United Nations
Convention to Combat Desertification

DROUGHT IN NUMBERS 2022

- restoration for readiness and resilience -

Drought in Numbers

COP-15 Côte d'Ivoire

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- restoration for readiness and resilience -

UNITED NATIONS DECADE ON
ECOSYSTEM
RESTORATION
2021-2030

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COP-15 Côte d'Ivoire

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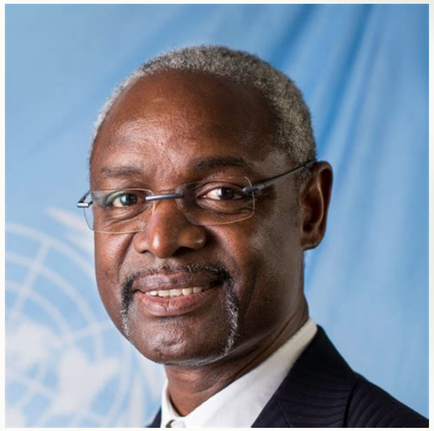
Convention to Combat Desertification

United for land



Foreword by Ibrahim Thiaw

Throughout the world, people are feeling the impacts of the climate and environmental crises most strongly through water: the land is drying up, fertile grounds are turning to dust and drought is prevailing. In fact, since 1970, weather, climate and water hazards accounted for 50 percent of all disasters and 45 percent of all reported deaths. Tragically, 9 in 10 of these deaths occurred in developing countries, where drought led to the largest human losses during this period (WMO, 2021).

Droughts are among the greatest threats to sustainable development, especially in developing countries, but increasingly so in developed nations too. The number and duration of droughts has increased by 29 percent since 2000, as compared to the two previous decades (WMO, 2021). When more than 2.3 billion people already face water stress, this is a huge problem. More and more of us will be living in areas with extreme water shortages, including an estimated one in four children by 2040 (UNICEF). No country is immune to drought (UN-Water 2021).

The facts and figures of this publication all point in the same direction: an upward trajectory in the duration of droughts and the severity of impacts, not only affecting human societies but also the ecological systems upon which the survival of all life depends, including that of our own species.

We are standing at a crossroads, on top of a watershed, where we need to gain a new awareness and consciousness. We need to steer toward the solutions rather than continuing with destructive actions, believing that marginal change can heal systemic failure.

Rigorous scientific knowledge coupled with political will forms the pathway to impact and enable this urgently required planetary action, guided by empowering policies with clear targets and with environmental justice, commitment and willingness at its heart. We must deal with drought urgently, using every tool we can.

One of the best and most comprehensive ways to do so is through land restoration, which addresses many of the underlying factors of degraded water cycles and the loss of soil fertility. We must build and rebuild our landscapes better, mimicking nature wherever possible and creating functional ecological systems.

Restoration helps vulnerable communities adapt to droughts by, for example, increasing water infiltration and retention, which in turn increases agricultural production. Such measures would reduce the estimated 700 million people at risk of being displaced by drought by 2030.

Restoration is not enough, however. We need to protect and manage lands through improved consumption and production practices. On the agriculture side, this means sustainable and efficient management techniques that grow more food on less land and with less water. On the consumption side, this means changing our relationships with food, fodder and fiber, moving toward plant-based diets, reducing or stopping the consumption of animals.

We must also understand that drought is complex, with a range of causes and impacts. These should not be considered in isolation. We need coordination, communication and cooperation, driven by sufficient finance and political will.

Parties to the UNCCD and other stakeholders are radically shifting how they respond to water scarcity, desertification, land degradation and drought. To date, 128 countries have expressed political will to follow an approach to achieve or exceed Land Degradation Neutrality. Nearly 70 countries participated in the UNCCD's global drought initiative, which aims to shift from reactive approaches to drought to a proactive and risk-reducing approach. This is progress and a reason for hope, but so much more needs to be done.

We should commit to pursue concerted policy and partnerships at all levels. Developing and implementing integrated drought action plans is the first step. We should set up effective early-warning systems that could work across boundaries. New technologies, such as satellite monitoring and artificial intelligence, offer much-needed guidance and precision for informed decisions. Our strategic actions should be regularly reported so that we can monitor and ensure continuous improvement in our effectiveness in addressing droughts.

We should also mobilize sustainable finance to improve drought resilience at the local level. Investing in soil health makes business sense, while protecting our communities and ecosystems. According to recent economic analyses, every single dollar invested in land restoration can generate up to 30 dollars in ecosystem services.

Finally, we will only succeed if we work together – if we are inclusive and mobilize farmers, local communities, businesses, consumers, investors, entrepreneurs and, above all, young people, who are the engines of awareness and action.

Drought is daunting, as its effects on people's lives are devastating. But through ingenuity, commitment and solidarity, it can be successfully addressed. It can motivate action toward much-needed sustainable practices in land and water management, enabling us not only to survive, but to thrive.

PART I

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Drought at a glance

Scientific consensus: There is strong evidence that human-induced climate change has led to an increased risk of drought (Hoegh-Guldberg et al, 2018)
Human activities, there is an increase in average surface temperatures around the world (IPCC, 2021)

Drought is deadly: From 1970 to 2019, drought was one of the hazards that led to the largest human losses, with a total of approximately 650,000 deaths
Among all the climate-related deaths during the period, more than 90 percent occurred in developing countries (WMO, 2021b)

Drought is costly: Economic losses due to drought have increased multifold in the past decades (WMO, 2021b)

Drought is devastating: An estimated 55 million people globally are directly affected by droughts every year, making it the most serious hazard to livestock and crops in nearly every part of the world (WHO, 2021)

Drought affects women and girls disproportionately: Greater burdens and suffering are inflicted on women and girls in emerging and developing countries in terms of education levels, nutrition, health, sanitation, and safety (Algur et al., 2021).
Almost 160 million children are exposed to severe and prolonged droughts - by 2040, it is estimated that one in four children will be living in areas with extreme water shortages (UNICEF, 2019)

Drought is underestimated: Droughts have deep, widespread and underestimated impacts on societies, ecosystems, and economies, with only a portion of the actual losses accounted for (UNDRR, 2021)

Drought preparedness polices make a difference: Proactive measures to reduce risks and increase resilience of ecosystems and communities can be achieved through sustainable land management and ecosystem restoration policies (King-Okumu, C. et al., 2019)

Land restoration is cost-effective: In Niger, farmers have substantially reduced drought risks by creating new agroforestry systems on 5 million hectares over 20 years, with average costs below USD20 per hectare (WRI, 2017)

Education instills readiness : Through a program of ecological restoration-based education, farmers in the Colombian Amazon set up 71 novel nursery gardens, producing 400,000 seedlings of 21 native forest species (Vizcarra, N. 2020)

Media matters: A case study of California in 2017 shows that an increase of about 100 drought stories over two months was associated with a reduction of 11 to 18 percent in typical household water-use (Quesnel, K. J., & Ajami, N. K., 2017)

Turning the tide: Limiting global warming to 1.5 degrees Celsius, along with regenerative land and improved water management practices, is expected to substantially reduce the probability of extreme drought events (Hoegh-Guldberg, O., 2018)

