



EASTERN AND
SOUTHERN AFRICA

Madagascar CCDR

Background Note
Human Capital for Madagascar

World Bank Group

COUNTRY
CLIMATE AND
DEVELOPMENT
REPORT

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Acronyms

AAP	Ambient Air Pollution
AFD	<i>Agence Française de Développement</i> (French Development Agency)
AQI	Air Quality Index
BADEA	Arab Bank for Economic Development in Africa
BNGRC	<i>Bureau National de Gestion des Risques et des Catastrophes</i> (National Office for Risk and Disaster Management)
CBRA	Community-Based Responsibility Approach
CCA	Climate Change Adaptation
CCC	<i>Conseil Consultatif Construction</i> (Construction Advisory Council)
CERC	Contingency Emergency Response Component
CHVA	Climate and Health Vulnerability Assessment
CPD	Continuing Professional Development
CSB	<i>Centre de Santé de Base</i> (Primary Health Care Center)
CWG	Cash Working Group
DREN	Regional Directorate of National Education
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EMIS	Education Management Information System
ESD	Education for Sustainable Development
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
GIZ	<i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i> (German Agency for International Cooperation)
GPE	Global Partnership for Education
GPSS	Global Program for Safer Schools
HAP	Household Air Pollution
HDCT	Human Development Cash Transfer
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IFC	International Finance Corporation
ILO	International Labour Organization
IMF	International Monetary Fund
IPC	Integrated food security Phase Classification

ITE	Initial Teacher Education
LIC	Low-Income Country
MIGA	Multilateral Investment Guarantee Agency
MOE	Ministry of Education
MoH	Ministry of Health
MPA2	Phase 2 of the Multiphase Programmatic Approach
MPSPPW	Ministry of Population, Social Protection, and Promotion of Women
NAAPH	National Adaptation Action Plan for the Health Sector
NAP	National Adaptation Plan
ND-GAIN	Notre Dame Global Adaptation Initiative
NGO	Nongovernmental Organization
ODA	Official Development Assistance
PANSS	<i>Plan d'Action National pour la Sécurité Sanitaire</i> (National Action Plan for Health Security)
PASEC	<i>Programme d'analyses des systèmes éducatifs de la CONFEMEN</i>
PFM	Public Financial Management
PPSB	Pandemic Preparedness and Basic Health Services Delivery Project
PSE	Education Sector Plan
PSNP	Productive Safety Net Program
RBF	Results-Based Financing
RCC	Response to Climate Change
SNGRC	National Disaster Risk Management Strategy
SNPS	<i>Stratégie Nationale de Protection Sociale</i> (National Social Protection Strategy)
SNRP	Safety Nets and Resilience Project
SSNP	Social Safety Nets Project
STEM	Science, Technology, Engineering, and Mathematics
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WASH	Water, Sanitation, and Hygiene
WFP	World Food Programme
WHO	World Health Organization
ZAP	<i>Zones d'Administration Pédagogique</i>

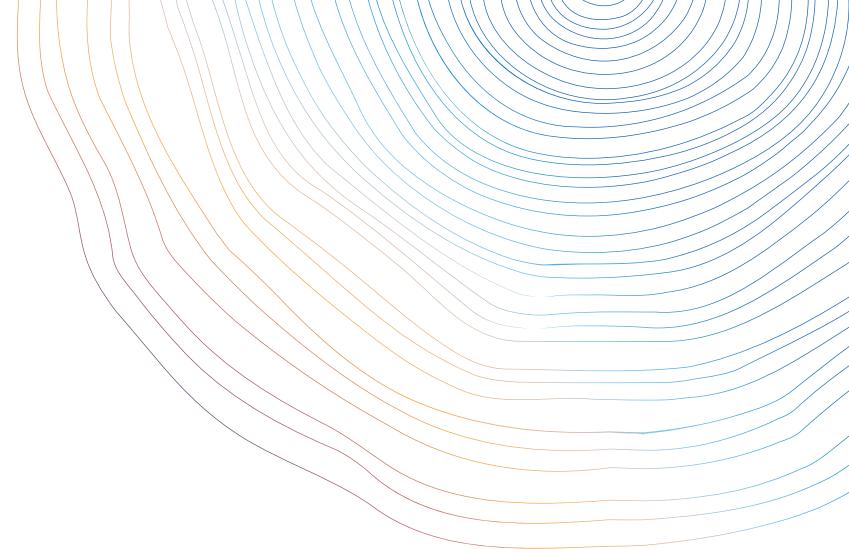
INTRODUCTION

Madagascar remains ill-equipped to respond to the climate crisis. Driven by large-scale disruptions in atmospheric circulation and exacerbated by poor land use practices, droughts are common in the south—the hottest and driest part of the island. Madagascar is also among the most cyclone-prone countries in Africa, with an average of three to four cyclones yearly. Intense rainfall caused by strong storms also affects the country, leading to frequent damaging floods. Finally, shoreline erosion caused by sea-level rise is an increasing problem for Madagascar’s ports and beaches. All these phenomena are becoming more frequent and more severe due to global heating.

Madagascar’s human capital remains deeply vulnerable to climate change, with far-reaching social and economic implications. Around one in four Malagasy live in areas exposed to extended droughts, cyclones, or floods. These are also the families with the lowest levels of preexisting human capital (with high rates of chronic malnutrition, for example), limited access to health and education services, and only incipient coverage of social protection programs. In the poorest households, climate shocks are the most important driver of reduced household consumption, significant asset loss, and longer-term poverty.¹ Climate-driven impacts like reduced school attendance and learning losses, spread of communicable diseases like malaria, and acute malnutrition further deepen communities’ vulnerability.

Well-designed policies and investments in the health, education, and social protection sectors are critical to ensure that Malagasy communities can adapt to global heating and, where appropriate, contribute to mitigation. Multiple studies have shown that areas with better education, health, or social protection systems have better adaptation to climate change, lower mortality rates during disaster, lower rates of mental illness following those events, and faster recovery. Therefore, strengthening the resilience of the education, health, and social protection systems in Madagascar is critical to mitigate the impacts of climate change, particularly on children.

¹ World Bank 2016.



Climate impacts across human capital outcomes are interrelated and should not be considered from a narrow sectoral perspective. High stunting rates are strongly linked to climate change-induced land degradation, decreasing crop yields, resulting food insecurity, and waterborne diseases. In turn, stunting affects cognitive development, which is a key threat to learning with direct long-term impacts on labor productivity. Recognizing these interlinkages, the World Bank Green, Resilient, and Inclusive Development approach calls for an integrated, multisectoral approach to addressing the climate crisis. Resilience requires a range of critical public services including resilient infrastructure and health systems, social safety nets, safe schools, and early warnings.



Education

Climate change affects children's education and well-being. Climate shocks are becoming more frequent and more intense due to changing climate. Between 2000 and 2020, over 532 climate-related shocks, such as cyclones, floods, heat and cold waves, periods of droughts, high-pollution events, earthquakes, avalanches, and tornadoes, took place around the world.² These climate events have affected nearly half of the world's children—1 billion—who live in extremely high-risk countries for climate shocks.³ Many of these climate shocks, which can be prolonged due to their destructive impact, have resulted in school closures.⁴ Extreme weather events, accelerated by climate change, often destroy or damage schools, learning materials, and vital infrastructure, making it harder for children to attend school and resume their education. Even when schools remain open, increasing temperatures and indirect impacts on nutrition, health, and financial stability compromise children's well-being and learning outcomes.

Madagascar is deeply affected by climate change. From 1980 to 2010, it experienced 53 natural hazards, including droughts, earthquakes, epidemics, floods, and extreme temperatures. An average of three cyclones per year hit the country. These extreme weather events have caused economic damages of over US\$1 billion, contributing to high poverty rates and lack of well-functioning institutions, including the education sector.⁵

Education in Madagascar is severely affected by climate-related events. In March 2024, Tropical Cyclone Gamane destroyed over 430 classrooms, leaving 42,000 children without a classroom to attend school. Tropical Cyclones Cheneso⁶ (January 2023) and Freddy⁷ (March 2023) damaged 1,692 education buildings, destroying over 1,655 classrooms. Tropical Cyclone Freddy hit Madagascar twice in early 2023, leading to school closure due to partial or complete destruction of classrooms, affecting more than 169,000 children.⁸

Key Risks: How Does Climate Change Affect the Education Sector?

Climate-related shocks are causing widespread school closures around the world. Between January 2022 and June 2024, 81 countries were forced to temporarily close schools due to climate shocks such as cyclones, floods, droughts, and heat waves.⁹ In these countries, an estimated 404 million children lost an average of 28 days of instruction. However, the average masks significant disparities. Affected schools in low-income countries (LICs) during the same period lost about 45 days, while those in high-income countries lost only 6 days. Madagascar is one of the LICs experiencing frequent and extended school closures due to climate shocks, particularly cyclones and floods.

2 Nagesh et al. 2024.

3 UNICEF 2021.

4 Venegas Marin, Schwarz, and Sabarwal 2024a.

5 World Bank, Climate Change Knowledge Portal, accessed August 28, 2024.

6 Ministère de l'Education Nationale. CHENESO_ Rapport des Dégâts_ 24 février 2023.

7 Ministère de l'Education Nationale. FREDDY_ Rapport des Dégâts_ 13 mars 2023 (1er passage); Ministère de l'Education Nationale. FREDDY_ Rapport des Dégâts_ 17 mars 2023 2eme passage.

8 Ministère de l'Education Nationale. CHENESO_ Rapport des Dégâts_ 24 février 2023; Ministère de l'Education Nationale. FREDDY_ Rapport des Dégâts_ 13 mars 2023 (1er passage); Ministère de l'Education Nationale. FREDDY_ Rapport des Dégâts_ 17 mars 2023 (2eme passage)

9 Sabarwal et al. 2024.

Cyclones destroy school buildings faster than Madagascar can rebuild them, worsening the challenge of providing school facilities for all its learners. The frequency and intensity of cyclones in the region result in recurrent destruction, leaving schools vulnerable and struggling to keep up with repairs and reconstruction efforts. Madagascar encounters significant challenges in completing school building projects, particularly within communities classified as extremely remote. Construction costs may escalate because transporting building materials to school sites becomes more difficult as a result of flooded or damaged roads. Rebuilding schools is delayed and becomes costly in the aftermath of climate crises, exacerbating preexisting challenges in acquiring and transporting materials, particularly to remote and inaccessible sites.

School closures are often prolonged by damaged school infrastructure. Inadequate school infrastructure makes school buildings highly vulnerable to climate events. Each year, cyclones affect schools, damaging roofs and/or causing partial or full damage to one or more classrooms. The Ministry of Education (MOE) typically responds to school damage by closing schools until minimum repairs are complete and lessons can safely resume. School closures may be extended when schools serve as temporary housing for affected populations.¹⁰ Table 1 details climate-related damages sustained by Malagasy schools over the past five school years. Only 24.7 percent of damaged schools have undergone reconstruction and/or rehabilitation, and according to the MOE's Risk and Disaster Management Service, 80 percent of schools are considered highly vulnerable to cyclones.

