



Climate change effects on vulnerable populations in the Global South: a systematic review

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Abstract

The climate and environmental changes in the Global South have devastating effects on vulnerable populations, which have been perpetuated by socio-economic and political as well as gender inequalities and non-existent interventions to adapt and mitigate its adverse effects. Underpinned by the Protection Motivation Theory and Social-Cognitive Preparation model, this systematic literature review article depicts how vulnerable populations are impacted by climate change in the Global South. Using the empirical data from credible databases including the Web of Science and Scopus, 23 articles published since 2018 were searched, retrieved, coded, and classified with three themes emerging from the synthesised literature. The analysis of the literature confirms that climate change indeed impacts vulnerable populations adversely; the adaptability mechanisms are not applied by governments which are contrary to the international frameworks; and lastly, that such groups are discriminated against, undermined, and overlooked in societal programmes and interventions to mitigate the impacts of climate-induced disasters. Climate change impacts have severely destroyed the livelihoods of vulnerable populations and are exacerbated by socio-economic and political inequalities, with the adaptation and mitigation mechanisms deemed ineffective. Gaps in current research studies include the paucity of empirical data shedding light on the interventions provided for sexual gender-based violence victims and punitive actions issued against the perpetrators during and in the aftermath of the climate-induced disasters. There is also scant empirical data testing the adaptation and mitigation mechanisms' effectiveness.

Keywords Adaptation strategies · Climate change · Frameworks · Persons with disabilities · Sexual gender-based violence · Women

1 Introduction

Vulnerable populations have been severely affected by the disastrous effects of climate change and are being perpetuated by huge socio-economic gaps, unequal power relations, poor governance and increased risks with limited ineffective adaptation and mitigation

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strategies. A plethora of authors in the Global South have assessed the vulnerability of women due to climate induced disasters from diverse perspectives which include gender inequalities (Chidakwa et al. 2020); a gendered caveat on the flawed disaster preparedness during and post disasters (Chitongo et al. 2019); the relationship between SGBV against women and girls (Desai and Mandal 2021); children's proactive response; and adding value to make communities and households resilient to the impacts of climate change (Treichel 2020). Dados and Connell (2012: 12) term Global South as referring to regions (Latin America, Asia, Africa, and Oceania) who are in the "Third World", "Periphery", low income, politically or culturally marginalized, primitive, and formerly colonized.

Women and children have encountered unprecedented abuse ranging from SGBV, lack of privacy and protection, and mental trauma while the perpetrators were protected during and post climate-induced disasters (Desai and Mandal 2021; Treichel 2020). Zaidi and Fordham (2021) suggest that well-crafted and executed policies on climate change as well as the inclusion and engagement of women with regard to disaster risk reduction (DRR) initiatives and activities, can be a powerful influence on change (Memon 2020). In addition, the pertinent roles, diverse needs, perspectives, and experiences of children in DRR have been overlooked by researchers and policymakers (Ronoh et al. 2015). According to Anderson (2005) and Haynes and Tanner (2015), children's capacities can inform and contribute to DRR interventions, preparedness initiatives and decision-making processes. This article is therefore aimed at critically assessing how climate change effects the vulnerable populations in the Global South.

People with disabilities form part of different sub-groups of marginalised and vulnerable populations, have different challenges to adapt to climate-induced disasters and are not recognised in the sustainability research agenda – therefore, they cannot add value to the adaptation processes (Kosanic et al. 2022). Kosanic et al. (2022: 9) argue that inter-governmental bodies, including the Intergovernmental Panel on Climate Change (IPCC) and Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), can perform a significant role to ensure that people with disabilities are included and involved in scientific research studies involving them and on decision-making processes. Ronoh et al. (2015) state that children have been overlooked in DRR interventions (including preparedness) without them having access to resourcing. There are notable and relevant advancement and sustainable policies dealing with persons with disabilities globally, but empirical knowledge is meagre with regard to the effects of climate change on such sub-groups (Bennett et al. 2019; Kosanic et al. 2022; Morchen et al. 2021).