New horizons: A paradigm shift from ‘reactive’ and ‘crisis-based’ approaches to ‘proactive’ and ‘risk-based’ drought management approaches are indispensable (Tsegai, D. & Brüntrup, M., 2019)

Afghanistan
Angola
Brazil
Burkina Faso
Chile
Ethiopia
Iraq
Iran
Kazakhstan
Kenya
Lesotho
Mali
Mauritania
Madagascar
Malawi
Mozambique
Niger
Somalia
South Sudan
Syria
Pakistan
United States
Zambia

fig. 1: Countries facing drought emergencies in the last two years (2020-2022)

(for UNCCD map disclaimer see page 45)

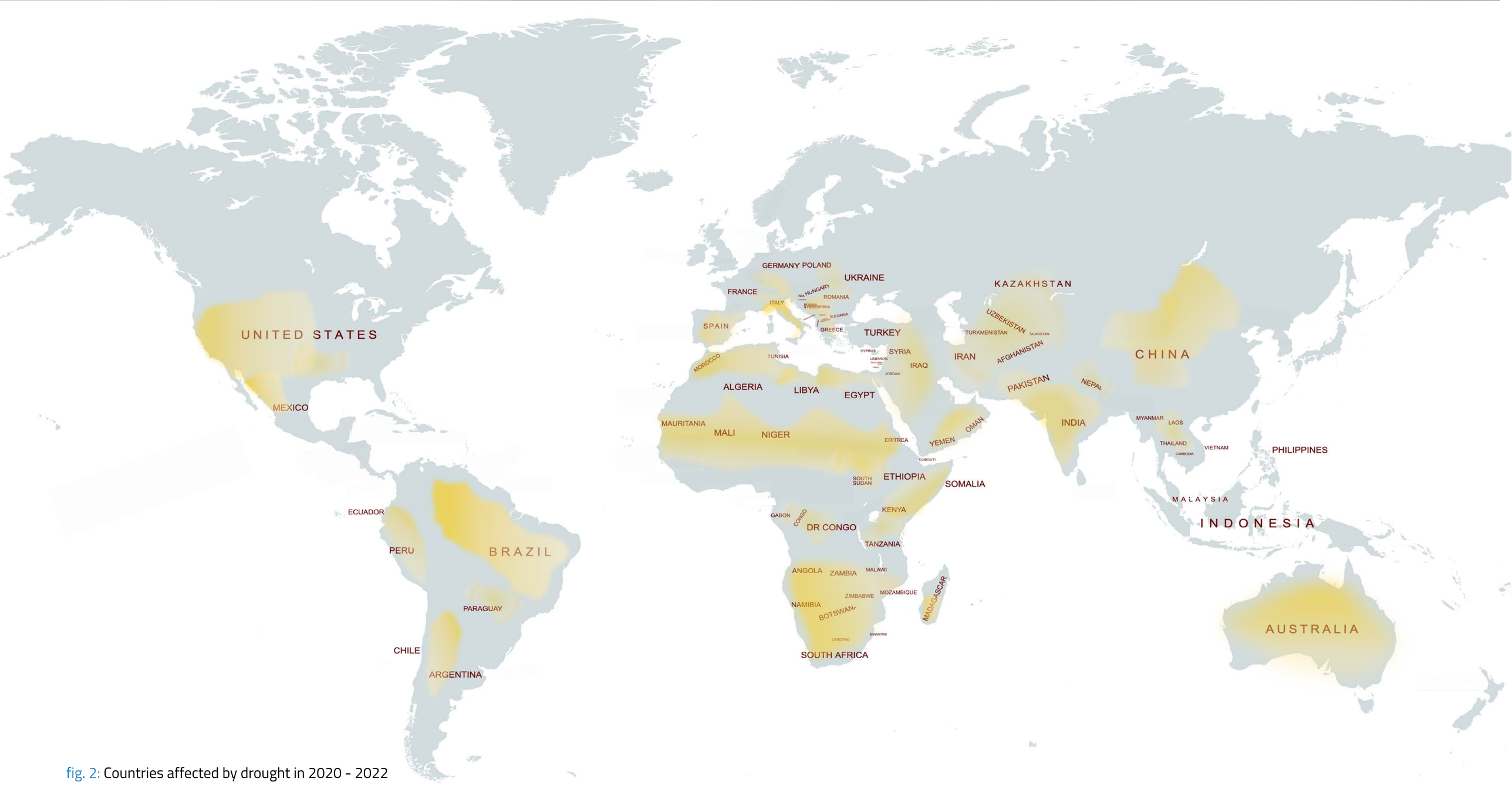
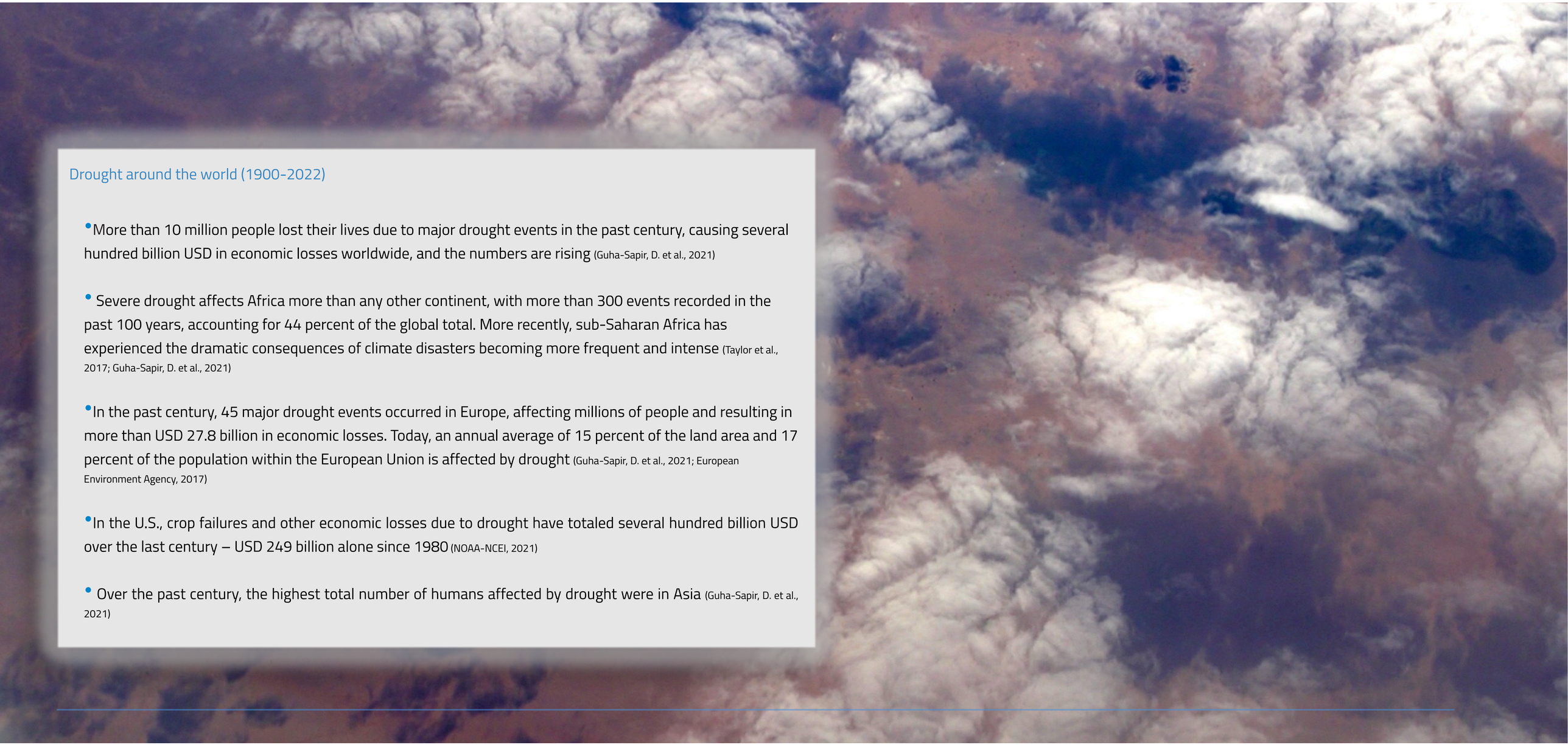


