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Review: Climate change resilience disconnect in rural communities in coastal Kenya. A rhetoric communication discord proliferated by COVID-19 pandemic

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The world has been hit by consequential pandemics in the past two millennia. The COVID-19 pandemic has taken center stage, paralyzing vulnerable communities in the global south impacted by unprecedented climate vagaries. The focus of this study is COVID-19 and climate resilience communication rhetoric. In this context, we embed this study in response to the resilience of rural livelihoods to the COVID-19 crisis and climate resilience education communication rhetoric. We posit our review based on the following questions: Has COVID-19 worsened the climate resilience pathway for rural communities in coastal Kenya? Is the COVID-19 pandemic a proxy for climate resilience in rural livelihoods? How does COVID-19 communication rhetoric undermine climate resilience for vulnerable coastal communities in Kenya? Through a resilient theoretical paradigm, we enclose our view based on the existing literature along with climate resilience and COVID-19 proliferation. In light of the current state of COVID-19, the focus has shifted to the pandemic that will cover climate resilience. From the review, climate resilience pathway has been impacted by corona virus with noted funding response variations, in addition, even with the corona virus pandemic, climate resilience communication should be on-going rather than sporadic. Increasing the discursive process about climate change challenges is critical among Kenyan coastal communities. We recommend inclusion of climate resilience communication in existing policy frameworks as a salient solution to notable information discourse bottlenecks.

KEYWORDS

climate resilience, resilience theory, COVID-19 pandemic, rhetoric communication, coastal communities, indigenous communities, digital media, rural communities

Introduction

Climate resilience is a technique on how systems and societies respond to external shocks and disruptions resulting from climate change extremes (Heckelman et al., 2018; Mitchell et al., 2021; Al-Humaiqani and Al-Ghamdi, 2022). The accruing climate change effects are daunting, with unprecedented environmental extremes globally (He and Silliman, 2019; Ngare et al., 2020; Bandh et al., 2021). The Intergovernmental Panel for Climate Change (IPCC) report elucidates surging global temperatures past 1.5°C against the projected ambition of the pre-industrial mark (IPCC, 2021). The novel coronavirus disease in Wuhan, China was reported in 2019 and led the World Health Organization (WHO) to declare a global public health concern in March 2020 (Sohrabi et al., 2020; de Santana et al., 2022). Approximately 6.2 million lives have been lost from the COVID-19 pandemic, with more than 500 million infections reported across the globe [WHO Coronavirus (COVID-19) Dashboard, 2022]. It is undeniably evident that this pandemic is the deadliest in history and its decentralized discourse has been felt vastly across the world, further marginalizing communal groups, unlike climate change linked disasters that are fast proliferating.

The complexity of global, systemic, and compounding crises has been revealed by COVID-19 (Ringsmuth et al., 2022). The emphasis on curbing COVID-19 has been effective, causing a disconnect on combating climate change effects. The greatest threat to public health in the twenty-first century is climate change, which is linked to environmental degradation and negative health effects (Nicholas et al., 2021; McKinnon et al., 2022). It is possible that climate change impacts and deviant responses to them could impede societies at multiple communication levels, impacting the most highly susceptible to climate extremes. The consequences of climate change are detrimental to the socioeconomic wellbeing of communities, food systems, economic development, and environmental sustainability (Nicholas and Breakey, 2017; Abbass et al., 2022). According to the World Meteorological Organization (WMO) report 2021 on Mortality and Economic Losses from Weather, Climate, and Water Extremes (1970–2019), on average, climate related disasters kill approximately 115 people daily in the United States of America (USA) and cause proliferating \$202 million in losses to the economy annually (WMO, Zhongming and Wei, 2021). Even with well-installed Early Warning Systems (EWS) infrastructure, climate related hazards wreck the USA. Sub-Saharan Africa (SSA), a region with limited EWS, is more vulnerable to climate shocks where communication to affected communities is still low.

Climate change is increasing the frequency of extreme weather events such as heatwaves, storms, and floods; food systems are being disrupted; zoonoses and food-, water-, and vector-borne diseases are increasing; and mental health issues are becoming more prevalent (Marazziti et al., 2021; Raimi et al., 2021). Many social determinants of health and wellbeing, such

as employment, equality, and easy access to medical care, are also under threat as a result of climate change. People who are most vulnerable to climate-related health risks include women and children; ethnic minorities; poor communities; migrants or displaced people; older populations; and those with pre-existing health conditions, among others (Uddin et al., 2021). These accrued ramifications from climate change still aren't conveyed to these vulnerable communities, even with existing scholarly research information and knowledge. Unlike climate change, which has been going on for decades, the COVID-19 pandemic spread quickly to all groups, even the most vulnerable ones (Eitzinger et al., 2018; Botzen et al., 2021).

In this review, we domicile our focus on climate resilience disconnect in rural communities of coastal Kenya with the communication response rhetoric in the case of the COVID19 pandemic. In terms of building reputable climate change resilience, the COVID-19 pandemic is viewed as a barrier toward curbing the effects of climate change through communication.

Resilience theory and communication rhetoric

This research review embeds the resilience theory and the with the communication rhetoric theory, and its prognostications on perceived climate resilience and COVID-19 in coastal rural communities in Kenya. The Kenyan coastal landscape is diverse with different ethnic occupancy—the Boni, Dahalo, Digo, Duruma, Giriama, Mijikenda, Pokomo, and Waata (Figure 1). It runs parallel to and immediately south of the equator, with a covering length of approximately 600 km on land and 450 km by air. The Kenyan coastal strip is made up of Mombasa, Kilifi, Kwale, Tana River, and Lamu counties. Dominant ethnicities are the Giriama and Boni tribes which largely boarder the Boni forest in Kenya. Majority of these coastal communities practice substance farming and fishing as key economic activities in the rural set ups (Lau et al., 2021).

