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CLIMATE CHANGE IMPACTS ON HEALTH:

MALAWI ASSESSMENT

IFRC

Climate Centre

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EXECUTIVE SUMMARY

The global climate crisis will affect Malawi through increased temperatures (certain), decreased mean monthly rainfall (uncertain), increases in the amount of rainfall during extreme events (highly likely), and an observed increase in the frequency and intensity of drought events. The impacts these changes will have on an already weak health system are significant. The climate crisis will exacerbate humanitarian needs, compounding vulnerabilities, and deepen the health burden of many climate-sensitive diseases directly and indirectly. As such, health is clearly prioritized in policy instruments such as the National Adaptation Programme of Action and the National Determined Contributions.

The most urgent risks of the climate crisis to human health in Malawi, identified within this scoping study, are: the increased incidence of climate-sensitive diseases such as Diarrhoea and Malaria, and increased food insecurity and its association with malnutrition. Climatic stresses and shocks will also influence displacement and migration to urban areas (leading to an urbanization of health problems) and mental health challenges.

Women and girls already face challenges in terms of equity, access to resources and control over decision-making. They are likely to be disproportionately affected as a result of the climate crisis, in terms of health generally and specifically in terms of sexual and reproductive health and rights. Stressors on food supplies and livelihoods are linked with negative sexual and reproductive rights and health (SRHR) outcomes. These include increased child marriages in girls as young as 13 years old; women increasingly engaging in transactional sex, increasing their exposure to the risk of HIV/AIDS which is already prevalent (9.6 per cent of the population); and an increased incidence of gender-based violence and abuse.

The urgency to act is clear. The purpose of the report is to act as a reference document on the likely impacts – direct and indirect – of the climate crisis on the wellbeing of people in terms of their health and livelihoods. The intention is that this report can act as a springboard for planning and implementing activities and programmes focused on climate action and adaptation. Some recommendations and opportunities for action have been offered, however, these should be considered as only a starting point to further complement and expand existing programmes and projects. Cross-sector and widespread collaboration between National Societies, government agencies and services, the private sector, NGOs, civil societies and our communities is key as no one organization alone can tackle the increased risks posed by climate change nor alleviate the exacerbated risks of vulnerable populations. Together, acting now, with the evidence at hand, it is possible to avert the most dire consequences of the climate crisis.

Table 1: Summary table of the climate projections and major projected impacts on health and SRHR

PHENOMENON AND DIRECTION OF TREND	LIKELIHOOD OF FUTURE TREND	MAJOR PROJECTED IMPACTS PER SECTOR	
		HEALTH (INCL. WASH)	SEXUAL AND REPRODUCTIVE HEALTH AND RIGHTS
SLOW ONSET/ STRESSORS			
Temperatures increase by 2.7°C by 2075, meaning that warmer winters and hotter summers are highly likely, evenly distributed over all regions, with the largest increases in the early summer months; increase in the number of days and nights considered "hot" by 2060; increase in mean number of days >30°C and the increased evaporation of water sources.	Highly likely	Number of heat-related deaths in the elderly increases; longer favourable warm conditions increases the incidence of Malaria across 7–9 months rather than the historical 3–4 months (January–April) and expands the range towards the highlands (similar dynamics for other vector-borne diseases, such as Dengue Fever; increased likelihood of diarrhoeal diseases (especially Cholera); evaporation of water sources may impact agricultural productivity and contribute towards increasing food insecurity and malnutrition.	Drying of Lake Chilwa is associated with an increased number of early marriages in daughters; increased seasonal transmission of vector- borne diseases (such as Malaria) pose a risk of complications to pregnant women.
Decrease in rainfall towards the end of the rainy season, leading to an earlier cessation of rains primarily felt in the Shire Valley and in eastern and southern Malawi. Little change in monthly rainfall in the northern region of the country.	Uncertain	Increased malnutrition rates due to crop failure dependent on rain, particularly impacting female-headed households; mental health issues may increase as a result of the stress of drier periods, especially amongst farmers.	People living with HIV/ AIDS may be particularly affected by food shortages and malnutrition; food insecurity may lead to an increasing trend in women engaging in transactional sex e.g. "fish for sex"
RAPID ONSET/ SHOCKS			
Increase in the proportion of rainfall during extreme events (especially in December–January), increasing the chances of riverine and flash flooding (especially at the end of the rainy season, in March, when river basins are full).	Likely	Crops destroyed by riverine and flash floods can lead to food insecurity and malnutrition especially in the south; mental health issues may increase as a result of extreme weather events.	People living with HIV/ AIDS may be particularly affected by food shortages and malnutrition; displacement caused by floods and resulting unemployment forces women into transactional sex increasing the risk of HIV/AIDS.

1. INTRODUCTION

1.1. POLICY LANDSCAPE

Malawi outlines its climate change and health priorities in the National Adaptation Programme of Action (NAPA) and the Nationally Determined Contributions (NDCs). Health is a priority sector and is identified as being vulnerable to climate change under both policy instruments. Firstly, the urgency of potential risks caused by recurrent floods and droughts as well as their effects on human well-being and ecologies are highlighted in the country's adaptation plans. Secondly, addressing the spread of climate-sensitive diseases such as Diarrhoea and Malaria, while responding to declining access to food / agricultural production, which may result in increased levels of undernutrition, is a priority. Finally, the NDC highlights efforts aimed at enhancing local institutional and human resource capacity in order to provide sustainable disease monitoring, prevention and control. However, fast-growing urbanization and waste generation (especially in informal settlements) pose critical risks to these efforts. As a result, Malawi's programmes stress the importance of technological approaches to reducing emissions in the waste sector e.g. controlled waste incineration and composting for organic manure. Additionally, public awareness, research and improved standards of living inform the futurity of the country's ambitions.

2. CLIMATE PROJECTIONS

The following section is adapted from climate projections prepared for a study on *Climate Change and Food Security in Southern Africa* by the Red Cross Red Crescent Climate Centre.

2.1. GENERAL CLIMATE AND CLIMATIC ZONES

Malawi has a generally mild, subtropical climate and three major separate climatic zones: the semi-arid Shire Valley and the lakeshore plain, the medium-altitude plateaus which are semi-arid to sub-humid, and the sub-humid high-altitude plateaus and hills (Jury 2014). Temperatures are highest in the Shire Valley (daily averages around 25–26°C, but can increase to 37°C in the summer) (Ministry of Natural Resources, Energy and Environment 2011). October and early November are the warmest months, with mean monthly temperatures of 25–37°C and low average humidity (around 50 per cent) (Malawi Meteorological Services 2020; Ministry of Natural Resources, Energy and Environment 2011). May–October are the cooler, drier months; the coldest months are from May–July when mean daily temperatures fall to 17–27°C (Malawi Meteorological Services 2020; Ministry of Natural Resources, Energy and Environment 2011).

Generally speaking, 95 per cent of the rain falls during the summer rainy season, which stretches from November–April (Malawi Meteorological Services 2020). The months of January and February have the most rainfall, when daily average humidity is around 87 per cent (Malawi Meteorological Services 2020). There is a high degree of season-to-season and within season variability in the amount and the pattern of rainfall, largely driven by elevation as well as the annual migrations of the Intertropical Convergence Zone (ITCZ) and the Congo Air Mass/Zaire Air Boundary (Malawi Meteorological Services 2020).

