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SAVING  
LIVES  
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LIVES

# Restore. Energize. Empower.

## WFP's Climate Action in Sierra Leone

### KEY TAKEAWAYS

**Extreme weather-related floods accounted for 90 percent of Sierra Leoneans affected by disasters in 2018** (GoSL data). Exacerbated by widespread tree cutting, disasters threaten food security and the livelihoods of the most of vulnerable populations, most of them rural-based.

**Freetown is losing USD 30 million a year because of extreme heat and humidity**, a [study](#) concluded. With its population spending over 90 percent of their working hours in nonclimate-controlled conditions, the city is paying a price for reduced human productivity. Without adaptation and reduced global emissions, by 2050, around 120 days, or four months, will be as warm as the hottest ten days currently. As a result, economic losses will rise.

**WFP is scaling up its climate-smart agricultural programme**, empowering small-scale farmers to relocate from the uplands, where slash-and-burn farming is practiced to the high-productivity inland valley swamps. This is part of WFP's multi-faceted programme supporting climate adaptation efforts nationally for Zero Hunger. Simultaneously, WFP supports peacebuilding, improved nutrition, and low-energy cooking in schools.

**WFP is generating evidence and jointly advocating with the National Disaster Management Agency (NDMA)** to save a forest reserve for the supply of Freetown's drinking water. The reserve lost over 4,000 ha of trees in just seven years, more than half of them in the last less than two years. An emergency is imminent if no action is taken.

November 2022



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The fish-roasting hub at Goderich market in Freetown. The search for fuel wood is a key reason for tree-cutting in the city.

## THE SITUATION

### Agriculture and Food

Agriculture is a primary food source, a livelihood for over 60 percent of the population and a key contributor to the national economy. Current climatic conditions are ideal for the cultivation of the primary crops, including rice, sugarcane, banana, coconut, citrus, cocoa, pineapple, yam, and cassava. However, with regional climate modelling projections (top right) demonstrating increased temperatures (approx. +1.7 °C for Representative Concentration Pathway (RCP) 4.5 and 2.3°C for RCP8.5) and rainfall changes from -5% to 5% with high variability, agriculture is under threat. For instance, if no corrective action is taken, changes in precipitation will gradually increase vulnerability around the production of rice, a staple food crop grown mainly by smallholder farmers in rain-fed conditions. This trend is compounded by the persistent poverty and farmers without insurance or the resources to invest in irrigation and other agricultural technologies. The increased temperatures and rainfall variations are also likely to increase water requirements for crops, competition for water resources, as well as the frequency of pest and disease outbreaks.

### Malnutrition and Disease

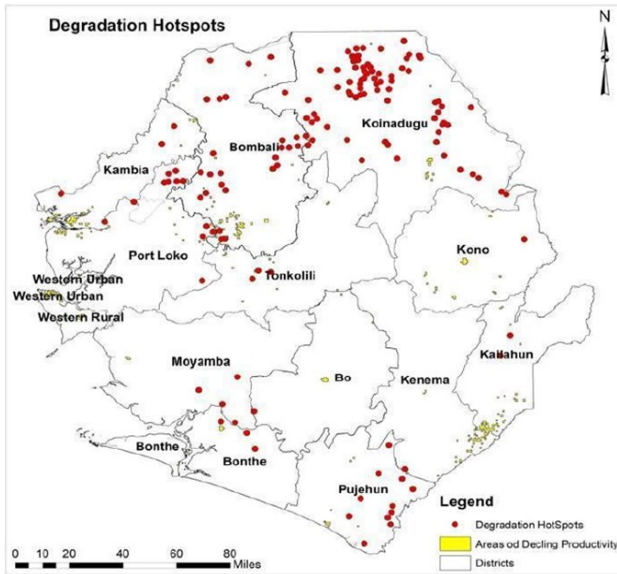
Sierra Leone already has one of the highest rates of malnutrition and child mortality in the world, yet higher temperatures are likely to increase incidence of diarrhea, seafood poisoning, and dangerous pollutants. Waterborne diseases are also expected to increase with more frequent and intense flooding. Heavy rains recently increased the likelihood of communicable diseases and more intense dry seasons (with increased temperatures) in the north and west of Sierra Leone have been linked to reduced water quality, warm spells, and disease outbreaks. Furthermore, warmer seas contribute to toxic algae bloom and increased cases of food poisoning from consumption of shellfish and reef fish. Disease compromises the body's ability to utilize food, which impacts food security and nutritional wellbeing.

