

# The Impact of Climate Change on Nutrition

*Policy Brief*



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**Cover Page:** South Sudan's women are the faces of resilience in the fight against hunger and disasters. Ateny Mathiang, an expectant mother is amazed at the harvest and smiles. She is joyful because her family will not depend on wild fruits anymore.



# Summary

**Climate change leads to more extreme weather events and has caused a surge in natural disasters over the past 50 years, disproportionately impacting poorer countries.<sup>i</sup>**

Natural disasters, including floods, landslides and droughts, and displacement by storms and floods are greatly impacting food security in Africa. In 2020, approximately 98 million people suffered from acute food insecurity and needed humanitarian assistance in Africa - an almost 40% increase from 2019.<sup>ii,iii</sup>

Climate change affects all forms of malnutrition through pathways and inter-linkages related to the three underlying causes of malnutrition: insufficient household food security; inadequate maternal and child care; and insufficient health services and an unhealthy environment.<sup>iv</sup> Good nutrition is an essential foundation for the health and development of young people, yet malnutrition continues to be the world's most serious health problem and the single-biggest contributor to child mortality.<sup>v</sup> World Vision Ireland supports an ongoing health programme, Access Infant and Maternal (AIM) Health Plus, in Mauritania, Sierra Leone, Tanzania and Uganda that is working to reduce neonatal, under-five mortality rates and maternal mortality rates. Despite the overall success of the health programme, the food security situation and factors outside the scope of the programme, such as climate change, are having an impact on the nutritional status of children and their care givers.

This policy brief is based on a review carried out to assess the impact of climate change on the potential causes of malnutrition in the four AIM Health Plus countries of implementation. This brief explores how climate change has exacerbated the underlying causes of malnutrition and examines approaches being taken by the AIM Health Plus programme to enable community responses and adaptations to climate change. Finally, the brief makes key recommendations on how organisations can adapt health and nutrition programmes to climate change.



**Today we eat.  
Uganda.**

Want some? A child at Kimba Child friendly space in zone 2 Bidibidi settlement offering some of his porridge to the photographer. At the CFSs, kids are taught the importance of giving and sharing with others.

# The Impact of Climate Change on Nutrition

When examining the impact of climate change, it is important to note the link between poverty and climate change. African regions are extremely vulnerable to climate variability and change. Close to half of the population in sub-Saharan Africa live below the poverty line<sup>1</sup> and have a high dependency on weather-sensitive activities, such as rain-fed agriculture, fishing and herding to sustain their livelihoods.

<sup>1</sup>The poverty line is measured as the poverty head count at US\$ 1.90 a day in terms of 2011 purchasing power parity.

Limited financial buffers and low levels of education and health care hinder a person's ability to adapt to the shocks of climate change leaving them increasingly vulnerable.<sup>iii</sup> Climate shocks also push vulnerable people just above the poverty line into poverty. Without action, climate change could force more than 100 million people into extreme poverty by 2030.<sup>vi</sup>

Climate change affects all types of malnutrition.<sup>2</sup> The particular causes depend on the context and the relationships to climate change can be wide-ranging. According to UNICEF,<sup>iv</sup> the immediate causes of malnutrition are inadequate dietary intake and disease, and the three related underlying causes are household food security; maternal and child care; and healthy environment and health services. The impact climate change has on the underlying causes has been used to frame the discussion of climate change and nutrition for the current analysis.

<sup>2</sup>Overnutrition (overweight and obesity) and undernutrition (chronic, acute and micronutrient deficiencies).

<sup>3</sup> Although this topic is very relevant to nutrition, it was not explored in the interviews because the effect is 'hidden' and would require laboratory testing to verify.