Table 1. Seasonal calendar

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Warmer summer months				Cooler winter months					Hottest		
Rainy season				Dry season						Rainy season	
Most rainfall											

2.2. EXTREME WEATHER EVENTS

Riverine and flash floods as well as severe droughts are among the most common extreme weather events in Malawi. Cyclones are relatively rare, but a high-impact event can contribute to widespread loss of life and the destruction of assets and infrastructure. Historically, dry spells and droughts have had a significant impact on the water levels of Lake Malawi, which is a central feature of the country's (and region's) water security. Negative fluctuations in the level of the lake have caused its tributaries to run dry. An extremely severe drought, linked to El Niño, in 2017 affected over 6.5 million people throughout Malawi (IFRC 2017). Historic extreme rainfall has caused significant flooding events, and the country (though landlocked) was affected by seven cyclones in 1946–2008 (Ministry of Natural Resources, Energy and Environment 2011). In 2015, a one-in-500 year rainfall event led to massive floods which were "devastating in terms of geographical coverage, severity of damage and extent of loss" (Government of Malawi 2015). In 2019, Cyclone Idai tore through Malawi, killing hundreds of people and leaving thousands of others homeless, due to the high winds and flooding it caused.

2.3. CLIMATE CHANGE

OBSERVED CHANGES	CLIMATE PROJECTIONS
RAINFALL	RAINFALL

OBSERVED CHANGES	CLIMATE PROJECTIONS
Rainfall trends are unclear and highly variable year-to-year. Overall, rainfall increased by 98mm in 1961–1970 and 1991–2000. Most of the increase in average rainfall is due to escalated rainfall in the rainy summer months (Warnatzsch and Reay 2019). In January, average rainfall is now above 225mm for the month. Conversely, in the drier, cooler winter months, rainfall has decreased, averaging less than 12mm per month in June–September. The incidence of drought increased in 1971–2000, and even in the rainy season there are longer dry spells between rainfall events (Warnatzsch and Reay 2019; USAID 2017). The intensity, frequency and magnitude of floods and droughts has increased since the 1960s (USAID 2017).	The overall increases or decreases in rainfall are difficult to predict in Malawi and there is a high level of uncertainty (Warnatzsch and Reay 2019). Within the rainy season (November–April), an **increase** in rainfall specifically in December–January is expected; however, a **decrease** in rainfall across February–April is also expected. This may indicate an early cessation of the rainy season in the future (USAID 2017). In particular, lower than average rainfall during these months is projected to be felt more severely in the Shire Valley (a decrease of 4.8 per cent) and in eastern and southern Malawi, with little change in the northern region of the country (Ministry of Natural Resources, Energy and Environment 2011). It is expected that the intensity of rainfall during extreme events may increase by 19 per cent annually by 2090 (USAID 2017), increasing the risk of flash flooding. Flooding is a risk in districts that are projected to experience more rainfall, but also in districts downstream. For example, low-lying areas in the Shire Valley (such as Nsanje and Chikwawa) may feel the effects of increased rain in other districts upstream (e.g. Mwanza, Thyolo and Blantyre).
TEMPERATURE	**TEMPERATURE**
In 1960–2006, the mean annual temperature increased by 0.9°C. This increase in temperature has been most rapid in the rainy summer season and specifically in December–February (World Bank 2020). This corresponds to an increase in the number of 'hot' days (i.e. average daily temperature above 30°C). Since the 1960s, an additional 30 'hot' days and 41 'hot' nights have been recorded (USAID 2017). Temperature increases have been lowest in September–November (the typically hottest months) (WB Climate Portal). The average rate of temperature increase has been 0.21°C per decade (World Bank 2020).	Mean annual temperatures are projected to continue to increase, bringing warmer winters and hotter summers evenly distributed across all regions (FCFA 2017). By 2050, the early summer months are likely to experience the most pronounced warming (USAID 2017). By 2060 there is likely to be a further increase – beyond the additional days already being experienced – in the number of days and nights considered 'hot'. By 2075, the average national temperature may increase by 2.7°C compared to baseline (Ministry of Natural Resources, Energy and Environment 2011) which will have negative impacts on agriculture.

3. AT-RISK POPULATIONS

The risks certain populations face due to climate change impacts are mediated by a combination of social, economic and political factors. People may face a heightened exposure to natural hazards and weather events or barriers which limit their individual coping capacity. In general, displaced people, women, children and the elderly are disproportionately at risk of climate change impacts, due to their limited access to information, technology and financial resources. The southern region of Malawi – the most densely populated region – also has the highest concentration of poor people. These communities are vulnerable to extreme weather events caused by climate change (Government of Malawi 2019). Specifically, in this scoping assessment, existing evidence on the impacts of climate change on certain health outcomes were identified for the following populations (but are not limited to these populations):

- Elderly people (heat and disaster risk)
- Children (Malaria, Diarrhoea, undernutrition, mental health issues, SRHR)
- Displaced populations (Diarrhoea, SRHR)
- Female-headed households (food security and undernutrition)
- Women (SRHR and undernutrition)
- People living with HIV/Aids (food security and undernutrition)
- Farming communities (especially rural) (mental health issues)

Whilst it is known that persons with disabilities may experience impacts from climate change differently and more severely than others, there was limited data and research available on these interactions in Malawi. The United Nations High Commissioner for Refugees (UNHCR) has highlighted that persons with disabilities are among those that suffer the highest mortality and morbidity in an emergency or when access to healthcare and social protection systems is disrupted. In particular, people with multiple vulnerabilities, such as women and girls with disabilities, are at heightened risk of abuse, violence and sexual exploitation during periods of stress or crisis (UNHCR 2020).

4. HEALTH IMPACTS

Health is impacted by a number of socioeconomic as well as environmental factors. This report focuses only on how climate change will affect health. Other factors – such as population growth, global recessions, international trade, conflict etc. – also intersect with the climate crisis and influence health; however, they are beyond the scope of this research.

In general, Malawi has poor health conditions. Infectious diseases such as Malaria and Cholera are endemic, chronic and acute malnutrition as well as micronutrient deficiencies are prevalent. This report synthesizes the existing evidence on the impacts of climate change on health in terms of: 1) direct mortality and injury (from natural hazards) and indirectly mediated through the environment via 2) vector-borne diseases, 3) waterborne diseases, 4) malnutrition and food insecurity, as well as considering 5) displacement. Additionally, the evidence for impacts on mental health are presented, alongside the impacts on critical infrastructure and health systems. Particular focus is given to possible links between the changing climate and sexual and reproductive health rights. The most urgent risks to human health as a result of the changing climate include the increased risk of diarrhoeal diseases, expanded range of Malaria to the highlands, and increased food insecurity (USAID 2017).

4.1. INJURY/MORTALITY

> *"Vulnerable groups such as children, the physically challenged and pregnant women will not be able to run away during flooding or they have limited capacity to escape from danger so they might be injured or even die." KII8*

Malawi faces a number of climate-induced natural hazards such as flooding, droughts and heatwaves, which can cause direct fatalities.

