. Start by consulting local forestry or agriculture officers to select native, drought-tolerant species and to align planting with rainfall patterns. Learners construct shaded seedbeds, mix soils, and manage watering schedules; each seedling is assigned a “tree guardian” who monitors growth, records observations, and reports issues at club meetings.

STEPS:

1. **Select native, drought-tolerant species** with local forestry or agriculture officers
2. **Set up low-cost nursery** (seed trays, shade, watering schedule).
3. **Create a planting calendar** around rains; pair each seedling with a “tree guardian.”

Resources: [FAO Africa: Youth in Agriculture portal](https://www.fao.org/africa/youth-in-agriculture/en).¹²

¹² For more information and ideas, see the “Youth in Agriculture” portal of the United Nations’ Food and Agriculture Organization (FAO) Regional Office for Africa: <https://www.fao.org/africa/youth-in-agriculture/en>.

MEDIUM-TECH ACTIVITIES

WhatsApp microlearning and youth info groups

According to the research, WhatsApp is widely used. Microlessons overcome time and connectivity constraints. This activity must be paired with digital skills to expand safe access.

A moderated WhatsApp group can deliver bite-size climate learning at the pace of adolescents' lives. Set clear rules up front for privacy, respect, and evidence-based sharing; then post weekly 3-minute lessons as text, images, or short audio clips that translate complex ideas into local, actionable steps.

STEPS

1. **Create teacher- or adult-moderated WhatsApp groups** with consent from parents or guardians where relevant (rules: privacy, respect, no misinformation).
2. **Send one short “3-minute lesson” per week** (text + image + short audio) on local climate topics.
3. **Host one quiz or poll on WhatsApp per month** to gauge content uptake and application.

Resources:

[GSMA: Mobile Internet Skills Training Toolkit \(overview\) | UNESCO best practice: MISTT \(impact\).](#)¹³

¹³ Regarding the GSMA Mobile Internet Skills Training Toolkit (MISTT), see “Improving Mobile Internet Access Through Literacy (blog)” (Abdullahi 2020) (<https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-for-development/blog/improving-mobile-internet-access-through-digital-literacy/>); and a summary of MISTT as a best practice (UNESCO 2022) (https://media.unesco.org/sites/default/files/webform/ed3002/79_The_GSMA_Mobile_Internet_Skills_raining_Toolkit_.pdf)

Offline-first lesson packs and posters

Many schools lack textbooks and connectivity. Education for Sustainable Development (ESD) packs and posters support cross-curricular teaching and assemblies.

Printable ESD packs and posters compensate for textbook shortages and intermittent connectivity while enabling cross-curricular work. Adapt UNESCO's ESD Toolkit to your local syllabus by selecting themes that cut across subjects—such as water, energy, and health—and framing inquiry questions that ask students to investigate their school or community.

STEPS:

1. **Download ESD pack** onto a flash (USB) drive
2. **Load ESD content** onto a school computer in the library.
3. **Prepare a timetable** of content access.

Resources: [UNESCO: Education for Sustainable Development Toolkit | UN CC:Learn – UNESCO Climate Change in the Classroom kit](#)¹⁴

¹⁴ See UNESCO'S "Education for Sustainable Development Toolkit" (McKeown 2002) (https://www.fundee.org/esd_toolkit_v2.pdf); and Climate Change in the Classroom: UNESCO Course for Secondary Teachers on Climate Change Education for Sustainable Development (UNESCO 2013) (<https://www.unclearn.org/wp-content/uploads/library/pdf.pdf>).

Early-warning action drills and risk mapping

Extreme weather disrupts learning. Drills and simple risk maps prepare schools and households. This activity should be tied into national Early Warnings for All initiatives.¹⁵

Regular drills and simple risk maps build a culture of readiness that protects learning time and reduces anxiety.

STEPS:

1. **Begin with a walk-through** to identify hazards in and around the school .
2. **Develop and practice** evacuation routes, assembly points, and communication protocols aligned to the most likely events, such as floods, storms, or heat waves.

Resources: [WMO: EW4All Action Plan for Africa](#) | [UNDRR: IDDRR 2024 Toolkit & Stop Disasters game](#) | [IFRC: School-based Risk Reduction Handbook](#).¹⁶

¹⁵ The Early Warnings for All (EW4All) initiative, launched by United Nations Secretary-General António Guterres in 2022, aims to ensure that everyone globally is protected from hazardous environmental events by implementing lifesaving early-warning systems by 2027 (<https://earlywarningsforall.org/site/early-warnings-all/about-ew4all>).

¹⁶ See “Early Warnings For All Action Plan for Africa Is Launched” (WMO 2023) (<https://wmo.int/news/media-centre/early-warnings-all-action-plan-africa-launched>); the International Day for Disaster Risk Reduction Toolkit 2024 of the United Nations Office for Disaster Risk Reduction (UNDRR) (<https://iddrr.undrr.org/toolkit>); and the “Handbook for a School-Based Risk Reduction Initiative” of the International Federation of Red Cross and Red Crescent Societies (IFRC 2022).

Climate-smart agriculture and school gardens

Adolescents and youths demand practical food, water, and livelihood solutions. Gardens teach adaptation (mulching, small grains, water harvesting) and nutrition. A school garden is a laboratory for resilience where learners practice mulching to conserve soil moisture; intercropping and crop rotation to protect yields; and simple water harvesting to bridge dry spells.

STEPS:

1. **Choose climate-resilient crops** familiar to local households—small grains, legumes, and drought-tolerant vegetables.
2. **Organize student teams** to manage beds, record growth.
3. **Reflect** on the links between climate variability, nutrition, and attendance.

Resources: [GCA: Youth Adaptation – Climate-resilient agriculture factsheet](https://gca.org/wp-content/uploads/2025/01/Factsheet-Climate-resilient-agriculture.pdf) | [Africa Youth Trust: Climate-smart agriculture](https://africayouthtrust.org/climate-smart-agriculture/).¹⁷

¹⁷ See “Climate-Resilient Agriculture” a Youth Adaptation Forum factsheet (GCA 2025) (<https://gca.org/wp-content/uploads/2025/01/Factsheet-Climate-resilient-agriculture.pdf>); and the Africa Youth Trust web page, “Climate Smart Agriculture” (<https://africayouthtrust.org/climate-smart-agriculture/>).

ONLINE AND HIGH-TECH ACTIVITIES

Eco-Schools online training and courses

Where connectivity allows, short online courses deepen teacher, adolescent, and youth capabilities and open international communities of practice. FEE Academy's e-learning portfolio introduces the Eco-Schools seven-step framework, climate resilience and school safety, and youth reporting, and offers certificates that recognize engagement and learning.

Resources: [FEE Academy: free ESD and Eco-Schools courses | Eco-Schools global portal](#).¹⁸

Adolescent and youth policy literacy (UNFCCC, NDCs, Paris Agreement)

Policy literacy empowers adolescents and youths to connect local action to national and global climate commitments. Use youth-friendly explainers to unpack how the Paris Agreement works; what Nationally Determined Contributions (NDCs) mean for their country; and where youth can contribute through consultations, campaigns, or monitoring community-level progress.

Resources: [UNICEF: Toolkit for Young Climate Activists](#).¹⁹

Adolescent and youth media and solutions journalism

Youth-produced media that spotlights workable solutions shifts the narrative from fear to agency. Train students to identify local problems, verify information, interview diverse community voices, and present evidence of impact using audio, photo essays, or short videos.

Resources: [BBC Media Action: climate storytelling courses](#).²⁰

¹⁸ See the Foundation for Environmental Education (FEE) Academy (<https://www.fee.global/fee-academy>); and FEE's Eco-Schools global portal (<https://www.ecoschools.global/>).

¹⁹ Find youth-friendly explainers in UNICEF's online "Toolkit for Youth Climate Activists" (<https://www.unicef.org/lac/en/toolkit-young-climate-activists>).

²⁰ See BBC Media Action's Climate Change Courses (<https://www.bbcmmediaactionilearn.org/learn/public/catalog/view/27>).

TEACHER PROFESSIONAL DEVELOPMENT, PEDAGOGY, AND ASSESSMENT

A sustained program rests on teacher professional development as well as pedagogies that balance knowledge, values, and practical skills—the “heads, hearts, hands” model at the core of ESD. Structure inquiry so lessons begin with local observation and problem framing, move through collaborative experimentation and community dialogue, and close with reflection on personal and collective responsibility. Adopt UNESCO’s ESD “heads, hearts, hands” approach: combine knowledge, values and emotions, and practical skills. Use inquiry and project-based learning; embed local relevance and justice; and co-assess with adolescents and youth.

References: [UNESCO ESD for 2030 – Greening Education Partnership| ESD Learning Objectives \(overview\)](#).²¹

²¹ See UNESCO’S ESD overview (<https://www.unesco.org/en/sustainable-development/education>) and “Greening Education Partnership” portal (<https://www.unesco.org/en/sustainable-development/education/greening-future?hub=72522>).

WEBINAR 1:

EMPOWERING EDUCATORS FOR CLIMATE EDUCATION – PRACTICAL STRATEGIES AND RESOURCES

Duration: 2 hours (including Q&A and interactive activities)

Welcome and introduction (10 minutes)

- *Brief overview* of climate education importance
- *Objectives* of the webinar
- *Icebreaker*: “What’s one word that comes to mind when you think of climate education?” (Participants share via chat or poll.)

Session 1: The role of educators in climate education (15 minutes)

- *Why teachers are central* to climate literacy
- *Examples from the dataset*: integrating climate topics into geography, science, and agriculture lessons
- *Interactive activity*: Quick poll—“Do you currently teach climate topics? If yes, in which subject?”

Session 2: Challenges faced by educators (20 minutes)

- *Common challenges identified by the research*: resistance from learners, lack of resources, poor attendance, and attitude issues
- *Group discussion* on overcoming these barriers
- *Interactive activity*: Breakout rooms—participants share one challenge they face and brainstorm solutions. Each group posts top three ideas in chat.

Session 3: Essential resources for effective climate education (15 minutes)

- *Highlight resources from data*: textbooks, ICT gadgets, internet access, projectors
- *Showcase low-cost alternatives* for resource-limited settings
- *Interactive activity*: Resource mapping exercise—participants list resources they have and those they need using a collaborative board (e.g., Miro or Jamboard).

Session 4: Innovative classroom practices and play-based methods (25 minutes)

- *Examples from dataset:* role-plays, dramas, poetry, music, storytelling
 - *Demonstration:* how to turn a climate topic into a role-play or game
 - *Interactive activity:* Mini role-play challenge—participants create a short skit or dialogue on “Why trees matter” in breakout rooms and share highlights.
-

Session 5: Extending learning beyond the classroom (15 minutes)

- *Community engagement strategies:* cleanup campaigns, tree planting, awareness clubs
 - Linking school projects to community action
 - *Interactive activity:* Action planning—participants draft one idea to involve parents or local leaders in climate education.
-

Session 6: Recommendations and policy support (10 minutes)

- *Institutional support:* capacity building, provision of gadgets, inclusion in curriculum
- *How educators can advocate* for systemic change.

Q&A and closing remarks (10 minutes)

- *Open floor* for questions
- *Share* resource links and next steps.

WEBINAR 2:

EMPOWERING EDUCATORS FOR CLIMATE EDUCATION— PRACTICAL STRATEGIES, PLAY-BASED PEDAGOGIES, AND LOW-RESOURCE SOLUTIONS

Audience: Teachers and educators (primary, secondary, vocational); heads of department; club patrons, NGO school facilitators

Duration: 2 hours (120 minutes)

Format: Live virtual session (Teams or Zoom) with polls, breakout rooms, and collaborative boards; low-tech contingency provided.

Learning outcomes: By the end of the webinar, participants will be able to

- *Identify top barriers to climate education* in their contexts and select evidence-based mitigation strategies;
- *Apply play-based methods* (drama, role-play, poetry, music, storytelling) to teach causes, impacts, and solutions to climate change;
- *Design low-resource lesson plans* using locally available materials and community partnerships (e.g., tree planting, cleanup, school clubs); and
- *Advocate for institutional support* (capacity building, ICT access, core-subject integration) with an actionable 60-day plan.

