ADAPTATION FUND

AFB/PPRC.37/Inf.40
16 March 2026

Adaptation Fund Board
Project and Programme Review Committee
Thirty-seventh Meeting
Bonn, Germany, 7-8 April 2026

PROPOSAL FOR
MALAWI, MOZAMBIQUE, ZAMBIA, ZIMBABWE

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regional Project Concept

Countries/Region: Malawi, Mozambique, Zambia and Zimbabwe (Southern Africa)
Project Title: Building Climate-Resilient WASH Services in Southern Africa
Thematic Focal Area: Disaster risk reduction and early warning systems
Implementing Entity: World Health Organization (WHO)
Executing Entities: Governments of Malawi, Mozambique, Zambia and Zimbabwe
AF Project ID: AF00000419
IE Project ID: xxx
Requested Financing from Adaptation Fund (US Dollars): 18,644,000
Reviewer and contact person: Ahmad Ghosn
Co-reviewer(s): Timileyin Tobi Oyebade
IE Contact Person: xxx

Technical Summary	The project "Building Climate-Resilient WASH Services in Southern Africa" aims to enhance climate change adaptation and resilience of communities through sustainable access to climate-resilient WASH services in Malawi, Mozambique, Zambia, and Zimbabwe. This will be done through the three components below: Component 1: Setting up and operationalization of Early Warning Systems (USD 2,950,986). Component 2: Installation and operationalization of Climate-resilient Water, Sanitation, and Hygiene (WASH) Infrastructure. (USD 10,800,000). Component 3: Capacity building for Climate-resilient WASH among key stakeholders (USD 1,800,000). Requested financing overview: Project/Programme Execution Cost: USD 1,632,424 Total Project/Programme Cost: USD 17,183,410 Implementing Fee: USD 1,460,590 Financing Requested: USD 18,644,000 The proposal includes a request for a project formulation grant of USD 160,000. The first technical review raises several issues, such as specifying the EEs; shortening document length to AF limits; revising components financing table; providing more information on project activities, USPs, and AF outcomes supported by the project; providing initial gender assessment; further demonstration of project cost-

	effectives; double checking relevance of UNCBD and UNCCD; providing list of related projects; specifying the activities to which national standards apply; clarifying the consultations in Zambia and providing summary tables of all consultations; revising AF RF alignment table; specifying the project overall risk and adding more details in the AF E&S checklist table; among other Clarification Requests (CRs), Corrective Action Request (CARs), and notes raised in the review.
Date	**03 March 2026**

Review Criteria	**Questions**	**First Technical Review Comments 03 March 2026**
Country Eligibility	1. Are all of the participating countries party to the Kyoto Protocol and/or the Paris Agreement?	**Yes.**
	2. Are all of the participating countries developing countries particularly vulnerable to the adverse effects of climate change?	**Yes.** The Southern African countries are vulnerable to adverse climate change effects including severe droughts, floods, and cyclones which result in food insecurity, malnutrition, spread of vector-borne (malaria) and water-borne (cholera) diseases, among others.
Project Eligibility	1. Have the designated government authorities for the Adaptation Fund from each of the participating countries endorsed the project/programme?	**Yes.** As per the Endorsement letters listed below: Malawi: 04 February 2026 Mozambique: 09 February 2026 Zambia: 02 February 2026 Zimbabwe: 21 November 2024

	2. Does the length of the proposal amount to no more than fifty (50) pages for the project/programme concept, including its annexes?	**No.** The document is 54 pages including Endorsement letters (be inserted in Part IVA or attached as Annex) and excluding initial gender assessment, and additional text to address the review comments. Also, the CN Parts and sections letter numbering does not align with AF template, EEs are not specified, among other issues noted below. **CAR1:** On p. 1, please specify the executing entities (EEs) at the country level and at regional level if (any). Stating that EEs are the "Governments of Malawi, Mozambique, Zambia and Zimbabwe" does not meet AF requirements in this respect. (*Note: the executing entities as indicated in the PFG are the Ministries of Health in the covered countries).* **CAR2:** Please address the following: 1. Insert letters of endorsement in Part IA or attach as annex to the document. 2. Align CN document parts and section numbering with the AF template (i.e., II, II, IV for the parts; and A, B, etc. for the sections). Refer to the AF template found at https://www.adaptation-fund.org/document/regional-concept-note-proposal-template/. 3. Revise Part I to shorten it without losing key contexts, to maintain document and annexes within the AF 50 pages limit ((after addressing review comments). **CAR3:** Please revise the components financing Tabe 1, pp. 31-32, to address the following: 1. Allocate amounts at output and component levels. 2. Specify amount allocated for each of involved country. 3. Total project cost at the bottom of Table 1 should be USD 17,183,410 (Total project cost = total components cost + execution costs= 15,550,986 + 1,632,424). Please refer to the AF cost and fees calculator for guidance https://www.adaptation-fund.org/wp-content/uploads/2024/06/IE-and-EE-fees-Calculations-1.xlsx. **Editorial Notes:**

		1. Add lists of abbreviations, tables & figures (will not count towards proposal length). 2. Revise table of contents to reflect the document/ proposal key contents. 3. Spell out abbreviations when first used and refer to figures, tables, annexes at related discussions. 4. The terms “project” and “programme” are used interchangeably in the document discussions. Please use the term “project” throughout the discussion. 5. Conduct a round of editing/ proofreading for the document after addressing the review comments. Ensure that CN document length after revisions remains within the AF 50 pages limit.

	3. Does the regional project / programme support concrete adaptation actions to assist the participating countries in addressing the adverse effects of climate change and build in climate resilience, and do so providing added value through the regional approach, compared to implementing similar activities in each country individually?	**Yes.** See section 2.1 (should be Part IIA), pp. 32-35. Concrete actions include upgrading EWSs by integrating climate, water quality and health data; climate-proofing water supply systems (elevated intakes, flood-resistant boreholes, solar-power pumping, etc.); building/ upgrading sanitation systems to withstand floods and droughts; implementing nature-based solutions to safeguard water resources (e.g., catchment protection, erosion control, wetland restoration, etc.); improving WASH services in health care facilities; among related capacity building and others as discussed in Part IIA. However, more details on the activities and discussions layout need to be revised for more clarity, among other issues note below. **CAR4:** Please revise the components description to address the following: 1. Rearrange the discussion layout to reflect components, followed by the outcome/s under the component, the outputs/s under each outcome, and the activities under each output. outputs, activities. 2. Provide more details on the activities locations along with supporting quantification (e.g.: direct/ indirect beneficiaries; number of improved water supply systems, upgraded sanitary systems, nature-based solutions, etc.; established infrastructures; numbers of capacity building activities/ participants; etc.) to demonstrate the size of work and substantiate allocated budgets. 3. Clarify how EWARS implementation will be adapted to differing national surveillance capacities to ensure equitable and functional regional integration. 4. The proposal refers to disruptive climate events affecting health systems and infrastructure. Kindly clarify how the proposed intervention will maintain its effectiveness in the context of compound climate shocks. 5. Specify unidentified activities subprojects (USPs), if any, and related arrangements to comply with related AF requirements found at https://www.adaptation-fund.org/wp-content/uploads/2021/05/Updated-guidance-on-USPs-.pdf.

		CR1: As appropriate in Part I or Part IIA, please briefly discuss the project Theory of Change (ToC) and provide a schematic presentation of the same. **CAR5:** As appropriate in Part I (e.g.: after objectives) or in Part IIA, indicate the AF outcomes supported by the project (related info can be extracted from Part IIIA AF RF alignment table).
	4. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy of the Fund?	**Yes.** See section 2.3 (Should be Part IIC), pp. 35-36. However, more details related to the quantification of benefits are recommended. **CR2:** Please provide more supporting quantification of the project interventions benefits (e.g., no. of beneficiaries taking into gender/ vulnerable groups aspects gender/ ; no. of facilities established; no. of NbSs implemented; no. of catchments protection, wetland restored, etc.). Also, as possible/ available at this stage provide dollar estimates of the economic benefits, and potential new jobs created under social benefits, if any, etc. **CR3:** Please clarify if indigenous peoples are identified in the expected project areas. **CAR6:** Compliance with the Gender Policy requires an initial gender analysis/ assessment at the earliest stage of project preparation to determine the different needs, capabilities, roles and knowledge resources of women and men, and/or identify how changing gender dynamics might drive lasting change. Please provide an initial gender analysis/ assessment. Include under a dedicated heading in Part I or attach as annex and refer to it at related CN sections.

	5. Is the project / programme cost-effective and does the regional approach support cost-effectiveness?	**Unsure**. See section 2.3 (should be Part IID), pp. 36-37. Cost-effectiveness of the project proposed interventions against/ compared with other alternative options and/ or no action should as well be demonstrated. **CAR7:** Please demonstrate (in a tabulated form) the cost-effectiveness of the project proposed interventions against/ compared with other alternative options and/ or no action. Provide indicative dollar figures. (gains/ avoided losses), where possible, to support the cost effectives comparison.
	6. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments? If applicable, it is also possible to refer to regional plans and strategies where they exist.	**Yes.** See section 2.5 (should be Part IIE), pp. 37-38. However, please double check the relevance of the national plans/ commitment under the UNCBD and UNCCD, as the project interventions as indicated in components description, involve catchment protection, erosion control, wetland restoration, etc. **CAR8:** please double check the relevance of the national plans/ commitments under the UNCBD and UNCCD and include in Table 3 (for each country), if it is the case. **CR4:** Please revise the discussion in the third column of Table 3, pp. 37-38, to provide more details on the planned project intervention and the corresponding "listed plan" objective/ action supported by the intervention. This will help better clarify/ map the project alignment with the objectives of the listed strategies/ plans.
	7. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	**Yes.** See section 2.6 (should be Part IIF), pp. 39-40. However, please explicitly refer to the project outputs/ activities to which the listed standards apply. **CR5:** In column 3 of Table 4, please explicitly refer to the project outputs/ activities to which the listed standards apply.

	8. Is there duplication of project / programme with other funding sources?	**Unsure.** Only general discussion is provided. See section 2.7 (should be Part IIG), pp. 40-41. **CAR9:** Please provide a tabulated list of nation and regional related projects. The table should include project title and funding source, date (start and end dates) and status (ongoing, completed, etc.); project interventions objectives focus and location; and synergy/ lessons learned/ complementarities with the proposed project. **CR6:** Please clarify if there are coordination arrangements built into the project with parallel/ ongoing investments (e.g. humanitarian cholera response, routine WASH programs) at country and regional levels including other Adaptation Fund investments in the region.
	9. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	**Yes.** See section 2.8 (should be Part IIH), p.41. The discussion indicate that the learning and knowledge management aspects are integrated in project design. More details are needed regarding on related outputs/ activities (e.g.: outputs under components 2 &3). **CAR10:** Please briefly discuss the related "learning and knowledge management" outputs/ activities (e.g.: outputs under components 2 &3) and revise the discussion in section 2.8 accordingly.
	10. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	**Unsure.** See Part 2.9 (should be Part II"I"), pp. 42-43. More details are needed. **CAR11:** Please address the following: 1. Table 6 does not reveal any consultations in Zambia. Also. no consultations with local communities/ vulnerable groups/ etc. are indicated. Please clarify. 2. Provide a summary table of the consultations conducted. The table should reflect date of consultation, consulted entity/ group, number of participants disaggregated by gender, topics discussed, outcomes and how they were considered in project design. 3. Please indicate if/ when future consultations will be conducted.

	11. Is the requested financing justified on the basis of full cost of adaptation reasoning?	**Yes.** See section 2.10 (should be Part IIJ), pp. 44-45. However, some revisions are needed. **CR7:** In Table 7, p. 44, under the first column "components", reference is made to "Regional Coordination, Knowledge & Systems" which reads as a component. Please delete from the table and include, as needed, as part of the discussion. **CAR12:** Please add a brief paragraph to explicitly indicate the planned project will achieve its adaptation objectives solely based on the requested AF funds, irrespective of any additional funding/ co-financing from other donors.
	12. Is the project / program aligned with AF's results framework?	Yes. See Table 9, pp. 49-50. However, the AF RF alignment table is not fully consistent with the latest AF guidance, **CAR13:** In Table 9, pp. 49-50: i) delete outcome 4 to ensure consistency with the three outcomes listed in components financing table; ii) include allocated amounts at output level (table lower part); iii) in dedicated rows in Table 9, include total allocated amounts at AF outcome level (table upper part) and AF output level (table lower part). Each of these totals should add up to the components total ($15,550,986). Please refer to the latest related AF guidance on the above found at Results Framework Alignment Table (Amended in November 2025) (77 kB, DOC). **CR8:** No need for the implementation arrangements at this stage. Delete to save space or briefly reflect in Part IIA discussions as deemed appropriate (Note: the last para in the implementation arrangements, p. 48, refer to the MoH in three countries- should be four countries).
	13. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	Yes. See section 2.11 (should be Part IIK), pp. 45-46. However, the issues noted below need to be clarified. **CR9:** Please clarify the following: 1. Arrangements for the sustainability of O&M of the infrastructures/ facilities to be established by the project. (*Note: The proposal mentions "use of locally available materials and labor to minimize O&M". Please clarify how the mentioned would enhance sustainability*).

		2. The potentials for the replication/ scaling up of the project outcomes with other funds after its end. **CR10:** The proposal identifies weak institutional systems as a key barrier to effective climate-health surveillance and policy implementation (meaning, some of the structures are currently existing); further clarification is therefore needed on how project activities will strengthen long-term national ownership and sustainability of surveillance systems and policy frameworks, and avoid continued reliance on external technical and financial support beyond the project duration.
	14. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	**Not fully.** See section 2.11 (should be Part IIL), pp. 46-48. **CAR14:** Please address the following: 1. Under "Risk classification", please specify risk category as per AF classification (e.g., A, B, C). 2. In Table 8, column 3, specify the risks and level (low, medium or high) for each principle, further assessments needed (if any), and indicate the mitigation measure as well as how compliance will be ensured. Further information on this can be found at https://www.adaptation-fund.org/wp-content/uploads/2016/07/ESP-Guidance_Revised-in-June-2016_Guidance-document-for-Implementing-Entities-on-compliance-with-the-Adaptation-Fund-Environmental-and-Social-Policy.pdf 3. The proposal refers to the use of local labor; however, it does not address any potential labor risks. Please reflect related risks, if any, as as appropriate in Table 3. 4. Refer to USPs and initial gender assessment at related principles. Guidance Document for Project/Programme with Unidentified Sub-Projects 5. At column 2 please un-check ESPs 1 4, and 6 as further assessments are always required.
	15. Does the project promote new and innovative solutions to climate change adaptation, such as new approaches, technologies and mechanisms?	**Yes.** See section 2.2 (should be Part IIB), p. 35. Sufficient for CN. More details would be needed at full proposal stage.

		CR11: It would be helpful to clarify if the project will have in place a mechanism to translate lessons into replicable models for other regions or countries in the region.
Resource Availability	1. Is the requested project / programme funding within the funding windows of the regional projects/programmes?	**Yes.**
	2. Are the administrative costs (Implementing Entity Management Fee and Project/ Programme Execution Costs) at or below 10 per cent of the project/programme for implementing entity (IE) fees and at or below 10 per cent of the project/programme cost for the execution costs?	**Yes.** Execution costs ($1,632,424) are 9.5% of total project cost ($17,183,410) and IE fee ($1,460,590) is at 8.5%. *However amendment is required in the PFG.* **CAR15:** 1. Please indicate the PFG implementing fee in the PFG budget. 2. Please clarify if "Ministries of Health in the target countries" will also execute the PFG. If it is intended for WHO to execute the PFG please amend the PFG request form.
Eligibility of IE	1. Is the project/programme submitted through an eligible Multilateral or Regional Implementing Entity that has been accredited by the Board?	**Yes.** WHO is accredited by AF Board. Accreditation Expiration Date: 24 November 2028.
Implementation Arrangements	1. Is there adequate arrangement for project / programme management at the regional and national level, including coordination arrangements within countries and among them? Has the potential to partner with national institutions, and when possible, national implementing entities (NIEs), been considered, and included in the management arrangements?	n/a at concept stage
	2. Are there measures for financial and project/programme risk management?	n/a at concept stage
	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund? Proponents are encouraged to refer to the Guidance document for Implementing Entities on compliance with the Adaptation Fund Environmental and Social Policy, for details.	n/a at concept stage
	4. Is a budget on the Implementing Entity Management Fee use included?	n/a at concept stage

	5. Is an explanation and a breakdown of the execution costs included?	n/a at concept stage
	6. Is a detailed budget including budget notes included?	n/a at concept stage
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?	n/a at concept stage
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	n/a at concept stage
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	n/a at concept stage
	10. Is a disbursement schedule with time-bound milestones included?	n/a at concept stage

ADAPTATION FUND

CONCEPT NOTE FOR REGIONAL PROJECT

PART I: PROJECT INFORMATION

Title of Project: Building Climate-Resilient WASH Services in Southern Africa

Countries: Malawi, Mozambique, Zambia, Zimbabwe

Thematic Focal Area[1]: Disaster risk reduction and early warning systems

Type of Implementing Entity: Multilateral Implementing Entity

Implementing Entity: World Health Organization (WHO)

Executing Entities: Governments of Malawi, Mozambique, Zambia and Zimbabwe

Amount of Financing Requested: $18,644,000 (in U.S Dollars Equivalent)

Project Formulation Grant Request: Yes ☒ No ☐

Amount of Requested financing for PFG: $160,000 (in U.S Dollars Equivalent)

Letters of Endorsement (LOE) signed for all countries: Yes ☒ No ☐

NOTE: LOEs should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: https://www.adaptation-fund.org/apply-funding/designated-authorities

Stage of Submission:

☒This proposal has been submitted before including at a different stage (pre-concept, concept)

☐ This is the first submission ever of the proposal at any stage

In case of a resubmission, please indicate the last submission date: 6/6/2025

Please note that the Concept note proposal document should not exceed 50 pages, including annexes.

[1] Thematic areas are: Food security; Disaster risk reduction and early warning systems; Transboundary water management; Innovation in adaptation finance.

TABLE OF CONTENTS

1. Project/Programme Background and Context

1.1 Climate change and Health Nexus

Climate change poses a significant threat to global water resources, with Africa particularly vulnerable to increased water stress and shortages. By 2050, cities may experience a drastic reduction in water availability, leading to a potential 6 percent decrease in GDP due to losses in agriculture, health, income, and property (World Bank, 2016). This is especially concerning for Least Developed Countries (LDCs) in Africa, where changing weather patterns, lower water levels, and extreme weather events exacerbate existing challenges. Countries such as Malawi, Mozambique, Zambia, and Zimbabwe face persistent threats from cyclones and floods, which severely impact the Water, Sanitation, and Hygiene (WASH) sector. Limited access to clean water and sanitation in rural areas increases the risk of waterborne diseases, while inadequate and vulnerable infrastructure further heightens vulnerabilities. Climate change intensifies these challenges by disrupting water supplies, damaging infrastructure, and contaminating water sources. Additionally, institutional issues like poor coordination, insufficient funding, and weak governance hinder the effectiveness of WASH interventions, increasing socio-economic vulnerabilities and slowing progress toward sustainable development outcomes.

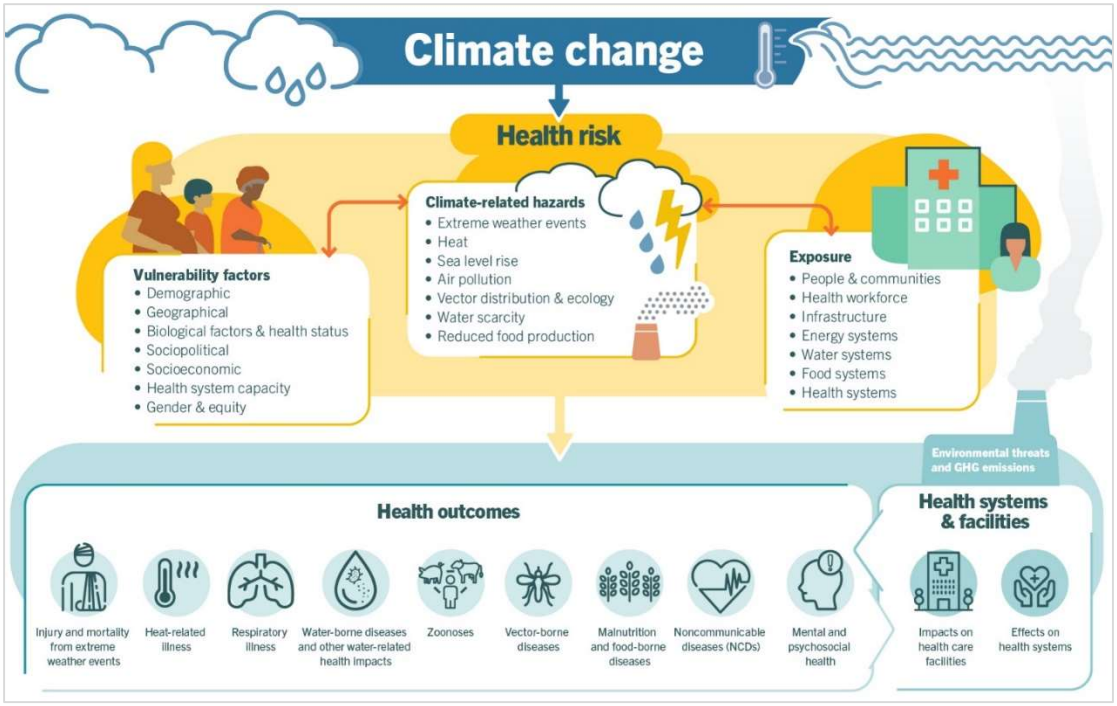


Figure 1: *Climate Change and Health Nexus*

This schematic diagram above clearly illustrates how climate change drives health risks by linking hazards such as extreme weather, heat waves, air pollution, and water scarcity with vulnerability factors like demographics, health status, socioeconomic conditions, and health system capacity. These interactions shape exposure for communities, health infrastructure, and essential systems, leading to outcomes including injuries, infectious diseases, malnutrition, NCDs, and mental health impacts. It visually demonstrates the climate–health linkages and the need for integrated adaptation strategies to build resilient health systems while reducing environmental threats.

The health sectors of Malawi, Mozambique, Zambia, and Zimbabwe are increasingly challenged by frequent cyclones, exacerbated by climate change. Cyclones such as Idai, Freddy and, most recently, Filipo in 2024, strike annually, causing massive destruction and health crises. These storms fuel the spread of

deadly diseases such as cholera, malaria, typhoid and yellow fever, which thrive in the aftermath of flooding and poor sanitation. With 61% of the population lacking access to safe drinking water and 72% lacking adequate sanitation (World Bank, 2021), building resilient infrastructure is urgent to control outbreaks and prevent future disasters. Climate resilience is essential to protect public health in these vulnerable regions.

The cholera epidemic in Southern Africa remained a significant public health challenge throughout 2023, severely impacting vulnerable communities and overwhelming healthcare systems. By the end of the year, about 188,000 cholera cases, including 3,000 deaths, were reported across eight countries in the region. Six countries continued to experience active cholera transmission into 2024, namely the Democratic Republic of Congo (DRC), Malawi, Mozambique, Tanzania, Zambia, and Zimbabwe, with outbreaks that began as early as October 2023. Malawi was the hardest hit, reporting the highest number of cases in the region, with 59,000 confirmed cases. [2]Mozambique, Zambia, and Zimbabwe followed, each reporting between 10,000 and 50,000 cases. Tanzania and South Africa had fewer than 2,000 cases combined. In Zambia, a sharp increase in cholera cases led to the delayed opening of schools until mid-February 2024, affecting about 4.3 million learners. In Zimbabwe, by April 2024, there were 33,004 reported cases and 703 deaths, with a case fatality rate of 2.1%. [3]Mozambique grappled with its largest cholera outbreak in 25 years, with over 43,000 cases reported between September 2022 and January 2023. As of February 2024, the Mozambique had reported a total of 43,200 cases and 165 deaths.[4]Beyond cholera, Zambia along with the other 3 countries also contends with a burden of other climate-sensitive waterborne diseases such as typhoid and dysentery, which are exacerbated by compromised WASH conditions following climate shocks. The existing WASH infrastructure in these countries particularly in vulnerable communities, is not adequately designed to withstand these increasingly frequent and intense climate events, leading to recurrent breakdowns and service interruptions. This situation places immense strain on the national health system, diverting resources from routine healthcare to emergency response.