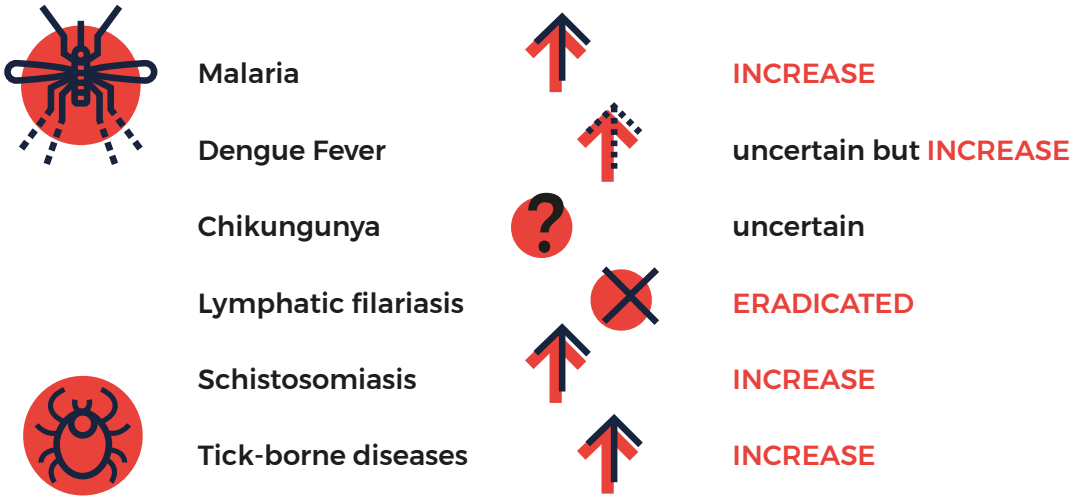
Floods (riverine flooding and flash floods). Malawi has experienced numerous severe flooding events linked to the El Niño/La Niña phenomena, which cause displacement, injury, and death. Increases in extreme rainfall are likely to increase flood risk which may increase: 1) mortality either directly from drowning or indirectly via the increased transmission of waterborne diseases (such as Dysentery and Cholera); and 2) morbidity, through injuries as people try to escape the approaching water or are hit by objects in the rapidly moving water, or via waterborne diseases. Despite being landlocked, some floods are linked with tropical disturbances (e.g. tropical cyclones such as Idai and Kenneth in 2019) that form in the Mozambique channel. These rare but extreme events can cause loss of life and injury: during the 2015

floods there were 106 deaths and during Cyclone Idai, 60 people lost their lives and more than 500 were injured.

Higher temperatures. The increase in mean annual temperatures – especially the increase in the number of 'hot' days and summer temperatures – is predicted to lead to more heat-related deaths. The elderly will predominantly be affected, but children as well as those with chronic illnesses are also projected to be at risk. Under a high emissions scenario, heat-related deaths in the elderly are expected to increase from a baseline of three deaths per 100,000 annually (1961–1990 annual average) to 73 deaths per 100,000 per year by 2080 (WHO and UNFCCC 2015). Under lower emission scenarios, and with adaptation efforts, heat-related deaths in the elderly could only increase to 16 deaths per 100,000 in 2080 (WHO and UNFCCC 2015).

4.2. INFECTIOUS DISEASE PATTERNS

Vector-borne diseases



Vector-borne diseases, such as Dengue Fever, Chikungunya, Malaria and Yellow Fever, pose significant health impacts and are highly sensitive to changing climatic conditions (temperature, precipitation, humidity), which exert a strong influence on the life cycles of the vectors (such as mosquitoes) (Khamis 2006; IRISH AID 2017; Pullanikkatil *et al.* 2013; USAID 2017; TROCAIRE 2015). Vector-borne diseases are also influenced by anthropogenic factors – population growth, urbanization and control measures – although these are not the focus of this research.

Malaria Currently, the whole population of Malawi is considered to be exposed to high transmission (i.e. >1 case per 1,000 people) of Malaria, which is the leading cause of morbidity and mortality in children and pregnant women (WHO 2017; Ministry of

Health 2015). Under all emissions scenarios, the range and incidence of Malaria is projected to increase[1]. An increase in mosquito populations in locations such as Mzuzu and the Viphya Plateau (1,200m elevation) which are experiencing temperatures above 15°C more frequently is already being felt, and Malaria transmission is likely to increase further (USAID 2020; 2017). In all projected future circumstances, the seasonal risk of Malaria transmission may increase beyond the historic 3–4 months (January–April), and peaks are likely to alter as rainfall patterns change (January–April) (USAID 2020).

> *Previously, we could predict that a high Malaria transmission rate could range from early December to somewhere in June. Today, this is not the case due to shifts in rainfall patterns. Now the high transmission rate is starting from January to May. All this has come into play due to climate change. An increase in temperature has also contributed to a shift in the survival rate and reproduction of the mosquito. We also used to know that Malaria was more common in areas along the lake shore and Shire Valley, but now this is not the case. Malaria is now even more common in highland places like Kasungu, Ntchisi and Rumphi due to the conducive environment brought by climate change which favours the Malaria vectors" (KII13)*

Dengue Fever. There is limited information on the risk of Dengue Fever in Malawi but, as it is spread by mosquitoes, similar dynamics to the transmission of Malaria can be expected. The vectorial capacity (the total number of potentially infectious bites that could arise from mosquitoes biting a single person on a single day) is projected to increase towards 2070, from 0.47 to 0.61 under a high emissions scenario. If global emissions decline rapidly and under lower emissions scenarios, the vectorial capacity may only increase to 0.53 (WHO and UNFCCC 2015).

Other vector-borne diseases:

- **Chikungunya.** There is limited information on the risk of Chikungunya in Malawi, despite a number of outbreaks being recorded over the years. Data was not available on the projected incidence as a result of climate change.
- **Schistosomiasis (Bilharzia).** The rate of transmission of parasites (*B. pfeifferi)* by freshwater snails to humans in sub-Saharan Africa is expected to shift with changes in temperature, precipitation, drought and flooding. However, there was not specific information on how climate change may affect the incidence and prevalence of Schistosomiasis. In general, it is known that seasonal floods affect the transmission, as snails are washed into downstream pools and rivers specifically in the Lower Shire Valley and floodplains in Chikwawa, in which children (6–15 years old), farmers who practice irrigation farming, and fishermen are particularly exposed (Kayuni *et al.*

1 Population growth is also a contributing factor to those at-risk in areas where the presence of Malaria is a constant in the future.

2020; Pullanikkatil *et al.* 2014).[2] Increased flood risk, may therefore put these populations at greater risk.

> *Due to climate change there are seasonal variations in Bilharzia." (KII13)*

Zoonotic diseases

Limited information exists on the dynamics between zoonotic diseases and climate change specifically in Malawi. Tick-borne diseases such as East Coast Fever (also known as Theileriosis) may expand as a result of temperature increases which are favourable to the geographic expansion of ticks (R. appendiculatus) (Olwoch *et al.* 2008).

Communicable diseases

Communicable disease outbreaks are primarily caused by displacement or a disruption to routine immunization services.

Measles The link between Measles and climate change are typically mediated by the dynamics of displaced populations (Yang *et al.* 2014). Displaced people may experience a disruption of routine vaccination services or may not have access to vaccination services at all. Displacement may, therefore, bring unvaccinated people into direct contact with cases of Measles, which can cause outbreaks amongst the displaced people as well as members of the host community who may not yet have received the Measles vaccine. There is limited data available on the interactions of Measles and climate change in Malawi.

Meningitis Malawi lies outside of the African Meningitis Belt but nevertheless experiences seasonal peaks of the disease during the dry months. Meningitis is caused by the transmission of a bacterium through droplet infection from person-to-person contact. Cases of the disease are increasing throughout sub-Saharan Africa with links to climate change and the increasing hot, dry weather and low rainfall (Bickton 2016; Wall *et al.* 2013). Meningitis cases in Malawi have been shown to decrease with rainfall (by 28 per cent) and increase significantly with hot weather (by 42.8 per cent) (Wall *et al.* 2013). Annual increases in temperature are expected across

2 Other human-induced factors, such as the creation of dams associated with water management and irrigation schemes, are known to influence and enhance the spread of Schistosomiasis through water snails (Ministry of Environment and Climate Change Management, 2012).

Malawi, which could favour increased Meningitis infection; however, there is limited data on this connection and so the outlook is very uncertain.