Speaker roles and responsibilities

- **Host or MC** (*with facilitation experience*)
Opens, frames objectives, manages time, handles housekeeping and tech, runs polls, records key decisions, and captures resources shared in chat
- **Lead facilitator** (*climate education and pedagogy specialist*)
 - *Synthesizes research insights*, leads pedagogy segments, and anchors Q&A
 - *Demonstrates play-based pedagogies*, e.g., drama, role-play, poetry, or storytelling techniques and guides design mini-sprint
 - *Presents educational technology alternatives* in low- and no-cost resource settings (offline boards, radio prompts, printed visuals) and ICT “starter stacks”
 - *Models activities beyond classroom*: cleanups, tree planting, clubs, local leadership engagement
- **Youth co-facilitator** (*student club leader*)
Performs a short skit and shares what motivates peers and how teachers can keep them engaged.

Pre-work (optional)

- *Five-minute survey*: current barriers, resources, subject taught
- *Bring one local story* (extreme heat, floods, drought) to convert into a classroom skit.

Run-of-Show (2 hours)

Welcome, orientation, and icebreaker (10 minutes)

- *Host*: Objectives, agenda, tech check, accessibility notes
- *Interactive activity*: One-word warm-up (“What comes to mind when you think of climate education?”) via chat; word cloud poll
- *Context framing*: Why adolescents need engaging, relevant climate learning; teachers are central

Session 1: What the data says about challenges and needs (15 minutes)

- Rapid synthesis of research findings
 - *Top challenges*: resistance or low interest, poor attendance, scarce financial and material resources
 - *Key needs*: internet access; ICT gadgets (phones, laptops, projectors); textbooks; and media or research training
- *Interactive poll*: “Which barrier is most acute in your context?” Results inform later breakouts.

Session 2: Play-based pedagogies that work (20 minutes)

- *Demos of drama, role-play, poetry, music, and storytelling* for topics like deforestation, extreme weather, or mitigation
- *Turning any climate concept into a timed activity*: Teams script a 1-minute scene on “Why trees matter” and present in plenary for inputs.

Session 3: Teaching with limited resources (20 minutes)

- *Low-tech toolkit*: paper storyboards, printed infographics, community noticeboards, radio segments, offline reflection journals, “poster prompts”
- *No-internet lesson structure*: local observation walk → data tally on paper → class debate → action pledges.

Session 4: Beyond the classroom—clubs and community action (15 minutes)

- *How to align class objectives with community calendars* on tree planting, cleanup campaigns, agricultural extension or environmental engagements, and field day
- *Interactive activity*: Stakeholder map—identify one local ally (e.g., leadership, NGOs, parents) and draft a joint activity (e.g., “School–Community Tree Day”); post in chat.

Session 5: Integrating into core subjects and assessment (15 minutes)

- *Practical integration* into geography, science, agriculture, heritage studies; climate homework and projects
 - *Interactive activity*: Microlesson design sprint—in pairs, outline a 45minute lesson (objective, play-based activity, formative check); volunteers share for quick coaching.
-

Session 6: Securing support—policy and institutional levers (15 minutes)

- *Host and lead facilitator*: Advocate for capacity building, ICT provision, curriculum inclusion, time and materials; draft letters or agenda items for school leadership, Parent Teacher Associations and School Development Committees
- *Interactive activity*: 60-day action plan—choose one institutional ask + one classroom practice + one community activity; commit in chat.

Youth voice, Q&A, and close (10 minutes)

- *Youth cofacilitator*: 2-minute reflection—“What keeps us engaged: projects, performance, and clarity on ‘what to do’”
- *Open Q&A*: All speakers
- *Close*: Resource pack link, office hours, post-webinar challenge

INTERACTIVE ACTIVITIES (DETAILS AND MATERIALS)

- *One-word warm-up*: Chat or word cloud (using Mentimeter or Slido)
 - *Mini-skit jam*: Use prompt cards (“causes / effects / solutions”), flip chart, or shared doc; 1-minute performances
 - *Resource mapping board*: Digital board or paper; categorize existing tools versus needed ICT and textbooks; add *community assets* (NGOs, local leadership, churches, media)
 - *Stakeholder map*: Simple diagram linking school clubs to external actors; identify quick joint activity
 - *Microlesson design sprint*: Template: Objective → Play-based task → Assessment → Home/community extension; emphasize drama, role-play, poetry, music, and storytelling
 - *60-day action plan*: Three commitments—institutional ask (ICT, data, textbooks); classroom practice (play-based); community action (tree day or cleanup).
-

ACCESSIBILITY AND LOW-TECH CONTINGENCIES

- *Provide printable prompts and poster packs* for schools without projectors or internet
 - *Encourage radio announcements or community noticeboards* to disseminate climate messages and club activities
 - *Offer offline reflection journals and paper rubrics* for assessment.
-

DELIVERABLES AND FOLLOW-UP

- *Resource pack*
 - *Play-based activity cards* (drama, role-play, poetry, music, and storytelling)
 - *Low-tech lesson templates*, stakeholder mapping sheets, 60-day action plan canvas
 - *Community of Practice* (WhatsApp group) with monthly contact and a 30-day microchallenge: run one play-based lesson and share a 2-minute recap video or photo storyboard.
-

QUICK ASSESSMENT TOOLS FOR TEACHERS AND EDUCATORS

- *Climate action log (weekly)*: Record actions taken, observations, reflection
- *Peer teaching scorecard*: Score for clarity, relevance, evidence, participation
- *Project rubric*: Problem definition, local context, feasibility, impact, teamwork, reflecti
- *Household knowledge quiz*: Hazards, preparedness, water and energy saving.

INFLUENCING POLICY

Below is an example of a policy that adolescents and youths can design and deliver with support from teachers or educators and stakeholders.

Policy brief title

Building Climate-Resilient Education Systems for Adolescents and Youths

Summary

This policy brief is aimed at policy and decisionmakers, emphasizing the urgent need to build climate-resilient education systems for adolescents and youths through the following points:

- *Climate shocks disrupt schooling.* Floods, droughts, and heat waves cause absenteeism, dropouts, and infrastructure damage.
- *Economic strain reduces access.* Families facing crop failure and income loss cannot afford school fees, leading to early marriages and child labor.
- *Gendered impacts are significant.* Girls bear the brunt of water scarcity and household chores, missing school more often.
- *Learning-environment challenges play a role.* Extreme heat and lack of resources hinder concentration and practical skill development.
- *Resource gaps persist.* Limited ICT access and teacher training impede climate education.

Recommendations

- *Invest in resilient infrastructure:* Floodproof schools, safe roads, and water systems
- *Expand digital access:* Provide ICT tools and internet connectivity for climate learning
- *Integrate climate education:* Make climate literacy part of curricula and teacher training
- *Support vulnerable groups:* Provide targeted programs for girls and marginalized communities
- *Community engagement:* Establish climate learning hubs and youth-led environmental clubs.

Implementation road map (90 days)

The first 90 days should prioritize momentum and credibility. Start with stakeholder mapping to understand who cares about which risks and resources, then co-select three or four themes that reflect learner interest and community need. Launch the club and secure small wins that are highly visible, such as a waste station or nursery beds, while setting up WhatsApp microlearning to maintain a weekly cadence of content and engagement.

- *Weeks 1-2:* Stakeholder mapping; select three or four priority themes; form or refresh clubs; agree upon a code of conduct
- *Weeks 3-6:* Run two low-tech activities; start nursery or garden; launch WhatsApp microlearning
- *Weeks 7-8:* Conduct one drill and risk map; integrate assemblies; invite local extension officer
- *Weeks 9-12:* Host festival or showcase; document outcomes; plan next term's projects & scale to feeder schools.

Section 6:

Recommendations

GENERAL RECOMMENDATIONS, BY PROFILE GROUP AND COUNTRY

Adolescents and youths

- *Join or establish climate clubs* in schools and communities to lead awareness campaigns and practical projects such as tree planting and cleanup drives
- *Engage in creative and culturally relevant methods* like drama, songs, debates, and social media advocacy to spread climate messages and mobilize peers
- *Participate in community initiatives* such as local dialogues in Kenya, or Umuganda in Rwanda, to strengthen resilience and promote sustainable practices
- *Leverage technology and media platforms*—radio, TV, and social media—to access climate information and share solutions widely
- *Adopt practical, climate-smart actions* such as afforestation, ecobrick projects, and water conservation techniques to build hands-on skills and environmental stewardship.

Teachers and educators

- *Integrate climate education into core subjects* like geography, science, and agriculture, using interactive and play-based methods to make learning engaging
- *Access and use essential resources* such as textbooks, posters, ICT tools, and internet connectivity to deliver effective lessons and overcome resource gaps
- *Participate in capacity-building programs* including workshops, refresher courses, and collaborative platforms to strengthen knowledge and teaching strategies
- *Adopt creative pedagogies* like drama, role-play, and storytelling to help students internalize climate concepts and encourage active participation
- *Advocate for institutional and policy support* to secure curriculum reform, funding for resources, and partnerships with NGOs and local leaders for sustained climate education.

By country

Kenya

- *Encourage adolescents to join school-based clubs* and participate in community dialogues that promote climate literacy and sustainable practices
- *Use social media advocacy and integrate climate topics* into civic education to ensure engaging learning beyond the classroom.

Malawi

- *Form youth clubs* that use creative methods like drama, songs, and debates to spread climate messages in culturally relevant ways
- *Increase access to climate information* through radios, community meetings, and school programs while promoting tree planting and conservation activities.

Rwanda

- *Leverage Umuganda* (required community service) to engage youths in hands-on conservation activities such as planting trees and preventing soil erosion
- *Create and strengthen environmental clubs* and improve access to technology through ICT hubs and media platforms to enhance climate education.

South Africa

- *Promote creative pedagogies* such as drama, role-play, and visual media to make climate education interactive and engaging
- *Support youth-led initiatives* like ecobrick projects and cleanup campaigns, complemented by improved access to digital resources and technology.

Zimbabwe

- *Establish environmental clubs* in schools and communities to lead climate awareness campaigns and practical projects such as tree planting and cleanup drives
- *Integrate climate education* into subjects like geography and agriculture, supported by access to resources such as textbooks, posters, and internet connectivity.

RECOMMENDATIONS REFLECTING DISTINCT CONTEXTUAL PRIORITIES

How adolescents and youths can increase their climate knowledge and skills

Across the five countries studied—Kenya, Malawi, Rwanda, South Africa, and Zimbabwe—adolescents and youths share a common aspiration to deepen their climate knowledge and skills, yet the strategies proposed reflect distinct contextual priorities.

Kenya

The climate education strategy in Kenya focuses on encouraging adolescents to join environmental clubs and participate in community dialogues that promote climate literacy and empower youth action. Sustainable practices such as tree planting and afforestation are coupled with advocacy through social media campaigns, reinforcing the role of young people in climate resilience.

Training for both teachers and students is highlighted as a priority, with recommendations to develop teaching materials and incorporate climate topics into civic and science education to ensure consistent and structured learning.

Malawi

The recommendations for Malawi echo the importance of youth clubs but also highlight creative engagement through drama, songs, and debates to disseminate climate information in culturally resonant ways. Increasing access to media and technology—particularly radio programs, mobile phones, and community cinemas—is prioritized to overcome rural connectivity challenges and ensure broader reach.

Capacity building for teachers is another cornerstone, with calls for training to deliver climate education effectively and for schools to provide teaching aids such as books and visual materials alongside allocating time for climate-focused lessons and experiential learning through field visits

Rwanda

Integration of climate education into the formal curriculum is emphasized in Rwanda, particularly within subjects like geography and science, supported by environment clubs that undertake activities such as tree planting and erosion control. A distinctive feature of Rwanda's approach is leveraging Umuganda, the national tradition of community service, to engage youths in hands-on conservation efforts like building terraces and educating peers.

Improving access to climate information and technology through youth centers, ICT hubs, and media platforms—including radio, television, and social media—is also considered critical alongside providing smartphones, computers, and internet connectivity to enhance research and learning capabilities.

South Africa

In contrast to some of the other countries, South Africa places strong emphasis on creative pedagogies, advocating for the use of drama, role-play, and visual media such as posters and games to help students internalize climate concepts. Improving access to climate information through television, radio, and internet platforms is seen as essential alongside equipping schools with projectors, computers, and digital resources to support interactive learning.

Youth-led initiatives are also encouraged, including awareness campaigns, community cleanup activities, and practical projects such as creating ecobricks and planting trees, which combine environmental action with skill development.