The resilience paradigm was introduced in the early 1970s by ecologists, a technique of thinking about the way ecosystems and communities react to outside stressors (Brown, 2014). Resilience is a quality that enables us to bounce back when confronted with difficulties. In the face of and following adversity, it helps us endure, recover, and even thrive, but that's not all there is to it. Adversity, according to resilience theory, isn't essential, but how we handle it. Communication rhetoric theory, as defined by Aristotle and Plato, is the art of discovering all available techniques for persuasion. In common usage, the term "rhetoric" typically has negative connotations. Rhetoric contrasts starkly with action; it consists of empty words, empty talk, and mere decoration (Foss, 2017). This contemporary understanding of rhetoric is at loggerheads with a lengthy history of rhetorical theory, which dates back to ancient Greece and Rome in the West and serves as a foundation for the modern field of

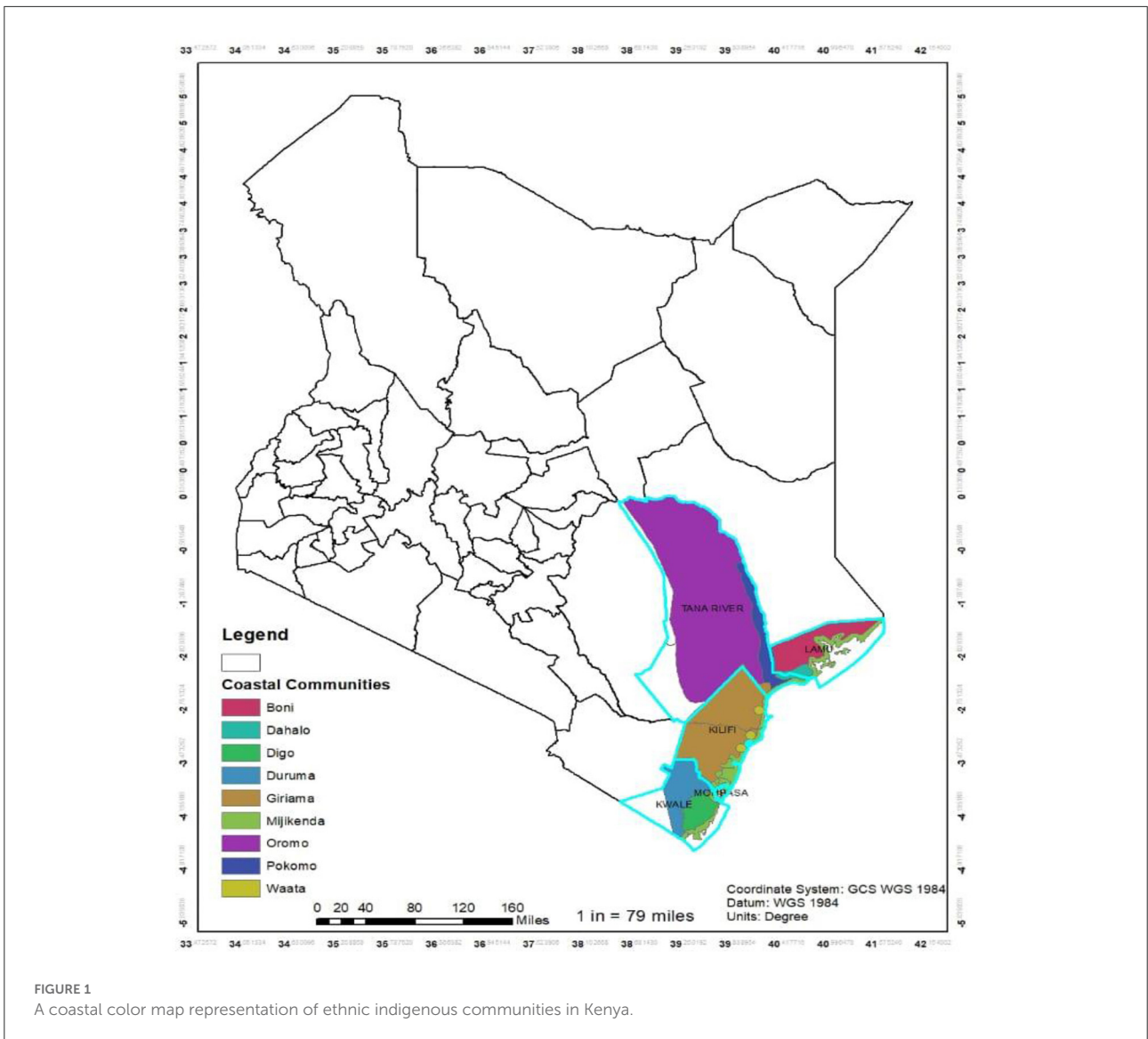


FIGURE 1
A coastal color map representation of ethnic indigenous communities in Kenya.

communication (Smith, 2017). Foss (2017), adds that, rhetorical criticism should lens our daily symbolic communications and intent responses. Through vulcanized theoretical discernment, we draw pragmatism from existing literature on COVID-19 and climate change. The reviewed scholarly works are inculcated in response to the research’s intent questions.

The unprecedented effects of climate change and COVID-19 are not exaggerated, but rather based on empirical evidence. COVID-19 is a zoonotic infection of the SARS-CoV-2 virus (de Santana et al., 2022; Choudhary et al., 2022) that is highly infectious from man to man or animals that serve as reservoirs. Anthropogenic effects nest the linkages between zoonotic and climate extremes (Bartlow et al., 2019; Wilcox et al., 2019; Kruidbos, 2022). Resilience to climate change communication may have a rhetorical bias toward science-driven COVID-19

reparations rather than multifaceted propositions that confront the vulnerabilities of marginalized ethnic communities (Poitras, 2021).

Due to shrinking natural ecosystems and ecological disturbance, increasing pandemic uncertainty and the advent of new infectious diseases are being linked to global land-use change configurations and an accelerating trend of land conversion (Washbourne et al., 2021). Even in times of pandemics like COVID19, vast research and policy institutions often overlook the enormous potential of informative communication to contribute to climate-resilient responses by inculcating local knowledge of the effects of climate change, acclimatization, and building resilience (Mitchell et al., 2021). In many cases, indigenous and local insights have been pilfered, often without consent (Dawson et al., 2018).

Working with rural, climate-sensitive, vulnerable communities can generate open discussions and new approaches to solving problems. This, for example, can be used in both the public and private sectors if people in Kenyan coastal communities can understand and use it.

Daunting bottlenecks of COVID-19 in climate resilience communication in rural communities

There is no doubt that climate change has serious effects globally both on global north and global south developing countries (Apollo and Mbah, 2021; Seife, 2021). Africa is the most vulnerable continent to climate variability and change. Climate change adaptation has been slowed by a lack of adaptive capacity, particularly in third-world countries (Wright et al., 2022). Compared to the COVID-19 pandemic, there is a strong response and priority given to fighting the virus. Local communities lack a clear understanding of climate change issues due to inadequate communication (Lyytimäki et al., 2020). In addition to this, inadequate communication on scientifically established communication on climate change is still low. The COVID-19 pandemic has dominated local, regional, and international media communication (Crossley, 2020). In the wake of COVID-19, climate change pandemic response has been reduced. Climate change is rarely in the media spotlight as compared to COVID-19. Although the world has declared climate change an emergency, the sense of its urgency is still not felt.

