

# Climate change and young people in Uganda: a literature review

## Introduction

*“No continent will be struck as severely by the impacts of climate change as Africa.”*

(United Nations Environment Programme, undated).

Climate change disproportionately affects young people. The impact of climate change upon the livelihoods of young people in Uganda--now and in the future--presents two contradictions. Firstly, the poorest and most vulnerable young people are the most exposed to climate shocks - despite their negligible role in driving climate change. Secondly, these same young people offer insights which could be instrumental in addressing climate change, yet such insights are rarely sought. This scenario is not unique to Uganda; rapid population growth in the rest of the countries in the East and Central African countries, has led to large youth populations whose circumstances and geographical location combine to make them particularly vulnerable to the impacts of climate change (Barford et al., 2021). In part, this vulnerability stems from livelihood opportunities becoming increasingly constrained in the face of growing competition for jobs driven in part by population pressure, in a context of insufficient labour market demand. This has been exacerbated by recent economic shocks and increased worklessness associated with the COVID-19 pandemic (ILO, 2020; Fox et al., 2020, Barford et al., 2020). Insufficient work and working poverty equate to fewer resources with which an individual or household can build resilience to both rapid and slow onset environmental change (Adger et al., 2014). Thus poverty and climate change can aggravate one another (Mfitumukiza, 2021).

Uganda, positioned within its wider East African regional context, is expected to be on track for shorter wet spells and a slight increase in heavy rainfall (Shepard, 2019). Yet these projected environmental changes have strong geographical and temporal variability, which are smoothed when focusing on annual averages and regional trends. Other predictions emphasise the increases in high intensity and sporadic rainfall events (Christensen et al., 2017). With an estimated population growth of 2.8% per year, in an environment of shrinking natural resources, including land availability and water resources, the Intergovernmental Panel on Climate Change (IPCC) describes climate change as a threat multiplier, exacerbating existing problems including conflicts and economic insecurity.

Home to the Congo Basin forests and the second largest tropical forest area in the world, many Central African countries to the north and south of the Congo Basin

forest are projected to be severely affected by climate change. Impacts such as increased variability in agricultural production could exacerbate the refugee situation in the region arising from the migration of the diverse populations from these countries (including young people) highlighting the need for climate change adaptation options (Davis & Gephart, 2018). Many Central African countries have sought mitigation and adaptation funding to protect their forestry heritage (Clionadh et al., 2015). With many countries in the Central and Eastern Africa region currently categorized in the 'least developed country' group (table 1), it is a difficult combination of social and environmental factors that prompt this literature review, in which we seek to understand the challenges to climate change mitigation and adaptation by the youth.

The shocks and underlying stressors associated with climate change – drought, floods, heat stress, fires, sea level rise, storm drainage, pests and other impacts – are expected to become more frequent and intense (Karen, 2019). The alternative scenario is that adaptation and mitigation be incorporated meaningfully and quickly into development policies and investments (*ibid.*). In Uganda, young people are recognised as being particularly vulnerable to climate change shocks, including the landslides in Bududa, locust infestation in Karamoja and neighbouring regions, floods in Bundibugyo and Kasese districts, and the rising levels of water in Lake Victoria (Mugenyi et al., 2020). Throughout Uganda, young people are reeling from prolonged droughts, internal displacement, destruction of properties and infrastructure and reduced erratic and unpredictable rainfall which is affecting agriculture production and food security. The situation has been compounded by the COVID-19 pandemic which is not only claiming lives but has also led to the loss of jobs and livelihoods, especially in the informal sector (Mugenyi et. al., 2020). Large numbers of young people are involved in agricultural work and this sector is especially exposed to climate change (Karen, 2019). Studying the impacts of climate change on young people in Uganda offers in depth insight into some of the challenges faced more widely in the region.

Besides, the impacts of climate change are gendered. A recent UNICEF study demonstrates that climate change disproportionately impacts women and young people (Godfrey & Tunhuma, 2020), and leaving young women who embody both these demographic profiles particularly exposed. Many of the health risks due to climate change show gender differentials, including the risk to life. In Burundi, Rwanda and the Democratic Republic of Congo for instance, natural disasters such as droughts, floods and storms kill more young women than young men. Additionally, young women disproportionately suffer the health consequences of nutritional deficiencies and the burdens associated with travelling further to collect water when this resource is harder to access (Godfrey & Tunhuma, 2020). The impacts of climate change are unevenly felt; those with the least power and resources are the worst impacted, further exacerbating the existing inequalities.

This paper assesses the peer-reviewed and grey literature on young people and climate change in Uganda and other Central and Eastern African countries (table 1; FAO, 2021). In undertaking this review, we address three key questions (box 1): (i) What are the diverse livelihood strategies of young people in rural and urban settings in Uganda, and in the wider Central and Eastern Africa regions?; (ii) How does climate change impact upon young people's lives and livelihoods?; and (iii) What are the solutions to the challenges faced by young people in coping with climate change?