While the older populations tend to overlook the early warning systems even though it has been upgraded with digital tools, their past failures, lack of understanding and illiteracy worsen their resistance to the latter systems (Malak et al. 2020). An empirical study by Malak et al. (2020) assessing the extent to which aging people are vulnerable and the available adaptation mechanisms in the Bangladesh's coastal areas in the face of cyclones, found that the elderly did not have access to government income support while they are deprived of proper sanitation, and are experiencing food insecurity without the support and care from their families. The authors called for special attention to be paid to the elderly and suggested a collective effort by different stakeholders including governments and Non-Governmental Organisations (NGOs) as well as the development of older people's agenda framework to reduce their risk and vulnerability. Given the fact that different people have different exposure to disasters when they unfold, the intersectional lens has been promoted by Kuran et al. (2020) to be applied to vulnerable groups in order to provide a well-balanced view to such sub-groups. In Bangladesh, Sams (2019) delivered fascinating findings on the relationship between the impact of coastal cyclones and the socio-economic

conditions of migrants (women in particular) who were prone to these climate change-induced disasters. The qualitative findings differentiated gender in terms of women and men and found women to be more vulnerable than their male counterparts due to socio-economic conditions and gender discrimination in a patriarchal society. Another interesting study by Memon (2020), which examined Gender-Based Violence (GBV) against women and natural disasters in the flood settlement camps, espoused emotional and physical violence committed by their partners and complete strangers during and in the aftermath of disasters. The author suggested the development of policies and climate change interventions which are gender sensitive to be implemented as such events impact disastrously on women during and post a disaster period.

Against the above backdrop, this study primarily focused on the systemic review of literature on how vulnerable populations have been impacted by climate change in the Global South. The adaptation and mitigation capacity mechanisms possessed by the vulnerable populations to adapt to the effects of climate change are assessed. Furthermore, the effectiveness of international mechanisms and policies to support vulnerable groups to be proactively involved in climate change adaptation initiatives and interventions is examined. Lastly, limitations of the vulnerable groups to participate in climate and environmental change initiatives in their communities are analysed.

2 Methods and review strategy

This paper follows a systematic literature review methodology to comprehensively and concisely state the review objectives, to define a search strategy, and the criteria used to build a sample of credible and relevant empirical articles. The impact of climate change and variations to vulnerable groups data are assessed and synthesised to show patterns and trends (Briner and Denyer 2012). The peer reviewed literature in the form of journal articles in English which were published between 2018 and 2022 with the exclusion of grey literature including unpublished work, reports, and books, was analysed. A total of 23 journal articles were identified by using a search method and retrieved from three credible databases including Scopus, the Web of Science and PubMed, which have articles published on climate change and vulnerable populations. The key words which were used during searches included “climate change”, “vulnerable groups”, “climate-induced disasters”, “women”, “children”, “people with disabilities”, and “gender”.

Only research studies showing how the vulnerable groups are impacted by climate change were included, with meta-analyses and review articles being excluded during the screening phase. The first phase of screening for inclusion included reading 81 abstracts which resulted in using 23 articles which were further analysed and they form part of this study. A total of 58 articles were excluded as they did not fulfil all the criteria for inclusion. A three-step approach was followed for screening the articles which were included in the online platform (with the title and abstract reading), followed by text screening by two scholarly experts in the field and using the ATLAS.ti 22 software during the coding stages.

Included articles were captured and coded with ATLAS.ti 22 for data analysis where codes were established which were mostly guided by chosen theories. The codes were established around climate change and its impacts on a host of issues including vulnerable groups; threats, beliefs and attitudes regarding acceptable behaviour; the value of community participation and involvement; adaptation mechanisms; international frameworks and policies and preparedness; formations; and decision making. In addition, sub-codes were

developed in terms of the triggers, objectives, methodology, findings, major conclusions and recommendations or innovative practices from the study.

A combination of the gathered articles which met a search criterion was synthesised with the patterns, themes and trends identified, followed by the thematic analysis. Thematic analysis (Clarke and Braun 2013) was chosen because it is a simple, rich, flexible and robust methodology to categorise problems, insights, realities and recommendations together (Onwuegbuzie et al. 2009).

3 Key issues

3.1 Conceptual and theoretical

A plethora of theories – including the Theory of Planned Behaviour (TPB), the Person Relative to Event Theory and the Community Engagement Theory – were considered in this study and partially excluded as they were not aligned with the current study's objectives. However, in this study, a PMT was followed as it is prevalently used by scholars in a host of areas, including climate and environmental changes and risks (Floyd et al. 2000; Rogers 1975). The PMT is a social cognition theoretical model which postulates how the vulnerable groups are being impacted by behaviours, fear and health-related attitudes according to this study's objectives. The participatory and interactive approach (at community and institutional levels) was chosen, which is underpinned by the Social-Cognitive Preparation Model and focusses on identifying information on how vulnerable people interpret information during and post disasters – their experiences, beliefs, and expectations to sustain community and social context were relevant to the study objectives as these objectives investigated the significance of the involvement of the designated groups during such situations (McIvor et al. 2009; Paton 2007).

