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Research Article

EXTREME WEATHER EVENTS AND HUMAN DISPLACEMENT IN SUB-SAHARAN AFRICA: TOWARD SOCIAL POLICY INTERVENTIONS

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Ensuing climate change is one of the most defining problems of the 21st century. In Sub-Saharan Africa (SSA), natural hazards such as floods, storms, droughts, and epidemics are among the major causes of human displacement. Existing studies, however, mainly explore these hazards' economic and environmental impact while limited attention is given to the social impact. This has significant practical and policy implications as the social fabric is underacknowledged. To close this research gap, this article identifies dominant extreme weather events in SSA, examines human displacement related to these events, and proposes social policy-based interventions. Underpinned by a quantitative approach, the article is based on displacement data on Africa purposefully selected from the Internal Displacement Monitoring Centre. Simple descriptive data analysis was deployed. The article also benefits from secondary literature on climate change and social policy. The study shows that extreme events, declining rainfall, and increasing temperatures under climate change ignite human displacement and unplanned migration. This disrupts food production, promotes political instability, and worsens the spread of diseases. The article shows how transformative social policy interventions focusing on production, reproduction, social cohesion, protection, and accumulation wields much potential as an adaptive and resilient mechanism.

***Keywords*:** adaptation, climate change, displacement, extreme weather events, resilience, social policy

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1. INTRODUCTION

The sixth assessment report (2021) by the Intergovernmental Panel on Climate Change (IPCC) warns of increasing temperatures, changing precipitation patterns, and increased frequency of extreme weather events – of the type that threaten life and the structural integrity of surrounding property and land. These include floods, droughts, storms with extremely strong winds, wildfires, and erosion-inducing landslides, which have costly repercussions, especially for financially developing countries (Balgah et al., 2023). It is estimated that by 2050, climate change could force 216 million people out of their homes globally, 85.7 million of which are in sub-Saharan Africa (Clement et al., 2021). In SSA, climate displacement coincides with other structural problems, such as poverty and pre-existing socio-economic and governance challenges. By 2022, millions had already been displaced by extreme weather events in SSA (Cairo International Center for Conflict Resolution, Peacekeeping and Peacebuilding (CCCPA), 2022). Although the region contributes less to global greenhouse gas (GHG) emissions, it remains the hotspot of extreme climate change (Oliver & Peters, 2020). The IPCC (2022) defines climate change as "a change in the state of the climate that can be identified … by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer." Temperature increases coupled with high evaporation and low precipitation are forecasted to displace vast sections of the African population, which rely on land and agricultural activities for livelihoods and income (Khan et al., 2021). Extreme weather events or natural disasters are also increasing on the continent. In August 2017, flooding and mudslides in Sierra Leone killed over one thousand people and many were unaccounted for. The 2011 drought hit the East African countries of Kenya, Eritrea, Ethiopia, Somalia and Djibouti. It was widely described as the worst drought experienced in those countries in over 60 years (Adjei-Mantey & Adusah-Poku, 2019). A volcanic eruption in Eritrea in 2011 and severe flooding in Southern Africa in 2019 and 2022 (South Africa) are just a few examples of many natural disasters that Africa has recorded recently.

Many governments in the region and local communities lack the adequate capacities to prevent, prepare for and adapt to the impacts of climate change on human mobility. Some governments also lack the capacity to support farmers to benefit from the high prices of agricultural products induced by drought

(Pourzand & Noy, 2022). Interventions on the prevention, preparedness, and response fronts are needed to allow communities to be more resilient to the risk of forced displacement and to consolidate development efforts. There is, however, limited academic work on the impact of extreme events on human displacement in SSA.

There are limited studies that provide comprehensive interventions on human displacements that are induced by climate change in SSA. There are two dominant strands of literature on climate change in the region. One strand comprises longitudinal studies on the trajectory of temperature and precipitation (see Abrams et al., 2018; Zougmore et al., 2018). This strand is highly scientific and provides detailed current scientific and projections evidence projections on climate change. The other strand comprises studies on adaptation and mitigation of climate change impact, with a focus on agriculture – the main socioeconomic and livelihoods activities by the majority of people in the region (see Ndhlovu & Dube, 2024a; Ndhlovu & Mhlanga, 2023a; Nwaerema, 2020). These studies focus mainly on crop and livestock production and related pests and diseases. Existing studies on extreme events and human welfare are mainly grey literature (see Food and Agricultural Organisation (FAO), 2017; Internal Displacement Monitoring Centre (IDMC), 2022; International Monetary Fund (IMF), 2022; United Nations Climate News, 2020; World Bank, 2023a, b). As a result, the impact of climate change on human welfare (outside their agricultural activities) has not received adequate academic attention. This has enormous practical and policy implications. This study brings the human welfare aspect to the climate change impact debate.

This study (i) identifies dominant extreme weather events in SSA, (ii) examines human displacement related to these extreme events, and (iii) proposes social policy-based interventions. The study has the potential to contribute to ongoing debates on links between climate change and human development by inserting social policy-inspired debates that may guide policy formulation and practical implementation by policymakers and development practitioners and further theorisations by academics.

This article is organised as follows: After the current introduction, section 2 reviews the literature on extreme weather events in SSA. The third section outlines the research methodology for the study. The fourth section presents the results. Section five discusses the results and proposes social policy-based interventions. Lastly, conclusions are drawn from the results and the discussion.

2. IMPACT OF EXTREME WEATEHR EVENTS IN SUB-SAHARAN AFRICA

The literature on the impact of extreme weather events or natural hazards on African development has been increasing recently (Shimada, 2022). It is posited that although natural hazards are a global phenomenon, African countries are disproportionately punished, even though they contribute the least toward greenhouse gas emissions compared with developed countries (Oliver & Peters, 2020; Shimada, 2022). In recent years, the occurrence and concentration of droughts, floods, and storms—such as cyclones Idai and Kenneth, and droughts caused by the El Niño–Southern Oscillation (ENSO)—have worsened. These disasters are taking a severe toll on the region's economic performance, particularly through agriculture and services, given SSA's reliance on rain-fed agriculture (Ndhlovu & Mhlanga, 2023a). The consequences are most distinct for lower-income households, which are the least equipped to handle these shocks (Nwaerema, 2020).