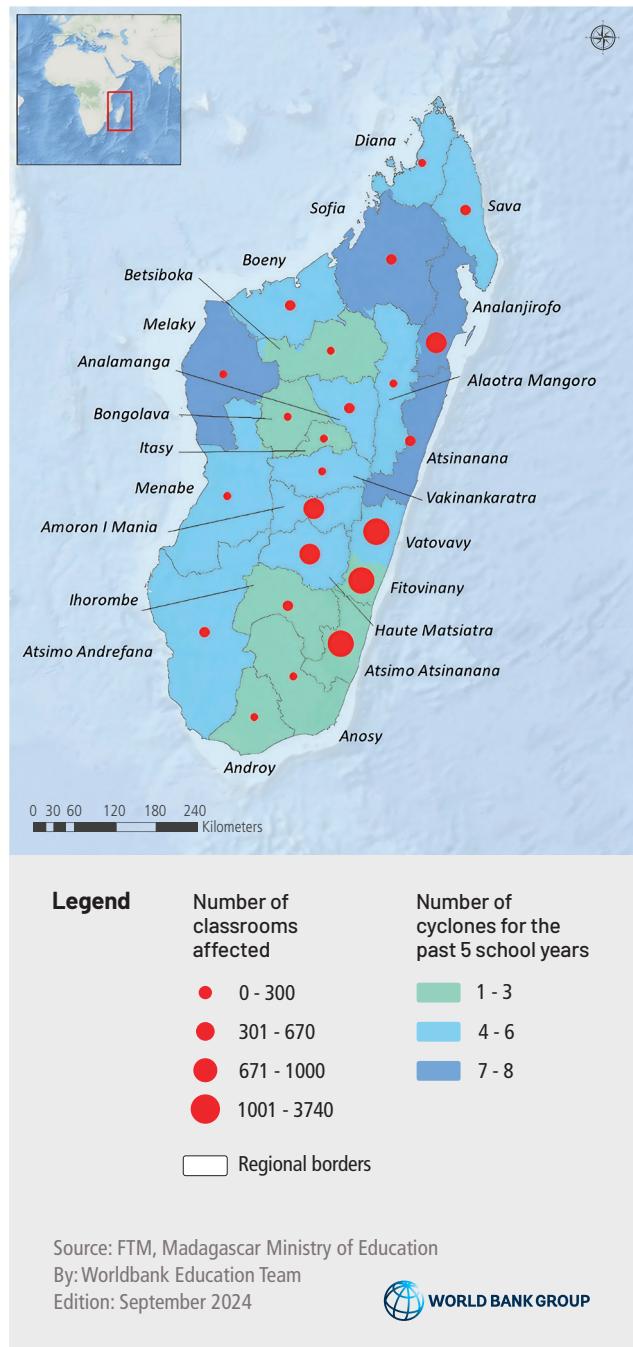
Table 1. Schools and classrooms affected by cyclones, by school year

School year	Number of affected schools	Classrooms left without a roof	Fully destroyed classrooms	Partially destroyed classrooms	Number of school children affected
2023/2024	520	114	431	183	58,188
2022/2023	1,777	1,815	1,011	1,095	181,889
2021/2022	3,521	5,425	2,246	2,550	361,359
2020/2021	292	155	416	79	31,010
2019/2020	386	362	295	80	37,717

Source: MOE.

10 UNICEF 2023.

Figure 1: Classroom destruction by region since 2019/2020



Source: MOE.

There is large regional variation in terms of classroom destruction. Since the school year 2019/2020, a total of 16,257 classrooms have been partially or fully destroyed or left without a roof. The most affected regions are Vatovavy, Fitovinany, Atsimo Atsinanana, Analanjirofo, Haute Matsiatra, and Amoron'i Mania.

Vatovavy experienced five cyclones, resulting in significant damage to 3,740 classrooms while Fitovinany and Atsimo Atsinanana each experienced three cyclones, affecting 2,554 and 2,415 classrooms, respectively. Analanjirofo endured eight cyclones, affecting 986 classrooms. Haute Matsiatra was hit by five cyclones, affecting 828 classrooms. Amoron'i Mania faced four cyclones, resulting in damage to 673 classrooms, and other regions also faced considerable destruction. The intensity and frequency of these cyclones have led to widespread damage across the country, highlighting the urgent need for resilient infrastructure in the education sector.

Extreme weather also causes economic and health shocks, which indirectly affect children and their learning. These shocks can damage agriculture and cause food insecurity, leading to economic strains on households and reduced investment in children's schooling. This economic uncertainty can force families to prioritize immediate needs over education, sometimes resulting in increased child labor or early marriages.¹¹ Mental health issues arising from climate-related stress and trauma can also significantly hinder academic performance and cognitive development.¹² Climate change can increase health risks, altering the distribution of infectious diseases, which can increase student absence and long-term health complications that affect learning.¹³ Perhaps most concerning are the intergenerational effects, such as pregnant women's exposure to extreme heat which

11 Asadullah, Islam, and Wahhaj 2020.

12 Agnafors, Barmark, and Sydsjö 2021; Murphy et al. 2015.

13 Williams et al. 2021.

can increase the risk of developmental issues, affecting children's educational outcomes years later.¹⁴ Ultimately, the indirect effects of extreme weather can lead to lower educational attainment, decreased student readiness to learn, diminished demand for schooling due to household coping mechanisms,¹⁵ and reduced human capital development, perpetuating cycles of vulnerability to climate change.

Climate change erodes human capital

In Madagascar, climate shocks increase student and teacher absenteeism, decreasing learning outcomes.

Climate-related school closures exacerbate student and teacher absenteeism and reduce learning performance. School closures have led to immense learning losses. The MOE estimates that children in Madagascar are receiving just half of the planned 960 schooling hours. Global evidence suggests that one day of school closure equates to one day of learning lost.¹⁶ In 2021, following school closures during COVID-19, the percentage of students with correct answers dropped from above 50 percent in 2019–2020 to 39.6 percent, with decreased student performance in reading (Malagasy) and mathematics. Moreover, 30 percent of students felt they had lost learning despite school-level distribution of paper-based home-learning materials, 18 percent noted a deterioration in their handwriting, and 8 percent reported losing their schooling habits and finding it difficult to return to school.

Prolonged school closures increase the risk of students dropping out of school. When schools reopened in Ethiopia and Pakistan following COVID-19 school closures, enrollment among six-year-olds dropped 4 percentage points and among 14-year-olds dropped 6 percentage points.¹⁷ Declines were much larger for students from lower socioeconomic backgrounds. In Madagascar, students from privileged backgrounds are significantly more likely than other students to find alternative learning opportunities when schools close due to crises.¹⁸ This discrepancy increases the gap in student learning outcomes.

Even when schools are open, temperature and rain variability often curtail student attendance, threatening student learning.¹⁹ Climate projections for Madagascar indicate a significant increase in the number of days above 30 °C, with an expected increase of 50 percent by 2050. When children do manage to attend school during heat waves and droughts, they frequently suffer the effects of subpar nutrition and hydration, which affects their academic performance.²⁰ During rainfall deviations and cyclones, increased absenteeism has been found to reduce Malagasy student performance in foundational subjects (for example, math and reading in French).²¹ Climate change affects children's well-being which reduces students' cognitive capabilities²² and affects learning outcomes.

14 Randell and Gray 2019.

15 Venegas Marin, Schwarz, and Sabarwal 2024b.

16 Schady et al. 2023.

17 Ibid.

18 ECW 2023.

19 Randell and Gray 2016.

20 ECW 2023.

21 Marchetta, Sahn, and Tiberti 2019.

22 Mani et al. 2013.

Unpredictable weather worsens absenteeism. Disruptions caused by weather frequently exacerbate already significant levels of teacher absenteeism. The majority (60 percent) of Madagascar's teachers are community teachers, and they rely on parent-teacher associations for their compensation. Teachers are often absent from their classrooms²³ because they need to travel distances to pick up their paychecks, work on farms, or perform administration-related tasks in schools lacking administrative support. Teacher motivation is hampered by low and unpredictable payment for their efforts, insecurity in their status as teachers, and weather-related incidents, such as impassable or destroyed roads or excessive heat and long commutes, which limit teachers' access to schools. Moreover, Madagascar's cyclone season runs from November through April, overlapping with the school year, which runs from September to June, and the planting period of the local agricultural calendar.²⁴ This leads to high absenteeism for both teachers and students. With an increased likelihood of cyclones, schools are at risk of closure. Also, with the planting season occurring during the school year, students and teachers, many of whom farm, are more likely to be absent.

Climate change intensifies malnutrition

Increasing heat and changing precipitation exacerbate food insecurity. In Madagascar, increased food insecurity due to droughts correlates with weak education outcomes.

Deteriorating quality of education and student performance in Madagascar are especially felt in regions heavily affected by climatic events.²⁵ Madagascar's most recent Education Sector Plan for 2018–2022 acknowledged malnutrition and food insecurity as significant risks for the education system. Children who experience stunting at age five are 19 percent less likely to be able to read a simple sentence three years later and 13 percent less likely to be able to write the same simple sentence.²⁶ In the 2019 *Programme d'analyses des systèmes éducatifs de la CONFEMEN* (PASEC),²⁷ Madagascar ranked fourth in the proportion of students consistently experiencing hunger while in class. In 2019, 44 percent of Malagasy students frequently or consistently experienced hunger while attending school.²⁸ Children who do not experience hunger attend school more consistently and have fewer difficulties understanding lessons than those who do.²⁹ Droughts decrease food quality and availability, decreasing children's nutrition, negatively affecting health and human capital.

Climate change undermines education financing

In response to climate emergencies and slow-onset climate-induced disasters, limited funding from governments, households, and donors may be reprioritized away from education toward other needs.

23 République de Madagascar - Indicateurs de prestation de services en éducation (SDI) - round ii et Tableau de bord des politiques mondiales de l'éducation - round i – 2021.

24 The agricultural calendar in Madagascar is divided into two main phases: the rainy season (from October to May) is the planting season, and the dry season (from April-May to August-September) is the harvesting and plowing season.

25 PIROI 2022.

26 Varly 2022.

27 In English: Program for the Analysis of Educational Systems of CONFEMEN. Since its creation in 1991, PASEC has carried out assessments in 24 countries in Africa, the Middle East, and Asia.

28 PASEC 2019.

29 Ralinoro 2013.

Madagascar's education spending has remained below that of other LICs and Sub-Saharan Africa's regional average. Between 2010 and 2022, government spending on education as a percentage of GDP in LICs grew from 2.9 percent to 3.9 percent of GDP.³⁰ During this same period, education spending in Sub-Saharan Africa changed from 3.7 percent to 3.8 percent of GDP.³¹ In Madagascar, the government spending on education per student also significantly lags peer countries at both the primary and secondary levels.³² Given the rapidly increasing pressures on governments to adapt to and mitigate climate change, there is an imperative to understand the effects of climate change on education financing better.

