

Climate change is expected to increase the frequency and magnitude of hydro-climatic extremes events, such as floods and droughts, impacting economies, livelihoods, and the environment, particularly in vulnerable areas, such as in some African countries, where the occurrence of multi-hazard events is likely to amplify disaster impacts (IPCC, 2022) (1). The EM-DAT international disaster database indicates that over the last twenty years (2002-2021) floods (n=793) and droughts (n=137) represented 55% of natural hazards in Africa (n= 1,693), with 14,053 and 20,821 deaths, respectively¹.

Floods and drought are two extremes of the hydrological cycle. Despite their different physical processes, with different spatial and temporal scales, their interplay can enhance the resulting detrimental cascading effects. For instance, drought hazards lead to soil degradation, reduced sub-surface water storage, and a lower capacity for soil infiltration, which increases runoff and proneness to flood risk. In comparison to the previous twenty years (1982-2001), EM-DAT indicates an increasing temporal trend in occurrences of floods and droughts in Africa, with a more important increase for floods (+180 %) than for drought (+30 %).

Figure 1 shows a fluctuating trend of annual drought-flood recurrences, indicating that the interplay of droughts with floods – as also observed by Di Baldassare et al. (2017) (2) – may merit further study. In numerical terms, floods occur more frequently than droughts, with annually an average of 40 flood events and seven drought events. Most floods in Africa occurred in 2007 (n=64) and 2020 (n= 66), while the highest number of drought events hit Africa in 2005 (n= 13), 2010 (n=10), and 2011 (n=11).

1. This CRED Crunch newsletter does not consider disaster events in 2022 as some of the EM-DAT data have not yet been validated.

Floods are usually sudden, fast-moving phenomena, which are commonly limited to one or two catchments, even though this can vary, depending on the specific circumstances, while droughts are slow-onset extensive processes, characterized by a prolonged period of below-average precipitation, evolving over relatively long time scales. This can make documenting drought durations and losses more challenging than is the case for floods. Even though comparing numbers of people affected by floods and droughts must be done with care – as this can vary considerably, depending on a number of factors – the EM-DAT database indicates that droughts appear to affect more people than floods. In the past three to five years, flood events in Africa had considerable impacts, with a peak of seven million people being affected in 2020. In contrast, droughts affected about 33 million people in 2021, 30 million in 2015, and 24 million in 2011 (Fig. 1). The total number of people affected by droughts (about 295 million people) was about five times higher than the number of people affected by floods (about 58 million people) between 2002 and 2021.

The spatial distribution of impacts caused by droughts and floods in Africa indicates that some countries have been more affected than others during the last twenty years. Since 2002, the geographical distribution of drought mortality in Africa, has been concentrated exclusively on a few East African countries and South Africa (Fig. 2). The 2010 drought in Somalia alone caused 20,000 deaths, followed by severe droughts such as the one in Malawi with 500 deaths in 2002, and the one in Burundi in 2005, leading to 120 fatalities (Fig.2a). Floods affected the African continent more frequently and on a wider spatial scale than droughts. However, flood mortality has mainly affected Kenya (1,699 fatalities), Nigeria (1,551 fatalities), Ethiopia (1,540 fatalities), and Sudan (995 fatalities) during the last twenty years (Fig.2 b).

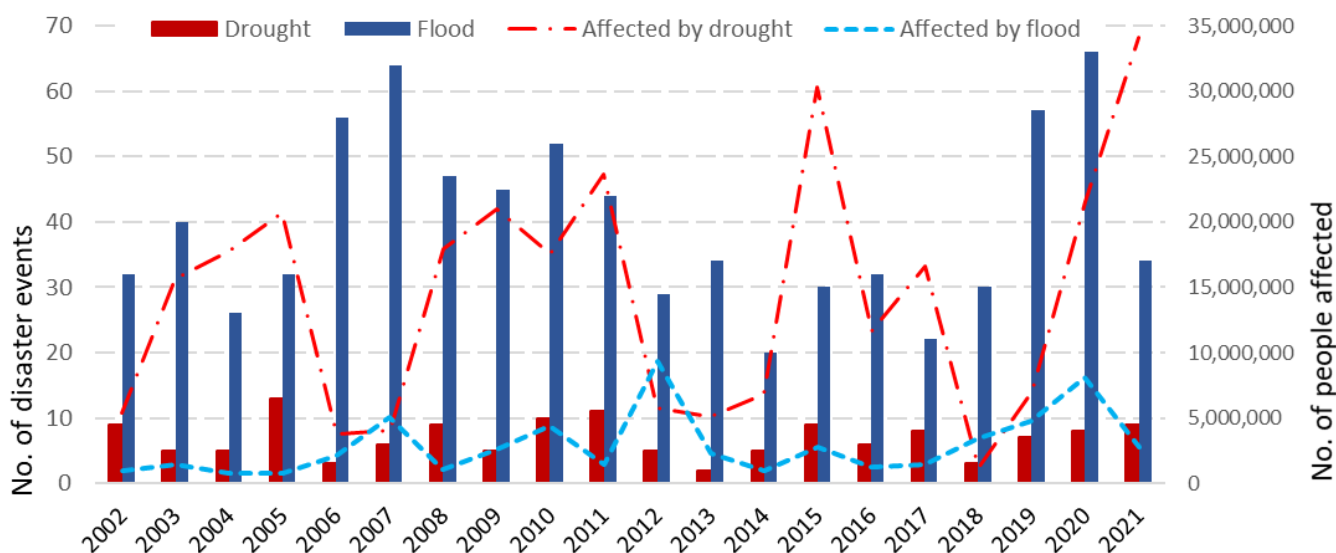


Fig. 1. Drought and flood events and their impact in Africa (2002-2021). Source: EM-DAT.