Access to the climate fund has been very challenging as compared to the COVID-19 fund, especially in African countries. In the conference of parties (COP), countries submitted Nationally Determined Contributions (NDCs) that outline national goals for greenhouse gas emissions reductions and identify financial needs for mitigation and adaptation efforts. There has been an inadequacy of this NDC's commitments (Qimin et al., 2020). The issue with climate change commitments is that there have been few incentives for national leaders to launch and sustain long-term implementation. There is also inadequate accountability by international regimes on climate goals. International and national policies focused on climate change are divided. This makes mitigation and adaptation measures difficult. The financial resources mobilized to help vulnerable communities, especially those in developing countries, are still low and limited. Climate hazards have increased vulnerability and reduced the capacity of communities to adapt to the changing impacts of climate change. In developing countries, the most vulnerable people have to deal with the effects of climate change because the climate fund and donor support are not always reliable (Broberg, 2020).

Kenya continues to experience negative climate change impacts (Kogo et al., 2021; Dongmo, 2022) where vulnerable coastal communities are both struck by COVID-19 and climate change threats (Lau et al., 2021). These multiple hazards put these vulnerable communities at a higher risk. There has been pressure to lose of hundreds of homes, livelihoods, and some of the economic generating potential like tourism in these coastal communities. Climate hazards such as floods and increased storms accelerate the impact of the COVID-19 pandemic (Tangcharoensathien et al., 2021). Limited resources, lack of risk assessment and lack of communication strategy put in place hinder the contingency plan by the government of Kenya to deal with climate change. Approximately 60,000 inhabitants face direct and indirect impacts of climate change in the coastal city of Mombasa in Kenya (Okaka and Odhiambo, 2019). Additionally, 17% of areas in Mombasa are usually submerged by a sea level rise of 0.3 meters, with a larger area rendered uninhabitable (Akanwa and Joe-Ikechebelu, 2019; Njenga, 2020; Mogo et al., 2021). The city has a history of disasters related to climate extremes causing huge damage.

The recently released IPCC (2021) report identifies indigenous peoples (IPs) as being particularly vulnerable to the direct effects of climate change because they frequently live on the front lines of the natural environment and rely on healthy ecosystems for their existence. Kenya's coastal marine boundary environments are home to numerous IP vulnerable to climate shocks. Therefore, the climate crisis compounds to the lengthy list of challenges that indigenous communities have endured for generations, such as land and resource loss, violations of human rights, discrimination, and marginalization. Human actions have severely impacted three-quarters of the land-based ecosystem and approximately 66% of the maritime environment, according to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)¹ report (Fisher et al., 2018). In territories held or administered by IPs and local groups, these tendencies have been less severe. For instance, COVID-19 recovery investment must be in line with the Paris Agreement's goals. In addition, the decade-old pledge to mobilize \$100 billion per year to help mitigation and adaptation in impoverished nations must be fulfilled.

Many governments have redirected resources to the COVID-19 response, leaving behind the climate change threat (Herrero and Thornton, 2020; Stuart et al., 2022). Climate activists all over the world have been advocating for a quick and effective response to climate change threats, and most governments have been slow to respond. This is different when we come to the COVID 19 pandemic, where all countries all over the world responded quickly. Disaster crisis communication is considered to be an important strategy in response to any disaster emergency. However, communication has become

¹ <https://ipbes.net/assessment-reports/scenarios>.

challenging and potentially problematic, especially with climate change in developing countries (Ruiu et al., 2020). By contrast, there is a good communication strategy put in place in response to COVID-19 as compared to climate change.

In Kenya, for example, various Digital Media Platforms and Social Networking Sites such as Twitter, Facebook, WhatsApp, Instagram, Telegram, Discord, LinkedIn, and YouTube are used to inform people about climate change information. According to Perkins et al. (2021), the alludes that the hinderance to quick response to climate change to COVID-19 is that climate change is invisible to the latter. The Kenyan population has not yet experienced severe consequences from climate change first hand, and those who might have not be able to attribute their hardships to the exclusive problem of the changing climate. The time lag between our actions and the climate and the sources of climate change are diffuse, and this makes it challenging to assign responsibility or hold particular actors responsible (Povitkina, 2021). Systemic corruption also accelerates unethical practices that hinder climate change mitigation. Embezzlement of funds diverts public climate funds and aid away from climate goals.

Climate resilience disconnect and COVID-19 communication proliferation

The COVID-19 pandemic has claimed hundreds of thousands of lives and has been responsible for a global recession. Not all countries, however, have been affected similarly, with the response in some countries relatively successful in reducing transmission of the SARS-CoV-2 virus (Hyland-Wood et al., 2021). The global statistics of the SARS-CoV-2 infection surpass half a billion, with fatalities slightly above 6 million. Infections in Africa stand at 8.7 million, portraying it as the least affected continent, with Europe being most affected at 215 million [WHO Coronavirus (COVID-19) Dashboard, 2022]. The COVID-19 outbreak indicated that the most critical and effective strategy in public health response to outbreaks is proactive and effective communication. With the advent of the COVID-19 pandemic, it is more important than ever to give accurate and timely information while combating disinformation and misinformation (Adebisi et al., 2021).

For instance, effective messaging, a key objective of the Kenya National Communication and Community Engagement Strategy for Coronavirus (Ministry of Health, 2020), aimed to identify and understand the audience. Key messages have been consistently amplified through multimedia channels and community dialogues, and promoted through health workers and county officials. To counter the escalating COVID-19 infection rate, the Kenyan government also strengthened security surveillance in various hotspots throughout the country, including the Kenyan Coast, Western Kenya, Mombasa, and

Nairobi, among other counties, to limit individuals' mobility away from COVID-19 lockdown regions (Lau et al., 2021). Residents would receive this essential information from the Ministry of Health via daily media briefings (Kenya News Agency Information for Development, 2022).