The next sections of this paper present the methodology used for this literature review followed by the findings of the observed and expected regional environmental changes associated with anthropogenic climate change, the youth demographics of the regions and how young people are getting by. They also present the impacts of climate change on young people and how they are responding to the phenomenon and a commentary on the policy responses. The paper ends with a discussion and conclusions.

	<b>Countries</b>	<b>Least developed country</b>
<b>Central Africa</b>	Cameroon	No
	Central African Republic	Yes
	Chad	Yes
	Congo	No
	Democratic Republic of Congo	Yes
	Equatorial Guinea	No

	Gabon	No
	São Tomé and Príncipe.	Yes
<b>Eastern Africa</b>	Burundi	Yes
	Djibouti	Yes
	Eritrea	Yes
	Ethiopia	Yes
	Kenya	No
	Rwanda	Yes
	Somalia	Yes
	South Sudan	Yes
	Uganda	Yes

*Table 1. Country overview. Least developed countries in Central and Eastern Africa, sourced from: UN Committee for Development Policy. 2020. Regional definitions for Central and Eastern Africa, sourced from FAO, 2021.*

## Methodology

The methodology for this literature review is designed to not only rigorously review but also summarise understandings of this area (Gough et al., 2017, Sambunjak et al, 2017). The approach is to review documents using clearly formulated questions (see box 1), with systematic and explicit criteria to select relevant research (Ford & Pearce, 2010). Thus, the search terms are fully reported, alongside stating the criteria for inclusion and exclusion of articles, documenting publications excluded in the analysis along with those included (table 2). This more systematic approach to literature reviews is widely used in the health sciences, yet remains rare in the social sciences and humanities.

**Box 1: Research questions**

- (i) What are the diverse lives and livelihood strategies of young people in rural and urban settings in Uganda, and in the wider Central and Eastern Africa regions?
- (ii) How does climate change impact upon young people's lives and livelihoods?
- (iii) What solutions are there to the challenges faced by young people?

The literature review process focused primarily on peer reviewed journal articles, and official policy documents. In addition, the review process drew upon the grey literature of NGO, government, and international organizations' reports. The following databases were searched between May and October 2020: Ebscohost, JSTOR, Wiley Online Library, Springer eBooks, Project MUSE, University of Chicago journals, Palgrave Macmillan Journals, ACLS Humanities E-Book (HEB), and Google Scholar. Table 2 reports the key Boolean search terms used. Overall, these searches yielded 117 articles which were reviewed to confirm relevance to the study based upon the abstracts and subsequently full text. In the end, 62 articles met the inclusion criteria (table 2).

Boolean search terms	Inclusion criteria	Exclusion criteria
“youth*” “climate change*” “livelihoods” “Uganda” “youth policy” “Karamoja” “Jinja” “East Africa”	<ul style="list-style-type: none"><li>● Written in English;</li><li>● Published between 2015-2020 (plus ‘classical’ references and policy documents);</li><li>● Includes a measure of, or report on youth, livelihoods and climate change;</li><li>● Includes a measure of, or report on rainfall, sunshine, foods and irrigation;</li><li>● Geographical scope involves Eastern</li></ul>	<ul style="list-style-type: none"><li>● Theoretical studies with no empirical findings;</li><li>● Intervention studies that did not provide pre-intervention or control data.</li></ul>

“Central Africa” “rainfall” “sunshine” “floods” “irrigation”	Africa; • Provides empirical findings, conclusions and recommendations.	
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*Table 2. Search terms and criteria for systematic literature search*

A template was developed to systematically summarize the articles in a fine grained manner, under the broad headings of: 1) Study details; 2) Evidence on the nature and pace of climate change in Eastern Africa; 3) Youth livelihoods and 4) Recommendations on youth responses to climate change (table 3). The template was used to delineate the themes of interest and communicate these clearly amongst the research team. The template was developed based upon the team’s existing expertise on youth livelihoods and climate change in Uganda, and unexpected findings were incorporated through the category ‘other’. Tabulating findings allowed for quick comparisons and overview of the emerging themes, and also sought to identify gaps in the literature. Analysis was conducted using the Framework Analysis Approach (Ritchie & Spencer, 1994) which compares the content of the articles across the four themes identified to answer the research questions (box 1), namely: youth livelihood strategies in rural and urban settings, youth policy and climate change, the impact of climate change on young lives, and solutions to the challenges faced by the youth in dealing with anthropogenic climate change. Looking for patterns within data, and allowing emerging themes to then become analytical categories facilitated analysis (after Fereday et. al., 2006). It is these themes that structure the findings sections.