When limited resources are urgently needed for disaster risk reduction (DRR) efforts, education financing is often limited. Limited funding from governments, households, and donors may be reprioritized away from education and toward other sectors in response to climate emergencies and slow-onset climate-induced disasters. For example, between 2013 and 2020 the proportion of official development assistance (ODA) toward climate action steadily increased from 21.7 percent to 33.4 percent, while the proportion of ODA toward education steadily declined from 11.7 percent to 9.7 percent between 2010 and 2020.³³

Climate-related shocks disproportionately affect vulnerable populations, exacerbating disparities in access to education. In Ethiopia, 81 percent of children from the poorest households experienced one or more extreme weather events while just 22 percent of the least poor households were exposed. Similar patterns exist in India, Peru, and Viet Nam.³⁴ Families facing financial strains from climate events might prioritize immediate needs over education, leading to increased dropout rates among children from disadvantaged backgrounds. Children from poor families are more likely to drop out of school following a natural disaster or when the family experiences an illness, death, or asset shock.³⁵ In Madagascar's most fragile regions, student dropout rates average 40 percent at the secondary level.³⁶

Parents' ability to pay for education declines with climate-induced economic shocks. Nationally, about three-quarters of students (74 percent) participate in agricultural work to help their parents earn a living.³⁷ In rural Madagascar, children contribute to household earnings through farming and livestock herding, resulting in higher levels of student absenteeism, particularly among boys.³⁸ When confronted with negative income shocks, rural households often divert more of children's time away from education.³⁹ Also when climate-related shocks decrease agricultural productivity, families do their best to seek alternative (nonfarming) income. Teachers report delays in enrollment whenever there is a drought due to parents' inability to afford schooling.⁴⁰ Both children's time and school fees become scarce.

30 Government spending on education averaged 2.3 percent of GDP from 2011 to 2015 and 2.6 percent of GDP between 2016 and 2020. Mazraani 2023.

31 EFW 2024.

32 Mazraani 2023.

33 Tammi and Munnelly 2023.

34 Porter 2021.

35 Glick, Sahn, and Walker 2016.

36 Ministère de l'Education nationale. Annuaires Statistiques 2021-2022.

37 PASEC 2019.

38 Arciprete and Silva Leander 2022.

39 Gubert and Robilliard 2008.

40 SEED 2022.

Policy and Institutional Framework: Are Sector Policies and Institutions Prepared to Face Climate Change?

The PSE 2018–2022 proposed a strategy to enhance the education system's resilience to climate risks, focusing on reducing risks arising from natural or anthropogenic hazards.⁴¹ However, its implementation was hampered. The new Education Law (adopted in January 2023) emphasizes provision of educational opportunities aligned with sustainable development principles and delivery of training that reflects the realities of Madagascar's natural environment and ongoing economic, technological, social, and cultural changes. However, it does not explicitly address climate change. The Partnership Compact⁴² provides a broader framework of reforms aimed at transforming education system governance, enhancing system resilience, and strengthening equity in education in the face of climate change. Key objectives include adopting a flexible school calendar that accounts for regional differences in climate-related vulnerabilities; developing alternative teaching methods, such as distance and blended learning, self-study tools, and educational radio programs; strengthening capacity to handle climate-related shocks; enhancing emergency education measures; and creating a National Resilience Strategy for the Education System. Crosscutting interventions have been identified, including proposals for DRM, emergency education, and education for sustainable development. By strengthening these competencies, the Partnership Compact aims to better equip educators to effectively respond to climate crises, ensure learning continuity, and integrate sustainable practices into the curriculum.

There is a need to develop a cohesive and unified approach to disaster risk reduction and management within the education sector. While implementation of DRR actions at the school level has garnered significant interest from various development partners in collaboration with the government, this effort has been ad hoc. Several pilot DRR initiatives have been implemented by the private sector, nongovernmental organizations (NGOs), and various associations to benefit selected communities vulnerable to climate-related events,⁴³ but a more integrated and coordinated strategy is needed to ensure that diverse efforts contribute to enhancing the overall resilience of Madagascar's education system to climate change. As of 2024, many schools in Madagascar are not built to withstand climate shocks, and teachers and school leaders are not adequately trained to protect students from climate change. Communication and education funding mechanisms are not sufficiently decentralized to ensure DRR and learning continuity during and in the aftermath of climate crises.

Most schools are not built to withstand climate change

In 2007, Madagascar's MOE developed a cost-effective cyclone- and earthquake-resistant classroom block standard through a participatory process.⁴⁴ Since then, partners have followed the same standard model with minimal variations and periodically share related information through a Construction Advisory

41 Anthropogenic means 'of, relating to, or resulting from the influence of human beings on nature (for example, air pollution)'.

42 Led by the Global Partnership for Education (GPE), the Partnership Compact articulates how a GPE partner country intends to work with others around a priority reform with the potential to catalyze systemwide change. See Madagascar's Partnership Compact at <https://www.globalpartnership.org/fr/content/pacte-de-partenariat-madagascar-2023>

43 PIROI 2022.

44 Ministère de l'Education Nationale et de la Recherche Scientifique. "Stratégie de construction scolaire de l'École Fondamentale." Septembre 2007. The standard drawing was participatorily developed by a team of construction experts from the MOE and local offices of the United Nations Children's Fund (UNICEF), International Labour Organization (ILO), Norway, the French Development Agency (Agence Française de Développement, AFD)/Agetipa, the Arab Bank for Economic Development in Africa (BADEA), the Development Intervention Fund (*Fonds d'Intervention pour le Développement*, FID), under the auspices of the MOE's General Secretary. The paracyclonic resilience of the standard drawing was certified by SOCOTEC.

Council (*Conseil Consultatif Construction*, CCC) created under the auspices of the General Secretary. The 2019 National Standards for Buildings Resistant to Natural Hazards in Madagascar apply to all public buildings—including all school buildings.⁴⁵ Guidelines for construction standards and school planning, including zoning based on the type of hazard risks, are incorporated within the broader framework of land use planning documents established by the Ministry of Territorial Planning, at a decentralized level.⁴⁶ However, the limitation of public and donor investment funding so far results in a small share of paracyclonic school buildings.



Multiple approaches are used in planning and managing school construction. Although the MOE has adopted a paracyclonic standard for school and classroom construction, different approaches with regard to implementation arrangements are followed: (a) centralized approach (with domestic budget), (b) decentralization to local governments, and (c) delegation of contract management to empowered communities. The planning of new education buildings is based on the outcomes of the school mapping activities conducted at the subdistrict education office (CISCO) level which establishes a prioritized list of eligible new constructions (opening new schools, extensions, reconstruction, and rehabilitation of classrooms). The central MOE is then responsible for establishing standards and prioritization criteria, determining distribution of quotas per CISCO with well-defined criteria, and ultimately overseeing and controlling implementation of school construction planning by the CISCO.⁴⁷ In 2019, the MOE introduced a bottom-up and demand-driven process from communities to the CISCO to better target beneficiary communities, mitigate the risk of supply in the absence of demand, and increase communities' ownership

45 Primature 2019.

46 Le plan communal de développement (PCD) serves as a foundational reference document for human and economic development.

47 Plan Sectoriel de l'Education 2018–2022, p. 99.

of their schools.⁴⁸ The PSE 2018–2022 allowed for various implementations approaches and planned for 40 percent of school constructions to be built under the Community-Based Responsibility Approach (CBRA). This approach was recently enriched by a regulation on human hauling of construction materials, creating new conditions to equitably build paracyclonic schools in the hardest-to-reach communities that are also the most exposed to cyclones.⁴⁹

When climate crises occur, teachers and school leaders have not been trained to protect students and their access to education

Currently, Madagascar's teachers and local administrators are not adequately trained to anticipate and respond to climate risks. In 2021, just over one-third (35 percent) of teachers reported having participated in continuing professional development (CPD) or in-service teacher training, and only 44 percent recalled receiving any initial teacher education (ITE) or induction training before entering the profession.⁵⁰ Teachers do not have the training or skills to impart knowledge on climate-related hazards, vulnerabilities, and risks, nor the pedagogical skills to convey this knowledge to their students.⁵¹ Administrative personnel dedicated to disaster response is insufficient and quasi nonexistent at the *Zones d'Administration Pédagogique* (ZAP)⁵² level. The training given to Chief ZAP focuses on managing natural and climate-related hazards, but their actual capacity to handle such disasters is limited.

Existing school programs and curricula cover only the basics of climate risks and disasters; associated documents and practice drills are generally lacking. Curriculum content gaps have been partially addressed by a few initiatives from decentralized units dedicated to DRR⁵³ and include development of manuals⁵⁴ and guides on DRR for students and teachers⁵⁵ at the primary school level (first and second cycles of basic education). Monitoring and evaluation of the uptake and incorporation of these initiatives and manuals by, and their impact on, teachers and students and planning for extension to higher grade levels are essential.⁵⁶

Data unreliability and inefficiency of the education management information system (EMIS) pose a significant challenge to disaster monitoring and response mechanisms. The national education information system experiences a slow data reporting process due to remoteness and limited connectivity, lack of material resources, and capacity at the school level. The unique report on national education in Madagascar (Statistical Yearbooks) is published every year and is typically completed within an average of eight months from the beginning of the school year. Current statistical data are not sufficiently disaggregated for the climate indicators.

48 Ministère de l'Education. Projet d'Appui à l'Enseignement de Base. Manuel d'Opérations (MOP) Approuvé 12 juillet 2018.

49 See GPE blog : « Going great length to build classrooms in remote areras » <https://www.globalpartnership.org/results/stories-of-change/madagascar-going-great-lengths-build-classrooms-remote-areas>

50 République de Madagascar - Indicateurs de prestation de services en éducation (SDI) - round ii et Tableau de bord des politiques mondiales de l'éducation - round i - 2021

51 MEN 2023.

52 Ibid.

53 PIROI 2022.

54 MEN 2021.

55 PIROI 2022.

56 Plan Sectoriel de l'Education 2018–2022, p. 180.

Teachers and students do not have access to resources needed to ensure learning continuity

When climate shocks take place, local education authorities are often unaware of what DRM resources are available. Generally, authorities at the Regional Directorates of National Education (DRENs) and CISCOs are unaware of resources available from the central level. Resources for DRR and climate change adaptation (CCA) usually come directly from the MOE or technical and financial partners, like the World Food Programme (WFP), UNICEF, and the World Bank.⁵⁷ Absence of information coordination and communication is compounded by limited capacity at the DREN and CISCO levels, where staff frequently lack internet connectivity, computers, printers, and other equipment, hampering daily productivity and capacity to conduct awareness-raising activities for disaster preparation.