4.3. WATER, SANITATION AND HYGIENE (WASH)

> *"When there are more rains than usual we experience floods and floods cause health-related challenges like the disruption of WASH facilities, which causes health-related diseases like Cholera and Diarrhoea." KII2*

Overall, the majority of the population (67 per cent) has access to improved sources of drinking water (National Statistical Office Malawi and ICF 2017). Urban households tend to use piped water in their dwelling or yard (41 per cent) or a public tap or standpipe (33 per cent) (ibid). In contrast, rural households tend to access water from a tube well or borehole (72 per cent) (National Statistical Office Malawi and ICF 2017). Water supplies are drawn from both surface water (the rivers and Lake Malawi) as well as groundwater (i.e. water underground in aquifers). Groundwater levels are not well monitored in Malawi and, as a result, there is a lack of information about its status and depletion (UPGro 2020). Throughout the dry season, groundwater is currently available and provides around 65 per cent of the population's domestic supply; rising to 82 per cent for the rural population (UPGro 2020). Extended dry periods, erratic rains and increased temperatures (leading to increased evaporation rates) will affect the quantity and availability of water in Malawi (USAID 2017; Pullanikkatil *et al.* 2013). Poor sanitation – only 26 per cent of the population accesses even basic sanitation systems – contributes to the high disease burden in the country (UNICEF 2020b). It is expected that the cases of communicable diseases, such as Cholera and Dysentery, will increase as a result of the further contamination of surface waters from floods and droughts (Pullanikkatil *et al.* 2013; IRISH AID 2017; Khamis 2006; USAID 2017).

Waterborne diseases

Diarrhoea. Diarrhoeal diseases account for approximately 19 per cent of deaths of children under the age of five in the country, and are the second leading cause of under-five mortality (Masangwi *et al.* 2016; USAID 2019). An elevated incidence of diarrhoeal diseases is associated with higher temperatures (moderate/high confidence), heavy rainfall events and flooding (moderate confidence), heavy rainfall following dry periods (moderate confidence) and the displacement of people and/or the degradation of WASH services as a result of disaster (flooding or drought). Disasters and displacement force affected communities to use a single water source, thereby increasing the risk of contamination (high confidence) (Levy *et al.* 2016;

Bickton 2016). Under a high emissions scenario, diarrhoeal deaths attributable to climate change in children under 15 years old is projected to increase from 10.6 per cent of deaths projected in 2030, to approximately 14.9 per cent of deaths projected by 2050 (WHO and UNFCCC 2015).

> *When drought hits the community, members – especially women – are forced to walk long distances to fetch water; and, if a water source is found, usually it is not even good. It could be a shallow well which might be contaminated with pathogens. Poor quality water exposes people to water-borne diseases." KII5*

10.6%

Under a high emissions scenario, DIARRHOEAL DEATHS attributable to climate change in children < 15 years old is projected to INCREASE from

of deaths projected in 2030,

to approximately

14.9%

of deaths projected by 2050

WHO and UNFCCC 2015

Malawi is a hotspot for **Cholera** outbreaks in Africa. Communities located along Lake Malawi, Lake Chilwa and in the flood plains of the Shire Valley, as well as urban centres of Lilongwe and Blantyre are regularly affected (Cholera Platform 2015). Globally, Cholera transmission has been linked with seasonal trends in rain, and especially extreme weather events such as abrupt and heavy rainfall (de Magny *et al.* 2012; Luque Fernández *et al.* 2009; Matsuda *et al.* 2008). It is also known that rising temperatures, both ambient and water temperatures, increases the growth of Vibrio cholerae (Olago *et al.* 2007; Pascual *et al.* 2000; Rodo *et al.* 2002).

The 2016 Malawi outbreak which affected 1,300 people near Lake Chilwa was attributed to the severe drought (linked with El Niño), which led to lower water levels in the lake, in effect concentrating the bacteria in the water (USAID 2017; IFRC 2016). According to UNICEF (2020), 26 cases of Cholera and one Cholera-related death were recorded during Cyclone Idai in 2019. The risk of Cholera is therefore linked to both climate variability and extreme weather, as disaster events damage WASH infrastructure, disrupt access to clean water or sanitation, and create conditions conducive to faecal–oral transmission of Cholera (Bickton 2016).

4.4. UNDERNUTRITION

Climate change-induced undernutrition occurs in areas that are already food insecure across the globe (IPCC 2018). The risk of food insecurity and undernutrition is highly likely to increase due to higher temperatures, land and water scarcity, flooding, drought and displacement, which, combined, will negatively impact agricultural production (IPCC 2018; WHO and UN 2015). Frequent floods and droughts, which occur throughout Malawi but particularly affect the southern regions that are low-lying, are the leading causes of chronic food insecurity nationally (IRISH AID 2017). Malawi's Global Hunger Index Score is 22.6 which places it in the lower end of the 'serious' category (GHI 2020).

Food insecurity

> *Climate change can affect rainfall patterns in terms of low rainfall. Insufficient rainfall leads to low food production so there is inadequate food for the families so this leads to malnutrition." KII MoH*

The majority of livelihoods (85 per cent) are dependent on rainfed agriculture in Malawi (predominantly smallholder farms) (USAID 2017; WFP 2020). Agricultural production of cassava, cowpeas, groundnuts, maize, pigeon peas, potatoes, pulses and sorghum is highly sensitive to increases or decreases in rainfall (Stevens and Madani 2016; USAID 2017). Maize crops, in particular, account for 80 per cent of cultivated land and 60 per cent of caloric intake in Malawi (ibid). There are uncertainties around trends in agricultural production. In the short-term, there is some indication that maize farming could benefit from faster crop growth from warmer temperatures in the northern and central regions (Stevens and Madani 2016). However, longer term projections indicate that increasing temperatures and a reduction in rainfall (as well as declining soil fertility) will decrease maize crop yield (Stevens and Madani 2016). What is certain, is that Malawi's experience of extreme weather events undermines the country's food security (Stevens and Madani 2016). Decreased crop yield caused by extremes in rainfall (both too much and too little, and at the wrong time) leads to increases in the market price of food, which may impact poorer people's access to sufficient food (Pullanikkatil *et al.* 2013; USAID 2017; Grist 2015). For example, the 2015 floods led to maize production declines of 30 per cent. This was then followed by a country-wide drought that increased food insecurity for nearly one-fifth of the population (USAID 2017). In times of food shortages, households tend to reduce the number and/or size of meals per day (Ministry of Health 2015).

Undernutrition

The following population groups are most at risk of undernutrition due to climate change:

- **Children under five years old.** Currently, Malawi has the fifth highest prevalence of stunting in children under five years old in the Southern African Development Community, which is an indication of overall chronic malnutrition (WFP 2018). In 2015, undernutrition was associated with 23 per cent of child mortality cases in Malawi, which demonstrates an improvement since the early 2000s (WFP 2019). Forest cover loss (a driver of climate change) is associated with reduced dietary diversity and the lower consumption of vitamin A-rich foods among children in the country (Johnson *et al.* 2013). It is anticipated – though there is uncertainty with this projection – that the nutritional status, particularly of children, may in the long-term deteriorate due to poor crop yields and food insecurity caused by dry periods and flash floods (without assistance programmes) (Pullanikkatil *et al.* 2013; USAID 2017; IRISH AID 2017; Zulu 2016).
- **Female-headed households,** in general, are more vulnerable to climatic stresses and shocks and, specifically, are more at risk of undernutrition as a result of climate-induced food insecurity. Compared to male-headed houses, female-headed households have a lower daily caloric intake (69.4 per cent versus 50.3 per cent respectively) (Asfaw *et al.* 2018). When maximum temperatures arise, there is a large decrease in food consumption (29.8 per cent) and caloric intake (22.2 per cent) (Asfaw *et al.* 2018).
- **People living with HIV/AIDS.** Approximately, 9.6 per cent of the population in Malawi live with HIV/AIDS and, as such, are particularly vulnerable to disease outbreaks and food shortages (USAID 2017). Increased food insecurity negatively affects the capacity of public health systems to respond to HIV/AIDS-related concerns as good nutrition and a balanced diet are fundamental to treating and managing symptoms of the virus.