<b>Parent category</b>	<b>Specific questions</b>
Paper details	Full reference of publication
Climate change	Evidence on the nature and pace of climate change

in Uganda, and in the wider Central and Eastern African regions	Information on quick or slow onset events
	Locations which worst are affected, and why
	Locations which are less affected, and why
	Comment on data quality
	Identification of gaps in the literature
	Other
Youth livelihoods in Central and Eastern Africa	What work young people do (inc. unpaid and domestic work)
	Young people's aspirations of for work, plus barriers/enablers
	Anything on youth Not in Education Employment or Training
	Variation by gender, income, location, education level etc.
	Levels of education and training
	Comment on data quality
	Other
Climate change affects youth livelihoods (may include papers from outside the region)	Impact in rural areas
	Impact in urban areas
	Changes in livelihoods in response to climate change
	Evidence for migration in response to climate change
	Disruptions to education, training, or apprenticeships
	Climate change and marriage and child bearing
	Climate change and conflict
	Young people affected differently to other groups

	Influence of gender, age, income, location on youth impacts
	Identification of gaps in the literature
	Other
Responses	How young people feel about climate change
	If and how young people adapting
	If young people are mitigating climate change
	Young people's involvement in policy responses
	The change young people want to see
	Identification of gaps in the literature
	Other

*Table 3. Criteria for systematic literature search*

## Significance of the review

In addition to contributing to the academic discourse and knowledge gap on this subject, this review was also aimed to inform policy making and programme implementation by stakeholders at various levels in Uganda and other countries in Eastern and Central Africa. At the local level, the review seeks to inform young people about livelihoods opportunities and how they respond to climate change. For government (local and national), the recommendations of this review should inform the design and implementation of youth livelihoods and climate change mitigation and adaptation interventions. Policy makers at the regional and international levels can also draw upon the findings of the review aims to engage young people in seeking solutions to unemployment and other impacts of climate change.

## Limitations

Despite more systematic and rigorous reviews having great advantages over traditional reviews, there are limitations to be considered. First, by selecting only English language academic literature, this study excludes literature published in other languages, especially French. Although there is more linguistic diversity than just the colonial languages, French is still the official or dominant language in the Central African countries of Burundi, Cameroon, Central African Republic, Chad,

Democratic Republic of Congo, Gabon, Republic of Congo, and Rwanda. Secondly, much as systematic analysis of the literature limits bias and increases transparency of the process, the thematic analysis of evidence leaves open a certain level of interpretation (Marijn, 2018). The researchers limited this bias by reporting on only their analysis of the theme, and working as a team to identify, source and review papers.

## Characterizing the literature

The general characteristics of the literature reviewed for this paper are as follows. Of the 62 articles that met the inclusion criteria, 47 were single-case studies; with a few studies comparing multiple cases of youth livelihoods and climate change adaptation and mitigation strategies. A total of 11 articles did not report on the study design and other vital aspects of the methodology (such as case selection, sample size and analysis procedures). Surveys (32), mixed methods (19), document study (8) and focus group discussions (3) were the most widely used methods of data collection. For data analysis, most of them refer to the use of statistical techniques such as correlation and chi-square tests (51) while the rest (11) refer to the use of qualitative techniques such as thematic coding and social network analysis.

# Findings

Reviewing the state of knowledge around how young people intersect with climate change in Uganda, and other Eastern and Central African countries, we first discuss the nexus between climate change, youth demographics, and youth livelihoods. We then present the youth-specific impacts of climate change, and responses to the challenges faced by young people in dealing with climate change.

## Features of climate change

The environmental changes associated with climate change in Africa are diverse, yet understandings of both current and longer-term trends are hampered by a lack of data (IPCC, 2021; Toulmin, 2009). Nonetheless, it is established that Africa is expected to warm during the 21<sup>st</sup> century and there has already been an observed increase in the hot extremes in South East and North East Africa (*ibid*). Summarizing the literature, Nyasimi et al; (2018) describe how “Climate change and variability is exacerbating the drying up of already arid zones in Africa, decreasing volumes of inland surface and subsurface water, causing shifts in cropping and farming systems, changes in pests and disease dynamics, and creating competing demands for shrinking natural resources that have the potential for creating bilateral and multilateral conflicts.” (p.172). These observed environmental changes are decidedly uneven, both spatially and temporally. For instance, in the period 1960-2010, Uganda has experienced a 0.28°C per decade temperature increase. Disaggregating these averages by calendar month shows a decade long average increase of 0.37°C for January and February (NAPA, cited in Opio, 2019). Looking ahead, it is expected that Uganda will experience a further 2°C of warming during the next 50 years (Nyasimi et al., 2016). These averages hide larger local increases at certain times, with some areas impacted more acutely than others.