In response, the proposed intervention will support national health sector priorities in Malawi, Mozambique, Zambia, and Zimbabwe by addressing public health challenges related to cholera outbreaks, improving access to clean water, establishing of climate resilient WASH infrastructure and technologies, and enhancing disaster preparedness. In addition to addressing national priorities, the intervention contributes to the Sustainable Development Goals (SDGs), including SDG 3 (Good Health and Well-being), SDG 6 (Clean Water and Sanitation), and SDG 13 (Climate Action), by strengthening resilience to climate change and promoting public health. For example, the project addresses structural challenges in WASH infrastructure, bolstering capacity to withstand climate-induced disasters such as floods and cyclones.

1.2 Specific vulnerability of Africa to climate change impacts on health

The urgency to address the impacts of climate change on health in Africa cannot be overstated. African nations, though responsible for less than 4% of global CO2 emissions, bear a disproportionate share of the negative impacts of global warming. Climatic events have devastated the lives of millions of people across the continent. Between 2001 and 2023, 56% of the nearly 2,300 recorded public health events on the continent were linked to climate change. In 2022, disasters triggered 32.6 million internal displacements in Africa, and in 2023, extreme weather events killed over 15,000 people and affected over 80 million in the region[1]. Across the continent, climate change is driving increased transmission of vector- and waterborne diseases. For example, from the 1950s to the decade between 2012 and 2021, the number of months for malaria transmission increased by 13.8% in the highland areas of Africa, and the likelihood of dengue fever transmission rose by 12.0%[2]. Climate change has also promoted an unprecedented surge in cholera

[2] https://reliefweb.int/report/malawi/southern-africa-cholera-situation-snapshot-28-january-2024

[3] https://www.afro.who.int/sites/default/files/2024-07/WHO%20-%20Cholera%20March%20%20April%20Bulletin.pdf

[4]https://reliefweb.int/report/mozambique/mozambique-cholera-update-cholera-cases-continue-lead-rainy-season-31-jan-2024

outbreaks in Africa and globally. Many African countries that reported cholera outbreaks in 2022, 2023, and 2024 experienced natural disasters: cyclones in the South-East Africa region (Madagascar, Mozambique, Malawi, Zambia, and Zimbabwe), flooding in Nigeria, and drought in the countries that make up the greater Horn of Africa[3]. Outbreaks related to flooding reflect non-existent or inadequate water, sanitation and hygiene (WASH) infrastructures and practices. Extreme events also limit access to basic health services because facilities are destroyed, access to sustainable energy for care services and immunization is compromised, or essential services such as antenatal and postnatal care are disrupted.

The loss and damage costs in Africa due to climate change are estimated to range between US$ 290 billion and US$ 440 billion between 2020 and 2030[1], thus the need to build more resilient and sustainable health systems in Africa, including the building of diseases and extreme events early warning and response systems, the improvement of the quality and sustainability of Energy and WASH services in health care facilities to face extreme shocks. While the whole of Africa is facing climate change and health-related impacts and challenges, some countries, including Small Island Developing States (SIDS), are disproportionately affected due to their specific socio-environmental vulnerabilities related to several fragilities, such as their small size, geographical isolation, and limited societal, technological, economic, and institutional capacities. Given the escalating risks and vulnerable populations, immediate action is imperative to address and respond to the adverse effects of climate change on public health in Africa, particularly in the most vulnerable countries. Malawi, Mozambique, Zambia, and Zimbabwe are among the most vulnerable countries to climate change in the African region. The changing climate in these nations, combined with their socio-economic and environmental vulnerabilities, makes them particularly susceptible to the most devastating impacts on their populations' health and well-being.

1.3 Problem statement

Malawi, Mozambique, Zambia, and Zimbabwe face a set of interconnected challenges that significantly undermine their capacity to protect public health from the accelerating impacts of climate change. First, all four countries have disease surveillance and disaster preparedness systems that struggle to detect, anticipate, and respond effectively to climate-sensitive health threats such as cholera, typhoid, and diarrheal diseases. Second, institutional and technical capacities remain limited, including gaps in climate-informed health planning, intersectoral coordination between health, WASH, and meteorological sectors, and inadequate climate-health workforce skills. Third, health systems are structurally vulnerable: many health facilities lack resilient infrastructure, sustainable energy sources, and reliable climate-resilient WASH services, making them highly susceptible to disruptions from floods, droughts, and cyclones.

These weaknesses are compounded by limited access to reliable climate and health data, weak modeling and forecasting capabilities, and insufficient investment in climate-smart WASH and health infrastructure. As a result, communities, especially those in rural and informal urban settlements—remain highly exposed to climate-related health hazards, including recurrent cholera outbreaks, while progress toward universal health coverage is slowed. Given the cross-border nature of climate hazards and disease outbreaks in Southern Africa, these systemic barriers make a strong case for a coordinated regional approach to climate-resilient WASH and public health preparedness.

[1] 2023 Global Report on Internal Displacement: https://www.internal-displacement.org/global-report/grid2023/
[2] Romanello M, et al. The 2022 report of the Lancet Countdown on health and climate change: health at the mercy of fossil fuels. The Lancet, Volume 400, Issue 10363, 1619 - 1654
[3] WHO, 2023, New cholera cases in Africa surging fast, reach a third of 2022 total in a month. https://www.afro.who.int/news/new-cholera-cases-africa-surging-fast-reach-third-2022-total-month#
[1] https://wmo.int/news/media-centre/africa-suffers-disproportionately-from-climate-change#:~:text=The%20loss%20and%20damage%20costs,figure%20due%20to%20data%20unavailability.

1.4 Existing barriers

The proposed project aims to specifically address five key barriers in Malawi, Mozambique, Zambia, and Zimbabwe.

1. Weak disease and disaster surveillance systems, hindering their preparedness and response to health risks and losses associated with climate change.

Recurrent outbreaks of climate-sensitive diseases, particularly cholera, continue to expose deep weaknesses in disease detection, reporting, and response systems across Malawi, Mozambique, Zambia, and Zimbabwe. WHO's regional cholera bulletins from 2023–2024 show that a substantial share of all cholera cases in the African Region originated in Southern African countries affected by climate-induced disasters such as floods, cyclones, and droughts. These outbreaks repeatedly demonstrate that early-warning and surveillance systems are not adequately sensitive or timely to detect emerging threats before they spread widely. The consequences are significant: delayed detection leads to delayed response, larger and longer outbreaks, higher mortality, and increased pressure on already fragile health and WASH systems.

A major contributor to these gaps is the limited integration of disease surveillance systems with climate and environmental data. Assessments of public health systems in the SADC region have found that surveillance platforms often operate in "epidemiological isolation," lacking inputs from meteorological and hydrological monitoring systems that could signal heightened risks of disease transmission following heavy rainfall, flooding, droughts, or heatwaves. This results in surveillance systems that remain reactive rather than anticipatory at a time when climate variability is increasing. Weak laboratory networks further undermine timely confirmation of cases, as limited diagnostic capacity leads to delayed or missed identification of outbreaks, particularly in the aftermath of cyclones, flooding, or disruptions to WASH services when rapid confirmation is most critical.

Climate-related disasters intensify these surveillance challenges by damaging infrastructure, isolating communities, and triggering population displacement, all of which hinder accessibility for sample collection, reporting, and coordinated response. Studies of climate-driven health crises in the region have shown that floods and cyclones frequently render health posts non-functional, disrupt communication systems, and weaken local response capacity. As people move across borders or between urban and rural areas in search of safety or resources, the risk of cross-border disease spreads increases. WHO and Africa CDC have documented rising regional cholera transmission linked to such mobility patterns. Without strong, coordinated cross-border surveillance and early-warning mechanisms, a weakness in one national system becomes a vulnerability for the entire region. Climate change, by increasing both the frequency of extreme events and the strain on health and WASH systems, intensifies this vulnerability, creating an urgent need for climate-informed, resilient, and regionally coordinated surveillance systems.

2. Limited Institutional and Technical Capacity for Climate-Resilient WASH and Health Planning

Across Malawi, Mozambique, Zambia, and Zimbabwe, institutional and technical capacity constraints undermine the development and implementation of climate-resilient WASH and health systems. These constraints manifest at multiple levels, from national ministries to local governments and community structures, and impede the ability to anticipate, prepare for, and respond to climate-related public health risks. While policy frameworks may exist, critical gaps in human resources, financing, data integration, and cross-sector coordination continue to limit operational effectiveness.

Malawi's climate and health institutions operate in a fragmented manner, with local councils lacking the technical expertise needed for climate-health risk assessments and anticipatory adaptation. Mozambique's systems are repeatedly weakened by major climate shocks such as cyclones and floods which damage government infrastructure, displace staff, and erode long-term planning capacity. In Zambia, strong national

policy frameworks exist, but provincial and district authorities face shortages of skilled personnel and limited capacity to implement climate-resilient WASH measures. Zimbabwe's long-standing economic challenges have resulted in severe human resource shortages, constrained budgets, and limited access to technical training, all of which diminish preparedness and the ability to integrate climate information into WASH and health planning.

Across all four countries, these institutional weaknesses are compounded by poor multisector coordination between health, WASH, meteorology, water resources, and disaster management agencies. Critical functions such as early warning, water quality surveillance, environmental monitoring, infrastructure planning, and disease detection remain siloed, limiting the effectiveness of climate-resilient interventions. The climate-health workforce is also insufficient, with few professionals trained in climate modelling, environmental epidemiology, climate-resilient engineering, or integrated risk assessment. Collectively, these systemic gaps hinder the development, implementation, and scale-up of climate-resilient WASH systems, leaving communities increasingly vulnerable to climate-related health risks and infrastructure failures.

3. Climate-Vulnerable and Non-Resilient WASH Infrastructure and Technologies

Across Malawi, Mozambique, Zambia, and Zimbabwe, WASH infrastructure remains highly vulnerable to the increasing frequency and intensity of climate-related hazards, and the slow adoption of climate-resilient technologies further exacerbates this fragility. Water supply systems, sanitation facilities, and hygiene-related infrastructure were largely designed for historical climate conditions and are not equipped to withstand today's more extreme cyclones, floods, prolonged droughts, and shifting rainfall patterns. As a result, critical WASH services are frequently disrupted during disasters, water points are washed away or contaminated during floods, boreholes dry up during droughts, sanitation systems collapse under soil saturation, and health-care facilities lose access to safe water at the precise moment when disease risk is highest. Recent events such as Cyclones Idai, Kenneth, Freddy, and Filipo demonstrate the scale of this challenge, with extensive damage to pipelines, water treatment systems, latrines, and rural water schemes. These failures place communities, particularly rural populations and informal settlements at heightened risk, with an estimated 61% of the population lacking safe drinking water and 72% lacking adequate sanitation.

Compounding this vulnerability is the limited uptake of climate-resilient WASH technologies and the insufficient integration of nature-based and low-carbon solutions. Many communities still rely on shallow wells, traditional pit latrines, gravity-fed systems, and diesel-powered pumps, all of which are highly sensitive to climate shocks and expensive to maintain. More resilient options such as solar-powered borehole systems, raised and flood-proofed water points, ecological sanitation designs, drought-tolerant water systems, reinforced pipelines, and managed aquifer recharge remain underutilized due to financing gaps, lack of technical expertise, and weak local capacity for operation and maintenance. Nature-based solutions such as catchment protection, wetland restoration, upstream erosion control, and watershed management are rarely mainstreamed into WASH planning despite their proven ability to reduce flood risk, improve water quality, stabilize water flows, and enhance long-term resilience. The lack of sustainable, low-carbon WASH approaches also increases dependence on energy-intensive or short-lived technologies that fail quickly under repeated climatic stress.

Together, these challenges leave communities dependent on fragile WASH systems that repeatedly collapse during climate shocks, driving outbreaks of cholera, typhoid, and other waterborne diseases; undermining infection prevention and control in health-care facilities; and placing additional strain on overstretched health services. Without systematic investment in climate-resilient WASH technologies, infrastructure

strengthening, and nature-based solutions, the four countries will continue to face escalating public health risks and service disruptions as climate impacts intensify.

4. Socio-Economic Vulnerabilities Intensifying Climate Impacts

The impacts of climate change on WASH and public health systems in Malawi, Mozambique, Zambia, and Zimbabwe are magnified by deep-rooted socio-economic vulnerabilities that limit communities' ability to cope, adapt, and recover. Many households live in poverty, particularly in rural districts and rapidly expanding informal settlements, where access to reliable water and sanitation services is already limited. These socio-economic constraints reduce families' capacity to invest in resilient infrastructure or protective behaviors, leaving them dependent on fragile water sources and unsafe sanitation options that are highly vulnerable to floods, droughts, and seasonal changes. When climate shocks occur, the poorest communities experience the most prolonged service disruptions and the slowest recovery, reinforcing cycles of vulnerability and chronic health risks.

Gender dynamics further exacerbate these challenges. Women and girls shoulder the primary responsibility for water collection and household hygiene across the four countries, a burden that increases when water points dry up or are damaged by floods. Climate stressors, therefore, disproportionately affect their time, safety, and well-being, reducing opportunities for education, economic participation, and leadership. The destruction of WASH facilities during cyclones or floods also heightens risks related to privacy, dignity, and menstrual hygiene management, further undermining resilience at the household and community levels.

Other vulnerable groups, including children, older persons, people with disabilities, and displaced populations, face heightened exposure to climate-sensitive diseases and hazards linked to deteriorating WASH conditions. Children are especially at risk of diarrhoeal diseases and malnutrition during climate-related emergencies, while displaced households often reside in overcrowded or temporary shelters where WASH services are insufficient or absent. These pressures place additional strain on health systems already burdened by recurrent outbreaks, diverting scarce resources away from essential health services. Together, these socio-economic vulnerabilities amplify the human impacts of climate change, deepen inequalities, and hinder the ability of communities to withstand and recover from WASH-related disruptions.

1.5 Health, Environment, Socio-economic Contexts, and vulnerabilities.

1.5.1 Malawi

1.5.1.1 Socio-economic context and vulnerabilities

Malawi remains among the poorest countries in Southern Africa: over half of its population is classified as poor, and many households depend on small-holder, rain-fed agriculture, making them highly susceptible to climate and economic shocks[5]. In rural and peri-urban areas, limited access to formal water and sanitation infrastructure forces many families to rely on unprotected wells, seasonal streams, and surface water sources, supplies that are vulnerable to contamination or depletion under drought or flooding[6].

[5] World Bank (2022) *Escaping Poverty in Malawi Requires Improved Agricultural Productivity, Climate Resilience, and Structural Transformation*: https://www.worldbank.org/en/news/press-release/2022/11/08/escaping-poverty-in-malawi-requires-improved-agricultural-productivity-climate-resilience-and-structural-transformation

[6] UNICEF Malawi (no date) *Water, sanitation and hygiene*: https://www.unicef.org/malawi/water-sanitation-and-hygiene

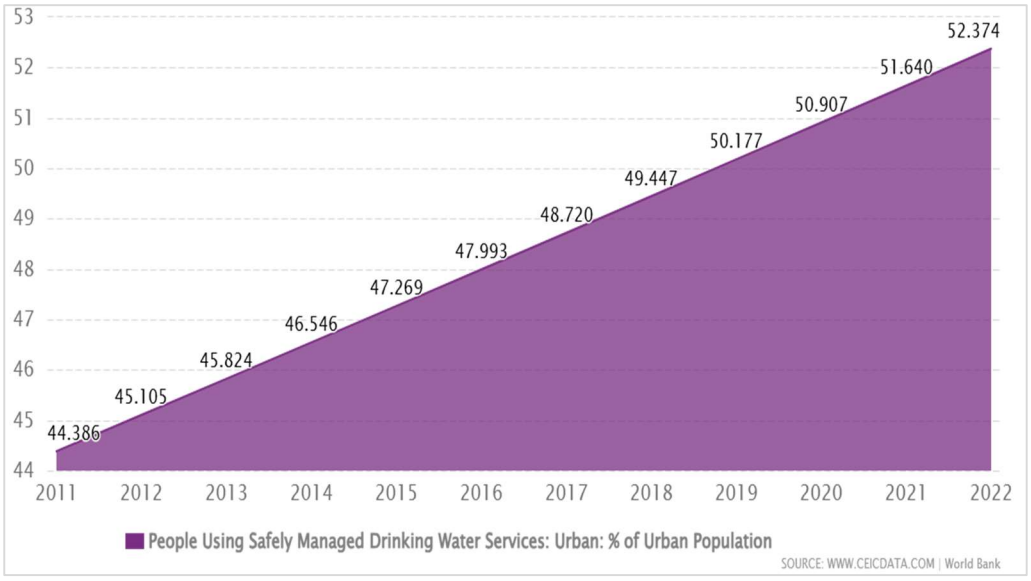


Figure 2: *Percentage of Malawi Urban Population Using Safely Managed Drinking Water Services from 2000 to 2022*

The WASH (water, sanitation, hygiene) deficit in Malawi is stark: roughly one in three people lack access to safe water, and more than half the population lacks improved sanitation[7]. In addition, many rural water schemes and boreholes are nonfunctional or poorly maintained, leaving communities exposed even outside climate emergencies[8].

These socio-economic and infrastructural vulnerabilities amplify the impact of climate-driven disasters, floods, droughts, storms, or cyclones. Poor households often lack the resources to rebuild or relocate when water sources and sanitation infrastructure are damaged or destroyed, prolonging the disruption of water supply and hygiene services[9]. In urban and peri-urban informal settlements, high population density, inadequate waste management, and insufficient drainage further increase the risk of contamination and disease outbreaks when climate events strike [10]. As a result, climate shocks disproportionately impact the poorest, undermining health, livelihoods, and resilience. To protect vulnerable populations, especially in rural, peri-urban, lakeshore, and flood-plain communities, there is a strong need for investments in resilient WASH infrastructure, improved maintenance, and equitable access to safe water and sanitation.

1.5.1.2 Observed climate trends and projections.

In recent years, Malawi has experienced a pronounced rise in the frequency and severity of extreme weather events, reflecting growing climate volatility. Between 1975 and 2023, the country recorded over 50 disasters triggered by hydrometeorological hazards, including floods, cyclones, droughts, and storms[11]. The period 2022–2023 alone was especially severe: heavy rains from Tropical Storm Ana and Cyclone Gombe caused major floods and damage in southern districts and were followed in March 2023 by Cyclone Freddy

[7] WaterAid Malawi (no date) *Facts and statistics: Malawi*: https://www.wateraid.org/mw/facts-and-statistics
[8] UNICEF Malawi (no date) *Water, sanitation and hygiene*: https://www.unicef.org/malawi/water-sanitation-and-hygiene
[9] The Guardian (2025) *Water crisis in Malawi worsens as drought and climate change collide* (23 August): https://www.theguardian.com/world/2025/aug/23/water-malawai-drought-climate-crisis
[10] Chidumwa, G. et al. (2023) *Cholera outbreaks in Malawi: climate, WASH and health system vulnerabilities*. *Journal of Global Health*, 13: 10835636: https://pmc.ncbi.nlm.nih.gov/articles/PMC10835636/
[11] Government of Malawi (2023) *Tropical Cyclone Freddy Post-Disaster Needs Assessment* https://malawi.un.org/sites/default/files/2023-06/Tropical%20Cyclone%20Freddy%20Post%20Disaster%20Needs%20Assessment%20Government%20of%20Malawi%20%20April%202023-12_05_2023.pdf

a record-breaking storm in intensity and duration[12]. Cyclone Freddy, in particular, dropped unprecedented rainfall over several days, triggering floods and mudslides, damaging roads, water systems, sanitation infrastructure, and health facilities; over 2.2 million people were affected[13]. Such repeated shocks have exposed the fragility of existing infrastructure and underlined how unpredictable climate stress undermines traditional seasonal planning, especially in the absence of resilient WASH systems[14].

Looking ahead, climate projections suggest that Malawi will continue to face increased variability in rainfall patterns, more frequent and intense extreme weather events, and heightened risk of flooding, droughts, and storms[15]. Within this context, the vulnerability of water, sanitation and hygiene (WASH) services becomes even more pronounced: deteriorating infrastructure, water scarcity, contamination risk, and disrupted sanitation pose mounting threats to public health. The growing climate risk underscores the urgent need for targeted adaptation interventions, particularly investments in resilient WASH infrastructure, improved water management, and disaster-adaptive planning to safeguard communities and reduce long-term vulnerabilities.

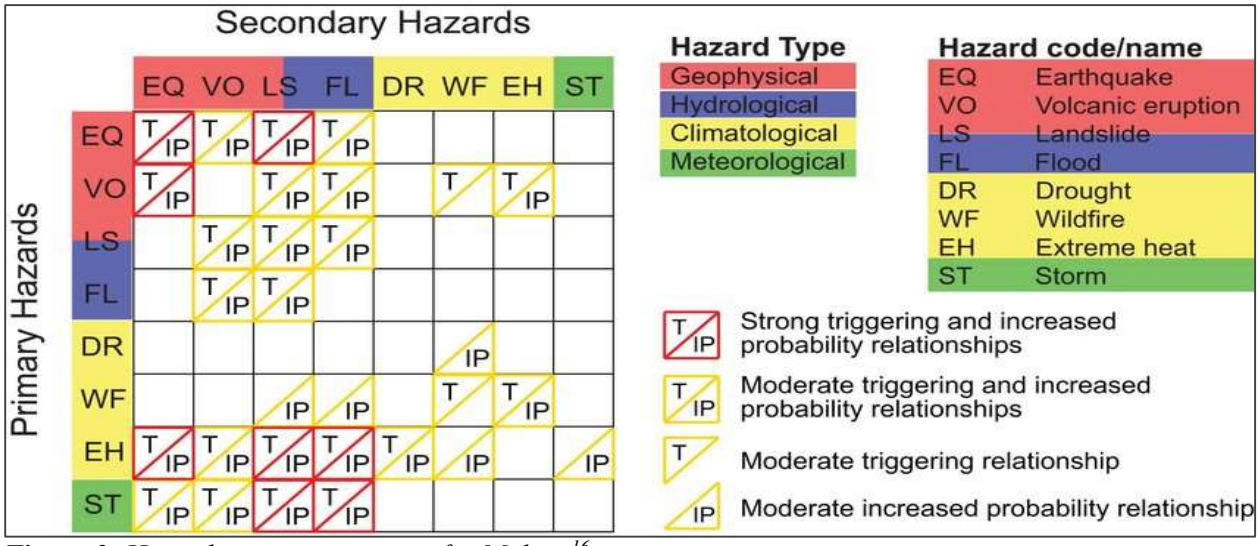


Figure 3: *Hazard interaction matrix for Malawi*[16].

The Hazard Interaction Matrix for Malawi visually demonstrates how multiple climate-related hazards such as floods, droughts, cyclones, landslides, strong winds, and disease outbreaks interact, reinforce one another, and increase overall risk. This aligns closely with observed climate trends in Malawi, which show clear patterns of increasing climatic variability, growing frequency of extreme weather events, and intensifying hydrometeorological shocks.

Over recent decades, Malawi has experienced an increasing number of compound climate events, in which one hazard triggers or amplifies another. For example, extreme rainfall often results in flooding, which in turn increases the likelihood of water contamination, leading to cholera outbreaks and other waterborne

[12] PreventionWeb (2023) *Extreme weather jeopardises Malawi's development goals* :https://www.preventionweb.net/news/extreme-weather-jeopardises-malawis-development-goals
[13] Department of Climate Change and Meteorological Services (Malawi) (2023) *State of the Malawi Climate 2023* :https://www.metmalawi.gov.mw/products/state-of-malawi-climate/state-of-malawi-climate-2023/
[14] Government of Malawi (2023) *Tropical Cyclone Freddy Post-Disaster Needs Assessment* (duplicate of #12). https://malawi.un.org/sites/default/files/2023-06/Tropical%20Cyclone%20Freddy%20Post%20Disaster%20Needs%20Assessment%20Government%20of%20Malawi%20%20April%202023-12_05_2023.pdf
[15] Times Malawi (2023) *Extreme weather jeopardises Malawi's development goals*:https://times.mw/extreme-weather-jeopardises-malawis-development-goals/
[16] *Goda, Katsuichiro. (2025). Compound Multi-hazards & Risk-informed Disaster Management: A Malawi Perspective.*

diseases. Similarly, prolonged droughts reduce water availability, weaken agricultural systems, and contribute to food insecurity, which heightens community vulnerability when intense storms or floods later occur. These cascading risks are clearly illustrated in the matrix, which aligns with long-term climate evidence showing that Malawi is increasingly facing multi-hazard events rather than isolated hazards.