4.5. DISPLACEMENT AND MIGRATION

> *If a disaster occurs in urban areas, it will have a more negative impact because of the many people living there and their increased vulnerability. It is important, therefore, that urbanization issues should be prioritized in the national development agenda. Climate change will also increase urbanization because many subsistence farmers will migrate to urban areas due to decreasing agricultural productivity" KII1*

Displaced people are at risk of being caught in a cycle of poverty as well as lacking access to legal services, sanitation and healthcare. Displacement in Malawi arises as a result of climate shocks and stressors. For example, in 2019, Cyclone Idai displaced some 87,000 people across 15 districts of the country. Floods regularly displace

people in the Lower Shire Valley (Chikwawa and Nsanje Districts) as well as lakeshore districts such as Salima. Droughts and changing seasonal patterns negatively impact agricultural productivity and also contribute towards displacement and increased urbanization (ACTSA 2009). Displaced people face specific health risks that arise because of access issues to sanitation and health services. They may also invertedly introduce diseases into new areas as a result of moving from places in which a particular disease is endemic to one that was previously free of that disease. For example, in Lilongwe and Blantyre there are no large water bodies, but these cities have been reporting an increase in the prevalence of Bilharzia, which may be due to an increase in rural-urban migration (Yaron *et al.* 2012).

4.6. MENTAL HEALTH

According to the World Health Organization (WHO), mental health is one of the principal health outcomes affected by climate change. Studies in Malawi have already begun to explicitly make connections between extreme weather events and mental health concerns. A quasi-experimental study with Malawian farmers showed that they experienced significantly worse mental health during seasons with less rainfall (Wellard 2012). Following Cyclone Idai in 2019, the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) registered a number of cases of trauma-induced mental health issues in Malawi. UNICEF has warned that households experiencing cumulative shocks, such as those associated with climate change, are less able to form healthy coping mechanisms or survive a crisis (UNICEF 2020a; 2015). Malawian households grappling with the concurrent challenges of erratic weather, poverty and communicable diseases "resorted to unsustainable coping mechanisms" (UNICEF 2015). In this context, Malawi's vulnerability to flooding, unpredictable rainfall patterns and other climate-induced weather events suggests a need to address the mental health–climate gap, especially, but not limited to, farming communities and frequently displaced persons, especially children.

4.7. CRITICAL INFRASTRUCTURE AND HEALTH SYSTEMS

Malawi has a weak health system that is vulnerable to shocks and stresses and can easily become overwhelmed by an increase in disease burden or direct damage to infrastructure. There are 1,060 health facilities nationwide for a population of 18 million people (Ministry of Health 2015), and the ratio of medical personnel to patients is low (1.9 doctors per 100,000 people) (GHSI 2020). An increase in vector-borne and water-borne diseases, as described in the previous sections, could easily result in the system becoming overburdened. Damage to infrastructure from floods – the main natural hazard in Malawi – is also a major concern where the number of facilities is low and existing water and sanitation systems are limited. Damage to infrastructure has cascading effects on the treatment and management of diseases, as facilities may be unable to accommodate patients or provide services for chronic conditions. For example, the 2019 floods significantly affected the country's already limited maternity and paediatric facilities, reducing these core services even further (Government of Malawi 2019). According to the Ministry of Health and Population, one-fifth of the Malawian population do not live within walking distance of a healthcare provider (2020). Although the local government has established innovative intervention mechanisms to address access issues – including the construction of rural facilities providing access to skilled maternal and antenatal healthcare – limited technical capacity, on a backdrop of disruptive weather events, poses significant challenges for monitoring and maintaining their efficiency (Urwin 2017). Floods also affect the sewage and water systems, causing contamination of ground and surface wasters (USAID 2017). Climate change risks overwhelming and collapsing the fragile health and sanitation systems of Malawi.

> *Infrastructure collapse due to climate change issues e.g. floods, strong winds and heavy rains. Infrastructure should be redesigned to suit the current environmental conditions." KII7*

> *It is doubtful if the rural health facilities can manage to use the met. data to make informed health decisions and to share with the people. There is a need for infrastructure, computers and software in health facilities so that met. data is interpreted at local level and used to predict what may happen in that locality and make decisions to avert the effects of climate change." KII2*

5. SEXUAL AND REPRODUCTIVE HEALTH AND RIGHTS

> *When there is scarcity of water it creates a challenge, whereby women travel long distances to fetch water. They can face abuse or be exposed to all sorts of protection issues." KII5*

Climate change already is, and will continue to, affect men and women as well as boys and girls differently. Key areas of concern from global studies have shown how a changing climate is altering the dynamics and risk of negative maternal health outcomes, forced child marriages, human trafficking, sexual exploitation and gender-based violence (Castañeda Carney *et al.* 2020; Women Deliver 2021). Malawi is party to several SRHR agreements through regional bodies on the continent. It has also established a Directorate for Reproductive Health to integrate SRHR into the Ministry of Health. However, the domestication of SRHR policies in relation to climate change remains overlooked. This means there are gaps in universal access to sexual and reproductive health services, limited institutional capacity to monitor SRHR outcomes and a lack of technical capacity in the public health sector (Ministry of Health and Population 2020). These challenges – responses to disease, shortages of essential drugs and population proximity to healthcare facilities – will be amplified by climate change and require an urgent and coordinated domestic response.

Some key trends bear consideration with regards to SRHR and climate change:

- **Accessing sexual and reproductive health services:** Floods and other extreme events may limit women's access to healthcare facilities or interrupt supplies of contraceptives or medication.

- **Menstrual hygiene:** Overall, there is very limited information on menstrual hygiene management in Malawi and how climate change will affect this. Typically old cloths are used, or menstrual products provided by NGOs (Kambala *et al.* 2020). Girls face inadequate sanitation infrastructure in schools and will preferentially manage their periods at home (Kambala *et al.* 2020), thus missing crucial days of education which can have impacts on their socioeconomic well-being in adulthood.

- **Sexual and reproductive health:** Climatic stressors on food supplies and livelihoods have been linked with increased child marriage in girls as young as 13 years old (Pullanikkatil *et al.* 2013). For example, the drying of Lake Chilwa led to children dropping out of school and increased the number of early marriages (Saka *et al.* 2013). Women have also been found to engage in transactional sex, for example "fish for

sex", in communities living along the banks of Lake Malawi during periods of food insecurity, or if they have been forced to migrate but are unable to gain employment in their new location (Khamis 2006). Women are thus exposed to a greater risk of HIV/AIDS, in a country in which the prevalence of HIV/AIDS in adults aged 15–49 is already high at 9.6 per cent (UNAIDS 2020; OXFAM 2009; Wellard *et al.* 2012).

- **Maternal health:** Child marriage prolongs the period of child-bearing which amplifies a need for access to modern contraception and family planning. In this context, maternal and child health outcomes, the increased incidence of communicable diseases and access to healthcare are the main SRHR concerns for vulnerable communities in Malawi. Yet, there is little evidence of robust policy or institutional connections between SRHR and climate change in the country.