When it comes to the total population affected by droughts and floods, both types of these extreme events have a similar geographic distribution across the continent. The most impacted countries appear to be located in the Sahel and East Africa. In recent years, many African countries have faced severe flooding in various parts of West and Central Africa. In 2021, South Sudan experienced the third straight year of extreme flooding, and Niger experienced high-intensity rainfall that led to flooding across many parts of the country, affecting about 100,000 people.

Table 1 reports the top ten countries with the highest number of people affected by droughts and floods in Africa. These numbers should be interpreted with caution. If the EM-DAT data for Africa have improved over the last few years, these data remain uncertain and the figures may be underestimated. Compared to continents equipped with more developed disaster monitoring systems, the impacts of extreme events are more likely to be unrecorded in Africa. Further, multi-hazard interactions and feedback processes vary over time and space as they do for drought-to-flood events. For that reason, more accurate estimates of disasters data will improve the assessment of hazards, exposures, and vulnerabilities, especially in fragile contexts. The Sendai Framework highlights, and rightly so, the importance of improving disaster risk information to better understand disaster risks in all their dimensions, and to reduce global disaster mortality, the number of affected people, and direct disaster-related economic losses by 2030 (3).

(1) IPCC 2022. *Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press
 (2) Di Baldassarre *et al.* (2017). Drought and flood in the Anthropocene: Feedback mechanisms in reservoir operation. *Earth System Dynamics*, 8(1), 225–233. <https://doi.org/10.5194/esd-8-225-2017>.
 (3) United Nations 2015. *Sendai Framework for Disaster Risk Reduction 2015 – 2030*. Geneva.

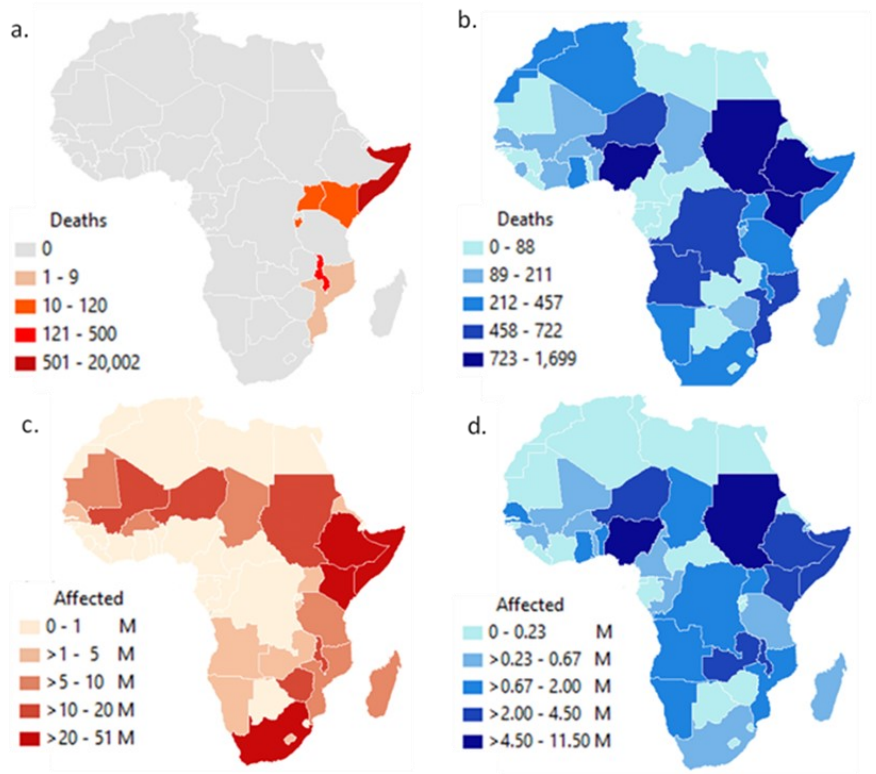


Fig. 2. Mapping drought and flood-related impacts in Africa between 2002 and 2021. (a) Total deaths due to drought-related events; (b) Total deaths due to flood-related events; (c) Total affected people due to drought-related events; and (d) Total numbers of people affected by flood-related events. Source: EM-DAT.

Table 1. Top 10 countries in Africa with droughts and floods, by total number of people affected (2002-2021). Source: EM-DAT.

Country	Affected by Droughts	Country	Affected by Floods
Ethiopia	50,605,679	Nigeria	11,419,911
South Africa	30,450,000	Somalia	4,513,098
Kenya	29,250,000	Sudan	4,271,143
Somalia	26,335,624	South Sudan	3,954,591
Niger	21,319,428	Kenya	3,852,904
Malawi	17,049,435	Ethiopia	3,458,324
Zimbabwe	15,135,118	Zambia	3,124,880
Mali	11,925,000	Niger	2,961,489
Mozambique	9,899,500	Malawi	2,624,172
Burkina Faso	9,750,000	Mozambique	2,085,603

CRED updates

- CRED is organizing its first Scientific and Technical Advisory Group meeting in Brussels on March 20 and 21, 2023



Data: "EM-DAT: The OFDA/CRED International Disaster Database". Data are subject to change, for enquires: contact@emdat.be
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