The COVID-19 virus arrived in a world already affected by climate change. Nonetheless, communication about it was effortless. COVID-19's combined impacts and reactions are socially and geographically unequal, aggravating existing imbalances (Pelling et al., 2021). Malhi et al. (2021) posit that Africa contributes <5% of the greenhouse gases responsible for climate change, but it is the most vulnerable continent to the consequences. According to the 2019 Kenya Population and Housing Census, Kenya has around 19.5 million impoverished people, 14 million of whom live in rural areas. Drought has continued to ravage coastal Kenya in the aftermath of the COVID-19 outbreak, destroying crops, animals, and human life. The socioeconomic consequences of such climate shocks endanger food security and the overall wellbeing of the population. Unfortunately, local communication on the climate catastrophe in Kenya remains poor, necessitating the intervention of external communication channels. For example, in 2021, Cable News Network, Inc. (CNN) ran this segment² "Severe Drought Ravages Kenyan Communities." In this segment, CNN's News correspondent Larry Madowo covers Kilifi County, one of the counties in coastal Kenya. He mentions how climate has impacted the agro-ecosystems leading to water shortages, death of livestock and crop failure. This has necessitated to climate migrations especially men to other areas to cater for the needs of their families.

The Republic of Kenya, through its Ministry of Finance, successfully applied for a 188-million-euro loan from the African Development Bank (AfDB) to fund the COVID-19 Emergency Response Support Program (ERSP), which aimed to respond to the pandemic and mitigate its economic and social impacts. One of the program's policy goals was to help the poor and vulnerable people cope with the impacts of the pandemic (African Development Bank Group, 2020). Despite efforts being made to prevent more damage from the COVID-19 pandemic, little attention is being given toward the climate crisis.

In spite of Kenya's strong climate policy, local planning and action have been largely separated from the national approach. The technical capacities of county governments and local authorities remain insufficient, development planning ignores vital community priorities, and financial resources are scarce. The Kenya Climate Change Act, 2016, for example, devolved climate change action to counties in order to achieve low carbon, climate resilient sustainable development (Government of Kenya, 2016); the Kenya Climate Change Learn Strategy, 2021–2031, recognizes climate change as a cross-cutting issue

² Severe Drought Ravages Kenyan Communities. CNN—YouTube: <https://www.youtube.com/watch?v=BkvPtei9I6A>.

affecting various sectors; and the Climate Smart Agriculture Strategy 2017–2026 aims to achieve sustainable food production and income generation while also building climate resilience and decarbonization (Ministry of Agriculture, 2017).

In spite of these comprehensive policy options, climate communication remains woefully inadequate. We are paying the price for the government's failure to recognize climate change as a serious and immediate threat. The prospects for future generations are bleak, and there isn't much time left to do something about climate change, even if the worst effects are decades away (Berge, 2020). COVID-19 caused a large-scale systemic disruption with the potential to effect long-term transformation. Businesses went out of operations or went online, governments reallocated resources, hospitals implemented emergency measures, and the majority of people changed their behavior by using virtual learning platforms (Hochachka, 2020).

COVID-19 proxy rhetoric on building climate resilience in marginalized coastal rural communities

Many IPs are critical but undervalued populations affected by climate change. This diversity includes complex systems of knowledge and inhabitation, developed over many generations of coevolution with environmental change (Comberti et al., 2019). This is what is referred to as traditional ecological knowledge (TEK), also referred to as indigenous peoples' knowledge (IPK) in line with the International Indigenous Peoples Forum on Climate Change, deeply rooted in cultural traditions and lifeways, developing relevant climate change adaptation strategies (Nicoson, 2021).

Climate change is a topic that has been discussed in various historical eras (Kangai et al., 2021; Borrás et al., 2022). When it comes to climate and climate systems, Aristotle, an ancient Greek philosopher and one of the best early realistic scientists in antiquity, made significant contributions (Heymann, 2010). In his book "Sophistical Refutations," the Greek philosopher Aristotle named a dozen of common logical fallacies in human discourse 2,300 years ago (Krabbe, 2012; Athanassopoulos and Voskoglou, 2020). Interestingly, essentially all of the typical reasons for concern about climate change are manifestations of Aristotle's dozen fallacies of applicability or presumption, the most notable among them being the consensus fallacy. Nonetheless, it was Theophrastus who eventually made sophisticated scholarly assertions about the possibility of climate dynamism. He philosophically posits about man's interaction with nature that consists of animal happiness, however with early developmental modernity this reflects the effect of man on biodiversity (Muratori, 2016). Environmental depletion negates man to zoonoses heightened by climate change on host-pathogen interaction and exposure to pandemics (Rupasinghe

et al., 2022). Climate change, on the other hand, has only reemerged as the most prominent environmental issue and has been underpinned by unprecedented COVID-19 global north and global south focus. Climate change is arguably the most debated or preferred discourse in environmental fora in Kenya in recent years. In spite of Kenyans being aware of the term "climate change," they have little information about this phenomenon (Ojwang et al., 2017; Ageyo and Muchunku, 2020).

Communication about climate change in Kenya will only be successful if the nation's most vulnerable coastal communities are reached by an army of committed communicators armed with a robust knowledge base. The media and basic education teachers rarely enhance this understanding in reporting climate-related tragedies or the concept of climate change. This therefore, outline the absence of climate change information at the localized settings. This therefore dims the climate resilient knowledge for the general populace at large, and being overtaken by COVID-19 discourse. In Kenya, the National Climate Change Response Strategy (NCCRS) and the National Climate Change Action Plan (NCCAP) are two of the government's several climate change policy documents that have set pace toward climate action. The NCCAP is an excellent example of a robust strategy for a low-carbon, climate-resilient growth route for the country (Government of Kenya, 2012). Additionally, the Climate Change Act 2016 has been enacted in parliament. The dilemma is that very little of this information has been disseminated to the general public. Moreover, communication and capacity building that should serve as major information enablers have missing links.

Kenyans face a confrontational quandary over the foundation of climate resilience communication. Kenyans appear to be influenced by their indigenous knowledge of climate change, as well as their basic education curriculum and digital media communication platforms (Manei et al., 2016). Whenever it comes to climate change correspondence in the country, these imperatives cannot be ignored, and because of this, revamping how we approach climate resilience discourse in coastal communities is critical. This will aid Kenya's coastal communities, to reinvigorate the conceptualization and implementation of climate resilience communication rhetoric in the country.

Built resilience on COVID-19 and climate action in coastal Kenya

Climate change, environmental degradation, and extreme poverty are all intertwined crises (Bales and Sovacool, 2021; Newell, 2022). Climate change has already had an impact and is expected to exacerbate the decline of biodiversity and ecosystem services (Pörtner et al., 2022). The rural and impoverished coastal populations in Kenya (Figure 1) are disproportionately affected because they rely on healthy ecosystems for food, water,

TABLE 1 The landscape of climate financing in Kenya.