CASE STUDY: LILONGWE CITY – AN URBAN SPECIFIC CLIMATE-HEALTH PERSPECTIVE

Lilongwe is the capital and most populous city of Malawi, home to 1.1 million inhabitants. It lies along the Lilongwe River in the plateau of central Malawi, 1,050m above sea level. Its altitude keeps temperatures in the city relatively low for a tropical city, averaging 19.8°C (15–24.6°C year-round). Whilst heatwaves have been experienced in the city, there is limited data on how and whether this is contributing to premature mortality (KII2 – city). The city experiences a short monsoon season in December–March. In months preceding the monsoon season there are indications of an increase in Malaria, Cholera and cases of malnutrition as well as diarrhoeal cases linked with both the rainy season and dry periods (KII2 – city). Significant flash flooding has occurred in the city, leading to drowning as well as damaged households and infrastructure. Low-income inhabitants in the flood-prone parts of the city, and especially in the surrounding floodplains which are not designated for habitation, are particularly vulnerable to flash floods. These areas include: Area 22, Area 25, Chipasula, Kaliyeka, Kauma, Kawale, Mgona, Mtandire, Nankhaka and New Shire. (KII1– city; KII2 – city). A number of informal settlements exist in the city, but disaggregated health data – for example, on how changing temperatures may affect them – is not collected (KII1 – city).

> *City level consortiums such as the City Civil Protection Committee and the Disaster Risk Management Committee exist to develop disaster management plans for Lilongwe and ensure that community members are aware of risk mitigation activities and how to prepare, respond and recover from a disaster" (KII1– city).*

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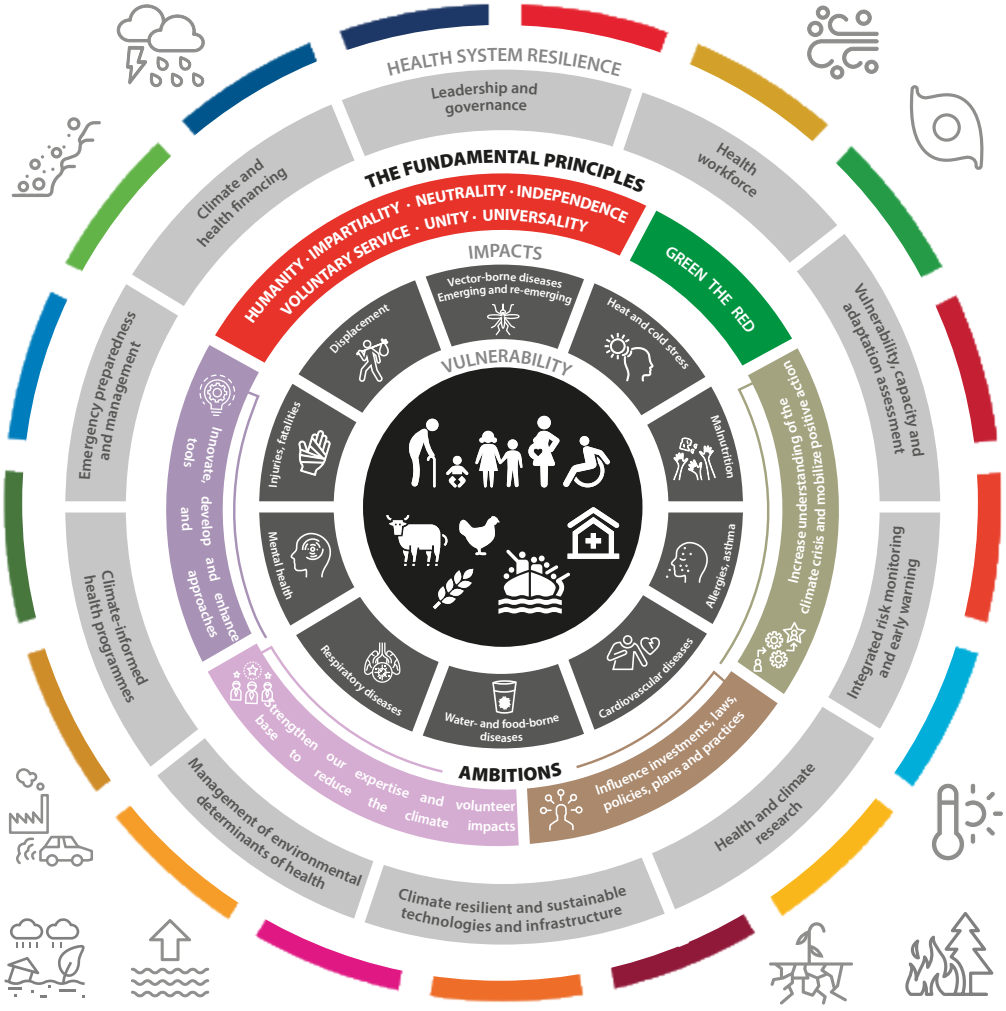
6. RECOMMENDATIONS AND OPPORTUNITIES

This section is based upon the findings in this assessment and inspired by the *IFRC Position Paper on Health and climate* (2021), which includes a roadmap to address climate change-related health risks. Figure 2. explains how local action, centred around vulnerability, is key for delivering national and international ambitions on climate change, the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction. Each recommendation is supported by the evidence of a gap or opportunity for further work to strengthen programming on the health–climate change nexus.

Figure 2: Addressing the drivers of health and climate vulnerability at the community level (reducing vulnerabilities (centre) and strengthening community resilience through IFRC action on the ground will support health systems' resilience as well as country progress towards the Sendai Framework for Disaster Risk Reduction as well as the Sustainable Development Goals (outer ring))



RECOMMENDATION 1: Continue to increase knowledge and awareness of the impacts climate change will have on health through effective communication and translation of findings at the local levels to communities, local governments and Civil Society Organizations (CSOs)..

Gap: The linkages between the climate crisis and health outcomes are not well understood. It can be challenging to simply and clearly explain the climate projections and complex interactions with the environment and what this means in terms of lived experience or risk to communities and individuals. Data on the specific drivers of vulnerability for different groups, e.g. women and children, and especially people living with disabilities is limited.

Opportunity for action: There are three key opportunities for action. 1) In climate awareness training at all scales and especially the local, continue to translate the impacts of the projections on health into simple understandable information, possibly via the use of tools and games developed by the Red Cross Red Crescent Climate Centre. Examples of simplified explanations could be that increased temperatures mean that more days are likely to reach temperatures that are very uncomfortable. Heat can be deadly to the elderly and people with underlying conditions like heart problems (problems which people may not know they have). Heat can also make it harder or more unpleasant to work, particularly outdoors, which can put a real strain on the body. Heat at night can also stress the body and make one less able to work the day after, which could affect productivity and income. Warmer temperatures also typically increase the growth of bacteria that can cause Diarrhoea. 2) Work with communities, volunteers and local health workers or health departments to systematically collate local data, evidence and stories on the health impacts of climate change in order to channel this upwards into policy discussions on strengthening the health system. 3) Ensure that climate information reaches the 'last mile' and that local communities, CSOs and government have access to climate information in a timely manner along with knowledge of the key early public health actions to take, through the sharing of good practice in climate–health risk assessment (i.e. knowledge mobilization).

RECOMMENDATION 2: Scale-up climate-smart programming and preventative health activities that adopt a multi-hazard Early Warning Early Action approach to preparedness.

Gap: Relatively few Early Warning Early Action programmes are in place across Malawi. Local capacity to conduct data collection, monitoring and evaluation – in order to develop early warning systems and responsive infrastructure – is limited by a lack of expertise, research and financial capacity across sectors. There is also a silo between climate and health practitioners which compounds this issue.