### Environment and Forests

Sierra Leone is a hotspot for biodiversity characterized by rainforests, including one of the last remaining tracts of Atlantic coastal rainforest, savannah forests, inland valley swamps, coastal mangroves, and rich aquatic life. But these ecosystems are threatened by storm surges, flash floods, and high winds, which are exacerbated by pollution,

| Country/Region | Scenarios    |                |                |             |              |              |              |               |
|----------------|--------------|----------------|----------------|-------------|--------------|--------------|--------------|---------------|
|                | RCP 4.5      |                |                |             | RCP 8.5      |              |              |               |
|                | 2021-2050    |                | 2051-2080      |             | 2021-2050    |              | 2051-2080    |               |
|                | Mean         | range          | Mean           | range       | Mean         | range        | Mean         | range         |
| Precipitation  | -5% to 5%    | -20% to 30%    | -5% to 10%     | -30% to 30% | -5% to 10%   | -20% to 30%  | 0% to 10%    | -20% to 40%   |
| Temperature    | 1°C to 1.8°C | 0.5°C to 2.5°C | 1.5°C to 2.5°C | 1°C to 3°C  | 1°C to 2.3°C | 0.5°C to 3°C | 2°C to 3.5°C | 1°C to 14.5°C |

Above and below, NDC/INAP 2021, GoSL



landslides, coastal erosion, de-forestation, and loss of biodiversity. Between 2000 and 2015, there was an increase in forestland conversion to cropland and an overall reduction in tree-cover by 26.9 percent. Mostly driven by timber logging, charcoal production, rapid urbanization, sand mining, and mineral extraction, deforestation is increasing the likelihood of both landslides and floods because it removes tree roots that stabilize the ground. Slash-and-burn agriculture itself involves the burning of vegetation and short fallow periods, further reducing soil quality and the level of yields.



**37k**  
people

**Benefit from WFP's  
climate resilience  
nutrition-sensitive  
programmes**



**The NDC 2021 identified poor governance, weak law enforcement, and lack of co-ordination among sector ministries as serious threats to forest management.**

## Droughts, Floods, Storms

The likelihood of more severe droughts, floods and storms threatens agriculture, fisheries, as well as infrastructure and hydroelectric power production. Urban and rural seasonal flooding, recurrent flash flooding, and coastal flooding are the most frequently observed disasters. In the recent past, disasters have mostly happened in Kroo Bay, Susan's Bay and Lumley in Western Urban district. Port Loko, Kambia, Western Rural, Pujehun, Bo, Kenema and Moyamba districts and the coastal beaches of the Western Area Peninsula are also vulnerable. There are also transboundary risks of overflows at the Great Scarcies and Little Scarcies rivers from Guinea and Mano from Liberia (World Bank 2017). Floods overwhelm existing systems, contaminating drinking water, creating sewage overflows and damaging roads.

## Crisis at Guma Valley!

Deforestation of the Western Area Peninsular Forest Reserve (WAPFOR) poses a serious threat to Freetown as it is the catchment area for the Guma Valley reservoir, which supplies 90 percent of Freetown's drinking water. In March 2022, WFP satellite images proved the loss of over 4,000 ha of trees. Despite a legal framework being in place to protect the reserve, unregulated human activity has contributed to WAPFOR's decimation.

## Extreme Heat and Economic Losses

Freetown's equatorial climate barely varies through the year. Even within 24 hours, most days are hot and the nights, warm and most residents have no air-conditioning. This means that that the working residents of the Sierra Leonean capital are continuously exposed to high temperatures, according to the Arshat Rock study. Without corrective measures, by 2050, economic losses will rise to the equivalent of USD 150 million. Deforestation due to rural-urban migration exacerbates the overheating.