Fund allocation	Time of funding	References
US\$14.2 million—External Sources	2009–2012	The National Treasury Planning, 2021
US\$34.8 million—Kenya National Budget		
The Adaptation Fund approved a USD 10 million proposal from the National Environment Management Authority (NEMA), in 2014 and disbursed the first tranche of USD 4.9 million to Kenya. NEMA is Kenya's National Implementing Entity (NIE) for the Adaptation Fund	2014	FANRPAN, 2015
KES 76 billion disbursed in climate-related development expenditures	Financial year 2017/18	The National Treasury Planning, 2021
KES 243.3 billion (USD 2.4 billion) in public and private capital was invested in climate mitigation and adaptation activities in Kenya from both domestic and international sources	2018	The National Treasury Planning, 2021

shelter, safety, and social connections. These circumstances limit their ability to lift themselves out of poverty ([Ambrosino et al., 2020](#)). Kilifi County for instance, has a poverty rate of 71.7% and is 67% food insecure where droughts and floods have adverse effects on crop yields and food availability. Farmers have trouble adapting to these climate variability effects because of poor infrastructure, inadequate agricultural inputs, and poor agricultural extension services ([MoALF, 2016](#)).

According to the Paris Agreement, the global north ought to raise funds for climate action for the global south. For example, it was proposed that by 2020, countries in the global north would have raised and committed to spending \$100 billion on climate action. To combat climate change, the global south needs to invest 60–70% of the estimated US 95 trillion by 2030 in infrastructure (energy, transportation, water, and telecommunications; [Bracking and Leffel, 2021](#)). According to the [World Health Organization \(2021\)](#), climate change is particularly a danger toward global health. According to [Klioutchnikov and Kliuchnikov \(2021\)](#) COVID-19 pandemic has long-term consequences for people's environmental awareness and the availability of funds for climate change mitigation and adaptation globally.

TABLE 2 The landscape of Covid-19 Financing in Kenya.

Fund allocation	Time of funding	References
World Bank Approves \$1 Billion budget support operation for Kenya, to Address COVID-19 Financing Gap and Support Kenya's Economy	2020	The World Bank, 2020
European Union has contributed more than Ksh35 billion (\$350 million) to Kenya's COVID-19 response measures, with other EU member States having contributed a further Ksh3.3 billion (\$33 million) for the same.	2020	The East African News, 2020
To reinforce Kenya's resilient, inclusive and green economic recovery from the COVID-19 crisis, the World Bank approved \$750 million in development policy financing to support policy reforms that will strengthen transparency and accountability in public procurement and promote efficient public investment spending	2021	The World Bank, 2021

[Table 1](#) shows climate financing in Kenya between the years 2009 and 2018. The statistics clearly demonstrates the laxity in climate financing, yet the effects of climate change continue to occur in the face of widespread ignorance. COVID-19, on the other hand, has received enormous support in Kenya within a relatively short period of time (2020–2021), in spite of its short-term impacting effects it has had on the Kenyan population ([Table 2](#)).

Conclusion

The ability to effectively convey climate change information relies heavily on being able to comprehend the phenomenon and finding ways to simplify it while conveying its full significance. Although climate resilience communication in Kenya has been blighted by misinformation and passive punditry since the publication of the COVID-19, this is not due to a lack of information. It is impossible to avoid a climate change communication discourse aimed at making it easier for the general public to understand, but this should not conflict with rising COVID-19 debate. Climate change communication in Kenya will only be successful if a solid knowledge basis and an army of dedicated communicators reach the country's most vulnerable coastal communities.

The foundation of climate resilience communication presents Kenyans with a confounding and potentially contentious conundrum. It would appear that Kenyans are influenced not only by their traditional understanding of climate change but also by their basic education curriculum and the communication channels provided by the media. When it comes to discussions about climate change in the country, these necessities cannot be disregarded under any circumstances. In view of this, it is absolutely necessary for us to rethink how we approach the discourse on climate resilience in coastal communities. In order to be of assistance to the coastal communities of Kenya, it is necessary to revitalize the conceptualization and implementation of climate resilience communication rhetoric throughout the nation.

Author contributions

IN: conceptualization, investigation, visualization, writing-original draft, and writing-review and editing. SG: conceptualization, visualization, and writing-review