Schools do not have dedicated DRR response plans or funds. DRR has been incorporated into the National Disaster Risk Management Strategy since 2015. Public schools receive grants known as *caisse-école* from the MOE each school year based on the number of students enrolled. The payment of these *caisse-école* is often delayed due to complex administrative procedures governing school transfers and recurrent budget issues. Schools rely on the school grant to procure basic supplies. These intergovernmental transfers are tied exclusively to enrollment and do not contemplate the climate vulnerability of various locations. This structure can unintentionally compound climate change impacts on education access. If student attendance drops because the school sustains an isolated or repeat climate crises, fewer resources are made available to the school precisely when the school is most vulnerable. Eventually, this may well mean that children in the areas most vulnerable to climate change need to travel further to reach a functioning school, increasing education inequity. Climate change, unless carefully planned for, exacerbates inequality. Integrating climate change considerations into education funding is imperative. Teachers and local education administrators need adequate funding and training to support students and ensure learning continuity in the face of climate change.

Recommendations for Greater Climate Change Resilience in the Education Sector

There is an urgent need to adapt Madagascar's education system for climate change. Recommendations stemming from the information presented in this note are structured around four areas: (a) establishing education management for climate resilience, (b) building and rebuilding school infrastructure for climate resilience, (c) ensuring learning continuity in the face of climate shocks, and (d) leveraging students and teachers as change agents.

Establish education management for climate resilience

- **Decentralize to address each school's unique risks and vulnerabilities.** When climate shocks hit, schools typically await instructions from the MOE regarding local measures to be taken, when at times, these directives arrive late or might not exist at all. Madagascar would benefit from exploring options for decentralized funding mechanisms that empower local authorities, including schools. This could involve developing local budgets that earmark funds for disaster preparedness and risk reduction. Intergovernmental transfers should consider school-level climate change vulnerability in addition to per-student funding mechanisms. While an early warning system could be established at the national level, the response could be made more effective if responsibility is allocated to those closest to affected schools.

⁵⁷ MEN 2023.

- **Train local leaders and teachers for effective disaster preparedness and assess progress in DRR/response to climate change (RCC).** The MOE should invest in building the capacity of education supervisors and trainers at regional education offices (DRENs), educational circumscription (CISCO), and ZAP. Also, directors and teachers should receive training in DRR. Regular school drills for cyclones should be designed and conducted in at-risk areas.
- **Strengthen data collection and reporting systems for damages caused by climate crises.** This effort would entail monitoring of school closures due to climate shocks and the ability of schools to report infrastructure damage because of the event. Comparison of climate shock and slower-onset incidences such as drought, heat waves, and school attendance data should be included in Madagascar's EMIS, particularly to support education planning and funding. Plans for emergency measures to avoid interrupting the learning process should complement this reform.
- **Capitalize on existing experience.** The sector would benefit from capitalizing on existing expertise, particularly within academic and community spheres. Madagascar has been experiencing worsening effects of climate change for decades, and broad stakeholder inclusion in education amid climate change planning would be beneficial.

Build and rebuild school infrastructure for climate resilience

- **Strengthen school construction standards by securing them into a reference document.** The sectoral school construction strategy should be updated to organize the convergence of the current community-driven approach with the ongoing development of the Emerging Decentralization Policy. This is critical to ensure stakeholder agreement and streamline funding. Application of disaster-resistant infrastructure norms should be extended to high-risk zones.
- **Develop strategies and adopt faster and more innovative ways to build and rebuild schools and classrooms in remote and shock-prone areas.** The Global Program for Safer Schools (GPSS), coordinated by the World Bank's global unit for disaster and climate risk management and funded by the Global Facility for Disaster Reduction and Recovery (GFDRR), has collaborated with multiple countries to ensure the climate resilience of school infrastructure. As a first step, a vulnerability assessment of schools in cyclone-prone areas is conducted before planning to retrofit schools.⁵⁸ WASH facilities should be installed across all new and existing schools, including rain-water catchment.

Ensure learning continuity in the face of climate shocks

- **Strengthen remote learning mechanisms to ensure learning continuity during climate-related disruptions.** Remote learning models can be an important adaptation strategy to ensure continuous learning during school closures. COVID-19 disruptions demonstrated that remote learning needs to be done more effectively. Remote instruction proved to be most successful when it was fit for purpose, enhanced effectiveness of teachers, established meaningful interactions, and engaged parents and students as partners.⁵⁹ For example, across five countries (India, Kenya, Nepal, the Philippines, and Uganda), phone-based targeted instruction significantly improved learning by delivering up to four years of quality instruction.⁶⁰

⁵⁸ World Bank 2024.

⁵⁹ Munoz-Najar et al. 2021.

⁶⁰ Angrist et al. 2023.

- **Scale up successful catch-up and remedial education as children return to school.** When schools reopen after climate shocks, it is important to address the learning losses that have likely taken place. Catch-up programs can address learning losses for the most affected students. A growing number of resources have been produced with recommendations on how to best implement recovery programs, including scaling up tutoring, summer learning programs, and expanded learning time.⁶¹ A 2022 study on high-dosage tutoring, summer learning programs, reductions in class size, and extension of school days (specifically for literacy instruction) found that tutoring can be effective in addressing learning loss.
- **Reform the school calendar to ensure better education continuity.** The school calendar overlaps with cyclone and key agricultural seasons,⁶² creating an obstacle to school attendance for many Malagasy children. The school year runs from September to June, similar to the European school calendar, leading to high absenteeism among students and teachers who attend farms during harvest time and to school closures during cyclones and heavy rains. Adopting a schedule to accommodate the local agricultural and cyclonic seasons could help ensure better learning continuity.
- **Use school feeding programs to reach shock-prone families while promoting school retention.**⁶³ In 2017, efforts in school feeding programs by the ministry and its partners covered 10 percent of primary school children.⁶⁴ Reliance on school feeding is growing as increasing weather and climate extreme events are driving millions of people toward food insecurity. Hence, the provision of school meals offers a strong incentive for children to attend school daily. Community involvement through sourcing of food from local producers and suppliers and involvement of community members in meal preparation are key factors to successful school feeding programs.

Educate and train students and teachers as change agents

- **Introduce climate-smart curricula.** Incorporating essential information about climate change, disaster management, and risk reduction into school curricula is crucial for embedding climate-related principles in education. However, this must be done without crowding out foundational learning. Instead, climate topics can be used to teach and reinforce foundational skills. The school curriculum can cultivate awareness and encourage the adoption of climate-resilient behaviors. Climate education raises awareness among teachers and students, which can build pro-climate behaviors and support for policies. Pro-environment policies usually come at an initial cost to GDP as economically viable green solutions must be found. Raising climate awareness through Madagascar's education system will enhance the vulnerable island nation's likelihood of pro-climate policies being requested by communities and policy makers' enactment of needed solutions. Perhaps even more important, education can help with climate action today, not just tomorrow, as evidenced by studies showing that climate-related lessons taught to children in school can increase pro-climate behavior in both children and their parents.⁶⁵

61 Kuhfeld et al. 2022.

62 The agricultural calendar in Madagascar is divided into two main phases: the rainy season (from October to May) is the planting season, and the dry season (from April–May to August–September) is the harvesting and plowing season.

63 Fayad 2023.

64 Varly 2022.

65 Sabarwal et al. 2024.

- **Build green skills.** Despite increasing acknowledgment of the need to prepare for the green economy, the school education systems of most countries put limited emphasis on developing green knowledge and skills.⁶⁶ Analysis of national curriculum frameworks from 100 countries in 2021 revealed 43 percent did not mention climate change and 40 percent contained minimal climate change content.⁶⁷ This gap is particularly concerning as green skills are increasingly critical for future employability. Around 65 percent of youth from eight low- and middle-income countries believe that without green skills, their future employability is at risk.⁶⁸ However, there are widespread misconceptions about the nature of green skills. Nearly 54 percent of youth across these countries mistakenly believe green skills are attainable only through a master's degree, while 73 percent incorrectly assume that it is impossible to get a green job without science, technology, engineering, and mathematics (STEM) skills. It is crucial to understand that green skills are broad, encompassing not only technical and sector-specific skills but also nontechnical, socioemotional, and cross-sectoral skills. Any job and sector can become greener with the right set of skills, and these skills are needed not just for new jobs but also for augmenting existing ones. Education systems, particularly at the upper secondary and tertiary levels, need to be better harnessed to generate green skills at scale and propel green transitions. Without these skills, delivering on climate commitments will not be possible.

66 Further, according to a forthcoming World Bank report, "... education remains overlooked in the climate policy agenda. Education made up less than 1.3 percent of climate-related ODA in 2020 and mentioned in less than 1 in 3 Nationally Determined Contribution plans."

67 UNESCO 2021.

68 Sabarwal et al. 2024.



Health

Key Risks: How Does Climate Change Affect the Health Sector?

Madagascar suffers from significant health challenges, particularly **communicable**, maternal, neonatal, and nutritional diseases that could be exacerbated due to climate change. Madagascar's Climate and Health Vulnerability Assessment (CHVA)⁶⁹ identified and assessed five climate related health risk categories: (a) nutrition, (b) waterborne disease risks, (c) vector-borne disease risks, (d) air quality health risks, and (e) zoonotic diseases.

Nutrition Risks

Stunting and malnutrition are major climate-sensitive concerns in Madagascar. Approximately 40 percent of children experience stunting, 8 percent wasting, and 23 percent are underweight. The consequences of malnutrition, especially in children, are far-reaching with profound implications on human and physical capital, which can constrain a county's overall economic growth and development. More than 1.6 million people are food insecure and in need of humanitarian assistance, particularly the regions of Androy, Anosy, and Atsimo Andrefana.

Climate change has a largely negative impact on rice production in Madagascar, particularly through severe drought and significantly below-average soil moisture conditions. In the southern region of the country, around 80 percent of the population depend on rain-fed agriculture. Changes in precipitation and temperature will affect fisheries and coastal communities where marine products are the main source of protein. Rising sea temperatures and acidification influence the abundance, migratory patterns, and mortality rates of marine life, which have health, economic, and social consequences for people dependent on fisheries and aquaculture.⁷⁰

Production shortfalls are likely to aggravate food insecurity at the household level. Quantity in terms of both food availability and calories consumed and quality of food products play a considerable role in nutrition outcomes. Additional drivers of malnutrition include poor feeding practices and infectious diseases, such as diarrhea.⁷¹ In the absence of adaptation, climate change is likely to substantially aggravate food insecurity and compromise nutrition outcomes in Madagascar. While there is uncertainty on the precise number of individuals in Madagascar that will be at risk for food insecurity because of climate variability, recent findings suggest that globally, between 2010 and 2050 the population at risk could increase by up to 30 percent as a result of climate change.⁷²

69 The CHVA involves the identification of key climate exposures and related health risks to provide a summary of estimated current climate-related health burdens along with projections of changes in risks over the short (2020–2039) and medium term (2040–2059) at the country level. The assessment then builds on these identified health risks to analyze adaptive capacity identifying any gaps to adequately deal with current and projected health risks. It aims to assist decision-makers in planning effective adaptation measures to address climate-related health risks.