As a result of erratic rainfalls and increased temperatures due to climate change, communities depending on rainfed agriculture are predominantly experiencing the devastating impacts of slow onset drought. Over 75% of the population in the region depends on land and agriculture as a livelihood and income source (Moyo, 2016; Ndhlovu, 2021a). In this region, in addition to the destruction and disruption of the social fabric of society through loss of human lives and displacement, as well as forced migration, natural hazards are implicated in causing low agricultural productivity (Shimada, 2022). This occurs through crop and livestock destruction, land degradation due to soil erosion and landslides, pests and diseases, infrastructure destruction, and the disruption of the entire food system in general (inputs, production, processing, marketing, retail, and consumption) (Owusu-Sekyere et al., 2021). Lesk et al. (2016) found that extreme events such as droughts had reduced national cereal production in Africa by 9–10% in terms of impact on crop production. In Cameroon, Balgah et al. (2023) found that floods had reduced livestock production by around 95% and crop production by about 88%. Ainuddin et al. (2014) reported a 98.3% loss of crops in the North Western Zone of Ethiopia following flood events. In a study conducted in Ethiopia, Malawi, Mali, Niger, Nigeria, and Tanzania under the auspices of the World Bank, Wollburg et al. (2024) found that crop losses due to disasters and adverse climatic events were widespread and significant in African smallholder agriculture. Farmers in the studied countries reported crop losses of between 11%

(Nigeria 2018/19) and 90% of plots (Adjei-Mantey & Adusah-Poku, 2019), depending on country and year. Several factors account for SSA's aggravated vulnerability to climate change impact: the agriculture-dependent structure of the economy, high poverty rates, credit constraint, financial exclusion, shortages of adaptive technology, the rain-fed character of farm products (Adjei-Mantey & Adusah-Poku, 2019; Chivangulula et al., 2023; Clement et al., 2021; Khan et al., 2021; Ndhlovu, 2021b). Most farmers in Africa are smallholder farmers without adequate education or skills to adapt to the challenges of increasing temperatures and damage caused by natural disasters (Shimada, 2022).

There are, however, mixed interpretations of the exact impact of extreme weather events by scholars. Owusu-Sekyere et al. (2021) posit that these events cause severe disruptions to how communities function because interact with exposure conditions, vulnerability, and capacity. The United Nations General Assembly (2017) avers that these disasters cause enormous human, material, economic, and environmental losses and impacts. Many studies have examined the impacts of disasters on economic growth considering factors, such as time frames, severity, and disaster types (Adjei-Mantey & Adusah-Poku, 2019; McDermott et al., 2014; Zougmore et al., 2018). Adjei-Mantey and Adusah-Poku (2019) found a negative impact of disasters on economic growth in the short-run. However, these scholars did not explore the long-run effect of disasters, and yet, it is crucial to understand the long-term impact on affected areas. Owusu-Sekyere et al. (2021) examined the direct and indirect losses by natural disasters. They explain that the direct losses relate to losses to critical infrastructure such as buildings, communication networks, highways, and crops, whilst indirect losses are secondary effects such as disturbances to service delivery, such as transport, utilities, tourism, and employment losses.

Another strand of literature argues that even though disasters may reduce physical capital investment, they also generate an opportunity to replace or update damaged capital stock, thus paving the way for the adoption of new technologies (McDermott et al., 2014). Scholars such as Bennett et al. (2014) argue that the rebuilding action may generate both increased sales tax receipts and additional employment.

Existing literature, however, mainly focuses on the economic impact of natural disasters, while the social aspect, which might be more important for many smallholder farmers who draw on it for production and reproduction, is not accorded the same level of scholarly attention. The transformative social policy approach offers much flexibility and depth to explore the economic, social,

environmental, and political impact of natural disasters and provide groundwork for practical and policy interventions.

3. MATERIALS AND METHODS

Data collection

This article adopted a quantitative research approach that was underpinned by a descriptive research design. The source of the data utilised article was the Internal Displacement Monitoring Centre (IDMC) (2022). This is the world's leading data source on internal displacement. IDMC was established by the Norwegian Refugee Council in 1998 at the request of the Inter-Agency Standing Committee to set up a global database on internal displacement. Today, the centre remains the leading source of information and analysis on internal displacement caused by armed conflict, generalised violence, and human rights violations worldwide. Since 2009, IDMC has also monitored displacement due to disasters associated with natural hazards.

The IDMC Data Portal enables the luxury to explore, filter, and sort data to produce autonomous representations in graphs, tables, and charts. The data can also be accessed and exported to generate visualisations. The data on the portal also covers a relatively long period, which stretches back to 2008, enabling the authors to examine the displacement trajectory over time. The authors acknowledge that solely relying on the IDMC data is a limitation. This is because displacements associated with events such as drought are much more complex to measure and monitor than displacements generated by sudden-onset hazards such as floods, storms, landslides, and earthquakes. However, the data provided by IDMC is critical in providing an idea of the context in which extreme events trigger displacement. The data is also utilised by UN refugee agencies, giving credence to its usability and reliability.

Sampling

The author purposefully selected countries with the highest incidents of disasters to be included in the study. Studying all 54 countries would be a much bigger project that could not be covered in a single article. Five countries were selected per each of SSAs' four regions: East Africa, West Africa, Southern Africa, and Central Africa. North Africa was omitted since it is not within SSA. Countries were selected based on the magnitude of climate-related displacements recorded against them.

Data analysis

The focus of the study was to provide a description of extreme weather-related displacement statistics, measuring and observing the displacement trajectory over time. This method is reputable for its capacity to provide objective, reliable, and generalisable results. The study used simple descriptive statistics to analyse and interpret the data. The aim was to provide a reliable overview of extreme weather events and human displacement in Africa through a more robust, coordinated, data-driven verification process.

The study focused on displacements by the three most prevalent disasters across the selected countries: drought (acute general precipitation or snow deficiency over an extended period (usually a season or more), leading to water shortage (Chivangulula et al., 2023), floods (in this study, a flood is defined as a natural hazard, a natural phenomenon that is the result of heavy rainfall causing flooding of riverbeds, uprooting trees, and destroy buildings) (Maranzoni et al., 2023), and storms (a weather disturbance that, in the context of hydrological science, produces precipitation or affects the formation and distribution of precipitation). A storm can be marked by significant disruptions to normal conditions, such as strong winds, hail, tornadoes, thunder and lightning, rainfall (snowstorm and rainstorm), and heavy freezing rain.

Data on conflict and violence was not included since the study was on weather-related events. The study covered 11 years (2012 - 2022) to include as much data as possible. Simple statistical interpretation and analysis using frequencies and percentages were used. The data was summarised using graphs and tables. The data by IDMC is available on its website for anyone to check and use. Therefore, as part of ethical commitment, the author ensured that the conclusions reached in this article are based on the data utilised without distortion.