fig. 2: Countries affected by drought in 2020 - 2022



Drought around the world (1900-2022)

- More than 10 million people lost their lives due to major drought events in the past century, causing several hundred billion USD in economic losses worldwide, and the numbers are rising (Guha-Sapir, D. et al., 2021)

- Severe drought affects Africa more than any other continent, with more than 300 events recorded in the past 100 years, accounting for 44 percent of the global total. More recently, sub-Saharan Africa has experienced the dramatic consequences of climate disasters becoming more frequent and intense (Taylor et al., 2017; Guha-Sapir, D. et al., 2021)

- In the past century, 45 major drought events occurred in Europe, affecting millions of people and resulting in more than USD 27.8 billion in economic losses. Today, an annual average of 15 percent of the land area and 17 percent of the population within the European Union is affected by drought (Guha-Sapir, D. et al., 2021; European Environment Agency, 2017)

- In the U.S., crop failures and other economic losses due to drought have totaled several hundred billion USD over the last century – USD 249 billion alone since 1980 (NOAA-NCEI, 2021)

- Over the past century, the highest total number of humans affected by drought were in Asia (Guha-Sapir, D. et al., 2021)

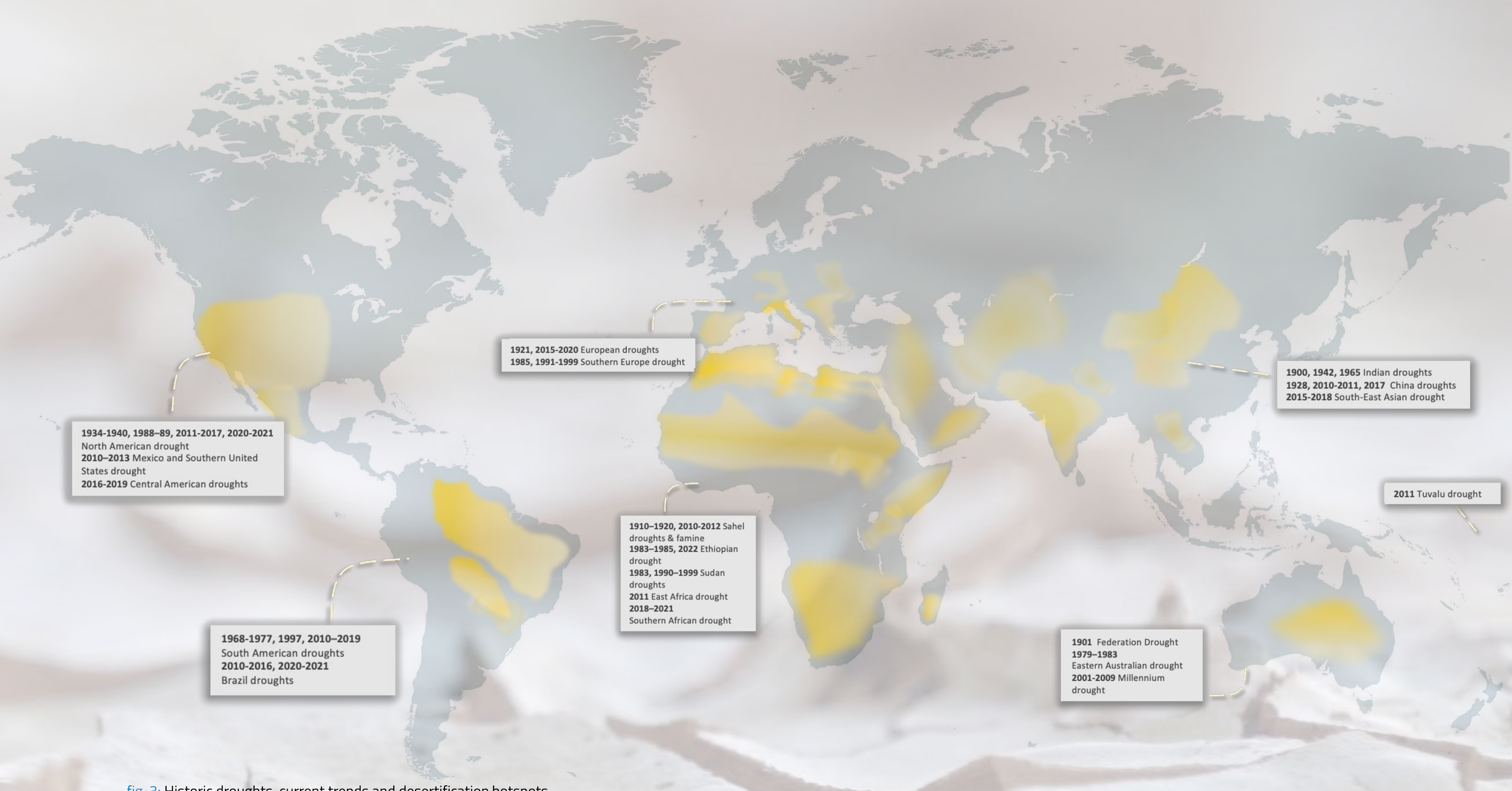


fig. 3: Historic droughts, current trends and desertification hotspots

Drought impacts on human society

- Over 1.4 billion people were affected by drought in the period of 2000 to 2019. This makes drought the disaster affecting the second-highest number of people, after flooding. Africa suffered from drought more frequently than any other continent with 134 droughts, of which 70 occurred in East Africa (Wallemacq, P. et al., 2015)