70 <https://www.oecd.org/greengrowth/fisheries/climatechangeandfisheries.htm>

71 <https://academic.oup.com/jn/article/133/1/328S/4687565>

72 Michiel et al. 2021.

Waterborne Diseases

Madagascar faces an important burden of waterborne diseases such as diarrhea, dysentery, cholera, food poisoning, and parasitic infections, particularly affecting children under five years of age. Current drivers of waterborne diseases throughout the country are attributable to many factors including water sources, quality and quantity of drinking water, sanitation facilities, and hygiene practices, each of which can be negatively affected by climate-related factors in particular floods and landslides. Madagascar has reported a diarrhea prevalence between 8 and 10 percent in children since 2003. Subnationally, diarrhea prevalence is highest in the Androy region with 16.2 percent, followed by Vatovavy fitovinany (14.7 percent), Menabe (13.8 percent), and Antananarivo (13.3 percent).

Lack of access to safe water sources, and limited sanitation and hygiene practices, exacerbate the risk of diarrhea and other water-related diseases. Less than half of the households have access to improved drinking water sources (48 percent), less than 35 percent of the households have an improved sanitation facility, and 53 percent of households are not using any methods for treating the water before consumption. Areas experiencing increased precipitation, flooding, droughts, and storm events with limited access to safely managed drinking services will likely experience greater vulnerability to waterborne disease in Madagascar.

Vector-Borne Diseases

Malaria is the main vector-borne disease in the country, with more than 25 million people at high risk (88 percent of the population). Malaria transmission and vector reproduction are sensitive to seasonal changes in rainfall and temperature as well as extreme weather events. Increasing temperatures and changing precipitation patterns is expected to increase suitable areas for the Anopheles mosquitoes in higher altitudes. In the absence of adaptation measures, ongoing climate change is likely to increase malaria prevalence, especially along the highlands in Madagascar.⁷³ It is projected that by 2070, 46 million people will be at risk of malaria.

Air Quality Health Risks

The Air Quality Index (AQI) 2023 shows a moderate concentration of PM2.5 and PM1.0 in Madagascar (AQI=77), which is 2.7 times above the guidelines recommended by the World Health Organization (WHO). Ambient air pollution (AAP) is notably affected by wildfires and brick production and burning, which tend to increase during the dry season. Indoor air pollution is a major concern in Madagascar, with two out of five households (42 percent) cooking indoors and almost all (98 percent) of households using solid fuel for cooking. AAP and household air pollution (HAP) pose a risk to the health of people, exacerbating respiratory illnesses which have a high prevalence in the country. Both AAP and HAP increase risks for acute respiratory infections which are among the top three morbidities in children.

Zoonoses

Madagascar is among the countries with highest levels of biodiversity, which increases the interactions between humans and animals and therefore the risk of zoonotic diseases such as plague which is endemic in Madagascar. The country has mainly experienced small and isolated outbreaks of bubonic plague. Wildfires have increased due to adequate temperature and precipitation conditions, coupled with deforestation rates. These conditions alter rodents' natural habitats and drive them to inhabited areas,

73 <https://www.pnas.org/doi/full/10.1073/pnas.1302089111>

increasing the risk of zoonotic infections. In the context of high biodiversity, such as in Madagascar, coupled with decreasing natural habitats due to wildfires or droughts, interactions between animals and humans increase, thereby raising the risks for zoonotic diseases.

Policy and Institutional Framework: Are Sector Policies and Institutions Prepared to Face Climate Change?

Madagascar's National Adaptation Plan (NAP), published in December 2021, details adaptation measures for 10 years. The NAP has three main strategic axes: (1) strengthening governance and adaptation integration, (2) implementing a priority sectoral action program, and (3) financing adaptation to climate change. Priority sectors for the implementation of adaptation actions include (a) agriculture, farming, and fisheries; (b) water resources; (c) public health; (d) biodiversity and forestry; (e) coastal zones; (f) management of territory and infrastructure; (g) management of climate-related risks and hazards; and (h) habitat and new cities. The NAP outlines two strategic public health priorities: improving the health sector's capacity to address climate-related adverse effects and increasing the population's capacity in the face of climate and climate-related health risks.⁷⁴

The National Adaptation Action Plan for the Health Sector (NAAPH) aims to strengthen the technical, institutional, and organizational capacities of the health sector in the face of climate change. The activities to be carried out to increase the health sector's resilience to climate change are grouped into seven components: (a) risk and capacity assessment, (b) capacity building, (c) integrated monitoring of the environment and health, (d) response, (e) research, (f) monitoring and evaluation, and (g) program coordination and management. However, most of the activities being implemented are related to surveillance and the integration of information systems and dependent on external financing mechanisms. Activities focusing on preparedness and climate resiliency systems are not included in the action plan, and performance and progress monitoring is lagging.



The Environmental Health Department of the Ministry of Health (MoH) is charged with climate change and health and engages up to the regional level. The Environmental Health Department is responsible for implementing the NAAPH and has focused mostly on implementing activities related to capacity building, information systems, and emergency response. For example, the department recently conducted training sessions for 33 focal points aiming at providing technical support to develop subnational action plans for climate change and health. There is limited integration of climate adaptation activities in other departments within the MoH, constraining integration of these activities into the health system. Regarding information systems, they have developed the climate and health bulletin and the 3-2-1 SMS system for climate and health, and for emergency responses they have focused their efforts on coordinating and mobilizing key public and private stakeholders for emergencies, notably for nutrition programs. However, progress in research on climate and health-related risks, risk and capacity assessment, monitoring and evaluation, preparedness of climate-related hazards, and coordination and management of programs is minimal.

Implementation challenges are mostly due to limited budgets being allocated to the action plan and lack of human resource capacities at the district and local levels. For example, there is limited financial support and capacity for technical guidance toward emergency response and preparedness at the local level and for the development of contingency plans in case of extreme weather events. Even for the strategies currently being implemented, there is an absence of monitoring mechanisms for overseeing the use of resources. In addition, there are limited enforcement mechanisms and budget to ensure that the regional or local levels carry out the development of action plans or implement any other climate-related efforts, as implementation is at their discretion.

The National Adaptation Action Plan for Climate Change and the Health Sector estimates costs of US\$3.7 million for implementing the key strategies for the health sector in the face of climate change. From that budget, 38 percent is being directed to capacity building (US\$1,421,798), followed by 23 percent directed to implementing integrated monitoring of the environmental health (US\$850,000) and 18 percent to emergency response. The rest of the budget is allocated to program coordination and management, monitoring and evaluation, research, and risk and capacity assessment.⁷⁵ This estimated budget is based at the national level, with regional, commune, district, fokontany, and facility levels lacking budgets for climate adaptation or mitigation work, including emergency preparedness. While budgets have been estimated, these are not being financed depending on development partners or the private sector for implementation.

The central MoH does not have a budget line for climate-related activities, including emergency preparedness and other adaptation measures. Work on climate change appears to be limited to the Environmental Health Department. Despite having estimated the costs for the key strategies from the National Action Plan for Health Security (*Plan d'Action National pour la Sécurité Sanitaire*, PANSS), the MoH depends on external funders to allocate resources for implementing the activities. Development partners such as the German Agency for International Cooperation (*Deutsche Gesellschaft für Internationale Zusammenarbeit*, GIZ), the WHO, and the United States Agency for International Development (USAID) are among the key stakeholders advancing climate and health strategies in Madagascar. However, most of the activities outlined in the PANSS have had weak or a low level of implementation due to lack of resources being allocated, as the MoH resource allocation to climate change and health is limited. For example, the climate and health bulletin was developed in a partnership with a private consulting firm, the main mobile company Airtel, and funded by GIZ. The forthcoming World Bank project for pandemic preparedness will focus on funding PANSS activities.

75 <https://climhealthafrica.org/wp-content/uploads/2021/10/PNASS-VERSION-FINALE-3-1.pdf>

Table 2: Health system adaptive capacity gaps

Health system building block	Summary of gaps in adaptive capacity
Leadership and governance	<ul style="list-style-type: none"> The Climate Change Coordination Bureau does not have the enforcement capacity, budget lines to allocate resource for implementation, or the systems in place to ensure adoption of the NAP. Implementation challenges are mostly due to limited budgets being allocated to the Action Plan and lack of human resource capacities at the district and local levels. Cross-sectoral coordination mechanisms lack clear definitions of roles, activities, and budget that could incentivize participation.
Health workforce	<ul style="list-style-type: none"> The health sector faces an imbalance in the number, skill mix, and deployment of the health workforce, including large urban-rural disparities. Health personnel lack formal training to lead primary health care centers (<i>Centre de Santé de Base</i>, CSBs), especially training that includes preparedness and response amid climate-related hazards. Packages that incentivize health workforce distribution in climate-vulnerable areas are nonexistent.
Health information and disease surveillance systems	<ul style="list-style-type: none"> Climate data produced by the Department of Climate Change and Meteorological Services are not well integrated into MoH decision-making and strategic planning as well as at the facility level. Climate and Health Bulletin and 3-2-1 SMS service lack concrete recommended actions for climate-related health risks or climate-related hazards. Moreover, these systems do not use climate vulnerability as a criterion to direct messages.
Essential medical products and technologies	<ul style="list-style-type: none"> Distribution of essential medicines lacks contingency plans for climate-related hazards that hinder adequate distribution. Centralization of the Salama system poses a challenge for the distribution for remote and distant communities. There is a lack of decentralized warehousing and storage that would shorten times for the delivery of products amid extreme weather events.
Health service delivery	<ul style="list-style-type: none"> Climate change and associated impacts are not mainstreamed into the operations and decision-making of health programs at all levels. Cross-sectoral coordination lacks clear roles and strategies. There is a lack of assessments for climate-resilient health care facilities, health infrastructure, and water, sanitation, and hygiene (WASH) infrastructure, which makes prioritization of needs and enforcement of adoption of building codes challenging. The primary health care directorate lacks technical capacities on climate and health.
Financing	<ul style="list-style-type: none"> The NAAPH lacks budget for implementing its strategies and activities, depending on development partners. Protection mechanisms for the population are limited and do not target climate-vulnerable populations. Budgets are centralized and at the national level, limiting operability capacity at the district and fokontany levels.

Recommendations for Greater Climate Change Resilience in the Health Sector



Madagascar © Tsiky Lalatiana Ranaivoarisoa

The CHVA proposes a set of recommendations to enhance health system resilience and adaptation to climate change, including potential health interventions and strategies that can be put in place.

Leadership and governance:

- (a) **Strengthen intersectoral coordination through the implementation of the One Health platform, including climate-related health risks, with a focus on tracking the progress of the PANSS and the efforts led by different stakeholders.** Notably, programs addressing malnutrition and the high levels of food insecurity in the south could benefit from the improved coordination and monitoring of activities and progress to ensure effectiveness, avoid duplication, and improve collaboration.