1.5.1.3 Cholera and Other Waterborne Disease Trends in Malawi

Cholera remains a major public health threat in Malawi, and recent outbreak data highlight how climate pressures and weak WASH systems have converged to fuel a severe and prolonged epidemic. The 2022–2023 outbreak has become the worst in Malawi's recorded history: by mid-2024, over 59,000 cases and 1,770 deaths had been reported nationwide[17] [18]. This far exceeds previous major outbreaks, for example, in 1998–1999 and 2001–2002, which reported approximately 25,000 and 33,500 cases, respectively[19].

Traditionally, cholera in Malawi has been seasonal, with outbreaks occurring mostly during the rainy season (November–May), especially in the low-lying, flood-prone southern region[20] However, the ongoing epidemic has disrupted this pattern: cholera transmission persisted through the 2022 dry season (June–October), a period during which cases are rarely reported[21]. The spread of cases beyond the southern region into central and northern districts, including urban centres such as Lilongwe and Blantyre, demonstrates that cholera has become a national threat rather than a regionally restricted risk[22].

Epidemiological and genomic analyses suggest the outbreak was "climate-amplified": flooding and displacement triggered by Tropical Storm Ana (January 2022) and Cyclone Gombe (March 2022) are linked to the re-emergence and spread of Vibrio cholerae in vulnerable communities lacking safe water, sanitation, and hygiene infrastructure[23]. Poor WASH coverage, contaminated water sources, disrupted sanitation, and population movement combined to create ideal conditions for transmission and prolong the epidemic beyond the usual seasonal dynamics.

Beyond cholera, these conditions also elevate risk of other waterborne and hygiene-related diseases (e.g., acute watery diarrhoea, typhoid, dysentery), though comprehensive public data remain limited. The frequency, duration, and severity of the current cholera crisis have placed extraordinary strain on the health system: hospitals and treatment centres reached capacity, routine health services were disrupted, and resources were diverted toward outbreak response and emergency WASH interventions.[24] This unfolding trend underscores the critical importance of strengthening WASH infrastructure, improving water quality monitoring, and implementing climate-resilient, equitable sanitation and hygiene services, especially in flood-prone, lakeshore, peri-urban, and rural communities. Without these investments, Malawi remains highly vulnerable to recurring, climate-amplified waterborne disease outbreaks.

---

[17] Nature Communications (2024) *Article in Nature Communications* https://www.nature.com/articles/s41467-024-50484-w
[18] World Health Organization (2024) *WHO Malawi Annual Report 2024*. WHO Regional Office for Africa. https://www.afro.who.int/sites/default/files/2025-10/WHO%20MALAWI%202024%20ANNUAL%20REPORT_0.pdf
[19] World Health Organization (2022) *Cholera – Malawi: Disease Outbreak News, 5 December 2022 (DON435)*. https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON435
[20] World Health Organization (2022) *Cholera – Malawi: Disease Outbreak News, 15 November 2022 (DON419)*. https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON419
[21] Global Task Force on Cholera Control (2024) *Cholera epidemic in Malawi – Update*. https://www.choleraalliance.org/en/news/cholera-epidemic-malawi-update
[22] World Health Organization (2022) *Cholera – Malawi: Disease Outbreak News, 5 December 2022 (DON435)*. https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON435
[23] World Health Organization (2022) *Cholera – Malawi. Disease Outbreak News: 15 November 2022 (DON419)*.https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON419
[24] World Health Organization (2023) *WHO Malawi Annual Report 2023*. WHO Regional Office for Africa. https://www.afro.who.int/sites/default/files/2024-08/WHO%20Malawi%202023%20Annual%20Report.pdf

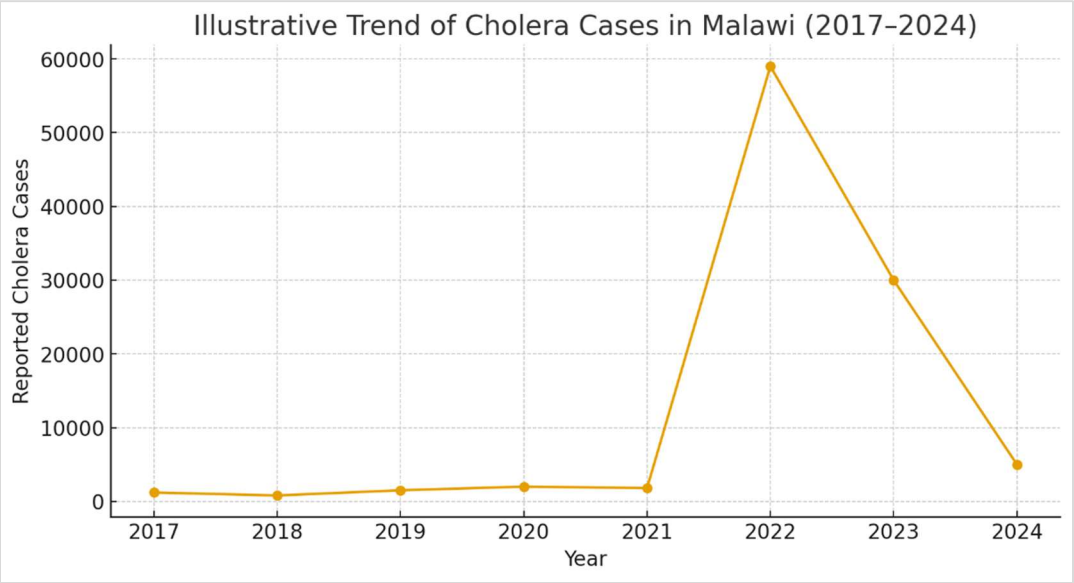


Figure 4: *Trend of Cholera Cases in Malawi (2017–2024)*

The figure illustrates the significant escalation of cholera transmission in Malawi over the 2017–2024 period, culminating in the country's largest and deadliest outbreak on record. Between 2017 and 2021, cholera cases remained relatively low and followed typical rainy-season patterns, with limited transmission during the dry months. This aligns with WHO's historical reporting showing Malawi's cholera profile as seasonal and localized mainly to southern flood-prone districts[25].

In 2022, however, Malawi experienced an unprecedented surge, reporting more than 59,000 cases and 1,770 deaths, far surpassing previous major outbreaks from 1998–1999 and 2001–2002 [26]. This explosive increase coincided with major climate shocks, including Tropical Storm Ana (January 2022) and Cyclone Gombe (March 2022), which caused widespread flooding, WASH infrastructure destruction, and population displacement conditions strongly associated with cholera transmission. Transmission remained unusually high through 2023, with continued spread in both rural and urban districts, marking a shift from localized, seasonal outbreaks to nationwide, multi-season transmission. Epidemiological assessments indicate that the 2022–2023 outbreak was "climate-amplified," driven by extreme weather events, water contamination, and disrupted sanitation systems[27]. By 2024, cases declined but remained above pre-2022 levels, reflecting the persistent vulnerability of Malawi's WASH systems and the need for climate-resilient water and sanitation infrastructure.

1.5.1.4 Health System, Climate-Sensitive Diseases and Vulnerabilities

Malawi's health system faces significant structural and resource constraints that limit its capacity to prevent, detect, and respond to climate-sensitive diseases. The country operates a decentralized health system with primary care delivered through health posts, health centres, and district hospitals; however, many facilities lack reliable water, sanitation, electricity, and climate-resilient infrastructure. According to the Malawi Harmonized Health Facility Assessment (2022), only 61% of facilities had access to an improved water source on premises, and fewer than 40% had functional hand-washing stations across all service areas (MoH

[25] World Health Organization (2022) *Cholera – Malawi: Disease Outbreak News, 27 October 2022 (DON372)*. https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON372

[26] World Health Organization (2023) *Multi-country outbreak of cholera: Situation Report 3 (22 May 2023)*. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20230522_multi-country_outbreak-of-cholera_sitrep-3.pdf

[27] Centers for Disease Control and Prevention (2025) *Emerging Infectious Diseases: Vol. 31, Issue 6*. https://wwwnc.cdc.gov/eid/article/31/6/24-0930_article

Malawi, HHFA 2022). These gaps heighten vulnerability during climate shocks, when health service demand increases and WASH infrastructure is often disrupted.

Climate-sensitive diseases, particularly cholera, acute watery diarrhoea, malaria, schistosomiasis, typhoid fever, and vector-borne viral infections, remain major public health challenges. Flooding, heavy rainfall, and contamination of surface water significantly increase the incidence of cholera and diarrhoeal diseases, which consistently rank among the top causes of outpatient visits and under-five mortality in Malawi [28] The unprecedented 2022–2023 cholera outbreak, exacerbated by Tropical Storm Ana and Cyclone Gombe, exposed how climate extremes can rapidly overwhelm disease surveillance, laboratory capacity, and treatment centres[29]

Malaria transmission also shows strong sensitivity to climatic variability. Changes in temperature, humidity, and rainfall patterns alter mosquito breeding and survival. Malawi continues to record a high malaria burden, accounting for 3% of global malaria cases and 2% of global malaria deaths[30]. Increased rainfall intensity and prolonged wet seasons have expanded breeding sites, especially in southern low-lying districts such as Nsanje, Chikwawa, and Mangochi. These districts also face repeated flooding, which damages homes and displaces populations, increasing exposure to vectors.

The health system's vulnerability is further exacerbated by chronic shortages of skilled personnel, limited supply chain reliability, and inadequate emergency preparedness capacity. Malawi has approximately 0.12 physicians and 0.34 nurses/midwives per 1,000 population, far below the WHO's recommended threshold[31]. During recent climate-related emergencies, health facilities reported stockouts of essential supplies, challenges in maintaining cold chains, and limited surge capacity for emergency care. Moreover, climate change threatens to reverse gains in child and maternal health by increasing undernutrition, water insecurity, and exposure to disease. Recurrent droughts and erratic rainfall contribute to food insecurity, which affects over 20% of households annually[32]. Undernourished children are more susceptible to infections, compounding the impacts of climate-sensitive diseases. Taken together, Malawi's health system remains highly vulnerable to climate shocks that increase disease burden, disrupt service delivery, damage infrastructure, and strain already limited resources. Strengthening climate-resilient WASH services, early warning systems, and emergency preparedness is critical to reducing future health risks.

1.5.1.5 Climate Change and Health Policy

Malawi has made important strides in integrating climate change considerations into national development, health, and WASH policies; however, significant implementation gaps persist due to limited institutional capacity, financing constraints, and weak cross-sectoral coordination. The overarching framework guiding climate action is the Malawi National Climate Change Management Policy (2016), which identifies health, water, and sanitation as climate-sensitive sectors requiring targeted adaptation measures. The policy emphasizes the need to strengthen surveillance systems, climate-resilient infrastructure, and community-level resilience.

In the health sector specifically, the Malawi Health Sector Strategic Plan II (HSSP II, 2017–2022) and the newly adopted HSSP III (2023–2030) acknowledge climate-sensitive diseases such as malaria, diarrhoeal diseases, cholera, and undernutrition as major threats to national health outcomes. These documents outline commitments to improve early warning systems, integrate climate information into disease surveillance,

[28] *Ibid.* (refers to footnote 26)https://www.afro.who.int/sites/default/files/2024-08/WHO%20Malawi%202023%20Annual%20Report.pdf
[29] World Health Organization Regional Office for Africa (2023) *Tropical storms, flooding and cholera: Malawi faces cholera emergency amidst severe weather*. https://www.afro.who.int/photo-story/tropical-storms-flooding-and-cholera-malawi-faces-cholera-emergency-amidst-severe
[30] MDPI (2023) *Atmosphere Journal – Article 16(1):71*. https://www.mdpi.com/2073-4433/16/1/71
[31] PMC (2014) *Article in Journal of Infectious Diseases* (see webpage for full title). https://pmc.ncbi.nlm.nih.gov/articles/PMC3974437/
[32] PMC (2024) *Article in Journal of Global Health* (full title available on webpage): https://pmc.ncbi.nlm.nih.gov/articles/PMC12258551/

and enhance preparedness for climate-induced public health emergencies[33] . However, the Ministry of Health continues to face chronic human resource and financing limitations that hinder the operationalization of these climate-related priorities. Malawi is also a signatory to key international climate and health frameworks, including the Paris Agreement, the WHO Health and Climate Change Global Action Agenda, and the SADC Regional Climate Change Strategy. In alignment with these commitments, the country developed its National Adaptation Plan (NAP), finalized in 2020, which identifies health as a priority sector. The NAP highlights climate-sensitive diseases, malnutrition, water security, and sanitation as key vulnerabilities requiring urgent adaptation investments[34]

In the WASH sector, the National Water Policy (2018) and the National Sanitation and Hygiene Policy (2018) underscore the importance of climate-resilient water supply systems, water quality monitoring, and sustainable sanitation services. Both policies call for increased investment in disaster-resilient WASH infrastructure, including flood-safe sanitation systems and drought-resistant water technologies. UNICEF's WASH sector assessments, however, show that implementation remains uneven due to fragmented responsibilities across ministries, insufficient financing, and limited technical capacity at district and local council levels.[35]Despite this solid policy foundation, the relationship between climate change and health is not yet fully mainstreamed across government systems. Many district councils lack climate adaptation plans, and coordination among the Ministry of Health, the Department of Water Resources, the Department of Climate Change and Meteorological Services, and the Department of Disaster Management Affairs (DoDMA) remains limited. Recent climate-induced emergencies, such as Cyclone Freddy (2023), revealed gaps in risk communication, early warning dissemination, and emergency response. To strengthen climate-health governance, Malawi requires more robust financing mechanisms, improved intersectoral coordination, enhanced data-sharing systems, and capacity building for climate-resilient WASH and health services. These measures are essential for translating national climate policies into effective local action and reducing vulnerabilities across communities.

1.5.2 MOZAMBIQUE

1.5.2.1 Socio-Economic Context and Vulnerabilities

Mozambique is one of the most climate-vulnerable and economically constrained countries in Southern Africa, with socio-economic challenges that significantly heighten vulnerability to climate-induced WASH and health risks. The country ranks among the world's lowest on the Human Development Index 185 out of 193 countries in 2023, reflecting persistent poverty, limited human capital, and systemic service delivery gaps.[36]

A large share of livelihoods depends on subsistence agriculture, fisheries, and informal labour, sectors that are highly sensitive to climatic variability. More than 70% of households rely on rain-fed agriculture, making them highly exposed to droughts, floods, and cyclones[37]. Climate shocks routinely destroy crops, livestock, and fishing assets, resulting in food insecurity, reduced incomes, and long-term losses in household resilience. According to the World Food Programme, an estimated 1.8–2.5 million people require food assistance annually due to recurring climate events (WFP Mozambique Food Security Update 2023).

Urbanization has accelerated, but much of it occurs in unplanned, high-risk settlements with inadequate WASH infrastructure. Cities such as Beira, Quelimane, and Nampula host dense informal settlements with

[33]Government of Malawi (2017) *Health Sector Strategic Plan II (2017–2022)*:https://extranet.who.int/countryplanningcycles/sites/default/files/planning_cycle_repository/malawi/health_sector_strategic_plan_ii_030417_smt_dps.pdf

[34] NAP Global Network (2019) *Malawi gears up for its climate change adaptation* https://napglobalnetwork.org/2019/09/malawi-gears-up-for-its-climate-change-adaptation/

[35] World Health Organization (2023) *WHO WASH–Climate Change–Health Strategy (Draft)*. https://cdn.who.int/media/docs/default-source/wash-documents/who-wash_climate-change_health-strategy_draft.pdf?sfvrsn=dcf85c42_3

[36] UNDP (n.d.) *Mozambique – Adaptation Actions Overview*. https://www.adaptation-undp.org/explore/africa/mozambique

[37] FAO (n.d.) *EPIC Programme: Mozambique Country Overview*. https://www.fao.org/in-action/epic/countries/moz/en/

unreliable water supply, limited sanitation coverage, and poor drainage systems, conditions that exacerbate vulnerability during floods and cyclones. UNICEF reports that only 32% of Mozambicans have access to basic sanitation, while 39% rely on unimproved water sources, with significant disparities between urban and rural areas (UNICEF WASH Snapshot Mozambique, 2022).

Mozambique's location along a 2,700-km coastline exposes it to some of the most intense and frequent cyclones in Africa. Catastrophic events such as Cyclones Idai and Kenneth (2019), Cyclone Eloise (2021), and Cyclone Freddy (2023) caused widespread destruction, displacement, and severe disruption to water and sanitation systems. Cyclone Idai alone affected 3 million people and displaced more than 478,000, disproportionately impacting the poorest communities living in low-lying areas and floodplains (World Bank Post-Disaster Needs Assessment, 2019). Recurrent displacement erodes assets, increases dependence on humanitarian relief, and deepens socio-economic fragility.

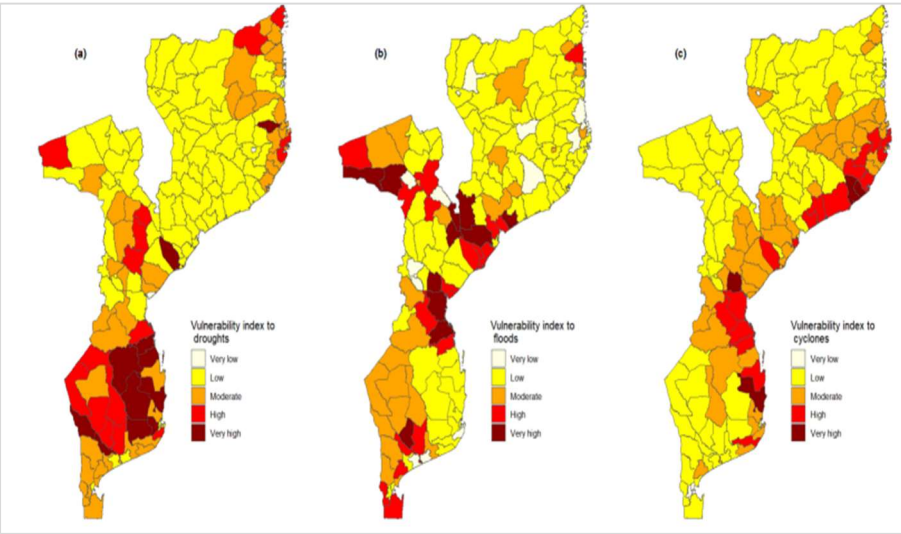


Figure 5: *Mozambique's Vulnerability Index to droughts, floods, and Cyclones (1979-2019)*

Gendered vulnerabilities further intensify climate impacts. Women and girls bear the primary responsibility for water collection, often travelling long distances to access unsafe sources during droughts or after infrastructure damage. This increases exposure to violence, reduces school attendance for girls, and amplifies labour burdens. Overall, Mozambique's socio-economic landscape, characterized by high poverty, fragile livelihoods, rapid urbanization, and unequal access to basic services, magnifies the impacts of climate change on WASH and health systems. Strengthening climate-resilient WASH services is therefore essential to protect vulnerable populations and reduce long-term socio-economic risks.

1.5.2.2 Observed Climate Trends and Projections

Mozambique's climate is characterized by high variability and exposure to multiple hydrometeorological hazards, such as tropical cyclones, storm surges, riverine and flash floods, and recurrent droughts that have increased in frequency and intensity over recent decades. The country's long coastline and extensive river basins (notably the Zambezi and Pungwe) place large populations and critical infrastructure at risk from storm surge and flooding; catastrophic events such as Cyclone Idai (2019) and Cyclone Freddy (2023) illustrate the scale and destructive potential of these hazards, with Idai alone causing multi-billion-dollar losses and affecting millions of people[38].

[38] GFDRR (2019) *Mozambique Cyclone Idai: Post-Disaster Needs Assessment (PDNA)*. https://www.gfdrr.org/en/publication/mozambique-cyclone-idai-post-disaster-needs-assessment-full-report-2019

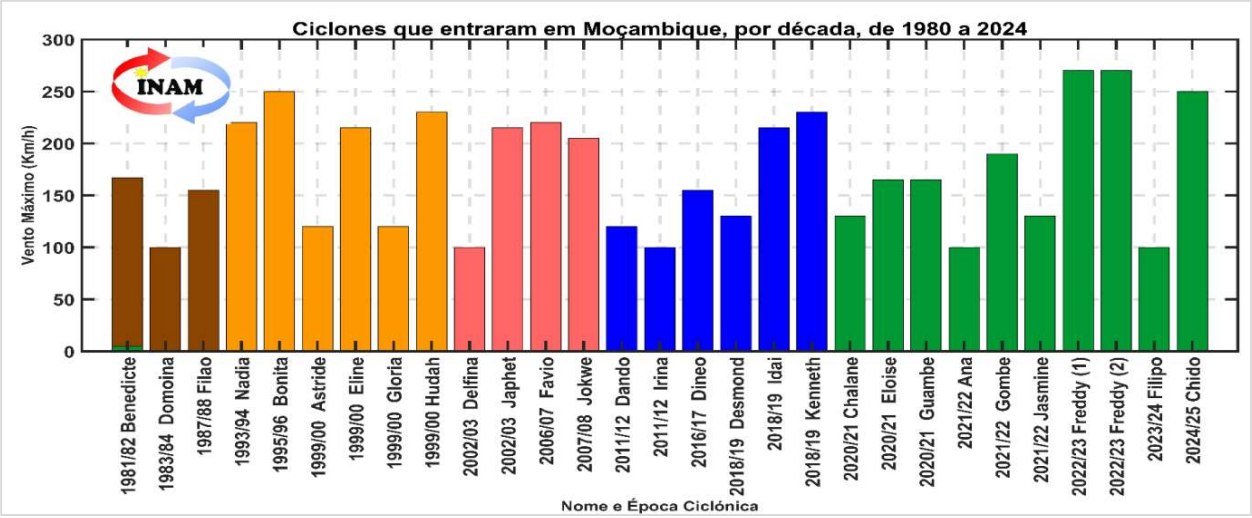


Figure 6: *Cyclone occurrence in Mozambique 1980-2025*

Observed trends show an increase in rainfall extremes and compound events in many parts of Mozambique. Analyses and forensic reviews of recent cyclones indicate unusually high rainfall accumulations over short periods. Freddy deposited months' worth of rain in days across some provinces, leading to unprecedented flooding even in areas not traditionally flood-prone. These compound events (e.g., back-to-back cyclones, or drought followed by intense rainfall) amplify impacts on water and sanitation systems and challenge conventional disaster response capacities[39] [40].

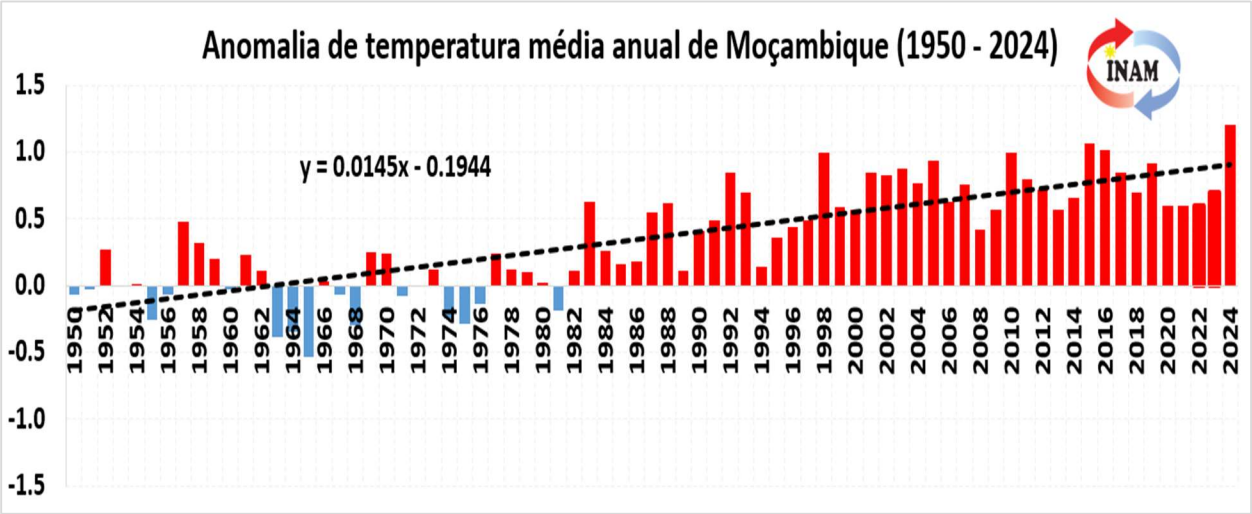


Figure 7: *Mozambique average annual temperature from 1950 to 2024.*

Climate projections for Mozambique point to continued increases in climate variability and extremes: models indicate greater seasonal rainfall variability, a higher likelihood of intense precipitation events, and sea-level rise that will exacerbate coastal flooding and erosion. Projected changes threaten hydropower reliability (which supplies most of the country's electricity), agricultural productivity, and the performance

[39] UNDRR (2023) *Southern Africa Cyclone 2023 – Forensic Analysis Report*. https://www.undrr.org/resource/southern-africa-cyclone-2023-forensic-analysis

[40] OCHA (2023) *Mozambique Response Plan: Cyclone Freddy, Floods and Cholera (March–September 2023)*. https://humanitarianaction.info/plan/1153/article/mozambique-response-plan-cyclone-freddy-floods-cholera-march-september-2023

of water and sanitation infrastructure unless resilience measures are implemented. The World Bank Climate Knowledge Portal and related country assessments emphasise rising flood and drought risk under a warming climate, with significant implications for WASH service continuity[41] [42].