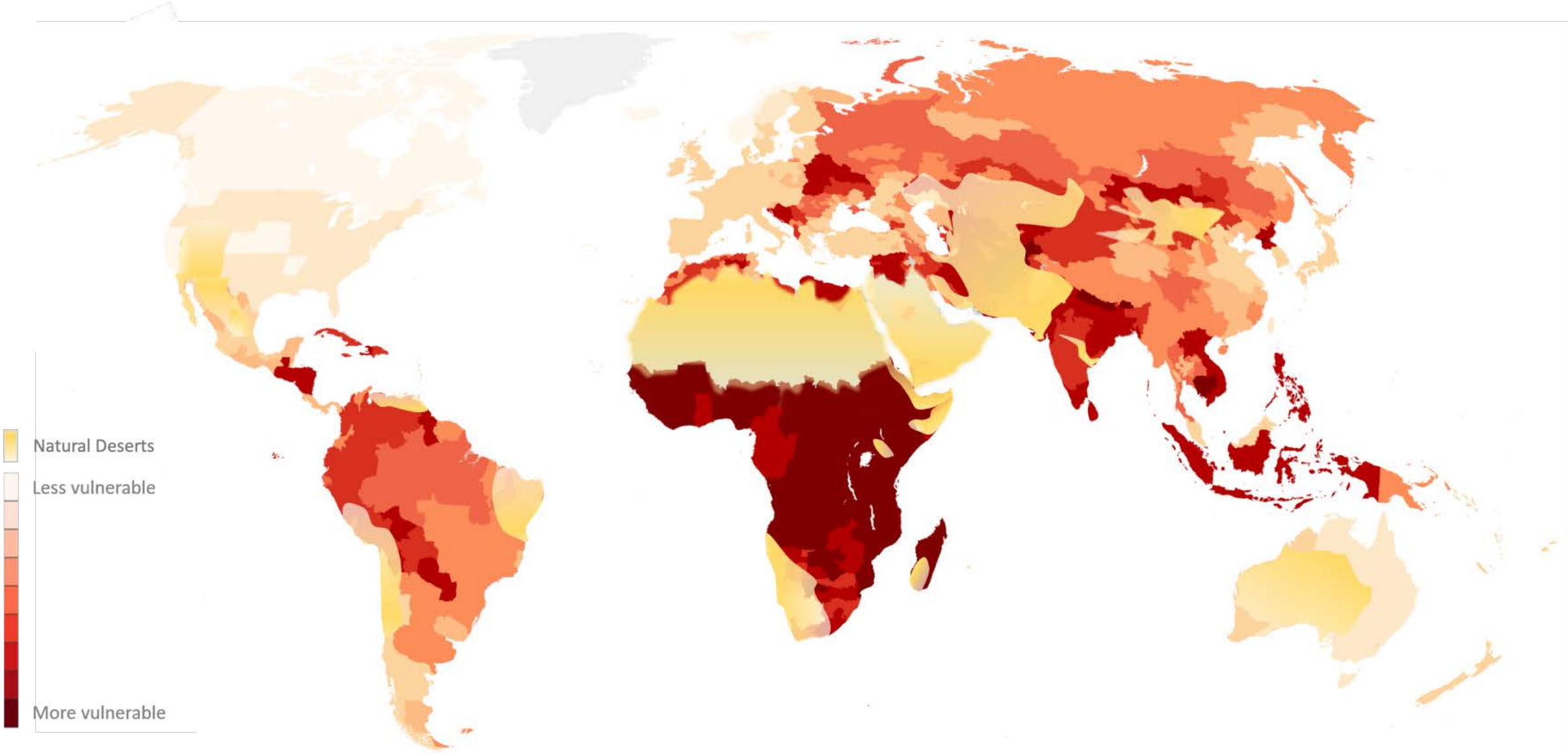
- The effect of severe droughts was estimated to have reduced India's gross domestic product by 2 to 5 percent over a period of 10 years (1998 to 2017) (UNDRR, 2021)

- As a result of the Australian Millennium Drought, total agricultural productivity fell by 18 percent in the period of 2002 to 2010 (WMO, 2021a)

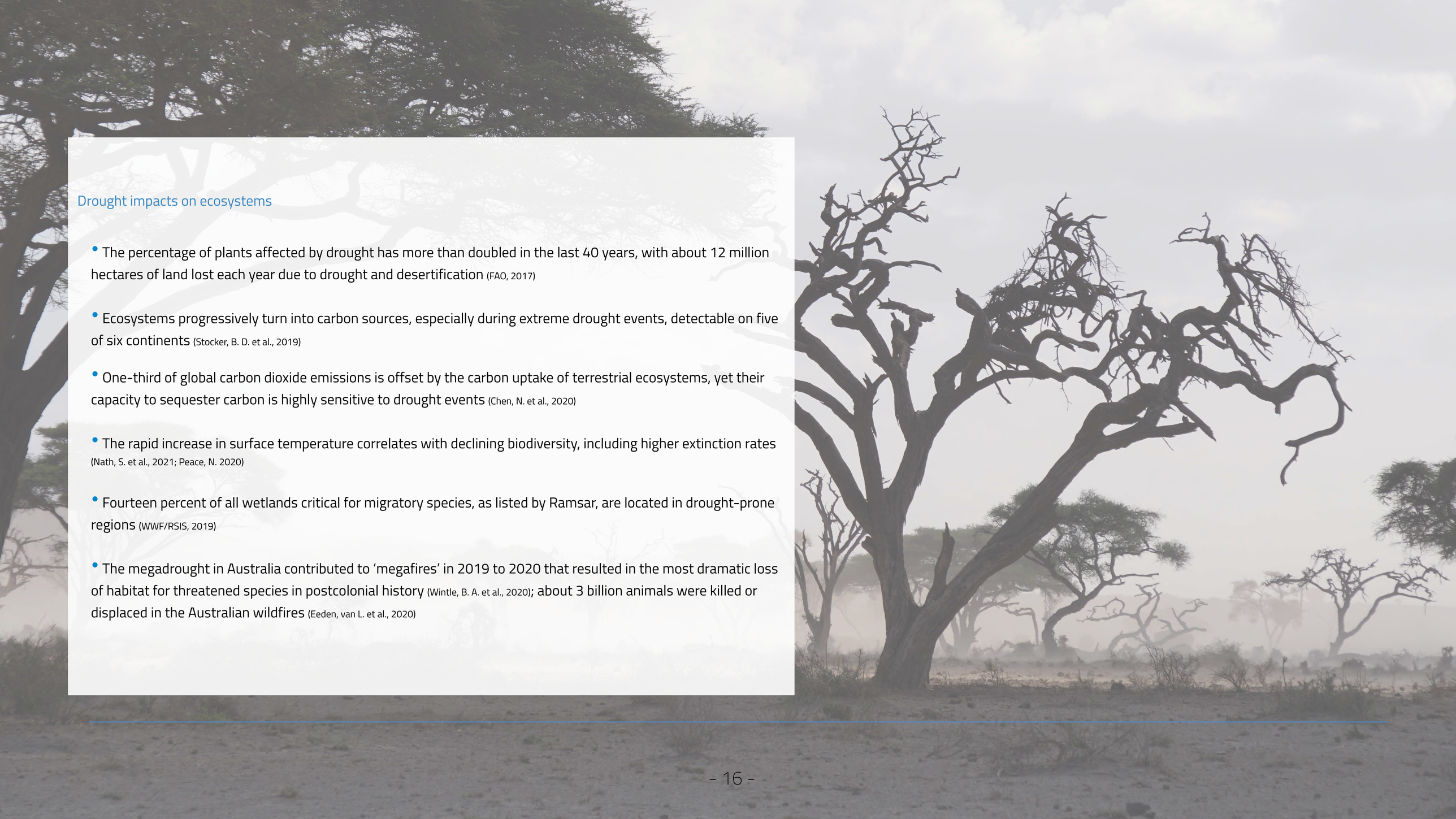
- The burden of water collection – especially in drylands – falls disproportionately on women (72 percent) and girls (9 percent), who, in some cases, spend as much as 40 percent of their calorific intake carrying water (UNDRR, 2021)