Zimbabwe

The emphasis in Zimbabwe is on establishing climate change clubs within schools and communities as platforms for peer education, awareness campaigns, and practical activities such as tree planting and cleanup drives. These clubs are seen as vital for fostering leadership and advocacy skills while promoting environmental stewardship.

Complementing this approach, access to climate education resources—including textbooks, internet connectivity, and visual aids like posters and videos—is considered essential to bridge information gaps. Schools are encouraged to integrate climate content into subjects such as geography and agriculture and to organize field trips that demonstrate real-world impacts. Finally, Zimbabwean adolescents are urged to participate actively

in community initiatives such as afforestation and waste management, which build ownership and practical experience in climate mitigation.

Taken together, these recommendations reveal shared priorities—such as the centrality of school-based clubs, community engagement, and improved access to resources—while underscoring country-specific approaches shaped by cultural practices, infrastructure realities, and technological access (Table 19). Kenya and Zimbabwe emphasize structured clubs and curriculum integration; Malawi and Rwanda lean heavily on community traditions and creative methods; and South Africa foregrounds digital tools and performance-based learning.

Across all contexts, the call for teacher training and resource provision is universal, reflecting the pivotal role educators play in equipping adolescents and youths with the knowledge, skills, and agency to address climate change effectively.

TABLE 19

A cross-country comparison captures nine key themes across the five countries

Theme	Kenya	Malawi	Rwanda	South Africa	Zimbabwe
Clubs and peer education	School-based clubs and community dialogues for climate literacy	Youth clubs using drama, songs, and debates for climate awareness	Environmental clubs for tree planting and erosion control	Youth-led initiatives encouraged, including cleanup campaigns	Strong emphasis on schools and community clubs for awareness and action
Curriculum integration	Incorporate climate topics into civics and science education	Limited mention; focus on creative engagement	Explicit integration into geography and science subjects	Emphasis on creative pedagogy rather than formal integration	Integrate climate topics into geography and agriculture subjects
Teacher training and capacity	Training for teachers and students emphasized	Strong focus on teacher training and provision of teaching aids	Capacity building through workshops and focal teachers	Mentioned indirectly via resource provision and pedagogy support	Highlighted as a need but not detailed in
Access to resources and technology	Social media advocacy; less focus on hardware	Radio, mobile phones, and community cinemas for outreach	ICT hubs, smartphones, and internet access	Needs for projectors, computers, and digital resources in schools	Textbooks, internet, posters, and videos prioritized
Community engagement	Community dialogues and advocacy campaigns	Drama and sensitization meetings in communities	Leverage Umuganda for hands-on conservation work	Cleanup activities and awareness campaigns encouraged	Active involvement in afforestation and waste management
Creative or play-based methods	Suggested through debates and symposiums	Drama, songs, and debates central to engagement	Limited mention; focus on practical conservation	Strong emphasis on drama, role-play, and visual media	Not emphasized in recommendations
Practical projects	Afforestation and sustainable practices promoted	Afforestation and soil conservation activities	Tree planting and erosion control through clubs and Umuganda	Ecobricks and tree planting highlighted	Tree planting and cleanup drives recommended
Field trips and experiential learning	Not emphasized in recommendations	Field visits suggested for experiential learning	Not explicitly mentioned in recommendations	Not mentioned in recommendations	Explicitly recommended for real-world impact

SOURCE: Author's analysis.

NOTE: ICT = information and communication technology.

Adolescent-focused interventions

- *School-based modules.* Incorporate topics on the causes, effects, and mitigation of climate change using interactive methods such as role-plays, drama, visual aids, and quizzes
- *Resource provision.* Ensure access to textbooks, posters, and affordable ICT tools to support climate education in schools
- *Peer clubs.* Establish environmental clubs to lead awareness campaigns and organize practical activities like tree planting
- *Low cost-learning resources and materials.* Provide posters and radio programs because tech access is uneven
- *Resilience skills.* Training on water conservation, waste recycling that can be practiced at home.

Youth-focused interventions

- *Link climate education to livelihoods.* Through vocational training, provide instruction in climate-smart agriculture, renewable energy, and waste recycling to build practical skills
- *Digital literacy.* Equip youths to use social media for advocacy and access online learning platforms
- *Entrepreneurship support.* Offer training on green business models and facilitate access to microfinance for climate-related enterprises
- *Community hubs and mobile platforms.* Use these for outreach because youths are more active in informal work and on social media.

Cross-cutting strategies

- *Community engagement.* Promote awareness campaigns through radio, WhatsApp groups, and local meetings to reach wider audiences
- *Gender inclusion.* Address barriers that limit girls' participation, such as water access and household chores
- *Monitoring and evaluation.* Track participation, knowledge gains, and the implementation of climate action projects to measure impact.

System-level recommendations

- *Integrate climate education into core curriculum.* Make climate change a mandatory topic across subjects like geography, agriculture, and science, and include practical modules linked to career pathways such as renewable energy and sustainable agriculture
- *Expand access to digital and physical resources.* Provide schools with internet connectivity, laptops, and climate-focused textbooks to bridge resource gaps
- *Support community-based learning hubs.* Establish resource centers equipped with ICT tools for adolescents and youths in rural areas

- *Link climate education to livelihoods.* Promote climate-smart agriculture and green entrepreneurship training for youths to connect learning with economic opportunities
- *Strengthen multistakeholder partnerships:* Engage NGOs, local leadership, and government programs to fund and scale climate education initiatives.

COUNTRY-SPECIFIC RECOMMENDATIONS FOR INCREASING THE ROLE OF ADOLESCENTS AND YOUTHS IN ADDRESSING CLIMATE CHANGE

The analysis of the aspirations of adolescents and youths, along with the five countries' distinct contextual priorities, yields the following list of recommendations for youth involvement, by country.

Kenya

- *Join and lead school-based environmental clubs and community dialogues* that translate climate literacy into visible action, such as tree nurseries, climate-smart agriculture, and water harvesting projects
- *Use creative and interactive platforms—debates, symposiums, drama, and storytelling—*to advocate for climate action and engage peers and communities, building on approaches such as environmental clubs, tree nursery projects, and public speaking events already emerging in Kenyan schools
- *Leverage digital and media platforms,* including television, social media, and the Kenya Education Cloud's digital climate curriculum,²² to access and share climate knowledge while advocating for stronger support to counter the displacement, migration, and resource barriers that limit youth participation.

Malawi

- *Establish youth clubs* for climate education that use drama, songs, and debates to spread climate messages in culturally relevant ways
- *Promote tree planting and environmental conservation activities* to strengthen resilience and sustainability
- *Increase access to climate information* through radios, community meetings, and school programs to empower adolescents with knowledge and tools for action.

Rwanda

- *Join community work* (Umuganda) to participate in national service days focused on planting trees and preventing soil erosion
- *Create and participate in environmental clubs* that disseminate climate change information and promote sustainable practices

²² The Kenya Education Cloud is a digital platform created by the Kenya Institute of Curriculum Development (KICD) that serves as a centralized hub for e-learning, promoting access to interactive content, supporting modern pedagogical methods, and fostering collaboration among educators and learners. To explore its offerings, see <https://lms.kec.ac.ke/#frontpage-cards>.

- *Use media and technology*—including social media, radio, and TV—to spread climate change messages and engage youth in digital advocacy.

South Africa

- *Engage in ecobrick and recycling projects* to promote sustainability and reduce waste in schools and communities
- *Participate in climate change drama and role-play* as creative methods to teach and engage students in climate education
- *Advocate for climate action* through social media platforms and school campaigns to raise awareness and share solutions.

Zimbabwe

- *Form environmental clubs* in schools and communities to lead climate awareness and action initiatives
- *Actively participate in cleanup campaigns and tree planting* to promote afforestation and environmental stewardship
- *Take leadership roles* in educating peers and community members about climate change through advocacy and awareness activities.

RECOMMENDATIONS FOR SUPPORTING TEACHERS AND EDUCATORS

Teachers and educators across Kenya, Malawi, Rwanda, South Africa, and Zimbabwe face significant challenges in delivering climate education. The highlighted recommendations emphasize three critical areas of support, incorporating cross-country perspectives.

Resources and infrastructure

First, the provision of resources and infrastructure is essential to overcome systemic gaps, with the following needs emphasized, by country:

- *Kenya.* Teachers called for charts, booklets, projectors, and internet access, noting connectivity gaps in rural areas.
- *Malawi.* Visual aids, radios, and community-based resources were highlighted as essential for reaching rural learners.
- *Rwanda.* Smartphones, laptops, and projectors were requested to enable field-based learning, along with booklets and posters for tangible concepts.
- *South Africa.* Stakeholders prioritized smart boards, monitors, and projectors, especially in urban schools, and advocated for curriculum integration.
- *Zimbabwe.* Teachers emphasized the need for textbooks, internet access, and ICT gadgets to move beyond theoretical instruction.

Capacity building and training

The second area of focus is capacity building and training, which educators across all five countries identified as critical for confidence and competence in teaching climate change. Specifically, they recommended the following

- *Kenya*. Specialized training on green technologies, climate-smart agriculture, and sustainable waste management
- *Malawi*. Workshops and community learning hubs, incorporating drama and arts-based methods to engage learners
- *Rwanda*. Regular training sessions and the appointment of focal teachers to lead climate education efforts
- *South Africa*. Networking opportunities and practical case studies to enrich teacher knowledge
- *Zimbabwe*. Refresher courses, access to current climate data, and collaborative platforms for sharing strategies.

Institutional and policy support

Finally, institutional and policy support emerged as a universal need, with calls for curriculum reform, funding for resources and training, and partnerships with NGOs and local leaders to sustain climate education. These recommendations collectively underscore that effective climate education requires not only materials and technology but also systemic investment in teacher development and multistakeholder collaboration to embed climate literacy across education systems.

- *Kenya*. Teachers and educators urged increased integration of climate education across all subjects, formation of environmental clubs, and collaboration with NGOs and local businesses.
- *Malawi*. Teachers and educators advocated partnerships with NGOs and local leaders to support climate clubs and community outreach.
- *Rwanda*. Teachers and educators recommended cross-sector collaboration, including government-led awareness campaigns and adolescent-led initiatives.
- *South Africa*. Teachers and educators highlighted the need for policy-level commitment, funding, curriculum reform, and teacher incentives.
- *Zimbabwe*. Teachers and educators called strongly for climate change to be prioritized in the national curriculum and financial support for training and resources.

This list shows common priorities across all countries—such as resource provision, teacher training, and systemic support—while reflecting context-specific approaches such as Malawi’s emphasis on drama and community hubs, Rwanda’s use of Umuganda, and South Africa’s focus on digital tools and creative pedagogy.

Annex A:

Glossary of key terms

The terms in Table A.1 appear throughout this report. Definitions reflect their specific usage in the context of the study and toolkit. Sources are drawn from references cited in the report. Terms are listed alphabetically.