Rainfall volume has already decreased in the region, and the next 50 years are expected to lead to further reductions in annual rainfall in Uganda (Nyasimi et al., 2016; Opio, 2019). As with temperature change, the uneven and unpredictable nature of changes to precipitation presents a challenge, alongside the changing annual averages. The start and end of rainy seasons has become increasingly erratic, with particularly heavy and sometimes violent rainfall events being recorded. These new rainfall patterns have led to more flooding and landslides, especially in the Mount Elgon region of Eastern Uganda (Osuret et al., 2016; Opio, 2019). Alongside times of intense and destructive precipitation is another form of disruption caused by insufficient rain. In Mbale, Eastern Uganda, 63% of people surveyed had been impacted by both drought and erratic rainfall (Oxfam 2017, in Oriangi et al., 2020). Some districts, specifically Kiruhura and Isingiro, now report frequent and severe droughts (Nagasha et al., 2019). Furthermore, significant bodies of water have also been observed to have shrunk, including lowering water levels of both

Lake Victoria and the River Nile which has its source in Uganda (Muhumuza et al. 2011).

To capture something of the magnitude of the impacts of climate change, four of every five natural disasters are linked to climate change and severe weather (Chirambo, 2017). While the physical changes brought by climate change are of great significance to natural systems and other forms of life irrespective of their human impacts, the remainder of this paper ‘humanizes’ climate change (after Dorling and Barford, 2006) by making sense of how long term environmental change intersects with young people’s livelihoods, understandings, and to review youth and policy-level responses.

## Youth demographics and definitions

The global youth population is projected to peak at 1.5 billion in 2035 and it will increase most rapidly in Sub-Saharan Africa (SSA) and South East Asia (by 26 percent and 20 percent respectively between 2005 and 2035) [see IPCC, 2021]. The Food and Agricultural Organization (FAO) estimates that around 55 percent of young people reside in rural areas, but this figure is as high as 70 percent in Sub Saharan Africa and South Asia. In Sub Saharan Africa, young people aged 15-24 comprise 36 percent of the entire labour force, 33 percent in the Near East and North Africa, and 29 percent in South Asia.

Widely perceived as an individual’s ‘before adulthood’ (Oxford Online Dictionary), but also as a time of being *as well as* becoming (Barford et al., 2021 after Uprichard, 2008), youth is defined and understood differently between countries. Only nine publications included in our literature review conceptualize youth; albeit with considerable variation in the definitions of ‘youth’ between Central and Eastern African countries. In Uganda, a youth is for instance—by Constitutional definition—an individual below 35 years of age (Uganda Constitution, 1995), although the Uganda Youth Policy defines a youth as a person who is aged between 18-30 years (UBOS, 2017). On the other hand, the Kenyan government defines youth as a person aged over 18 but not yet 35 years old (Kenya Constitution, 2010). On its part, Ethiopia defines youth as individuals aged between 15-29 (Ethiopian National Youth Policy, 2012). Overall, there is minimal focus on the conceptualization of youth in the literature reviewed.

## Youth livelihoods

Even before the impacts of the climate emergency really began to set in, there was another crisis in full swing - one of inequality, widespread poor sanitation, curable diseases allowed to run rampant, and poverty (Dorling & Barford, 2006). Within this, the lack of good jobs and the prevalence of working poverty, especially amongst

young people, hampers resilience and security (O'Higgins, 2017; Barford et al., 2020; Fox et al., 2020). Findings of this review shows that most of the literature on youth livelihoods in Eastern and Central Africa largely focuses on 'the capabilities, assets (both material and social resources) and activities required for a means of living' (Bennell, 2007). Seven (7) articles conceptualized youth livelihoods under the framework that divides livelihood assets into 6 types: natural assets, physical assets, financial assets, human assets, social assets and cultural assets. A total of 19 articles that report on livelihoods for young people in Uganda, the Central African Republic, Kenya and Rwanda highlight agriculture as the most important source of livelihood for most young people in the region. Fourteen (14) others allude to the fact that a significant number of young people are employed in the formal sector and earn salaries and wages on a regular basis, while six (6) demonstrate that many young people eke out a living from informal sector activities due to lack of education, assets, investment capital and skills, among other reasons. Other articles emphasize that it is largely young people who are dependent on the informal sector that are highly vulnerable to the impacts of climate change on their livelihoods (Okalebo, 2015). There is also grey literature showing that young people rely on a host of small-scale diversified wealth creation activities to improve household incomes including in major trading centres (Barford & Coombe, 2019).

Other recent studies show a growing sense of pessimism about the situation of youth livelihoods and the scope for improving their wellbeing amidst the ever-escalating impacts of climate change (see Care International, 2016; Hardi, 2017; Lee et al., 2020). Given that 'peak' youth comprise the majority of the total population in Eastern and Central Africa, the future looks potentially bleak amidst limited livelihood opportunities (O'Higgins, 2017; Barford et al., 2020; Cieslik et al., 2021). The situation is worsened by the limited political will to fully implement climate change undertakings agreed to by most countries during the 2015 Paris Climate Agreement (UNFCCC, 2016). Underemployment is high in all the Central and Eastern African countries, especially for young people. Low incomes render communities and families particularly vulnerable, hence their ability to cope with climate related shocks is constrained yet adaptation to a changing climate is crucial (Jasmina, 2019). The literature reviewed presents a range of youth livelihood strategies as they struggle to overcome unpredictable and increasingly extreme environmental conditions.