The IPCC's assessment of weather and climate extremes reinforces these country-level findings: tropical cyclone rainfall intensity and the probability of compound and concurrent extremes are expected to increase in many regions, including the western Indian Ocean and southern Africa, elevating the frequency of events that can damage WASH infrastructure and trigger waterborne disease outbreaks[43]. Taken together, observed events and projections indicate that Mozambique will face more frequent, intense, and compound hydrometeorological hazards that will stress water resources, degrade sanitation systems, contaminate drinking water sources, and heighten the risk of climate-amplified disease outbreaks. These trends underscore the urgent need for climate-resilient WASH investments particularly in coastal, riverine, and rapidly urbanizing areas to reduce exposure and safeguard public health[44].

1.5.2.3 Cholera and other waterborne disease trends in Mozambique

Mozambique has experienced a major resurgence of cholera since late 2022, with outbreaks amplified by extreme weather, population displacement, and long-standing WASH gaps. Between September 2022 and early 2023, Mozambique reported more than 43,000 cholera cases in what UNICEF described as the largest outbreak in the country in 25 years, affecting dozens of districts across multiple provinces[45] [46].

Over the course of 2023, cholera transmission remained widespread and intensified following successive climate shocks, including heavy rains, flooding and the passage of Cyclone Freddy, which expanded the geographic spread of cases to most provinces; by the end of 2023 cumulative reports indicated ~38,000–40,000 cases and more than 150 deaths in the country that year[47]. The outbreak's timing and scale are clearly linked to hydrometeorological hazards: flooding and infrastructure damage increase contamination of water sources, overwhelm sanitation systems, and force displacement to overcrowded settlements where transmission accelerates[48].

Beyond cholera, Mozambique regularly contends with other waterborne and hygiene-related diseases acute watery diarrhoea, typhoid, and dysentery that surge after flooding and during protracted rainy seasons. The country's limited access to safely managed water and sanitation, especially in rural areas and informal urban settlements, creates persistent exposure pathways for these pathogens and constrains outbreak prevention. UNICEF and WHO reporting emphasize that inadequate water quality monitoring, low sanitation coverage, and disruptions to services during disasters are consistent drivers of recurrent waterborne disease outbreaks[49] [50].

---

[41] World Bank (2023) *Mozambique Country Climate Profile*. https://climateknowledgeportal.worldbank.org/sites/default/files/country-profiles/17258-WB_Mozambique%20Country%20Profile-WEB.pdf

[42] World Bank Climate Knowledge Portal (2024) *Mozambique: Sea Level Rise Projections*. https://climateknowledgeportal.worldbank.org/country/mozambique/sea-level-projections

[43] IPCC (2021) *Sixth Assessment Report (AR6), Working Group I – Chapter 11: Extreme Events in a Changing Climate*. https://www.ipcc.ch/report/ar6/wg1/chapter/chapter-11/

[44] *Ibid.* (refers to footnote 41)https://www.gfdrr.org/en/publication/mozambique-cyclone-idai-post-disaster-needs-assessment-full-report-2019

[45] UNICEF Mozambique (2024) *Cholera Update – January 2024*. https://www.unicef.org/mozambique/en/reports/mozambique-cholera-update-january-2024

[46] ReliefWeb (2024) *Mozambique: Cholera Update – Cholera Cases Continue to Rise During Rainy Season (31 Jan 2024)*. https://reliefweb.int/report/mozambique/mozambique-cholera-update-cholera-cases-continue-lead-rainy-season-31-jan-2024

[47] UNICEF (2023) *Mozambique Humanitarian Situation Report No. 12 (Jan–Dec 2023)*. https://www.unicef.org/media/152136/file/Mozambique-Humanitarian-SitRep-No.12-%28End-of-Year%29-January-to-December-2023.pdf

[48] World Health Organization Africa Regional Office. (n.d.) *Tropical cyclones Idai and Kenneth — Mozambique national situation report 7*. https://www.afro.who.int/publications/tropical-cyclones-idai-and-kenneth-mozambique-national-situation-report-7

[49] United Nations Children's Fund (UNICEF). (2024) *Mozambique Humanitarian SitRep No. 12 (End-of-Year) January to December 2023*. https://www.unicef.org/media/152136/file/Mozambique-Humanitarian-SitRep-No.12-%28End-of-Year%29-January-to-December-2023.pdf

[50] United Nations Children's Fund (UNICEF). (2024) *Cholera outbreak in Eastern and Southern Africa 2024*. https://www.unicef.org/esa/reports/cholera-outbreak-eastern-and-southern-africa-2024

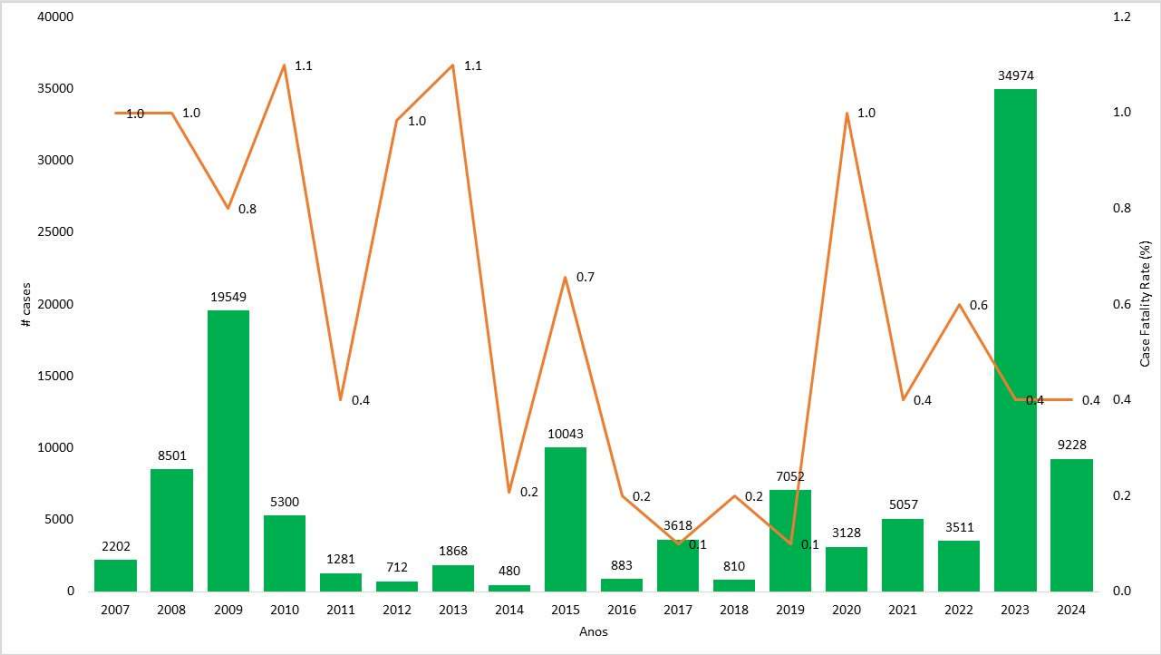


Figure 8: *Cholera trends in Mozambique from*

Surveillance and response capacity have improved in some districts but remain uneven; timely laboratory confirmation, water-quality testing, and rapid deployment of WASH-in-emergency measures are frequently challenged by damaged roads, communication breakdowns, and resource constraints following cyclones and floods. These operational limitations slow case detection and containment in remote and high-risk coastal and riverine districts, contributing to sustained transmission cycles.[51]Taken together, epidemiological trends and operational reports indicate that Mozambique's waterborne disease burden is increasingly climate-sensitive and spatially widespread. This underscores the urgent need for investments in climate-resilient WASH infrastructure, strengthened water-qua lity surveillance and laboratory networks, and pre-positioned emergency WASH supplies to reduce outbreak risk and improve rapid response capacity in flood- and cyclone-prone provinces[52].

1.5.2.4 Health system, climate-sensitive diseases and vulnerabilities

Mozambique's health system has improved in recent years, but it remains vulnerable to climate shocks due to gaps in infrastructure, workforce distribution, supply chains, and WASH services within health facilities. Primary care is delivered through a network of health posts, centres, and hospitals, yet many facilities lack reliable water, sanitation, waste management, and energy systems, constraints that are acute in rural and cyclone-affected provinces and that undermine infection prevention and control (IPC) during emergencies. Large cyclones such as Idai (2019) and Freddy (2023) caused widespread damage to health infrastructure and disrupted service delivery, demonstrating how extreme events can rapidly erode system functionality and surge demand for emergency care[53]. Climate-sensitive diseases, particularly cholera and other acute watery diarrhoeas, typhoid, dysentery, and vector-borne infections such as malaria, remain persistent threats that are closely linked to hydrometeorological hazards.

[51] Bandeira, T., Neto, A., Silva, J. et al. (2020) 'Clinical and epidemiological characteristics of patients with COVID-19 in Mozambique' [online]. *PMC* (PMC7298796). https://pmc.ncbi.nlm.nih.gov/articles/PMC7298796/

[52] United Nations Children's Fund (UNICEF). (2024) *Mozambique cholera update, January 2024*. https://www.unicef.org/mozambique/en/reports/mozambique-cholera-update-january-2024

[53]United Nations Development Programme (UNDP). (2019) *PDNA Mozambique Cyclone Idai: Post-Disaster Needs Assessment – Executive Summary* https://www.undp.org/sites/g/files/zskgke326/files/publications/PDNA%20Mozambique%20Cyclone%20Idai%20-%20Post-Disaster%20Needs%20Assessment_Executive%20Summary.pdf

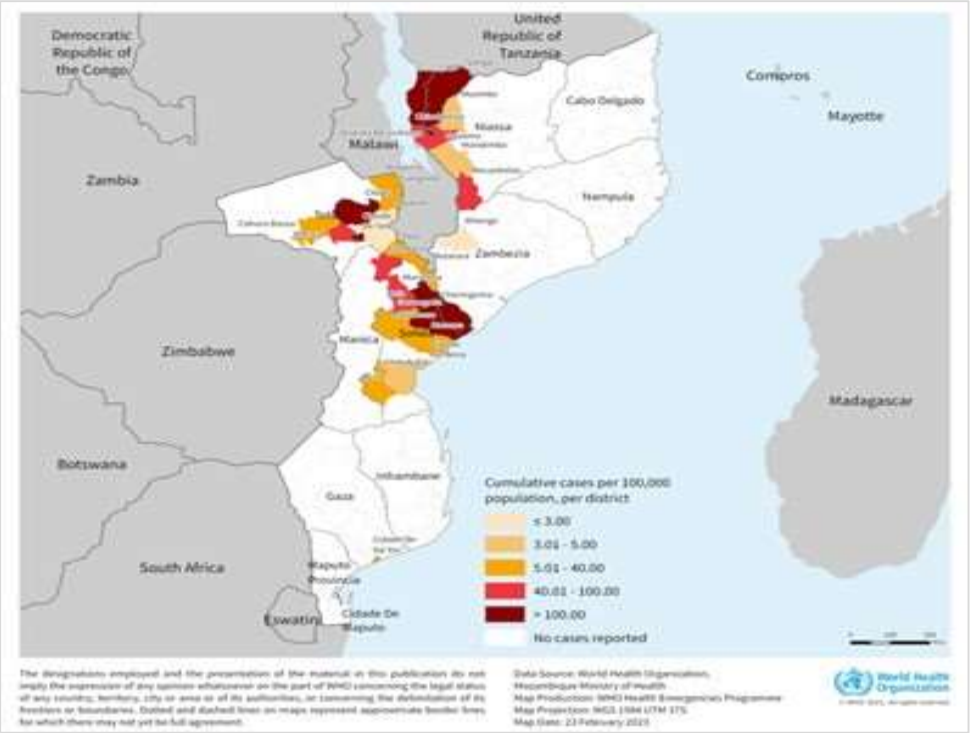


Figure 9: *Cholera Cases in Mozambique 2022 - 2023*

The 2022–2023 cholera resurgence (≈38,879 reported cases and 153 deaths nationally in the outbreak period) was explicitly amplified by heavy rains, flooding, and cyclone-related infrastructure damage that contaminated water sources and increased population displacement and overcrowding. These conditions overwhelmed routine surveillance, laboratory confirmation, and WASH-in-emergency responses in many provinces[54].

Operational vulnerabilities further compound epidemiological risks. Surveillance capacity and laboratory networks vary sub-nationally, with delays in case confirmation and limited routine water-quality monitoring in remote or flood-affected districts. Health supply chains and cold-chain systems are frequently disrupted after extreme weather, leading to stockouts of essential medicines, oral rehydration salts, and WASH supplies impairing timely case management and community outreach. Community health worker networks have expanded and provide important frontline capacity, but they require stronger integration with EWARS (early warning and response systems), climate information services, and pre-positioned WASH stocks to be effective in multi-hazard scenarios[55].

Social and contextual drivers magnify vulnerability. Recurrent displacement from cyclones and floods forces households into temporary, crowded shelters with inadequate sanitation, elevating transmission risks. Urbanization in high-risk coastal and riverine cities has produced dense informal settlements with poor drainage and limited sanitation, creating persistent hotspots for waterborne disease transmission.

In summary, Mozambique's health system is exposed to a cycle in which climate extremes damage WASH and health infrastructure, drive displacement and overcrowding, and trigger climate-amplified outbreaks that strain limited surveillance, laboratory and service capacities. Closing these gaps requires targeted

[54] World Health Organization (WHO). (2023) *Cholera – Mozambique*. Disease Outbreak News, 24 February. https://www.who.int/emergencies/disease-outbreak-news/item/2023-DON443

[55] World Health Organization (WHO). (2020) *Inter-Agency Humanitarian Evaluation of the Response to Cyclone Idai in Mozambique – Final Report*. https://www.who.int/docs/default-source/documents/evaluation/iahe-mozambique-final-report.pdf

investments in climate-resilient WASH in health facilities and communities, strengthened surveillance and laboratory networks, secure supply chains and pre-positioned emergency WASH supplies, and enhanced integration between health, WASH, meteorological and disaster management systems[56].

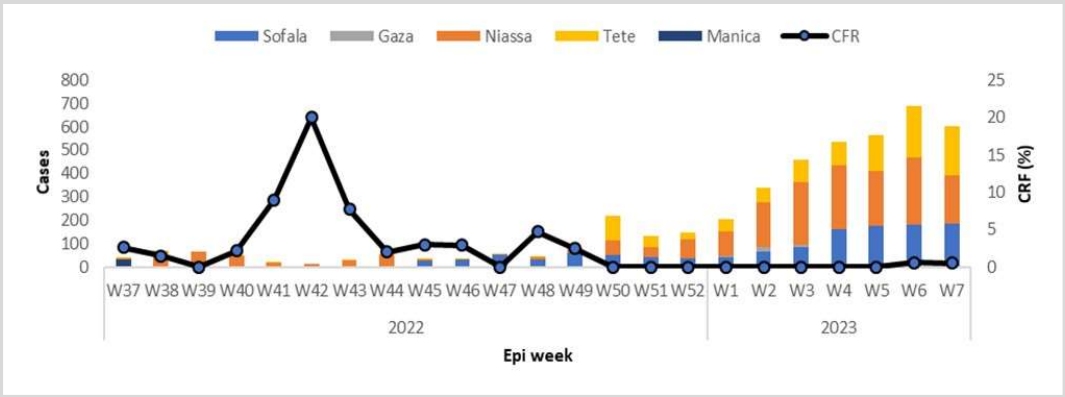


Figure 10: *Cholera cases reported by week and province in Mozambique from 14 September 2022 to 19 February 2023*

1.5.2.5 Climate Change and Health Policy

Mozambique has developed a comprehensive set of national policy instruments recognizing the health risks of climate change and the need for adaptation across water, sanitation and health sectors. The country's National Adaptation Plan (NAP) and related climate strategy documents provide an overarching framework that identifies health and WASH as priority sectors for adaptation action and calls for strengthened surveillance, resilient infrastructure, and community-level risk reduction measures[57].

At the sectoral level, the Ministry of Health's strategic planning documents and national health sector policies (PESS / Health Sector Strategic Plans) increasingly reference climate-sensitive diseases and the need to integrate climate information into health planning and emergency preparedness. Pilot initiatives and WHO-supported projects launched since 2018 have sought to build the ministry's capacity to monitor climate risks, integrate early-warning signals into health surveillance, and coordinate multisectoral response mechanisms. These efforts have improved institutional awareness and generated practical tools for health adaptation, though coverage remains patchy across provinces[58]. Mozambique has also invested in national vulnerability and adaptation assessments for the health sector, producing district-level analyses that identify priority hazards, vulnerable populations, and adaptation needs. These vulnerability assessments form an evidence base for the NAP and for targeted interventions such as strengthening water-quality monitoring, bolstering laboratory networks, and climate-proofing health-care facilities in cyclone- and flood-prone districts[59].

Despite policy progress, major implementation gaps persist. Key constraints include limited domestic financing for climate-resilient health and WASH infrastructure, weak subnational operational capacity to translate national plans into local investments, fragmented data-sharing between meteorological services and health authorities, and uneven laboratory and surveillance capacity across provinces. Recurrent

[56]United Nations Development Programme (UNDP). (2019) *PDNA Mozambique Cyclone Idai: Post-Disaster Needs Assessment – Executive Summary*. https://www.undp.org/sites/g/files/zskgke326/files/publications/PDNA%20Mozambique%20Cyclone%20Idai%20-%20Post-Disaster%20Needs%20Assessment_Executive%20Summary.pdf

[57] Government of Mozambique. (2023) *National Adaptation Plan — Mozambique*. United Nations Framework Convention on Climate Change (UNFCCC). https://unfccc.int/sites/default/files/resource/National_Adaptation_Plan_Mozambique.pdf

[58] World Health Organization (WHO). (2021) *Mozambique: WHO country story*. https://www.who.int/about/accountability/results/who-results-report-2020-mtr/country-story/2021/mozambique

[59]ATACH Community. (2020) *Mozambique Vulnerability Assessment 2020, Part 1*. https://www.atachcommunity.com/fileadmin/uploads/atach/Documents/Country_documents/Mozambique_VA_2020_Pt1.pdf

cyclones and floods further erode institutional continuity, divert resources to emergency response, and expose weaknesses in maintenance and supply chains, limiting the practical impact of policy commitments[60].

Mozambique is incorporating climate services for health into national forecasting mechanisms and has piloted district-level early warning systems that combine meteorological data with epidemiological surveillance. Strengthening these climate-health interfaces, scaling up WASH-in-health-facility investments, and securing predictable adaptation financing would enable Mozambique to operationalize policy commitments and reduce climate-amplified disease risk. The proposed Adaptation Fund investment, focused on climate-resilient WASH, strengthened surveillance, and multisector coordination, directly aligns with the NAP priorities and would accelerate translation of policy into sustained, locally implemented resilience measures[61].

1.5.3 ZAMBIA

1.5.3.1 Socio-economic context and vulnerabilities

Zambia is a lower-middle-income country with persistent multidimensional poverty, high rural dependency on rain-fed agriculture, and large vulnerable urban populations in informal settlements, factors that increase sensitivity to climate shocks and water-related health risks. Poverty and limited public finance constrain household and public investment in resilient WASH infrastructure, while uneven service delivery leaves many communities dependent on unprotected water sources and inadequate sanitation. Rural livelihoods remain heavily dependent on smallholder agriculture and rain-fed cropping, making households highly exposed to droughts and rainfall variability that reduce incomes and coping capacity. Zambia's recent droughts (linked to El Niño and longer-term climate change) have undermined food security and household resilience across multiple provinces, forcing emergency assistance and increasing pressure on WASH and health systems[62].

Urbanization has produced dense peri-urban settlements with limited sanitation, unreliable piped water, and poor drainage conditions that become acute during heavy rains and floods, creating hotspots for waterborne disease transmission. National budget and sector analyses indicate declining WASH budget shares in recent years and constrained public maintenance funding has left many rural water points non-functional or poorly managed, further exacerbating vulnerability to climate shocks[63]. Gender and social inequalities amplify climate impacts: women and girls typically shoulder water collection and household hygiene duties, increasing exposure when water sources are distant or contaminated; children, persons with disabilities and displaced households face disproportionate health risks during climate events. These socio-economic and demographic patterns justify targeted, equity-focused investments in climate-resilient WASH services, prioritizing rural, peri-urban, and drought/flood-affected districts to reduce shock exposure and build adaptive capacity[64].

1.5.3.2 Observed climate trends and projections

Zambia's climate is becoming increasingly variable and extreme, with observable trends toward more intense heat, shifts in seasonal rainfall, and increases in both drought and intense short-duration precipitation events across the country.

---

[60] Nweti, J. (2024) *Health Sector Financing Strategy Mozambique: Policy Note*. Wemos. https://www.wemos.org/wp-content/uploads/2024/08/Nweti_Policy-Note_Health-Sector-Financing-Strategy-Mozambique_2024.pdf

[61] ClimaHealth. (2025) 'Impact of climate on health in Mozambique', *ClimaHealth Journal*, [online PDF]. https://climahealth.info/wp-content/uploads/2025/06/1-s2.0-S2667278224000713-main.pdf

[62] Reuters. (2024) *World Bank approves $208 million Zambia drought response*. https://www.reuters.com/world/africa/world-bank-approves-208-million-zambias-drought-response-2024-07-02/

[63] United Nations Children's Fund (UNICEF). (2023) *Zambia Budget Brief: WASH 2023*. https://www.unicef.org/esa/media/12586/file/UNICEF-Zambia-Budget-Brief-WASH-2023.pdf

[64] United Nations Children's Fund (UNICEF). (2023) *Zambia Budget Brief: WASH 2023*. https://www.unicef.org/esa/media/12586/file/UNICEF-Zambia-Budget-Brief-WASH-2023.pdf

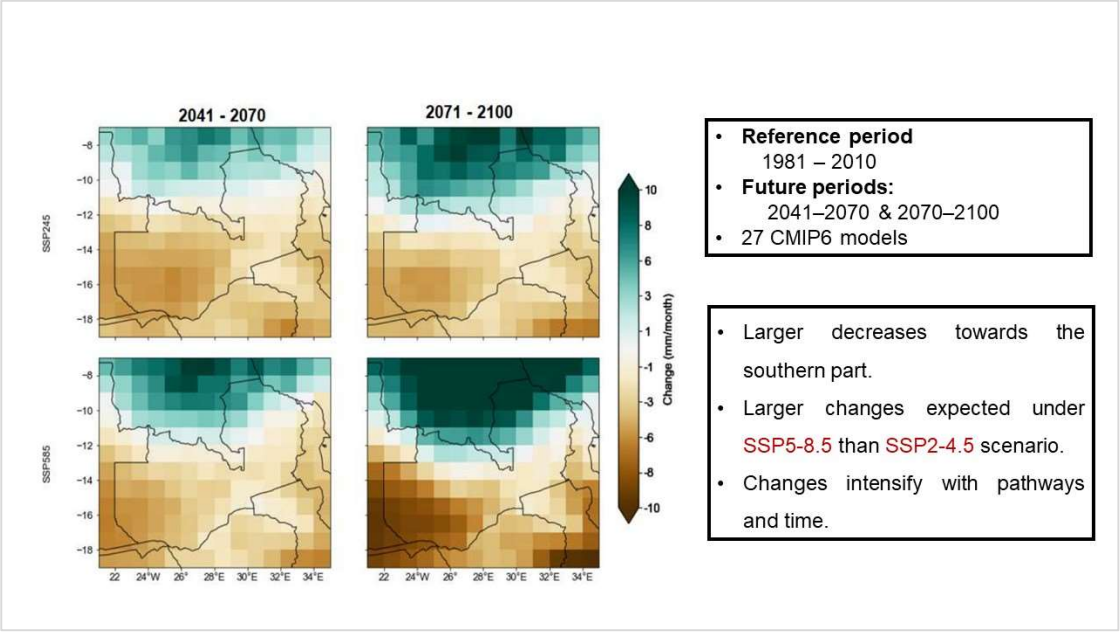


Figure 11: *Zambia's project annual changes in precipitation*

Historical and CMIP6 model projections compiled by the World Bank's Climate Knowledge Portal indicate rising mean temperatures across Zambia and changes in precipitation patterns that increase drought risk in southern and western provinces while producing stronger episodic rainfall in others[65]. The country has experienced severe, repeated drought episodes and hydrometeorological shocks in recent years. The 2023–2024 regional drought severely affected Zambia's agricultural production and water availability, prompting the Government to declare states of disaster in multiple provinces and mobilize emergency support for millions of affected people. These events are linked to El Niño variability amplified by background warming, and they have immediate consequences for water supply reliability and sanitation functioning[66].