References

- Abbass, K., Qasim, M. Z., Song, H., Murshed, M., Mahmood, H., and Younis, I. (2022). A review of the global climate change impacts, adaptation, and sustainable mitigation measures. *Environ. Sci. Pollut. Res. Int.* 29, 42539–42559. doi: 10.1007/s11356-022-19718-6
- Adebisi, Y. A., Rabe, A., and Lucero-Priso Iii, D. E. (2021). Risk communication and community engagement strategies for COVID-19 in 13 African countries. *Health Promot. Perspect.* 11, 137–147. doi: 10.34172/hpp.2021.18
- African Development Bank Group (2020). *Kenya – COVID-19 Emergency Response Program*. Available online at: <https://projectsportal.afdb.org/dataportal/VProject/show/P-KE-K00-007>
- Ageyo, J., and Muchunku, I. G. (2020). Beyond the right of access: a critique of the legalist approach to dissemination of climate change information in Kenya. *Sustainability* 12, 2530.
- Akanwa, A. O., and Joe-Ikechebelu, N. (2019). “The developing world’s contribution to global warming and the resulting consequences of climate change in these regions: a Nigerian case study,” in *Global Warming and Climate Change*, ed J. P. Tiefenbacher (London: IntechOpen).
- Al-Humaiqani, M. M., and Al-Ghamdi, S. G. (2022). The built environment resilience qualities to climate change impact: concepts, frameworks, and directions for future research. *Sustain. Cities Soc.* 80, 103797. doi: 10.1016/j.scs.2022.103797
- Ambrosino, C., Hufton, B., Nyawade, B. O., Osimbo, H., and Owiti, P. (2020). “Integrating climate adaptation, poverty reduction, and environmental conservation in Kwale county, Kenya,” in *African Handbook of Climate Change Adaptation*, eds N. Oguje, D. Ayal, L. Adeleke, and da I. Silva (Cham: Springer), 2713–2731. doi: 10.1007/978-3-030-42091-8_118-1
- Apollo, A., and Mbah, M. F. (2021). Challenges and opportunities for climate change education (CCE) in East Africa: a critical review. *Climate* 9, 93. doi: 10.3390/cli9060093
- Athanassopoulos, E., and Voskoglou, M. G. (2020). Quantifying Aristotle’s fallacies. *Mathematics* 8, 1399. doi: 10.3390/math8091399
- Bales, K., and Sovacool, B. K. (2021). From forests to factories: how modern slavery deepens the crisis of climate change. *Energy Res. Soc. Sci.* 77, 102096. doi: 10.1016/j.erss.2021.102096
- Bandh, S. A., Shafi, S., Peerzada, M., Rehman, T., Bashir, S., Wani, S. A., et al. (2021). Multidimensional analysis of global climate change: a review. *Environ. Sci. Pollut. Res.* 28, 24872–24888. doi: 10.1007/s11356-021-13139-7
- Bartlow, A. W., Manore, C., Xu, C., Kaufeld, K. A., Del Valle, S., Ziemann, A., et al. (2019). Forecasting zoonotic infectious disease response to climate change: mosquito vectors and a changing environment. *Vet. Sci.* 6, 40. doi: 10.3390/vetsci6020040
- Berge, C. (2020). *What if We Responded to Climate Change Like We Have to Coronavirus?* Elle Canada. Available online at: <https://www.ellecanada.com/culture/society/what-if-we-responded-to-climate-change-like-we-have-to-coronavirus>
- Borras Jr, S. M., Scoones, I., Bavisar, A., Edelman, M., Peluso, N. L., and Wolford, W. (2022). Climate change and agrarian struggles: an invitation to contribute to a JPS Forum. *J. Peasant Stud.* 49, 1–28.
- Botzen, W., Duijndam, S., and van Beukering, P. (2021). Lessons for climate policy from behavioral biases towards COVID-19 and climate change risks. *World Dev.* 137, 105214. doi: 10.1016/j.worlddev.2020.105214
- Bracking, S., and Lefel, B. (2021). Climate finance governance: fit for purpose?. *Wiley Interdiscipl. Rev. Clim. Change* 12, e709. doi: 10.1002/wcc.709
- Broberg, M. (2020). Parametric loss and damage insurance schemes as a means to enhance climate change resilience in developing countries. *Clim. Policy* 20, 693–703. doi: 10.1080/14693062.2019.1641461
- Brown, K. (2014). Global environmental change I: a social turn for resilience? *Prog. Hum. Geogr.* 38, 107–117. doi: 10.1177/0309132513498837
- Choudhary, O. P., Priyanka, Fahrni, M. L., Metwally, A. A., and Saied, A. A. (2022). Spillover zoonotic ‘Langya virus’: is it a matter of concern?. *Vet. Q.* 42, 172–174. doi: 10.1080/01652176.2022.2117874
- Combetti, C., Thornton, T. F., Korodimou, M., Shea, M., and Riamit, K. O. (2019). Adaptation and resilience at the margins: addressing indigenous peoples’ marginalization at international climate negotiations. *Environ. Sci. Policy Sustain. Dev.* 61, 14–30. doi: 10.1080/00139157.2019.1564213
- Crossley, É. (2020). Ecological grief generates desire for environmental healing in tourism after COVID-19. *Tour. Geograph.* 22, 536–546. doi: 10.1080/14616688.2020.1759133
- Dawson, N., Coolsaet, B., and Martin, A. (2018). “Justice and equity: emerging research and policy approaches to address ecosystem service trade-offs,” in *Ecosystem Services and Poverty Alleviation*, eds K. Schreckenberg, G. Mace, and M. Poudyal (London: Routledge), 22–39.