## Youth-climate change interactions

Context matters. Young leaders and the academic literature alike acknowledge how climate change is not simply an environmental problem, but rather intersects with social, economic and political issues. We now review the types of impact, young people's adaptive and mitigative responses to these impacts, and how young people's responses to climate change are constrained. Young people's solutions to the challenge of climate change are discussed in numerous papers in this review

(Frappart et al., 2016; Garg & Lal, 2018; Hermans & Korhonen, 2017; Hestness et al., 2016; Jackson & Pang, 2017; Karpudewan et al., 2015; Puttick et al., 2015; Scott-Parker & Kumar, 2018; Wilks & Harris, 2016). Curiously, African youth activism has received less attention to date.

Overall, Africa is expected to be especially negatively affected by climate change (UNEP, no date). With three quarters of the African population under the age of 35 this means that numerically young Africans will be highly impacted. The literature describes key pathways of these detrimental impacts through direct impacts on physical health, mental health, forced migration and reduced capacity to make a living leading to increases in poverty. Physical health impacts include drowning in floods, especially for those who cannot swim, death or injury in landslides, heat stress which particularly impacts agricultural and construction workers and leads to a slower pace of work, and increased disease (ILO, 2019). The type of changes projected are also more disruptive than conducive to improving growing conditions (Toulmin, 2009, p.15). There are several ways in which climate change impacts young people in Central and Eastern Africa featured in the literature reviewed. Loss of livelihoods, deaths, displacement and social misery are featured as the main impacts of climate change on youth in the literature reviewed. Over half of the articles reviewed on this theme indicate that the impact is greater in rural, mountainous areas where landslides and floods have become a perennial phenomenon in many countries.

Other notable impacts documented in the literature include: rising lake water levels (Mugenyi et.al., 2020), torrential downpours causing floods in cities and towns and rising temperatures (Klara & Hajdu, 2017; Oriangi et.al., 2020; Tenywa et al., 2016; Nagasha et.al., 2019). While being on the receiving end of the effects of climate change presents young people as one of the groups of individuals who have fallen victim to human-driven environmental changes, their response to local, national and global efforts to mitigate its effect on society could well make them part of the solution. Overall the literature review presents young people as 'victims and solution providers' in the climate change and development equation (Osuret, et al., 2016; Oriangi et al., 2020).

In terms of young people's reactions and responses to climate change, the literature focuses on the benefits of mitigation and adaptation among vulnerable communities such as young people (NEJAC, 2018). There is evidence of diversification and flexibility in livelihood practices, with some young people opting for sports betting and other forms of gambling (Njeri, 2017; Bruno & Kizito, 2018; Ramadhani, 2019), though this also offers little certainty or income security. While sugarcane and sugar yields fluctuate with extreme climate events (drought and tropical cyclones) in most countries in the region (Duli, 2015), a number of young people have diversified their cultivation of the crop (Salami et. al; 2018). In Uganda and neighbouring countries,

some young people have found diverse alternatives to growing sugar cane such as apiculture, poultry keeping and zero-grazing (Mugenyi et al, 2020).

Migration is a key part of the adaptive toolkit for young people. Research in some African countries has shown that cities offer opportunities for off-farm work, near to rural areas, which can increase people's resilience (World Bank, 2018). A mix of 'push' factors, including climate change-induced pressures, poverty-level agricultural incomes, and shrinking plot sizes, are leading young people to seek alternative livelihoods to agriculture. In Rwanda, young people—both migrants and host communities members—have shown great leadership in tackling climate change issues through *Choose Yourself*, a youth-led Non-Governmental Organisation (NGO) that empowers young migrant women to navigate the job market and avoid gender-based exploitation. This, through varying forms of capacity building, has also provided a range of opportunities to promote environmental conservation (USAID, 2019). Much as the literature reviewed points to a host of mitigation and adaptation strategies by young people in dealing with the impacts of climate change, it also features a number of challenges faced in dealing with the phenomenon.

Elsewhere, the literature presents young people as a key pillar in the sustainable management of natural resources in some countries (Kwado et al, 2018; Thew, 2018). In most cases, youth mobilization activities occur through numerous networks that are orchestrated by government, political parties, civil society groups, grassroots networks, and/or community associations. Some common examples of these networks are include; eco-clubs organized by NGOs, youth groups within Forest Community Associations, school-based youth councils or grassroots networks animated by autonomous youth groups and school-based youth councils (Kurt, 2015). Many of these networks have diverse mandates that often include environmental issues, prevention of domestic violence, watchdog activities or extracurricular activities, among others. While school-based youth councils are extensive and include an environmental component, these are generally non-operational in most schools due mostly to a lack of leadership. In cases where they are active, they are often teacher-directed rather than student-led (Masuda, 2019).