Kuran et al. (2020: 1) describe vulnerable populations as a:

“population within a country that has specific characteristics that make it at a higher risk of needing humanitarian assistance than others or being excluded from financial and social services”.

Climate change is described as an increase in global temperatures or long-term shifts in temperatures and weather patterns which might be natural as a result of solar cycle variations (United Nations 2016). The changes in the variability of properties which occur continuously over a decade or longer are termed “climate change” (Disaster Management Act of 2002). In a nutshell, in this literature overview study, an attempt is made to apply the above-mentioned concepts and frames and assess the gaps, new insights and extension from them (Fig. 1).

3.2 Climate change effects on vulnerable populations

Both the global environmental and anthropogenic climate changes which lead to environmental degradation have adversely jeopardised people's quality of life and its effects have different impacts on the social groups as confirmed by the IPCC. The wellbeing of the vulnerable and marginalised groups and communities (including disabled populations, women, the poor, elderly, black and indigenous people) has been disproportionately affected by the impacts of climate change (Gaskin et al. 2017; IPBES, 2019; Kosanic et al. 2022; Pacifici et al. 2015). Admittedly, Ronoh et al. (2015: 2) argue that significant numbers of children

policy and DRR interventions). Sams (2019: 6) argues that in the patriarchal society of Bangladesh amongst the climate migrants, the unequal socio-economic conditions have condemned women to poverty, limited access to and control over natural resources, and a lower status in the family and society, therefore increasing their vulnerability to discrimination. Ayeb-Karlsson et al. (2020) opines that when a disaster strikes, women's mobility tend to be at risk and they are usually constrained to their homes as compared to their male (masculine) counterparts who have the ability and flexibility to move. Rhodes et al. (2010) opine that patriarchal power and socio-cultural systems as well as the socio-political processes exacerbate gender imbalances during and post disasters. Gender power relations and imbalances are also experienced during capacity development regarding disaster preparedness training (including early warning systems), shelter for the displaced and social positions (Nadiruzzaman and Wrathall 2015). In countries like Pakistan, the perceived norms, roles, and responsibilities of women have generally placed them at a disadvantaged position which make them vulnerable to climate-induced gender-based violence (Memon 2020).

Climate change and extreme weather events have laid bare major gender inequalities as the marginalised sub-groups have minimal capacity to adapt to climate change variations (Benjamin and Thomas 2020; Memon 2020) with excessive harassment recorded against women in Northern Bangladesh (Masson et al. 2019). Gender disproportions have been notable within rural populace as women are seen as more vulnerable to climate change. This situation is a threat to human security and can have devastating implications for agro-based livelihoods (Chidakwa et al. 2020). In Africa, countries such as Zimbabwe have experienced the devastating impacts of climate change as women, children and the elderly rely on rain-fed agriculture and are deeply vulnerable when their agricultural production is drastically reduced because of urbanisation and the emigration of their men to cities and neighbouring countries (Chidakwa et al. 2020). A susceptibility to the effects of natural disasters is also experienced by seasonal farmworkers and socially isolated migrants and low-income people (Burke et al. 2012) with women experiencing more violence than their male counterparts (Camey et al. 2020). Meanwhile, women are disproportionately susceptible to climate-induced disasters especially those in the informal sector who are mostly seen as providing support to their families and communities (Datey et al. 2023).

Children and infants are also severely affected by the adverse impacts of changes in the climate as these changes pose risks to their education, safety, family security, survival and diseases such as diarrhoea as well as dehydration and heat stress (Goldhagen et al. 2020; Philipsborn and Chan 2018). A report from the IPCC (2018) revealed that the devastating effects of climate change and its variations vary in populations and in some countries it leads to massive migrations. After the 2005 earthquake in Kashmir, serious cases of SGBV and physical violence against young girls were reported (Mehta and Manjari, 2007). A decade later, the World Bank warned that during and post disasters, observations showed that women were more prone to sexual and physical harassment as well as increased domestic violence with its dire repercussions (WHO, 2015).