Opportunity for action: 1) Climate-smart programmes and projects can be introduced and scaled up significantly. These programmes need to adopt a **multi-hazard Early Warning Early Action approach** to preparedness and prioritize risk-informed early action programming (such as forecast-based action/financing, ideally using an impact-based forecast that provides a warning about what the weather will do, rather than only an indication of the parameters of the hazard). These customized forecasts and warnings should also systematically integrate **medium- and long-term climate information to anticipate, prepare for and reduce the health impacts in high-risk areas.** Materials to advance climate risk management, including climate-smart health programming, can be found in the Climate Training Kit. 2) This programme must seek to continually identify and adapt to specific drivers of vulnerability for health as well as the social and economic impacts of environmental and climate change, and develop stronger analytical capability for integrated health and climate risk assessments (using an all-hazard approach) at the local level. 3) This programme should also increase the integration of disaster risk reduction and public health work, and liaise with communities to holistically map the interactions in their environment to identify where health risks specifically, and risks in general, can be reduced; for example, by a) identifying areas at risk of flash floods; b) mapping the essential assets that could be affected (e.g. cropland or key roads); c) building preparedness into the communities using climate information (e.g. weather bulletins and river monitoring or the stocking of sand bags to help stem the flow of water); and d) investigating if there are non-climatic factors which may be exacerbating the risk of flooding (e.g. poor solid waste management clogging drainage).

RECOMMENDATION 3: Explore the use of anticipatory actions (forecast-based actions) for health, especially with regards to vector-borne diseases.

Gap: Relatively few Early Warning Early Action programmes that use forecast-based actions for health are in place across Malawi. For example, the precise dynamics of how the high burden of Malaria will change as a result of the climate crisis is uncertain, but the general pattern is relatively well established. It is expected that Malaria transmission will extend across more rainy months and expand into geographically higher areas.

Opportunity for action: The relationship between disease outbreaks/burden and climate change/variability, coupled with the predictability of climate variability events like ENSO, provide good opportunities for humanitarian organizations to strengthen health preparedness activities, including strengthening Early Warning Early Action. Explore the introduction or scaling up of anticipatory actions (Forecast-based Financing or impact-based forecasting) for floods and droughts and the health risks they pose. For example: a) introducing interventions for vulnerable urban communities to buffer the increasing prices of food before or during food shortages (e.g. cash for work); b) setting up food distribution for displaced communities; c) identifying and disseminating the necessary anti-Cholera outbreak packages prior to exceptionally heavy rainfall predictions; d) identifying and communicating evacuation/access routes for critical healthcare facilities ahead of heavy rains; e) devising a Heat Action Plan for the most vulnerable regions to reduce the impact of heat on the most vulnerable people; f) ensuring there is a progressively longer surveillance period for Malaria (increased to cover 7–9 months) and expanding activities into highland areas (e.g. Kasungu, Ntchisi and Rumphi) where the burden is likely to increase; and g) working with the Ministry of Health to digitize the surveillance information (which is currently paper-based) in order to share real-time data to anticipate and respond more quickly to disease outbreaks.

RECOMMENDATION 4: Advocate for the increased access to climate and health financing to reduce future vulnerabilities.

Gap: Climate and health financing remains limited or siloed between departments within the National Society.

Opportunities for action: The Malawi Red Cross Society should advocate for increased access to climate and health financing to be able to invest in climate and health research and action. Specific areas of research could focus on a) the link between climate change and mental health; b) the impacts of heat risks in informal settlements; and c) the influences of climate change on SRHR. Additionally, integrating climate risk management into all social protection programmes, that provide consistent support to populations known to be vulnerable to climate change, would enable such systems to function well during times of climate shocks and potentially provide additional support during times of acute need (or in anticipation of acute need). Finally, this financing could also be used in building back better and other green approaches to reduce future vulnerabilities (e.g. by addressing the root causes of risks when caused by ecosystem degradation or drivers of environmentally motivated voluntary and involuntary displacement). These approaches should be guided by the Green Response Framework, *Green the Red*, and incorporate environmentally sustainable practice into all operations, programmes and advocacy work in order to "do no harm" now and in the future.

RECOMMENDATION 5: Explore innovative, low-cost ways to manage heat.

Gap: The Ministry of Health has not explored the potential of using local indigenous knowledge and practices (LIKSP) in the assessment of vulnerability and the adaptation of the health sector to the impacts of climate change (Government of Malawi 2015). Heat-related deaths are projected to increase significantly from the baseline by 2070 and will need to be managed.

Opportunity for action: Community spaces that contain more greenery, or increasing the number of trees planted in a community, can provide shade and reduce temperatures. Explore traditional cultural ways of managing heat, or learn from experiences in neighbouring countries that have historically dealt with higher temperatures.

RECOMMENDATION 6: Integrate mental health and coping with stress as part of all programmes

Gap: : The mental health impacts of climate change are under-researched in Kenya.

Opportunity for action: Identify and work with groups (e.g. farmers) seeing significant changes in their environment or experiencing cyclical losses – e.g. repeated dry seasons – and broaden existing climate–health monitoring and intervention efforts to include mental health.

RECOMMENDATION 7: Enhance the capacity to undertake integrated health and climate risk assessments and action (using an all-hazards approach) for highly vulnerable or at-risk groups.

Gap: Data on the specific drivers of vulnerability and risk is limited for different groups e.g. women and especially female-headed households, people living with disabilities, or displaced people from across borders.

Opportunities for action: 1) Work with communities to identify the specific health impacts of environmental and climate change on vulnerable people, such as female-headed households, outdoor workers, people living in informal settlements, people with disabilities and displaced people. 2) In the face of climate-induced stresses and displacement, urgent attention must be given to increasing knowledge and awareness of sanitation, hygiene, sexual and reproductive health and the rights of vulnerable communities in informal settlements and displaced communities, before and during the climate-related event. The message should be easy to understand and shared on widely accessed media – for example, if phone utilization is high and phone signal coverage is good then public health SMS messages could be sent to help keep people aware of key hygiene practices. 3) Volunteers working closely with at-risk communities can amplify, within their organizations, the voices and experiences of, for example, women and girls who are displaced, so there is a better understanding of the unique challenges they face as a result of the impacts of climate change. Piloting projects on supporting and empowering women with livelihood options and education is important, to devise evidence-based projects that help to safeguard women and girls by enabling them to avoid adverse coping strategies during crises.

RECOMMENDATION 8: Continue to foster cross-sector collaboration across programmes

Gap: No organization can tackle the increased risks posed by climate change alone or alleviate the exacerbated risks to vulnerable populations. The Ministry of Health has limited capacity to manage key climate change-related diseases – it does not have the capacity to apply early warning systems to predict disease outbreaks, or have adequate financial and human resources to manage the impacts of climate change on health (Government of Malawi 2015).

Opportunities for action: 1) The Malawi Red Cross Society (MRCS) is well-placed to empower those most at-risk through capacity-building and capability enhancing activities that take an inclusive and gender-sensitive approach. The focus should be on empowering youth, volunteers, marginalized groups and women to understand their risks better and take up or call for dedicated evidence-informed climate action at the local and national levels.2) The MRCS should continue to foster and strengthen partnerships both within and outside the humanitarian and development sectors. There are opportunities to work closely with national agencies and donors to improve finance flows, strengthen infrastructure and facilitate access to technology-based solutions and innovations for climate adaptation and resilience. In addition, support for Forecast-based Financing initiatives would help to scale-up anticipatory on the ground adaptation. More internal integration is needed within the disaster management, communication and policy teams; and, in tandem, closer partnerships with external collaborators such as the Malawi Meteorological Services, private sector, academia and CSOs is key in holistic early warning systems and disseminating accessible information about disease outbreaks and adverse health outcomes to at-risk communities. 3) The MRCS is well positioned to showcase the local action required to address the risks and needs of the most vulnerable people and to broker collaborations to support policies and cross-sectoral planning processes, including the national ambitions for health within the Nationally Determined Contributions (NDCs) and to augment the local and National Adaptation Plan (NAP).