Zambia's National Adaptation Plan (NAP) and related climate assessments recognize both observed changes and future projections: models indicate increases in average annual temperature, a higher likelihood of extreme heat days, and greater inter-annual rainfall variability, with implications for both drought frequency and flood risk in river basins such as the Kafue and Zambezi tributaries. These projected trends are expected to stress water resources, reduce groundwater recharge in some regions, and increase the incidence of both water scarcity and extreme runoff events that damage WASH infrastructure[67].Taken together, observations and projections indicate a need for diversified water resources management, climate-proofed WASH infrastructure (drought-tolerant supplies, flood-safe sanitation), and improved climate services integrated with public health early-warning systems to reduce future climate-related disease risk and infrastructure fragility[68].

[65]World Bank. (2024) *Zambia: Climate Data and Projections*. Climate Knowledge Portal. https://climateknowledgeportal.worldbank.org/country/zambia/climate-data-projections
[66] Reuters. (2024) *World Bank approves $208 million Zambia's drought response*. https://www.reuters.com/world/africa/world-bank-approves-208-million-zambias-drought-response-2024-07-02/
[67] United Nations Framework Convention on Climate Change (UNFCCC). (2023) *Zambia National Adaptation Plan 2023*. https://unfccc.int/sites/default/files/resource/NAP-Zambia-2023.pdf
[68] World Health Organization (WHO) Regional Office for Africa. (n.d.) *Cholera – WHO African Region*. https://climateknowledgeportal.worldbank.org/country/zambia/climate-data-projections

1.5.3.3 Cholera and other waterborne disease trends in Zambia

In recent years Zambia has experienced significant cholera activity as part of the broader 2022–2024 Southern Africa cholera wave; outbreaks in 2023–2024 centered initially in eastern and northern districts and later spread to urban centres, including Lusaka. National reporting and regional WHO summaries show that Zambia recorded thousands of cholera cases during this period, with high case-fatality ratios in some districts reflecting delays in care-seeking and overstretched response capacity[69].

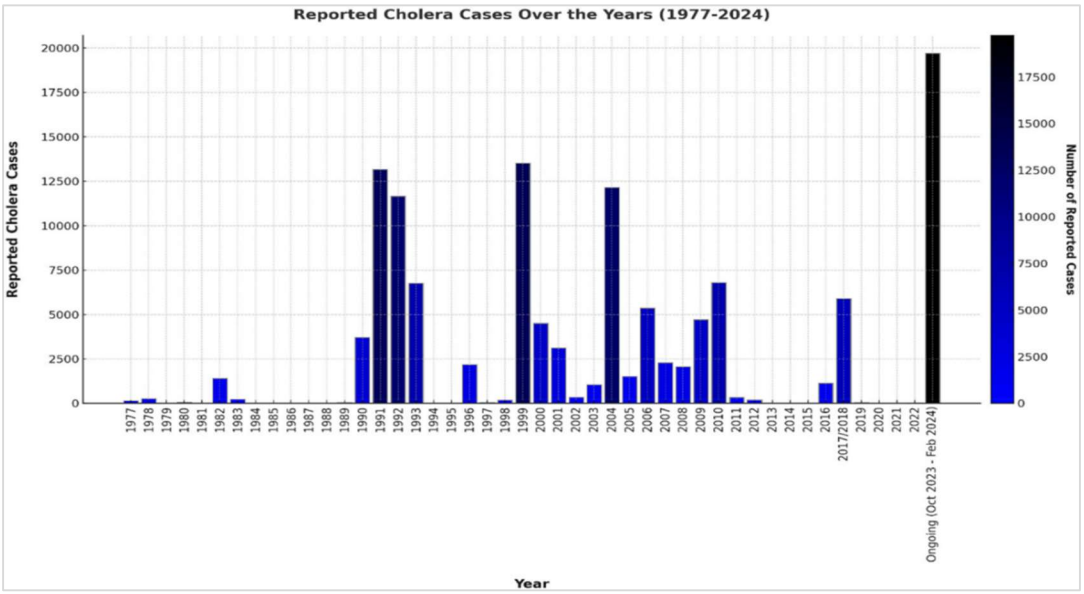


Figure 12: *Reported Cholera Case from 1977 – 2024 in Zambia.*

Epidemiological patterns indicate that cholera outbreaks in Zambia are closely linked to hydrometeorological conditions (flooding, heavy rains) and to chronic WASH gaps, especially in peri-urban informal settlements, where sanitation and safe water access are limited. The 2023 - 2024 outbreaks highlighted how urban flooding and water-system breakdowns create conditions for rapid spread, while rural outbreaks often follow contamination of surface sources and breakdowns of water supply during dry spells. Public health reporting during the outbreak emphasized lapses in water quality monitoring, insufficient sanitation coverage, and challenges in reaching remote communities with WASH interventions[70].

[69] https://www.afro.who.int/health-topics/disease-outbreaks/cholera-who-african-region
[70] https://www.afro.who.int/health-topics/disease-outbreaks/cholera-who-african-region

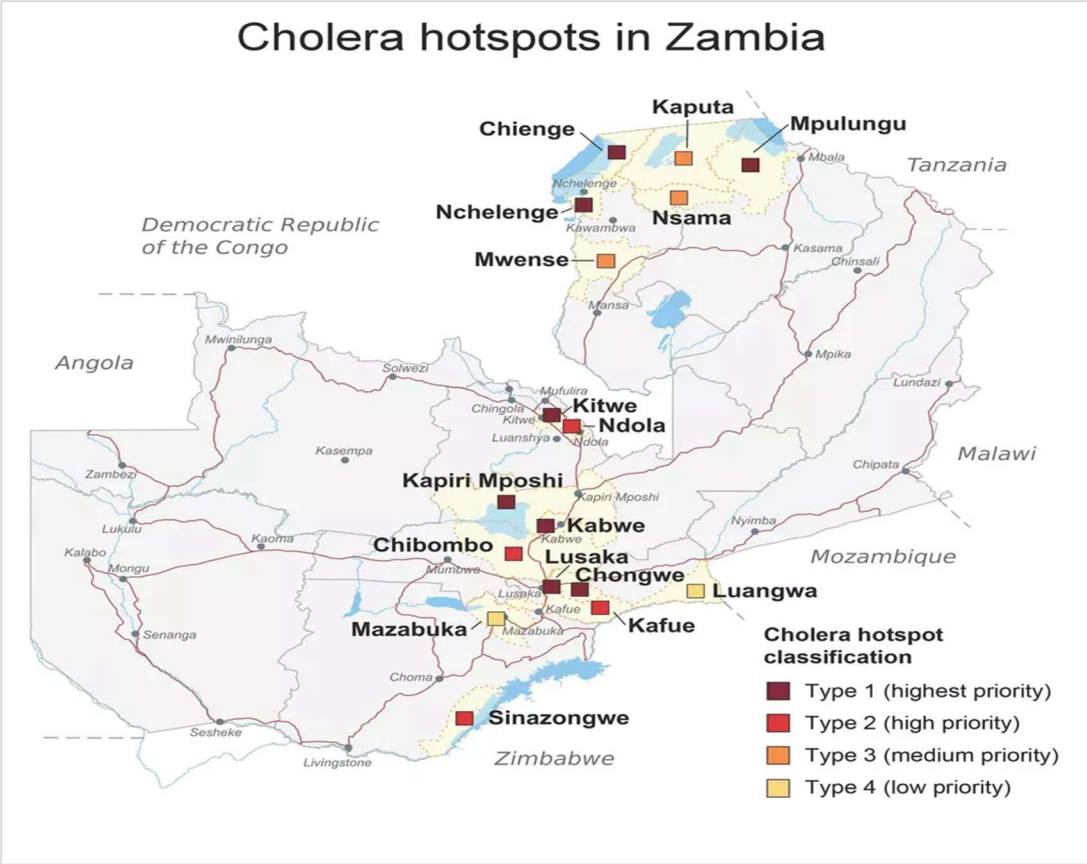


Figure 13: *Cholera hotspots in Zambia*

Beyond cholera, Zambia continues to grapple with diarrheal diseases and typhoid linked to contaminated drinking water and poor sanitation, and malaria patterns are sensitive to shifts in rainfall and warming, which can expand vector breeding seasons and geographic range, increasing malaria incidence in new areas. Recent situational reports and programme analyses point to rising malaria incidence and seasonal surges following heavy rains in some provinces.[71] These trends underscore an urgent need to strengthen WASH coverage, water-quality surveillance, cholera preparedness (including pre-positioned supplies and vaccination where appropriate) and integrated early-warning systems that link climate/hydrological forecasts with public health action to prevent and rapidly contain outbreaks[72].

1.5.3.4 Health system, climate-sensitive diseases, and vulnerabilities

Zambia's health system delivers care through networks of rural health posts, urban clinics, and referral hospitals, but it faces structural weaknesses, limited WASH in health-care facilities, uneven distribution of human resources, intermittent supplies, and weak surge capacity, all of which reduce resilience to climate shocks. WHO country reporting and recent sector assessments note that many facilities lack fully functional water and sanitation services, reliable power, and IPC capacity, particularly in remote or flood-prone districts, undermining routine services and emergency response[73].

[71] PATH. (2024) *Building climate-resilient health systems in Zambia*. https://www.path.org/our-impact/articles/building-climate-resilient-health-systems-in-zambia/

[72] https://apnews.com/article/zambia-cholera-outbreak-health-climate-6333109a9e996d81e8dc1b9a946da972

[73] World Health Organization (WHO) Regional Office for Africa. (2024) *WHO Zambia Annual Report 2023/24*. https://www.afro.who.int/sites/default/files/2025-07/WHO%20Zambia%202324%20Annual%20Report%20Final.pdf

Climate-sensitive diseases (cholera, diarrheal disease, malaria) place recurring demands on the system. The cholera outbreaks of 2023–2024 exposed gaps in surveillance timeliness, laboratory confirmation capacity, and the ability to rapidly deploy WASH-in-emergency interventions at scale. Stockouts of essential therapeutics and ORS, cold-chain interruptions, and limited field logistics compounded case management challenges during peak transmission. WHO and national sitreps documented pressure on referral hospitals in Lusaka and other provincial centres, with staff redeployed from routine services to outbreak response[74].

Operational weaknesses also include limited water-quality testing networks at the district level, fragmented data systems, and incomplete integration between meteorological services and public health early-warning platforms. Human resource constraints and low physician and nurse densities relative to WHO benchmarks further limit surge capacity and continuity of care during disasters. Strengthening WASH in health-care facilities, improving laboratory and surveillance networks, securing supply chains, and training health and WASH workers in climate-informed risk management are thus critical priorities to reduce morbidity and maintain essential services under increasing climate stress[75].

1.5.3.5 Climate change and health policy

Zambia has a growing policy framework that recognizes climate-health linkages and commits to adaptation across sectors. The Government's National Adaptation Plan (NAP, 2023) and related climate policy instruments (National Climate Change Response Strategy, NAPA, updated NDCs) prioritize water resources, agriculture, and health among sectors requiring urgent adaptation. The NAP emphasizes integrated risk management, climate-resilient infrastructure, and institutional capacity building elements directly relevant to strengthening climate-resilient WASH and health systems[76].

At the health sector level, Zambia's health strategic plans and emergency preparedness frameworks reference the need to integrate climate information into surveillance and early warning, improve WASH in health facilities, and bolster community health systems. Pilot programmes, some supported by international partners, have tested climate-informed early warning systems, water security interventions, and health system resilience measures. However, national reports and donor analyses emphasize persistent implementation gaps, limited domestic financing for adaptation, weak subnational capacity to operationalize national plans, and fragmented institutional coordination across health, water, meteorology, and disaster management[77].

Opportunities exist to accelerate implementation: Zambia's NAP includes resource mobilization and an M&E framework that can be leveraged to secure climate finance (including from the Adaptation Fund), and recent emergency funding (e.g., the World Bank's drought response) demonstrates the willingness to invest in resilience. The proposed regional programme on climate-resilient WASH aligns with national priorities by offering targeted investments in climate-proofed WASH infrastructure, strengthened surveillance and lab capacity, and enhanced multisector coordination to help bridge policy intent and on-the-ground resilience.

1.5.4 ZIMBABWE

1.5.4.1 Socio-economic context and vulnerabilities

Zimbabwe faces deep-rooted socio-economic and WASH vulnerabilities that exacerbate its sensitivity to climate shocks and health risks. Decades of economic stress, under-investment in infrastructure, and

---

[74] Ibid

[7575] World Health Organization (WHO). (2023) *WASH in Health Care Facilities: 2023 Data Update*. https://www.who.int/publications/m/item/wash-in-health-care-facilities-2023-data-update

[76] https://unfccc.int/sites/default/files/resource/NAP-Zambia-2023.pdf

[77] NAP Global Network. (2023) *An Inclusive Approach to Developing a Monitoring, Evaluation, and Learning (MEL) Framework for Zambia's NAP*. https://napglobalnetwork.org/wp-content/uploads/2023/08/napgn-en-2023-zambia-inclusive-approach-developing-mel-framework-for-nap.pdf

recurring environmental crises have eroded previous gains in water and sanitation coverage. According to a country overview report, access to basic water supply is only about 63 % nationally, with a striking rural–urban divide: rural coverage remains low (around 48 %), compared with roughly 93 % in urban zones[78]. Basic sanitation coverage is similarly poor, driven by ageing infrastructure, inadequate maintenance, and limited institutional capacity[79]. A 2020 WASH Budget Brief from UNICEF finds that 22.9 % of the overall population lacks access to improved drinking water sources; for sanitation, 31.2 % lack access to improved sanitation services. The disparities are stark: in rural areas, 32.1 % lack improved water and 44.8 % lack improved sanitation, whereas in urban areas, only 2.7 % and 1.6 % lack improved water and sanitation, respectively[80].

The deterioration of WASH services reflects constrained public finance, weak maintenance regimes, and obsolete infrastructure. A 2019 financing assessment notes that between 2000 and 2015, Zimbabwe lost ground: the number of people with access to piped water supplies fell from 5.25 million to 4.58 million[81]. The rural WASH subsector is hampered by aging and obsolete infrastructure, the proliferation of substandard pump parts, weak operation and maintenance systems, undercapitalized service providers (e.g., village pump mechanics), and poor institutional capacity, all of which make rural water points highly vulnerable to breakdowns.[82]Moreover, Zimbabwe's economy remains heavily dependent on agriculture, with roughly 62 % of rural households engaged in farming[83]. Many of these households rely on rain-fed agriculture, making them highly exposed to climatic variability. The economic crisis, repeated droughts, and erratic rainfall undermine livelihoods, reduce incomes, and limit household adaptive capacity[84].

These socio-economic and WASH vulnerabilities shape exposure and sensitivity: rural households with poor water/sanitation access are more likely to draw water from unsafe or distant sources; they are also more likely to lack latrines or proper sanitation, especially in resettlement areas or underserved rural districts. The burden of water collection and hygiene often falls on women and girls, increasing gender inequities and limiting opportunities for education or income generation[85].

Given these realities, there is a strong case for targeted, equity-focused investments in climate-resilient WASH infrastructure. Priorities should include rehabilitation of rural water points (e.g., boreholes, handpumps), sustainable financing for operation & maintenance, improved sanitation coverage (especially in rural and peri-urban areas), and hygiene promotion, all designed to increase adaptive capacity at the household and community level, reduce exposure to waterborne diseases, and enhance resilience to climatic shocks.

1.5.4.2 Observed climate trends and projections.

Zimbabwe is increasingly experiencing climate stress, characterized by recurrent droughts, erratic rainfall, and episodic extreme events, all of which threaten water security and WASH infrastructure. Historically,

[78] Sanitation and Water for All (SWA). (2022) *Country Overview: Zimbabwe 2022*. https://www.sanitationandwaterforall.org/sites/default/files/2022-07/2022%20Country%20Overview_Zimbabwe.pdf
[79]United Nations Children's Fund (UNICEF). (2022) *Zimbabwe Country Programme 2022–2026*. https://www.unicef.org/zimbabwe/media/5091/file/Zimbabwe%20Country%20Programme%202022-2026.pdf
[80] United Nations Children's Fund (UNICEF). (2020) *Zimbabwe WASH Budget Brief 2020*. https://www.unicef.org/esa/media/8411/file/UNICEF-Zimbabwe-2020-WASH-Budget-Brief.pdf
[81] United Nations Children's Fund (UNICEF). (2019) *Zimbabwe WASH Financing Assessment 2019*. https://www.unicef.org/esa/sites/unicef.org.esa/files/2019-10/UNICEF-Zimbabwe-2019-WASH-Financing-Assessment.pdf
[82] https://www.sanitationandwaterforall.org/sites/default/files/2022-07/2022%20Country%20Overview_Zimbabwe.pdf
[83] IPS News. (2024) *Conditions in Zimbabwe worsen as El Niño drought intensifies*. https://www.ipsnews.net/2024/08/conditions-zimbabwe-worsen-el-nino-drought/
[84] DevelopmentAid. (2024) *Devastating drought in Zimbabwe*. https://www.developmentaid.org/news-stream/post/186226/devastating-drought-in-zimbabwe
[85] United Nations Children's Fund (UNICEF). (n.d.) *Climate-Resilient Water, Sanitation and Hygiene in Zimbabwe*.https://www.unicef.org/zimbabwe/climate-resilient-water-sanitation-and-hygiene

the frequency and intensity of natural hazards in Zimbabwe have included droughts, floods, storms, and epidemics[86].

According to the United Nations Development Programme (UNDP), average ambient temperatures across the country are rising. Projections suggest Zimbabwe could become 0.5 °C to 2 °C warmer by 2030, with concomitant increases in heat-stress, evapotranspiration, and water demand[87]. The ongoing 2023–2024 El Niño-induced drought is a stark example: low and erratic rainfall, river, and dam depletion, drying boreholes, with severe impacts on water supply, agriculture, and livelihoods[88]. A recent drought flash appeal noted that drought will increase water insecurity, compromise hygiene practices, and heighten the risk of outbreaks of infectious and waterborne diseases.

Even where surface water infrastructure exists (dams, reservoirs), drought has drastically reduced storage levels. For example, urban water supply systems relying on dams and reservoirs now struggle as inflows shrink, increasing the risk of water rationing and supply interruptions[89]. Concurrently, climate variability is not limited to drought: sporadic heavy storms and flood events remain a risk. While drought tends to dominate in much of the country, floods, and flash-flooding events, especially in low-lying or flood-prone districts, can damage WASH infrastructure (boreholes, piped systems, sanitation), contaminate water sources, and trigger outbreaks of waterborne disease, complicating WASH planning and resilience[90].

These observed trends and projections underscore the urgent need for climate-resilient WASH planning: infrastructure that can withstand both drought (boreholes, solar-powered pumps, groundwater sources) and flood/contamination risk (elevated or flood-resistant sanitation; water-quality safeguards). Water resource management must diversify beyond surface supply toward groundwater, rainwater harvesting, decentralized community water kiosks, and maintenance systems that remain functional under stress.

1.5.4.3 Cholera and other waterborne diseases trends in the country

Zimbabwe's WASH deficits and climate-driven water stress have led to periodic, sometimes large outbreaks of waterborne disease, especially Cholera. The most recent major outbreak began in February 2023 and extended through 2024. According to the World Health Organization (WHO) regional office and national authorities, the outbreak affected all 10 provinces and 62 districts[91]. By mid-2024, the cumulative burden was substantial. One sitrep (as of 31 May 2024) reported 34,373 cholera cases and 716 deaths (approximately 2.1 % case fatality rate)[92].

[86]United Nations Children's Fund (UNICEF). (2025) *Evaluation of Climate Action in Eastern and Southern Africa – Zimbabwe Case Study*. https://www.unicef.org/esa/media/16186/file/UNICEF-Evaluation-Climate-Action-ESA-2025-Zimbabwe-Case-Study.pdf
[87] United Nations Development Programme (UNDP). (n.d.) *Towards a Climate-Resilient Zimbabwe*. https://www.undp.org/zimbabwe/news/towards-climate-resilient-zimbabwe
[88] United Nations Children's Fund (UNICEF). (2024) *El Niño-Induced Drought Disaster: Domestic and International Appeal for Assistance – Zimbabwe*. https://www.unicef.org/zimbabwe/reports/2024-el-nino-induced-drought-disaster-domestic-and-international-appeal-assistance
[89] IPS News. (2024) *Water shortages hit towns in Zimbabwe as the country struggles with impacts of El Niño drought*. https://www.ipsnews.net/2024/12/water-shortages-hit-towns-in-zimbabwe-as-country-struggles-to-overcome-impacts-of-el-nino-drought/
[90] UNICEF, 2025. *UNICEF Evaluation Climate Action ESA 2025: Zimbabwe Case Study*. https://www.unicef.org/esa/media/16186/file/UNICEF-Evaluation-Climate-Action-ESA-2025-Zimbabwe-Case-Study.pdf
[91]WHO, 2024. *Zimbabwe declares cholera outbreak over*. https://www.afro.who.int/countries/zimbabwe/news/zimbabwe-declares-cholera-outbreak-over
[92] UNICEF, 2024. *Zimbabwe Humanitarian SitRep: Multi-hazard, 31 May 2024*. https://www.unicef.org/media/159271/file/Zimbabwe-Humanitarian-SitRep-Multi-hazard-31-May-2024.pdf

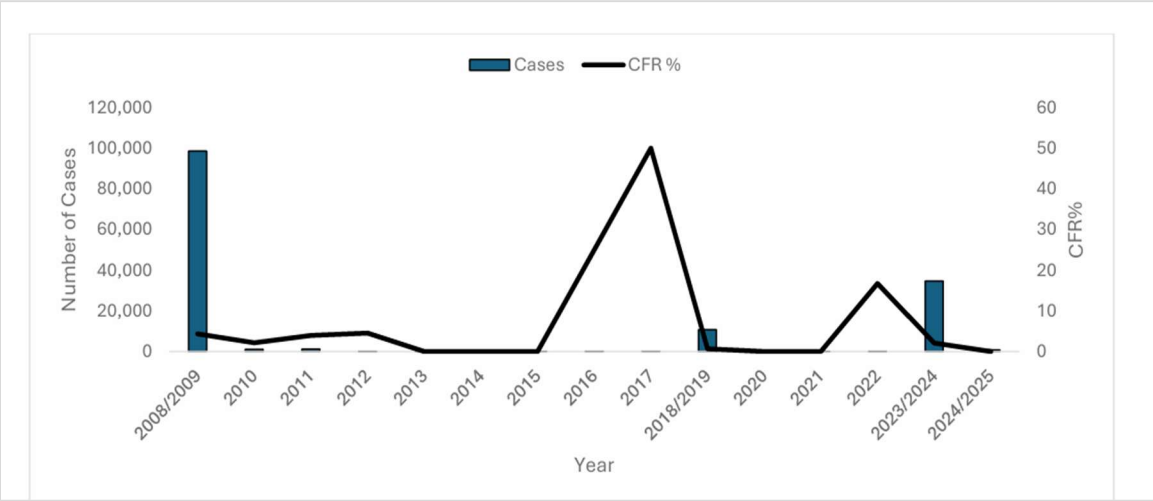


Figure 14: *Zimbabwe Cholera Cases and Case Fatality 2008-2025*

The outbreak occurred in the context of the 2023/24 El Niño drought, which severely depleted water resources, dried boreholes, and left many communities with limited or no safe water access[93]. As water scarcity forced households to rely on unsafe or distant sources, hygiene and sanitation deteriorated under difficult conditions, creating a perfect storm for cholera transmission. Additionally, weak maintenance and breakdown of the WASH infrastructure aggravated the risk[94].