TABLE A.1

Definitions of key terms used throughout the report

Term	Definition	Source(s)
Adolescents	Young people ages 10-18 years. In this study, adolescents form the primary target group for climate education interventions and represent the largest cohort of study participants (n=151).	Study definition; UNICEF (2023)
Afforestation	The process of planting trees in areas where there was no previous tree cover, used in this study as a practical, hands-on climate action activity undertaken by young people in school and community settings.	Asante Africa Foundation (2023)
Agency (youth agency)	The capacity of adolescents and youths to act independently and make their own choices, particularly in the context of climate action. The study positions young people as active agents of change rather than passive recipients of education.	Kwauk and Winthrop (2021)
Carbon literacy	An understanding of the carbon costs and impacts of everyday activities and the ability to reduce emissions on an individual and organizational level. Referenced in the context of digital climate curricula developed for learners in Kenya.	UNICEF Kenya (2024)
Climate change	A long-term shift in global weather patterns and temperatures, primarily driven by human activities such as burning fossil fuels, deforestation, and greenhouse gas emissions. In this report, climate change is understood as both a threat to education systems and a subject requiring dedicated educational attention.	IPCC (2022)
Climate change education (CCE)	Formal and informal educational approaches that build knowledge, skills, values, and attitudes related to climate change, aiming to equip learners to understand climate science, assess impacts, and take meaningful action.	UNESCO and MECCE (2024)
Climate finance	Funding directed at climate change mitigation and adaptation activities. The report notes that insufficient climate finance is directed specifically to education despite the availability of cost-effective adaptation options.	Sabarwal et al. (2024); AU (2022)

Term	Definition	Source(s)
Climate justice	A framing of climate change that highlights the unequal distribution of climate impacts across different groups, particularly marginalized communities, women, and girls. The study underscores that climate justice principles should be embedded in curriculum design.	Kwauk and Steer (2023); Plan International (2024)
Climate literacy	The knowledge and understanding of the causes, impacts, and potential responses to climate change. Positioned in this report as a core outcome of effective climate education and a foundation for green skills development.	GPE (2022); UNESCO and MECCE (2024)
Climate resilience	The ability of individuals, communities, and systems to anticipate, absorb, accommodate, and recover from climate-related hazards. Building climate resilience is a central goal of the education approaches described in this toolkit.	UNICEF ESARO (2025)
Climate shocks	Sudden and severe climate-related events such as floods, cyclones, droughts, and extreme heat that disrupt livelihoods, infrastructure, and schooling. The report documents multiple climate shocks across the five study countries	UNICEF ESARO (2025); Musarandega and Masocha (2023)
Climate-smart agriculture	Agricultural practices adapted to reduce vulnerability to climate change while maintaining or improving productivity. Referenced in the context of school gardens and community farming activities used to teach climate adaptation.	Asante Africa Foundation (2023); FAO, n.d.
Climate-smart education systems	Education systems designed to withstand climate shocks and deliver climate change education effectively. Defined in the context of the Global Partnership for Education's Climate-Smart Education Systems Initiative (CSESI).	GPE (2025).
Collaborative research	A research approach in which multiple organizations work jointly to design, implement, and analyze a study. This report is the product of a collaborative research partnership led by CARE Zimbabwe and the Center for Universal Education at the Brookings Institution, involving seven partner organizations across five countries.	
Community learning hubs	Community-based spaces equipped with learning resources, including internet access, that serve as alternative or supplementary venues for climate education, particularly in areas with limited school infrastructure.	Study findings (Section 4)
Competence-based curriculum	An education framework that organizes learning around the development of specific skills and competencies rather than purely content knowledge. Rwanda's competence-based curriculum is highlighted as integrating cross-cutting issues of climate change and sustainability.	UNESCO (2024a)

Term	Definition	Source(s)
Deforestation	The clearing or removal of forests, widely recognized by study participants as a primary cause of climate change and a subject for climate education, with afforestation activities used as practical responses.	Study findings (Section 4); IPCC (2022)
Digital divide	The gap between populations with access to digital technologies and those without. This study documents a significant digital divide between adolescents (25 percent internet access) and stakeholders and teachers (87 percent and 72 percent, respectively), with major implications for technology-based climate education delivery.	ITU (2023); GSMA (2023)
Disaster risk reduction (DRR)	Systematic efforts to identify, assess, and reduce the risks of disaster. In this report, DRR is referenced in the context of school drills, standard operating procedures, and emergency education programs that help communities prepare for and respond to climate-related hazards.	GPE (2025); ECW (n.d.-b)
Early marriage	Marriage of girls below 18 years of age, often used as a coping mechanism during climate-induced economic hardship. Identified as a significant gendered consequence of climate shocks in the region.	GCA (2023); Kahomwe and Muzingili (2025)
Eco-Schools	A global program that engages schools in environmental action through a seven-step methodology, including the IVAC (Investigation–Vision–Action–Change) approach. Rwanda’s Eco-Schools are highlighted as low-cost, action-learning models demonstrating measurable gains in climate education.	ARCOS Network (2024); Copsey et al. (2024)
Education Cannot Wait (ECW)	A global fund for education in emergencies and protracted crises, referenced as a financing mechanism that has supported education continuity and disaster risk reduction messaging in climate-affected contexts.	ECW (n.d.-a, n.d.-b)
Education for Sustainable Development (ESD)	An approach to education that empowers learners with the knowledge, skills, values, and attitudes needed to make informed decisions and act responsibly in support of environmental, social, and economic sustainability.	UNESCO ESD 2030 overview (https://www.unesco.org/en/sustainable-development/education/); DBE (2024)
Education management information system (EMIS)	A system for collecting, processing, and disseminating education data to inform planning and policy. The report recommends mainstreaming climate resilience data within an EMIS to support evidence-based decisionmaking.	UNICEF ESARO (2025); Sabarwal et al. (2024)
Experiential learning	A learning approach based on hands-on, real-world experience and reflection. The report argues that climate education must be experiential to be effective, connecting classroom knowledge to community contexts and practical action.	Kwauk and Winthrop (2021); Muccione et al. (2025)

Term	Definition	Source(s)
Focus group discussion (FGD)	A qualitative data collection method involving a structured discussion with a small group of participants. FGDs were conducted in all five countries with adolescents, youths, teachers, and community members to gather in-depth perspectives on climate education.	
Food insecurity	A state in which people lack consistent access to enough food for an active, healthy life. Identified as a major driver of school absenteeism and dropout among adolescents, particularly during climate-induced droughts.	Study findings (Section 4); Sabarwal et al. (2024)
Fossil fuels	Nonrenewable energy sources—including coal, oil, and natural gas—formed from decomposed organic material. The burning of fossil fuels is identified by study participants as the primary human-driven cause of climate change.	Study findings (Section 4); IPCC (2022)
Gender-based violence (GBV)	Violence directed against a person on the basis of gender. Climate shocks are documented as heightening the risk of GBV, particularly for adolescent girls during displacement and periods of economic stress.	Chigwanda et al. (2024); Plan International (2024)
Gender-responsive education	Education design and delivery that recognizes and responds to the different needs, barriers, and vulnerabilities of girls and boys. Identified as essential for effective climate education, given the disproportionate impact of climate change on adolescent girls.	Kwauk and Steer (2023); Murphy and Fuyani (2025)
Global Partnership for Education (GPE)	An international partnership dedicated to improving education in lower-income countries, referenced in connection with the GPE's Climate-Smart Education Systems Initiative (CSESI) and education financing for climate adaptation.	GPE (2022, 2025)
Green skills	The knowledge, abilities, values, and attitudes required to live and work in sustainable ways that reduce the impact of human activity on the environment. Defined using the African Continental Qualifications framework (Gvasalia et al. 2024) definition and positioned as a key outcome of climate education.	Gvasalia et al. (2024); Sabarwal et al. (2024)
Greenhouse gas emissions	Gases released into the atmosphere that trap heat and contribute to global warming, including carbon dioxide, methane, and nitrous oxide. Cited by study participants as a primary cause of climate change.	Study findings (Section 4); IPCC (2022)
Heritage-based curriculum	Zimbabwe's national curriculum framework (2024-2030) that draws on Indigenous cultural heritage and values as a foundation for learning. The report references efforts to strengthen sustainability and climate content within this curriculum.	UNESCO (2025); Makombe (2024)

Term	Definition	Source(s)
Indigenous knowledge	Local and traditional knowledge developed by communities over generations, including practices for interpreting weather patterns, managing land, and predicting environmental change. The study emphasizes its integration into climate education to ensure cultural relevance.	Machaya (2025); AU (2022)
Inquiry-based learning	A pedagogical approach in which learners explore questions and problems through investigation and critical thinking rather than direct instruction. Referenced as one of the effective methods for climate education, particularly in teacher professional development.	Muccione et al. (2025); Fundisa for Change (n.d.)
IPCC (Intergovernmental Panel on Climate Change)	The United Nations body responsible for assessing the science related to climate change. IPCC assessments are cited in this report as key sources of evidence on climate impacts, including heat-related learning losses in Africa.	IPCC (2022)
IVAC (Investigation–Vision–Action–Change)	A four-step pedagogical methodology used in Eco-Schools programs, particularly in Rwanda, engaging students, parents, and teachers in cocreating climate action projects through a structured cycle of inquiry and action.	ARCOS Network (2024); Copsey et al. (2024)
KoboCollect	A mobile data collection platform used for fieldwork. In this study, KoboCollect was used to administer individual interview guides with adolescents, youths, teachers, and key stakeholders across all five countries	https://support.kobotoolbox.org/data_collection_kobocollect.html
Low-carbon development	Development pathways that minimize greenhouse gas emissions while supporting economic growth and human well-being. Education is positioned as a catalyst for low-carbon development by equipping young people with green skills.	UNESCO and MECCE (2024); Sabarwal et al. (2024)
Microlearning	Short, focused learning activities or content delivered in small segments, often via digital platforms. WhatsApp microlessons are highlighted in the toolkit as an effective medium-tech approach to delivering climate education to adolescents and youth.	
Mixed-methods research	A research approach that combines quantitative and qualitative methods. This study employed a mixed-methods design comprising a survey, individual interviews, and focus group discussions to generate a comprehensive evidence base.	
Nationally Determined Contribution (NDC)	A country's plan for reducing greenhouse gas emissions and adapting to climate impacts under the United Nations Framework Convention on Climate Change. Referenced in the context of policy literacy activities for youth.	UNFCCC (2021)

Term	Definition	Source(s)
Pastoralism	A livelihood system based on the raising of livestock, practiced across semiarid and arid regions. Samburu County, Kenya—one of the study sites—is characterized by pastoralism, which is under increasing threat from climate change-induced droughts.	MoALFC (2021); Asante Africa Foundation (2023)
Pedagogy	The theory and practice of teaching and learning. The report focuses on innovative pedagogies for climate education, including play-based learning, project-based learning, inquiry-based learning, and place-based approaches.	UNESCO and MECCE (2024); Muccione et al. (2025)
Peri-urban	Areas on the fringe of urban centers, combining both urban and rural characteristics. Peri-urban communities formed one of three geographic categories in this study, alongside rural and urban settings.	
Place-based learning	A pedagogical approach that uses the local environment, community, and culture as a starting point for learning. Identified as effective for making climate education relevant and contextually grounded.	Fundisa for Change (n.d.); Thenga (2025)
Play-based learning	A pedagogical approach using play activities—such as drama, songs, role-play, games, and outdoor exploration—as vehicles for learning. Found to be particularly effective for engaging adolescents in climate education and improving knowledge retention.	
Policy literacy	The ability to understand, interpret, and engage with policy frameworks and processes. The toolkit includes youth policy literacy as a high-tech activity aimed at enabling young people to participate in climate governance.	UNFCCC (2021); study toolkit (Section 5)
Project-based learning (PBL)	A student-centered pedagogical approach in which learners gain knowledge and skills by working over an extended period on a real-world project or challenge. Highlighted as an effective and innovative approach for delivering climate education.	Muccione et al. (2025); Kwauk and Winthrop (2021)
Psychosocial support	Interventions that address the mental, emotional, and social well-being of individuals affected by crises or trauma. The report notes the need for psychosocial support in schools following climate-related disasters such as cyclones and floods	Munthali (2023); Musarandega and Masocha (2023)
Purposive sampling	A nonrandom sampling method in which participants are selected based on specific characteristics relevant to the research. Used in this study to select data collection sites and participants in areas already served by the collaborative research partners.	
Rainwater harvesting	The collection and storage of rainwater for reuse on-site. Referenced as both a climate adaptation practice and a practical learning activity implemented by school communities in the study.	Asante Africa Foundation (2023); GCA (2025)

Term	Definition	Source(s)
Responsible data management (RDM)	The ethical and secure handling of data throughout its life cycle—encompassing privacy, confidentiality, consent, and other ethical principles. CARE Zimbabwe’s RDM guidelines governed data collection and management in this study.	Study methodology (Section 3); UNICEF Ethics in Evidence Generation training (https://agora.unicef.org/course/info.php?id=33813)
Scalability	The capacity of a program or intervention to be expanded in scope or reach without compromising quality or effectiveness. The report assesses the scalability of various climate education approaches, particularly in low-connectivity settings.	Kemeni Kambiet and Mbah (2025); Muccione et al. (2025).
Sex disaggregation	The breakdown of data by sex (male and female) to reveal differences in outcomes, access, or participation. Sex-disaggregated analysis in this study highlights gendered patterns in climate education access and impact.	
Solutions journalism	A form of reporting that focuses on responses to social problems rather than solely on the problems themselves. Referenced in the toolkit as a high-tech activity enabling youth to communicate climate action stories.	
Standard operating procedures (SOPs)	Documented instructions for carrying out routine operations. SOPs have been developed under the GPE Climate-Smart Education Systems Initiative (CSESI) in Malawi to guide school safety drills and continuity of learning during climate-related emergencies.	GPE (2025)
Sustainable Development Goals (SDGs)	A collection of 17 interlinked global goals adopted by the United Nations in 2015 as part of the 2030 Agenda for Sustainable Development. SDGs 4 (Quality Education), 5 (Gender Equality), and 13 (Climate Action) are highlighted as particularly relevant to the nexus between education and climate change.	GPE (2022); Kwauk and Winthrop (2021)
Teacher professional development (TPD)	Ongoing learning opportunities that support teachers in strengthening their knowledge, skills, and practice. Identified as a critical enabler of effective climate education. The toolkit includes a dedicated TPD section with webinar outlines, design sprints, and classroom assessment tools.	Wadson et al. (2023); Thenga et al. (2021)
Transformative education	An approach to education that challenges assumptions, develops critical thinking, and promotes active engagement with social and environmental issues. Referenced as an aspiration for climate education, contrasted with content-transmission approaches.	UNESCO and MECCE (2024); Muccione et al. (2025).