Health financing:

- (b) **Establish a budget line at the MoH for the implementation of the strategies and activities identified in the NAAPH and incorporate objectives of the NAAPH into annual planning for departments throughout the MoH.** A budget line and integration of NAAPH activities into annual planning would help ensure that they are completed while decentralizing activities in the ministry would help execute and institutionalize climate adaptation activities more effectively.
- (c) **Use climate and health vulnerability as a criterion for implementing the PANSS and allocating resources.** Specifically, climate vulnerability can be used to prioritize health workers, resource allocations, and other activities to locations that are most vulnerable to climate-related hazards for advancing efforts on implementing adaptation actions that would reduce the population's risks.

Health workforce:

- (d) **Extend the existing training on climate to all health workers, including those at the community level, as well as subnational-level administrators such as those working at the district and facility levels, along with local authorities such as the chief fokontany.** Additionally, the pre-service training curriculum should be adapted to include climate-related health risks and climate emergency preparedness and response.

Health information systems:

- (e) **Prioritize the expansion of the 3-2-1 SMS information system to reach climate-vulnerable areas and populations.** Broadening the coverage of the system will enable the effective dissemination of climate and health emergency response and preparedness early warning messages to those most susceptible to climate-related hazards and extreme weather events. This includes tailoring the timing and frequency of messages to match the climate-related hazards faced by different populations.

Service delivery:

- (f) **Implement a climate adaptation and resilience certification system for health care and WASH infrastructure.** The certification system would include an assessment of facilities against existing climate-resilient infrastructure codes and identify health facility needs, facilitating the prioritization of resources allocation and supporting enforcement. Such a system may be integrated within existing health facility quality assessments.
- (g) **Develop training modules on climate and health risks for primary health care personnel.** These modules should be directed to the national, regional, district, and fokontany levels, including commune mayors and other local-level key stakeholders that are in coordination with the CSBs.
- (h) **Elaborate contingency plans for the procurement of essential medicines amid extreme weather events such as storms or floods.** These plans should include pre-positioning protocols in climate-vulnerable communities; clear roles and coordination with fokontany, NGOs, and other key stakeholders; and regular testing and updating of contingency plans based on feedback from previous events.
- (i) **Develop formal standard operating procedures that focus on preparedness for climate-related hazards.** Preparedness processes should include communication and coordination systems for decision-making, training for health care workers and first responders, and establishment of evacuation plans, tailored to different climate exposures.

Review of Current Projects That Can Be Redesigned to Be Climate Responsive

The current World Bank-financed health projects, primarily the Pandemic Preparedness and Basic Health Services Delivery Project (PPSB, P174903) and Phase 2 of Improving Nutrition Outcomes Using the Multiphase Programmatic Approach (P175110), offer opportunities to begin to address some of the challenges identified through the CHVA. Some climate-related actions have been identified in the Project Appraisal Documents and can be enforced through project implementation, while others can be integrated into project implementation or additional financing, which is tentatively planned for the pandemic preparedness project. The following aspects were accepted as options for incorporating the CHVA recommendations.

A. PPSB

1. **Coordination of climate change and health** will be supported through the One Health platform at the national level and coordinated at the subnational levels, including support for the multisectoral climate and health response plans.
2. **Early warning systems for climate emergencies and climate-sensitive disease outbreaks** will be incorporated into the overall support for early warning systems.
3. **Operational support for climate change emergency preparedness and response, including climate emergency response planning**, will be supported through assistance provided to the emergency response committees (*Centre d'Operations d'Urgences de Santé Publique - COUSP*) at the regional and district levels.
4. **Support for pre-positioning pharmaceuticals for climate-sensitive diseases and during climate shocks** will be given through the overall support for pre-positioning medications for and during emergencies.
5. **Public financial management (PFM) capacity building for budgeting and budget advocacy for climate adaptation and emergency preparedness and response** will be provided to the regional and district levels as part of the overall PFM capacity building.
 - (a) It was discussed that **climate vulnerability could be explored as a criterion in the formulas for the following**. However, two aspects are still being considered: (a) whether climate-vulnerable areas differ from areas meeting the existing criteria of being poor and/or remote should be explored and (b) the incorporation of climate vulnerability into the criteria may come at a later stage since decrees for these formulas are close to being finalized and released. Those decrees include (a) distribution of funds to the basic health centers at the commune level (CSBs), (b) deployment of health workers to locations, and (c) health worker retention packages.
6. **Climate emergency preparedness and response training** will be incorporated into the support of the overall HR training.
7. **The PANSS and strategy will be launched** as part of the launch of the Pandemic Preparedness Plan to support advocacy for the documents.

B. Phase 2 of the Multiphase Approach (MPA2) for Nutrition

1. **A dashboard for the continual overlay of the climate and health data** will be developed. Climate and nutrition data are currently being analyzed periodically in the analytics produced by the Nutrition Cluster Technical Group.
2. Climate adaptation needs will be incorporated into work planning and budgeting as well as the seasonal planning of activities, with the caveat that the project will not be able to finance the implementation of all these needs.
3. **Climate emergency preparedness and response measures will be incorporated into results-based financing (RBF) measures**, and climate adaptation/emergency preparedness and response activities **may also be used as criteria for using a portion of the funds**.

C. Opportunities for Cross-Sectoral Engagement for Health Co-Benefits:

1. Engaging with the WASH sector to increase resiliency against waterborne diseases in the face of climate change
2. Engaging with the energy sector for solarization of health facilities for increased resiliency in the face of power outages due to extreme weather events and ensuring development of adequate technical capacities for installation, maintenance, and repair of solar equipment
3. Engaging with the private sector (both nonprofit and for-profit) and NGOs as key health service delivery providers in the country to ensure better coordination between all the different projects and programs from different stakeholders in the country
4. Integrating health programs formally into DRM coordination mechanisms at the national and local levels and supporting local disaster management councils to fulfill their coordination mandate through increased resource allocations.



Social Protection

Key Risks from a Social Protection Standpoint

The increasing focus on adaptive social protection, which helps build the resilience of poor and vulnerable households by investing in their capacity to prepare for, cope with, and adapt to shocks, so that they do not fall into, or deeper into, poverty has proved promising both in Madagascar and globally, but more needs to be done to incorporate adaptation and mitigation measures into the design of social protection programs.

In designing responses to the effects of climate change, the government and partners have categorized the main risks into two categories: risks from rapid-onset shocks and risks from slow-onset shocks.

Disasters caused by the passage of rapid-onset hazards—most commonly, cyclones and floods—usually result in destruction through immediate physical impact. In recent years, the severity of such hazards is being amplified by the effects of climate change. In 2022 alone, five cyclones—Ana, Batsirai, Dumako, Emnati, and Gombi—damaged food crops, livestock, and infrastructure, with hundreds of thousands of households directly affected by one or more of them. The average cyclone, of which Madagascar faces three to four annually, decreases total consumption by 12 percent and increases the probability of being poor by 7.4 percent.⁷⁶ These shocks affect all types of households—rich and poor, urban and rural—but poor households generally have heightened vulnerability due to the lower quality of their housing, likelihood of living in areas more vulnerable to flooding, and lack of assets to cope with shocks. In greater Antananarivo, an estimated 30 percent of land and 750,000 people (almost one-third of the population) are exposed to flooding, with poor neighborhoods facing the highest exposure.⁷⁷

In addition to the immediate effects on housing, food security, health, and assets, poor households can suffer longer-term impacts. Due to their lack of assets to deal with the immediate impacts of the shock, poor households face the risk of increased usage of negative coping mechanisms. These can include selling productive assets, forgoing health care and leaving school, child labor, and child marriage, among others. In turn, recourse to such coping mechanisms can lead to a loss of human capital or slowed pace of human capital accumulation.

Disasters emanating from a slow-onset hazard, such as a prolonged drought, create long-term social and economic crises in the affected areas. Prolonged drought prevents households from producing for daily consumption and compromises their health and nutritional well-being. Just as with rapid-onset shocks, its medium- to long-term effect can lead households to adopt negative coping strategies such as withdrawing their children from school, engaging in early marriage, involving children in labor, and selling essential assets and capital to their income-generating activities.

Southern Madagascar, the country's most arid and poorest region, has experienced since 2016 acute food insecurity and the worst drought in 40 years, which led to widespread crop failure, severe food insecurity, and internal migration. The drought in the South remains severe, according to the last results (June 2024) of the Integrated food security Phase Classification (IPC). In total, 1.21 million people are estimated to be in IPC phase 3 or worse during the current period of June to September 2024. This number is expected to increase to 1.77 million people between January and April 2025.

76 Andrianarimanana 2015.

77 Cyclones and flooding in the capital have been shown to lower incomes and reduce food consumption for affected households by as much as 80 percent.

Social Protection Strategic Framework for Addressing Climate Risk

The existing institutional framework is generally well developed to assign roles and responsibilities to different actors for adaptive social protection and shock response. Annex 1 presents laws, policies, and partnership agreements governing adaptive social protection and shock response.

The Ministry of Population, Social Protection, and Promotion of Women (MPSPPW) is responsible for social protection in Madagascar. The ministry was established in 2004, then disappeared in 2008, and reappeared in 2013. This ministry has gradually improved its capacity for coordination. A key step was the signing of the memorandum of understanding (MoU) for the coordination of social safety net programs in 2017. In addition, with support from UNICEF and the World Bank, a 'Social Protection Thematic Group' ('Groupe Thématique de Protection Sociale') was formed at national and regional levels in 2015–2018 to reinforce the role of the ministry in term of coordination especially with humanitarian actors.

The ministry is now among institutions that are responsible for the development and interventions in southern Madagascar where poverty and vulnerability are concentrated. There is currently a nascent coordination among social protection and humanitarian actors, under the leadership of the MPSPPW and BNGRC through the Cash Working Group (CWG). UNICEF is a primary partner for policy and program support, whereas the WFP is involved in humanitarian assistance, and both work in close partnership with the World Bank. The CWG has been an important mechanism in bringing technical and financial partners together to expand the social safety net, using tools such as the World Bank-supported beneficiary registry and program inventory, as well as support to the government for coordinated emergency response. Humanitarian interventions remain critical given the multitude of crises, but they are not well coordinated among one another or with the Government of Madagascar's social safety programs. The government under the leadership of the MPSPPW has continued coordination and harmonization of responses.

The National Social Protection Strategy (*Stratégie Nationale de Protection Sociale, SNPS*) 2019–2023 emphasized the development of a national system of shock-reactive social protection that is capable of responding to the increased severity of shocks resulting from climate change. The SNPS noted that humanitarian assistance is often used to address chronic poverty issues, especially in the southern regions of Madagascar affected by drought. In addition, many humanitarian and development agencies support households in drought-affected areas but with different visions and modalities. A new strategy for 2024–2030 is under preparation.