Beyond cholera, Zimbabwe continues to struggle with other climate-sensitive waterborne and hygiene-related diseases, including diarrhoeal disease, typhoid, and potentially vector-borne diseases like malaria, whose transmission may expand or shift with changing rainfall and temperature regimes. While national data are uneven, humanitarian reports warn that water scarcity, combined with malnutrition, especially among children and women, will likely exacerbate susceptibility to infections.[95] The combination of recurrent WASH gaps and climate variability implies that future outbreaks may intensify in severity or frequency. Floods or heavy rainfall following drought may contaminate water sources; drought may force people to use unsafe water or concentrate use on limited, overburdened water points.

Thus, strengthening WASH coverage and water-quality monitoring, improving sanitation, and ensuring reliable and resilient water supply are critical. This includes establishing early warning systems linking climate/hydrological forecasts to public health risk, pre-positioning WASH-in-emergency supplies (water treatment, hygiene kits), and investing in community-based surveillance and outreach particularly in high-risk rural, peri-urban and resettlement areas.

1.5.4.4 Health system, climate-sensitive diseases, and vulnerabilities

Zimbabwe's health system, already under stress from economic and infrastructure constraints, is highly vulnerable to recurrent climate shocks, WASH failures, and disease outbreaks. Chronic deficiencies in WASH services at health care facilities (HCFs), limited water-quality monitoring, weak supply chains, and constrained operational resources combine to reduce the system's resilience and surge capacity. Reports by UNICEF and other stakeholders highlight that many rural HCFs lack access to basic water, sanitation, and hygiene services; this undermines infection prevention and control (IPC), safe delivery of maternal and

[93] UNICEF, 2025. *2025 HAC Zimbabwe*. https://www.unicef.org/media/166161/file/2025-HAC-Zimbabwe.pdf
[94] AllAfrica, 2024. *Zimbabwe:* https://allafrica.com/stories/202412110337.html
[95] UNDP, 2024. *Towards Climate-Resilient Zimbabwe*. https://www.undp.org/zimbabwe/news/towards-climate-resilient-zimbabwe

child health services, and emergency response to epidemics[96]. The 2023–2024 cholera outbreak exposed these vulnerabilities starkly: many treatment centres reportedly lacked essential supplies; water-quality monitoring and environmental hygiene services (for example, for shared sanitation facilities) were insufficient; outreach and contact tracing were hampered by limited mobility and resources; and overwhelmed referral hospitals had to shift staff from routine care to outbreak response[97].

Beyond cholera, climate-sensitive diseases such as diarrhoea, typhoid, and malaria place recurring demands on the health system. Drought- or flood-induced water scarcity or contamination increases the incidence of diarrhoeal disease; warming and shifting rainfall patterns may expand vector habitats and prolong malaria transmission seasons. The compounding effect of malnutrition (due to food insecurity) further impairs immunity, increasing vulnerability to infections, especially among children under five, pregnant and lactating women, and other at-risk groups. Additionally, structural challenges such as a shortage of trained personnel, weak laboratory and surveillance capacity, limited supply chains for essential therapeutics and water-sanitation supplies, and fragmented coordination between health, water, and disaster-management sectors hamper effective prevention, early-warning, and outbreak response[98].

Strengthening health system resilience requires prioritizing WASH improvements in HCFs (safe water, sanitation, hygiene); establishing robust disease surveillance and laboratory capacity; integrating climate and hydrological data into early-warning platforms; ensuring supply chain resilience (e.g., for ORS, water treatment supplies); and building human-resource capacity to mount surge responses. Community health outreach, hygiene promotion, risk communication, and gender-sensitive interventions are also essential for reducing disease risk, especially during droughts and floods.

1.5.4.5 Climate change and health policy

Zimbabwe has begun to recognize and respond to the intersecting challenges of climate change, WASH vulnerability, and public health risk, but significant gaps remain between policy and implementation. The ongoing 2023/24 drought and recent crises have underscored the need for a robust, integrated, and well-financed climate-resilient WASH and health adaptation strategy[99].In response to the El Niño-induced drought, the government declared a "State of Disaster" and launched a humanitarian appeal, mobilizing domestic and international actors[100]. Under this, emergency WASH interventions (rehabilitation of boreholes; water point repairs; community water kiosks; water chlorination) were prioritized to reduce water insecurity and mitigate disease risk.[101]

On the policy front, development partners are advocating for and supporting "climate-resilient WASH" approaches integrating WASH investments with climate-risk management, community engagement, maintenance, and sustainability. However, challenges persist, financing remains constrained, institutional coordination between water, health, disaster response, and climate sectors is weak, and long-term maintenance capacity is limited.[102]

---

[96] UNICEF, 2025. *Climate-resilient Water, Sanitation and Hygiene*. https://www.unicef.org/zimbabwe/climate-resilient-water-sanitation-and-hygiene

[97] Development Aid, 2024. *Devastating drought in Zimbabwe*. https://www.developmentaid.org/news-stream/post/186226/devastating-drought-in-zimbabwe

[98] UNICEF, 2024. *2024 HAC Zimbabwe*. https://www.unicef.org/media/149816/file/2024-HAC-Zimbabwe%281%29.pdf

[99] UNICEF, 2024. *2024 El Niño-induced drought disaster: Domestic and International Appeal for Assistance*. https://www.unicef.org/zimbabwe/reports/2024-el-nino-induced-drought-disaster-domestic-and-international-appeal-assistance

[100] Nyadire, 2024. *Update on Southern Africa Regional Drought, December 2024*. https://www.nyadire.org/uploads/4/7/6/4/4764398/update_on_southern_africa_regional_drought_dec_2024.pdf

[101] UNICEF, 2025. *Climate-resilient Water, Sanitation and Hygiene*. https://www.unicef.org/zimbabwe/climate-resilient-water-sanitation-and-hygiene

[102] Sanitation and Water for All, 2022. *Country Overview: Zimbabwe*. https://www.sanitationandwaterforall.org/sites/default/files/2022-07/2022%20Country%20Overview_Zimbabwe.pdf

1.6 Project Objectives

Overall objective: To enhance climate change adaptation and resilience of communities through sustainable access to climate-resilient WASH services in Malawi, Mozambique, Zambia, and Zimbabwe.

Specific objectives

1. To strengthen Early Warning Systems for water-related disease outbreaks in the face of climate change and extreme weather events.
2. To strengthen Water, Sanitation, and Hygiene (WASH) infrastructure and practices to reduce water related diseases transmission and improve community resilience to climate change impacts.
3. To strengthen health systems' capacity for water-related diseases surveillance, case management, and outbreak response in the context of climate change.

1.7 Project Components and Financing

Table 1: *Project Components and Financing*

Project Components	Expected Outcomes	Expected Outputs	Countries	Amount (US$)
Component 1: Setting up and operationalization of Early Warning Systems	Enhanced early warning systems for effective response to water-related disease outbreaks in the face of climate change and extreme weather events.	1.1 Vulnerability and adaptation assessments conducted in Malawi, Mozambique and Zimbabwe to inform Early Warning, Alert and Response System (EWARS)[103] and WASH Infrastructure design.	Malawi, Mozambique, Zambia, and Zimbabwe.	$2,950,986
		1.2 EWARS established and operationalized in Malawi, Mozambique, Zambia, and Zimbabwe.		
		1.3 Government officials, Communities and relevant stakeholders are trained on the utilization Early Warning Systems		
		1.4 Policy Reforms and Coordination Mechanisms Established for Effective Management of Climate-Informed Early Warning Systems (EWARS) at National and Sub-national Levels.		
		1.5: Laboratory systems strengthened for early detection and monitoring of climate-sensitive waterborne diseases (Zimbabwe)		
Component 2: Installation and operationalization of Climate-resilient Water, Sanitation, and Hygiene (WASH) Infrastructure.	Improved and climate-resilient WASH infrastructure, reducing vulnerability to climate-related risks like floods and landslides.	2.1 Climate-resilient WASH infrastructure installed and operationalized.	Malawi, Mozambique, Zambia, and Zimbabwe.	*$10,800,000*
		2.2 Climate-resilient WASH technologies demonstrated		
		2.3: Catchment protection, flood risk management, and water quality safeguarding measures implemented		
		2.4 Knowledge, Attitudes, and Practices (KAP) surveys conducted with community awareness raised on Climate-resilient WASH practices.		
Component 3: Capacity building for Climate-resilient WASH among key stakeholders	Strengthened capacity of stakeholders to plan, design, implement, and monitor	3.1 Capacity-building programs conducted for stakeholders	Malawi, Mozambique, Zambia, and Zimbabwe.	$1,800,000
		3.2 Coordination mechanisms between health and WASH sectors strengthened		
		3.3 Regional Knowledge Products on Climate-Resilient WASH developed and disseminated		

[103] https://www.who.int/emergencies/surveillance/early-warning-alert-and-response-system-ewars

	climate-resilient WASH initiatives, improving disease surveillance and outbreak response.	3.4 Regional policy advocacy products on climate-resilient WASH produced and published		
6. Project/Programme Execution cost				$15,550,986
7. Total Project/Programme Cost				$1,632,424
8. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)				$1,460,590
Amount of Financing Requested				**$18,644,000**

1.8 Projected Calendar

Table 2: *Project Calendar*

Milestones	Expected Dates
Start of Project/Programme Implementation	November 2026
Mid-term Review (if planned)	May 2028
Project/Programme Closing	November 2029
Terminal Evaluation	December 2029

2. PROJECT JUSTIFICATION

2.1 Describe the project components, particularly focusing on the concrete adaptation activities, how these activities would contribute to climate resilience, and how they would build added value through the regional approach, compared to implementing similar activities in each country individually. For the case of a programme, show how the combination of individual projects would contribute to the overall increase in resilience.

2.1.1 Programme Rationale and Regional Context

Malawi, Mozambique, Zambia, and Zimbabwe are experiencing a convergence of climate hazards that are intensifying cyclones, floods, droughts, heatwaves, and shifting rainfall patterns, directly undermining water, sanitation, and hygiene (WASH) and health systems, threatening the lives and livelihoods of over 80 million people. Across the four countries, climate change is accelerating infrastructure damage, disrupting water supply reliability, and increasing exposure to waterborne diseases, particularly cholera. These risks are amplified in flood-prone river basins, drought-affected rural areas, rapidly growing urban and peri-urban settlements, and border districts characterized by high population mobility, where vulnerable populations face compounding threats to their health, food security, and economic stability.

Although each country has its own climate challenges, they all face critical systemic weaknesses that demand urgent intervention. Their WASH infrastructure is highly vulnerable to climate shocks, early warning and response systems for diseases are inadequate, and chronic underinvestment in climate-resilient services leaves communities exposed to recurring crises. After floods, cyclones, or prolonged dry periods, cases of cholera and diarrheal diseases surge dramatically, overwhelming health systems, reversing development gains, and causing preventable deaths. These problems increasingly transcend national borders, with disease outbreaks, climate shocks, and population movements creating regional vulnerabilities, especially near lakes, rivers, transport

routes, and border crossings. Without coordinated regional action, these transboundary risks will continue to escalate, undermining national efforts and wasting scarce resources on reactive emergency responses.

This project directly addresses these common risks through a transformative, region-wide intervention that provides large-scale, climate-resilient WASH and health solutions while strengthening regional coordination, knowledge sharing, and preparedness systems. Instead of fragmented national projects that duplicate efforts and miss critical transboundary risks, the programme integrates early warning systems, climate-resilient WASH infrastructure, capacity building, and shared learning across all four countries. This coordinated regional approach delivers three critical advantages that justify the investment: (1) cost efficiency through economies of scale and shared technical resources; (2) enhanced effectiveness by addressing transboundary disease and climate risks that no single country can tackle alone; and (3) sustainable impact through harmonized standards, joint monitoring systems, and regional knowledge platforms that build long-term institutional capacity. The return on investment is clear: every dollar spent on climate-resilient WASH infrastructure saves an estimated four to twelve dollars in avoided health costs, emergency response, and lost productivity.

2.1.2 Programme Structure and Components

The programme has three integrated components designed to deliver measurable, cost-effective climate adaptation outcomes. These components address urgent climate risks such as disease outbreaks, infrastructure failures, and service disruptions while building long-term resilience in institutions, systems, and communities. This integrated design maximizes funding efficiency by ensuring that investments in early warning, infrastructure, and capacity building reinforce one another, creating compounding benefits that exceed the sum of the individual interventions.

Component 1: Setting up and Operationalization of Climate-Sensitive Early Warning Systems (EWS)

Climate change is increasing the frequency and unpredictability of disease outbreaks linked to floods, droughts, and heat stress. While some countries have early warning tools, such as EWARS pilots, these systems are often fragmented, under-resourced, and poorly integrated with decision-making and response processes. As a result, alerts do not consistently prompt early action, leaving communities and health systems to respond after issues arise. This component enhances early warning systems that integrate weather, water, WASH, and disease data to predict and prevent climate-related disease outbreaks. The emphasis is on ensuring that early warnings result in timely, coordinated action at the national, district, and community levels, rather than solely on collecting data.

Proposed Adaptation Activities

- Expand and harmonize early warning systems for climate-sensitive diseases, such as EWARS-CSD, by integrating climate, water quality, and health data.
- Enhance data sharing among weather services, water authorities, health ministries, and local governments.
- Establish clear standards for flood, drought, and disease outbreak alerts and response protocols.
- Train national and local staff to interpret forecasts, alerts, and risk maps, and to implement preparedness actions.
- Share early warnings with communities using communication methods that are easy to access and include everyone.

Component 2: Installation and Operationalization of Climate-Resilient WASH Infrastructure

Most WASH infrastructure in the four countries was designed for past climate conditions and now faces challenges from current and future extremes as well as increased population pressures. Floods damage water intakes, boreholes, sanitation systems, and health facilities. Droughts reduce water supplies and hinder hygiene. Heat accelerates infrastructure deterioration and increases contamination risks. This component supports climate-resilient WASH infrastructure that withstands floods, droughts, and heat. The goal is to ensure uninterrupted services for vulnerable communities and institutions, with a focus on health care facilities and cholera-prone areas.

Proposed Concrete Adaptation Activities

- Climate-proofing of water supply systems (elevated intakes, flood-resistant boreholes, solar-powered pumping, increased and protected storage).
- Build and or upgrade sanitation systems to withstand floods and droughts, prioritizing safe sanitation in high-risk areas.
- Implement nature-based solutions, such as catchment protection, erosion control, and wetland restoration, to safeguard water resources.
- Improve WASH services in health care facilities to prevent infections and maintain care during climate emergencies.
- Integrate sustainable renewable energy technologies to reduce vulnerability to energy and water shortages, primarily solar water pumping.

Component 3: Capacity Building for Climate-Resilient WASH among Key Stakeholders

Infrastructure and early warning systems alone are insufficient without strong institutions, skilled personnel, and empowered communities. Across the four countries, limited technical capacity, weak coordination between climate, WASH, and health sectors, and insufficient inclusion of vulnerable groups constrain effective adaptation. This component strengthens human, institutional, and community capacity to plan, deliver, operate, and sustain climate-resilient WASH services.

Proposed Adaptation Activities

- Training government staff, utilities, and health workers on climate risk assessment, resilient design, and adaptive management.
- Strengthening coordination mechanisms between climate, meteorological services, health, water and WASH institutions at national and sub-national levels.
- Community-based capacity building on hygiene, water safety, and climate risk reduction.
- Gender-responsive and disability-inclusive programming to ensure equitable access and participation.
- Regional knowledge exchange, peer learning, and documentation of best practices.

2.1.3 Programme-Level Impact and Added Value of the Regional Approach

The combined implementation of the three components across Malawi, Mozambique, Zambia, and Zimbabwe generates synergistic resilience gains that exceed the sum of individual country-level projects. By integrating climate-sensitive early warning systems, climate-resilient WASH infrastructure, and capacity building, the project delivers systemic resilience, in which prevention, service continuity, and institutional preparedness mutually reinforce one another, creating robust, adaptive systems rather than isolated or short-term interventions. The regional approach enables transboundary risk reduction, particularly in shared river basins, border districts, and high-mobility corridors, where coordinated action reduces cross-border disease transmission and shared climate risks.

Efficiency and scale are achieved through shared tools, standards, and learning platforms, which lower costs, reduce duplication, and accelerate implementation and impact. Harmonized design standards and technical specifications improve infrastructure quality while reducing procurement and design costs across countries, and the demonstration of scalable, climate-resilient WASH models facilitates rapid replication throughout the region. Standardized indicators, alert thresholds, and response protocols strengthen joint preparedness and interoperability of national systems, enhancing regional health security.

The project will establish regional platforms and communities of practice to further accelerate the learning and dissemination of successful adaptation approaches, supported by shared training curricula, technical guidance, and knowledge products that strengthen consistency and institutional capacity across countries. By fostering

regional ownership, collaboration, and institutional strengthening, the project ensures that adaptation benefits are sustained beyond the project period, contributing to long-term climate resilience and health security across Southern Africa.

2.2 Describe how the project would promote new and innovative solutions to climate change adaptation, such as new approaches, technologies and mechanisms.

This project promotes innovation in climate change adaptation by introducing new approaches to designing, testing, scaling, and institutionalising climate-resilient WASH solutions and Early Warning Systems at the regional level. Innovation is embedded not only in the technologies deployed, but also in the approaches, delivery mechanisms, governance arrangements, and learning systems that underpin the programme. At the core of the project's innovation is a regional innovation lab model, which enables participating countries, i.e., Malawi, Mozambique, Zambia, and Zimbabwe, to jointly generate, pilot, refine, and scale climate-resilient WASH and health solutions. This model moves beyond conventional project implementation by creating a structured space for experimentation, rapid learning, and adaptive management across diverse climate, institutional, and socio-economic contexts.

2.2.1 Innovative Approaches to Climate Adaptation

The project introduces a transformational regional innovation model that shifts climate adaptation from isolated national pilots to coordinated, multi-country learning and scaling. Through a regional innovation lab, climate-resilient WASH and health solutions are co-designed with institutions and communities, tested across diverse risk contexts (flood, drought, cyclones), and refined through iterative learning and real-time feedback. This enables rapid comparison of effectiveness, cost, and scalability, reduces the risk of maladaptation, and accelerates the replication of proven approaches across countries. At the same time, the project pioneers an integrated climate–WASH–health framework that breaks sectoral silos by jointly designing early warning systems, infrastructure, and service delivery to address climate hazards and disease risks together, shifting from reactive emergency response to anticipatory, systems-based adaptation.

These innovations are reinforced by climate-sensitive early warning systems that integrate meteorological, hydrological, WASH, and health surveillance data into harmonised regional platforms, enabling predictive risk analysis and timely action. Climate-resilient and low-carbon WASH technologies—such as flood- and drought-resilient water systems, context-appropriate sanitation, and nature-based solutions—are embedded as new standards for sustainable service delivery. Complemented by innovative regional cooperation mechanisms, including shared data systems, communities of practice, and aligned monitoring frameworks, the project establishes durable platforms for learning, coordination, and policy alignment. Together, these technological, institutional, and process innovations fundamentally change how adaptation solutions are developed, embedded into routine planning, and scaled across borders, creating a replicable model for climate-resilient WASH and health systems in Southern Africa and beyond.

2.3 Describe how the project would provide economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project/programme would avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.

The project will deliver significant economic, social, and environmental benefits for climate-vulnerable communities in Malawi, Mozambique, Zambia, and Zimbabwe, while fully complying with the Adaptation Fund's Environmental and Social Policy and Gender Policy.

Economic benefits will arise primarily from reduced climate-related health and productivity losses and the creation of local livelihood opportunities. Climate-resilient WASH services will reduce waterborne diseases

such as cholera and diarrhoea, lowering household health expenditures, preventing income losses, and improving productivity across agriculture and informal livelihoods. The project will also generate local employment through WASH infrastructure construction and rehabilitation, operation and maintenance, ecosystem restoration, and community-based surveillance and hygiene promotion. These opportunities will prioritise local labour, particularly women and youth, contributing to skills development, income diversification, and poverty reduction.

Social benefits will be substantial, particularly for women, children, persons with disabilities, the elderly, and displaced populations. Reliable access to safe water, sanitation, and hygiene will improve health, dignity, and quality of life in climate-exposed communities. Women and girls will benefit from reduced time spent collecting water, improved menstrual hygiene management, greater safety and privacy, and increased participation in education, livelihoods, and community decision-making. Climate-resilient WASH services in schools and health care facilities will reduce healthcare-associated infections, strengthen maternal and child health outcomes, and ensure continuity of essential services during climate shocks. The project will benefit both direct community beneficiaries and indirect beneficiaries, including health workers, local institutions, and civil society actors.

Environmental benefits will be achieved through nature-positive adaptation approaches integrated into WASH service delivery. Catchment protection, reforestation, wetland restoration, and erosion control will improve water quality, enhance groundwater recharge, reduce flood and drought impacts, and strengthen ecosystem services. The project will promote low-carbon and resource-efficient solutions, including solar-powered water systems, water-saving technologies, and climate-resilient sanitation, reducing environmental footprints while improving service reliability. Community-based environmental stewardship will further strengthen links between ecosystem health, climate resilience, and public health.

Environmental and social risks are expected to be limited, temporary, and manageable. Potential impacts such as construction-related disturbances or minor land-use effects will be mitigated through full compliance with the Adaptation Fund's Environmental and Social Policy. Measures include environmental and social screening, avoidance of sensitive ecosystems, minimisation of land acquisition, application of mitigation measures such as erosion control and habitat restoration, and fair, transparent, and participatory processes for any land-related impacts. A culturally appropriate, gender-responsive Grievance and Redress Mechanism will ensure accessible and effective resolution of concerns, with specific protections for vulnerable groups.

Gender equality and social inclusion are core to project design and implementation. Women's meaningful participation in planning, decision-making, and implementation will be ensured, alongside targeted capacity building, employment, and leadership opportunities for women, girls, and marginalised groups. WASH infrastructure will be designed to be safe, accessible, and inclusive, and sex- and age-disaggregated data will guide monitoring, learning, and adaptive management.

In the long term, the project will reduce the frequency and severity of waterborne disease outbreaks, strengthen community and institutional resilience to climate extremes, improve public health and productivity, and enhance ecosystem resilience and water security. Through its integrated economic, social, environmental, and gender-responsive approach, the project delivers transformational adaptation outcomes while responsibly managing risks in line with the Adaptation Fund's policies.

2.4 Describe or provide an analysis of the cost-effectiveness of the proposed project/programme and explain how the regional approach would support cost-effectiveness.

The project is designed to maximise adaptation impact per dollar invested by combining locally led implementation with targeted regional coordination. Cost-effectiveness is achieved by prioritising local institutions, labour, and context-appropriate solutions, while using external expertise only where specialised technical support is required for system integration, innovation, and capacity transfer. Most activities will be implemented through existing national and sub-national structures, reducing costs associated with international

consultants, logistics, and parallel implementation arrangements, while strengthening national ownership and long-term sustainability. Investments in training and knowledge transfer ensure that technical capacity remains in-country, lowering future operation and maintenance costs.

A targeted gap analysis will guide investments toward the most critical vulnerabilities and highest-impact adaptation actions. Technologies will be selected based on cost, durability, scalability, and climate performance, drawing on internationally recognised best practices such as the WHO and UN agencies' Compendium of Environmentally Sound Health Technologies. This approach minimises lifecycle costs, reduces the risk of system failure, and ensures solutions are affordable and appropriate for low-resource, climate-vulnerable settings.