- During the past two years (2020 and 2021), widespread precipitation deficits were recorded across the South American continent (Marinho Ferreira Barbosa et al, 2021)

- Drought is a major driver of crop yield volatility and, in particular, causes low yields that can lead to substantial financial losses (Bucheli, J. et al., 2021)



Global drought-vulnerability index 2022



Drought impacts on ecosystems

- The percentage of plants affected by drought has more than doubled in the last 40 years, with about 12 million hectares of land lost each year due to drought and desertification (FAO, 2017)

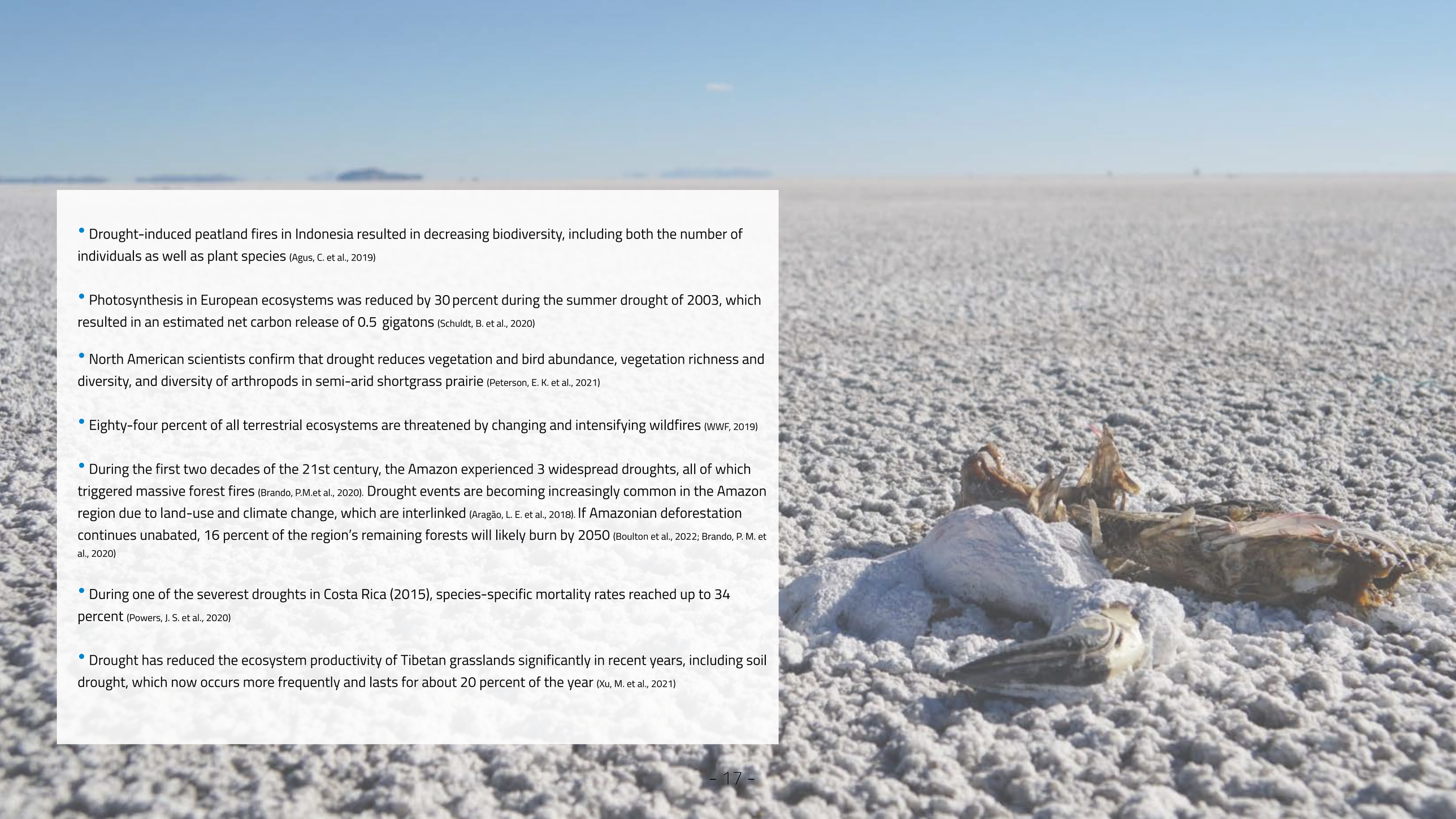
- Ecosystems progressively turn into carbon sources, especially during extreme drought events, detectable on five of six continents (Stocker, B. D. et al., 2019)

- One-third of global carbon dioxide emissions is offset by the carbon uptake of terrestrial ecosystems, yet their capacity to sequester carbon is highly sensitive to drought events (Chen, N. et al., 2020)

- The rapid increase in surface temperature correlates with declining biodiversity, including higher extinction rates (Nath, S. et al., 2021; Peace, N. 2020)

- Fourteen percent of all wetlands critical for migratory species, as listed by Ramsar, are located in drought-prone regions (WWF/RSIS, 2019)

- The megadrought in Australia contributed to ‘megafires’ in 2019 to 2020 that resulted in the most dramatic loss of habitat for threatened species in postcolonial history (Wintle, B. A. et al., 2020); about 3 billion animals were killed or displaced in the Australian wildfires (Eeden, van L. et al., 2020)



- Drought-induced peatland fires in Indonesia resulted in decreasing biodiversity, including both the number of individuals as well as plant species (Agus, C. et al., 2019)

- Photosynthesis in European ecosystems was reduced by 30 percent during the summer drought of 2003, which resulted in an estimated net carbon release of 0.5 gigatons (Schuldt, B. et al., 2020)

- North American scientists confirm that drought reduces vegetation and bird abundance, vegetation richness and diversity, and diversity of arthropods in semi-arid shortgrass prairie (Peterson, E. K. et al., 2021)

- Eighty-four percent of all terrestrial ecosystems are threatened by changing and intensifying wildfires (WWF, 2019)

- During the first two decades of the 21st century, the Amazon experienced 3 widespread droughts, all of which triggered massive forest fires (Brando, P.M.et al., 2020). Drought events are becoming increasingly common in the Amazon region due to land-use and climate change, which are interlinked (Aragão, L. E. et al., 2018). If Amazonian deforestation continues unabated, 16 percent of the region's remaining forests will likely burn by 2050 (Boulton et al., 2022; Brando, P. M. et al., 2020)

- During one of the severest droughts in Costa Rica (2015), species-specific mortality rates reached up to 34 percent (Powers, J. S. et al., 2020)