Sampling techniques and procedure

The sampling methodology employed in this study was a non-random convenience sampling technique. This approach involved selecting participants based on their accessibility and convenience rather than using a random selection process. Specifically, members of the organization's staff were chosen for the survey in a way that was convenient for the researchers. To implement this sampling technique, the staff members were grouped according to their respective departments. Additionally, eligibility criteria were established to ensure a specific level of experience and responsibility among the participants. Only those staff members who had been working with the organization for more than 12 months

were considered eligible to participate in the survey. Furthermore, the survey targeted individuals within the middle and senior management staff tiers, excluding other levels of the organizational hierarchy. This sampling strategy likely aimed to focus on individuals with a more substantial tenure and managerial roles, possibly in an effort to gather insights from those with a deeper understanding of the organization's internal dynamics and strategic decision-making processes. While convenience sampling can offer practical advantages, such as ease of access to participants, it's important to acknowledge its limitations, as the results may not be fully representative of the entire staff population.

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4. RESULTS AND DISCUSSION

Due to the immense size of SSA, each sub-region region is susceptible to certain types of extreme weather events. However, the results presented in this article show that floods, storms, and droughts are certainly the most prevalent. This article presents the results of the study region by region.

Southern Africa

Angola, Mozambique, Madagascar, South Africa, and Malawi were purposefully selected for analysis due to the recurrence of extreme weather events as well as high human displacement rates due to these events. The IDMC data shows storms and floods as the most prevalent extreme natural hazards in Southern Africa. Table 1 shows that in Angola, about 92,623 were displaced or forced to migrate due to floods between 2012 and 2022. However, the figures have been high in Mozambique (269,029), Madagascar (107,410), Malawi (193,642), and South Africa (105,816) in the same period. In countries such as Mozambique, Malawi, and South Africa, the number of people displaced by floods increased, mainly due to Cyclone Idai, which wrecked these countries in 2019. Cyclone Idai caused both floods and storms, which displaced about 505,900 people in Mozambique alone in 2019. The data shows that all three natural hazards are concentrated in East Africa. Climatologically, this is explained by the idea that tropical cyclones initially move westward due to easterly winds and slightly towards the poles. Many tropical cyclones in the end drift far enough from the equator to move into areas dominated by westerly winds (found in the middle latitudes). This explains why the most affected countries in Southern Africa are countries that border the Indian Ocean – Mozambique, Madagascar, and South Africa and also other inland countries close to them, including Malawi, Zimbabwe, Botswana, Eswatini, Lesotho, Namibia, and Zambia. Figure 1 shows that Mozambique, Madagascar and Malawi are the three countries mostly affected by extreme weather events of natural hazards in Southern Africa.

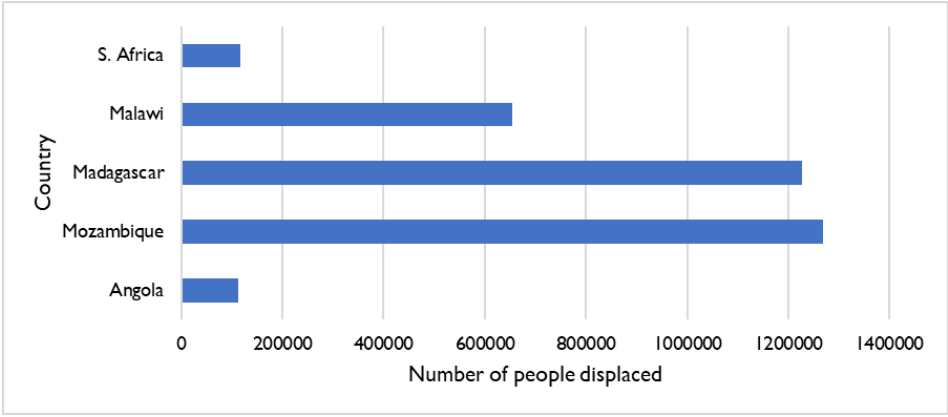

Figure 1. Human displacement by extreme weather events in selected countries in Southern Africa. Source: author compilation using IDMC data.

Droughts are also emerging as another challenge in the region particularly since 2017. The most affected countries are Angola and Madagascar. In 2016, 1200 people were displaced by drought in Madagascar. This was followed by a displacement of 690 people in 2018, 17,000 in 2019, and 29,000 in 2020. In 2021, Angola also experienced a drought that displaced 7,400 people. No drought displacements were recorded by the IDMC for Mozambique, Malawi and South Africa between 2012 and 2022. There were also no droughts recorded for Angola between 2012 and 2021 as well as for the year 2022. No drought was recorded for Madagascar between 2012 and 2016, as well as 2022. The data shows that 3,373,501 people were displaced by floods, storms, and drought in Southern Africa between 2012 and 2022.

Table 1. Displacement by extreme weather events in Southern Africa, 2012-2022.

State	Angola			Mozambique			Madagascar			Malawi			South Africa		
Year	F	S	D	F	S	D	F	S	D	F	S	D	F	S	D
2012	6380	-	-	-	10000	-	-	268,000	-	5000	5000	-	-	2000	-
2013	2400	-	-	186000	-	-	-	20,000	-	33000	-	-	17720	-	-
2014	-	-	-	-	22200	-	1100	2800	-	600	-	-	3500	-	-
2015	5580	-	-	61000	-	-	79000	48,800	-	33600	7000	-	-	-	-
2016	19000	-	-	7000	-	-	-	51,000	-	9500	-	-	12200	-	-
2017	13344	570	-	25100	167000	-	-	247,000	1200	69900	13510	-	240	2167	-
2018	3108	1468	-	1400	29000	-	1700	103,000	690	12890	3140	-	47	11	-
2019	6684		-	2100	503800	-	-	5187	17000	6240	111290	-	5034	127	-
2020	13572	-	-	43149	5300	-	25000	17080	29000	22312	-	-	214	160	-
2021	21285	11085	7400	180	43180	-	-	47040	20000	600	-	-	5921	6650	-
2022	1270	256	-	-	220000	-	610	285,270	-	-	321000	-	60940	-	-
Total	92,623	13379	7,400	269,029	1,000,480	-	107,410	1,051,177	67,890	193,642	460,940	-	105,816	11,115	-

Source: Author's compilation using IDMC data

Key

F – Flood

S – Storm

D - Drought

The data also shows that the number of people displaced or forced to migrate due to natural hazards has been more pronounced, particularly since 2016. The number of people displaced reached the highest in 2021 in Angola, when floods displaced 21,285 people. In Mozambique, the highest number of 220,000 people were displaced by the storm in 2022, while in Madagascar, a staggering 285,270 people were displaced by storms in 2022. About 321,000 people were displaced by storms in Malawi, while in South Africa, the highest figure was 60,940 people displaced by floods in 2022.