Efficiency gains and cost per beneficiary will be achieved through scalable, standardised, and locally adapted interventions, allowing fixed costs such as system development, training materials, and monitoring frameworksvto be shared across a large beneficiary base. Additional savings will result from the use of local materials and labour, integration of climate resilience into existing WASH and health systems, and the prevention of disease outbreaks and infrastructure damage through early warning and anticipatory action, which is significantly more cost-effective than emergency response and reconstruction.

The regional approach is a central driver of cost-effectiveness. Shared tools, platforms, and standards such as early warning frameworks, monitoring systems, and training curricula generate economies of scale and reduce duplication across countries. Joint testing and learning lower the risk of investing in ineffective solutions and accelerate the scaling of proven approaches, while shared knowledge platforms reduce learning costs and transaction burdens. By replacing multiple country-specific design and learning cycles with a single coordinated regional pathway, the project significantly improves value for money while strengthening resilience to transboundary climate and health risks.

Over the long term, climate-resilient infrastructure, low-carbon technologies, and ecosystem-based solutions will reduce repair, replacement, and water treatment costs while protecting critical ecosystem services. Strengthened national and regional capacity for planning, monitoring, and adaptive management will further lower future adaptation costs and improve access to climate finance, creating sustained fiscal and resilience benefits beyond the project lifetime.

2.5 Describe how the project is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist. If applicable, please refer to relevant regional plans and strategies where they exist.

Table 3: *Relevant national/sub-national strategies/plans*

Level	Policy / Plan / Strategy / Framework	Objectives alignment
Global	**United Nations Framework Convention on Climate Change (1992)**	The project applies the precautionary and risk-management principles of the UNFCCC by addressing current and future climate risks to health and WASH systems through anticipatory, resilience-building measures.
	Paris Agreement	The project supports the Paris Agreement's adaptation goal by strengthening climate resilience of health and WASH systems, while delivering mitigation co-benefits through energy-efficient and low-carbon infrastructure.
Regional (Africa)	**Africa Water Policy & Agenda 2063**	The project advances continental priorities on equitable access to safe water and sanitation, sustainable water resources management, and climate resilience, contributing to Agenda 2063 goals.

	WHO Africa Framework for Climate-Resilient & Sustainable Health Systems (2024–2033)	The project operationalizes the framework by strengthening climate-resilient health infrastructure, surveillance, early warning systems, and multisectoral collaboration for climate-sensitive diseases.
Malawi	**Malawi Vision 2063**	The project supports Vision 2063 by strengthening climate-resilient WASH and health systems as foundations for human capital development, productivity, and inclusive growth.
	Malawi National Adaptation Plan (NAP)	The project implements national adaptation priorities on resilient water management, climate-proofed infrastructure, ecosystem protection, and social inclusion.
	Health Sector Strategic Plan III (2023–2030)	The project aligns with HSSP III objectives to improve equitable access to quality health services and strengthen resilience of health infrastructure and systems.
	Climate-Resilient WASH Financing Strategy (2022–2032)	The project contributes to closing the WASH financing gap by supporting climate-resilient investments aligned with long-term sustainability and climate risk considerations.
	Multi-Sectoral Cholera Control Plan (2025–2030)	The project supports the transition from emergency response to sustainable cholera prevention by addressing WASH, climate, and community-level vulnerabilities.
	National Sanitation and Hygiene Strategy	The project advances national goals on ending open defecation and improving equitable sanitation and hygiene access, with attention to women, girls, and vulnerable groups.
Mozambique	**National Health Adaptation Plan to Climate Change (HNAP 2026–2030)**	The project operationalizes HNAP priorities by strengthening climate-resilient health and WASH systems in high-risk areas, aligned with national NAP and NDCs.
	Health Vulnerability & Adaptation Assessment (2021)	Project interventions are targeted to the most climate-vulnerable regions and populations identified in the national assessment.
	Cholera Elimination Plan (2025–2030)	The project supports multisectoral cholera elimination through climate-resilient WASH, strengthened surveillance, and preventive infrastructure in hotspot areas.
	National Water Supply & Sanitation Strategy (2017)	The project aligns with national guidance on expanding equitable access to climate-resilient water and sanitation services in support of SDG 6.
	Water Sector Action Plan for SDGs (2015–2030)	The project contributes to universal access, institutional strengthening, and long-term sustainability of water and sanitation services.
Zambia	**National Development Strategy (NDS) II (2022–2026)**	The project supports NDS II priorities on strengthening WASH and health systems, institutional capacity, and climate resilience for sustainable development.
	National Adaptation Plan (2023–2030)	The project implements priority adaptation actions for the water and health sectors, including climate-resilient infrastructure, risk management, and service continuity.
	National Water Policy (2024)	The project aligns with policy objectives on water security, climate-resilient infrastructure, equity, and sustainable resource management.
	National Water Supply and Sanitation Policy (2020)	Project investments support universal, climate-resilient, and safely managed WASH services, particularly for vulnerable and underserved populations.
	Nationally Determined Contribution (NDC) 3.0	The project contributes to Zambia's adaptation commitments by strengthening resilience of WASH and health systems and supporting climate-informed planning.
Zimbabwe	**National Development Strategy (NDS) II**	The project supports national priorities on resilient WASH and health service delivery, institutional strengthening, and capacity development.
	National Climate Change Adaptation Plan (NAP)	The project operationalizes adaptation priorities for water and health, including climate-informed surveillance and resilient service provision.
	National Climate Policy	The project addresses identified health and WASH vulnerabilities by integrating climate risk information into planning and implementation.
	Nationally Determined Contribution (NDC) 3.0	The project supports Zimbabwe's adaptation priorities through climate-resilient WASH and health interventions aligned with national commitments.
	National Climate Change Response Strategy (NCCRS)	The project strengthens disease surveillance, early warning systems, and resilience to climate-sensitive health risks.
	Green Resilient Recovery Strategy (GRRS)	The project aligns with recovery priorities by strengthening health system preparedness, integrating climate information into surveillance, and promoting renewable energy solutions in health facilities.

2.6 Describe how the project meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

Table 4: *Relevant national technical standards*

Country	Relevant National Technical Standards	How the project addresses the relevant technical standards
Malawi	**Environment Management Act (2017)**	All project activities are screened for environmental and social risks, and mitigation measures are integrated into design and implementation in line with national requirements and the Adaptation Fund Environmental and Social Policy (ESP).
	Environmental Impact Assessment (EIA) Guidelines	Subprojects undergo environmental screening and EIAs where required, with approval from competent authorities prior to construction.
	Construction Industry Regulatory Authority (CIRA)	Contractors are registered with CIRA and comply with national construction quality, safety, and professional standards.
	Public Health Act (1948)	WASH interventions are designed to prevent waterborne diseases and improve environmental health conditions in communities and health facilities.
	Physical Planning Act (2016)	Infrastructure siting and layout comply with approved land-use plans and zoning requirements to avoid environmental and social risks.
	Physical Planning Regulations (2020)	Development permits are obtained, and construction adheres to approved planning and development control procedures.
	Malawi Water Quality Standards & Monitoring	Water supply systems are designed, monitored, and operated to meet national drinking water quality standards, including routine water quality testing.
	National Standards & Guidelines for WASH in Health Facilities (2024)	Health facility WASH upgrades comply with national service level, IPC, accessibility, and safety requirements.
	Malawi Bureau of Standards (MBS)	All construction materials, pipes, fittings, and treatment components comply with certified national product standards.
	National Construction Industry Act & Regulations	Civil works comply with statutory construction regulations, occupational health and safety requirements, and inspection procedures.
Mozambique	**Regulations on Drinking Water Quality (Ministerial Decree No. 180/2004)**	Water systems are designed and operated to meet national drinking water quality parameters, with regular monitoring and corrective actions.
	Environmental Law (Law No. 20/97)	Environmental protection principles are integrated into project planning, implementation, and monitoring to minimize adverse impacts.
	Resettlement Regulations (Decree No. 31/2012)	Any land acquisition or displacement follows national resettlement procedures, emphasizing avoidance, minimization, consultation, and fair compensation.
	Environmental Impact Assessment Regulation (Decree No. 54/2015)	Environmental screening and licensing are completed prior to works, with mitigation measures incorporated into technical designs and contracts.
	Water and Sanitation Law (Law No. 9/2024)	Interventions align with national institutional, service delivery, and regulatory frameworks for water and sanitation services.
	Rural Sanitation Strategy (2021)	Community sanitation activities follow approved rural sanitation approaches, emphasizing behavior change and climate-resilient practices.
	Public Health Law (Law No. 3/2022)	Project designs prioritize disease prevention, hygiene promotion, and protection of public health during climate shocks.
Zambia	**Environmental Management Act (2011)**	All subprojects undergo environmental and social screening, and mitigation measures are implemented in compliance with ZEMA requirements and the Adaptation Fund ESP.
	Environmental Impact Assessment Regulations (2011)	EIAs or project briefs are prepared and approved by ZEMA before construction begins.
	Water Resources Management Act (2011)	Water abstraction, source protection, and catchment management activities comply with national permitting and IWRM requirements.
	Water Supply and Sanitation Act (1997)	WASH investments align with national service delivery mandates, institutional roles, and regulatory oversight frameworks.

	National Water Policy (2024)	Project designs integrate climate-resilient water resource management, equity, and sustainability principles.
	Zambia Bureau of Standards (ZABS)	Construction materials, pipes, tanks, and treatment components meet certified national quality standards.
	Public Health Act (1995)	WASH interventions reduce exposure to waterborne diseases and strengthen environmental health safeguards.
	National Guidelines for WASH in Health Care Facilities	Health facility WASH improvements follow national standards on service levels, IPC, accessibility, waste management, and patient safety.
Zimbabwe	**Water Act (Chapter 20:24)**	Water abstraction, use, and protection measures comply with national water resource management and permitting requirements.
	ZINWA Act (Chapter 20:25)	Coordination with ZINWA ensures compliance with national water supply, monitoring, and infrastructure standards.
	Public Health Act (Chapter 15:17)	WASH interventions are designed to prevent disease outbreaks and improve environmental health conditions.
	Environmental Management Act (Chapter 20:27)	All project activities comply with national environmental protection requirements, including pollution control, ecosystem protection, and community safeguards, consistent with the Adaptation Fund ESP.
	Environmental Impact Assessment Policy and Regulations (Statutory Instrument 7 of 2007)	Subprojects undergo mandatory environmental screening and, where required, full EIAs approved by the Environmental Management Agency prior to construction, with mitigation measures embedded in designs and contracts.
	Finance Act (Chapter 23:04)	Financial management, procurement, and reporting comply with national public finance regulations to ensure transparency and accountability.

2.7 Describe if there is duplication of the project with other funding sources, if any.

Table 5: *Relevant/similar projects*

Malawi
Ongoing investments by the Government of Malawi, World Bank, AfDB, GCF, UNDP, and Global Fund in bulk water supply, groundwater development, watershed management, and health emergency preparedness provide a strong enabling environment. The project complements these efforts by climate-proofing last-mile WASH services, strengthening safe water distribution, storage, and functionality during climate shocks, and integrating early warning, disease surveillance, hygiene promotion, and community-level resilience, thereby maximizing adaptation benefits and avoiding duplication.

Zambia
Zambia is implementing major climate-relevant water, WASH, and health initiatives, including the World Bank–supported Water Supply and Sanitation Program-for-Results (WSS-PforR), the EU-funded Nexus Energy and Water Programme for Zambia (NEWZA), national WASH in Health Care Facilities (WASH-in-HCF) programmes, and climate adaptation actions under the National Adaptation Plan (NAP) and NDC 3.0. The proposed project complements these initiatives by focusing on climate resilience and health outcomes, strengthening climate-informed early warning systems, disease surveillance, and outbreak response, enhancing functionality and continuity of WASH services during floods and droughts, and building institutional and community adaptive capacity, thereby amplifying the resilience impact of existing infrastructure and policy reforms.

Zimbabwe
Zimbabwe hosts multiple ongoing WASH, water, sanitation, energy, and health programmes led by UNDP, UNICEF, Global Fund, Welt Hunger Hilfe, bilateral donors, and Government-led borehole initiatives. The project complements these investments by strengthening system-wide resilience, improving governance and sustainability of WASH services, integrating climate information into surveillance and preparedness, and ensuring that solar-powered and piped water systems translate into reduced water-related disease risks and improved adaptive capacity.

Mozambique
In Mozambique, EU-, BMZ-, UNICEF-, and government-supported initiatives focus on resilient sanitation, child-centred disaster risk reduction, climate-resilient service delivery, and institutional strengthening. The project complements these efforts by scaling climate-resilient WASH solutions, strengthening integration of health, WASH, and climate planning at district and local levels, supporting innovation and learning, and reinforcing early warning, preparedness, and adaptive service delivery in highly climate-vulnerable provinces.

Regional and Cross-Cutting Synergies
At the regional level, the project complements and strengthens ongoing climate adaptation, WASH, and health initiatives across Southern Africa by promoting harmonized, climate-resilient approaches to early warning systems, WASH service delivery, and health system preparedness for water-related diseases. It builds on existing national investments and regional commitments by facilitating cross-country learning, standardization of climate-informed surveillance and response practices, and sharing of lessons on resilient WASH infrastructure and service continuity during climate shocks**.** Through regional coordination mechanisms, communities of practice, and joint learning platforms, the project enhances policy coherence, institutional collaboration, and scalability of proven solutions, ensuring that adaptation gains achieved in Malawi, Mozambique, Zambia, and Zimbabwe can be replicated and sustained across the region.

2.8 If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.
Learning and knowledge management are integral to the programme's design, recognising that effective climate adaptation requires continuous learning, evidence generation, and the ability to scale successful approaches across diverse contexts. Given differing climate risks and institutional capacities across Malawi, Mozambique, Zambia, and Zimbabwe, the programme adopts a structured, regionally coordinated learning-by-doing approach. Real-time monitoring data, beneficiary feedback, and periodic country and regional learning reviews will inform adaptive management, enabling continuous refinement of interventions and improved effectiveness.

The Learning and Knowledge Management (LKM) component will generate actionable evidence on climate-resilient WASH and health adaptation, support cross-country learning and replication, and inform policy, planning, and future climate finance. Regional knowledge platforms and communities of practice will facilitate regular peer-to-peer exchange, thematic collaboration, and mentoring, accelerating uptake of proven solutions, reducing duplication, and improving cost-efficiency.

The programme will produce a focused set of practical knowledge products, including case studies, technical guidance, toolkits, and concise policy briefs. Gender- and inclusion-focused learning products will document impacts and lessons related to women, girls, and other vulnerable groups. All products will be disseminated through regional platforms, national institutions, and partner networks to support replication and scale-up.

To enable systematic learning and data sharing, the programme will strengthen harmonised monitoring frameworks, shared indicators, and common reporting formats across countries. A regional knowledge repository and digital collaboration platforms will ensure that data and learning products remain accessible and usable beyond the project lifetime, with alignment to national systems to support sustainability.

Learning will be explicitly linked to decision-making and policy processes. Evidence and lessons will inform national and regional planning frameworks, technical standards, and investment priorities, and will be integrated into strategies, guidelines, and training curricula. By institutionalising learning within government systems and regional coordination mechanisms, the programme ensures sustained impact and continued influence on climate-resilient WASH and health adaptation beyond project completion.

2.9 Describe the consultative process, including the list of stakeholders consulted, undertaken during project/programme preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy of the Adaptation Fund.

Table 6: *Stakeholder consultations*

Country	Stakeholder group/Actors	Key contacts
MALAWI	Ministry of Health and Sanitation	Annie Msiska Ngulube annie_ngulube@yahoo.com
	Ministry of Finance	Patrick Liphava liphava1976@gmail.com
	Public Health Institute of Malawi (PHIM)	Flora Dimba floradimba@gmail.com
	National Malaria Control Program	Dr Lumbani Munthali Lumbani.munthali09@gmail.com
	Malawi Redcross Society	Dan Banda dbanda@redcross.mw
	Department of Climate Change and Meteorological Services (DCCMS)	Brenda Soko brendamdzagada@gmail.com
	Environmental Affairs Department	Nisile Mwaisunga nisile2002@yahoo.com
	Civil Society Network on Climate Change (CISONEC)	Julius Ng'oma julius@cisoneccmw.org
	Malawi University of Science and Technology (MUST)	Dr Vincent Sadala vmsadala@must.ac.mw
	Malawi University of Business and Applied Sciences (MUBAS)	Dr. Kondwani Chidziwisano kchidziwisano@mubas.ac.mw
	Lilongwe University of Agriculture and Natural Resources (LUANAR)	Dr Abel Chiwatakwenda abelchiwatakwenda@yahoo.co.uk
	Water and Environmental Sanitation Network (WESNET)	Hope Chaima hopeson.chaima@wesnetwork.org
	Ministry of Agriculture and water development	Peter Chipeta chipeta99@yahoo.co.uk
	University of Malawi-Chancellor College	Prof. Tawonge Manda tiomanda@gmail.com
	Water Boards	Engineer Chawanangwa Jana chawanangwakajisojana@gmail.com Blantyre Water Board
	Water Users Association (WUA)	Richard Matemba Sombani WUA, +265 999 17 99 54 Mr Mphepo Phalombe Major WUA, +265 999 14 70 47, +265 888 09 74 63
	National Youth Climate Change Network	Dominic Nyasulu dominicnyasulu@yahoo.com
	National Water Resources Authority	Mr Tony Nyasulu +265 993 83 79 50

	Malawi College of Health Sciences (MCHS)	Maxwell Luhanga msluhanga@gmail.com
	MoH Planning department	Wikise Chilema wwsilema@yahoo.co.uk
	Digital Health	Dr. Alinafe Mbewe nafekmbewe@gmail.com
	Ministry of Energy	Gift Chiwaula giblechimz@gmail.com
ZIMBABWE	Ministry of Health and Child Care	Mr Victor Nyamandi +263772809265 victornyamandi@gmail.com
	Ministry of Lands, Agriculture, Fisheries, Water and Rural Development	Eng G Mawere
	WASH Department	Mr Nesbert Shirihuru nshirihuru@gmail.com
	Climate Change Management Department	AF NDA
	Meteorological Services Department	Mrs R Manzou manzou.becky@gmail.com
	Local Government	
	Academia and Research Institutes	Harare Institute of Technology and SIRDC
	UNICEF	Mr. Carlos Vasquez cvasquez@unicef.org UNICEF Zimbabwe, Chief of WASH.
	WHO Country Office	Dr Trevor Kanyowa +263772104246 kanyowat@who.int
	Ministry of Finance and Economic Development	
	Department of Civil Protection (DCP)	Mr Nathan Nkomo
	Zimbabwe National Water Authority (ZINWA)	
	Zimbabwe National Statistics Agency (ZIMSTAT)	
	Ministry of Gender, Small and Medium Enterprises	Ms Tariro Chipepera tarirochipy@gmail.com
MOZAMBIQUE	Ministry of Health	Dr Catarina Maguni catarinamaguni@yahoo.com.br
	World Health Organization	Mrs Sónia Casimiro Trigo casimirotrigos@who.int
	National Institute of Health	Dr Tatiana Marrufo tatiana.marrufo@ins.gov.mz
	National Institute of Meteorology	Mr Fernando Congolo nandocongolo@gmail.com
	Directorate of the Environment and Climate Change	Mr Joaquim Pepete jpepete75@gmail.com
	National Directorate for Water Supply and Sanitation	Mr Sandra Fumo sisabelf73@gmail.com
	Eduardo Mondlane University	DR Genito Maure genito.maure@gmail.com
	UNICEF	Dr. Julie Aubriot Jaubriot@unicef.org
	Community-Based Organizations (CBOs) & Local Councils	To be identified

2.10 Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

The requested Adaptation Fund financing covers the incremental costs required to adapt existing WASH and health systems to current and projected climate risks in Malawi, Mozambique, Zambia, and Zimbabwe. In the absence of the project, baseline investments would continue to address development needs, but without systematically integrating climate risk**,** leaving communities exposed to escalating climate hazards, service disruptions, and disease outbreaks. The Adaptation Fund resources, therefore, finance the additional and incremental measures required to ensure that WASH and health systems are climate-resilient, anticipatory, and sustainable**.**

Table 7: *Full adaptation reasoning justification*

Component	Baseline Scenario (Without Project)	Adaptation Fund Scenario (With Project)	Full Cost of Adaptation Justification
Component 1: Climate-Sensitive Early Warning Systems	Disease surveillance and climate monitoring remain fragmented and largely reactive. Limited integration between meteorological, WASH, and health data; early warning tools are under-resourced, non-harmonized, and weakly linked to response mechanisms. Outbreaks are detected late, resulting in high health and economic costs.	Integrated, climate-informed early warning systems operational across countries, linking climate, hydrological, WASH, and disease data. Harmonized thresholds, predictive analytics, and response protocols enable anticipatory action and cross-border coordination.	Adaptation financing covers the incremental cost of integrating climate data, developing predictive models, harmonizing systems regionally, and operationalizing early action protocols. These costs go beyond routine surveillance and are required specifically to manage climate-induced disease risks.
Component 2: Climate-Resilient WASH Infrastructure	WASH infrastructure designed for historical climate conditions continues to be damaged by floods, droughts, cyclones, and heat. Recurrent repairs and emergency replacements strain public budgets and fail to ensure service continuity, especially in high-risk areas.	WASH systems are climate-proofed through resilient design, flood- and drought-tolerant technologies, renewable energy solutions, and nature-based measures that protect water sources and sanitation services under extreme conditions.	Adaptation funding finances the additional cost of climate-resilient design, materials, siting, and ecosystem-based solutions, compared to standard infrastructure. These incremental investments prevent repeated losses and ensure long-term service reliability under climate stress.
Component 3: Capacity Building for Climate-Resilient WASH	Limited technical capacity to assess climate risks, plan resilient investments, or operate systems under extreme conditions. Climate considerations are not systematically embedded in WASH or health planning, leading to maladaptation and inefficiencies.	National and sub-national institutions, communities, and service providers are trained in climate risk management, resilient planning, early warning interpretation, and adaptive operation and maintenance. Regional learning platforms institutionalize climate-resilient practices.	Adaptation financing supports the incremental cost of specialized training, tools, and institutional strengthening required to integrate climate risk into decision-making. These capacities are not part of baseline development spending but are essential for sustained adaptation.
Regional Coordination, Knowledge & Systems	Countries act independently, duplicating efforts, tools, and learning processes. Limited mechanisms exist for cross-border coordination, knowledge sharing, or harmonized monitoring of climate risks and responses.	Shared regional platforms, harmonized tools, joint monitoring systems, and communities of practice reduce duplication, enable cross-border preparedness, and accelerate scaling of effective adaptation solutions.	Adaptation resources cover the incremental cost of regional coordination mechanisms, shared systems, and learning platforms that address transboundary climate risks and deliver economies of scale not achievable through national projects alone.

In the baseline scenario**,** public investments in WASH and health would continue to focus on expanding access and addressing immediate service gaps. However, these investments would not adequately account for increasing climate variability and extremes**,** leading to infrastructure failures, repeated emergency responses, disease outbreaks, and rising long-term costs. These baseline expenditures, therefore, do not provide climate resilience and cannot prevent climate-induced losses. The Adaptation Fund scenario finances the incremental costs necessary to climate-proof these systems**,** transforming them from vulnerable, reactive services into

resilient, anticipatory systems capable of withstanding future climate conditions. These incremental investments constitute the full cost of adaptation, as they would not be undertaken under a development-only scenario but are essential to avoid escalating climate-related losses. By financing these adaptation-specific costs, the Adaptation Fund enables a cost-effective shift from repeated emergency spending to preventive, long-term resilience**,** delivering sustained benefits for vulnerable populations across the four countries.

2.11 Describe how the sustainability of the project outcomes has been taken into account when designing the project/programme.

Sustainability has been a central consideration in the design of this regional programme. The project has been structured to ensure that adaptation benefits endure beyond the funding period, through strong national ownership, institutional integration, capacity development, environmentally sound approaches, and regional cooperation. Rather than creating parallel systems, the programme strengthens and embeds climate-resilient practices within existing national and regional WASH, health, and climate governance frameworks**.**

Institutional and policy sustainability is ensured through full alignment with national climate, health, and WASH policies and strategies in Malawi, Mozambique, Zambia, and Zimbabwe, including National Adaptation Plans, Nationally Determined Contributions, health sector strategies, and WASH roadmaps. Interventions are implemented through government-led systems, with WHO country offices supporting Ministries of Health and relevant sector institutions. Climate-resilient WASH approaches, early warning systems, and operational protocols developed under the project will be embedded within existing government structures by integrating climate-sensitive early warning into national disease surveillance and emergency response mechanisms, adopting climate-resilient WASH standards for health facilities and communities, and strengthening coordination among health, WASH, meteorological, and disaster management authorities. This institutionalization ensures continuity, ownership, and policy relevance well beyond project completion.