While noting that neither humanitarian aid nor development assistance can address all the needs of people affected by climate-related shocks such as drought, the SNPS also called for an increased reinforcement of development assistance aimed at boosting resilience of households with the expectation that increased resilience could reduce—though not eliminate—the need for humanitarian assistance over time. The SNPS also sought to reinforce harmonization between different programs and sources of financing, in both the humanitarian and development sectors. This has been translated into reality through the development of two manuals for response to shocks, one for slow-onset crises such as drought and another for rapid-onset crises such as cyclones and floods.

In 2022, the MPSPPW organized a series of workshops with the technical assistance of the World Bank to bring together the different humanitarian and development actors to improve harmonization and coordination. With the support of BNGRC, the discussions led to updates of the operational manual for adaptive social protection in response to low-onset shocks as well as the development of a new manual for response to rapid-onset shocks. These manuals are to guide the interventions of government and humanitarian and development actors to promote increased harmonization in the sector.

The forthcoming national social registry will further strengthen Madagascar's ability to respond to climate-related shocks. Social registries are digitally enabled information systems, which include households' welfare information and objective ranking to support outreach, intake, registration, and determination of eligibility for one or more social programs. Once established, Madagascar's social registry will strengthen coordination and harmonization of climate shock-related and other social programs, enable efficiency gains and cost savings through harmonized data collection, reduce the risk of duplication and fraud, improve quality of beneficiary targeting including by identification of geographic areas most vulnerable to different shocks, and promote rapid identification of beneficiaries after a shock. Pilot data collection for the social registry was launched in September 2023, with registration of over 70,000 households in southern Madagascar. In 2024, the ministry in charge of population is expanding the social registry in the areas most exposed to natural disasters (70,000 new registrations expected by December 2024), while in parallel registering over 281,000 households in the context of enrollment for social safety net and resilience programs (281,000 households).

Main Interventions

A number of safety net programs have been established in recent years to address the main risks for poor and vulnerable households related to climate change (described in the previous section). These programs are already being implemented on the ground but at an insufficient scale due to limited resource availability. At present, Madagascar's main social safety net programs cover approximately 7 percent of households and 8 percent of the poor, contrasted with the country's poverty rate of 80 percent in 2021. The safety nets consist of core safety nets programs which operate on a continuous basis as well as crisis response safety nets which are capable of being scaled up in times of need.



Table 3. Number of social safety net beneficiary households per year

	2016	2017	2018	2019	2020	2021	2022	2023	2024
Core safety net programs	1,500	132,100	142,500	142,500	167,300	161,900	362,600	260,900	409,160
Crisis response programs	—	61,715	75,200	30,150	223,043	196,409	215,852	242,620	731,470 ^a
Total	1,500	193,815	217,700	172,650	390,343	358,309	578,452	503,520	1,140,630

Source: a. Including 657,000 estimated beneficiaries supported from the Contingency Emergency Response Component (CERC) (P178566).

Core safety net programs. In recent years, with the support of the World Bank through the Social Safety Nets Project (SSNP), Madagascar's social safety net system has evolved to have two core programs:

1. **The Human Development Cash Transfer (HDCT) program** provides income support to the poorest families to boost household consumption, food security, nutrition, and human capital, including in areas most vulnerable to climate risks. The program requires primary school attendance for children between the ages of 6 and 14 years and links beneficiary households to health, nutrition, livelihoods, and early childhood development services. The HDCT program currently covers 290,550 households in 19 regions out of 23.

In addition to targeting beneficiaries in areas with high vulnerability to climate risk, the HDCT program aims to build resilience to help poor households better withstand the impact of climate change. Support to boost resilience and enable exit from the need for social assistance begins after the beneficiary household has received support under safety net programs for enough time to stabilize consumption. At this time, each beneficiary household receives accompanying measures aiming to enhance human capital and promote financial inclusion, productive inclusion, as well as support to develop soft skills and life skills—enabling them to become more resilient in the face of future shocks.

2. **The Productive Safety Net Program (PSNP)** provides cash-for-work activities in targeted poor communities in areas which face high levels of environmental degradation as well as potential to increase local agricultural production. The cash for work boosts household consumption and food security as well as economic and financial inclusion, by enabling households to diversify livelihoods through new crops or agricultural practices and thereby increasing resilience to climatic shocks. The PSNP program currently covers 118,610 households in 14 regions.

In addition to providing a transfer in the form of wages, the PSNP promotes adaptation to climate change through climate-focused public works, cyclone-resilient social infrastructure, and adoption of improved techniques to cope with rainfall variability for small-scale agriculture. Participants

contribute to community-based natural resource management through reforestation, agroforestry, watershed management, and other soil and water conservation activities and receive technical training on improved agricultural practices including climate-smart agriculture.

Crisis response programs. Madagascar's safety net has also grown in its ability to scale up in periods of crisis, as shown in Table 4. Coordination between the social protection sector and BNGRC has been strengthened.

Since 2016, the World Bank has financed a social protection program called 'Fiavota' (meaning 'to rescue' in Malagasy), for households in the districts most affected by drought-induced food insecurity. Established with resources from the first additional financing to the SSNP, the program originally consisted of (a) conditional cash transfers for drought-affected households with children aged under five years, (b) livelihood recovery grants for these households, and (c) community-based nutrition services. In 2019, the program changed to mirror the HDCT program, with cash transfers supplemented by accompanying measures aiming to boost human capital development. Financing for HDCT-Fiavota will continue under the new Safety Nets and Resilience Project (SNRP) for 32,000 households in the two regions in the South most affected by drought and food insecurity. According to impact evaluations carried out under the Madagascar SSNP, the incidence of extreme poverty decreased by 14.9 percent for the first cohort of beneficiaries in the Fiavota program after three years.⁷⁸

The safety net system has been activated to respond to climate shocks numerous times in recent years. The second SSNP additional financing in 2019 added US\$20 million for crisis response, recognizing that emergencies—both rapid-onset (cyclones and floods) and slow-onset (drought)—affect the country almost every year, with fluctuations in intensity and impact from one year to the next. The third SSNP additional financing in January 2021 adapted existing programming to the context of COVID-19, while continuing to address concurrent climate shocks whose consequences were further exacerbated by the COVID-19 crisis. After severe cyclones in January and February 2022, the SSNP was restructured to make available approximately US\$40 million for cyclone response through unconditional cash transfers (200,000 households), cash for work (222 subprojects), and infrastructure rehabilitation (255 schools, health posts, and transport infrastructures). Since May 2024, 31 schools damaged by the Gamane cyclone in April are currently being rehabilitated under the crisis response component of the SNRP.

To be prepared for future shocks, the government's main social protection implementation agency, FID has developed an operational manual for shock response manual with a menu of rapid safety responses tailored to different types of shocks. FID's crisis response activities are triggered based on declarations of need from BNGRC. Responses can consist of (a) unconditional cash transfers for vulnerable populations, horizontal expansion to new beneficiaries, or vertical expansion for existing beneficiaries through top-ups on cash transfer amounts in areas where the cash transfer programs are operational; (b) cash-for-work activities for vulnerable populations in areas where manual labor is required to rehabilitate damaged physical infrastructure or assets or temporarily boost food production through agricultural-based activities; (c) rehabilitation/reconstruction of basic socioeconomic infrastructure in areas affected by natural disasters; and (d) nutritional supplements for children under five living in areas most affected by severe drought in the three regions of the south (Atsimo Andrefana, Androy, Anosy). Depending on the crisis, accompanying measures to support human capital development and economic inclusion for beneficiaries of this subcomponent can be supported. Overall coordination of the crisis response with the humanitarian actors is established through the CWG, the platform for coordination of social transfer under the leadership of the MPSPPW and BNGRC.

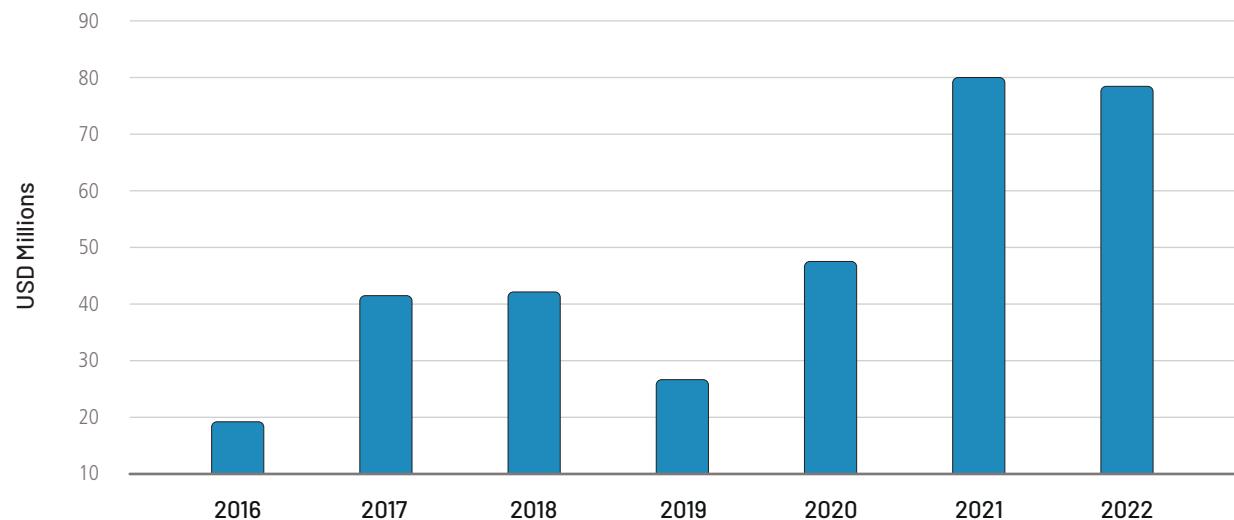
78 <http://documents.worldbank.org/curated/en/508261560410572331/Résultats-de-l-Évaluation-à-Mi-Parcours-du-Programme-Fiavota>

Financing

While the main safety net instruments to respond to both rapid-onset and slow-onset climate shocks are well-established and operational, the main constraint is the availability of financing to increase coverage of the programs. As climate change continues and other global sources of uncertainty evolve, and given the many shocks to hit the country in recent years, Madagascar must strengthen its ability to mobilize financing to address future shocks that could threaten to further derail economic growth and poverty reduction.

Madagascar's spending on social safety nets is lower than the average for LICs. In 2022, Madagascar's expenditures on safety nets amounted to about 0.35 percent of GDP, compared to an average of 0.9 percent of GDP for all LICs.⁷⁹ External financing is predominant, largely from the World Bank. The preponderance of safety net spending—including from the World Bank, UNICEF, and the government, when provided—is implemented by FID. Figure 2 shows the trend of safety net spending through FID.

Figure 2. Social safety net spending through FID, 2018–2022



Source: FID.

Other countries in the region have begun to devote important shares of national budgets to social safety nets. However, spending by the Government of Madagascar on safety nets is small and sporadic, peaking at about US\$7 million in 2021 but falling to zero since 2022, despite the government's commitment in the World Bank's Human Development budget support operation to mobilize about US\$7 million for safety net programs annually.