Term	Definition	Source(s)
UNFCCC (United Nations Framework Convention on Climate Change)	The international treaty under which countries cooperate to limit global warming and adapt to climate impacts. Referenced in connection with Nationally Determined Contributions and global climate commitments.	UNFCCC (2021)
Waste audit	A systematic assessment of the types and quantities of waste generated by a school or community, used in the toolkit as a practical low-tech activity through which learners investigate environmental impacts and develop climate action skills.	
Whole-school approach	An approach that engages the entire school community—students, teachers, administrators, parents, and the wider community—in working toward a shared goal. Identified as a promising practice for climate education across the region.	ARCOS Network (2024); UNICEF ESARO (2025)
Youths	Young people (ages 19-35) as defined in this study. Youths represent a distinct cohort from adolescents (ages 10-18) and bring different experiences, income sources, and educational attainment levels that shape their engagement with climate education.	

SOURCE: Author's compilation.

Annex B:

Demographic profile of participants

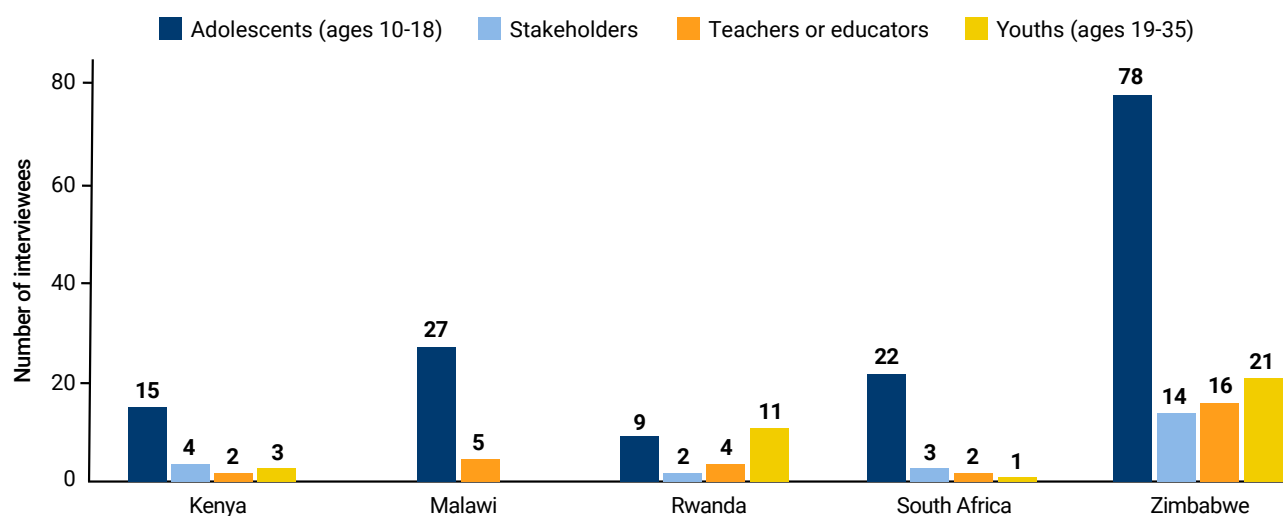
COUNTRY-LEVEL DISTRIBUTION

Overall, 239 people participated in the individual interviews conducted in 11 districts across five countries (Kenya, Malawi, Rwanda, South Africa, and Zimbabwe), as shown in Figure B.1 and Table B.1:

- Adolescents (10-18 years): 151 participants
- Youth (19-35 years): 36 participants
- Teachers and educators: 29 participants
- Stakeholders: 23 participants.

FIGURE B.1

Individual interviewees comprised four groups, distributed across five countries



SOURCE: Author.

TABLE B.1

The study interviewed 239 participants across 11 districts in five countries

Country	Number of districts	Names of districts	Interview participants
Kenya	1	Samburu	24
Malawi	1	Mulanje	32
Rwanda	1	Rubavu	26
South Africa	3	Pietermaritzburg, uMgungundlovu, Western Cape	28
Zimbabwe	5	Buhera, Chiredzi, Chitungwiza, Mutare, Mutoko	129
Total	11	n.a.	239

SOURCE: Author.

NOTE: n.a. = not applicable.

GEOGRAPHICAL LOCATION

Rural areas dominated the respondents: adolescents (117) and youths (31) are from rural regions (Table B.2). Urban areas have more educators and stakeholders compared to peri-urban. Peri-urban regions have moderate representation across all profiles

TABLE B.2

The study sample's geographic distribution varies by profile type

Geographic location type	Adolescent (10-18 years)	Youth (19-35 years)	Teacher or educator	Stakeholder
Peri-urban	18	4	2	5
Rural	117	31	19	9
Urban	16	1	8	9

SOURCE: Author.

SEX DISAGGREGATION

Overall, female constituted 51.88 percent while males constituted 48.12 percent of the individual interviewees. Table B.3 shows a summary of the sex-disaggregated data by profile of participant.

Adolescents have a higher proportion of females (55 percent) than males (45 percent). Youths, teachers, and stakeholders show a slight male majority (around 52-56 percent). Overall, gender distribution is relatively balanced across profiles, with adolescents being the most female-dominated group.

TABLE B.3

The sex-disaggregated data, by profile, shows a balanced sample distribution

Profile	Female	Male
Adolescent (10-18 years)	83 (55.0%)	68 (45.0%)
Youth (19-35 years)	16 (44.4%)	20 (55.6%)
Teacher or educator	14 (48.3%)	15 (51.7%)
Stakeholder	11 (47.8%)	12 (52.2%)

SOURCE: Author's calculations.

MARITAL STATUS

Single status is overwhelmingly the most common marital status (n=182), and nearly all adolescents (10-18 years) fall into this category (151 out of 182). This aligns with expectations because adolescents are typically unmarried. Married status is the second most common status (n=51), but it is almost exclusively found among teachers and educators (22) and stakeholders (18). Youths (19-35 years) also show some representation (11) in the married status, but none among adolescents. Divorced (3), widowed (2), and separated (1) are rare and appear only among adult profiles (teachers/educators and stakeholders).

Based on this study design, climate education strategies for adolescents can assume a predominantly single demographic. For adult educators and stakeholders, marital diversity may influence engagement styles or scheduling flexibility.

EDUCATION LEVEL

The majority of adolescents are in secondary education (54.3 percent), and a significant portion (45.7 percent) are still in primary school. Nearly half of adolescents are still in primary education, indicating that a significant portion may have limited exposure to advanced climate education content. Climate education strategies for adolescents should be tailored to both primary and secondary levels, using age-appropriate and simplified content for younger learners (Figures B.2 and B.3).

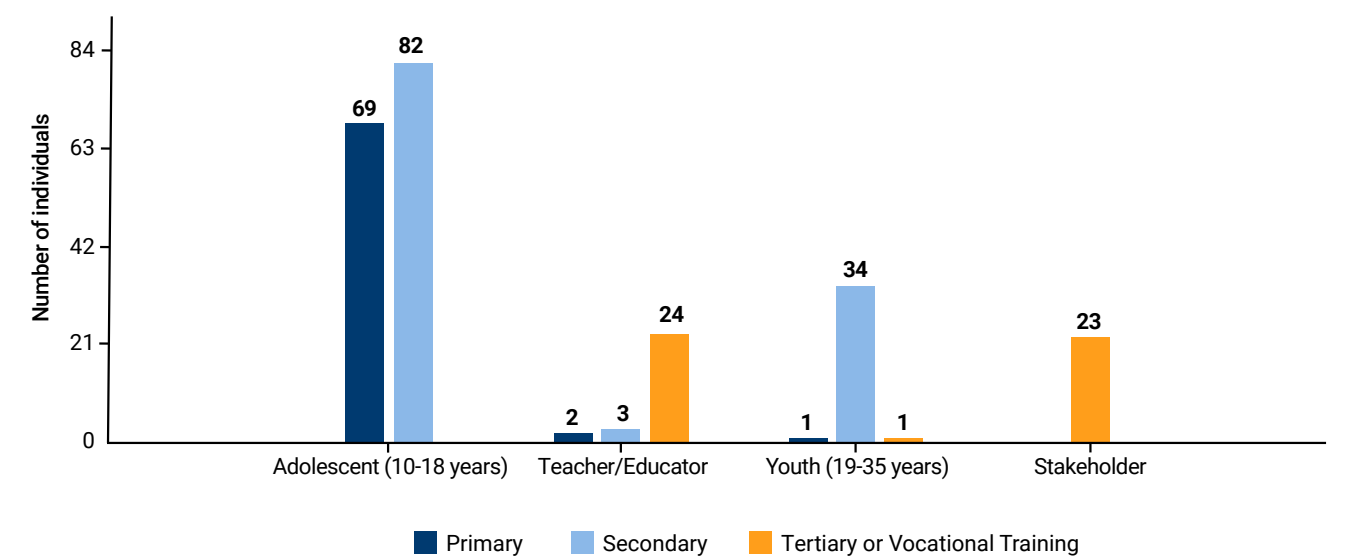
Almost all youths (94.4 percent) have secondary education, with very few in primary or tertiary. Thus, programs for youths should focus on bridging the gap between secondary knowledge and practical climate action skills, possibly through vocational training and community-based projects.

Teachers and educators have predominantly tertiary or vocational training (82.8 percent), as expected. Majority have tertiary or vocational training, which is positive for delivering structured climate education. A small fraction (17.2 percent) are at the primary or secondary level, suggesting potential disparities in teaching capacity and depth of knowledge; however, it is unclear whether this figure captures their education level or the level at which they are teaching. In any case, continuous professional development and refresher courses are essential to ensure all educators can effectively teach climate concepts.

All stakeholders who participated in the study have tertiary or vocational training. Stakeholders are well educated, which positions them as key influencers and resource providers. They can play a strategic role in policy advocacy, resource mobilization, and support schools with infrastructure and technology for climate education.