and editing. GN: contextualization, revising, rewriting, proofreading, and editing. EO: writing draft, visualization, investigation, and proofreading.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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- de Santana, W. F., Tavares, G. H., Pires, L. C., Romano, F. S., Cruz de Oliveira, N. R., Lusby, C., et al. (2022). The decrease in the physical activity levels during the COVID-19 social distancing period. *Motriz. Rev. Educ. Fis.* 28:10224. doi: 10.1590/s1980-657420220016521
- Dongmo, C. (2022). "Resilience to environmental challenges and the national disaster insurance program in Kenya," in *Energy Policy Advancement*, eds D. Kurochkin, M. J. Crawford, and E. V. Shabliy (Cham: Springer), 145–161. doi: 10.1007/978-3-030-84993-1_7
- Eitzinger, A., Binder, C. R., and Meyer, M. A. (2018). Risk perception and decision-making: do farmers consider risks from climate change?. *Clim. Change* 151, 507–524. doi: 10.1007/s10584-018-2320-1
- FANRPAN (2015). *Climate Change Financing in Kenya, South Africa*. Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN).
- Fisher, J., Scholes, R., and Montanarella, L. (2018). "Chapter 1: Assessment Report on land degradation and restoration." *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)*. Available online at: <http://www.ipbes.net>
- Foss, S. K. (2017). *Rhetorical Criticism: Exploration and Practice*. Prospect Heights, IL: Waveland Press.
- Government of Kenya (2012). *National Climate Change Action Plan 2013–2017: Executive Summary*. Nairobi: Ministry of Environment and Mineral Resources.
- Government of Kenya (2016). *The Kenya Climate Change Act: The Kenya Gazette Supplement No.68 (Acts No. 11)*. Nairobi: Government Press.
- He, Q., and Silliman, B. R. (2019). Climate change, human impacts, and coastal ecosystems in the Anthropocene. *Curr. Biol.* 29, R1021–R1035. doi: 10.1016/j.cub.2019.08.042
- Heckelman, A., Smukler, S., and Wittman, H. (2018). Cultivating climate resilience: a participatory assessment of organic and conventional rice systems in the Philippines. *Renew. Agric. Food Syst.* 33, 225–237. doi: 10.1017/S1742170517000709
- Herrero, M., and Thornton, P. (2020). What can COVID-19 teach us about responding to climate change? *Lancet Planet. Health* 4, e174. doi: 10.1016/S2542-5196(20)30085-1
- Heymann, M. (2010). The evolution of climate ideas and knowledge. *Wiley Interdiscipl. Rev. Clim. Change* 1, 581–597. doi: 10.1002/wcc.61
- Hochachka, G. (2020). Unearthing insights for climate change response in the midst of the COVID-19 pandemic. *Glob. Sustain.* 3, e33. doi: 10.1017/sus.2020.27
- Hyland-Wood, B., Gardner, J., Leask, J., and Ecker, U. K. (2021). Toward effective government communication strategies in the era of COVID-19. *Hum. Soc. Sci. Commun.* 8, 30. doi: 10.1057/s41599-020-00701-w
- IPCC (2021). *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.
- Kangai, R., Chitechi, W. E., Koske, J., Waswa, B., and Ngare, I. (2021). Small scale farmers perception of institutions and information channels on climate change and adaptation, Embu County, Kenya. *Afr. J. Agric. Res.* 17, 404–413. doi: 10.5897/AJAR2020.15165
- Kenya News Agency Information for Development (2022). *Residents Relocate from COVID-19 Lockdown Zones*. Government of Kenya.
- Klioutchnikov, I., and Kliuchnikov, O. (2021). Green finance: pandemic and climate change. *E3S Web Confer.* 234, 00042. doi: 10.1051/e3sconf/202123400042
- Kogo, B. K., Kumar, L., and Koech, R. (2021). Climate change and variability in Kenya: a review of impacts on agriculture and food security. *Environ. Dev. Sustain.* 23, 23–43. doi: 10.1007/s10668-020-00589-1
- Krabbe, E. C. (2012). Aristotle's on sophistical refutations. *Topoi* 31, 243–248. doi: 10.1007/s11245-012-9124-0
- Kruidbos, F. (2022). "Ecology of zoonotic pathways indicating conflict and mass migration," in *The Climate-Conflict-Displacement Nexus from a Human Security Perspective*, eds M. Behnassi, H. Gupta, F. Kruidbos and A. Parlow (Cham: Springer), 251–291. doi: 10.1007/978-3-030-94144-4_12
- Lau, J., Sutcliffe, S., Barnes, M., Mbaru, E., Muly, I., Muthiga, N., et al. (2021). COVID-19 impacts on coastal communities in Kenya. *Mar. Policy* 134, 104803. doi: 10.1016/j.marpol.2021.104803
- Lyytimäki, J., Kangas, H. L., Mervaala, E., and Vikström, S. (2020). Muted by a crisis? COVID-19 and the long-term evolution of climate change newspaper coverage. *Sustainability* 12, 8575.
- Malhi, G. S., Kaur, M., and Kaushik, P. (2021). Impact of climate change on agriculture and its mitigation strategies: a review. *Sustainability* 13, 1318. doi: 10.3390/su13031318
- Manei, N., Macopiyo, L., and Kironchi, G. (2016). "Integration of indigenous knowledge with ICTs in managing effects of climate change and variability in Kajiado County, Kenya," in *Fifth African Higher Education Week and RUFORUM Biennial Conference 2016, Linking Agricultural Universities With Civil Society, the Private Sector, Governments and Other Stakeholders in Support of Agricultural Development in Africa* (Cape Town), 231–236.
- Marazziti, D., Cianconi, P., Mucci, F., Foresi, L., Chiarantini, I., and Della Vecchia, A. (2021). Climate change, environment pollution, COVID-19 pandemic and mental health. *Sci. Total Environ.* 773, 145182. doi: 10.1016/j.scitotenv.2021.145182
- McKinnon, S., Breakey, S., Fanuele, J. R., Kelly, D. E., Eddy, E. Z., Tarbet, A., et al. (2022). Roles of health professionals in addressing health consequences of climate change in interprofessional education: a scoping review. *J. Clim. Change Health* 5, 100086. doi: 10.1016/j.jocl.2021.100086
- Ministry of Agriculture, Livestock and Fisheries (2017). *Kenya Climate Smart Agriculture Strategy-2017–2026*. Nairobi: Government Press.
- Ministry of Health (2020). *Kenya National Communication and Community Engagement Strategy for Coronavirus*. Government of Kenya.
- Mitchell, D., Barth, B., Ho, S., Sait, M. S., and McEvoy, D. (2021). The benefits of fit-for-purpose land administration for urban community resilience in a time of climate change and COVID-19 pandemic. *Land* 10, 563. doi: 10.3390/land10060563
- MoALF (2016). *Climate Risk Profile for Kilifi County. Kenya County Climate Risk Profile Series*. The Ministry of Agriculture, Livestock and Fisheries (MoALF), Nairobi, Kenya.
- Mogo, E. R., Wesonga, J. M., Gichuyia, L. N., and Shuckburgh, E. (2021). COP26 futures we want-Kenya country profile. *Cambridge Open Engage*. doi: 10.33774/coe-2021-llx5j-v2
- Muratori, C. (2016). "From animal happiness to human unhappiness: Cardano, Vanini, Theophrastus redivivus (1659)," in *Early Modern Philosophers and the Renaissance Legacy*, eds G. Paganini and C. Muratori (Cham: Springer), 185–200. doi: 10.1007/978-3-319-32604-7_11
- Newell, P. (2022). "Development and climate: a tale of two crises," in *Handbook on the Politics of International Development*, eds M. Deciancio, P. Nemiña and D. Tussie (Cheltenham: Edward Elgar Publishing), 231–242.
- Ngare, I. O., Koske, J. K., Muriuki, J. N., Chitechi, E. W., and Gathuku, G. N. (2020). Urban climate variability trend in the coastal region of Mombasa Kenya. *Afr. J. Environ. Sci. Technol.* 14, 214–221. doi: 10.5897/AJEST2020.2837
- Nicholas, P. K., and Breakey, S. (2017). Climate change, climate justice, and environmental health: implications for the nursing profession. *J. Nurs. Scholar.* 49, 606–616. doi: 10.1111/jnu.12326
- Nicholas, P. K., Breakey, S., Tagliareni, M. E., Simmonds, K., and Sabo, K. K. (2021). Climate change and population health: incorporating stages of nursing's political development. *Nurs. Outlook* 69, 65–73. doi: 10.1016/j.outlook.2020.08.001
- Nicoson, C. (2021). Towards climate resilient peace: an intersectional and degrowth approach. *Sustain. Sci.* 16, 1147–1158. doi: 10.1007/s11625-021-00906-1
- Njenga, J. K. (2020). *Evaluating Records Disaster Preparedness in Government Departments in Mombasa County, Kenya*. Doctoral Dissertation, MOI University.
- Ojwang, L., Rosendo, S., Celliers, L., Obura, D., Muiti, A., Kamula, J., et al. (2017). Assessment of coastal governance for climate change adaptation in Kenya. *Earth's Future* 5, 1119–1132.
- Okaka, F. O., and Odhiambo, B. (2019). Health vulnerability to flood-induced risks of households in flood-prone informal settlements in the Coastal City of Mombasa, Kenya. *Nat. Haz.* 99, 1007–1029. doi: 10.1007/s11069-019-03792-0
- Pelling, M., Chow, W. T., Chu, E., Dawson, R., Dodman, D., Fraser, A., et al. (2021). A climate resilience research renewal agenda: learning lessons from the COVID-19 pandemic for urban climate resilience. *Clim. Dev.* 14, 617–624. doi: 10.1080/17565529.2021.1956411
- Perkins, K. M., Munguia, N., Ellenbecker, M., Moure-Eraso, R., and Velazquez, L. (2021). COVID-19 pandemic lessons to facilitate future engagement in the global climate crisis. *J. Clean. Prod.* 290, 125178. doi: 10.1016/j.jclepro.2020.125178
- Poitras, G. (2021). Rhetoric, epistemology and climate change economics. *Ecol. Econ.* 184, 106985. doi: 10.1016/j.ecolecon.2021.106985
- Pörtner, H. O., Roberts, D. C., Adams, H., Adler, C., Aldunce, P., Ali, E., et al. (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability*. IPCC Sixth Assessment Report.
- Povitkina, M. (2021). *Reflecting on Democracy, Corruption and Climate Change in the COVID-19 Era*. Available online at: <https://www.e-ir.info/2020/05/06/reflecting-on-democracy-corruption-and-climate-change-in-the-covid-19-era/> (accessed 5 March 2021).