1

## Household Food Security

Droughts and floods and unseasonal weather patterns lead to lower yields, or different choices of crops and more reliance on staple crops. Pests and diseases can worsen, affecting yield and quality of produce. Soil degradation, another effect of climate change, can also affect production and quality of foods. Access to markets can be disrupted by flooding and storms, hindering the ability to buy and sell produce. Also, food prices tend to increase when availability is poor.<sup>vii</sup> Livestock and fisheries are also vulnerable due to poor grazing, lack of water and pest and diseases. 'Impacts in pastoral systems in Africa include lower pasture and animal productivity, damaged reproductive function, and biodiversity loss.'<sup>viii</sup> The nutritional quality of crops is also affected by climate change due to increase in ambient carbon dioxide levels.<sup>3</sup>

2

## Maternal and Child Care

There is a clear link between the effects of climate change and women's work and time constraints. For example, responsibilities for collecting wood and water and carrying out livelihood activities can all be affected by climate change and in turn affect caring capacity for young children. In addition, heat stresses affect the ability to work and cause stresses in pregnancy.<sup>vii</sup> The impact of climate change on food production and ecosystems can result in families limiting their food intake and in a reduction in the quality of food consumed. This can lead to an increase in chronic under nutrition or stunting in children. Poor nutritional outcomes for infants are being shaped even before birth as a result of "poor maternal nutrition, poor feeding practices, poor food or water quality, and frequent infections."<sup>vi</sup>

3

## Healthy Environment

There is a clear link between water availability and climate change, which relates to both agricultural productivity and water-borne diseases via hygiene practices. In addition, disruption to health services can occur as a result of floods, storms and other unpredictable climate events. Food-borne pathogens and aflatoxins increase with increases in temperature and food spoilage before consumption or sale can cause both economic and health problems.<sup>vii</sup>

4

## Gender and Equity

Gender and equity can be linked to all underlying causes of malnutrition. Food security and climate change have strong gender and equity dimensions because women play a key role in food security. Climate change impacts vary among diverse social groups depending on age, ethnicity, gender, wealth, and class. Climate extremes have immediate and long-term impacts on the livelihoods of poor and vulnerable communities, contributing to greater risks of food insecurity that can be a stress multiplier for internal and external migration.<sup>viii</sup>

### ***Impact of floods on communities in Uganda***

Children playing in the waters risk getting affected with waterborne diseases.



# **The Effects of Climate Change on World Vision Ireland's Programme Countries**

Since 2011, World Vision Ireland has been implementing the Access Infant and Maternal (AIM) health programme in four countries across East and West Africa. The programme is now in its second phase (AIM Health Plus) and is being implemented in Sierra Leone, Mauritania, Uganda and Tanzania. Each country is varied in terms of its climate change risks and socio-economic conditions. Despite the overall success of the programme, the food security situation and factors outside the scope of the programme, such as climate change, are having an impact on nutritional status of children and their care givers.

## The Effects of Climate Change on World Vision Ireland's Programme Countries



### **Kitchen Gardening. Uganda.**

Kitchen Gardening: World Vision has come up with an innovative approach to ensure refugees have a variety of food and nutrient alternatives at their disposal, whereas boosting their household incomes at the same time. This is being done through kitchen gardening, an approach that allows refugees to fully utilize the small pieces of land they are provided with, to grow high value vegetables. The Vegetables mostly grown in these gardens are high value and are easy to grow and maintain. They include amaranths, Onions, cabbages, tomatoes and others.



Forest Restoration Initiatives shield communities against the harrowing effects of floods. Community members in Nyatike, Kenya, using a low-cost tree growth and management technique known as Farmer Managed Natural Regeneration (FMNR) to promote the regrowth of indigenous trees in the

Anyango Lorine, of local partner ASHWA guiding care group members through the selection and election of their group leader mother, during the scaling up exercise in Nekuku Parish, Lunyo Sub County,

**All four AIM Health Plus country programmes were reviewed to assess the impact of climate change** on the causes of malnutrition and

to map the adaptations to climate change. This included a literature (published and grey) review to understand both the range of challenges to nutrition caused by climate change globally and in different bioregions, and the specific nutrition and food security problems

and approaches taken in programme areas. Interviews and focus group discussions were conducted with World Vision staff, local partners and community members to assess the experiences of communities. To understand the interface between nutrition and climate change, it was necessary to understand how both are experienced by communities. For example, how are diets affected by climate change? How is health affected by climate change? How are caring practices affected by climate change?