What makes Freetown's economy vulnerable is its over-reliance on labour-intensive production. While active cooling, such as air-conditioning, can produce additional greenhouse gas emissions, it also provides strong protection from heat. As most workers survive on low incomes, this lost value has disproportionate impacts on individuals' well-being and ability to escape hunger.

## Alignment with WFP Country Strategic Plan (2022-2025)

WFP's work is aligned with Outcome 2 on school feeding, Outcome 3 on reducing malnutrition and these, mainly:

### Outcome 4:

Smallholder farmers and communities in targeted areas have resilient livelihoods that better meet their food security and nutrition needs by 2030.

### Outcome 5

National and subnational institutions have strengthened capacities to manage food security and nutrition programmes by 2024.

WFP supports the Government's efforts to achieve the Sustainable Development Goals, primarily Zero Hunger (Goal 2) and Partnerships for the Goals (Goal 17).

## Sierra Leone's Vision for Climate Change

Sierra Leone recognizes the urgency for combating the climate crisis and is committed to contributing to the global response in the context of the Sustainable Development Goals. A least developing and very low emitting country, Sierra Leone's vision emphasizes adaptation while supporting global efforts to reduce emissions. The main objective of the **National Adaptation Plan (iNAP) 2021**, is to strengthen adaptive capacity and resilience and reduce vulnerability by half by 2030 through increased risk awareness, improvements in rule compliance, and robust institutional capacity.

As a party to the Paris Agreement, Sierra Leone also updated its **Nationally Determined Contribution (NDC)** to guide the country's mitigation and adaptation actions. Among the sectors worst-hit by climate change, the NDC identifies energy, food security, agriculture and forestry. The NDC 2021 is consisted with **the Medium-Term National Development Plan (2019-2023)** specifically its Clusters 2 (diversifying the economy and promoting growth), 3 (infrastructure and economic competitiveness) 5 (empowering women, children, and persons with disability) and 7 (addressing vulnerabilities and building resilience).



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**WFP-supported resilience building in Kambia district.**

These are some of the NDC 2021 recommendations:

- Increase energy efficiency and access through the dissemination of clean energy technologies;
- adopt and apply climate-smart and conservation agriculture through best agricultural practices that enhance soil fertility and improve crop yields;
- promote climate-smart agriculture and climate-resilient food security practices; and
- improve research and knowledge management capacities to support climate-smart agriculture and resilient land management.

## HOW WFP IS ASSISTING

### Restoring Ecosystems through Climate-Smart Agriculture

Sierra Leone is endowed with 690,000 hectares inland valley swamps (IVS) that, managed effectively, can provide agricultural yields for food self-sufficiency in the country. Through its food-assistance-for-assets programme and other incentives, WFP collaborates with the Ministry of Agriculture to draw small-scale farmers away from the uplands, where deforestation is rampant and yields are low, to the IVS. With year-round water availability and fertile soils that do not require fallow periods, irrigated IVS provide a high potential food production system that can be continuously cultivated with rice and nutritious vegetables, legumes, and tubers. Given the increasing rainfall variations and deforestation, irrigated IVS provide a more resilient food production system to both adapt to and mitigate against the effects of the climate crisis.

WFP and the Ministry assist 140 groups comprised of over 7,500 farmers across seven districts to cultivate the IVS. A large percentage of the farmers are women and youth, whom the Ministry trains in integrated farming techniques for higher yields (average of 2.4 metric tons/hectare). WFP also provides good seeds and fertilizers.

**Between 2020 and 2022, WFP-supported communities cultivated over 1,000 ha of IVS, including through a UN Peacebuilding Fund project implemented with UNDP.**

**Video** [Sierra Leone: Planting for Food and Climate and Peace](#)

**News** <https://www.bbc.com/news/av/world-africa-62827270>

### Cross-border Peacebuilding to Minimize Conflicts over Water

Ten of the 140 groups are in Falaba district in Sierra Leone where WFP is implementing a new UN peacebuilding project in collaboration with the International Organization for Migration (IOM) and a local non-governmental organization (NGO), Talking Drum Studio.