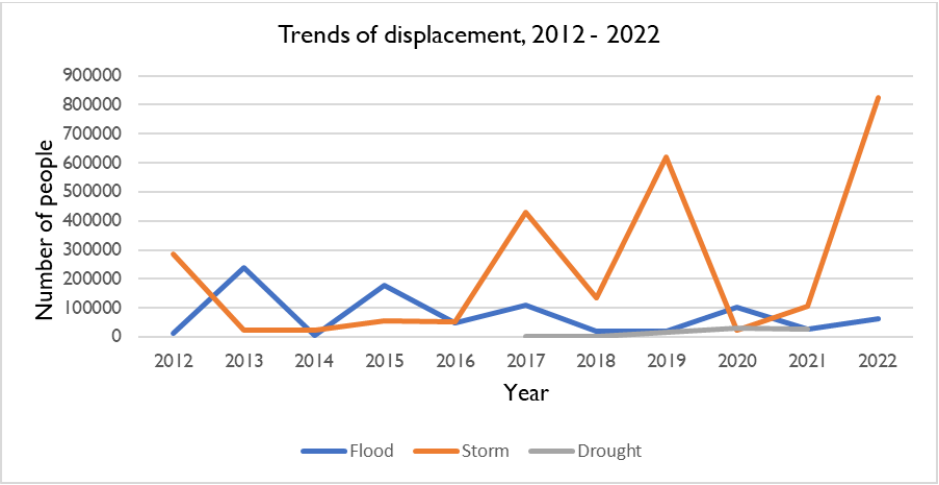

Figure 2. Natural hazards and displacement in South Africa
Source: Author's compilation using IDMC data

The unprocessed data on the IDMC website shows that most of the displacements occurred in rural areas. In Angola, the areas mostly affected were the Malanje and Cuanza Sul rural provinces, communal areas around Benguela City, and areas along the country's border with the DRC. In Malawi, the southern region was mainly affected, including areas such as Mzimba, Mulanje, Chikwawa and Nsanje Districts. Minimal displacements were also recorded in central regions around Lilongwe (Ntcheu District). In the northern parts of Malawi, the Chikwawa District has recorded significant displacements since 2012.

In Mozambique, the Sofala and Manica provinces recorded the highest displacements. However, many people were outside the cities of Maputo and

Beira. Displacements were also concentrated in rural areas. In Madagascar, the entire rural southern region, known as Grand Sud (the Grand South), is mainly affected. Dias et al. (2022) link this to the ongoing drought, which they describe as the worst drought in 40 years. Danevad (2022) reports that in this southern region of Madagascar, about 1.64 million people are facing acute food insecurity and need urgent humanitarian assistance due to the drought in that country. It is only in South Africa where most displacements were recorded in the urban areas of the coastal city of Durban in the KwaZulu-Natal Province. Most displacements in Southern Africa occurred in rural areas dominated by peasant populations relying on land and agricultural activities as their major livelihood and income source (Moyo, 2016). This makes the people most vulnerable to the ravages of extreme weather events.

East Africa

In East Africa, Ethiopia, Kenya, Tanzania, Somalia, and Uganda were purposefully selected for analysis. In these countries, floods are the major extreme weather events causing human displacement. Between 2012 and 2022, floods displaced 1,844,871 people in Ethiopia, 876,037 in Kenya, 129,470 in Tanzania, 2,686,340 in Somalia, and 73,6032 in Uganda (see Table 2). This brings the number of people displaced by floods in these countries to 6,272,750. The most affected country was Tanzania, with 2,686,340 people displaced in the entire period, while the least affected was Uganda, with 73,6032 people displaced in the same period.

The selected countries also experienced storms, which displaced people. Storms displaced 5,620 between 2012 and 2022 in Ethiopia, 4201 in Kenya, 43796 in Tanzania, 86332 in Somalia, and 64,555 in Uganda. In 2022, storms displaced a staggering 51,077 people in Uganda. Drought displaced 1,372,036 in Ethiopia, 315,640 in Kenya, and 2,579,851 in Somalia. There were no recorded drought-displacements for Uganda and Tanzania. It is, however, essential to note that displacement by drought is not sudden compared to floods and storms. Therefore, it may be difficult to measure it. Displacement by drought is also determined by the socioeconomic status of households, with some households more resilient than others. In addition, the impact of drought is mainly long-term, and people may decide to migrate long after the drought wave.

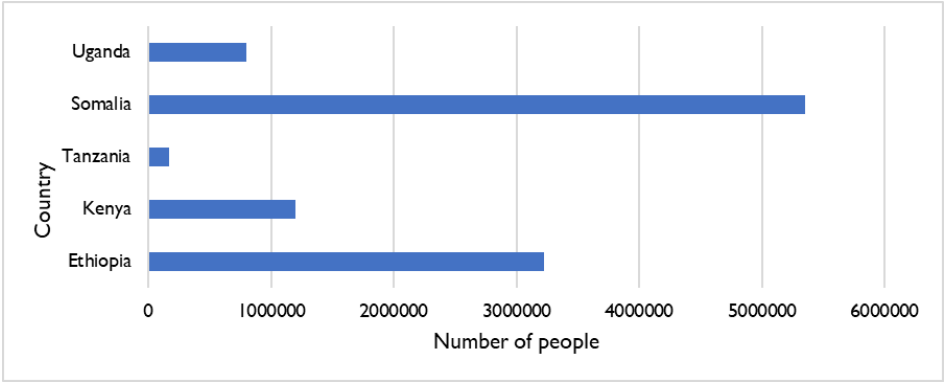

Figure 3. Total number of people displaced by selected countries, 2012-2022.
Source: author's compilation of IDMC data

Figure 3 shows that Somalia is the country most affected by natural hazards, with floods and drought being the major causes of human displacement (see Table 2). This is followed by Somalia, Kenya, and Uganda. Tanzania has been the least affected.

Table 2. Displacement by extreme events in East Africa, 2012-2022

Country	Ethiopia			Kenya			Tanzania			Somalia			Uganda		
Year	F	S	D	F	S	D	F	S	D	F	S	D	F	S	D
2012	20118	-	-	97626	-	-	10000	-	-	-	28000	-	216	-	-
2013	60,286	-	-	180282	-	-	-	-	-	54800	-	-	30219	-	-
2014	48,447	1570	-	1068	-	-	13650	-	-	36065	-	-	47681	2239	-
2015	119,596	-	-	105,084	-	-	-	3500	-	55350	2700	-	600	-	-
2016	347156	-	-	49,452	-	-	26081	-	-	70000	-	-	1347	-	-
2017	52541	-	381000	35424	-	-	493	1225	-	-	-	891857	91500	3500	-
2018	170760	4050	120,320	690	1950	-	23962	2563	-	289176	9116	248758	158202	1225	-
2019	195,979	-	130957	72,273	593	-	9338	1445	-	415663	-	59645	85555	1534	-
2020	644,131	-	-	332,638	1560	-	56248	81	-	615635	42100	11840	69652	-	-
2021	185254	-	54019	200	-	2	3348	30741	-	2397	-	167608	40034	4980	-
2022	603	-	685740	1300	98	315638	-	4241	-	1147254	4416	1134143	211026	51077	-
Total	1,844,871	5620	1,372,036	876037	4201	315640	129470	43796	-	2,686,340	86332	2579851	736032	64555	-