# The Effects of Climate Change on World Vision Ireland's Programme Countries



**Grace Andrea, Tanzania**  
“To me it is like a miracle to get 600 Kgs of maize from quarter an acre”

Grace Andrea looking bags of maize harvested in previous season. World Vision Ireland's AIM Health Plus Project is working closely with local partner Community Engagement for Sustainable Development (CESuDE) in addressing household food insecurity in communities through Conservation Agriculture to improve farming outputs. Grace was one of the farmers who participated in a training given by CESuDE. Grace applied the knowledge she gained from the training during the last planting and harvesting season. Receiving help from her neighbours to till the land and supply manure (techniques she learnt during her training), Grace planted improved maize seeds in a quarter acre plot.



## AIM health Plus is implemented in the Dodoma region of Tanzania, a semi-arid plateau with high levels of poverty and food insecurity.

Communities are subsistence crop farmers and pastoralist cattle keepers. Dodoma has experienced prolonged droughts in recent years, resulting in greater pressure on food security and increased risk of land degradation, water scarcity and desertification. In Uganda, the programme is implemented in Busia District, close to the country's border with Kenya. This is a densely populated area which benefits from cross-border trade with Kenya. AIM Health Plus is being implemented in M'Bagne and Guerrou in Mauritania. M'Bagne is in the Brakna region of south-western Mauritania, on the Senegal River, bordering

Senegal. It is home to multiple people groups whose main livelihoods are agriculture and fishing. Guerrou is in the semi-arid Assaba region, close to the main highway to Mali, and has a rapidly growing low-income population. The main economic activities are agriculture and livestock rearing. Prolonged droughts in recent years have placed households in both programme areas under long lean seasons. In Sierra Leone the programme is implemented in Imperi and Sherbro Island in Bonthe District in the south of the country. Populations in these programme areas engage in subsistence agriculture and fishing.



Sack Garden, Tanzania



**The review found that in all programme countries, climate change has disrupted food systems, exacerbating all the underlying causes of malnutrition, i.e., household food insecurity, inadequate maternal and child care, unhealthy environment and inadequate health services.**

There are many similarities in the ways in which countries experience climate change; all AIM Health Plus programme countries were affected by stresses on livelihoods related to agricultural production where there was drought or to unseasonal weather patterns such as excess rainfall or storms. The quality of food, access to markets and the price of food in the markets were identified in relationship to loss of livelihoods. A common theme that emerged was that food crops (often nutritious foods) were sold to gain income rather than being used as part of the diet. Agricultural diversity has decreased as households concentrate on providing staple crops – due to drought, seed shortages, unpredictable rainfall and storms, pests and diseases. At the same time, pasture availability for animals was reduced by drought and livestock have to be moved to find pasture. In Mauritania, pastoralist livelihoods have been severely affected by drought and many pastoralists have had to switch to a sedentary livelihood or migrate to urban areas. In all countries, increased food prices were an additional stress on food security and farmers were often selling at a low price and buying at a higher price when there were shortages. In addition, the quality of foods had decreased due to storage problems related to climate change. This included aflatoxin contamination and the risk that farmers sell the best quality and consume the most affected grains themselves.

In all countries women's workload was increased by climate change - whether it was fetching water, fuel, farming or other livelihood activities. This increased workload is having a negative impact on caring practices for young children. Women's work related to animal husbandry also increased where they were responsible for fetching water for animals, for example.