Young people engaged in climate change adaptation and mitigation interventions also face a host of institutional, structural and financial obstacles (Amponsem et. al., 2019). This involves limited government support in the form of subsidies to support alternative sources of livelihood such as apiculture or zero grazing, high levels of corruption and embezzlement of funds provided for them to start climate resilient income generating projects and limited access to information about resilience and adaptive capacity to climate change.

The literature further shows that the youth also face challenges in accessing training opportunities in various developmental activities of which climate change and environmental issues are central. With respect to gender, young people face varying forms of discrimination in access, ownership and utilization of resources and

technologies that would enable them deal with the effects of climate change. The situation is aggravated by the high levels of poverty. Uganda and Kenya heavily rely on rain-fed agriculture which is in turn greatly affected by the vagaries of climate change forces (Katharine et al, 2020; Chebet, 2017). Those who have succeeded in breaking the gender and poverty chains in their attempt to combat the climate change bottlenecks have also come face to face with the failure—by policy makers—to integrate climate change and environmental issues into the educational curriculum. This is especially relevant for the transfer and integration of indigenous knowledge into modern mitigation and adaptation practices.

There was a tendency for the literature to find that, similar to participants' knowledge of the causes and impacts of climate change, youth solutions to climate change were often somewhat superficial and featured misconceptions. The most recognized solutions were planting trees (Kilinc, 2018) and reducing pollution (Garg & Lal, 2016) particularly from factories (Daniel et al., 2016), and changing transportation systems (Bofferding & Kloser, 2015). However, young people's understandings of causes and effects were incomplete. One example is that the time lag involved in planting trees and storing carbon was not appreciated (Tenywa et al, 2017), and participants could not explain the mechanisms by which reducing pollution or planting trees would reduce global warming (Frappart et al., 2016). The literature reviewed also proposes the reduction in street litter or river pollution and the use of nuclear power in mitigating the impact of climate change (Hestness et al., 2016). A study conducted in the Karamoja region of Uganda showed that most people who perceived changes to the climate did not take any action to adapt, typically because they did not know how to (Chebet, 2017). Thus the literature flags limited understandings of the science of climate change thereby hampering the responses to the impact of the phenomenon.

## Youth-led climate activism

Little research into youth climate activism in Eastern and Central Africa was found during this literature review process. In contrast, there is growing literature on climate activism in the higher income countries (e.g. Kleres and Wettergren, 2017; Nairn, 2019). Since 2019 climate activism has become the most high profile part of the youth response to climate change. In Uganda, young women have become key players organising school strikes as part of the Fridays for Future global movement and engaging in practical activities to bring about more immediate change, such as collecting plastic rubbish from the streets and waterways (Chebet, 2017). To share some insight into the motivations and aspirations, Nakabuye Hilda Flavia, founder of the Fridays for Future Uganda emphasises the urgency and scale of climate change, how activism includes educating and motivating young people as well as pressuring decision makers. She also highlights the view that climate activism can be a lonely experience without community support. Nakabuye also describes the emotional

exhaustion and determination associated with challenging the status quo in the film 'Dear Future Children' (2021).

*"We are facing a climate emergency; we need unprecedented global action because we are running out of time. The only way to protect our generations future is by standing up and speaking out. We are the first generation to know what we are doing and the last one to be able to save it."*

*"Despite being directly affected by the consequences of climate change, most young people in my country are not aware of the climate breakdown we are facing because climate change is not taught in schools. I engage with youth during my strikes and urge them to join me as we demand for climate action."*

*"One of the challenges I face is the slow inaction and response from public, our governments and policy makers in my country towards climate action. Sometimes the community does not support me in my strikes because I disagree with some of their activities such as disposal of waste in lakes and rivers, car washing on lake shores."*

Nakabuye Hilda Flavia, 2019

The literature also shows that the law plays a double-edged role in climate change activism. Youth-led responses in Uganda, have for instance relied on the legal system to take national governments to court on the basis that climate change is compromising their constitutional and human rights (Hewitt and Gubbay, 2020). Although the 2012 case of Mbabazi and Others v The Attorney General and National Environmental Management Authority (Civil Suit No. 283 of 2012) was filed by the NGO Green watch, the case was supported both legally and financially from outside of Uganda. Evidence was heard in May 2019 (Adelman, 2021); yet "the matter is still pending" (Green watch, 2021, no page number). Given the level of vulnerability to climate change-induced harm, there have been surprisingly few litigations taking place in Africa (Adelman, 2021), which could in part be due to the slow progress of such cases within the courts. On the other hand, the law is also used to constrain activists. In September 2020, 20 young activists were arrested during a climate strike which aimed specifically to highlight threats of felling the Bugoma Forest. The police attributed these arrests to a lack of formal permissions to protest (Wetaya, 2020).