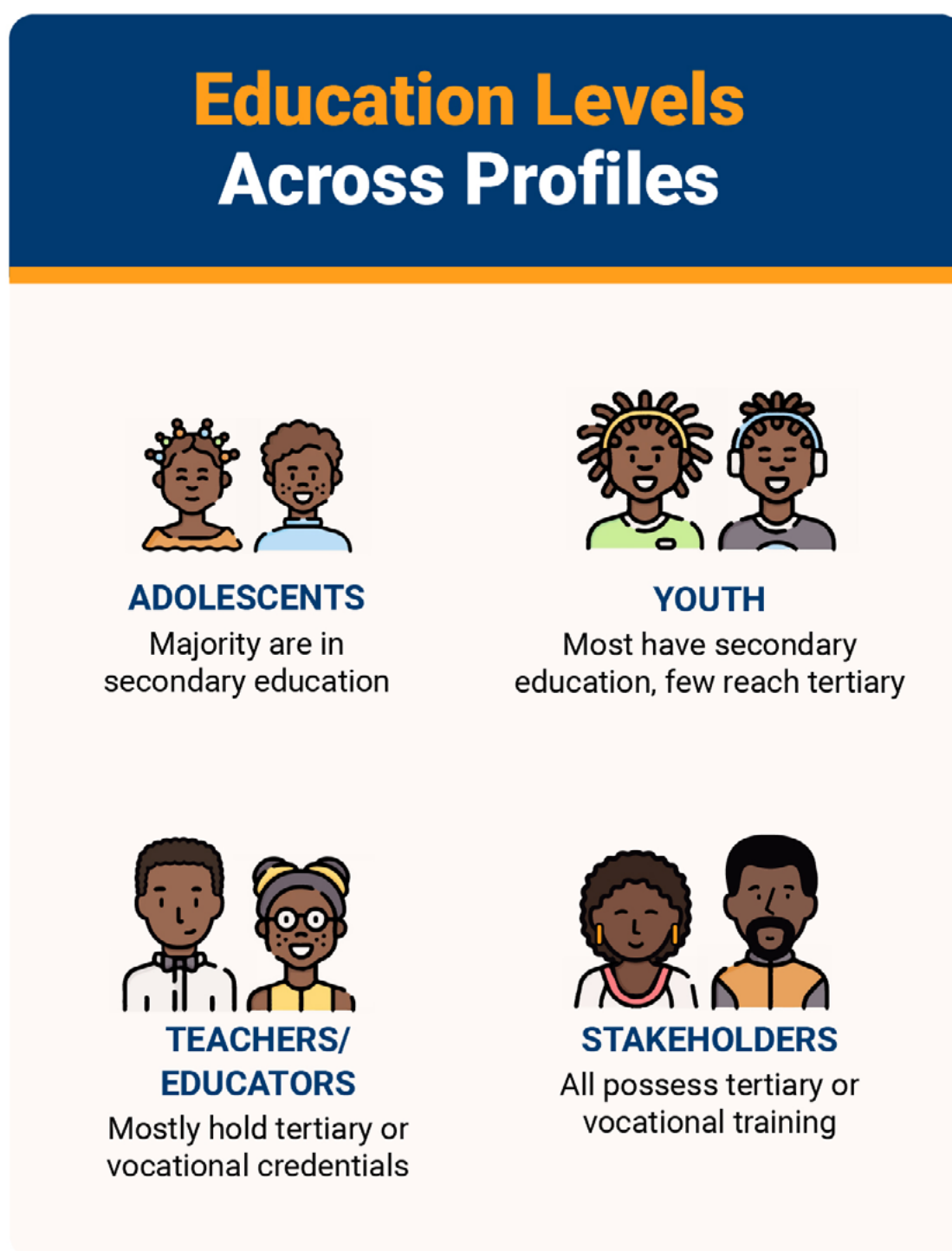
FIGURE B.2

Climate education strategies for adolescents and youths should be tailored to their respective education levels of study participants



SOURCE: Author.

The education level of each profile is summarized



SOURCE: Author.

The findings point to a gap between adolescents and teachers: while teachers are highly qualified, adolescents are mostly at basic education levels. This mismatch requires innovative pedagogies (e.g., play-based learning and use of visual aids) to make complex climate concepts accessible. The limited tertiary education among youths suggests a need for nonformal education channels like community workshops, online courses, and peer-led initiatives. Stakeholders' high education levels should be leveraged for mentorship programs and partnerships to address resource gaps in schools.

INCOME SOURCES

Climate change is disrupting education and livelihoods in Zimbabwe and other regions, with adolescents (10-18 years) and youths (19-35 years) facing distinct vulnerabilities. The study data shows that adolescents rely heavily on guardians (96 percent) for income, making them highly dependent on household stability (jeopardized by shocks such as droughts and floods). On the other hand, youths diversify income through entrepreneurship (30-40 percent), employment (25-30 percent), and agriculture (15-20 percent) but remain vulnerable to instability when exposed to climate shocks. In addition, guardian support is much lower for youths than for adolescents. Government support is negligible for both groups, indicating limited social safety nets.

Teachers in the dataset are primarily employed and occasionally engaged in entrepreneurship or part-time work. Guardian support is irrelevant for this group, and government benefits or retirement income are minimal. Because teachers have stable income and access to technology, they are ideal for capacity-building programs and can be leveraged as knowledge hubs for adolescents and youths. Programs should focus on training teachers in climate pedagogy and providing resources (ICT tools and teaching aids).

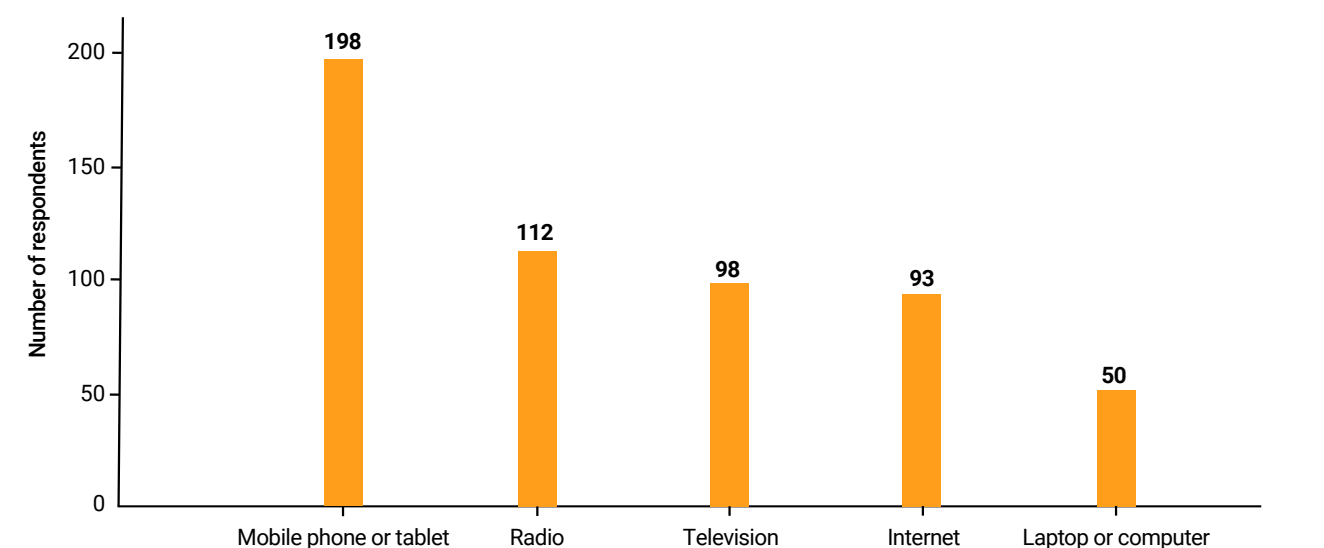
Meanwhile, stakeholders have stable income streams, mainly from employment, and entrepreneurship and agriculture supplement their income. Thus they can fund and support community programs through their networks. Programs should focus on capacity building for educators and collaboration with stakeholders for outreach and resource mobilization. They (stakeholders) are also well positioned to advocate for policy changes and fund climate education initiatives.

ACCESS TO TECHNOLOGY

The study found that mobile phones dominate access (198), followed by radio (112) and television (98). Internet access is relatively low (93) as depicted in Figure B.4.

FIGURE B.4

Mobile phones were the dominant technology used among respondents across all profiles



SOURCE: Author.

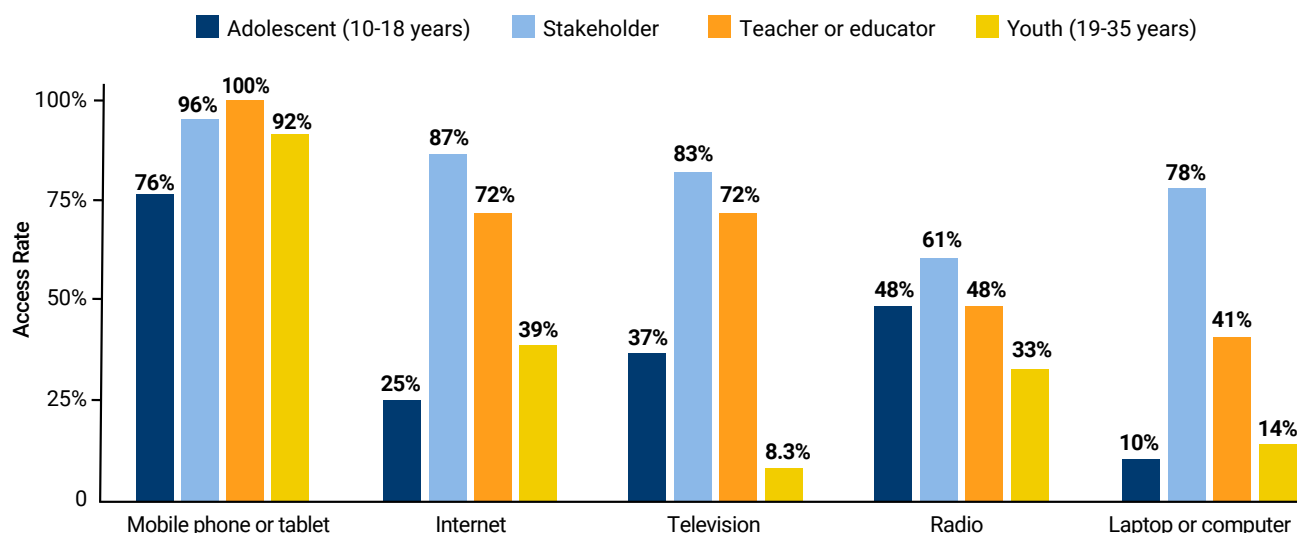
Mobile phone access is nearly universal across all profiles (75-100 pe cent). Internet access is highest among stakeholders (87 percent) and teachers (72 percent), but much lower for adolescents (25 percent). Television and radio are common for Adolescents (36 percent and 48 percent, respectively), but television access is very low for youths (8 percent). Laptop or computer access is strongest among stakeholders (78 percent) and teachers (41 percent) but minimal for adolescents (10 percent). About 11 percent of adolescents report having no access to technology—a response that is almost negligible for the other groups.

An analysis of the Figure B.5 and Table B.4 shows the following:

- *Mobile phones* have a high penetration across all profiles (76 pe cent among adolescents, 92 percent among youths, 100 percent among teachers, and 96 percent among stakeholders).
- *Internet* access rates show a significant disparity, with 87 pe cent among stakeholders and 72 percent among teachers, compared with 25 percent among adolescents and 39 percent among youths.
- *Laptop or computer* access is very low among adolescents (10 percent) and youths (14 percent) but far higher for stakeholders (78 percent).
- *Traditional media* such as radio remains relevant in rural areas (among 48 percent adolescents), whereas television access is concentrated among urban stakeholders and teachers.

FIGURE B.5

Access rates for each technology type vary across profiles



SOURCE: Author's calculations.

TABLE B.4

Disparities in access to technology, by profile, indicate a need for multiplatform climate education strategies

Profile	Mobile phone (%)	Internet (%)	Television (%)	Radio (%)	Laptop or computer (%)
Adolescent (10-18 years)	76	25	37	48	10
Youth (19-35 years)	92	39	8	33	14
Teacher or educator	100	72	72	48	41
Stakeholder	96	87	83	61	78

SOURCE: Author's calculations.

These patterns are consistent with broader regional evidence. According to the Mobile Gender Gap Report 2023, women and girls in sub-Saharan Africa remain significantly less likely than men and boys to own a mobile phone or access mobile internet, with a gender gap of 36 percent in mobile internet use across the region (GSMA 2023). The International Telecommunication Union estimates that only 22 percent of individuals in least developed countries used the internet in 2023, compared with 68 percent in developed countries, with rural areas and youth in lower-income households disproportionately excluded (ITU 2023). This study's finding that only 25 percent of adolescents had internet access—compared with 87 percent of adult stakeholders—reflects a structural divide that any climate education strategy must account for.

Rural areas, which dominated the responses, have limited access to the internet and laptops. Urban areas show higher access to the internet and laptops, but still not universal. Peri-urban areas fall between rural and urban areas, often closer to rural areas in terms of resource constraints.

Rural and peri-urban areas have severe deficits in terms of internet and lap op access. Urban areas have better access to digital, multimedia tools, whereas rural areas rely on radio and printed materials. In terms of infrastructure, rural zones face electricity and connectivity challenges that hinder technology adoption.

The digital divide limits climate education for adolescents and youths in rural and peri-urban areas. Teachers and stakeholders have better access, but lack of infrastructure and resources hinders inclusive learning. Traditional media (radio) remains a critical channel for rural outreach.

MODE OF TRANSPORTATION

Walking is the dominant mode of transportation among adolescents (about 67 percent) and youths (about 58 percent), indicating reliance on nonmotorized transportation (Table B.5). Stakeholders prefer private transportation (50 percent), likely owing to their higher economic status. Teachers and educators show a more balanced mix, with public transportation (36 percent) and walking (33 percent) being common. Cycling or motorcycle use is minimal across all profiles but highest among adolescents (about 7 pe cent).