- Qimin, C., Sha, F., and Xinyuan, W. (2020). Modeling the implementation of NDCs and the scenarios below 2°C for the Belt and Road countries. *Ecosyst. Health Sustain.* 6, 1766998. doi: 10.1080/20964129.2020.1766998
- Raimi, M. O., Vivien, O. T., and Oluwatoyin, O. A. (2021). Creating the healthiest nation: Climate change and environmental health impacts in Nigeria: a narrative review. *Scholink Sustain. Environ.* 6, 61. doi: 10.22158/se.v6n1p61
- Ringsmuth, A. K., Otto, I. M., van den Hurk, B., Lahn, G., Reyer, C. P., Carter, T. R., et al. (2022). Lessons from COVID-19 for managing transboundary climate risks and building resilience. *Clim. Risk Manage.* 35, 100395. doi: 10.1016/j.crm.2022.100395
- Ruiu, M. L., Ragnedda, M., and Ruiu, G. (2020). Similarities and differences in managing the Covid-19 crisis and climate change risk. *J. Knowl. Manage.* 24, 2597–2614. doi: 10.1108/JKM-06-2020-0492
- Rupasinghe, R., Chomel, B. B., and Martínez-López, B. (2022). Climate change and zoonoses: a review of the current status, knowledge gaps, and future trends. *Acta Trop.* 226, 106225. doi: 10.1016/j.actatropica.2021.106225
- Seife, T. K. (2021). The impact of climate change on agriculture and food security in the Greater Horn of Africa. *Politikon* 48, 98–114. doi: 10.1080/02589346.2020.1861509
- Smith, C. R. (2017). *Rhetoric and Human Consciousness: A History*. Long Grove, IL: Waveland Press.
- Sohrabi, C., Alsafi, Z., O'neill, N., Khan, M., Kerwan, A., Al-Jabir, A., et al. (2020). World Health Organization declares global emergency: a review of the 2019 novel coronavirus (COVID-19). *Int. J. Surg.* 76, 71–76. doi: 10.1016/j.ijsu.2020.02.034
- Stuart, D., Petersen, B., and Gunderson, R. (2022). Shared pretenses for collective inaction: the economic growth imperative, COVID-19, and climate change. *Globalizations* 19, 408–425. doi: 10.1080/14747731.2021.1943897
- Tangcharoensathien, V., Singh, P., and Mills, A. (2021). COVID-19 response and mitigation: a call for action. *Bull. World Health Organ.* 99, 78. doi: 10.2471/BLT.20.285322
- The East African News (2020). *Covid-19: Kenya Gets Additional \$78m Grant From EU*. Available online at: <https://www.theeastafrican.co.ke/tea/news/east-africa/covid-19-kenya-gets-additional-78m-grant-from-eu-1442932> (retrieved June 29, 2022).
- The National Treasury and Planning (2021). *The Landscape of Climate Finance in Kenya. On the Road to Implementing Kenya's NDC*. Nairobi: Government Press.
- The World Bank (2020). *World Bank Approves \$1 Billion Financing for Kenya, to Address COVID-19 Financing Gap and Support Kenya's Economy*. Available online at: <https://www.worldbank.org/en/news/press-release/2020/05/20/world-bank-approves-1-billion-financing-for-kenya-to-address-covid-19-financing-gap-and-support-kenyas-economy> (retrieved June 29, 2022).
- The World Bank (2021). *Kenya Receives \$750 Million Boost for COVID-19 Recovery Efforts*. Available online at: <https://www.worldbank.org/en/news/press-release/2021/06/10/kenya-receives-750-million-boost-for-covid-19-recovery-efforts> (retrieved June 29, 2022).
- Uddin, R., Philipsborn, R., Smith, D., Mutic, A., and Thompson, L. M. (2021). A global child health perspective on climate change, migration and human rights. *Curr. Probl. Pediatr. Adolesc. Health Care* 51, 101029. doi: 10.1016/j.cppeds.2021.101029
- Washbourne, C. L., Bell, S. C., and Osborn, D. (2021). Community responses to climate change: Editorial call for submissions to UCL open: Environment Special Series. *UCL Open Environ.* 3, 28. doi: 10.14324/111.444/ucloe.000028
- WHO Coronavirus (COVID-19) Dashboard (2022). *WHO Coronavirus (COVID-19) Dashboard With Vaccination Data*. Available online at: <https://covid19.who.int/> (retrieved April 26, 2022).
- Wilcox, B. A., Echaubard, P., de Garine-Wichatitsky, M., and Ramirez, B. (2019). Vector-borne disease and climate change adaptation in African dryland social-ecological systems. *Infect. Dis. Poverty* 8, 1–12. doi: 10.1186/s40249-019-0539-3
- World Health Organization (2021). *Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970–2019)*. Available online at: https://library.wmo.int/index.php?lvl=notice_display&id=21930#.YmZj9u1ByM9
- Wright, S., Plahe, J., and Jack, G. (2022). Feeling climate change to the bone: emotional topologies of climate. *Third World Q.* 43, 561–579. doi: 10.1080/01436597.2021.1987210
- Zhongming, Z., and Wei, L. (2021). *Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970–2019)*. WMO.