Source: Author's compilation using IDMC data

Key

F – Flood

S – Storm

D - Drought

Figure 4 shows the trends of extreme weather events in the selected countries. The data shows that all the events are worsening floods, starting at 127,960 displacements in 2012, reaching 494,036 displacements in 2016 and a staggering 1,718,294 displacements in 2020. Drought triggered 1,272,857 displacements in 2017 and drastically worsened to 2,135,521 in 2022. The data also shows that storm displacements are steadily increasing from near zero between 2012 and 2016 to 59,832 displacements in 2022. The pattern in Figure 4 implies that extreme events are on an upward trend and are likely to increase.

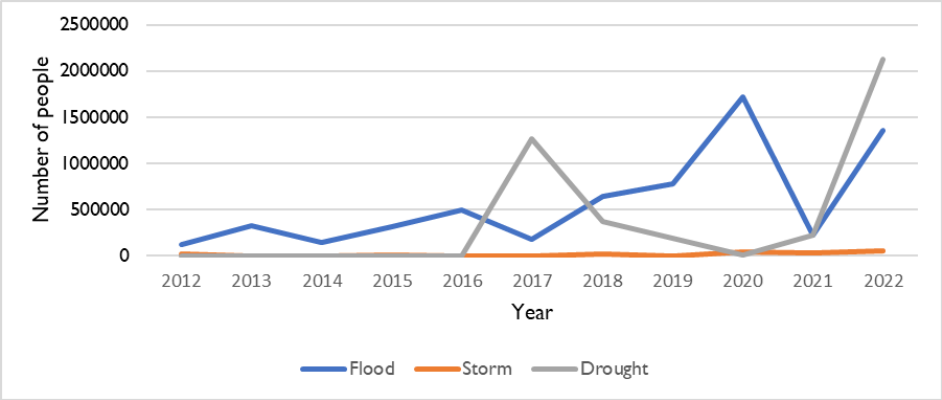

Figure 4. Trends of natural hazards in East Africa, 2012-2022.
Source: author's compilation using IDMC data.

In East Africa, natural hazard displacements were concentrated in areas such as Woqooyi Galbeed, Awdal, Bari, Hiraan, Lower and Middle Shabelle, and the Gedo region in Somalia. These are predominantly pastoral areas. Somalia is one of the few countries whose population still resides predominately in rural areas, although it is experiencing rapid urbanisation and is projected to become predominately urban by 2050 (Shimada, 2022). In Ethiopia, while drought displacements were countrywide, rural areas such as Tigray, Gambella, and Amhara were most affected. Displacements by drought and storms were minimal in urban areas, possibly due to better infrastructure and household resilience. Kenyan areas of Kiambu, Kisumu (Ombaka, Ombeyi, Ahero, Nanga, and Dunga), Nakuru, Makueni, Mbarara, and Baringo faced the most displacements, especially by storms. In Tanzania, displacements were concentrated in Musoma, the Kilimanjaro region, Tanga, Rukwa, and Arusha and Mara regions. There was also minimal displacement in urban areas such as Dar Es Salaam. In Uganda,

displacements were also concentrated in the rural areas, especially Butaleja, Budaka, Buikwe, Buyende, the western region (Kasese and Bundibugyo Districts) and the central region (Nakasongola District). Displacements were minimal in northern and eastern regions and urban areas such as Kampala. As in Southern Africa, displacements in East Africa are mainly concentrated in rural areas where people are forced to move as a coping strategy for natural hazards.

Central Africa

In Central Africa, Cameroon, Central African Republic (CAR), Democratic Republic of Congo (DRC), Rwanda, and Burundi were selected for analysis due to their distinct natural hazard experiences, as shown in Table 3. The data shows that floods were the dominant natural hazards in all five countries selected. Floods cause more human displacement than any other natural hazard. DRC was the country most affected by floods, with 16,293,185 people displaced by the hazard between 2012 and 2022. Cameron follows this with 375808 displacements, CAR with 243606, Burundi with 184940, and Rwanda with 18424 flood displacements. The highest flood displacements for all countries were recorded between 2019 and 2022 (see Table 3).

Table 3. Displacement by extreme events in Central Africa, 2012-2022.

Country	Cameroon			C.AR			D.R.C			Rwanda			Burundi		
Year	F	S	D	F	S	D	F	S	D	F	S	D	F	S	D
2012	30000	-	-	13700	3870	-	2000	21000	-	3225	-	-	-	-	-
2013	10000	-	-	1875	12620	-	3816	-	-	180	846	-	-	-	-
2014	3500	-	-	944	-	-	24103	-	-	-	-	-	12500	-	-
2015	11225	-	-	-	1109	-	2488	-	-	1789	210	-	3077	-	-
2016	-	-	-	3174	3159	-	128511	1040	-	-	-	-	6556	-	-
2017	-	-	-	2868	-	-	6636	18273	-	21	1677	-	2127	2698	4955
2018	-	-	-	9279	2924	-	52673	28480	-	-	47295	-	28695	2827	1688
2019	23280	-	-	101700	80	-	15,191,796	6923	-	6454	-	-	15317	4401	1718
2020	115782	-	-	15025	-	-	277809	-	-	6005	-	-	42617	6922	844
2021	115946	-	-	23589	-	-	257802	18873	-	196	803	-	73497	35867	-
2022	66075	-	-	71452	4391	-	345551	72129	-	554	5690	-	554	542442	-
Total	375808	-	-	243606	28153	-	16293185	166718	-	18424	56521	-	184940	595157	9205

Source: Author's compilation using IDMC data

Key

F – Flood

S – Storm

D - Drough

Floods have been the sole natural hazard causing displacements in Cameroon since 2012, except between 2016 and 2018, when no displacements were recorded. DRC was the most affected country, with 15,191,796 displacements in 2019. The data shows no record of storms and drought in Cameroon. CAR, DRC, and Rwanda experienced significant flood- and storm-related human displacements since 2012 but no drought displacements throughout the period. Storms were also more pronounced in CAR, DRC, and Burundi, with only a few years of no human displacement. In Burundi, storms displaced 595,157 people between 2012 and 2022. The data also show minimal drought recurrences except for Burundi, which recorded 9,205 drought-related displacements between 2017 and 2020.