The review found that these damaging effects of climate change on livelihoods, agriculture and post-harvest have resulted in extremely stressed household food security. Household diets have become severely affected in both quality and quantity with all countries reporting diet stresses. For Infant and Young Child Feeding (IYCF) practices, exclusive breastfeeding is difficult with the increased workload of women and a mother's own malnutrition affects her ability to feed adequately. Water shortages and flooding have reduced the availability of clean water and inevitably worsened hygiene and sanitation problems in the programme countries. The reported increases in water-borne diseases such as diarrhoea, cholera, and skin diseases are related to such unhealthy environments.

**Sifras Sendeu**  
Community Health Worker,  
in Mundemu, Tanzania

# Adaptation Strategies to Mitigate Climate Change and Improve Food Security in AIM Health Plus

‘Climate Change Mitigation’ activities are designed to reduce climate change and ‘Climate Change Adaptation’ activities are designed to adapt to those changes. In AIM Health Plus programme countries, the emphasis has been largely on adaptation.

## Activities to Mitigate the Effects of Climate Change Across Food Systems

Fanzo et al. (2018) made recommendations across food systems for nutrition in seven categories of response. Using these seven categories as a framework, the following table highlights examples of World Vision’s approaches and activities. *See chart on following page.*

# Activities to Mitigate the Effects of Climate Change Across Food Systems

## FOOD SYSTEMS RECOMMENDATIONS

## WORLD VISION APPROACHES/ACTIVITIES

### 1. Food supply-chain inputs

### World Vision Approaches/Activities

Use agricultural extension programmes to improve access to information and training about these varieties and breeds

All countries work with Agriculture Extension as a key partner to train and roll out innovations.

Improve soil quality through the use of cover crops, crop rotation, balanced use of fertilizers, and manure

Use of Conservation Agriculture in Tanzania and Climate Smart Agriculture in Uganda and Sierra Leone.

### 2. Food (agriculture) production

### World Vision Approaches/Activities

Invest in and provide education on integrated land-use policies and mixed crop and livestock systems

Improving diversity in production systems is integral to the Livelihoods approach.

Expand access to services and financing to support farmers, including farmer risk-management tools, insurance, and loans

'Farming as a business' training, savings and transformation training in all countries.

### 3. Post-harvest storage and processing

### World Vision Approaches/Activities

Provide training on safe storage and processing techniques, such as drying

Training is provided by local partners on post-harvest handling and storage and food processing in all countries.

### 4. Distribution, marketing, and retail

### World Vision Approaches/Activities

Create networks of food producers to increase market access and help limit food waste

Farmers groups are formed for improved market access and pricing in all countries.

### 5. Food consumption and utilization

### World Vision Approaches/Activities

Increase consumption of animal-source foods in low- and middle-income countries, while educating the public about the health risks associated with overconsumption of these foods

Small livestock using improved breeds and veterinary support in Tanzania and Uganda. Behaviour change communication activities to promote nutritious diets using local foods in all countries.

Increase access to healthcare for vulnerable populations, especially the rural poor, by increasing healthcare facilities and staff

Increased access to health care in all countries and support to local Community Health Workers.

### 6. Early warning systems

### World Vision Approaches/Activities

Provide training to producers on how to protect crops, store food, and otherwise prepare for extreme weather events

Conservation Agriculture (Tanzania) produces food with less water and perennial cropping systems, such as Agroforestry (Uganda) are more resilient to extreme weather.

### 7. Evidence for and inclusion of nutrition in climate research

### World Vision Approaches/Activities

Conduct research, and collect and analyse data on how climate change affects the food system and how to maximize nutrition amid these effects

This has not been done systematically



# Key Initiatives for Minimising Health Impacts from Climate Change

Tirado et al. (2015)<sup>ix</sup> recommend strategies to adapt and respond to the health-related aspects of climate change in Africa. In **all four** countries, programme activities are taking place to strengthen public health systems and to build the capacity of Community Health Workers. The programmes in **Tanzania** and **Sierra Leone** are involved in disease surveillance systems, and early warning systems by the health sector are in place in **Tanzania**. In **all four** countries, water sanitation and hygiene activities are taking place to address known environmental risk factors and water-related diseases. Nutrition and hygiene education is available through care groups, women's groups and Community Health Workers.