Copyright: WFP/Abu Jalloh

**This and front cover, two of hundreds of IVS farms developed with WFP's support in Tonkolili and Moyamba respectively.**

Competition for water is a major cause of localized disputes between cattle herders and crop farmers in Falaba and Faranah prefecture in Guinea. Historically in the dry season (November – May), herders allow their cattle to roam freely in search of water and pasture. This time happens to be the main season when women cultivate vegetables and groundnuts. Conflicts emerge when the cattle encroach on their farms, destroying their crops. Left unaddressed, these conflicts could ignite tensions between Sierra Leone and Guinea.

In addition to the IVS support, WFP assists the farmers to fence their farms while re-generating tree cover to minimize the impact climate change has had on water availability in the area. In 2023, WFP will collaborate with the Sierra Leone Agricultural Research Institute (SLARI) to multiply grass species for communal cattle grazing sites.

### **Composting for Soil Recuperation**

Inorganic fertilizers were already too expensive for small-scale farmers before the Ukraine crisis drove prices higher. But also, repeated application of chemical inputs can further acidify soil, reducing its fertility over time thus impacting farmers' capacity to engage in continuous and sustainable production. WFP and the Ministry of Agriculture empower farmers' groups to carry out organic composting at community level.

### **Holistic Agriculture & Market Support**

For a more whole-some kind of assistance that strengthens the groups' production and post-harvest capabilities, WFP provides power tillers, rice processing machines and solar driers, in addition to assisting to rehabilitate the farmers' grain stores and drying floors through its engineering division. WFP and its partners also train the FBOs in post-harvest crop management, group marketing and how to successfully manage the groups and operate village savings and loans schemes.

### **Addressing Root Causes of Malnutrition**

WFP supports the Government's efforts to address the multi-faceted drivers of undernutrition, through a multisectoral approach. It collaborates with district health management teams to improve health and nutrition among children aged 6-23 months and pregnant and lactating women and adolescent girls in rural Sierra Leone. WFP empowers mother support groups, key change agents that help address malnutrition at community level. On a regular basis, the groups educate women on optimal infant and young child (IYCF) feeding using locally available nutritious foods, and on hygiene and food safety. The women and girls are also linked to health facilities for improved health seeking behavior. As a result, nutritional and hygiene practices during the first 1,000 days of life and beyond have been enhanced.



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**WFP-trained cooks are now also using energy-efficient cooking stoves in Kambia district for home-grown school feeding.**

### Fuel-efficient Stoves for Schools

A WFP-commissioned survey conducted by the GIZ's Energizing Development (EnDeV) programme found that, on average, one Sierra Leonean school used 60 kilogrammes of firewood per day cooking meals on a traditional three-stones stove. It also found that the three stones took more than seven times the amount of fuel that a locally made improved stove required. Furthermore, the three stones took one to two hours longer to cook the same amount of food as the improved stoves, while exposing school cooks to excessive smoke.

To reduce the carbon footprint of school feeding and safeguard the health and wellbeing of volunteer cooks, in 2022, WFP piloted energy-efficient stoves manufactured locally in Sierra Leone and closely monitored their impact in collaboration with EnDEV. Based on the successes and learnings of the pilot, in the 2022/2023 school year, WFP will provide an additional 50 improved stoves to schools. This assistance will also contribute to reduced tree-cutting, as well as costs and time spent on cooking.

**Video:** <https://www.youtube.com/watch?v=9LWwlg7wAnU>

### Support to Disaster Management

In its first year, 2021, the National Disaster Management Agency (NDMA) received a logistics base with 37 mobile storage units, made available by WFP to assist the agency in establishing itself. Then, through a full-time disaster risk management expert seconded to the agency, WFP strengthened data handling, emergency response, and operational incident management.

This year, WFP and the NDMA jointly responded to a floods emergency after 145mm of rain – almost seven times above the flooding threshold of 20mm – fell in one day around Freetown.

Prior to this, through its Global Logistics Cluster field-based preparedness project, WFP began conducting emergency logistics and warehousing training to address a key challenge the NDMA still faces: limited capacity to quickly deploy and reach disaster-affected people. The training targeted NDMA staff, as well as first responders from the Red Cross, NGOs, army and other security agents, and district officials. The trainings took place in Freetown and Bo and Makeni, covering all the disaster-prone regions.

### DONORS



Norwegian Ministry of Foreign Affairs



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