Youth-led climate activism, which has rapidly scaled over the past 5 years, is now increasingly recognised as a global phenomenon, with young people's voices increasingly welcomed into high level discussions. The contentions now are to ensure that the voices of the most impacted are heard, and whether their messages are acted upon (see Barford, 2021; Barford and Nyiraneza, 2021).

## Policy responses

While young people are working to adapt to and mitigate climate change in their own lives, they are faced with the failure of most of their leadership to formulate and implement policies that ensure sustainable development at both local and continental levels through the integration of a youth and gender perspective (Shakespeare et. al., 2017). Policy responses to climate change related disruptions exist at the supranational, regional, national and local levels. Across Asia and Africa, there is an overall trend of policy interventions to support climate adaptation at the national level while lower levels of government have played a minimal role in recent years (Ford et al., 2015). Adaptation funds from the United Nations Climate Change (UNFCCC) have been disbursed to National Adaptation Programmes of Action. Agenda 2063 of the African Union Commission (2015) offers high level commitments to support young people and to address climate change. These statements include the following commitments:

54. The youth of Africa shall be socially, economically and politically empowered through the full implementation of the African Youth Charter.

56. All forms of systemic inequalities, exploitation, marginalization and discrimination of young people will be eliminated and youth issues mainstreamed in all development agendas.

57. Youth unemployment will be eliminated, and Africa's youth guaranteed full access to education, training, skills and technology, health services, jobs and economic opportunities, recreational and cultural activities as well as financial means and all necessary resources to allow them to realize their full potential.

58. Young African men and women will be the path breakers of the African knowledge society and will contribute significantly to innovation and entrepreneurship. The creativity, energy and innovation of Africa's youth shall be the driving force behind the continent's political, social, cultural and economic transformation.

(African Union Commission, 2015, p.9)

With respect to climate change, the African Union Commission (2015) discusses the importance of "prioritizing adaptation ... to ensure implementation of actions for the survival of the most vulnerable populations" (p.3-4), and notes the importance of targeting women and young people in climate change programmes (p.16).

There are country-specific climate change interventions for young people in some countries in the region. The Ugandan government enacted the National Youth Policy (2001) that among other specific interventions provided for the Youth Livelihood Programme (YLP) and Youth Livelihood Fund (YLF); created to provide funding and other support to small enterprises led by youth (NYP, 2001). Largely aimed to support small business development, job creation and add value to the core youth livelihood activities such as maize processing, livestock feed production and other non-farm livelihood activities; the policy was considered a panacea to most challenges that result from the impact of climate change on young people. Even if some groups of young people have variously benefitted from the YLP/YLF programme, the multiplier effect of its interventions is yet to be felt nationwide. Its implementation has also been dogged by claims of corruption and marginalization of some youth Savings and Credit Cooperatives (SACCOs) groups in some parts of the country.

## Discussion

Overall, the studies published in the past five years demonstrate that climate change and youth livelihoods are closely interwoven. The current climate shocks and stresses documented across the region greatly impinge on the well-being of young people through various mechanisms. By and large, young people's lives tend to be directly affected by climate change, albeit in diverse ways. Climate change does not occur in a vacuum, instead interacting with other trends, challenges and crises. The already fragile livelihood strategies - adopted due to a lack of other opportunities and a structural deficit of decent work - leave young people exposed to greater risks of disruption. The combination of insufficient jobs, widespread reliance of agriculture, and working poverty means that many of the cornerstones (savings, reliable income stream, and certainty of finding work) of economic security are absent.

While the impacts of climate change have been severely felt by young people, these are uneven amongst young people. For instance, desertification in South Sudan and the Democratic Republic of Congo has led to an influx of climate change refugees into Rwanda and Uganda, resulting in children and young people living in urban camps without adequate education and health care and subject to the resultant spread of disease (Kiaras & Anderson-Nathe, 2018). As with other vulnerable and marginalized communities, climate change impacts youth livelihoods in specific ways, contingent upon their roles and responsibilities at the household and community levels (IPCC, 2021). Faced with other challenges such as living with disabilities, lack of credit, limited education and employment opportunities and limited involvement in political and household decision-making processes, some young people have resorted to the illegal exploitation of timber and other natural resources for a living thereby exacerbating the climate change phenomenon in their settings. Cultural norms related to gender limit the capacity of young women to make

quick influential decisions about their livelihoods, such as whether to move to safer grounds in disaster situations (Adger et al., 2018).

Most studies reviewed document disproportionate harm to young people since they are more likely to be affected by poor health or death, damage to homes, workplaces and essential infrastructure, limited or non-existent public services, and the unavailability or unaffordability of water, food and other consumption items. The literature reviewed here suggests that much as there is well documented impact of climate change on young people, this group of individuals do—like most socially excluded groups—have limited opportunities to participate and influence the allocation of resources to ameliorate the impacts of climate change (UN 2016a).