Figure 5 shows that DRC had the highest natural hazard displacements of 16,459,903. Burundi followed this with 789,302 displacements, Cameroon with 375,808, CAR with 271,759, and Rwanda with 74,945 displacements

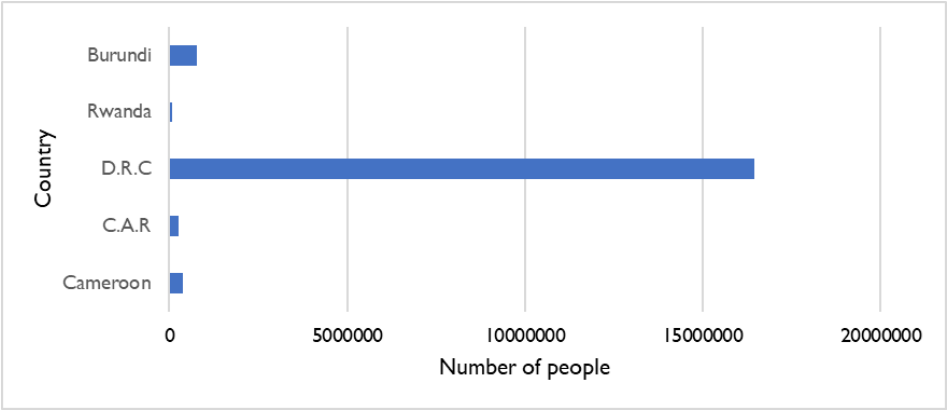

Figure 5. Total number of people displaced by natural hazards in selected countries 2012-2022.

Figure 6 summarises the trends of the three natural hazards in the Central Africa sub-region. The data shows a gradual increase in all hazards, although the magnitude differs among countries, as indicated in Table 3. Figure 6 shows a sharp rise in floods and storms between 2018 and 2019 and a gradual increase since 2020. Drought displacements are unclear, possibly because they were confined to Burundi.

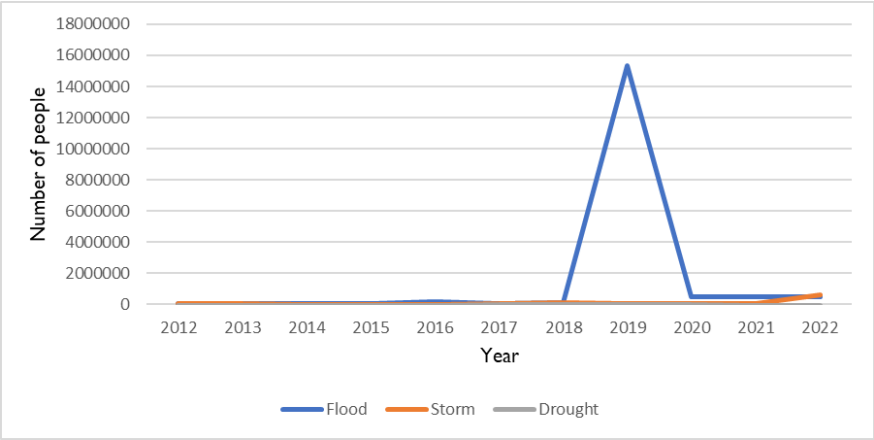

Figure 6. Trends of natural hazards in Central Africa.
Source: author's compilation of IDMC data.

The overall assessment of displacements in Central Africa is that in Burundi, they are concentrated in Bujumbura Rural, Karuzi, Makamba, Bururi Cankuzo, Ngozi, Bubanza, Murambya, Rutana, Muyinga, and Kirundo. In DRC, displacements were more pronounced in Baraka, Bumba territory, Bunia, Kongo Central (Lukula), Kasai (Ndjoku Punda, Tshikapa), Kasai Oriental (Mbujui-Mayi), and Ituri (Irumu territory). In the CAR, displacements were recorded in Ouham-Péndé, Bangui, Nana Gribizi, and Ouaka. The most affected areas in Rwanda were also rural Southern and Northern parts. While displacements were recorded for urban areas such as Kigali, they were not as pronounced as in rural areas. In Cameroon, huge numbers of displacements were concentrated in rural areas such as Littoral (Douala), Nord Ouest, and the entire northern Region.

West Africa

Ghana, Nigeria, Senegal, Mali, and Ivory Coast were selected for analysis in West Africa. The data in Table 4 shows that storms and droughts are not a significant problem in West Africa. This sharply contrasts the other sub-regions where these natural hazards have displaced many people (see Tables 1, 2, and 3). In West Africa, the main challenge is floods. Floods have displaced about 8,881,485 people in the sub-region between 2012 and 2022, while storms have displaced 39,373 people. There are only two drought displacements recorded in Senegal for the entire sub-region. Nigeria had the highest number of people displaced by floods (8,543,745). This was followed by Mali, where 11,142 people had been

displaced between 2012 and 2022. In Ghana, floods had displaced 142,875 people, 67,174 in Senegal, and 10,549 in Ivory Coast.

Table 4. Displacement by extreme weather events in West Africa, 2012 - 2022

Country	Ghana			Nigeria			Senegal			Mali			Ivory Coast		
Year	F	S	D	F	S	D	F	S	D	F	S	D	F	S	D
2012	-	-	-	3871000	-		20000	-	-	9000	-	-	-	-	-
2013	30646	-	-	3117420	-	-	13300	-	-	23500	-	-	78	-	-
2014	-	-	-	3002	-	-	-	-	-	-	-	-	4500	-	-
2015	9255	-	-	100420	-	-	-	-	-	400	-	-	-	-	-
2016	7018	-	-	77433	-	-	12900	11292	-	8025	-	-	-	-	-
2017	13463	9817	-	120000	2006	-	-	-	-	6848	-	-	-	-	-
2018	56300	4737	-	604900	8412	-	-	-	2	19397	-	-	1154	-	-
2019	12639	2412	-	156303	1992	-	4300	138	-	6630	-	-	622	96	-
2020	1991	-	-	291574	6531	-	3285	-	-	7397	-	-	1680	185	-
2021	9076	2939	-	23993	-	-	1300	22	-	5994	-	-	-	-	-
2022	2487	246	-	2437000	-	-	12089	-	-	29951	-	-	2515	-	-
Total	142875	20151	-	8543745	18941	-	67174	11452	2	117142	-	-	10549	281	-

Source: Author's compilation using IDMC data

Key

F – Flood

S – Storm

D - Drough

Regarding the total number of displacements, figure 7 shows that Nigeria had the highest number of 8,562,686. Ghana had 163026 displacements, Mali (117142), Senegal (78,628), and Ivory Coast (10830). The original IDMC data shows that most of the displacements in Nigeria occurred in rural areas, with only a few displacements recorded in urban areas such as Lagos in 2019. In Ghana, most displacements were recorded in the Northern Region, which is typically rural and agrarian (Owusu, 2023). There were also minimal displacements recorded in Dakar, Senegal, compared to the country's rural areas. This possibly highlights the resilience of urban dwellers to natural disasters and the vulnerability of rural folks.