World Vision has implemented many activities in the four programme countries that follow these two sets of recommendations, even without a comprehensive strategy to do so. This is an indication that the programme has adapted well to the context of climate change and the country programmes are able to respond to the problems they and communities identify in an on-going way.



# Working with Partners

Working with partners is a key approach taken in each country. Having such partners moves to increase localisation and address particular challenges - in this case food security and nutrition – and is key to being able to respond to a changing environment in a timely way. For example, in **Tanzania**, conservation agriculture, keyhole gardens and water harvesting are supported by a local partner. In **Mauritania**, a local partner offered cookery demonstrations and supported with community gardens. In **Sierra Leone**, veterinary support is provided by the Ministry of Agriculture and local partners have been working closely with Community Health Workers and women's groups to support the delivery of nutrition messaging. In **Uganda**, government partners train farmers and help with equipment for safe post-harvest handling and care groups are supported by a local partner to establish community and household kitchen gardens.

## Uganda

Charity getting lunch ready. Tomatoes, onions, cumin, and pepper are some of the spices bought from the market. After over an hour of cooking, the peas are ready. These are fried, mashed to make a thick sauce. The family is having Dura (mingled sorghum) for lunch.

# Recommendations for Adaptation of Health and Nutrition programmes to Climate Change



It is impossible to address the causes of climate change working locally only. Climate change is a global problem and originates outside of the countries that are most affected. Having said this, there are many approaches that will help communities adapt whilst addressing the causes of malnutrition.

01

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Given the far-reaching consequences of climate change on nutrition, well integrated and flexible programmes are required. To be comprehensive, activities need to cover all the underlying and basic causes of malnutrition. They necessarily span different sectors - such as Agriculture, Health, Gender, Disaster Risk Reduction amongst others. Building resilience in each sector is essential.

A Theory of Change for each programme related to climate change and nutrition is required to ensure a coherent strategy is designed. Within programmes, utilise agroecological approaches, such as agroforestry, conservation agriculture, climate-smart agriculture, permaculture, and organic agriculture to build resilience in agriculture systems.

Gender mainstreaming is essential because much of the burden of additional work falls to women as climate change affects food systems.

01

02

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A flexible strategy for climate change and nutrition, which draws on a set of core project models and a mechanism to diagnose and adapt according to the context is needed. Flexibility can be achieved in several ways. Where possible, build on the mechanisms that are already in place for flexibility of programmes. Identify and leverage existing programming approaches that can be adapted to deal with climate change.

Working with local partners is important as it increases context-specific flexibility and can draw on indigenous knowledge. Work with local agriculture research stations to understand what new plant varieties are adapted to the new climate conditions and pests and diseases.

02

# 05

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Capacity building at all levels of an organisation for climate change adaptation is necessary. Drawing up guidelines using in-house and global resources is advised with a full list of possible measures to take – for example, how to make agriculture more climate resilient, how to respond to health challenges, how to introduce surveillance. Ensure training and capacity building on these.

# 03

# 04

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Strong Community Resilience is essential to adapt to climate change and this can be nurtured to help communities cooperate, adapt, advocate and innovate in the face of the challenges. Problem solving skills can be learnt so communities and local partners are confident in making suggestions and innovating. A good example is participatory action learning.

Behaviour Change Communication activities are needed to adapt to local changing scenarios. For example, as the types of food available change, it is necessary to work with the communities to explore and demonstrate the types of healthy food combinations that can help to meet nutritional needs.

# 04

# 05

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A systematic monitoring system designed around the underlying causes of malnutrition and sub themes is necessary for organisations to share their experiences and build evidence about challenges and effective strategies. This should include quantitative and qualitative data and local perspectives. Monitor the context related to the assumptions in programme models because outcomes will be dependent on these assumptions.

# 05

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This paper was commissioned by **World Vision Ireland**  
through funding received from **Irish Aid**.