The 2020, the Gender, Climate and Security Report (United Nations Environment Programme [UNEP] & The United Nations Department of Political and Peacebuilding Affairs [UNDPPA], 2020) showed that governments apply gender-blind approaches with regard to vulnerable populations which made them less resilient to the impacts of climate change and have increased the vulnerabilities of women and exposed them to new risks and insecurities without teaching them adaptation skills. The report stated that women are disempowered regarding access to resources (Zaidi and Fordham 2021) even though they are

severely impacted by the effects of climate variations as they are the providers of the basic needs of their households and communities (Datey et al. 2023).

3.2.1.1 Elderly Vulnerability was found to border on the extreme by Malak et al. (2020)'s study detailing vulnerability amongst the elderly in the face of a cyclone in the coastal area of Bangladesh. The authors found numerous factors which made the aged more vulnerable to a cyclone as compared to young adults as they have fewer assets, less physical strength and a weakening mental capacity. The elderly are dependent on young adults, lack access to health facilities and social awareness as well as limited training. Numerous scholars state that in calamitous situations caused by climate-induced disasters in the Global South, the older adults are affected throughout all phases of a disaster and are less able to respond proactively to the impacts (Morrow 1999; Yadav and Barve 2017). In addition, the older adults experience devastating damages which are at the core of their lifestyle which include loss of culture (traditional practice, indigenous knowledge possessed by them) and friendships through death and dislocation (Rahman and Mamun 2010; Harvey 2019).

3.2.1.2 Persons with albinism (PWA) The well-being and health of Persons with Albinism (PWA) has been disproportionately affected by changes in temperatures as a result of climatic changes and variations (Astle et al. 2023). Discrimination against and the marginalisation of PWA still persist even though PWA are being protected by the Convention on the Rights of Persons with Disabilities (CRPD) (Astle et al. 2023). The devastating effects of climate change and its variations have also unprecedentedly impacted people living with disabilities causing poverty and unemployment to increase (Stein and Stein 2022a, b).

3.2.2 Coping mechanism on climate and environmental changes

Australia is one of the countries which is prone to climate-induced disasters where the elderly are severely affected as they may be ill-prepared, chronically ill and socially isolated, factors which make them more vulnerable and adversely affected. Hence, Chidakwa et al. (2020) and Treiche (2020) state that climate change has disproportionately increased women's socio-economic vulnerabilities which have adversely impacted on food security, people's livelihood and water consumption. The authors called for women to contribute to adaptation initiatives. Successful mitigation and adaptation strategies and climate change resilience cannot be a success without the involvement of women who are mostly active in the agricultural and informal sectors – while men are mostly urbanised – which will then enable households, communities, sectors, and systems to cope with disasters (Datey et al. 2023; IPCC 2014; Walker and Salt 2006). Adaptation options to climate change vary and are not uniform within families as gender type, ethnicity, age category and marital status differ (Johnson and Boyland 2017; Treichel 2020). Some authors (Amponsem et al. 2019; Mitchell and Borchard 2014; Tanner 2010) indicate that different stakeholders can harness from the knowledge, capacity and agency possessed by children and that they cannot be categorised as passive victims. While Sustainable Development Goals (SDG) 13's aim is to combat the effects of climate change, the persistent climate change and environmental degradations of persons with disabilities disproportionately affected with high mortality and morbidity recorded amongst them, remain a serious challenge (Kosanich et al. 2022). The climate change saga needs to be dealt from an intersectionality lens as persons with disabilities who are adversely affected are black women, poor and indigenous people, and PWA (Stein and Stein 2022a, b). Additionally, negative impacts of climate change have

compromised the wellbeing of persons with disabilities, especially those with limited access to emergency support who receive less attention from policy and service providers, while their needs are being overlooked during adaptation and mitigation interventions (Jodoin et al. 2020; Stein and Stein 2022a, b).