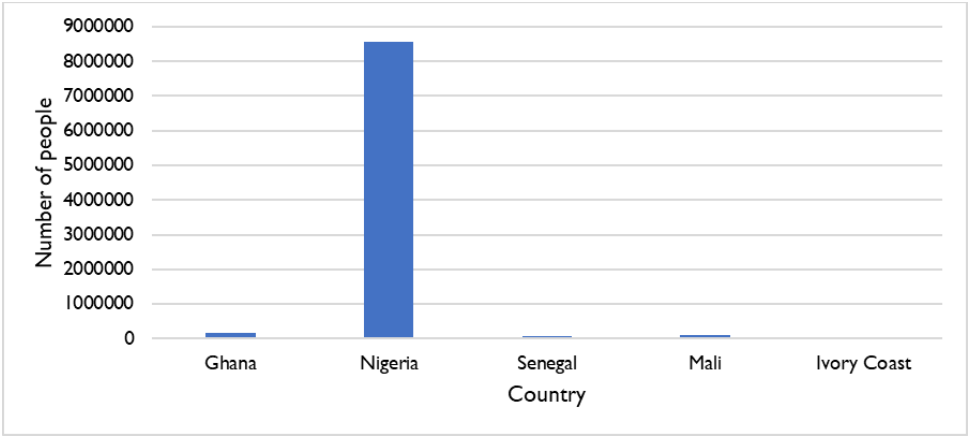

Figure 7. Total number of people displaced in selected countries in West Africa, 2012-2022.
Source: author's compilation using IDMC data

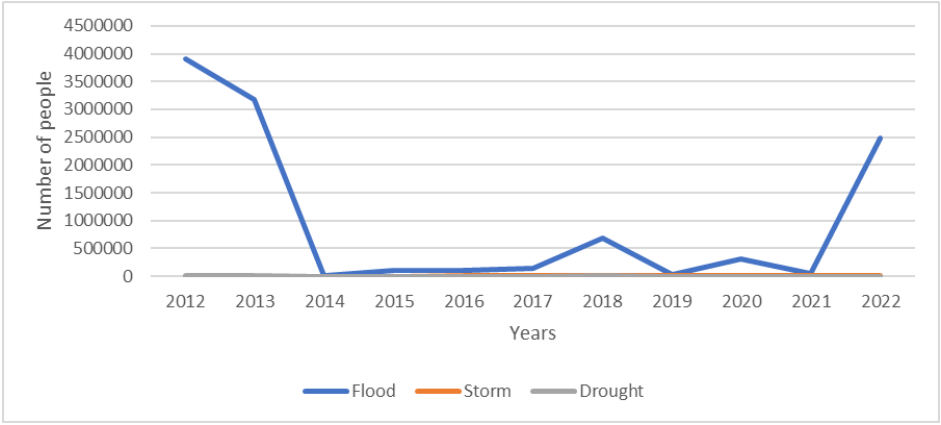

Figure 8. Trends of natural hazards in West Africa, 2012-2022.
Source: author's compilations using IDMC data.

Figure 8 shows the trends of natural hazards in West Africa. Floods are the dominant hazard in the region. This is followed by storms, especially since 2014. Floods have been on a sharp upward trajectory since 2021.

In West Africa, displacements were concentrated in rural areas. In Ghana, the Northern Region, particularly areas such as the Sagnarigu municipality, Savulugu District, Tamale metropolis, and Kumbug, were most affected. The area is dominated by the Gonja people, whose livelihoods are based on pastoralism and settled livestock (goats, cattle, and sheep) aided with some small-scale crop productions. In Nigeria, the northern and eastern areas were the most affected. In Ivory Coast and Senegal, natural displacements are also predominantly rural, with minimal displacements occurring in Abidjan and Dakar, the capital cities of the two countries.

5. DISCUSSION: TOWARD SOCIAL POLICY-BASED INTERVENTIONS

The high magnitude of human displacements observed across Africa's four sub-regions have enormous implications for lives and livelihoods. This has also huge developmental implications for Africa's quest to commence its development agenda in agriculture. The displacement of people from their homes and fields directly impacts their capacity to put their labour and savings to productive use in farming. In Africa, agriculture represents the engine for development. About 50 to 80% of the population on the continent lives in rural areas, and this rural population is predominantly peasant farmers (WFP, IOM &

FAO, 2023). Agriculture accounts for about 40% of Gross domestic product, 30% of exports, and 75% of employment (WFP, IOM & FAO, 2023). In addition, agriculture is the key provider of 90% of the domestic food supply (Nwachukwu, 2020).

Smallholder farms constitute about 80% of all farms in SSA and employ approximately 175 million people directly (FAO, 2020). For this reason, it has been consistently argued that the best development plan in and for the region must target raising agricultural productivity in rural areas (McDermott et al., 2014; Moyo, 2016; Ndhlovu & Dube, 2024b; Ndhlovu & Mhlanga, 2023a). Since the data in this study show that most of the displacements due to extreme weather events occur in rural areas, which, by default, also happen to be the backbone of African development, interventions targeted at rural areas are needed. The transformative social policy approach offers a comprehensive analysis that transcends economic focus and also considers aspects such as production, reproduction, and social protection.

The social policy approach involves public actions meant to drive social protection and development by the government or the nation-state (Adesina, 2007). It comprises "collective interventions directly affecting transformations in social welfare, social institutions and social relations… [as well as] access to adequate and secure livelihoods and income" (Mkandawire, 2001:1). It is also "…an instrument for ensuring a sense of citizenship [and] …a prerequisite for sustained economic development…" (Mkandawire, 2001:1). Social policy consists of five tasks: production, protection, reproduction and redistribution (Mkandawire, 2006), as well as social cohesion or nation-building (Adesina, 2021). The social policy commitment of governments is usually reflected in their implementation of economic projects meant to help the most vulnerable and by enacting by-laws, rules, and regulations that protect these people from private actors also executing development projects.

Being largely pro-poor, the social policy approach resonates with development pursuits that are both sustainable and also satisfactory to smallholder farmers and other working-class categories. Using this development approach could enable the nation-state to protect its population from the ravages of extreme weather events. In applying the social policy approach to deal with the impact of extreme weather events, governments could focus on production, social protection, social reproduction, social cohesion, and redistribution.