Capacity and human resource sustainability is strengthened through a strong focus on long-term capacity development and knowledge transfer. The project prioritises training national and sub-national staff, service providers, and community actors to design, operate, maintain, and continuously adapt climate-resilient WASH systems. Capacity-building activities will build in-country expertise and reduce reliance on external technical assistance, integrate climate risk management into routine planning, budgeting, and service delivery, and establish communities of practice and peer-learning mechanisms that persist beyond the project lifecycle. By embedding skills and knowledge within institutions and communities, the project ensures that adaptation practices can be sustained and scaled using domestic capacities and future financing.

Financial and economic sustainability is promoted through an emphasis on cost-effective, low life-cycle-cost solutions that reduce long-term expenditures associated with emergency response, infrastructure damage, and disease outbreaks. By investing in climate-resilient infrastructure, preventive early warning systems, and ecosystem-based approaches, the project lowers recurrent costs compared to reactive interventions. Sustainability is further reinforced through the use of locally available materials and labour to minimise operation and maintenance costs, adoption of energy-efficient and renewable technologies to reduce long-term operating expenses, and strengthened national capacity to plan for and mobilise additional climate and development finance using the evidence, systems, and institutional arrangements established under the project. Together, these measures support continued investment in resilience well beyond the end of Adaptation Fund support.

Environmental sustainability is embedded through the promotion of nature-based solutions, ecosystem protection, and climate-smart technologies. Catchment protection, wetland restoration, erosion control, and sustainable water resource management improve ecosystem health while safeguarding water quantity and quality over the long term. By reducing pressure on degraded ecosystems and integrating environmental safeguards into

infrastructure design and implementation, the project ensures that adaptation benefits do not come at the expense of environmental integrity. Low-carbon and resource-efficient technologies further reduce environmental footprints and enhance resilience to future climate variability.

The project emphasizes participatory approaches and social inclusion to ensure that outcomes are locally owned and socially sustainable. Community engagement throughout planning, implementation, and monitoring strengthens trust, accountability, and acceptance of interventions. Special attention is given to women, youth, persons with disabilities, and other vulnerable groups, ensuring that services are accessible, culturally appropriate, and responsive to diverse needs. Community-based management and behavior change initiatives foster long-term adoption of safe WASH practices and environmental stewardship. Grievance and redress mechanisms and transparent communication further reinforce social sustainability and accountability.

At the regional level, sustainability is strengthened through shared systems, harmonized approaches, and ongoing cooperation among participating countries. Regional platforms for learning, early warning coordination, and policy dialogue reduce duplication, enhance efficiency, and support continued collaboration beyond the project period. The regional approach also positions countries to jointly address transboundary climate and health risks and to leverage future climate finance more effectively, building on systems, standards, and partnerships established through the programme.

2.12 Provide an overview of the environmental and social impacts and risks identified as being relevant to the project/programme.

Overview of Environmental and Social Impacts and Risks

The project is expected to generate substantial positive environmental and social impacts by strengthening climate-resilient WASH and health systems across Malawi, Mozambique, Zambia, and Zimbabwe. Overall, the project is assessed as having low to moderate environmental and social risk**,** with impacts that are largely localized, temporary, and reversible. No large-scale, irreversible, or high-risk activities are anticipated. Potential risks are primarily associated with infrastructure development, construction activities, land use, and system changes**,** and will be managed through the application of the Adaptation Fund's Environmental, Social and Gender Policies, including environmental and social screening, mitigation planning, stakeholder engagement, and grievance redress mechanisms.

Positive Environmental Impacts

The project will generate multiple positive environmental impacts by strengthening the protection of water sources through catchment management, erosion control, and ecosystem restoration, thereby improving water quality and availability. Climate-resilient sanitation and wastewater management systems will reduce contamination of surface and groundwater, while adopting low-carbon, energy-efficient technologies, such as solar-powered water systems, will lower greenhouse gas emissions and reduce reliance on fossil fuels. In parallel, nature-based solutions will enhance ecosystem resilience and provide natural buffers against climate hazards such as floods and droughts. Together, these measures support long-term environmental sustainability while reinforcing the project's climate adaptation objectives.

Positive Social Impacts

The project will deliver significant positive social impacts, particularly for vulnerable and marginalised populations, by improving access to safe water, sanitation, and hygiene services, thereby reducing waterborne diseases and strengthening public health outcomes. Enhanced resilience of health care facilities will help ensure continuity of care during climate shocks, while reduced time and physical burdens associated with water collection—especially for women and girls will improve well-being and gender equity. The project will also create local employment and livelihood opportunities through infrastructure development, maintenance, and ecosystem restoration, alongside strengthened community participation, awareness, and capacity for climate risk

management. Collectively, these benefits are expected to enhance quality of life, dignity, and social equity across participating communities.

Potential Environmental Risks
Potential environmental risks associated with the project include temporary disturbance to soil, vegetation, and local habitats during the construction or rehabilitation of WASH infrastructure, as well as increased generation of construction-related waste if not properly managed. There is also a risk of localized water resource stress if water abstraction is not carefully planned and monitored, and minor impacts on sensitive ecosystems if infrastructure siting is inadequately assessed. Overall, these risks are expected to be localized, short-term, and manageable with appropriate planning and mitigation measures.

Potential Social Risks
Potential social risks include temporary disruption to services or access during construction activities, limited land use or access restrictions associated with infrastructure placement, and occupational health and safety risks for workers during construction and maintenance. There is also a risk of unequal access to project benefits if vulnerable groups are not adequately included, as well as potential community grievances related to consultation processes, perceived impacts, or benefit distribution. No involuntary resettlement or large-scale land acquisition is anticipated, and any minor land-related impacts will be managed through transparent, inclusive, and participatory processes.

Risk Mitigation and Management Measures
To effectively manage and mitigate identified risks, the project will apply a comprehensive set of environmental and social safeguards throughout implementation. All activities will undergo environmental and social screening prior to commencement, with site-specific management measures applied where required. Good construction practices will be enforced, including proper waste management, erosion control, and strict occupational health and safety standards. Inclusive stakeholder engagement will ensure the meaningful participation of women, persons with disabilities, and other vulnerable groups in planning and implementation. In addition, a Grievance and Redress Mechanism (GRM) will be established that is accessible, transparent, culturally appropriate, and gender-responsive. Robust monitoring and reporting systems will track environmental and social performance across the project lifecycle, enabling timely corrective action where necessary.

Risk Classification
Based on the nature, scale, and scope of proposed activities, the project is expected to fall within low to moderate environmental and social risk categories under the Adaptation Fund Environmental and Social Policy. No activities classified as high-risk are foreseen.

Table 8: *Environmental and social impacts and risks identified*

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law	✓	
Access and Equity		Equity risks will be assessed during project design and inception through stakeholder mapping and baseline surveys, with mitigation measures integrated into targeting criteria and monitored periodically.
Marginalized and Vulnerable Groups		Risks will be assessed at design and baseline stages, with inclusive measures embedded in activity planning and reviewed at mid-term and end-term evaluations.
Human Rights	✓	

Gender Equity and Women's Empowerment		Gender risks and opportunities will be assessed during project design and inception using gender analysis, with mitigation and empowerment actions monitored throughout implementation.
Core Labour Rights	✓	
Indigenous Peoples	✓	
Involuntary Resettlement	✓	
Protection of Natural Habitats		Site-specific risks will be screened during design and inception, with mitigation measures included in Environmental Management Plans (EMPs) and monitored periodically.
Conservation of Biological Diversity		Biodiversity risks will be assessed during design and site screening, with avoidance and mitigation measures incorporated into EMP/EIA where required and reviewed during implementation.
Climate Change	✓	
Pollution Prevention and Resource Efficiency		Pollution and waste management risks will be assessed at design stage, with mitigation measures included in EMP/EIA and monitored regularly during implementation.
Public Health		Public health risks will be assessed during design and baseline, with preventive measures integrated into project activities and reviewed at mid-term and end-term.
Physical and Cultural Heritage	✓	
Lands and Soil Conservation		Soil and land-related risks will be assessed during design and site selection, with mitigation measures included in EMP/EIA and monitored periodically.

3. IMPLEMENTATION ARRANGEMENTS

The World Health Organization (WHO) will take full responsibility for managing and overseeing the project, including financial, monitoring, and reporting functions, adhering to internationally accepted procurement principles, practices, and regulations. The Ministries of Health (MoH) in the target countries will serve as the Executing Entities, responsible for implementing the project at national and subnational levels under WHO's guidance and support. A Project Management Unit (PMU), jointly established by WHO and the MoHs, will include staff embedded in the MoHs and Regional Staff to execute the project. National and regional staff will coordinate the implementation, ensuring compliance with WHO and Adaptation Fund policies and procedures for procurement and fund disbursement.

A Project Board/Steering Committee, co-chaired by WHO and the respective Ministries of Health, will convene annually at the regional level and biannually at the national level to review progress and make key strategic decisions. The committee will comprise representatives from relevant government ministries, all National Designated Authorities (NDAs), National Implementing Entities (NIEs), as well as key partners including UNICEF, Oxfam, WaterAid, UNOPS, and other stakeholders in the WASH sector. A Technical Working Group (TWG), consisting of experts from government, civil society, research institutions, and the private sector, will provide technical guidance and recommendations to the committee. The project will ensure the active engagement of NDAs and National Implementing Entities (NIEs), such as the Environmental Management Agency of Zimbabwe (EMA), throughout the design, implementation, and monitoring phases. These entities will play a central role in coordinating national climate adaptation efforts and ensuring alignment with national climate strategies and priorities. Their responsibilities will include offering policy guidance, ensuring regulatory compliance, avoiding duplication of efforts, and helping identify key stakeholders—such as local communities and private sector actors—to ensure that interventions are contextually appropriate and responsive to national adaptation needs.

The governance structure, including the PMU, is designed to mitigate governance-related risks. The PMU, led by a Project Manager hosted within the MoH in the three countries and supported by a Project

Coordinator at WHO country offices, will oversee day-to-day management, coordination, reporting, and monitoring and evaluation functions. This ensures accountability and transparency. The project will follow WHO procurement policies and procedures to ensure transparency and fairness in procurement, with regular audits conducted in accordance with WHO standards to prevent fraud and corruption. Financial information will be made available as needed to enhance accountability and integrity in the project's execution. This inclusive governance structure will enhance alignment with national climate frameworks, promote meaningful participation of local governments in decision-making, and support effective monitoring, reporting, and compliance with the Adaptation Fund's operational and fiduciary requirements.

Demonstrate how the project aligns with the Results Framework of the Adaptation Fund

Table 9: *Project alignment to Results Framework of the Adaptation Fund*

Project Objective(s)[104]	**Project Objective Indicato**	**Fund Outcome**	**Fund Outcome Indicator**	**Grant Amount (USD)**
To strengthen Early Warning Systems for water-related disease outbreaks in the face of climate change and extreme weather events.	Number of countries and districts with functional, climate-informed early warning systems for water-related disease outbreaks.	**Outcome 1:** Reduced exposure to climate-related hazards and threats	1.1: Number of people and institutions with reduced exposure to climate-sensitive disease risks	**US$2,950,986**
To strengthen Water, Sanitation, and Hygiene (WASH) infrastructure and practices to reduce water-related disease transmission and improve community resilience to climate change impacts.	Number of people with sustained access to climate-resilient and safely managed WASH services (disaggregated by sex, age, and vulnerability).	**Outcome 1:** Reduced exposure to climate-related hazards and threats	1.3: Assets made climate-resilient (e.g. water supply and sanitation systems)	**US$10,800,000**
To strengthen health systems' capacity for water-related diseases surveillance, case management, and outbreak response in the context of climate change.	Number of health workers trained and demonstrating improved competencies in climate-sensitive disease surveillance, case management, and emergency response.	**Outcome 2:** Strengthened institutional and community adaptive capacity	2.2: Number of institutions with improved capacity to adapt to climate change	**US$1,800,000**
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
Outcome 1: Climate-sensitive early warning and response systems for water- and climate-related diseases are operational and effectively used	• No. of functional climate-sensitive early warning systems operational at national and sub-national levels. • % of alerts triggering timely preparedness or response actions	**Output 1.1:** Climate information and early warning systems strengthened and operational	**1.1.1:** No. of early warning systems installed or strengthened	
Outcome 2: Climate-resilient WASH infrastructure and services are improved in vulnerable communities and health care facilities	• No. of WASH facilities upgraded to climate-resilient standards. • % of targeted health facilities with uninterrupted WASH services during climate shocks	**Output 1.2:** Climate-resilient infrastructure developed or rehabilitated	**1.2.1:** No. of physical assets strengthened or constructed to withstand climate impacts	

[104] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

Outcome 3: Institutional, community, and technical capacity for climate-resilient WASH and health systems strengthened	• No. of personnel trained on climate-resilient WASH and health planning. • % of institutions integrating climate risk into plans and budgets	**Output 2.1:** Capacity of institutions and communities strengthened to reduce climate vulnerability	**2.1.1:** No. of people trained (disaggregated by sex and vulnerability)	
Outcome 4: Regional coordination, learning, and knowledge exchange on climate-resilient WASH and health systems strengthened	• No. of regional knowledge products developed and disseminated. • No. of countries adopting shared tools or approaches	**Output 3.1:** Knowledge management and learning systems strengthened	**3.1.1:** No. of knowledge products, platforms, or learning exchanges established	

4. ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government[105]

MALAWI Mr. Robert Mwanamanga Director, Debt and Aid Management Ministry of Finance and Economic Affairs P.O. Box 30049, Lilongwe 3, Malawi Tel: +265 999 814 796 rbmwanamanga@gmail.com;	Date: Date : ***22 January 2025***
MOZAMBIQUE Ms. Emilia Dique Fumo Permanent Secretary, Ministry of Land and Environment Rua de Kuassende, 167 CP 2020, Maputo, Mozambique Tel: +258 846 978 463 / 9440 769 emiliadiquefumo@gmail.com;	Date: ***19 December 2024***
ZAMBIA Mr. Billy Katontoka National Coordinator, Ministry of Green Economy and Environment Corner of Nationalist and John Mbita Road, Opposite Ridgeway Campus, P.O. Box 50555, 10101 Lusaka, Zambia Tel: +260 211 252625 / +260 97 536627 4 billy.katontoka@mgee.gov.zm	Date: Date: **2 June 2025**
ZIMBABWE Mr. Washington Zhakata Director, Climate Change Management Department Ministry of Environment, Water, & Climate 11th Floor, Kaguvi Building, 11th Floor, Kaguvi Building, Harare, Zimbabwe Tel: +263 4 701681/3 Climatechange@environment.gov.zw; washingtonzhakata@gmail.com;	Date: ***21 November 2024***

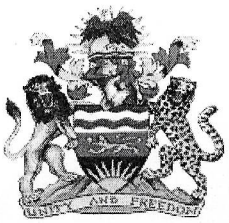
6. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

B. Implementing Entity certification *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (……list here…..) and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.
Jeremiah MUSHOSHO, Team Lead – Climate Change, Health and Environment (WHO AFRO) Implementing Entity Coordinator VILLALOBOS PRATS, Elena villalobose@who.int

Date: *(Month, Day, Year)*	Tel. and email:
Project Contact Person: Dr. Jeremiah MUSHOSHO, Team Lead – Climate Change, Health and Environment (WHO AFRO)	
Tel. And Email: mushoshoj@who.int , Tel +242 06 737 1271 or +263 772 326 001	

Telephone: 01 789 355
Telefax: 01 789 173
Telex: 44407
Email:secmof@finance.gov.mw



MINISTRY OF FINANCE,
ECONOMIC PLANNING AND
DECENTRALIZATION
P.O. BOX 30049,
CAPITAL CITY,
LILONGWE 3. MALAWI

Ref. No.: MoFEPD/DAD/DCU/4/1 **4th February, 2026**

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

ENDORSEMENT FOR THE PROJECT TITLED "BUILDING CLIMATE-RESILIENT WASH SERVICES IN SOUTHERN AFRICA"

In my capacity as designated authority for the Adaptation Fund in Malawi, I confirm that the above regional project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Malawi.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the World Health Organization and executed by the Malawi Ministry of Health.

Yours Sincerely,

Tiyamika Kanthambi
Director, Debt and Aid Management
For: SECRETARY TO THE TREASURY

REPUBLIC OF MOZAMBIQUE
MINISTRY OF AGRICULTURE, ENVIRONMENT AND FISHERIES

Ref: 31 /GSE/MAAP/09/2026 **Date, 09 February, 2026**

From: Mr. Gustavo Sobrinho Dgedge
Secretary of State for Land and Environment
Ministry of Agriculture, Environment and Fisheries
Rua da Resistência, 1746/7 CP 2020, Maputo, Mozambique

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

Dear Sir, Madam,

Subject: **Endorsement for The Project Titled "Building Climate - Resilient WASH Services in Southern Africa"**

In my capacity as designated authority for the Adaptation Fund in Mozambique, I confirm that the above regional project proposal titled *"Building Climate - Resilient WASH Services in Southern Africa"*) is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Mozambique.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the World Health Organization Regional Office for Africa and executed by [the Ministry of Health of Mozambique and the Ministries of Health from Malawi and Zimbabwe.

Sincerely,

Mr. Gustavo Sobrinho Dgedge
Secretary of State for Land and Environment
Ministry of Agriculture, Environment and Fisheries

All correspondence should be addressed to the
Permanent Secretary
Telephone: 0211 -252395
0211 -252394
0211 -252391

REPUBLIC OF ZAMBIA

In reply please quote

No.:.....

NDA/71/21/9

MINISTRY OF GREEN ECONOMY AND ENVIRONMENT

OFFICE OF THE PERMANENTS SECRETARY
Corner of John Mbita & Nationalist Road
P.O BOX 30147
Lusaka-Zambia

2nd February, 2026

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN N7-700
Washington D.C, 20433
Email: Secretariat@adaptation-Fund.org
UNITED STATES OF AMERICA

RE: ENDORSEMENT FOR THE PROJECT TITLED "BUILDING CLIMATE RESILIENT WASH SERVICES IN SOUTHERN AFRICA"

In my capacity as designated authority for the Adaptation Fund in the Republic of Zambia, I confirm that the above regional project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change Zambia.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the World Health Organization and will be executed by the Ministry of Health of the Republic of Zambia.

Dr. Douty Chibamba
Permanent Secretary
MINISTRY OF GREEN ECONOMY AND ENVIRONMENT

All communications should be addressed to

"The Secretary for Environment, Climate, Tourism and Wildlife

Telephone: 701691/2

Telegraphic address: *"TOURISMT"*

Fax: 702054

ZIMBABWE

Secretary for Environment, Climate and Wildlife

11th Floor, Kaguvi Building

Corner 4th and Central Avenue

Harare

ZIMBABWE

21 November 2024

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Dear Sir, Madam,

RE: ENDORSEMENT FOR THE PROJECT TITLED "BUILDING CLIMATE-RESILIENT WASH SERVICES IN SOUTHERN AFRICA".

In my capacity as designated authority for the Adaptation Fund in Zimbabwe, I confirm that the above regional project proposal titled *"Building Climate-Resilient WASH Services in Southern Africa"* is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Zimbabwe.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the World Health Organization Regional Office for Africa and executed by the Ministry of Health of Zimbabwe and the Ministries of Health from Malawi and Mozambique.

Sincerely,

Mr. Washington Zhakata
Director, Climate Change Management Department
Nationally Designated Authority
Ministry of Environment, Climate and Wildlife

Revised PFG Submission Form[1]

Project Formulation Grant (PFG)

Submission Date: 28 January 2026

Adaptation Fund Project ID:
Country/ies: Malawi, Mozambique, Zambia, Zimbabwe
Title of Project/Programme: Building Climate-Resilient WASH Services in Southern Africa.
Type of IE (NIE/RIE/MIE): Multilateral Implementing Entity
Implementing Entity: World Health Organization (WHO)
Executing Entity/ies: Ministries of Health in the target countries.

A. Project Preparation Timeframe

Start date of PFG	May 2026
Completion date of PFG	September 2026

B. Proposed Project Preparation Activities ($)

Proposed Project Preparation Activities	Output of the PFG Activities	US$ Amount	Budget Note
Four (4) National Stakeholder Consultations in Malawi, Mozambique, Zambia, and Zimbabwe	Final agreed project priorities; selected districts/provinces and target communities and health facilities; agreed institutional arrangements, roles, and coordination mechanisms with governments and partners	**US$40,000**	Covers four country missions (travel, accommodation, venue hire, facilitation, interpretation, and documentation). Costs are moderated through co-hosting with government counterparts and virtual follow-up consultations. This budget may be insufficient and potential co-financing from the IE, EEs, and partners will be explored.
Four (4) Climate Change, Health, and WASH Vulnerability and Adaptation Assessments	Identification of priority climate risks, vulnerable populations, climate-sensitive diseases, high-risk locations, health facilities, and WASH service gaps to inform project design	**US$60,000**	Covers technical experts and national consultants for data collection, analysis, and validation workshops across four countries. This budget may be insufficient given the technical scope; complementary resources will be explored.
Early Warning Systems and Surveillance Capacity Assessment (Regional with country-specific analysis)	Assessment report detailing gaps and opportunities in climate-informed early warning systems, disease surveillance, data integration, and response mechanisms, with prioritized recommendations	**US$20,000**	Desk review, stakeholder interviews, and technical validation led by regional and national experts. Costs are optimized through integration with national systems and existing assessments.

[1] As presented in AFB/PPRC.33/40 Annex 1.

Environmental and Social Screening, Environmental Management Plans (EMP), and Site Feasibility Assessments	Environmental and social screening reports; site-specific EMPs and feasibility summaries for proposed WASH and health facility investments	**US$30,000**	Includes site visits, baseline environmental and social assessments, feasibility analysis, and stakeholder validation. Full EIAs will be prepared during implementation if required by national regulations.
Preparation of the Full Project Proposal and Results Framework	Completed full project proposal, including results framework, budget, implementation arrangements, monitoring and evaluation framework, and risk management plan	**US$10,000**	Covers technical writing, coordination, quality assurance, and alignment with Adaptation Fund requirements.
TOTAL		**$160,000**	

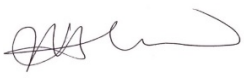
The Project Formulation Grant (PFG) activities are designed to generate the evidence base, institutional partnerships, and technical foundations required for a robust and implementable regional project. National stakeholder consultations in Malawi, Mozambique, Zambia, and Zimbabwe (US$40,000) will ensure strong government ownership, alignment with national WASH, health, and climate priorities, and consensus on priority districts, communities, and health facilities, as well as implementation and coordination arrangements.

Climate change, health, and WASH vulnerability and adaptation assessments across the four countries (US$60,000) will provide country-specific evidence on climate risks, vulnerable populations, water-related disease burdens, and system capacity gaps, ensuring that proposed interventions are targeted, context-specific, and responsive to climate change impacts. An assessment of early warning systems and disease surveillance capacities at regional and country levels (US$20,000) will identify gaps and opportunities for strengthening climate-informed alerts, data integration, and response mechanisms.

Environmental and social screening, site feasibility assessments, and preparation of Environmental Management Plans (US$30,000) will provide the technical, environmental, and social due diligence required to comply with national regulations and the Adaptation Fund Environmental and Social Policy. Finally, preparation of the full project proposal and results framework (US$10,000) will consolidate findings into a coherent, high-quality proposal aligned with Adaptation Fund requirements. Collectively, these activities, costed at US$160,000, will ensure the project is evidence-based, nationally owned, environmentally sound, and implementation-ready, laying a strong foundation for effective delivery and scaling of climate-resilient WASH and health outcomes.

C. Implementing Entity

This request has been prepared in accordance with the Adaptation Fund Board's procedures and meets the Adaptation Fund's criteria for project identification and formulation.

Implementing Entity Coordinator, IE Name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
VILLALOBOS PRATS, Elena WHO Headquarters villalobose@who.int	Jeremiah Mushosho, WHO AFRO. P.P. 	28 January 2026	Dr. Jeremiah Mushosho	+263772326001	mushoshoj@who.int