While Madagascar's fiscal position remains delicate following the COVID-19 pandemic and the effects of the war in Ukraine, the International Monetary Fund (IMF) has encouraged the government to create and strengthen fiscal space to allow for much needed investment and social spending.⁸⁰ As fiscal space becomes available through revenue growth, the IMF recommended devoting increasing shares to social safety nets as well as health and education.

79 ASPIRE database - www.worldbank.org/aspire

80 Staff Report for the 2022 Article IV Consultation, February 15, 2023.

There are numerous precedents for LICs to increase the share of domestic financing of safety net programs. As noted in *Charting a Course Towards Resilience, Equity, and Opportunity for All: Universal Social Protection*,⁸¹ “Ethiopia’s Rural Productive Safety Net Program was initially funded externally, but the government has been increasing its share, despite the country’s fiscal constraints and high vulnerability to macroeconomic instability, from 3 percent in 2015 to 27 percent in 2019 (World Bank, 2020c). Building on this experience, Ethiopia’s Urban Productive Safety Net Program, received around a third of its financing from the government’s budget from its launch.” In addition, disaster risk insurance mechanisms show promise for scaling up to fill financing gaps for climate shock response, to the extent that resources from insurance payouts can be earmarked for safety net responses.

⁸¹ Charting a Course Towards Universal Social Protection: Resilience, Equity, and Opportunity for All, World Bank 2022.



Priorities in Human Development

Education Sector Priority Investments and Reforms

No.	Quick wins (Priority investments to implement in the next 3–5 years)	Enabling conditions (What will it take to implement the recommended intervention?)	Cost estimate (US\$, millions)	Private sector investment opportunities
1.	Enhance efficiency of EMIS and existing disaster monitoring and response mechanisms (distribution of tablets to all school principals, operationalization of MOE data server, school cards, and so on).	<ul style="list-style-type: none"> Adoption of decree on the status and role of school principals Capacity building of local stakeholders and structures Enabling of effective data collection at the school level Active collaboration with BNGRC⁸² on DRM 	40	<ul style="list-style-type: none"> Support training of MOE technicians for data analysis Internet expenses School equipment, such as computers, tablets, and laptops
2.	Strengthen school-level preparedness by enhancing the existing school grant program, integrating equity-based resource allocations for climate change mitigation and adaptation actions in all schools.	<ul style="list-style-type: none"> Increased education budget Integration of adaptation and DRM at all decentralized levels Adoption of decree on the status and role of school principals Effective decentralization Stakeholder training 	100	
3.	Reform the school calendar and curriculum to align with meteorological and agricultural conditions, protecting education delivery and learning (including a flexible/modular school program and school year and flexible dates for national examination).	<ul style="list-style-type: none"> Capacity building for the decentralized level Continued teacher training Existence of self-learning tools for students and teachers Effective decentralization Effective autonomy for school principals in the implementation of the school program 	30	
4.	Develop and adopt context-adapted standards and update the 2007 implementation school construction strategy, for school infrastructure building and regional planning.	<ul style="list-style-type: none"> Active collaboration with Ministry of Planning and Land Management Collaboration between the MOE and Ministry of Decentralization 	5	<ul style="list-style-type: none"> Funds to support school and classroom construction

82 BNGRC = National Office for Risk and Disaster Management (Bureau National de Gestion des Risques et des Catastrophes).

No.	Mid- to longer-term actions (Priority investments to implement in the next 5–20 years)	Enabling conditions (What will it take to implement the recommended intervention?)	Cost estimate (US\$, millions)	Private sector investment opportunities
5.	Strengthen curricula and equip youth with green skills focused on climate resilience and green jobs to build human capital and promote sustainable approaches to economic development.	<ul style="list-style-type: none"> Strengthened links with industry to support technical education and higher education institutions to develop programs that respond to market needs and oriented toward green skills Expansion of secondary and technical education Existence of market analysis 	150	<ul style="list-style-type: none"> Internships Apprenticeships On-the-job training Career guidance and mentoring CSR initiative on local jobs, green jobs, sustainability Access to new technology and internet
6.	Allocate resources toward climate change knowledge and research.	<ul style="list-style-type: none"> Increased higher education budget and strengthened role of universities in the fight against climate change Increased collaborative partnership between educational institutions, research organizations, and industry partners 	10	<ul style="list-style-type: none"> Scholarships

Health Sector Priority Investments and Reforms

No.	Quick wins (Priority investments to implement in the next 3–5 years)	Enabling conditions (What will it take to implement the recommended intervention?)	Cost estimate (US\$, millions)	Private sector investment opportunities (low-hanging fruits)
1.	Strengthen emergency preparedness and response capacity at the decentralized level (budget, HR, plans)	<ul style="list-style-type: none"> Health programs formally integrated into DRM coordination mechanisms at the national and local levels Effective decentralization: emergency operations centers created at the local level with budgeted local emergency preparedness and response plans Capacity building for local structures Funding available under PPSB (P174903) 	20 (PPSB)	

No.	Quick wins (Priority investments to implement in the next 3–5 years)	Enabling conditions (What will it take to implement the recommended intervention?)	Cost estimate (US\$, millions)	Private sector investment opportunities (low-hanging fruits)
2.	Develop multisectoral and integrated early warning systems — interoperable digital data systems, for surveillance and notification of epidemic-prone diseases including climate-sensitive diseases	<ul style="list-style-type: none"> One Health platform and surveillance functional and inclusive of climate-sensitive diseases in addition to overlaying meteorologic data with surveillance data Multisectoral preparedness and response plans in place for when early warning systems are activated Specific climate and health emergency response and preparedness recommendations/actions are disseminated on time to the population using all media (including SMS) Effective data use at all levels Funding available under PPSB 	18 (PPSB)	Collaboration with mobile phone companies for dissemination of specific climate and health emergency response and preparedness messages
3.	Climate-resilient health care facility, health infrastructure, and WASH infrastructure: conduct assessments and enforce building codes for new infrastructures	<ul style="list-style-type: none"> Development and enforcement of building codes for health facilities Capacity of MoH in enforcing and monitoring building codes Cross-sectoral collaboration with WASH and energy sectors for increased resiliency of health facilities Mobilization of funding for new facilities 	n.a.	
4.	Climate adaptation and emergency preparedness training for local authorities and primary levels of health systems	<ul style="list-style-type: none"> Development of training modules directed to local-level key stakeholders that are in coordination with the CSBs Availability of formal standard operating procedures that focus on preparedness for climate-related hazards Funding available under PPSB 	~1	
5.	Upgrade infrastructure to be climate resilient based on new building codes	<ul style="list-style-type: none"> Cross-sectoral collaboration with WASH and Energy for increased resiliency of health facilities Mobilization of additional funding for upgrading the existing facilities 	~300	

Social Protection Priority Investments and Reforms

No.	Quick wins (Priority investments to implement in the next 3–5 years)	Enabling conditions (What will it take to implement the recommended intervention?)	Cost estimate (US\$, millions)	Private sector investment opportunities (low-hanging fruits)
1. Operationalize the social registry		<ul style="list-style-type: none"> International Development Association (IDA) support under SNRP Buy-in from key ministries and partners Collaboration with PRODIGY 	~1–2	
2. Increase scale and coverage of climate adaptative labor intensive public works		<ul style="list-style-type: none"> IDA support under SNRP Funding from Phase 2 of Regional Climate Resilience Project Mobilization of additional resources 	20–50	
3. Increase support to build household resilience to shocks through productive inclusion activities		<ul style="list-style-type: none"> IDA support under SNRP Mobilization of additional resources 	200 and up	
4. Establish functioning disaster risk financing mechanism		<ul style="list-style-type: none"> Availability of insurance or other financing mechanism (in collaboration with DRM colleagues) 	n.a.	
5. Access new sources of financing		<ul style="list-style-type: none"> Mobilization of significant and sustainable government financing Availability of new financing streams relating to Just Transition 	n.a.	

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Annex 1: Legal and Policy Framework for Adaptive Social Protection and Response to Climate and Other Shocks

Document	Relevance to adaptive social protection and shock response
National Social Protection Policy (2015)	<p>Strategic axis 1 aims to increase the incomes of the poorest and the specific objective (SO1) to scale up social transfers. SO1 provides for the establishment of cash transfers for emergency relief and post-disaster responses by providing nonfood support to disaster victims.</p>
Law 2015-031 on the National Risk and Disaster Management Policy (PNGRC)	<p>DRM is integrated into any development planning process, particularly in the areas of vulnerability reduction, climate change mitigation and adaptation, and poverty reduction (art. 5).</p> <p>DRM is based on the coherence and synergy of the actions of stakeholders throughout the national territory, through appropriate organizations, mechanisms and procedures (art. 7).</p> <p>At each level of intervention, DRM relies on structures that favor participatory and inclusive approaches in their organization and operation and advocate the principles of cooperation and synergy of actions (art. 13).</p> <p>The operational level ensures the coordination and implementation of the SNGRC through the development of intervention plans and their implementation, as well as the monitoring and evaluation of activities across the territory (art. 17).</p>
Law No. 2017-028 on the SP on the non-contributory scheme	<p>Law No. 2017-028 defines the forms of social protection and the structures for implementing the social protection policy of the noncontributory scheme.</p>
National Strategy for Social Protection (2019–23)	<p>Axis 1 on social transfers has as a strategic action (1.3) the adaptation to the context of poverty and vulnerability of the country through the following:</p> <ul style="list-style-type: none"> • A national system of shock-responsive social safety nets will be developed. • By 2019, 'shock-reactive social protection' approaches adapted to different areas of intervention and different types of shocks will be developed and piloted. • From 2020, after the evaluation of the pilot projects, these approaches will be gradually scaled up.
MoU on Shock-Reactive Social Protection between the MPSPPF and the MID (2019)	<p>The MoU signed on May 29, 2019, specifies the roles, responsibilities, and mutual relations of the parties. It sets out the steps to be followed (preparation, financing, implementation, monitoring and evaluation) in responding to crises involving the parties. It strengthens the framework for coordinating the parties' commitments in the preparedness, early warning, planning, response, and monitoring and evaluation phases.</p>
MoU between BNGRC and FID (2019)	<p>The MoU defines the roles and obligations of BNGRC and FID for the implementation and triggering mechanisms of the FID interventions in disaster response.</p>
Multisector cash group principles agreement (2019)	<p>An MoU on 10 principles for the coordination of cash response in emergencies: (1) coordination across the cash group, (2) information sharing, (3) joint analyses, (4) coordinated communication, (4) a manual of harmonized procedures, (5) a standard framework for monitoring, (6) a common and harmonized communication strategy, (7) joint advocacy, (8) links and coordination between the different levels, (9) a joint evaluation, and (10) links between general emergency response and development and resilience programming.</p>

Note: MID = Ministry of Interior and Decentralization; MPSPPF = Ministry of Population, Social Protection and Promotion of Women; SP = Social protection.