Production

Targeted interventions are needed to ensure extreme weather events do not frustrate agricultural production. There are many examples of land-use planning, agricultural, forestry and fisheries practices that increase resilience and reduce susceptibility to storm and flood damage if applied in an appropriate context. Examples include the introduction of more storm-resistant crops, such as tannia, ginger, cassava, pineapple, roots and tubers, diversified cropping systems, including conservation tillage, that offer insurance against crop losses, salt-resistant agriculture, forestry windbreaks or shelter belts, mangroves to serve as windbreaks and buffer zones as well as soil-conservation and water-management practices that reduce vulnerability to floods. However, the production of drought-resistant crop varieties requires concerted public and private partnerships to fund research and the development of such varieties. With most African smallholder farmers being resource-poor, providing material and infrastructure to protect crops and livestock from extreme weather requires government intervention. Agricultural communities in storm and flood-prone areas can also be protected through greater use of storm-resistant and protective structures, cyclone shelters and earth platforms to raise homestead ground levels. In South Africa and Zimbabwe, such support is often targeted at land reform beneficiaries (Majova & Ndhlovu, 2023; Ndhlovu, 2021). Efforts should be made to support even those outside government-initiated programmes. The government can initiate or run campaigns on the establishment of tree windbreaks meant to protect plants from strong winds during rainfall.

Each vulnerable country or region needs, however, a context-specific strategy that incorporates long-term measures to reduce production vulnerability to extreme weather events. Measures should be integrated into countries' overall development programmes, particularly for storm- and flood-prone areas. In addition, strategies should include an early-warning and storm-forecasting system and a preparedness plan for relief and rehabilitation. These efforts could assist in sustaining agricultural production and, thus, reduce human displacement or forced migration in pursuit of off-farm livelihoods.

Social protection

Social protection is one of the key features of transformative social policy. The policy stretches from the economy to social relations and institutions and "involves a wide range of instruments to raise human well-being, transform social institutions, social relations and the economy…" (Adesina, 2015, p. 4). Confronting the consequences of natural hazards transcending the provision of social

assistance programmes to include social security aspects such as health, education and land reforms. Infrastructure such as transport networks, health and educational facilities, markets, and water supplies are vital in transforming people's lives following natural disasters (Nzabamwita & Ndhlovu, 2024). In the absence of social protection, people migrate as a coping strategy. Departure from farms undermines food production, results in overcrowding in destinations, and generates conductive conditions for disease outbreaks and conflicts. Ensuring the availability of social infrastructure and services in areas affected by natural hazards is crucial and requires the government, both local and national, to work together and physically deliver infrastructure as part of the continued effort to achieve transformative outcomes.

Social Reproduction

The transformative social policy framework can also be used to examine how African households affected by natural hazards can sustain or improve productivity to secure their social reproduction. Social reproduction refers to a system of practices by which classes in an unequal society tend to sustain their status from one generation to another and how various institutions such as education, politics, and the economy ensure replication (Ndhlovu, 2022). Interventions by local and national governments could focus on the provision of irrigation facilities in response to drought and early warning systems for floods and storms. It could also focus on how farmers can benefit from higher prices of commodities and livestock during drought-induced scarcity. Financial inclusion is also another strategy that could ensure social reproduction resilience following natural disasters. However, financial inclusion should not merely be viewed as the delivery of financial services to the poor at an affordable cost (Amoah et al., 2020) but should also include the provision of finance to the people so that they can fund their production activities and thus, sustain productivity (Ndhlovu & Mhlanga, 2023b). This could lower displacement by hazards, especially drought, which is not a sudden event. Under drought, people only decide to move when their resilience plans and strategy prove ineffective or inefficient. This is usually a long-term process and can be avoided when households are given appropriate support.

Social cohesion

Interventions following natural disasters go beyond production and protection aspects and also consider the possibility for social cohesion and cooperation, which, for smallholders, for production and livelihoods. Social

cohesion is one of the basic components of the transformative social policy framework. Although it is multi-faceted, it can be expressed in four main categories: social, task relations, perceived utility, and emotion. It is defined by Burns et al. (2018:10) as ". . . the extent to which people are co-operative, within and across group boundaries, without coercion or purely self-interested motivation." It entails "understanding the social infrastructure, institutions, customs and material and non-material relations that either constrain or enable the individual in whatever pursuit they are engaged" (Murisa, 2007:2). In agriculture, social protection can denote the aptitude or the potential of smallholders to build a shared identity and a sense of belonging. Social cohesion can be achieved by improving people's resilience so that they are not displaced or by land reform programmes that are cognisant of cultures and beliefs and settle associated communities or people together. Social cohesion and cooperation in the form of networks (political and communal), cultural norms (formation of cooperatives), and other social attributes are essential in sharing knowledge, exchanging experiences, and cooperation. They can enable households to be more resilient to disasters. The networks and cooperatives of farmers are very important as they increase the chances for increased productivity. Productivity is a vital component of the transformative social policy framework as it also increases the social protection of farmers.

Redistribution

The redistribution of resources, particularly land is another transformative social policy aspect that can be used to deal with the human consequences of natural disasters that result in human displacement. This can be achieved through government-initiated land reform programmes that move people from natural hazard-prone areas to safe areas. This will reduce future displacements by natural hazards. In many instances, governments simply temporarily relocate people who have been affected by disasters and allow them to return to their communities. This is not a long-lasting arrangement as it does not deal with the vulnerability context of households and communities. With agriculture as the main source of livelihood and income in SSA, land redistribution, therefore, wields much potential as a transformative social policy tool.

6. CONCLUSION

This article identified the dominant extreme weather events in SSA, examined human displacements related to these events, and proposed social policy-based interventions. The study shows that floods, storms, and drought are the dominant extreme weather events resulting in the displacement of many people in the region. This has huge social, economic, and political consequences especially because most households on the continent depend on agriculture. Displacement drives people away from their land and hence, away from their means of production. This undermines the food security status of households and the continent and frustrates Africa's inclusive development commitment –of the type that delivers a progressive, sustained, and sustainable transformation of lives and societies – easily remains the most critical challenge facing the continent's peoples. The article proposes transformative social policy-based interventions to reduce displacement and sustain agricultural productivity following hazards. Reliance on IDMC data represents a particular limitation for this study. Some studies that examined the impact of extreme weather events on human displacement often employed spatial analysis to track population movements before and after a natural disaster, especially sudden onset events. The lack of spatial analysis in this study represents a limitation.

7. DECLARATION OF CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

8. DATA AVAILABILITY STATEMENT

The author, Emmanuel Ndhlovu, agrees to make the data and materials utilised in this article available upon reasonable request. The data can also be accessed on the Internal Displacement Monitoring Centre (IDMC) website without restrictions to access and utilisation. http://internal-displacement.org/database/displacement-data.

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