High reliance on walking (66-58 percent) among adolescents and youths suggests limited financial resou ces for private or motorized transportation. Many come from rural or peri-urban areas where public transportation is scarce or unaffordable. Stakeholder preference for private transportation (50 percent) reflects higher income and access to vehicles. For teachers and educators, the mixed use of public and walking indicates moderate income and occasional access to private transportation.

TABLE B.5

Predominance of walking as a mode of transportation among adolescents and youths may be a constraint on climate education access

Profile	Public (%)	Private (%)	Cycling or motorcycle (%)	Walking (%)
Adolescent (10-18 years)	22.99	2.87	7.47	66.67
Youth (19-35 years)	38.18	1.82	1.82	58.18
Teacher or educator	36.11	19.44	11.11	33.33
Stakeholder	29.41	50.00	2.94	17.65

SOURCE: Author’s calculations.

Rural areas often lack reliable public transportation infrastructure, making walking the default option. Urban or

peri-urban areas show slightly higher use of public transportation due to better availability. Poor road networks and lack of cycling lanes discourage cycling or motorcycle use, which remains very low across all profiles. Availability of public transportation (buses, shared taxis) influences public transportation uptake. In some communities, cycling may be culturally less accepted or considered unsafe, especially for adolescents. Gender norms can also affect mobility choices (e.g., girls walking in groups for safety).

As highlighted in the literature review (Section 2 of the report), climate conditions (such as heat or floods) can limit walking or cycling during certain seasons. With floods and heavy rains in rural and peri-urban areas, roads often become impassable, forcing adolescents and youths to walk longer distances or miss school entirely. Public transportation may also stop operating during floods. Cyclones and storms contribute to damage to infrastructure (bridges and roads), which reduces access to motorized transportation and increases reliance on walking.

In addition, high temperatures make walking uncomfortable and sometimes unsafe, but lack of alternatives means adolescents still walk, whereas teachers and stakeholders may opt for private cars to avoid exposure. Drought reduces household income (agriculture failure), limiting ability to pay for public or private transportation. In dry seasons, walking remains dominant, but long distances under heat stress affect attendance and concentration. Urban areas with better infrastructure maintain public transportation even during adverse weather, whereas rural areas experience complete reliance on walking during climate shocks.

Annex C:

Toolkit annex—resource directory (links)

BBC Media Action iLearn climate courses: <https://www.bbcmmediaactionilearn.org/learn/public/catalog/view/27>.

BBC Media Action climate policy note, “... and Action! How Media Can Address Climate Change in Countries Most Affected” (BBC 2021) (pdf): <https://downloads.bbc.co.uk/mediaaction/pdf/climate-policy-note-2021.pdf>

Eco-Schools global: <https://www.ecoschools.global/>.

Eco-Schools Handbook (WWF 2024) (pdf): https://wwffoundation.org/wp-content/uploads/2024/12/EN-ECO-SCHOOLS-HANDBOOK-2024_compressed.pdf.

EIAP (Education International Asia-Pacific Region) Teach for Climate Action Toolkit (pdf) (EIAP 2021): https://eiwebsite.blob.core.windows.net/uploads/20211012_035029_EIAP%20Teach%20for%20Climate%20Action_toolkit%2012-Oct-2021.pdf?sv=2019-10-10&ss=b&srt=o&sp=rdx&se=2030-05-26T22:00:00Z&st=2020-05-26T14:11:47Z&spr=https,http&sig=fqIBElD9cO6/PzqL90FD54Ufvt33KDBvH/hM9wslvLA%3D.

FAO (Food and Agriculture Organization of the United Nations) Youth in Agriculture portal: <https://www.fao.org/africa/youth-in-agriculture/en>.

FEE (Foundation for Environmental Education) Academy online courses: <https://www.fee.global/fee-academy>.

GCA (Global Center on Adaptation) Youth Adaptation Forum, Climate-Resilient Agriculture (factsheet): <https://gca.org/reports/factsheet-youth-adaptation-forum-climate-resilient-agriculture/>.

GSMA Mobile Internet Skills Training Toolkit (overview) (Abdullahi 2020): <https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-for-development/region/sub-saharan-africa-region/improving-mobile-internet-access-through-digital-literacy/>.

IFRC (International Federation of Red Cross and Red Crescent Societies) Handbook for a School-Based Risk Reduction (IFRC 2022) (pdf): <https://preparecenter.org/wp-content/uploads/2022/06/RCRC-Handbook-for-CSS.pdf>.

K12 Climate Action and The Nature Conservancy “This is Planet Ed” Youth Climate Action Toolkit (pdf): <https://www.thisisplaneted.org/img/YCAT.pdf>.

MCE: Youth Climate Education Toolkit (pdf) (MCE 2023): https://mcecleanenergy.org/wp-content/uploads/2023/04/Youth-Climate-Education-Toolkit_082224_Digital.pdf.

NDC partnership (CARE, Global Center on Adaptation, and Norwegian Agency for Development Cooperation [Norad]) Toolkit for Youth on Adaptation & Leadership: <https://ndcpartnership.org/knowledge-portal/climate-toolbox/toolkit-youth-adaptation-leadership#:~:text=The%20Toolkit%20for%20Youth%20on,solution%20to%20the%20climate%20crisis>.

UN CC:eLearn *Climate Change in the Classroom: UNESCO Course for Secondary Teachers on Climate Change Education for Sustainable Development* (UNESCO 2013) (pdf): <https://www.uncclearn.org/wp-content/uploads/library/pdf.pdf>.

UNDP (United Nations Development Programme) Climate Box Toolbox: <https://climate-box.com/toolkit/#:~:text=The%20Climate%20Box%20toolkit%20is,left%20corner%20of%20this%20page>.

UNDRR (United Nations Office for Disaster Risk Reduction) IDDRR (International Day for Disaster Risk Reduction) Toolkit 2024 and Stop Disasters Game: <https://iddrr.undrr.org/toolkit>.

UNESCO best practice, Impact of the GSMA Mobile Internet Skills Training Toolkit (MISTT) (pdf) (UNESCO 2022): https://media.unesco.org/sites/default/files/webform/ed3002/79_The_GSMA_Mobile_Internet_Skills_raining_Toolkit_.pdf.

UNESCO Education for Sustainable Development (ESD) 2030 overview: <https://www.unesco.org/en/sustainable-development/education>.

UNESCO ESD Toolkit (McKeown 2022) (pdf): <https://unesdoc.unesco.org/ark:/48223/pf0000152453>.

UNICEF Toolkit for Young Climate Activists: <https://www.unicef.org/lac/en/toolkit-young-climate-activists>.

WMO (World Meteorological Organization) Early Warnings For All Action Plan for Africa: <https://wmo.int/news/media-centre/early-warnings-all-action-plan-africa-launched>.

References

- Abdullahi, M. 2020. "Improving Mobile Internet Access Through Literacy (blog)." September 4, 2020 (last modified December 7, 2023). Overview of the GSMA Mobile Internet Skills Training Toolkit. GSMA (Global System for Mobile Association). <https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-for-development/blog/improving-mobile-internet-access-through-digital-literacy/>.
- ARCOS Network. n.d. "Four Years of Transformative Impact: Rwanda's Eco-Schools Programme Delivers Sustainable Education." Article. ARCOS Network. <https://arcosnetwork.org/?p=13011>.
- Asante Africa Foundation. 2023. "2023 Top 10 Extraordinary Moments." Web page. Asante Africa Foundation. <https://asanteafrica.org/2023-top-10/>.
- AU (African Union). 2022. "African Union Climate Change and Resilient Development Strategy and Action Plan (2022–2032)." AU. <https://au.int/en/documents/20220628/african-union-climate-change-and-resilient-development-strategy-and-action-plan>.
- BBC (British Broadcasting Corporation). 2021. " ... and Action! How Media Can Address Climate Change in Countries Most Affected." Media Action policy note. BBC.
- Chen, T., and D. Das. 2025. "Evaluation of the Impact of the 1.5 MAX Initiative on Climate Change Education in Malawi Secondary Schools: An Education for Sustainable Development Framework Approach." *Current Issues in Comparative Education* 27 (1): 124–52. <https://doi.org/10.52214/cice.v27i1.13212>.
- Chevallier, R. 2010. "South Africa's Dilemma : Reconciling Energy-Climate Challenges with Global Climate Responsibilities." In *Climate Change and Trade: The Challenges for Southern Africa*, edited by P. Draper and I. Mbirimi, 145–74. Fanele.
- Chigwanda, E., P. Mutopo, and N. Mutanana. 2024. "The Health-Related Impacts of Climate Change Faced by In-School Adolescent Girls in Rural Zimbabwe." *Journal of Education and Practice* 15 (6): 34–49. <https://doi.org/10.7176/JEP/15-6-04>.
- Copsey, O., J. P. Kubwimana, S. Kanyamibwa et al. 2024. "Climate Action to Enable Quality Education: Exploring the Potential of Eco-Schools to Reverse the Triple Education Crises in Rwanda." *Global Social Challenges Journal* 3 (1): 84–106. <https://doi.org/10.1332/27523349Y2024D000000016>.
- Daily Nation. 2025. "How Climate Education Is Taking Root in Kenyan Schools." *Daily Nation*, July 22, 2025. <https://nation.africa/kenya/health/-how-climate-education-is-taking-root-in-kenyan-schools-5126476>.
- DBE (Department of Basic Education, South Africa). 2024. "Addressing the Impact of Climate Change in Schools." Archived article. DBE. <https://www.education.gov.za/ArchivedDocuments/ArchivedArticles/Addressing-the-impact-of-climate-change-in-schools-0524.aspx>.
- ECW (Education Cannot Wait). n.d.-a. "ECW in Malawi: Addressing the Educational Needs of Girls and Boys Impacted by Devastating Cyclones in Malawi." Program information. ECW. <https://www.educationcannotwait.org/our-investments/where-we-work/malawi>.

- ECW (Education Cannot Wait). n.d.-b. "ECW in Zimbabwe: Addressing the Educational Needs of Girls and Boys Impacted by Devastating Cyclones in Zimbabwe." Program information. ECW. <https://www.educationcannotwait.org/our-investments/where-we-work/zimbabwe>.
- EIAP (Education International Asia-Pacific Region). 2021. "Teach for Climate Action: An Advocacy Toolkit on Climate Change Education for Educators and Their Unions." EIAP.
- FAO (Food and Agriculture Organization of the United Nations). n.d. "Youth in Agriculture." Online portal. FAO Regional Office for Africa. <https://www.fao.org/africa/youth-in-agriculture/en>.
- Fitzpatrick, R., and D. Amenyia. 2023. "Climate Change and Education in Kenya." Research report, Education Development Trust.
- Fitzpatrick, R., and W. Muhika. 2023. *The Impact of Climate and Environmental Change on Education in Rwanda: A Survey of School Leaders*. Education Development Trust.
- Fundisa for Change. n.d. "What Is Fundisa for Change?" Website home page. Fundisa for Change. <https://fundisaforchange.co.za/>.
- GCA (Global Center on Adaptation). 2023. "Education." In *State and Trends in Adaptation Report 2022: Adaptation at the Core of a Prosperous Africa in an Uncertain and Warming World*, 384–403. GCA. https://gca.org/wp-content/uploads/2023/01/GCA_State-and-Trends-in-Adaptation-2022_Education.pdf.
- GCA (Global Center on Adaptation). 2025. "Climate-Resilient Agriculture." Youth Adaptation Forum factsheet. GCA.
- Government of Kenya. 2021. "National Climate Change Learning Strategy (2021–2031)." Strategy document, Ministry of Environment and Forestry.
- GPE (Global Partnership for Education). 2023. "Toward Climate-Smart Education Systems: A 7-Dimension Framework for Action." Working paper. GPE.
- GPE (Global Partnership for Education). 2025. "Malawi: Building a Climate-Smart Education System for the Future." Country journeys story, GPE. <https://www.globalpartnership.org/results/country-journeys/malawi-building-climate-smart-education-system-future>.
- GSMA (Global System for Mobile Association). 2023. "The Mobile Gender Gap Report 2023." Annual research report. GSMA.
- Gvasalia, S., M. Pelucchi, and A. C. Gatti. 2024. "Green and Digital Skills Analysis in 4 African Countries: Based on Online Job Ads Data." Report. African Continental Qualifications framework. http://www.acqf.africa/skills-data-focus/green-skills/green-skills-reports-and-presentations/green-and-digital-skills-analysis-in-africa-updated-in-nov-2024/@display-file/file/ACQF_Skills%20Data%20ocus_Green%20&%20digital%20Skills_Africa%20_Report_WEB.pdf.
- GWR (Guinness World Records). 2025. "Longest Marathon Hugging a Tree." GWR. <https://www.guinnessworldrecords.com/world-records/118275-longest-time-to-hug-a-tree>.