- Drought has reduced the ecosystem productivity of Tibetan grasslands significantly in recent years, including soil drought, which now occurs more frequently and lasts for about 20 percent of the year (Xu, M. et al., 2021)

- Climate change is expected to increase the risk of droughts in many vulnerable regions of the world, particularly those with rapid population growth, vulnerable populations and challenges with food security (CRED & UNDRR, 2020)

- The World Bank estimates that up to 216 million people could be forced to migrate by 2050, largely due to drought, together with other factors such as water scarcity, declining crop productivity, sea-level rise and overpopulation (The World Bank, 2021)

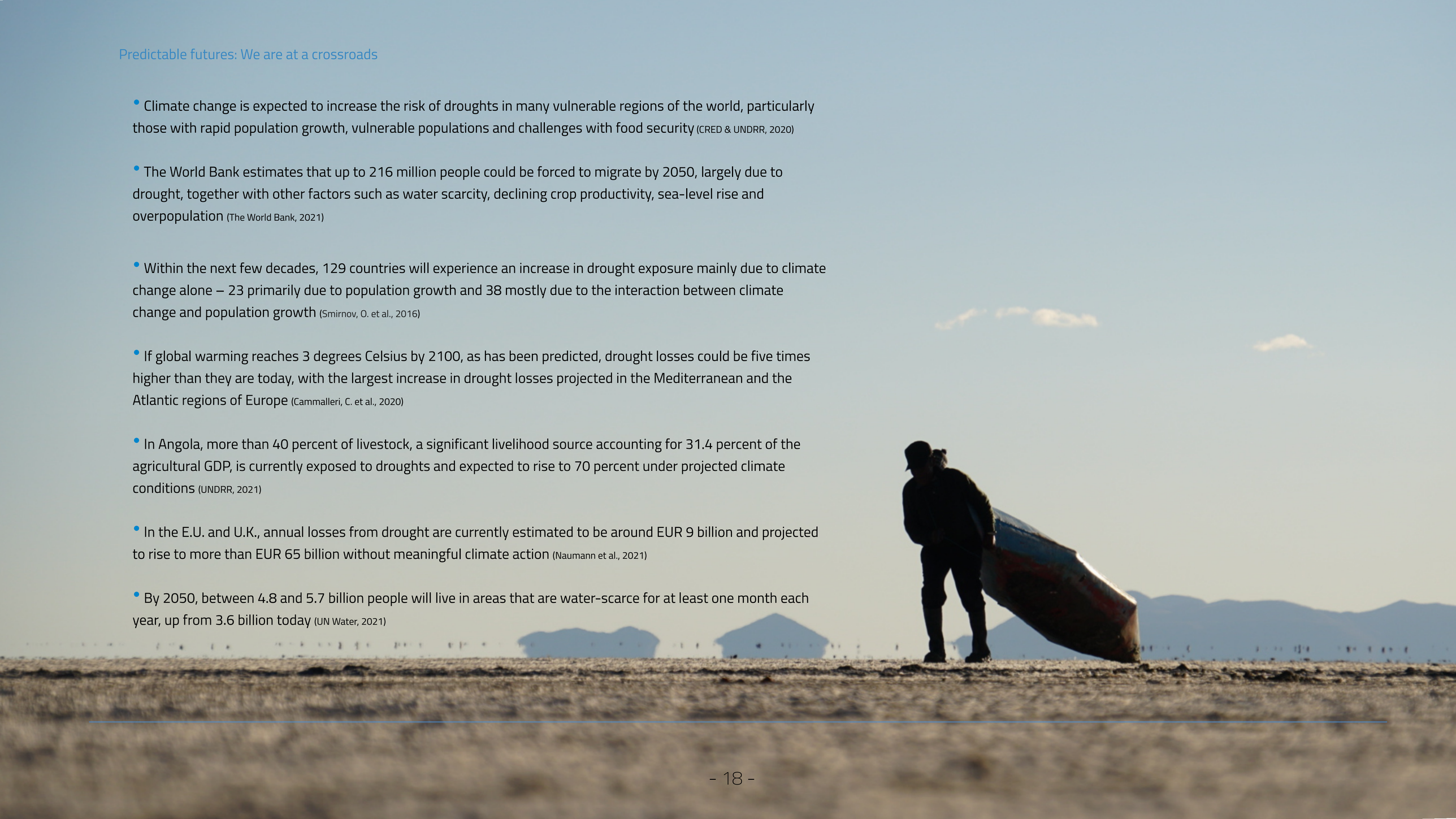
- Within the next few decades, 129 countries will experience an increase in drought exposure mainly due to climate change alone – 23 primarily due to population growth and 38 mostly due to the interaction between climate change and population growth (Smirnov, O. et al., 2016)

- If global warming reaches 3 degrees Celsius by 2100, as has been predicted, drought losses could be five times higher than they are today, with the largest increase in drought losses projected in the Mediterranean and the Atlantic regions of Europe (Cammalleri, C. et al., 2020)

- In Angola, more than 40 percent of livestock, a significant livelihood source accounting for 31.4 percent of the agricultural GDP, is currently exposed to droughts and expected to rise to 70 percent under projected climate conditions (UNDRR, 2021)

- In the E.U. and U.K., annual losses from drought are currently estimated to be around EUR 9 billion and projected to rise to more than EUR 65 billion without meaningful climate action (Naumann et al., 2021)

- By 2050, between 4.8 and 5.7 billion people will live in areas that are water-scarce for at least one month each year, up from 3.6 billion today (UN Water, 2021)