3.2.3 International frameworks and policies

The UN Flagship Report on Disability and Sustainable Development Goals, the 2030 SDG and the Sendai Framework for Disaster Risk Reduction 2015–2030, have recognised that climate and environmental changes will have differential impacts on societies, which will require the full involvement of people with disabilities, centred on the “integrative and inclusive approach guided by environmental justice” (Garai 2014; Sanchez and Chavez 2016). The international frameworks including the Sendai Framework which aimed at delivering gender responsive strategies had limitations to effectively address fundamental gender-based issues (with women in particular) in DRR as per the major highlights from the study conducted by Zaidi and Fordham (2021). According to Zaidi and Fordham (2021), global frameworks such as the Sendai Framework for Disaster Risk Reduction 2015–2030 with SDG 5 in particular, promote the inclusion of persons with disabilities and women in the areas of DRR, science-based research, indigenous knowledge, climate change adaptation and sustainable development initiatives. The authors further stated the framework accentuates that woman are affected the most by disasters and are mostly vulnerable to its impacts, which necessitate the importance of their inclusion in decision making concerning DRR initiatives. According to Desai and Mandal (2021), the international law is silent on the salient matter of producing international instruments that will harshly deal with the perpetrators of SGBV during and in the aftermath of climate-induced disasters against women and girls as there is a persistent and growing evidence to such crimes.

3.2.4 Vulnerable populations and participation to climate change initiatives

There is an agreement across the scholarly domain that women and girls in general as well as indigenous people (including those with disabilities) should play a significant role in combating climate-induced disasters through developing strategies and harnessing ecological knowledge into action (Akerlof et al. 2015; Whyte 2014). Kosanic et al. (2022) suggest that factors amplifying positive responses to climate change-induced disasters should guarantee that women and girls with disabilities have access to formal education in order to better understand the climate change effects so that they can use opportunities to participate in the community decision making. Meanwhile, mobility is constrained by gender discriminatory factors when cyclones strike, which is a serious problem for women and children as the roles of women and men during evacuation decisions are unequal which makes it difficult for women to evacuate to shelters for the displaced (Ayeb-Karlsson et al. 2020).

Vulnerable groups such as women suffer disproportionately due to the adverse consequences of environmental risks as they are unable to move to less risky areas without the power to choose to relocate or not (Ayeb-Karlsson et al. 2018; Farbotko and McMichael 2019). During and in the aftermath of climate-induced disasters, women severely suffer from social inequality, experiencing food insecurity, SGBV and mental and physical ill health (Ayeb-Karlsson et al. 2020). There is a multiplicity of factors that limit women in countries such as Bangladesh which delay their response to early warning systems such as inadequate swimming skills and clothing, children who limit their

movements and fear of the unknown in terms of the sexual and physical abuse outside their homesteads (Bhatta et al. 2015; Jordan 2018). Concerted efforts are made regarding the fight against and addressing SGBV matters in DRR programmes by including women and girls in disaster policy and programmes (Sams 2019; Zaidi and Fordham 2021) because women have been overlooked in participating in decision-making processes. A growing pattern has been noted during and after disasters, namely that the violence (emotional and physical) against women and children are mostly perpetrated by their partners and complete strangers and that the violence has resulted in critical implications to their wellbeing (Memon 2020). The climate-induced migration of men to places with employment opportunities increased the household workload of women where the roles and responsibilities which were performed by men are now in the hands of women – with its associated risks (Chidakwa 2020).

4 Discussion

As clearly outlined in our findings, four themes (vulnerable populations impacted by climate change; adaptation mechanisms; including international frameworks available to counter the impacts; as well as participation in the climate change initiatives) have emerged from the systemically, comprehensively, and critically reviewed literature. It is noteworthy to mention that the overview of the literature was informed by the PMT and Social-Cognitive Preparation Model, which outrightly proved that the empirical data gleaned from quality studies from the Global South reject the ethos of these chosen theories. It has further emerged from the analysis that the countries who published the most information on climate change effects regarding vulnerable populations, are Bangladesh, China, Pakistan, and Zimbabwe (Fig. 2).