- IFRC (International Federation of Red Cross and Red Crescent Societies). 2022. "Handbook for a School-Based Risk Reduction Initiative." Handbook for trainers. IFRC.
- IFRC (International Federation of Red Cross and Red Crescent Societies). 2023. "Rwanda Floods and Landslides: Operational Update." Situation report. IFRC. <https://reliefweb.int/attachments/855cfc43-2e05-4286-b4ec-c687f336b533/MDRRW022du1.pdf>.
- IPCC (Intergovernmental Panel on Climate Change). 2022. "Africa." In *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, edited by H.-O. Pörtner, D. C. Roberts, M. Tignor et al., 1285–1455. <https://www.ipcc.ch/report/ar6/wg2/chapter/chapter-9/>.
- ITU (International Telecommunication Union). 2023. *Measuring Digital Development: Facts and Figures 2023*. ITU Publications. <https://www.itu.int/itu-d/reports/statistics/facts-figures-2023>.
- Kahomwe, L., and T. Muzingili. 2025. "Impact of Climate Change Disasters on Access to Education and Coping Mechanisms for Rural Learners in Zimbabwe." *Cogent Education* 12 (1): 2517505. <https://doi.org/10.1080/2331186X.2025.2517505>.
- Kemeni Kambiet, P. L., and M. F. Mbah. 2025. "Climate Change Education in African Higher Education Institutions: Insights into Current Practices and Future Directions." In *Practices, Perceptions and Prospects for Climate Change Education in Africa*, edited by M. F. Mbah, P. Molthan-Hill, and E. L. Molua, 35–69. Springer.
- Kenya EiE WG (Kenya Education in Emergencies Working Group). 2023. "Drought July 5Ws Report." August 22, 2023. Kenya EiE WG. https://kenya-eie-wg.github.io/eie_wg_5ws/reporting_jul2023.html.
- Kwauk, C., and L. Steer. 2023. "Four Ways that Climate Change Impacts Girls' Education in Africa." Global Center on Adaptation blogs, January 24, 2023. <https://gca.org/4-ways-that-climate-change-impacts-girls-education-in-africa/>.
- Kwauk, C., and R. Winthrop. 2021. "Unleashing the Creativity of Teachers and Students to Combat Climate Change: An Opportunity for Global Leadership." Article, March 26, 2021. Brookings Institution. <https://www.brookings.edu/articles/unleashing-the-creativity-of-teachers-and-students-to-combat-climate-change-an-opportunity-for-global-leadership/>.
- Machaya, T. 2025. "The Integration of Indigenous Knowledge into Climate Change Education: A Case of the Advanced Level Geography Curriculum in Zimbabwe." Doctoral thesis. University of Fort Hare. <http://hdl.handle.net/20.500.11837/3408>.
- Makombe, E. 2024. "Climate Change Research and Education in Zimbabwean Universities (blog)." Independent Social Research Foundation. <https://isrf.org/blog/climate-change-research-and-education-in-zimbabwean-universities>.
- Mazuruse, G., and B. Nyagadza. 2025. "Barriers to Adopting Climate Change Awareness and Education in Zimbabwe: A Hybrid Structural Equation Modelling and Extreme Gradient Boosting Approach." *Quality & Quantity* 60 (1): 2883–2912. <https://doi.org/10.1007/s11135-025-02384-4>.
- MCE. 2023. "Youth Climate Education Toolkit." MCE.

- McKeown, R. 2002. "Education for Sustainable Development Toolkit." Version 2. Program and meeting document. United Nations Educational, Cultural and Scientific Organization (UNESCO).
- MINEMA (Ministry in Charge of Emergency Management). 2024. "Republic of Rwanda: National Action Plan for Building Country Resilience to Geohazards." MINEMA.
- MoALFC (Ministry of Agriculture, Livestock, Fisheries and Cooperatives). 2021. "Kenya County Climate Risk Profile: Samburu County" MoALFC Climate Risk Profile Series. Alliance Biodiversity International CIAT (International Center for Tropical Agriculture). <https://cgspace.cgiar.org/server/api/core/bitstreams/6bec36a6-9d53-4a6b-bca1-af7abbf0396b/content>.
- MoPSE (Ministry of Primary and Secondary Education). 2024. "Heritage-Based Curriculum Framework for Primary and Secondary Education 2024-2030." MoPSE, Zimbabwe. <https://www.scribd.com/document/890272184/Heritage-Based-Curriculum-Framework-for-PSE-2024-2030-to-Share>.
- Muccione, V., T. Ewen, and S. A. Vaghefi. 2025. "A Scoping Review on Climate Change Education." *PLOS Climate* 4 (1): e0000356. <https://doi.org/10.1371/journal.pclm.0000356>.
- Munthali, A. 2023. "Overburdened School Accommodates Displaced Students in the Aftermath of Cyclone Freddy." Article, May 31, 2023. UNICEF (United Nations Children's Fund) Malawi. <https://www.unicef.org/malawi/stories/overburdened-school-accommodates-displaced-students-aftermath-cyclone-freddy>.
- Murphy, M., and X. Fuyani. 2025. "Global Challenges, Local Narratives: Participatory Climate Education for Girls." South Africa case study final report. MECCE (Monitoring and Evaluating Climate Communication and Education) Project. <https://mecce.ca/publications/global-challenges-local-narratives/>.
- Murwira, S. 2024. "Zimbabwe's Education System Struggling to Stay Among Africa's Best amid Worsening Economic Crisis." Article, June 3, 2024. Development Aid. <https://www.developmentaid.org/news-stream/post/180226/zimbabwes-education-crisis>.
- Musarandega, H., and W. Masocha. 2023. "Disasters and the Education System: Cyclone Idai and Schooling Disruption in Eastern Chimanimani, Zimbabwe." *Jambá: Journal of Disaster Risk Studies* 15 (1): a1349. <https://doi.org/10.4102/jamba.v15i1.1349>.
- Nyerere, J., W. Gatwiri, and R. Okinyi. 2021. "Kenya's Climate Change Policy Actions and the Response of Higher Education." Transforming Universities for a Changing Climate, Working Paper No. 4. Institute of Education, UCL.
- OECD (Organisation for Economic Co-operation and Development). 2025. "Education at a Glance 2025: South Africa." Country note. OECD. https://www.oecd.org/en/publications/education-at-a-glance-2025_1a3543e2-en/south-africa_a1603bbe-en.html#section-d1e127.
- OCHA (United Nations Office for the Coordination of Humanitarian Affairs). 2023. "Drought Response Plan: Kenya, January 2023–December 2023." OCHA.
- Olingo, A., and S. Oduor. 2024. "How Climate Change Is Hitting Kenyan Girls' Education." *Daily Nation* story, October 9, 2024. The Fuller Project and *Daily Nation*. <https://www.fullerproject.org/climate-change-education-kenya/>.

- Plan International. 2024. "Real Choices, Real Lives: Climate Change and Girls' Education—Insights from Benin, Togo, and Uganda." Research report. Plan International.
- Sabarwal, S., S. Venegas Marin, M. Spivack, and D. Ambasz. 2024. "Choosing our Future: Education for Climate Action." Report No. 293267, World Bank.
- SANBI (South African National Biodiversity Institute). 2026. "Fundisa for Change Programme." Web page. SANBI. <https://www.sanbi.org/community-initiatives/fundisa-for-change-programme/>.
- Thenga, M. 2025. "Barriers and Opportunities in Implementing Climate Change Education in the FET Phase Geography Curriculum in South Africa." *Journal of Geography Education in Africa* 8 (1): 1–15. <https://doi.org/10.46622/jogea.v8i1.5382>.
- Thenga, M., P. Goldschagg, R. Ferguson, and C. Mandikonza. 2021. "Teacher Professional Development and Geography Teachers' Pedagogical Practices for Climate Change Education." *Southern African Journal of Environmental Education* 36 (3): 190–205. <https://doi.org/10.4314/sajee.v36i1.17>.
- UNESCO (United Nations Educational, Scientific and Cultural Organization). 2013. *Climate Change in the Classroom: UNESCO Course for Secondary Teachers on Climate Change Education for Sustainable Development*. UNESCO.
- UNESCO (United Nations Educational, Scientific and Cultural Organization). 2022. "Summary of the Best Practice: The GSMA Mobile Internet Skills Training Toolkit (MISTT)." Knowledge Hub, Collection of Best Practices for the United Nations Transforming Education Summit 2022. UNESCO. https://media.unesco.org/sites/default/files/webform/ed3002/79_The_GSMA_Mobile_Internet_Skills_raining_Toolkit_.pdf.
- UNESCO (United Nations Educational, Scientific and Cultural Organization). 2024a. "Education for Sustainable Development: Country profile, Rwanda (2024)" Program and meeting document. UNESCO.
- UNESCO (United Nations Educational, Scientific and Cultural Organization). 2024b. *Greening Curriculum Guidance: Teaching and Learning for Climate Action*. UNESCO.
- UNESCO (United Nations Educational, Scientific and Cultural Organization). 2024c. "Life on the Edge: Geoscientists Probe One of the Most Volatile Regions." Article, updated August 22, 2024. UNESCO. <https://www.unesco.org/en/articles/life-edge-geoscientists-probe-one-worlds-most-volatile-regions>.
- UNESCO (United Nations Educational, Scientific and Cultural Organization). 2025. "Greening the Curriculum: Integrating Climate Change Education into Malawi's National Curriculum." News article, July 28, 2025. UNESCO. <https://www.unesco.org/en/articles/greening-curriculum-integrating-climate-change-education-malawis-national-curriculum>.
- UNESCO and MECCE (United Nations Educational, Scientific and Cultural Organization and the Monitoring and Evaluating Climate Communication and Education Project). 2024. *Education and Climate Change: Learning to Act for People and Planet*. Global Education Monitoring Report 2024. UNESCO.
- UNFCCC (United Nations Framework Convention on Climate Change). 2021. *Opportunities and Options for Enhancing Adaptation Action through Education and Training, and Public and Youth Participation*. Technical paper. UNFCC Secretariat.

- UNICEF (United Nations Children's Fund). 2023. *The Climate-Changed Child: A Children's Climate Risk Index Supplement*. UNICEF.
- UNICEF ESARO (United Nations Children's Fund Eastern and Southern Africa Regional Office). 2025. "Strategy for Climate-Resilient Education Systems in Eastern and Southern Africa." Strategy document. UNICEF ESARO.
- UNICEF Kenya. 2024. "Kenya Takes Significant Step Forward in Climate Change Education as Alef Education, KICD, and UNICEF Sign Landmark Agreement." Press release, June 28, 2024. UNICEF Kenya. <https://www.unicef.org/kenya/press-releases/kenya-takes-significant-step-forward-climate-change-education-alef-education-kicd>.
- UNICEF Malawi. 2023. "UNICEF Launches Campaign to Support Students' Safe Return to Cyclone Freddy-Affected Schools." Press release, April 17, 2023. UNICEF Malawi.
- UNICEF Rwanda. 2024. "Education in Rwanda: A Situation Analysis." Briefing, UNICEF Rwanda. <https://www.unicef.org/rwanda/media/5346/file/UNICEF%20Rwanda.pdf>.
- Wadson, D., I. M. Mulenga, and I. Milupi. 2023. "Teacher Preparedness and Strategies in Teaching Climate Change Education in Malawi." *East African Journal of Education and Social Sciences* 4 (5): 62–71. <https://doi.org/10.46606/eajess2023v04i05.0320>.
- WMO (World Meteorological Organization). 2023. "Early Warnings For All Action Plan for Africa Is Launched." Press release, September 4, 2023. WMO.
- WWF (World Wildlife Fund). 2024. "Eco-Schools Handbook." WWF Foundation.

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