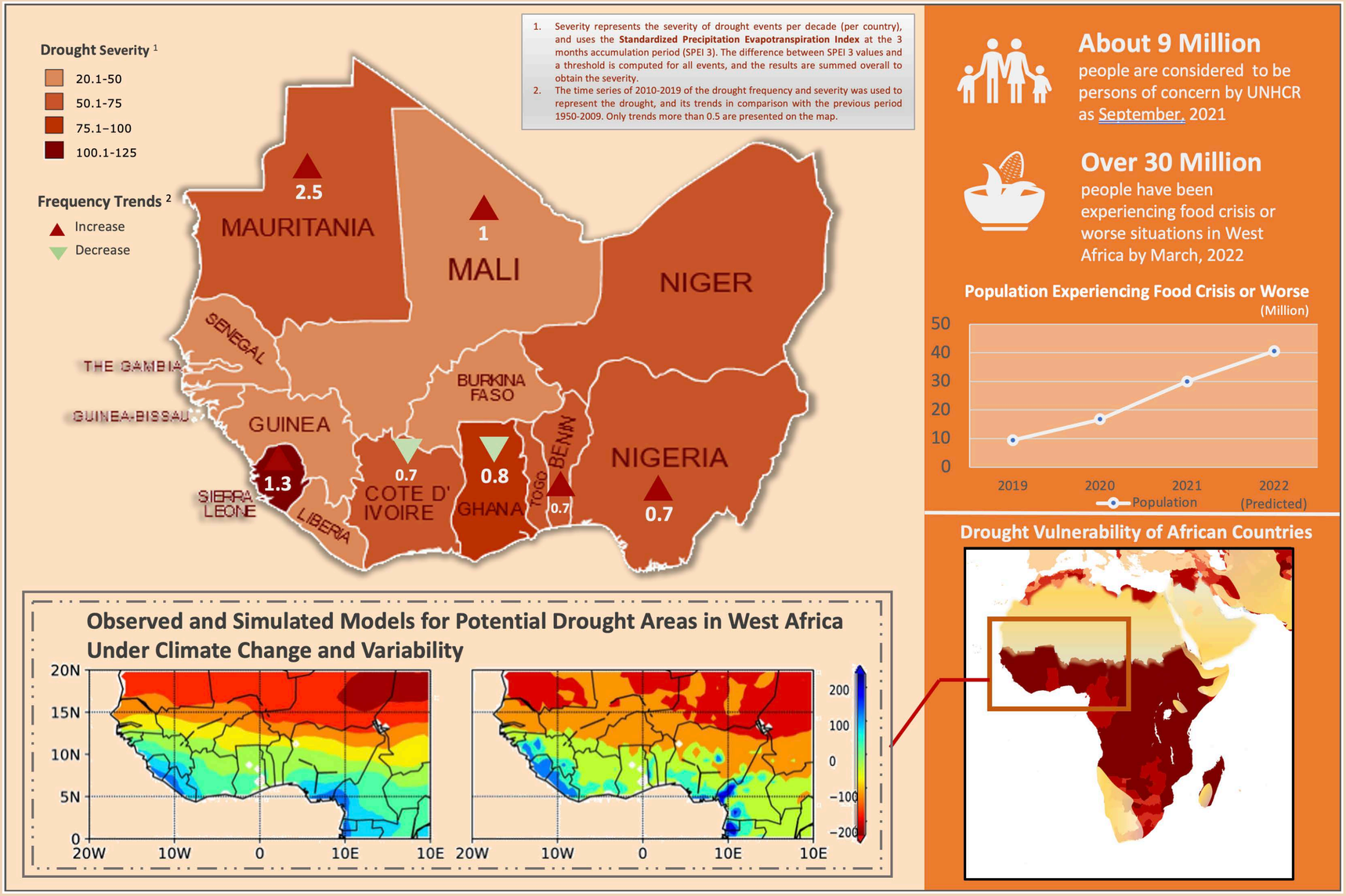
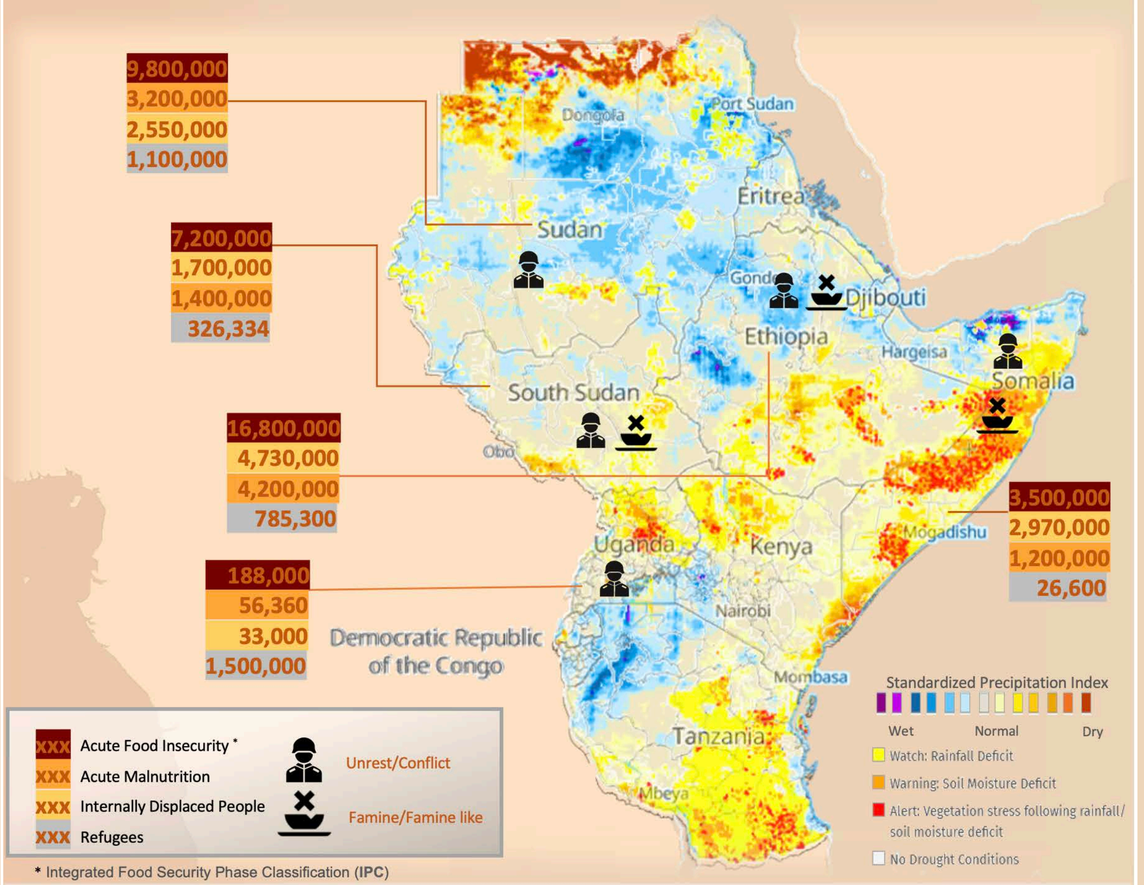


fig. 5: Drought infographic of West Africa

fig.6: Drought infographic of East Africa



40%
more humanitarian assistance will be needed in Ethiopia in 2022 compared to both 2021 and 2016, due to the significant crop and livestock production losses resulting from below-average rainfall in the eastern Horn in late 2020 and early 2021

5,8 Million
people in the area are displaced across borders by country of origin or facing internal displacements by mid 2021, with the majority from South Sudan, Somalia, Burundi, Sudan and Eritrea

3 Million
people have been exposed in areas of drought watch, warning and alert in East Africa in the past two years

58 %
lower overall cereal production was estimated for the last rainy season in southern Somalia.