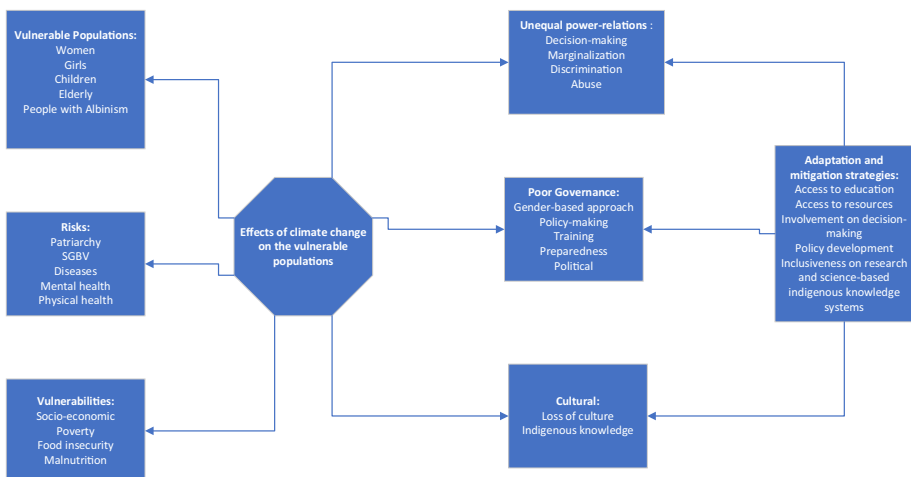


Fig. 2 Vulnerabilities, climate change and adaptation strategies. Source author

4.1 Women, children and climate change

The analysis revealed that women and girls are the most vulnerable to climate change effects as they lack socio-economic autonomy (Benjamin and Thomas 2020; Chidakwa et al. 2020; Sams 2019; Treiche 2020; Wisner et al. 2012); physical and political autonomy (Bukvic et al. 2018; Oven et al. 2019); they experience poverty and food insecurity (Malak et al. 2020; Tanjeela and Rutherford 2018); inequality (Jordan 2018); and a gender-blind approach and malnutrition (UNEP and UNDPPA 2020). Patriarchy, illiteracy (Malak et al. 2020) and lower social status in families; SGBV (Desai and Mandal 2021); being overlooked when decisions are made (Kosanic et al. 2022) and patriarchal communities have perpetuated the effects of climate change amongst women. Climate change also had an adverse effect on children and young girls as they are prone to SGBV, while governments apply gender-blind approaches (UNEP and UNDPPA 2020), which lead to new risks and insecurities. In a nutshell, the broad and complex factors which have a perpetual impact on women and young girls have severely threatened their human security although the literature shows that international frameworks have called for the inclusion and participation of women regarding leadership and decision-making structures on climate change, adaptation and mitigation interventions in their societies – something that has been vehemently overlooked by those in power. In view of the reviewed literature, it is obvious that developing countries in the Global South are acting contrary to international frameworks which propose the involvement of vulnerable designated groups, including women and young girls, on the impacts of climate change. The absence of policies as mandated by the UN through their frameworks suggests that women will in the foreseeable future still suffer from the devastating effects of climate change as there is a lack of evidence to show that the developing world adheres to the recommendations of the UN frameworks.

4.2 Persons with disabilities and effects on climate change

Another extremely vulnerable group which has emerged in the literature as the most discriminated category during and post climate and environmental changes are persons with disabilities, including persons with albinism. The observed causes of their extreme vulnerability to climate change are: a lack of access to formal education (Kosanic et al. 2022) as consistently revealed in the literature; family insecurities (Philipsborn and Chan 2018); and diseases (Goldhagen et al. 2020). The perpetual effects of climate change are mostly felt by persons with albinism as their vulnerability is aggravated by increased temperature (Astle et al. 2023), discrimination and marginalisation (Sams 2019), inaccessibility to resources (Zaidi and Fordham 2021), less emergency support (Stein and Stein 2022a, b), and being overlooked by policy-makers and service providers (Jodoin et al. 2020). There is a pattern in the reviewed literature with regard to the adaptation or coping strategies of these groups to climate change effects which include increasing access to education for people with disabilities (Kosanic et al. 2022) and participation in community decision-making processes (Ronoh et al. 2015). Consequently, children with disabilities are impacted severely by the devastating impacts of climate change as they have limited access to education (Kosanic et al. 2022), compromising their family security and their health. The coping strategies which have been provided by authors included the inclusion and integration of children in climate change initiatives and programmes as they can make a meaningful contribution to reversing the impacts of disasters. The literature further espoused that involving this

group to science-based research, harnessing from their indigenous and ecological knowledge, can be an adaptation strategy to counter the effects of climate-induced disasters. It can be deduced from the reviewed literature that climate and environmental changes with its associated induced disasters have an adverse effect on the quality of life of persons with disabilities with families, communities and their respective governments and community structures less prepared to minimise the effects of climate change by implementing the UN frameworks and other instruments that deal with DRR particular to this category. The contravention of the latter frameworks can be regarded as underpinnings of the vulnerability of persons with disabilities to climate-induced disasters with no evidence from governments regarding the implementation of the frameworks through policy development and implementation. The absence of monitoring and evaluation to measure the recommendations of the UN frameworks in countries which are prone to climate-induced disasters is disastrous to persons with disabilities.