A key conclusion from the literature on this subject is that investing in strategies to address vulnerability and often gendered socio-cultural attitudes, such as encouraging young people—especially young women—to learn skills such as swimming and tree climbing, can help people to survive during floods (Hunter et al, 2020). Similarly, the implementation of youth empowerment programmes to enable young people to acquire capital to venture into self-employment projects (notably in the service sector) instead of depending on natural resources for their livelihoods can have great impact (Arora-Jonsson, 2018). This is why it is even more critical to involve young people in efforts to integrate climate change into development planning –notably policy-making, budgeting and implementation processes at the national, sector and subnational levels as it is being done in Uganda (NPA, 2020).

In respect to solutions to the climate change challenges faced by young people in the region, the literature shows that many are involved in small-scale climate resilience practices aimed to enable young people to cope with the phenomenon. In Uganda, the Advocates Coalition for Development and Environment (ACODE) has been promoting inter-district learning visits for the youth in various parts of the country to enable those involved in agriculture learn and adopt climate resilient agricultural practices such as small scale irrigation, use of compost manure to improve soil fertility, use of biogas and maximize water resources (Mugenyi et.al., 2020). On its part, the East African Community (EAC) launched the East Africa Youth Inclusion Program (EAYIP); a five-year program (2016 -2021) aimed to improve the livelihoods of 25,000 economically disadvantaged young men and women (aged 15-24 years) in Uganda and Tanzania by creating ‘green jobs’ and entrepreneurship opportunities to offset the impact of climate change on their lives. In Uganda, the program is being implemented by providing young people with a proposition that involves value addition to agricultural products while promoting recycling of what was previously considered waste material into renewable energy resources (MOGLSD, 2020).

Overall, the key recommendations that emerged from this review show that addressing the climate change challenges facing the youth requires:

- Grading access roads to control flooding;
- Increasing funding to the Village Savings and Loans Associations (VSLAs);
- Training the youth in alternative livelihoods such as bakery, carpentry, auto mechanics and masonry.
- Implementing gender sensitive policies since both boys and girls are involved in the various sources of livelihood.
- Implementing the “nothing for us without us” policy by involving the youth in decision making and programming for themselves at all levels
- Creating new synergies between and across communities through climate change educational, awareness-raising and behavioural change campaigns;
- Involving the youth in climate change projects within different national and international organisations such as the United Nations Climate Change Conference of Parties (COPs).

## Conclusion

The aim of this systematic review is to report on (1) the diverse lives and livelihood strategies of young people in rural and urban settings in Uganda and neighbouring countries, (2) how climate change impacts upon their lives and livelihoods, and (3) solutions to these challenges. The review was largely qualitative and focuses on existing literature from which it is not necessarily possible to generalize its findings. Although certainly not exclusive, the 64 articles reviewed largely represent the recent literature that exists on this subject. The focus on literature published between 2015 and 2020 is also an important factor as it potentially provides the latest findings on the subject in the study region. With our focus on livelihoods opportunities and the impacts and solutions to climate change challenges facing young people, this paper contributes to knowledge through a review of the growing body of literature on this subject, clarifying key themes, and allowing the identification of research gaps.

This review identifies certain gaps in knowledge and understanding. In particular, understandings of pathways to adaptation to climate change are still patchy (Ford et al., 2015), and even understanding the nature of this change is limited by a lack of long term records for Africa (Toulmin, 2009; IPCC, 2021). In terms of the human geography of climate change, it has been recommended that more research is done to better understand climate change and the impact upon young people (Jevanic Henry, in Barford and Cieslik, 2019). New research should seek to produce more longitudinal studies to achieve a better sense of change over time (Rachel Proefke, in Barford and Cieslik, 2019), especially in light of the increasing levels of disruption which are faced by a growing youth population. Youth climate activism in Africa so far has received limited research. The impacts of climate change on young people’s mental well-being have been largely overlooked to date. Supporting young people in

relation to climate change will require more youth focused research and authentic youth engagement in national and international policy responses.

Much as the literature reviewed here highlights how young people are at the frontlines in climate action, as evidenced by the millions of young people who raised their voices in protests around the world in a massive display to demand urgent action on climate change (NPR, 2019). The struggle for climate justice is far from over. There is need for young people to not only continue to exert pressure on their national governments for more inclusion in climate change policy formulation and implementation strategies but also to build momentum for an equitable and sustainable global environmental management system during the annual United Nations Convention on the Climate Change Conference of Parties (COPs) held annually on various continents. Like for the other vulnerable groups of individuals, the youth voice on climate change injustices and the need for a just transition towards a low carbon society needs to be heard within *and* beyond the confines of the conference halls in order to result in tangible action against the climate crisis.

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## Conflict of interest

The authors have declared no conflicts of interest for this paper.

## Author contributions

**Anthony Mugeere:** Conceptualization; methodology; analysis; writing original draft. **Anna Barford:** Securing funding; Conceptualization; Search for literature resources; Writing original draft; and Editing. **Paul Magimbi:** Support to the search for literature resources; and Reviewing literature.

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