70%
less crop production is estimated in marginal coastal zones in south-eastern parts of Kenya

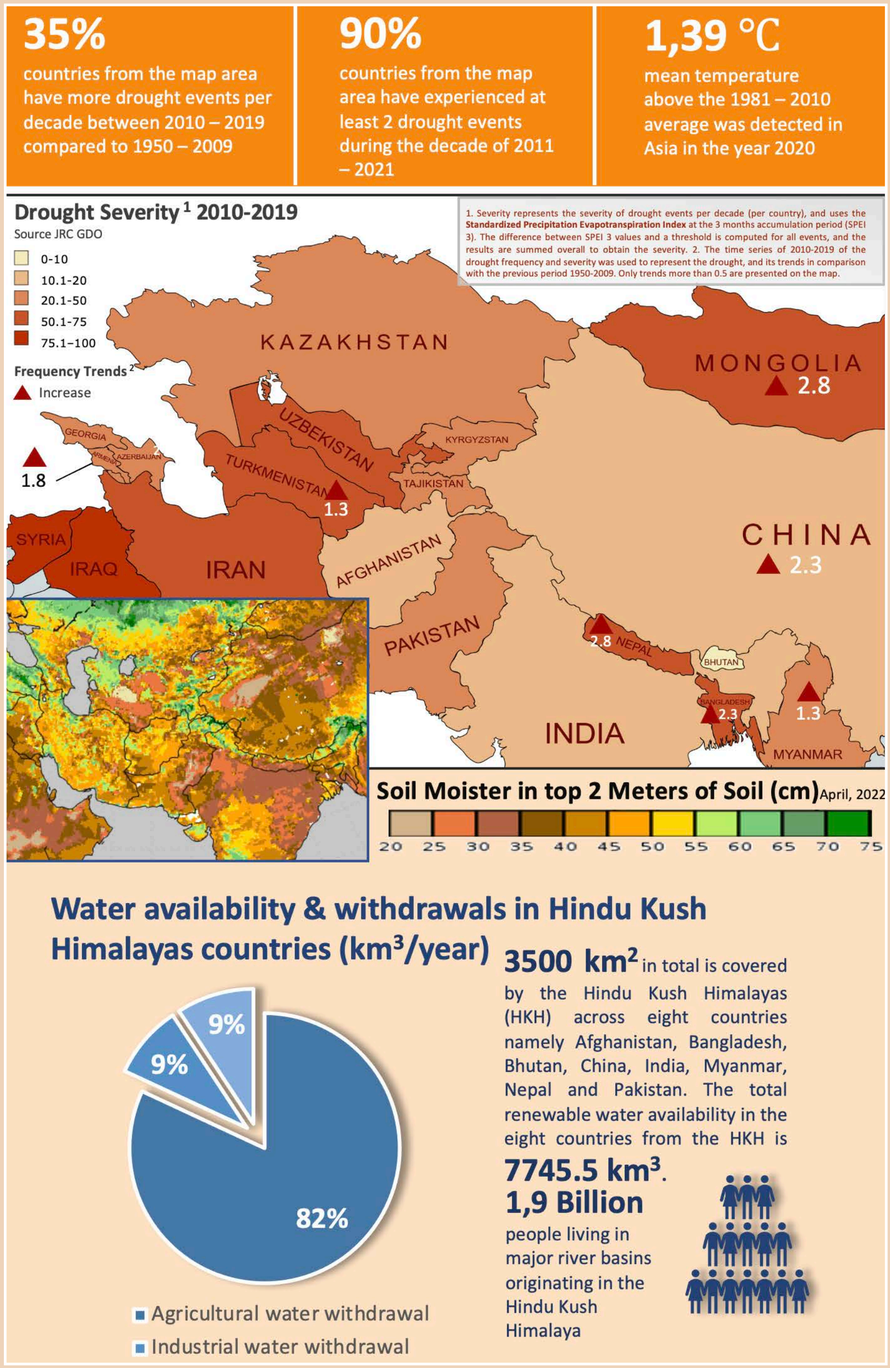


fig. 7: Drought infographic of Central and Southern Asia

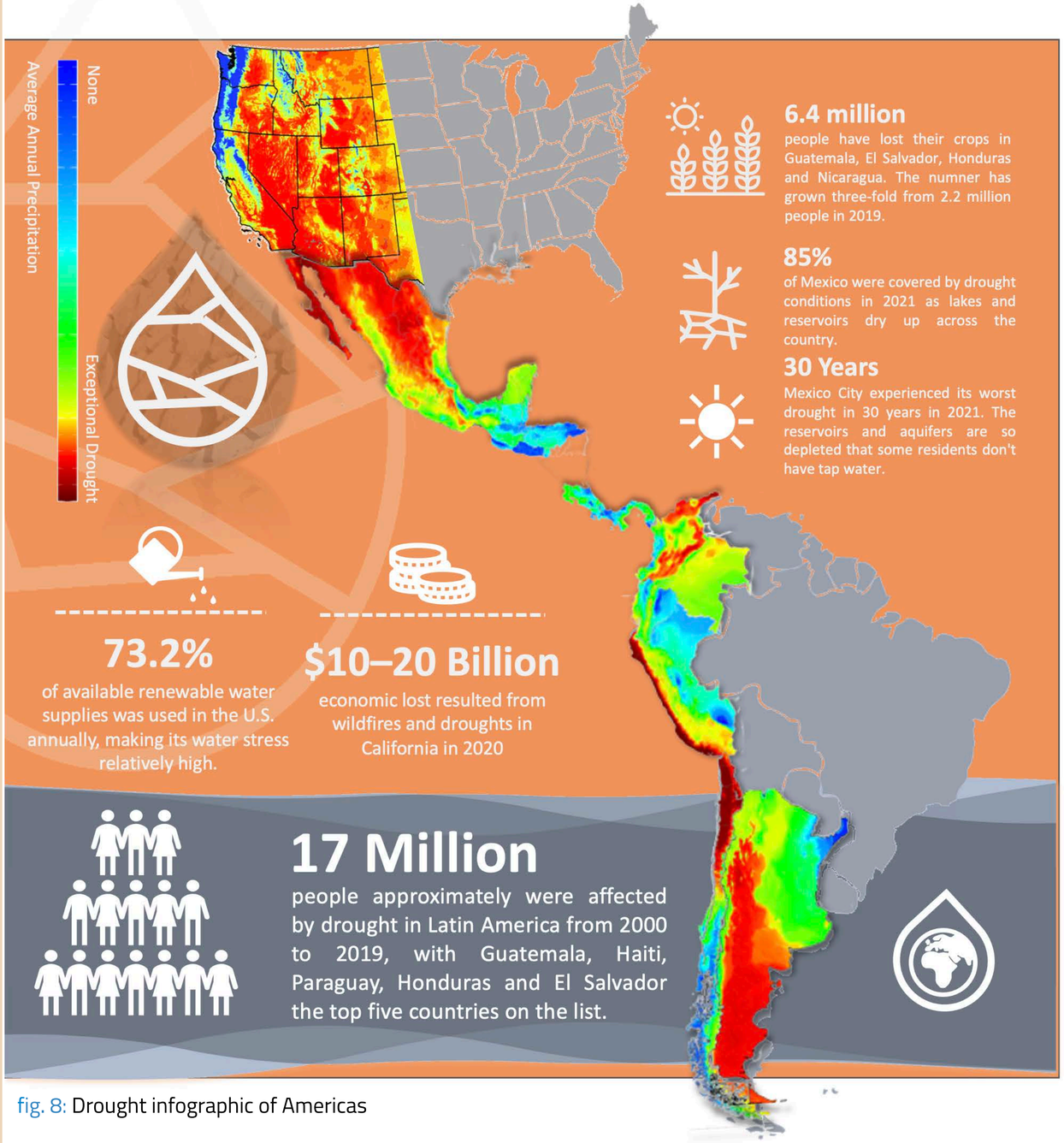


fig. 8: Drought infographic of Americas