4.3 Climate change effects to the elderly

Similarly, scholarly findings show a pattern concerning the repercussions of climate and environmental changes to the elderly with common causes of their extreme vulnerability as depicted in the above themes. Numerous factors have led to the vulnerability of the elderly due to climate change effects which include fewer access to resources (Ronoh et al. 2015), limited training on climate change (Malak et al. 2020), social exclusion and ill-preparedness on climate-induced disasters and their effects (Chidakwa et al. 2020). The empirical literature has yielded interesting patterns regarding the negative effects of climate and environmental changes to the livelihood of the elderly and society at large which include loss of culture (Rahman and Mamun 2010), loss of indigenous knowledge (Harvey 2019) as well as increased mortality and mobility amongst them (Ayeb-Karlsson et al. 2020). Different authors have suggested that to adapt the elderly to the effects of climate change was to deal with climate change from an intersectoral lens (Kuran et al. 2020). The literature clearly shows that the elderly before, during and post disasters are not supported by local structures and agencies through capacity developments; they are therefore severely exposed and vulnerable with regard to the negative impacts of climate change. Strong evidence in the paper suggests that local governments and societal structures overlook the indigenous knowledge systems which have led to the loss of culture which has discouraged the transfer of knowledge to young people on how to minimise the impacts of climate and environmental changes.

5 Conclusion

This paper has examined how vulnerable populations are impacted by climate change and assessed the existing adaptation and mitigation strategies to lessen the effects of disasters from the lens of the PMT theory and the Social-Cognitive Preparation model. The empirical research literature postulates on the complexities and extent of the vulnerability of women, children, and young girls claiming that societal and government mechanisms are unable to capacitate and include them to participate in the initiatives and interventions to avert the disastrous impacts of climate change. As an outline in the findings, the climate-induced disasters' impacts are exacerbated by socio-economic and socio-political and gender inequalities amongst women because they are not involved in decision-making

processes – which opposes the Social-Cognitive Preparation model (McIvor et al. 2009), a philosophy which promotes and is central to the involvement of women in such situations. Moreover, this review shows that the gender-blindness of societal and government structures has perpetuated the impacts of SGBV and increased women’s susceptibility to high risks and insecurities as they do not have the physical power to protect themselves. This counters the ethos of the PMT (Floyd et al. 2000), which encourages these vulnerable populations to be able to protect themselves. There are serious research gaps in the existing literature as it is silent on the salient matter of the existence of the interventions provided to the victims of SGBV and repercussions against the perpetrators of such violent acts during and in the aftermath of climate-induced disasters.

The current systemic review of literature shows strong evidence that the most vulnerable sub-group from the effects of climate change are persons living with disabilities. It is worthwhile to note that the extreme discriminatory levels amongst persons with disabilities, including children being prevented to access formal education and being overlooked in decision-making structures at community and government (policymakers and service providers) level, have exposed them to a myriad of risks while their rich knowledge is being ignored. There is less empirical evidence with regard to how climate change impacts such groups and the relevant available adaptation strategies which could be applied to them to mitigate the adverse impacts of such disasters.

It is worthwhile to note that the rigorously reviewed literature specifically revealed the elderly as more vulnerable to the impacts of climate change disasters as they lack training to mitigate its impacts and are ill-prepared to respond to climate-induced disasters. The high mortality rate and lack of mobility amongst the elderly have been found to be a loss to societies as they possess rich indigenous knowledge and culture. Moreover, the literature shows that an intersectoral lens could be applied to the elderly as a tool to adapt to the effects of climate-induced disasters although the minimal empirical data available have shown the effectiveness of this approach to the betterment of the elderly’s livelihoods. Hence, there is a need for future research to conduct empirical studies on the effectiveness of government interventions to assist victims of discriminatory tendencies, exploitation, and abuse of the designated groups during and post climate-induced disasters. Furthermore, it is recommended that future studies should investigate how effective the current adaptation interventions are in order to avert the impacts of climate-induced disasters on vulnerable populations.

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Declarations

Conflict of interest The authors declare no conflict of interest.

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