RECOMMENDATION 9: Increasingly engage in policy dialogues on climate change adaptation

Gap: The local perspective is not consistently reflected in national policies, nor is local level data used to help inform policy decisions.

Opportunity for action: The MRCS has ample experience on local climate and resilience programming, which could enrich nationwide adaptation dialogues and efforts to address the climate and environmental crisis in Malawi. The MRCS is well connected and positioned to engage in further dialogue to increase the integration of the health needs of the most at-risk people into climate change adaptation programmes at the national level and within the National Society programmes. It should also engage in policy dialogues to ensure that a new health infrastructure is established, based on the available climate information, while ensuring that the existing health infrastructure is protected from extreme weather events.

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ANNEX A
EXISTING PROJECTS

INTERNATIONAL NONGOVERNMENTAL ORGANIZATION PROJECTS

World Food Programme: More than 8,000 farming households (in Balaka, Blantyre, Chikwawa, Mangochi, Nsanje, Phalombe and Zomba) are receiving district-specific seasonal rainfall forecasts and agricultural advisories for their decision-making in response to COVID-19.
https://docs.wfp.org/api/documents/WFP-0000120934/download/

UNICEF: Teen Clubs staffed by trained Health and Social workers support adolescents with SRHR issues.
https://www.unicef.org/malawi/stories/teen-clubs-taking-steps-towards-tomorrow

World Health Organization: The Global Framework for Climate Services (GFCS) Adaptation Programme in Africa guides staff from across agencies to provide targeted, accurate and accessible climate services and information in Malawi and Tanzania. The project aims to increase resilience to climate-induced extreme weather events such as droughts, floods and their associated health risks.
https://www.who.int/globalchange/projects/gfcs/en/

World Bank: The Governance to Enable Service Delivery Project supports local authorities in providing more efficient and responsive services to citizens as well as building internal systems to manage service delivery resources.
https://www.worldbank.org/en/news/loans-credits/2020/04/30/malawi-governance-to-enable-service-delivery-project

World Vision: The Water, Sanitation and Hygiene (WASH) technical programme employs community-led total sanitation (CLTS) and school-led total sanitation (SLTS) approaches to increase access to clean water and sanitation in Malawi. The project also supports local efforts to build and revive boreholes and educate locals about sanitation.

United Nations Framework Convention on Climate Change (UNFCCC): The Climate Action Intelligence (CAI) database is an online decision support and risk assessment tool. It helps Governments and public officials to monitor, coordinate and implement climate change initiatives using the best available information about the actors and activities involved in each decision.
https://unfccc.int/climate-action/momentum-for-change/activity-database/climate-action-intelligence-cai-database

United Nations Development Programme (UNDP): The Climate Information and Early Warnings Malawi project, funded by the Green Climate Fund, aims to improve the forecasting and monitoring of extreme weather events as well as to facilitate the exchange of this information through mobile platforms for fishing, farming and other communities impacted by climate change in Malawi.
https://reliefweb.int/report/malawi/scaling-use-modernized-climate-information-and-early-warning-systems-malawi

NATIONAL GOVERNMENT PROJECTS

Department of Disaster Management Affairs (DoDMA): The M-Climes Project launched in partnership with the UNDP and the Green Climate Fund aims to increase the efficiency of early warning systems. The project is operational across 14 food insecure districts, where weather and climate-based advisories are disseminated by ICT/ mobile phone, print and radio to support agricultural decision-making.
https://www.dodma.gov.mw/index.php/projects/m-climes-project

Department of Climate Change and Meteorological Services: Conducts weather modelling and forecasting projects in partnership with the University of Malawi, Chancellor College and Lilongwe University of Agriculture and Natural Resources (LUANAR). These projects support early warning and disaster response efforts.

Ministry of Local Government and Rural Development: The District Civil Protection Committee along with the Village Civil Protection Committee assist in assessing the impacts of climate change as well as the climate change vulnerability of specific groups in Malawi. Evaluations are used to draw up action and mitigation plans for humanitarian intervention and health risk reduction.

Ministry of Health: Conducts health and climate change research in partnership with the WHO. In addition, it works to strengthen local capacity in using climate information for public health preparedness and resilience to climate-related health risks through projects supported by the Global Framework for Climate Services and the UK's Department for International Development (DFID). Its first objective is to improve the capacity of health professionals to understand and use climate information in health decision-making. Its second objective is to ensure that climate knowledge and decision tools are mainstreamed into health policies and operations. The DFID project mainly focuses on WASH and integrated disease surveillance.

Ministry of Health: The Malaria and National Health Communication Strategy aims to reduce mortality and morbidity rates in Malawi through evidence-based interventions and education as well as awareness programmes on issues including maternal and child health, nutrition and tropical disease.
https://ccp.jhu.edu/2016/07/25/malawi-health-communication-strategy/

Ministry of Natural Resources, Energy and Mining: Implements the National Climate Change Management Policy to support climate change adaptation and mitigation efforts with various stakeholders. The policy makes commitments around contributing resources and programmatic support to initiatives including capacity building, education, training and awareness as well as research and development on climate change.
https://www.ccpm.scot/assets/000/000/079/NCCM-Policy-Final-06-11-2016_original.pdf?1542206333

CIVIL SOCIETY AND NONGOVERNMENTAL ORGANIZATION PROJECTS

United Purpose Malawi: Supports several development interventions and disaster response initiatives including CUMO Microfinance, which offers financial literacy and emergency response finance across the country, especially to women. Girls Inspired also supports young and adolescent girls through sport and humanitarian response efforts e.g. by disseminating emergency supplies during Cyclone Idai.
https://united-purpose.org/malawi

Civil Society Network on Climate Change (CISONECC): Under the More Action for Justice Initiative (MAJI) knowledge exchange workshops were held for various Civil Society groups to exchange best practice and develop coordinated responses to climate change issues, including resilience-building policies.
https://www.cisoneccmw.org/projects-activities/

Self Help Africa: The Better Extension Training Transforming Economic Return (BETTER) project works with smallholder farmers to build climate resilience through Farmer Field school groups (promoting sustainable agricultural practices) as well as training and awareness-raising on issues such as conservation agriculture, soil and water conservation, small-scale vegetable production and crop diversification in response to climate change.
https://selfhelpafrica.org/uk/wp-content/uploads/sites/6/2019/07/CP_Malawi_2019.pdf

Plan Malawi: The Youth Community-Based Distribution Agents (YCBDAs) are trained sexual and reproductive health and rights experts who work with Plan Malawi to connect young women with family planning advice, contraception and other SRHR services.
https://plan-international.org/sexual-health/helping-young-people-access-srhr-services

ACADEMIC INSTITUTION AND RESEARCH PROJECTS

Lilongwe University of Agriculture and Natural Resources (LUANAR): Supports short- and long-term research projects on agriculture and climate as well as outreach projects on food security and natural resources management funded by the. Programme Coordinating Office (PCO) and the Royal Norwegian Embassy.
http://www.luanar.ac.mw/pco2/about.php

University of Oslo: A Health Management Information System, developed in Norway, supports accurate and high-quality statistical data collection in Malawi's health sector.
https://www.academia.edu/27471436/Health_Management_Information_System_in_Malawi_Issues_and_Innovations

IFRC

Climate Centre